relpol® S.A.

Catalogue 2021

Automation is our passion

www.relpol.com.pl

60 years of experience
in production of highest-quality relays

1958 Relay Division of REFA Świebodzice founded in Żary

1982 Independent enterprise of Zakład Przekaźników established

1991 Zakład Przekaźników transformed into Relpol S.A. in Żary

relpol S.A.®

1996 Relpol S.A. IPO at the Warsaw Stock Exchange

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2021 Relpol's presence in markets worldwide

Applications, certifications

Innovative features of our technological solutions and reliability of our products are confirmed by numerous recognitions and certifications: VDE, UL, CSA, EAC, LR, CCCs, IK and by prizes and awards.

Installation relays RPI
Bistable - impulse relays RPB
Time relays RPC
Monitoring relays RPN
Signal lamps RLK

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Installation contactors

Power supplies

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Electrical terminals						Coil / input				Type	Number and type of contacts / outputs	Rated current				
for PCB	SMT	for sockets	connectors	screw terminals	spring terminals	AC	DC	AC/DC	bistable DC		CO - changeover NO - normally open NC - normally closed	[A]	5	10	15	20
Subminiature - signal relays																
										RSM850	2 CO	2 A				
										RSM850B	2 CO	2 A				
										RSM822N	2 CO	3 A / 2 A (NO/NC)				
										RSM954N	1 CO	3 A				
										RSM957N	1 CO	1 A				
Miniature relays																
										RM12	1 CO, 1 NO	8 A				
										RM12N	1 CO, 1 NO	1 CO: 8 A, 1 NO: 10 A				
										RM32N	1 CO, 1 NO	1 CO: 5 A / 5 A (NO/NC)		1 NO: 5 A, 10 A ❸		
										RM40	1 CO, 1 NO	1 CO: 5 A, 1 NO: 8 A				
										RM45N	1 CO, 1 NO	1 CO: 5 A / 5 A (NO/NC)		1 NO: 5 A, 10 A ❸		
										RM50N	1 CO, 1 NO	6 A, 12 A ❸				
										RM51	1 CO, 1 NO	1 CO: 10 A / 7 A (NO/NC), 20 A ❸, 1 NO: 10 A, 20 A ❸				
										RM699B	1 CO, 1 NO	$AgSnO_2$, AgNi: 6 A				
										RM84	2 CO, 2 NO	8 A				
										RM85	1 CO, 1 NO	16 A				
										RM85 ❶	1 NO	16 A				
										RM85 inrush	1 NO	16 A				
										RM85 105 °C sensitive	1 NO	16 A				
										RM85 faston	1 NO	20 A				
										RM87	1 CO, 1 NO	12 A				
										RM87 sensitive	1 NO	10 A				
										RM96	1 CO, 1 NO, 1 NC	8 A				
										RM83	1 CO, 1 NO, 1 NC	16 A				
										RMP84	2 CO	8 A				
										RMP85	1 CO	16 A				
										RA2 ❷	1 CO, 1 NO, 2 NO	1 CO: 20 A / 12 A (NO/NC), 1 NO: 20 A				
Industrial relays																
										R2N	2 CO	12 A				
										R3N	3 CO	10 A				
										R4N	4 CO	7 A				
										RY2	2 CO	12 A				
										R2M	2 CO	5 A				

❶ **RM85** for switching higher voltages ❷ **RA2** - automotive relays (2 NO: 2 x 12,5 A) ❸ At lowered voltage

How to use the table: select the number and type of contacts, please; then, select a relay depending on its rated current, type of terminals and coil voltage.

The ordering code structure provides for formulation of **numerous variants**. Not all of them are defined as standard ones and, thus, not all of them are included in the product line. However, **deliveries of special versions according to the customer's specification are possible**. Please, contact with Relpol S.A. or our local representatives for details. The data of the devices may be changed with no prior notice.

Selection table

Electrical terminals						Coil / input				Type	Number and type of contacts / outputs	Rated current						
for PCB	for sockets	connectors	screw terminals	Push-in terminals	spring terminals	AC	DC	AC/DC	bistable DC		CO - changeover NO - normally open NC - normally closed	[A] 5	10	20	40	60	80
Industrial relays																	
										R15 - 2 CO	2 CO		10 A				
										R15 - 3 CO	3 CO		10 A				
										R15 - 4 CO	4 CO		10 A				
										RUC	2 CO, 3 CO, 2 NO, 3 NO		16 A				
										RUC-M	1 NO, 2 NO		16 A				
										RG25	2 NO			25 A			
										R20	1 NO, 2 NO			2 NO: 25 A, 1 NO: 30 A			
										R30N	1 CO, 1 NO			1 CO: 30 A / 20 A (NO/NC), 1 NO: 30 A			
										R40N	1 CO, 1 NO			1 CO: 40 A / 30 A (NO/NC), 1 NO: 40 A			
										RS35	2 NO				35 A		
										RS50	1 NO, 2 NO					50 A	
										RS80	1 NO						80 A
Interface relays																	
										PI84 with socket GZT80	2 CO		8 A				
										PI84 with socket GZM80	2 CO		8 A				
										PI84 with socket GZP80	2 CO		8 A				
										PI85 with socket GZT80	1 CO		12 A, 16 A ❹				
										PI85 with socket GZM80	1 CO		12 A, 16 A ❹				
										PI85 with socket GZP80	1 CO		12 A, 16 A ❹				
										PI85 inrush with socket GZT80	1 NO		12 A, 16 A ❹				
										PI84P with socket GZP80	2 CO		8 A				
										PI85P with socket GZP80	1 CO		12 A, 16 A ❹				
										PIR2 with socket GZM2	2 CO		12 A				
										PIR2 with socket GZP4	2 CO		12 A				
										PIR3 with socket GZM3	3 CO		10 A				
										PIR4 with socket GZM4	4 CO		7 A				
										PIR4 with socket GZP4	4 CO		7 A				
										PI6-1P	1 CO		$AgSnO_2$: 6 A				
										PI6-1T	1 NO		1,2 A				
										PIR6W-1P-...	1 CO		$AgSnO_2$: 6 A				
										PIR6W-1PS-... ❺	1 CO, 1 NO		R ($AgSnO_2$): 6 A	T, C: 1 A, O: 2 A			
										PIR6WB-1PS-... ❺	1 CO, 1 NO		R ($AgSnO_2$): 6 A	T, C: 1 A, O: 2 A			
										SIR6W-... ❻	1 CO, 1 NO		R ($AgSnO_2$): 6 A	T, C: 1 A, O: 2 A			
										SIR6WB-... ❻	1 CO, 1 NO		R ($AgSnO_2$): 6 A	T, C: 1 A, O: 2 A			

❹ See pages 267, 271, 275, 280, 288. ❺ Operational relay - electromagnetic **RM699BV** or solid state **RSR30**

How to use the table and the ordering code structure - see page 7.

Electrical terminals						Coil / input				Type	Number and type of contacts / outputs	Rated current
for PCB	for sockets	connectors	screw terminals	Push-in terminals	spring terminals	AC	DC	AC/DC	bistable DC		CO - changeover NO - normally open NC - normally closed	[A] 5 10 15 20
Relays for railroad industry												
										RM84	2 CO, 2 NO	8 A
										RM85	1 CO, 1 NO	16 A
										R2T	2 CO	12 A
										R3T	3 CO	10 A
										R4T	4 CO	7 A
										R15T - 2 CO	2 CO	10 A
										R15T - 3 CO	3 CO	10 A
										RUCT	3 CO, 3 NO	16 A
										RUCT-M	1 NO, 2 NO	16 A
										PI84T with socket GZT80-V0	2 CO	8 A
										PI85T with socket GZT80-V0	1 CO	16 A ❹
										PIR2T with socket GZT2-V0	2 CO	12 A
										PIR3T with socket GZT3-V0	3 CO	10 A
										PIR4T with socket GZT4-V0	4 CO	7 A
										PIR152T with socket PZ8-V0	2 CO	10 A
										PIR153T with socket PZ11-V0	3 CO	10 A
										PRUCT with socket GUC11S-V0	3 CO, 3 NO	16 A
										PRUCT-M with socket GUC11S-V0	1 NO, 2 NO	16 A
										MT-W...M	1 CO	10 A
Programmable relays												
										NEED-...-08-4R-.	4 NO	10 A
										NEED-...-08-4T-.	4 NO	0,5 A
										NEED-...-16-8R-.	8 NO	10 A
										NEED-...-16-8T-.	8 NO	0,5 A
										NEED-MODBUS		
Installation relays												
										RPI-.P-...	1 CO, 2 CO	2 CO: 8 A, 1 CO: 16 A
										RPI-.Z-...	1 NO, 2 NO	2 NO: 8 A, 1 NO: 16 A
										RPI-1ZI-D12	1 NO	16 A
										RPI-1ZI-U24A	1 NO	16 A
										RPI-.P-UNI	1 CO, 2 CO, 3 CO	2 CO, 3 CO: 8 A, 1 CO: 16 A
										RPI-.Z-UNI	1 NO, 2 NO, 3 NO	2 NO, 3 NO: 8 A, 1 NO: 16 A
Bistable - impulse relays												
										RPB-1P-...	1 CO	16 A
										RPB-1PM-...	1 CO	16 A
										RPB-2Z-...	2 NO	8 A
										RPB-1ZI-...	1 NO	16 A
										RPB-1PM-UNI	1 CO	16 A
										RPB-1ZMI-UNI	1 NO	16 A
										RPB-2PSM-UNI	2 x 1 CO	16 A
										RPB-2ZSMI-UNI	2 x 1 NO	16 A

❹ See page 362.

How to use the table and the ordering code structure - see page 7.

Electrical terminals						Coil / input				Type	Number and type of contacts / outputs	Rated current				
for PCB	for sockets	connectors	screw terminals	Push-in terminals	spring terminals	AC	DC	AC/DC	bistable DC		CO - changeover NO - normally open NC - normally closed	[A]	5	10	15	20
Time relays																
										MT-W...M	1 CO			10 A		
										RPC-.MA-…	1 CO, 2 CO			2 CO: 8 A, 1 CO: 16 A		
										RPC-.MB-…	1 CO, 2 CO			2 CO: 8 A, 1 CO: 16 A		
										RPC-2A-UNI	2 CO			8 A		
										RPC-1MC-UNI	1 CO					16 A
										RPC-.MD-UNI	1 CO, 3 CO					3 CO: 8 A, 1 CO: 16 A
										RPC-1ER-...	1 CO					16 A
										RPC-1EA-...	1 CO					16 A
										RPC-1ES-...	1 CO					16 A
										RPC-1EU-...	1 CO					16 A
										RPC-1IP-...	1 CO					16 A
										RPC-1SA-...	1 CO					16 A
										RPC-1WT-...	1 CO					16 A
										RPC-.E-...	1 CO, 2 CO					2 CO: 8 A, 1 CO: 16 A
										RPC-.WU-...	1 CO, 2 CO					2 CO: 8 A, 1 CO: 16 A
										RPC-.BP-...	1 CO, 2 CO					2 CO: 8 A, 1 CO: 16 A
										RPC-2SD-UNI	2 CO			8 A		
										RPC-1AS-A230	1 NO					16 A
										TR4N 1 CO	1 CO					16 A
										TR4N 2 CO	2 CO			8 A		
										TR4N 4 CO	4 CO		6 A			
										T-R4	4 CO		6 A			
										PIR15...T with time module COM3	2 CO, 3 CO			10 A		
										COM3						
Monitoring relays																
										RPN-1VF-A400	1 CO			12 A		
										RPN-1VFS-A400	1 CO			12 A		
										RPN-1VFR-A400	1 CO			12 A		
										RPN-1VFT-A400	1 CO			12 A		
										RPN-1A..-A230	1 CO			12 A		
										RPN-1TMP-A230	1 CO			12 A		
										MR-EU1W1P	1 CO		5 A			
										MR-EU31UW1P	1 CO		5 A			
										MR-EU3M1P	1 CO		5 A			
										MR-EI1W1P	1 CO		5 A			
										MR-ET1P	1 CO		5 A			
										MR-GU32P-TR2	2 CO		3 A / 5 A ❻			
										MR-GU3M2P-TR2	2 CO		3 A / 5 A ❻			
										MR-GU3M2P	2 CO		3 A / 5 A ❻			
										MR-GI1M2P-TR2	2 CO		3 A / 5 A ❻			
										MR-GT2P-TR2	2 CO		3 A / 5 A ❻			

❻ 3 A - if the distance between the relays mounted side by side is less than 5 mm; 5 A - if the distance between the relays mounted side by side is greater than 5 mm.

How to use the table and the ordering code structure - see page 7.

Electrical terminals						Coil / input				Type	Number and type of contacts / outputs	Rated current
for PCB	for sockets	connectors	screw terminals	Push-in terminals	spring terminals	AC	DC	AC/DC	bistable DC		CO - changeover NO - normally open NC - normally closed	[A] 5 10 20 40 60 80
Signal lamps												
										RLK-1.		
										RLK-3.		
Solid state relays												
										RSR32		2 A
										RSR35		0,1 A, 3 A, 4 A
										RSR52		10, 25, 40, 60, 80 A
										RSR62		25, 40, 60, 80 A
										RSR72		10, 20, 30, 40, 75 A
Installation contactors												
										RIK21	3 NO + 1 NO, 3 NO + 1 NC	20 A
										RIK20	2 NO, 1 NO + 1 NC, 2 NC	20 A
										RIK25	4 NO, 3 NO + 1 NC, 2 NO + 2 NC	25 A
										RIK40	4 NO, 3 NO + 1 NC, 2 NO + 2 NC, 4 NC	40 A
										RIK63	4 NO, 3 NO + 1 NC, 2 NO + 2 NC, 4 NC	63 A
										RIKN	2 NO, 1 NO + 1 NC	6 A
Power supplies												
										RZI10-12-M		0,83 A
										RZI10-24-M		0,42 A
										RZI30-12-M		2,1 A
										RZI30-24-M		1,25 A
										RZI60-12-M		4,5 A
										RZI60-24-M		2,5 A
										RZI100-24-M		3,8 A
										RZI60-24-P		2,5 A
										RZI120-24-P		5 A
										RZI240-24-P		10 A
										RZI480-24-P		20 A
										RZI-20R		20 A
										RZI-40R		40 A
										RZI-20B		20 A
										RZI-40B		40 A
										RZI-40UPS		40 A

How to use the table and the ordering code structure - see page 7.

Mounting options

Type	Method of mounting			
	For PCB mounting	On panel mounting	35 mm rail mount (EN 60715)	Flat insert - faston (connectors)
Subminiature - signal relays				
RSM850	direct	–	–	–
RSM850B	direct	–	–	–
RSM822N	direct	–	–	–
RSM954N	direct	–	–	–
RSM957N	direct	–	–	–
Miniature relays				
RM12	direct	–	–	–
RM12N	direct	–	–	–
RM32N	direct	–	–	–
RM40	direct	–	–	–
RM45N	direct	–	–	–
RM50N	direct	–	–	–
RM51	direct	–	–	–
RM699BV, RSR30 ❶	direct, with socket	–	with socket	–
RM699BH	direct	–	–	–
RM84	direct, with socket	with socket	with socket	–
RM85	direct, with socket	with socket	with socket	–
RM85 ❷	direct	–	–	–
RM85 inrush	direct, with socket	with socket	with socket	–
RM85 105 °C sensitive	direct, with socket	with socket	with socket	–
RM85 faston	direct	–	–	6,3 x 0,8 mm
RM87	direct, with socket	with socket	with socket	–
RM87 sensitive	direct, with socket	with socket	with socket	–
RM96 1 CO	direct	with socket	with socket	–
RM96 1 NO, 1 NC	direct	–	–	–
RM83	direct, with socket	–	–	–
RMP84	with socket	with socket	with socket	–
RMP85	with socket	with socket	with socket	–
RA2 ❸	direct	–	–	–

❶ Solid state relays **RSR30** - see www.relpol.com.pl ❷ **RM85** for switching higher voltages ❸ **RA2** - automotive relays

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Type	Method of mounting				
	For PCB mounting	On panel mounting	35 mm rail mount (EN 60715)	Cover with mounting flange - on panel mounting	Flat insert - faston (connectors)
Industrial relays					
R2N	with socket	with socket	with socket	–	–
R3N	–	with socket	with socket	–	–
R4N	direct, with socket	with socket	with socket	–	–
RY2	–	with socket	with socket	on request	4,8 x 0,5 mm
R2M	direct, with socket	with socket	with socket	–	–
R15 - 2 CO	direct	with socket	with socket	–	–
R15 - 3 CO	direct	with socket	with socket	–	–
R15 - 4 CO	–	with socket ❹	with socket	–	–
RUC faston 4,8x0,5	direct	with socket ❺ direct	with socket ❺ direct ❻	on request	4,8 x 0,5 mm
RUC faston 6,3x0,8	–	direct	direct ❻	on request	6,3 x 0,8 mm
RUC-M	direct	with socket ❺ direct	with socket ❺ direct ❻	on request	4,8 x 0,5 mm
RG25	–	–	direct	–	–
R20	–	direct	–	standard	6,3 x 0,8 mm
R30N	direct	–	–	–	–
R40N	direct	–	–	–	–
RS35	direct	–	–	–	–
RS50	direct	–	–	–	–
RS80	direct	–	–	–	–
Interface relays					
PI84 with socket GZT80	–	direct	direct	–	–
PI84 with socket GZM80	–	direct	direct	–	–
PI84 with socket GZP80	–	direct	direct	–	–
PI85 with socket GZT80	–	direct	direct	–	–
PI85 with socket GZM80	–	direct	direct	–	–
PI85 with socket GZP80	–	direct	direct	–	–
PI85 inrush with socket GZT80	–	direct	direct	–	–
PI84P with socket GZP80	–	direct	direct	–	–
PI85P with socket GZP80	–	direct	direct	–	–
PIR2 with socket GZM2	–	direct	direct	–	–
PIR2 with socket GZP4	–	direct	direct	–	–
PIR3 with socket GZM3	–	direct	direct	–	–
PIR4 with socket GZM4	–	direct	direct	–	–
PIR4 with socket GZP4	–	direct	direct	–	–

❹ Available sockets for connection behind panel mounting - GZ14Z, GZ14P ❺ For RUC faston 4,8 x 0,5 and RUC-M, with GUC11S-V0 socket, max. switching voltages and coil voltages of relays are limited to 250 V AC / DC ❻ Version with adaptor (V) or (H)

Mounting options

Type	Method of mounting		
	For PCB mounting	On panel mounting	35 mm rail mount (EN 60715)
Interface relays			
PI6-1P	–	–	direct
PI6-1T	–	–	direct
PIR6W-1P-...	–	–	direct
PIR6W-1PS-...	–	–	direct
PIR6WB-1PS-...	–	–	direct
SIR6W-...	–	–	direct
SIR6WB-...	–	–	direct
Relays for railroad industry			
RM84	–	with socket	with socket
RM85	–	with socket	with socket
R2T	–	with socket	with socket
R3T	–	with socket	with socket
R4T	–	with socket	with socket
R15T - 2 CO	–	with socket	with socket
R15T - 3 CO	–	with socket	with socket
RUCT	–	–	with socket
RUCT-M	–	–	with socket
PI84T with socket GZT80-V0	–	direct	direct
PI85T with socket GZT80-V0	–	direct	direct
PIR2T with socket GZT2-V0	–	direct	direct
PIR3T with socket GZT3-V0	–	direct	direct
PIR4T with socket GZT4-V0	–	direct	direct
PIR152T with socket PZ8-V0	–	direct	direct
PIR153T with socket PZ11-V0	–	direct	direct
PRUCT with socket GUC11S-V0	–	–	direct
PRUCT-M with socket GUC11S-V0	–	–	direct
MT-W...M	–	–	direct
Programmable relays			
NEED-...-08-4…	–	direct	direct
NEED-...-16-8…	–	direct	direct
NEED-MODBUS	–	–	direct
Solid state relays			
RSR32	direct	–	–
RSR35	direct	–	–
RSR52	–	with heatsink direct	with heatsink
RSR62	–	with heatsink	with heatsink
RSR72	–	–	direct ❼

❼ Relay integrated with heatsink

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Type	Method of mounting
	35 mm rail mount (EN 60715)
Installation relays	
RPI-.P-...	direct
RPI-.Z-...	direct
RPI-1ZI-D12	direct
RPI-1ZI-U24A	direct
RPI-.P-UNI	direct
RPI-.Z-UNI	direct
Bistable - impulse relays	
RPB-1P-...	direct
RPB-1PM-...	direct
RPB-2Z-...	direct
RPB-1ZI-...	direct
RPB-1PM-UNI	direct
RPB-1ZMI-UNI	direct
RPB-2PSM-UNI	direct
RPB-2ZSMI-UNI	direct
Monitoring relays	
RPN-1VF-A400	direct
RPN-1VFS-A400	direct
RPN-1VFR-A400	direct
RPN-1VFT-A400	direct
RPN-1A..-A230	direct
RPN-1TMP-A230	direct
MR-EU1W1P	direct
MR-EU31UW1P	direct
MR-EU3M1P	direct
MR-EI1W1P	direct
MR-ET1P	direct
MR-GU32P-TR2	direct
MR-GU3M2P-TR2	direct
MR-GU3M2P	direct
MR-GI1M2P-TR2	direct
MR-GT2P-TR2	direct
Signal lamps	
RLK-1G	direct
RLK-1R	direct
RLK-1Y	direct
RLK-3G	direct
RLK-3R	direct
RLK-3K	direct

Type	Method of mounting	
	On panel mounting	35 mm rail mount (EN 60715)
Time relays		
MT-W...M	–	direct
RPC-.MA-…	–	direct
RPC-.MB-…	–	direct
RPC-2A-UNI	–	direct
RPC-1MC-UNI	–	direct
RPC-.MD-UNI	–	direct
RPC-1ER-...	–	direct
RPC-1EA-...	–	direct
RPC-1ES-...	–	direct
RPC-1EU-...	–	direct
RPC-1IP-...	–	direct
RPC-1SA-...	–	direct
RPC-1WT-...	–	direct
RPC-.E-...	–	direct
RPC-.WU-...	–	direct
RPC-.BP-...	–	direct
RPC-2SD-UNI	–	direct
RPC-1AS-A230	–	direct
TR4N 1 CO	–	direct
TR4N 2 CO	–	direct
TR4N 4 CO	–	direct
T-R4	with socket	with socket
PIR15...T with time module COM3	direct	direct
COM3	with socket	with socket
Installation contactors		
RIK21	–	direct
RIK20	–	direct
RIK25	–	direct
RIK40	–	direct
RIK63	–	direct
RIKN	–	direct
Power supplies		
RZI10-..-M	–	direct
RZI30-..-M	direct	direct
RZI60-..-M	direct	direct
RZI100-24-M	direct	direct
RZI60-24-P	–	direct
RZI120-24-P	–	direct
RZI240-24-P	–	direct
RZI480-24-P	–	direct
RZI-..R	–	direct
RZI-..B	–	direct
RZI-40UPS	–	direct

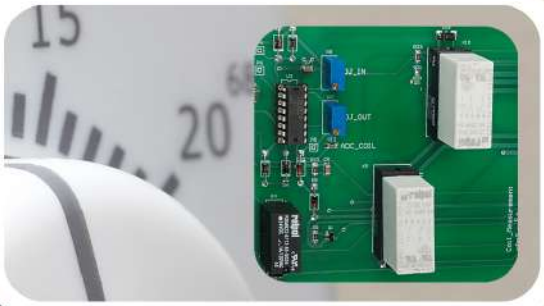
Relays
for electronics

Subminiature - signal relays

- I_n currents of contacts: 0,5 ... 3 A.
- Methods of mounting: THT, SMT - depending on the type of relay.

Applications:

- telecommunication equipment,
- office equipment,
- measurement equipment and devices,
- medical apparatus and medical monitoring equipment,
- audiovisual equipment,
- driving simulators, flight simulators,
- slot machines,
- protection, monitoring and alarm equipment,
- industrial and consumer electronic goods.



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Miniature relays

- I_n currents of contacts: 5 ... 20 A.
- Methods of mounting: THT, in plug-in sockets - depending on the type of relay.

Applications:

- general control of electrical equipment,
- equipment for air-conditioning, refrigeration products, heating, ventilation, lighting,
- protection, monitoring and alarm equipment,
- control systems and devices for household equipment,
- time relays and time switches,
- monitoring relays,
- temperature controllers,
- PLCs,
- electrical automation systems - industrial and power-engineering automation,
- equipment for smart buildings and equipment for automation of buildings,
- other.

Bistable relays - subminiature

- I_n currents of contacts: 0,5 A.
- Method of mounting: THT.

Applications:

- for energy-saving control of electrical devices which are switched on and off with a change of the state of bistable relays via short supply of their coils,
- in electrical systems of battery-powered equipment,
- applications specified in description of subminiature relays.

RSM850 version THT

Subminiature relays - electromagnetic

Contacts: 2 CO

Rated load: **AC1 - 0,5 A / 125 V AC; DC1 - 2 A / 30 V DC**

Coils: DC - 3, 5, 6, 9, 12, 24 V

Mounting: for PCB

page 102

RSM850 version SMT

Subminiature relays - electromagnetic

Contacts: 2 CO

Rated load: **AC1 - 0,5 A / 125 V AC; DC1 - 2 A / 30 V DC**

Coils: DC - 3, 5, 6, 9, 12, 24 V

Mounting: for surface mounting SMT

page 102

RSM850B

Subminiature relays - electromagnetic; bistable with one coil

Contacts: 2 CO

Rated load: **AC1 - 0,5 A / 125 V AC; DC1 - 2 A / 30 V DC**

Coils: DC - 3, 5, 6, 9, 12, 24 V

Mounting: for PCB

page 105

RSM822N

Subminiature relays - electromagnetic

Contacts: 2 CO

Rated load: **AC1 - 0,6 A / 125 V AC; DC1 - 3 A / 2 A** (NO/NC) **/ 30 V DC**

Coils: DC - 3, 5, 6, 9, 12, 24 V (sensitive coil), 48 V (standard coil)

Mounting: for PCB

page 108

RSM954N

Subminiature relays - electromagnetic

Contacts: 1 CO

Rated load: **AC1 - 3 A / 125 V AC; DC1 - 3 A / 30 V DC**

Coils: DC - 3, 5, 6, 9, 12, 24 V

Mounting: for PCB

page 111

RSM957N

Subminiature relays - electromagnetic

page 113

Contacts: 1 CO

Rated load: **AC1 - 0,5 A / 125 V AC; DC1 - 1 A / 30 V DC**

Coils: DC - 3, 5, 6, 9, 12, 24 V (sensitive coil)

Mounting: for PCB

RM12

Miniature relays - electromagnetic

page 116

Contacts: 1 CO, 1 NO

Rated load: **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Coils: DC - 5, 6, 9, 12, 18, 24, 48, 60 V

Mounting: for PCB

RM12N

Miniature relays - electromagnetic

page 119

Contacts: 1 CO, 1 NO

Rated load:
1 CO - **AC1 - 8 A / 250 V AC; DC1 - 8 A / 30 V DC**
1 NO - **AC1 - 10 A / 250 V AC; DC1 - 10 A / 30 V DC**

Coils: DC - 5, 9, 12, 18, 24, 48 V

Mounting: for PCB

RM32N

Miniature relays - electromagnetic

page 122

Contacts: 1 CO, 1 NO

Rated load:
1 CO (NO/NC) - **AC1 - 5 A / 5 A / 250 V AC; DC1 - 5 A / 5 A / 28 V DC**
1 NO - **AC1 - 5 A / 250 V AC, 10 A / 125 V AC; DC1 - 5 A / 28 V DC**

Coils: DC - 5, 9, 12, 18, 24 V (sensitive coil, standard coil)

Mounting: for PCB

RM40

Miniature relays - electromagnetic

page 125

Contacts: 1 CO, 1 NO

Rated load:
1 CO - **AC1 - 5 A / 250 V AC; DC1 - 5 A / 30 V DC**
1 NO - **AC1 - 8 A / 250 V AC; DC1 - 8 A / 30 V DC**

Coils: DC - 3, 5, 6, 9, 12, 24, 48 V

Mounting: for PCB

RM45N

Miniature relays - electromagnetic

page 128

Contacts: 1 CO, 1 NO

Rated load:
1 CO (NO/NC) - **AC1 - 5 A / 5 A / 250 V AC; DC1 - 5 A / 5 A / 28 V DC**
1 NO - **AC1 - 5 A / 250 V AC, 10 A / 125 V AC; DC1 - 5 A / 28 V DC**

Coils: DC - 5, 9, 12, 24 V (sensitive coil, standard coil)

Mounting: for PCB

RM50N

Miniature relays - electromagnetic

page 131

Contacts: 1 CO, 1 NO

Rated load:
AC1 - 6 A / 250 V AC, 12 A / 125 V AC; DC1 - 12 A / 28 V DC

Coils: DC - 5, 9, 12, 24, 48 V

Mounting: for PCB

RM51

Miniature relays - electromagnetic

page 134

Contacts: 1 CO, 1 NO

Rated load:
1 CO (NO/NC) - **AC1 - 10 A / 7 A / 250 V AC; DC1 - 10 A / 7 A / 30 V DC**
1 NO - **AC1 - 10 A / 250 V AC, 20 A / 125 V AC; DC1 - 10 A / 30 V DC**

Coils: DC - 5, 9, 12, 24, 48 V

Mounting: for PCB

RM699B

Miniature relays - electromagnetic

page 137

Contacts: 1 CO, 1 NO

Rated load: **AC1 - 6 A / 250 V AC; DC1 - 6 A / 30 V DC**

Coils: DC - 5, 6, 9, 12, 24, 48, 60 V

Mounting: RM699BV - for PCB, for plug-in sockets
RM699BH - for PCB

Accessories: screw terminals sockets - PI6W, 6W;
spring terminals sockets - PI6WB, 6WB; sockets for PCB - GD699 **(pages 396-397)**

RM84

Miniature relays - electromagnetic

page 141

Contacts: 2 CO, 2 NO

Rated load: **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Coils: DC - 3, 5, 6, 9, 12, 18, 24, 36, 48, 60, 110 V
AC - 12, 24, 48, 60, 110, 115, 120, 220, 230, 240 V

Available special versions: with increased contact gap, in transparent cover

Mounting: for PCB, for plug-in sockets; Accessories: screw terminals sockets - GZT80, GZM80, GZS80, GZF80; Push-in terminals sockets - GZP80; sockets for PCB - PW80, EC 50, GD50 **(pages 382-384)**; modules type M...

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RM85

Miniature relays - electromagnetic

page 146

Contacts: 1 CO, 1 NO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Coils: DC - 3, 5, 6, 9, 12, 18, 24, 36, 48, 60, 110 V
AC - 12, 24, 48, 60, 110, 115, 120, 220, 230, 240 V

Available special versions: with increased contact gap, in transparent cover

Mounting: for PCB, for plug-in sockets; Accessories: screw terminals sockets - GZT80, GZM80, GZS80, GZF80; Push-in terminals sockets - GZP80; sockets for PCB - PW80, EC 50, GD50 **(pages 382-384)**; modules type M...

RM85 special version

Miniature relays - electromagnetic,
for switching higher voltages - up to 480 V AC

page 151

Contacts: 1 NO

Rated load:
AC1 - 5 A / 480 V AC, 16 A / 250 V AC; DC1 - 16 A / 24 V DC

Coils: DC - 3, 5, 6, 9, 12, 18, 24, 36, 48, 60, 110 V

Mounting: for PCB

RM85 inrush

Miniature relays - electromagnetic

page 154

Contacts: 1 NO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Coils: DC - 3, 5, 6, 9, 12, 18, 24, 36, 48, 60, 110 V

Mounting: for PCB, for plug-in sockets

Accessories: screw terminals sockets - GZT80, GZM80, GZS80, GZF80; Push-in terminals sockets - GZP80; sockets for PCB - PW80, EC 50, GD50 **(pages 382-384)**; modules type M...

RM85 105 °C sensitive

Miniature relays - electromagnetic,
ambient temperature up to 105 °C

page 158

Contacts: 1 NO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Coils: DC - 5, 6, 9, 10, 12, 18, 24, 48 V (sensitive coil)

Mounting: for PCB, for plug-in sockets

Accessories: screw terminals sockets - GZT80, GZM80, GZS80, GZF80; Push-in terminals sockets - GZP80; sockets for PCB - PW80, EC 50, GD50 **(pages 382-384)**; modules type M...

RM85 faston

Miniature relays - electromagnetic

page 162

Contacts: 1 NO

Rated load: **AC1 - 20 A / 250 V AC; DC1 - 20 A / 24 V DC**

Coils: DC - 5, 6, 9, 10, 12, 18, 24, 48 V (sensitive coil)

Mounting: for PCB, for flat insert connectors - faston 250 (6,3 x 0,8 mm)

RM87

Miniature relays - electromagnetic

page 165

Contacts: 1 CO, 1 NO

Rated load: **AC1 - 12 A / 250 V AC; DC1 - 12 A / 24 V DC**

Coils: DC - 3, 5, 6, 9, 12, 18, 24, 36, 48, 60, 110 V
AC - 12, 24, 48, 60, 110, 115, 120, 220, 230, 240 V

Available special versions: with increased contact gap, in transparent cover

Mounting: for PCB, for plug-in sockets; Accessories: screw terminals sockets - GZT80, GZM80, GZS80, GZF80, GZT92, GZM92, GZS92; Push-in terminals sockets - GZP80; sockets for PCB - PW80, EC 50, GD50, EC 35, GD35 **(pages 382-385)**; modules type M...

RM87 sensitive

Miniature relays - electromagnetic

page 165

Contacts: 1 NO

Rated load: **AC1 - 10 A / 250 V AC; DC1 - 10 A / 24 V DC**

Coils: DC - 5, 6, 9, 10, 12, 18, 24, 48 V (sensitive coil)

Mounting: for PCB, for plug-in sockets

Accessories: screw terminals sockets - GZT80, GZM80, GZS80, GZF80, GZT92, GZM92, GZS92; Push-in terminals sockets - GZP80; sockets for PCB - PW80, EC 50, GD50, EC 35, GD35 **(pages 382-385)**; modules type M...

RM96

Miniature relays - electromagnetic

page 171

Contacts: 1 CO, 1 NO, 1 NC

Rated load: **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Coils: DC - 5, 6, 9, 12, 18, 24, 48 V

Mounting: 1 CO - for PCB, for plug-in sockets
1 NO, 1 NC - for PCB

Accessories: screw terminals sockets - ES 32 **(pages 385)**; modules type M...

RM83

Miniature relays - electromagnetic

page 175

Contacts: 1 CO, 1 NO, 1 NC

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Coils: DC - 5, 6, 9, 12, 18, 24, 36, 48, 60, 110 V (standard coil), 110 V (sensitive coil)

Available special versions: in transparent cover

Mounting: for PCB, for plug-in sockets

Accessories: sockets for PCB - PW80, EC 50, GD50 **(pages 383-384)**

RMP84

Miniature relays - electromagnetic

page 179

Contacts: 2 CO

Rated load: **AC1 - 8 A / 250 V AC**

Coils: DC - 12, 24, 48, 110 V; AC - 24, 115, 230 V

Equipment: standard - mechanical indicator (W), lockable front test button (T)
option - light indicator - LED diode (L)

Mounting: for plug-in sockets

Accessories: screw terminals sockets - GZF80; Push-in terminals sockets - GZP80; sockets for PCB - EC 50, GD50 **(pages 383-384)**; modules type M...

RMP85

Miniature relays - electromagnetic

page 183

Contacts: 1 CO

Rated load: **AC1 - 16 A / 250 V AC**

Coils: DC - 12, 24, 48, 110 V; AC - 24, 115, 230 V

Equipment: standard - mechanical indicator (W), lockable front test button (T)
option - light indicator - LED diode (L)

Mounting: for plug-in sockets

Accessories: screw terminals sockets - GZF80; Push-in terminals sockets - GZP80; sockets for PCB - EC 50, GD50 **(pages 383-384)**; modules type M...

RA2

Miniature relays - automotive relays

page 187

Contacts: 1 CO, 1 NO, 2 NO

Rated current:
1 CO (NO/NC) - **20 A / 12 A;** 1 NO - **20 A;** 2 NO - **2 x 12,5 A**

Coils: DC - 5, 6, 9, 12, 15, 18, 24, 48 V

Mounting: for PCB

Relays
for industry

Miniature industrial relays

- I_n currents of contacts: 5 ... 12 A.
- Methods of mounting:
  in plug-in sockets,
  direct on panel mounting, THT
  - depending on the type of relay.

Industrial relays of small dimensions

- I_n currents of contacts: 10 ... 40 A.
- Methods of mounting:
  in plug-in sockets,
  direct on 35 mm rail mount,
  direct on panel mounting, THT
  - depending on the type of relay.

Applications:

- general control of electrical equipment,
- industrial control systems,
- equipment for air-conditioning, refrigeration products, heating, ventilation, lighting,
- protection, monitoring and alarm equipment,
- control systems and devices for household equipment,
- electrical automation systems - industrial and power-engineering automation,
- building automation equipment (BMS),
- other.

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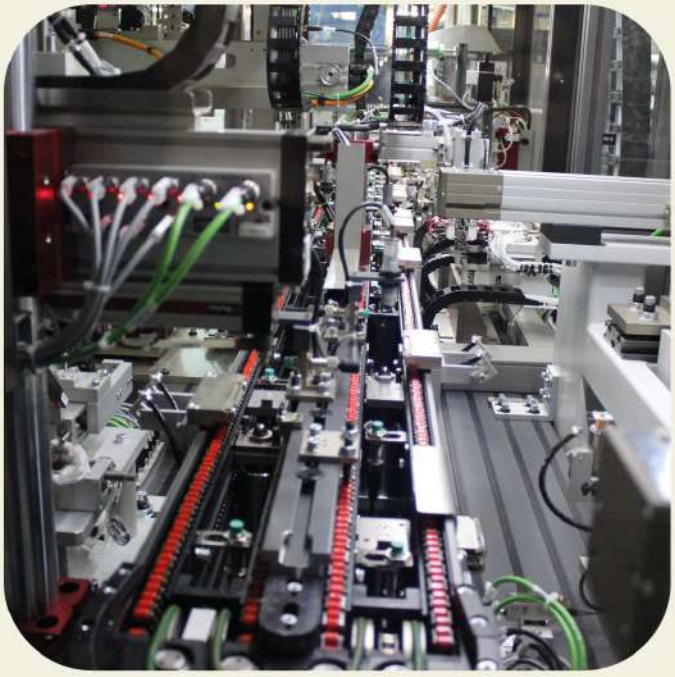

Interface relays (relay coupling modules)

- I_n currents of contacts: 1 ... 16 A.
- Connections of wiring: screw terminals, spring terminals - depending on the type of relay.
- Methods of mounting:
  - PI84, PI85, PIR2, PIR3, PIR4: on 35 mm rail mount or on panel mounting,
  - PI84P, PI85P, PI6, PIR6W, PIR6WB, SIR6W, SIR6WB: on 35 mm rail mount.

Applications:

- in applications with PLCs as input / output [I/O] separators,
- in industrial automation applications for isolation of input signals from output circuits,
- in electrical applications as universal interfaces between control and load, for medium load switching,
- applications specified in descriptions of relays - miniature industrial and industrial of small dimensions.

R2N - contacts 2 CO

Industrial relays - electromagnetic

page 191

R3N - contacts 3 CO

page 197

R4N - contacts 4 CO

page 202

R2N, **R3N** -

R4N -

Contacts: 2 CO, 3 CO, 4 CO

Rated load:
2 CO - **AC1 - 12 A / 250 V AC; DC1 - 12 A / 24 V DC**
3 CO - **AC1 - 10 A / 250 V AC; DC1 - 10 A / 24 V DC**
4 CO - **AC1 - 7 A / 230 V AC (VDE), 6 A / 250 V AC; DC1 - 6 A / 24 V DC**

Coils: DC - 5, 6, 12, 24, 48, 60, 80, 110, 125, 220 V
AC - 6, 12, 24, 42, 48, 60, 80, 110, 115, 120, 127, 220, 230, 240 V

Equipment:
standard - mechanical indicator (W), lockable front test button (T)
option - light indicator - LED diode (L), surge suppression element - diode (D)

Mounting:
R2N, **R3N** - for plug-in sockets
R4N - for plug-in sockets, for PCB

Accessories:
R2N - screw terminals sockets - GZT2, GZM2;
Push-in terminals sockets - GZP4;
sockets for PCB - SU4/2D;
solder terminals sockets - SU4/2L, G4/2 **(pages 386-387)**
R3N - screw terminals sockets - GZT3, GZM3 **(pages 387)**
R4N - screw terminals sockets - GZT4, GZM4, GZ4, GS4;
Push-in terminals sockets - GZP4;
sockets for PCB - SU4D;
solder terminals sockets - SU4L, G4 **(pages 388-390)**
modules type M...

RY2

Industrial relays - electromagnetic

page 208

Contacts: 2 CO

Rated load: **AC1 - 12 A / 250 V AC; DC1 - 12 A / 30 V DC**

Coils: DC - 5, 6, 12, 24, 48, 60, 80, 110, 125, 220 V
AC - 6, 12, 24, 42, 48, 60, 80, 110, 120, 127, 220, 230, 240 V

Equipment: option - light indicator - LED diode (L), surge suppression element - diode (D)

Mounting: for plug-in sockets, for flat insert connectors - faston 187 (4,8 x 0,5 mm)
- direct on panel (cover with mounting flange)

Accessories: screw terminals sockets - GZY2G **(pages 390)**

R2M

Industrial relays - electromagnetic

page 212

Contacts: 2 CO

Rated load: **AC1 - 5 A / 250 V AC; DC1 - 5 A / 24 V DC**

Coils: DC - 6, 12, 24, 48, 60, 80, 110 V
AC - 6, 12, 24, 50, 100, 110, 115, 120, 220, 230, 240 V

Mounting: for plug-in sockets, for PCB

Accessories: screw terminals sockets - GZ2;
sockets for PCB - S2M; solder terminals sockets - G2M **(pages 390-391)**

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R15 - contacts 2 CO

Industrial relays - electromagnetic

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R15 - contacts 3 CO

page 216

R15 - contacts 4 CO

page 221

R15 - 2 CO, 3 CO -

R15 - 4 CO -

Contacts: 2 CO, 3 CO, 4 CO

Rated load:
AC1 - 10 A / 250 V AC; DC1 - 10 A / 24 V DC

Coils:
R15 - 2 CO, **3 CO** - DC - 6, 12, 24, 40, 48, 60, 110, 120, 220 V
R15 - 4 CO - DC - 6, 12, 24, 48, 60, 110, 120, 220 V
R15 - 2 CO, **3 CO** - AC - 6, 12, 24, 48, 60, 115, 120, 220, 230, 240 V
R15 - 4 CO - AC - 6, 12, 24, 48, 60, 115, 120, 220, 230, 240, 400 V (50 Hz)
R15 - 4 CO - AC - 6, 12, 24, 48, 60, 110, 120, 220, 230, 240 V (60 Hz)

Equipment:
R15 - 2 CO, **3 CO** standard - mechanical indicator (W), lockable front test button (T)
R15 - 2 CO, **3 CO** option - light indicator - LED diode (L),
surge suppression element - diode (D), varistor (V)
R15 - 4 CO option - test button without block functions (K),
light indicator - LED diode (L), surge suppression element - diode (D)

Mounting: for plug-in sockets

Accessories:
R15 - 2 CO - screw terminals sockets, for mounting: on 35 mm rail mount
or on panel - PZ8, GZP8; on 35 mm rail mount - GZU8; on panel - GZ8;
solder terminals sockets - GOP8 **(pages 391-392)**
R15 - 3 CO - screw terminals sockets, for mounting: on 35 mm rail mount
or on panel - PZ11, GZP11; on 35 mm rail mount - GZU11; on panel - GZ11;
solder terminals sockets - GOP11 **(pages 392-393)**
R15 - 4 CO - screw terminals sockets, for mounting: on 35 mm rail mount - GZ14U;
on panel - GZ14; on panel, behind: GZ14Z;
Push-in terminals sockets, for mounting on panel, behind - GZ14P;
solder terminals sockets - GOP14 **(pages 393-395)**
modules type 21, 41; time modules COM3

RUC faston 4,8 x 0,5

Industrial relays - electromagnetic

page 225

RUC faston 6,3 x 0,8

page 225

Contacts: 2 CO, 3 CO, 2 NO, 3 NO
(available special versions 2 NO, 3 NO with contact gap ≥ 3 mm)

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Coils: DC - 6, 12, 24, 42, 48, 60, 110, 120, 220 V (standard coil)
DC - 12, 24, 48, 110, 220 V (reinforced coil)
AC - 6, 12, 24, 115, 120, 220, 230, 240 V (50/60 Hz)
AC - 400 V (50 Hz)

Equipment: option - test button without block functions (K), light indicator - LED diode (L)

Mounting:
RUC faston 4,8 x 0,5 - for plug-in sockets, direct on panel (cover with mounting flange),
direct on 35 mm rail mount (cover with adaptors: vertical V, horizontal H)
RUC faston 6,3 x 0,8 - direct on panel (cover with mounting flange),
direct on 35 mm rail mount (cover with adaptors: vertical V, horizontal H)
RUC - for PCB

Accessories: screw terminals sockets - GUC11S-V0 **(pages 394)**

RUC-M
faston 4,8 x 0,5

Industrial relays - electromagnetic; with permanent magnet whose magnetic field blows the electric arc between the contacts; for high DC loads

page 232

Contacts: 1 NO (double-break), 2 NO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 12 A** (1 NO); **4,5 A** (2 NO) **/ 220 V DC**

Coils: DC - 12, 24, 48, 110, 220 V (reinforced coil)
AC - 12, 24, 48, 115, 120, 230, 240 V

Equipment: option - light indicator - LED diode (L)
Mounting: for plug-in sockets, direct on panel (cover with mounting flange),
direct on 35 mm rail mount (cover with adaptors: vertical V, horizontal H), for PCB
Accessories: screw terminals sockets - GUC11S-V0 **(pages 394)**

RG25

Industrial relays - electromagnetic

page 237

Contacts: 2 NO

Rated load: **AC1 - 25 A / 400 V AC; DC1 - 25 A / 24 V DC**

Coils: DC - 12, 24, 48, 110, 220 V; AC - 12, 24, 110, 230, 400 V

Mounting: direct on 35 mm rail mount

R20

Industrial relays - electromagnetic

page 240

Contacts: 1 NO, 2 NO

Rated load:
1 NO - **AC1 - 30 A / 250 V AC**
2 NO - **AC1 - 25 A / 250 V AC**

Coils: DC - 12, 24, 110 V; AC - 24, 48, 115, 230 V

Mounting: for flat insert connectors - faston 250 (6,3 x 0,8 mm)
- direct on panel (cover with mounting flange)

R30N

Industrial relays - electromagnetic

page 243

Contacts: 1 CO, 1 NO

Rated load:
1 CO (NO/NC) - **AC1 - 30 A / 20 A / 240 V AC; DC1 - 30 A / 20 A / 14 V DC**
1 NO - **AC1 - 30 A / 240 V AC; DC1 - 30 A / 14 V DC**

Coils: DC - 5, 12, 24, 48, 110 V

Mounting: for PCB

R40N

Industrial relays - electromagnetic

page 246

Contacts: 1 CO, 1 NO

Rated load:
1 CO (NO/NC) - **AC1 - 40 A / 30 A / 240 V AC; DC1 - 40 A / 30 A / 30 V DC**
1 NO - **AC1 - 40 A / 240 V AC; DC1 - 40 A / 30 V DC**

Coils: DC - 5, 12, 24, 48, 110 V; AC - 12, 24, 110, 120, 220 V

Mounting: for PCB

PI84 - GZT80

Interface relays; with plug-in socket GZT80

page 253

Contacts: 2 CO

Rated load: **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Coils: DC - 12, 24, 48, 110 V; AC - 12, 24, 48, 120, 230, 240 V

Set: electromagnetic relay RM84, plug-in socket GZT80, module type M..., clip GZT80-0040, plate GZT80-0035

Mounting: direct on 35 mm rail mount or on panel

Accessories: interconnection strips ZGGZ80

PI84 - GZM80

Interface relays; with plug-in socket GZM80

page 257

Contacts: 2 CO

Rated load: **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Coils: DC - 12, 24, 48, 60, 110 V; AC - 12, 24, 120, 230, 240 V

Set: electromagnetic relay RM84, plug-in socket GZM80, module type M..., clip GZT80-0040, plate GZT80-0035

Mounting: direct on 35 mm rail mount or on panel

Accessories: interconnection strips ZGGZ80

PI84 - GZP80

Interface relays; with plug-in socket GZP80; Push-in terminals

page 261

Contacts: 2 CO

Rated load: **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Coils: DC - 12, 24, 48, 110 V; AC - 12, 24, 48, 120, 230 V

Set: electromagnetic relay RM84, plug-in socket GZP80, module type M..., clip GZP80-0400

Mounting: direct on 35 mm rail mount or on panel

Accessories: plates MP15, interconnection strips ZGZP...

PI85 - GZT80

Interface relays; with plug-in socket GZT80

page 266

Contacts: 1 CO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Coils: DC - 12, 24, 48, 110 V; AC - 12, 24, 48, 120, 230, 240 V

Set: electromagnetic relay RM85, plug-in socket GZT80, module type M..., clip GZT80-0040, plate GZT80-0035

Mounting: direct on 35 mm rail mount or on panel

Accessories: interconnection strips ZGGZ80

PI85 - GZM80

Interface relays; with plug-in socket GZM80

page 270

Contacts: 1 CO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Coils: DC - 12, 24, 48, 60, 110 V; AC - 12, 24, 120, 230, 240 V

Set: electromagnetic relay RM85, plug-in socket GZM80, module type M..., clip GZT80-0040, plate GZT80-0035

Mounting: direct on 35 mm rail mount or on panel

Accessories: interconnection strips ZGGZ80

PI85 - GZP80

Interface relays; with plug-in socket GZP80; Push-in terminals

page 274

Contacts: 1 CO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Coils: DC - 12, 24, 48, 110 V; AC - 12, 24, 48, 120, 230 V

Set: electromagnetic relay RM85, plug-in socket GZP80, module type M..., clip GZP80-0400

Mounting: direct on 35 mm rail mount or on panel

Accessories: plates MP15, interconnection strips ZGZP...

PI85 inrush - GZT80

Interface relays; with plug-in socket GZT80

page 279

Contacts: 1 NO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Coils: DC - 12, 24, 110 V

Set: electromagnetic relay RM85 inrush, plug-in socket GZT80, module type M..., clip GZT80-0040, plate GZT80-0035

Mounting: direct on 35 mm rail mount or on panel

Accessories: interconnection strips ZGGZ80

PI84P - GZP80

Interface relays; with plug-in socket GZP80; Push-in terminals

page 283

Contacts: 2 CO

Rated load: **AC1 - 8 A / 250 V AC**

Coils: DC - 12, 24, 48, 110 V; AC - 24, 115, 230 V

Set: electromagnetic relay RMP84, plug-in socket GZP80, module type M..., clip GZP80-0400

Mounting: direct on 35 mm rail mount or on panel

Accessories: plates MP15, interconnection strips ZGZP...

PI85P - GZP80

Interface relays; with plug-in socket GZP80; Push-in terminals

page 287

Contacts: 1 CO

Rated load: **AC1 - 16 A / 250 V AC**

Coils: DC - 12, 24, 48, 110 V; AC - 24, 115, 230 V

Set: electromagnetic relay RMP85, plug-in socket GZP80, module type M..., clip GZP80-0400

Mounting: direct on 35 mm rail mount or on panel

Accessories: plates MP15, interconnection strips ZGZP...

PIR2 - GZM2

Interface relays; with plug-in socket GZM2

page 291

Contacts: 2 CO

Rated load: **AC1 - 12 A / 250 V AC; DC1 - 12 A / 24 V DC**

Coils: DC - 12, 24, 48, 110 V; AC - 12, 24, 48, 120, 230 V

Set: electromagnetic relay R2N, plug-in socket GZM2, module type M..., clip GZT4-0040, plate GZT4-0035

Mounting: direct on 35 mm rail mount or on panel

Accessories: interconnection strips ZGGZ4

PIR2 - GZP4

Interface relays; with plug-in socket GZP4; Push-in terminals

page 295

Contacts: 2 CO

Rated load: **AC1 - 12 A / 250 V AC; DC1 - 12 A / 24 V DC**

Coils: DC - 12, 24, 48, 110 V; AC - 12, 24, 48, 120, 230 V

Set: electromagnetic relay R2N, plug-in socket GZP4, module type M..., clip GZP4-0400

Mounting: direct on 35 mm rail mount or on panel

Accessories: plates MP15, interconnection strips ZGZP...

PIR3 - GZM3

Interface relays; with plug-in socket GZM3

page 300

Contacts: 3 CO

Rated load: **AC1 - 10 A / 250 V AC; DC1 - 10 A / 24 V DC**

Coils: DC - 12, 24, 48, 110 V; AC - 12, 24, 48, 120, 230 V

Set: electromagnetic relay R3N, plug-in socket GZM3, module type M..., clip GZT4-0040, plate GZT4-0035

Mounting: direct on 35 mm rail mount or on panel

Accessories: interconnection strips ZGGZ4

PIR4 - GZM4

Interface relays; with plug-in socket GZM4

page 304

Contacts: 4 CO

Rated load: **AC1 - 7 A / 230 V AC, 6 A / 250 V AC; DC1 - 6 A / 24 V DC**

Coils: DC - 12, 24, 48, 110 V; AC - 12, 24, 48, 120, 230 V

Set: electromagnetic relay R4N, plug-in socket GZM4, module type M..., clip GZT4-0040, plate GZT4-0035

Mounting: direct on 35 mm rail mount or on panel

Accessories: interconnection strips ZGGZ4

PIR4 - GZP4

Interface relays; with plug-in socket GZP4; Push-in terminals

page 308

Contacts: 4 CO

Rated load: **AC1 - 7 A / 230 V AC, 6 A / 250 V AC; DC1 - 6 A / 24 V DC**

Coils: DC - 12, 24, 48, 110 V; AC - 12, 24, 48, 120, 230 V

Set: electromagnetic relay R4N, plug-in socket GZP4, module type M..., clip GZP4-0400

Mounting: direct on 35 mm rail mount or on panel

Accessories: plates MP15, interconnection strips ZGZP...

PI6-1P

Interface relays

page 313

Output circuit - contacts: 1 CO

Rated load:

1 CO ($AgSnO_2$) - **AC1 - 6 A / 250 V AC; DC1 - 6 A / 24 V DC**

Input circuit: DC - 12, 24, 36 V; AC/DC - 24, 42, 115, 230 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

Accessories: interconnection strips ZG20

PI6-1T

Interface relays

page 316

Output circuit - triac: 1 NO

Rated load: **AC1 - 1,2 A / 400 V AC**

Input circuit: DC - 5...32 V; AC/DC - 24, 230 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

Accessories: interconnection strips ZG20

PIR6W-1P-...

Interface relays; with socket PI6W-1P -...

page 318

Output circuit - contacts: 1 CO (RM699BV)

Rated load:

1 CO ($AgSnO_2$) - **AC1 - 6 A / 250 V AC; DC1 - 6 A / 24 V DC**

Input circuit: AC - 230 V; DC - 12, 24, 36 V; AC/DC - 24, 42, 115, 230 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

Accessories: interconnection strips ZG20

PIR6W-1PS-...

Interface relays; with universal socket PI6W-1PS -...

page 322

Output circuit - contacts: 1 CO (RM699BV);
triac, transistor: 1 NO (RSR30)

Rated load: 1 CO ($AgSnO_2$) - **AC1 - 6 A / 250 V AC; DC1 - 6 A / 24 V DC**
1 NO (triac) - **AC1 - 1 A / 240 V AC;** 1 NO (transistor) - **DC1 - 1 A / 48 V DC, 2 A / 24 V DC**

Input circuit: AC - 230 V; DC - 6, 12, 24, 36, 48, 60 V; AC/DC - 24, 42, 115, 230 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

Accessories: interconnection strips ZG20

PIR6WB-1PS-...

Interface relays; with universal socket PI6WB-1PS -...; spring terminals

CAGE CLAMP®

page 326

Output circuit - contacts: 1 CO (RM699BV);
triac, transistor: 1 NO (RSR30)

Rated load: 1 CO ($AgSnO_2$) - **AC1 - 6 A / 250 V AC; DC1 - 6 A / 24 V DC**
1 NO (triac) - **AC1 - 1 A / 240 V AC;** 1 NO (transistor) - **DC1 - 1 A / 48 V DC, 2 A / 24 V DC**

Input circuit: AC - 230 V; DC - 6, 12, 24, 36, 48, 60 V; AC/DC - 24, 42, 115, 230 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

Accessories: interconnection strips ZG20

SIR6W-...

Interface relays; with universal socket 6W-...

page 330

Output circuit - contacts: 1 CO (RM699BV);
triac, transistor: 1 NO (RSR30)

Rated load: 1 CO ($AgSnO_2$) - **AC1 - 6 A / 250 V AC; DC1 - 6 A / 30 V DC**
1 NO (triac) - **AC1 - 1 A / 240 V AC;** 1 NO (transistor) - **DC1 - 1 A / 48 V DC, 2 A / 24 V DC**

Input circuit: DC - 6, 12, 24 V; AC/DC - 12, 24, 48, 60, 110...125, 220...240 V

Indicator: LED diode; Mounting: direct on 35 mm rail mount

Accessories: interconnection strips JB20, separators 6W-SEP,
cards of description plates MP6-C

SIR6WB-...

Interface relays; with universal socket 6WB-...; spring terminals

page 334

Output circuit - contacts: 1 CO (RM699BV);
triac, transistor: 1 NO (RSR30)

Rated load: 1 CO ($AgSnO_2$) - **AC1 - 6 A / 250 V AC; DC1 - 6 A / 30 V DC**
1 NO (triac) - **AC1 - 1 A / 240 V AC;** 1 NO (transistor) - **DC1 - 1 A / 48 V DC, 2 A / 24 V DC**

Input circuit: DC - 6, 12, 24 V; AC/DC - 12, 24, 48, 60, 110...125, 220...240 V

Indicator: LED diode; Mounting: direct on 35 mm rail mount

Accessories: interconnection strips JB20, separators 6W-SEP,
cards of description plates MP6-C

Relays
for photovoltaic systems

- I_n currents of contacts: 16 ... 80 A.
- Methods of mounting: THT, direct on 35 mm rail mount, in plug-in sockets, direct on panel mounting - depending on the type of relay.

Applications:

- there are two major applications of electromagnetic relays in solar systems, i.e. at the DC side they connect/disconnect the DC voltage generated by photovoltaic cells; at the AC side they connect/disconnect the entire system to/from power network,
- delivery of power to a public network is subject to special requirements as for the relays applied - the major ones are: contact clearance of min. 1,5 mm and resistance of the contact clearance to surge voltage of 2 500 V; all the requitrements are set out by the Standard DIN VDE 0126-1-1,
- for safety reasons solar systems must be equipped with an automatic system to disconnect the generator section from the AC network; the protection system is usually built in the DC/AC inverter and double-break disconnected - thus, these must be relays of the 2 NO contact configuration (each contact disconnects one line - one the phase line and the other the neutral line); two contacts connected in series are required for each line - thus, the circuit separation is performed by two two-contact electromagnetic relays,
- the RUC-M relays are designed for connecting high DC currents.

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RS35

Relays for solar inverters and high current applications

page 249

Contacts: 2 NO

Rated load: **AC1 - 35 A / 250 V AC; DC1 - 35 A / 24 V DC**

Coils: DC - 5, 9, 12, 18, 24, 110 V

Mounting: for PCB

RS50

Relays for solar inverters and high current applications

page 249

Contacts: 1 NO, 2 NO

Rated load: **AC1 - 50 A / 250 V AC; DC1 - 50 A / 24 V DC**

Coils: DC - 5, 9, 12, 18, 24, 110 V

Mounting: for PCB

RS80

Relays for solar inverters and high current applications

page 249

Contacts: 1 NO

Rated load: **AC1 - 80 A / 250 V AC; DC1 - 80 A / 24 V DC**

Coils: DC - 12, 24 V

Mounting: for PCB

RG25

Industrial relays - electromagnetic

page 237

Contacts: 2 NO

Rated load: **AC1 - 25 A / 400 V AC; DC1 - 25 A / 24 V DC**

Coils: DC - 12, 24, 48, 110, 220 V; AC - 12, 24, 110, 230, 400 V

Mounting: direct on 35 mm rail mount

R20

Industrial relays - electromagnetic

page 240

Contacts: 1 NO, 2 NO

Rated load:
1 NO - **AC1 - 30 A / 250 V AC**
2 NO - **AC1 - 25 A / 250 V AC**

Coils: DC - 12, 24, 110 V; AC - 24, 48, 115, 230 V

Mounting: for flat insert connectors - faston 250 (6,3 x 0,8 mm)
- direct on panel (cover with mounting flange)

RUC
faston 4,8 x 0,5

Industrial relays - electromagnetic

page 225

Contacts: 2 CO, 3 CO, 2 NO, 3 NO
(available special versions 2 NO, 3 NO with contact gap ≥ 3 mm)

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Coils: DC - 6, 12, 24, 42, 48, 60, 110, 120, 220 V (standard coil)
DC - 12, 24, 48, 110, 220 V (reinforced coil)
AC - 6, 12, 24, 115, 120, 220, 230, 240 V (50/60 Hz)
AC - 400 V (50 Hz)

Equipment: option - test button without block functions (K), light indicator - LED diode (L)

Mounting:
RUC faston 4,8 x 0,5 - for plug-in sockets, direct on panel (cover with mounting flange), direct on 35 mm rail mount (cover with adaptors: vertical V, horizontal H)
RUC faston 6,3 x 0,8 - direct on panel (cover with mounting flange), direct on 35 mm rail mount (cover with adaptors: vertical V, horizontal H)
RUC - for PCB

Accessories: screw terminals sockets - GUC11S-V0

RUC
faston 6,3 x 0,8

page 225

RUC-M
faston 4,8 x 0,5

Industrial relays - electromagnetic; with permanent magnet whose magnetic field blows the electric arc between the contacts; for high DC loads

page 232

Contacts: 1 NO (double-break), 2 NO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 12 A** (1 NO); **4,5 A** (2 NO) **/ 220 V DC**

Coils: DC - 12, 24, 48, 110, 220 V (reinforced coil)
AC - 12, 24, 48, 115, 120, 230, 240 V

Equipment: option - light indicator - LED diode (L)
Mounting: for plug-in sockets, direct on panel (cover with mounting flange), direct on 35 mm rail mount (cover with adaptors: vertical V, horizontal H), for PCB
Accessories: screw terminals sockets - GUC11S-V0

Relays
for railroad industry

- I_n currents of contacts: 6 ... 16 A.
- Available relays:
  - miniature: RM84, RM85,
  - industrial: R2T/3T/4T, R15T, RUCT/RUCT-M,
  - interface: PI84T/85T, PIR2T/3T/4T, PIR152T/153T, PRUCT/PRUCT-M,
  - time: MT-W...M.
- Compliance with standards: EN 45545-2 (category EL10 ❶, requirement R26 ❶ - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1.
- Methods of mounting: in plug-in sockets, on 35 mm rail mount, on panel mounting - depending on the type of relay.

❶ MT-W...M: category EL5, requirement set R23

Applications:

- control switchboard,
- operator's panel and cabin systems,
- supply, monitoring, wagon lighting circuits,
- air conditioning, ventilation, heating,
- doors control,
- passenger information devices,
- mobile device chargers.

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RM84

Relays for railroad industry - miniature

page 141

Contacts: 2 CO, 2 NO

Rated load: **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Coils: DC - 24, 110 V

Mounting: for plug-in sockets

Equipment: screw terminals sockets - GZT80-V0; modules type M...-V0

RM85

Relays for railroad industry - miniature

page 146

Contacts: 1 CO, 1 NO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Coils: DC - 24, 110 V

Mounting: for plug-in sockets

Equipment: screw terminals sockets - GZT80-V0; modules type M...-V0

R2T - contacts 2 CO

Relays for railroad industry - industrial

page 339

Contacts: 2 CO

Rated load: **AC1 - 12 A / 250 V AC; DC1 - 12 A / 24 V DC**

Coils: DC - 24, 110 V

Mounting: for plug-in sockets

Equipment: screw terminals sockets - GZT2-V0; modules type M...-V0

R3T - contacts 3 CO

Relays for railroad industry - industrial

page 342

Contacts: 3 CO

Rated load: **AC1 - 10 A / 250 V AC; DC1 - 10 A / 24 V DC**

Coils: DC - 24, 110 V

Mounting: for plug-in sockets

Equipment: screw terminals sockets - GZT3-V0; modules type M...-V0

R4T - contacts 4 CO

Relays for railroad industry - industrial

page 345

Contacts: 4 CO

Rated load:
AC1 - 7 A / 230 V AC (VDE), 6 A / 250 V AC; DC1 - 6 A / 24 V DC

Coils: DC - 24, 110 V

Mounting: for plug-in sockets

Equipment: screw terminals sockets - GZT4-V0; modules type M...-V0

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R15T - contacts 2 CO	Relays for railroad industry - industrial
 **page 348**	Contacts: 2 CO Rated load: **AC1 - 10 A / 250 V AC; DC1 - 10 A / 24 V DC** Coils: DC - 24, 110 V (reinforced coil) Mounting: for plug-in sockets Equipment: screw terminals sockets - PZ8-V0
R15T - contacts 3 CO	Relays for railroad industry - industrial
 **page 348**	Contacts: 3 CO Rated load: **AC1 - 10 A / 250 V AC; DC1 - 10 A / 24 V DC** Coils: DC - 24, 110 V (reinforced coil) Mounting: for plug-in sockets Equipment: screw terminals sockets - PZ11-V0
RUCT faston 4,8 x 0,5	Relays for railroad industry - industrial
 **page 351**	Contacts: 3 CO, 3 NO Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC** Coils: DC - 24, 110 V (reinforced coil) Mounting: for plug-in sockets Equipment: screw terminals sockets - GUC11S-V0
RUCT-M faston 4,8 x 0,5	Relays for railroad industry - industrial; with permanent magnet whose magnetic field blows the electric arc between the contacts; for high DC loads
 **page 354**	Contacts: 1 NO (double-break), 2 NO Rated load: **AC1 - 16 A / 250 V AC; DC1 - 10 A** (1 NO); **3,8 A** (2 NO) **/ 220 V DC** Coils: DC - 24, 110 V (reinforced coil) Mounting: for plug-in sockets Equipment: screw terminals sockets - GUC11S-V0
PI84T - GZT80-V0	Relays for railroad industry - interface; with plug-in socket GZT80-V0
 **page 357**	Contacts: 2 CO Rated load: **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC** Coils: DC - 24, 110 V Set: electromagnetic relay RM84, plug-in socket GZT80-V0, module type M...-V0, clip GZM80-0041 Mounting: direct on 35 mm rail mount or on panel

PI85T - GZT80-V0

Relays for railroad industry - interface; with plug-in socket GZT80-V0

page 360

Contacts: 1 CO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Coils: DC - 24, 110 V

Set: electromagnetic relay RM85, plug-in socket GZT80-V0, module type M...-V0, clip GZM80-0041

Mounting: direct on 35 mm rail mount or on panel

PIR2T - GZT2-V0

Relays for railroad industry - interface; with plug-in socket GZT2-V0

page 363

Contacts: 2 CO

Rated load: **AC1 - 12 A / 250 V AC; DC1 - 12 A / 24 V DC**

Coils: DC - 24, 110 V

Set: electromagnetic relay R2T, plug-in socket GZT2-V0, module type M...-V0, clip G4 1052

Mounting: direct on 35 mm rail mount or on panel

PIR3T - GZT3-V0

Relays for railroad industry - interface; with plug-in socket GZT3-V0

page 366

Contacts: 3 CO

Rated load: **AC1 - 10 A / 250 V AC; DC1 - 10 A / 24 V DC**

Coils: DC - 24, 110 V

Set: electromagnetic relay R3T, plug-in socket GZT3-V0, module type M...-V0, clip G4 1052

Mounting: direct on 35 mm rail mount or on panel

PIR4T - GZT4-V0

Relays for railroad industry - interface; with plug-in socket GZT4-V0

page 369

Contacts: 4 CO

Rated load:
AC1 - 7 A / 230 V AC (VDE), 6 A / 250 V AC; DC1 - 6 A / 24 V DC

Coils: DC - 24, 110 V

Set: electromagnetic relay R4T, plug-in socket GZT4-V0, module type M...-V0, clip G4 1052

Mounting: direct on 35 mm rail mount or on panel

PIR152T - PZ8-V0

Relays for railroad industry - interface; with plug-in socket PZ8-V0

page 372

Contacts: 2 CO

Rated load:
AC1 - 10 A / 250 V AC; DC1 - 10 A / 24 V DC

Coils: DC - 24, 110 V (reinforced coil)

Set: electromagnetic relay R15T - 2 CO, plug-in socket PZ8-V0, clip PZ11-0031

Mounting: direct on 35 mm rail mount or on panel

PIR153T - PZ11-V0

Relays for railroad industry - interface; with plug-in socket PZ11-V0

page 372

Contacts: 3 CO

Rated load:
AC1 - 10 A / 250 V AC; DC1 - 10 A / 24 V DC

Coils: DC - 24, 110 V (reinforced coil)

Set: electromagnetic relay R15T - 3 CO, plug-in socket PZ11-V0, clip PZ11-0031

Mounting: direct on 35 mm rail mount or on panel

PRUCT - GUC11S-V0

Relays for railroad industry - interface; with plug-in socket GUC11S-V0

page 375

Contacts: 3 CO, 3 NO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Coils: DC - 24, 110 V (reinforced coil)

Set: electromagnetic relay RUCT, plug-in socket GUC11S-V0, clip MBA

Mounting: direct on 35 mm rail mount

Equipment: screw terminals sockets - GUC11S-V0

PRUCT-M - GUC11S-V0

Relays for railroad industry - interface; with plug-in socket GUC11S-V0; with permanent magnet; for high DC loads

page 378

Contacts: 1 NO (double-break), 2 NO

Rated load:
AC1 - 16 A / 250 V AC; DC1 - 10 A (1 NO); **3,8 A** (2 NO) **/ 220 V DC**

Coils: DC - 24, 110 V (reinforced coil)

Set: electromagnetic relay RUCT-M, plug-in socket GUC11S-V0, clip MBA

Mounting: direct on 35 mm rail mount

Equipment: screw terminals sockets - GUC11S-V0

MT-W...M

Time relays; modular cover; programming with two buttons only

page 467

Multifunctions - 25 time functions (Es, E, E(S), E(R), R, Wu, Wu(S), Wu(R), Ws, Wa, B, Wi, ER, EWs, EWa, EWu, WsWa, EWf, Wt, Pi, Pi(S), Pp, Pp(S), Est, Esp) + functions ON, OFF
Independent settings of T1, T2, T3 intervals (0,1 s ... 99 h 59 min. 59,9 s)

Output circuit - contacts: 1 CO

Rated load: **AC1 - 10 A / 250 V AC; DC1 - 10 A / 24 V DC**

Input circuit: AC/DC - 12...240 V; external control contact

Indicator: two digit LED display, LED diodes; Mounting: direct on 35 mm rail mount

Programmable relays

- I_n currents of outputs: 0,5 ... 10 A.
- Available versions of NEED relays:
  - with LCD display:
    8 inputs / 4 outputs, 16 inputs / 8 outputs,
  - without display:
    8 inputs / 4 outputs, 16 inputs / 8 outputs,
  - with relay outputs,
  - with transistor outputs:
    I_n = 0,5 A (version 24 V DC),
  - with supply voltage:
    230 V AC, 12 V DC, 24 V DC, 220 V DC.
- NEED-MODBUS: communication modules NEED Master / ModBus RTU Slave.
- Methods of mounting:
  - NEED: on 35 mm rail mount or on panel mounting,
  - NEED-MODBUS: on 35 mm rail mount.

Applications:

- in industrial automation (device and process control),
- in ARC automation
- in BMS automation,
- in production management systems,
- in water systems,
- in air-conditioning, ventilation, heating systems,
- in lighting systems,
- various other applications.

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NEED-...-08-4...	Programmable relays
 **page 413**	Outputs: 4 NO, relay or transistor Rated load: contacts - **AC1 - 10 A / 250 V AC;** transistor - **DC1 - 0,5 A / 24 V DC** Inputs: 6 digital + 2 analog-digital Supply: DC - 12, 24, 220 V; AC - 230 V Indicator: LCD display, LED diodes; Mounting: direct on 35 mm rail mount or on panel Accessories: cable NEED-PC-15B (or 15C), memory card NEED-M-4KB, software PC NEED (language LAD and STL)
NEED-...-16-8...	Programmable relays
 **page 417**	Outputs: 8 NO, relay or transistor Rated load: contacts - **AC1 - 10 A / 250 V AC;** transistor - **DC1 - 0,5 A / 24 V DC** Inputs: 13 digital + 3 analog-digital Supply: DC - 12, 24, 220 V; AC - 230 V Indicator: LCD display, LED diodes; Mounting: direct on 35 mm rail mount or on panel Accessories: cable NEED-PC-15B (or 15C), memory card NEED-M-4KB, software PC NEED (language LAD and STL)
NEED-MODBUS	Communication modules NEED Master / ModBus RTU Slave
 **page 423**	Input circuit: DC - 7...35 V; AC - 7...26 V Mounting: direct on 35 mm rail mount Appropriation: cooperation with NEED-... relays (reading and availability of the data, transmission of control commands, RTC clock setting)

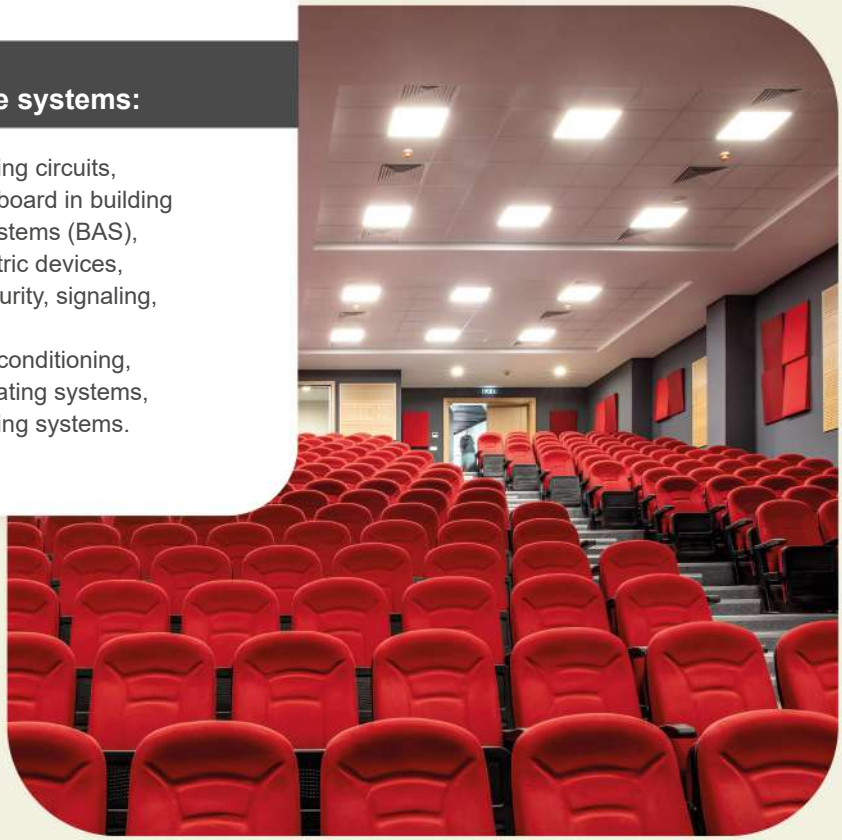
Installation relays

relpol® S.A.

- I_n currents of outputs: 8 A or 16 A.
- Available versions:
  - in modular covers: RPI series.
- Method of mounting:
  on 35 mm rail mount.

Applications in low voltage systems:

- control of lighting circuits,
- electric switchboard in building automation systems (BAS),
- control of electric devices,
- devices of security, signaling, alarm system,
- devices of air-conditioning, ventilation, heating systems,
- industrial heating systems.



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RPI-.P-...

Installation relays; modular cover

page 425

Output circuit - contacts: 1 CO, 2 CO

Rated load:
1 CO - **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
2 CO - **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Input circuit: DC - 12, 24, 48 V; AC - 24, 115, 230 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

RPI-.Z-...

Installation relays; modular cover

page 428

Output circuit - contacts: 1 NO, 2 NO

Rated load:
1 NO - **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
2 NO - **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Input circuit: AC - 230 V; AC/DC - 12, 24, 48, 115 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

RPI-1ZI-D12

Installation relays; modular cover

page 431

Switching lighting circuits

Output circuit - contacts: 1 NO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Input circuit: DC - 12 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

RPI-1ZI-U24A

Installation relays; modular cover

page 433

Switching lighting circuits

Output circuit - contacts: 1 NO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Input circuit: AC - 230 V; AC/DC - 24 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

RPI-.P-UNI

Installation relays; modular cover

page 435

Output circuit - contacts: 1 CO, 2 CO, 3 CO

Rated load:
1 CO - **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
2 CO, 3 CO - **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Input circuit: AC/DC - 12...240 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

RPI-.Z-UNI

Installation relays; modular cover

page 437

Output circuit - contacts: 1 NO, 2 NO, 3 NO

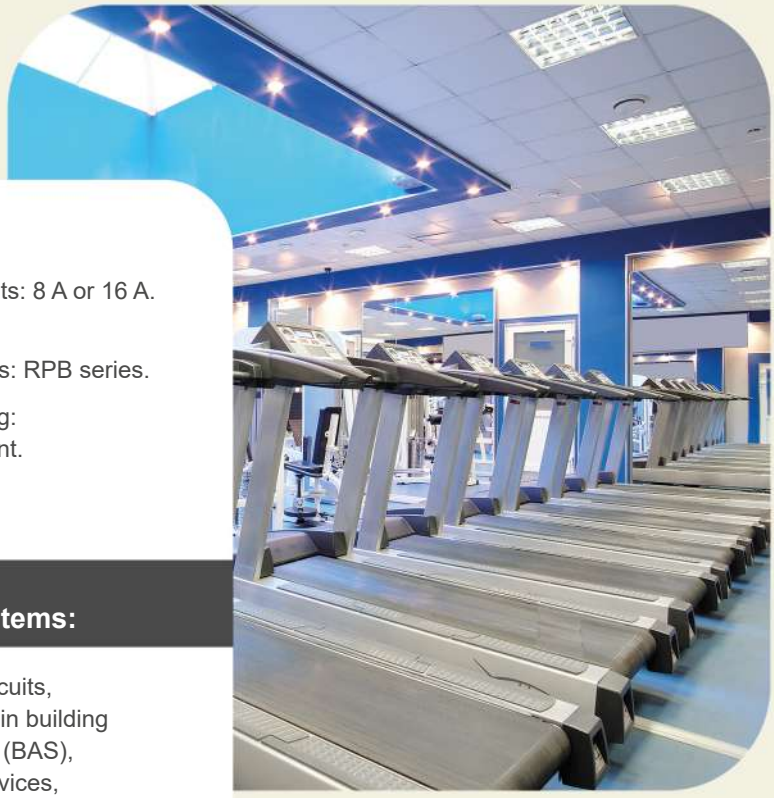
Rated load:
1 NO - **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
2 NO, 3 NO - **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Input circuit: AC/DC - 12...240 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

Bistable - impulse relays



- I_n currents of outputs: 8 A or 16 A.
- Available versions:
  - in modular covers: RPB series.
- Method of mounting:
  on 35 mm rail mount.

Applications in low voltage systems:

- control of lighting circuits,
- electric switchboard in building automation systems (BAS),
- control of electric devices,
- control of devices of air-conditioning, ventilation, heating systems,
- control of devices of security, signaling, alarm system.

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RPB-1P-...

Bistable - impulse relays; modular cover

page 440

Single-functions (RESET)
Output circuit - contacts: 1 CO
Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
Input circuit: AC - 230 V; AC/DC - 24 V
Indicator: LED diodes
Mounting: direct on 35 mm rail mount

RPB-1PM-...

Bistable - impulse relays; modular cover

page 443

Single-functions (NORMAL)
Output circuit - contacts: 1 CO
Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
Input circuit: AC - 230 V; AC/DC - 24 V
Indicator: LED diodes
Mounting: direct on 35 mm rail mount

RPB-2Z-...

Bistable - impulse relays; modular cover

page 446

Single-functions (RESET)
Output circuit - contacts: 2 NO
Rated load: **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**
Input circuit: AC - 230 V; AC/DC - 24 V
Indicator: LED diodes
Mounting: direct on 35 mm rail mount

RPB-1ZI-...

Bistable - impulse relays; modular cover

page 449

Single-functions (RESET)
Output circuit - contacts: 1 NO
Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
Input circuit: AC - 230 V; AC/DC - 24 V
Indicator: LED diodes
Mounting: direct on 35 mm rail mount

RPB-1PM-UNI

Bistable - impulse relays; modular cover

page 452

Multifunctions - 2 functions (NORMAL, RESET)
Output circuit - contacts: 1 CO
Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
Input circuit: AC/DC - 12...240 V
Indicator: LED diodes
Mounting: direct on 35 mm rail mount

RPB-1ZMI-UNI	Bistable - impulse relays; modular cover
 **page 455**	Multifunctions - 2 functions (NORMAL, RESET) Output circuit - contacts: 1 NO Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC** Input circuit: AC/DC - 12...240 V Indicator: LED diodes Mounting: direct on 35 mm rail mount
RPB-2PSM-UNI	Bistable - impulse relays; modular cover
 **page 458**	Multifunctions - 4 functions (BOTH, RESET BOTH, RESET SEQ, SEQ) Output circuit - contacts: 2 x 1 CO Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC** Input circuit: AC/DC - 12...240 V Indicator: LED diodes Mounting: direct on 35 mm rail mount
RPB-2ZSMI-UNI	Bistable - impulse relays; modular cover
 **page 462**	Multifunctions - 4 functions (BOTH, RESET BOTH, RESET SEQ, SEQ) Output circuit - contacts: 2 x 1 NO Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC** Input circuit: AC/DC - 12...240 V Indicator: LED diodes Mounting: direct on 35 mm rail mount

Time relays

- I_n currents of outputs: 6 ... 16 A.
- Available versions:
  - in modular covers: MT-W...M (with LED display), RPC series,
  - in industrial covers: TR4N series, T-R4, PIR15...T.
- Design features:
  - multifunctions,
  - single-functions,
  - with settings of T interval,
  - with independent settings of T1 and T2 intervals,
  - with independent settings of T1, T2 and T3 intervals (MT-W...M),
  - contacts / outputs: 1 CO, 2 CO, 3 CO, 4 CO - depending on the type of relay,
  - supply: universal AC/DC; specified voltage - depending on the type of relay.
- Methods of mounting: on 35 mm rail mount, on panel mounting, in plug-in sockets - depending on the type of relay.

Applications in low voltage systems:

- in industrial automation,
- in BMS automation,
- in air-conditioning, ventilation, heating systems,
- in protection, signalling, alarm systems,
- in lighting systems,
- various other applications.

MT-W...M

Time relays; modular cover; programming with two buttons only

page 467

Multifunctions - 25 time functions (Es, E, E(S), E(R), R, Wu, Wu(S), Wu(R), Ws, Wa, B, Wi, ER, EWs, EWa, EWu, WsWa, EWf, Wt, Pi, Pi(S), Pp, Pp(S), Est, Esp) + functions ON, OFF
Independent settings of T1, T2, T3 intervals (0,1 s ... 99 h 59 min. 59,9 s)
Output circuit - contacts: 1 CO
Rated load: **AC1 - 10 A / 250 V AC; DC1 - 10 A / 24 V DC**
Input circuit: AC/DC - 12...240 V; external control contact
Indicator: two digit LED display, LED diodes; Mounting: direct on 35 mm rail mount

RPC-.MA-...

Time relays; modular cover

page 474

Multifunctions - 10 time functions (E, Wu, Bp, Bi, R, Ws, Wa, Esa, B, T)
8 time ranges - settings of T interval (0,1 s ... 10 d) + ON / OFF
Output circuit - contacts: 1 CO, 2 CO
Rated load:
1 CO - **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
2 CO - **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**
Input circuit: AC - 230 V; AC/DC - 12...240 V; external control contact
Indicator: LED diodes; Mounting: direct on 35 mm rail mount

RPC-.MB-...

Time relays; modular cover

page 479

Multifunctions - 10 time functions (E, Wu, Bp, Bi, Ra, Wst, Wi, Esf, Esp, Est)
8 time ranges - settings of T interval (0,1 s ... 10 d) + ON / OFF
Output circuit - contacts: 1 CO, 2 CO
Rated load:
1 CO - **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
2 CO - **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**
Input circuit: AC - 230 V; AC/DC - 12...240 V; external control contact
Indicator: LED diodes; Mounting: direct on 35 mm rail mount

RPC-2A-UNI

Time relays; modular cover

page 484

Operation after the power supply is switched off
Multifunctions - 6 time functions (E, A, nWa, nWu, nWuWa, nWs)
10 time ranges - settings of T interval (0,1 s ... 10 min.)
Output circuit - contacts: 2 CO
Rated load: **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**
Input circuit: AC/DC - 12...240 V
Indicator: LED diodes; Mounting: direct on 35 mm rail mount

RPC-1MC-UNI

Time relays; modular cover

page 488

Immediate activation of the selected function
Multifunctions - 14 time functions (E, E(S), Wu, Wu(S), Bp, Bp(S), Bi, Bi(S), R, Ws, Wa, Esa(R), E(R), Wu(R)); 8 time ranges - settings of T interval (0,1 s ... 10 d) + ON / OFF
Output circuit - contacts: 1 CO
Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
Input circuit: AC/DC - 12...240 V; external control contact
Indicator: LED diodes; Mounting: direct on 35 mm rail mount

RPC-.MD-UNI

Time relays; modular cover

page 492

Immediate activation of the selected function

Multifunctions - 10 time functions (E, Wu, Bp, Bi, R, Ws, Wa, Esa, B, T)
8 time ranges - settings of T interval (0,1 s ... 10 d) + ON / OFF

Output circuit - contacts: 1 CO, 3 CO

Rated load: 1 CO - **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
3 CO - **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Input circuit: AC/DC - 12...240 V; external control contact

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

RPC-1ER-...

Time relays; modular cover

page 496

Single-functions (ER); 8 time ranges - independent settings
of T1 and T2 intervals (0,1 s ... 10 d) + ON / OFF

Output circuit - contacts: 1 CO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Input circuit: AC - 230 V; AC/DC - 12...240 V; external control contact

Indicator: LED diodes

Mounting: direct on 35 mm rail mount

RPC-1EA-...

Time relays; modular cover

page 496

Single-functions (EWa); 8 time ranges - independent settings
of T1 and T2 intervals (0,1 s ... 10 d) + ON / OFF

Output circuit - contacts: 1 CO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Input circuit: AC - 230 V; AC/DC - 12...240 V; external control contact

Indicator: LED diodes

Mounting: direct on 35 mm rail mount

RPC-1ES-...

Time relays; modular cover

page 496

Single-functions (EWs); 8 time ranges - independent settings
of T1 and T2 intervals (0,1 s ... 10 d) + ON / OFF

Output circuit - contacts: 1 CO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Input circuit: AC - 230 V; AC/DC - 12...240 V; external control contact

Indicator: LED diodes

Mounting: direct on 35 mm rail mount

RPC-1EU-...

Time relays; modular cover

page 496

Single-functions (EWu + NWu); 8 time ranges - independent settings
of T1 and T2 intervals (0,1 s ... 10 d) + ON / OFF

Output circuit - contacts: 1 CO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Input circuit: AC - 230 V; AC/DC - 12...240 V; external control contact

Indicator: LED diodes

Mounting: direct on 35 mm rail mount

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RPC-1IP-...	Time relays; modular cover
 **page 496**	Single-functions (Ii + Ip); 8 time ranges - independent settings of T1 and T2 intervals (0,1 s ... 10 d) + ON / OFF Output circuit - contacts: 1 CO Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC** Input circuit: AC - 230 V; AC/DC - 12...240 V; external control contact Indicator: LED diodes Mounting: direct on 35 mm rail mount
RPC-1SA-...	Time relays; modular cover
 **page 496**	Single-functions (WsWa); 8 time ranges - independent settings of T1 and T2 intervals (0,1 s ... 10 d) + ON / OFF Output circuit - contacts: 1 CO Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC** Input circuit: AC - 230 V; AC/DC - 12...240 V; external control contact Indicator: LED diodes Mounting: direct on 35 mm rail mount
RPC-1WT-...	Time relays; modular cover
 **page 496**	Single-functions (Wt); 8 time ranges - independent settings of T1 and T2 intervals (0,1 s ... 10 d) + ON / OFF Output circuit - contacts: 1 CO Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC** Input circuit: AC - 230 V; AC/DC - 12...240 V; external control contact Indicator: LED diodes Mounting: direct on 35 mm rail mount
RPC-.E-...	Time relays; modular cover
 **page 501**	Single-functions (E) 8 time ranges - settings of T interval (0,1 s ... 10 d) + ON / OFF Output circuit - contacts: 1 CO, 2 CO Rated load: 1 CO **- AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC** 2 CO **- AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC** Input circuit: AC - 230 V; AC/DC - 12...240 V Indicator: LED diodes; Mounting: direct on 35 mm rail mount
RPC-.WU-...	Time relays; modular cover
 **page 501**	Single-functions (Wu) 8 time ranges - settings of T interval (0,1 s ... 10 d) + ON / OFF Output circuit - contacts: 1 CO, 2 CO Rated load: 1 CO **- AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC** 2 CO **- AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC** Input circuit: AC - 230 V; AC/DC - 12...240 V Indicator: LED diodes; Mounting: direct on 35 mm rail mount

RPC-.BP-...

Time relays; modular cover

page 501

Single-functions (Bp)
8 time ranges - settings of T interval (0,1 s ... 10 d) + ON / OFF

Output circuit - contacts: 1 CO, 2 CO

Rated load:
1 CO **- AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
2 CO **- AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Input circuit: AC - 230 V; AC/DC - 12...240 V

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

RPC-2SD-UNI

Time relays; modular cover

page 505

Star-Delta start-up
10 time ranges - settings of T1 interval: 0,1 s ... 1 h; T2 interval: 0,05 s ... 0,9 s

Output circuit - contacts: 2 CO

Rated load: **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Input circuit: AC/DC - 12...240 V

Indicator: LED diodes

Mounting: direct on 35 mm rail mount

RPC-1AS-A230

Time relays; modular cover

page 508

Staircase switches - switching lighting circuits

Multifunctions - 5 time functions (ON, OFF, AUTO, R, Wi) + Extra Time
10 time ranges - settings of T interval (1 s ... 100 min.)

Output circuit - contacts: 1 NO

Rated load: **AC1 - 16 A / 250 V AC**

Input circuit: AC - 230 V; external control contact

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

TR4N - 1 CO

Time relays; compact cover

page 511

Multifunctions - 10 time functions (E, Wu, Bp, Bi, PWM, R, Ws, Wa, Esa, B)
+ function ON / OFF; 8 time ranges - settings of T interval (0,1 s ... 10 d)

Output circuit - contacts: 1 CO

Rated load: **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**

Input circuit: AC - 115, 230 V; AC/DC - 12, 24 V; external control contact

Indicator: LED diodes

Mounting: direct on 35 mm rail mount

TR4N - 2 CO

Time relays; compact cover

page 511

Multifunctions - 10 time functions (E, Wu, Bp, Bi, PWM, R, Ws, Wa, Esa, B)
+ function ON / OFF; 8 time ranges - settings of T interval (0,1 s ... 10 d)

Output circuit - contacts: 2 CO

Rated load: **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

Input circuit: AC - 115, 230 V; AC/DC - 12, 24 V; external control contact

Indicator: LED diodes

Mounting: direct on 35 mm rail mount

TR4N - 4 CO

Time relays; compact cover

page 515

Multifunctions - 10 time functions (E, Wu, Bp, Bi, PWM, R, Ws, Wa, Esa, B) + function ON / OFF; 8 time ranges - settings of T interval (0,1 s ... 10 d)

Output circuit - contacts: 4 CO

Rated load: **AC1 - 6 A / 250 V AC; DC1 - 6 A / 24 V DC**

Input circuit: AC - 115, 230 V; AC/DC - 12, 24 V; external control contact

Indicator: LED diodes

Mounting: direct on 35 mm rail mount

T-R4 - GZM4

Time relays; with plug-in socket GZM4 or GZT4

page 519

Single-functions - 4 versions (time functions: E, Wu, Bp, Bi)
7 time ranges - settings of T interval (0,1 s ... 100 h)

Output circuit - contacts: 4 CO

Rated load: **AC1 - 6 A / 230 V AC**

Input circuit: DC - 12, 24 V; AC - 24, 115, 230 V

Indicator: LED diodes; Mounting: for plug-in sockets

Accessories: screw terminals sockets, for mounting on 35 mm rail mount or on panel - GZM4, GZT4 **(pages 388)**

PIR15...T - COM3

Time relays; with time module COM3

page 523

Multifunctions - 8 time functions (E, Wu, Bp, Bi, R, Ws, Wa, Es)
8 time ranges - settings of T interval (0,1 s ... 10 d)

Output circuit - contacts: 2 CO, 3 CO

Rated load: **AC1 - 10 A / 250 V AC; DC1 - 10 A / 24 V DC**

Input circuit: DC - 24, 48, 60, 110, 120, 220 V; AC - 24, 48, 60, 110, 120, 230, 240 V; external control contact

Set: electromagnetic relay R15 - 3 CO (2 CO), plug-in socket GZP11 (GZP8), time module COM3, clip GZP-0054, plate GZP-0035
Indicator: LED diode; Mounting: direct on 35 mm rail mount or on panel

COM3

Universal time modules

page 528

Multifunctions - 8 time functions (E, Wu, Bp, Bi, R, Ws, Wa, Es)
8 time ranges - settings of T interval (0,1 s ... 10 d)

Output circuit - contacts: according to relays R15 - 3 CO (2 CO)

Input circuit: AC/DC - 12...240 V; external control contact

Indicator: LED diode

Mounting: combinable to relay R15 - 3 CO (2 CO) with plug-in socket GZP11 (GZP8)

Monitoring relays

- I_n currents of outputs: 5 A or 12 A.
- Available versions:
  - in modular covers: RPN series, MR-E series,
  - in industrial covers: MR-G series.
- Method of mounting: on 35 mm rail mount.

Applications in low voltage systems:

- DC voltage monitoring,
- AC voltage monitoring in 1- and 3-phase network,
- DC current monitoring,
- AC current monitoring in 1-phase network,
- motor temperature monitoring.

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RPN-1VF-A400

Monitoring relays; modular cover

page 532

Multifunctions (AC voltage monitoring in 3-phase network - 3(N)~ 400/230 V) - 2 functions (LOST D, ASYM D)
ranges of asymmetry - fixed value 55 V

Output circuit - contacts: 1 CO

Rated load: **AC1 - 12 A / 250 V AC; DC1 - 12 A / 24 V DC**

Measuring circuits: AC - 3(N)~ 400/230 V

Input circuit (supply) = Measuring circuits (monitoring voltages)

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

RPN-1VFS-A400

Monitoring relays; modular cover

page 536

Multifunctions (AC voltage monitoring in 3-phase network - 3(N)~ 400/230 V) - 3 functions (LOST D, ASYM D, SEQ D)
ranges of asymmetry - fixed value 55 V

Output circuit - contacts: 1 CO

Rated load: **AC1 - 12 A / 250 V AC; DC1 - 12 A / 24 V DC**

Measuring circuits: AC - 3(N)~ 400/230 V

Input circuit (supply) = Measuring circuits (monitoring voltages)

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

RPN-1VFR-A400

Monitoring relays; modular cover

page 540

Multifunctions (AC voltage monitoring in 3-phase network - 3(N)~ 400/230 V) - 3 functions (LOST D, ASYM D, SEQ D)
ranges of asymmetry - smooth adjustment

Output circuit - contacts: 1 CO

Rated load: **AC1 - 12 A / 250 V AC; DC1 - 12 A / 24 V DC**

Measuring circuits: AC - 3(N)~ 400/230 V

Input circuit (supply) = Measuring circuits (monitoring voltages)

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

RPN-1VFT-A400

Monitoring relays; modular cover

page 544

Multifunctions (AC voltage monitoring in 3-phase network - 3(N)~ 400/230 V) - 3 functions (LOST D, ASYM D, SEQ D)
ranges of asymmetry - smooth adjustment, time ranges of tripping delay - step adjustment

Output circuit - contacts: 1 CO

Rated load: **AC1 - 12 A / 250 V AC; DC1 - 12 A / 24 V DC**

Measuring circuits: AC - 3(N)~ 400/230 V

Input circuit (supply) = Measuring circuits (monitoring voltages)

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

RPN-1A..-A230

Monitoring relays; modular cover

page 548

Multifunctions (AC current monitoring in 1-phase network, with adjustable thresholds) - 6 functions (OD, OD+L, UD, UD+L, WD, WD+L)

Output circuit - contacts: 1 CO

Rated load: **AC1 - 12 A / 250 V AC; DC1 - 12 A / 24 V DC**

Measuring circuits (6 versions of relays): AC - 0,5 A, 1 A, 2 A, 5 A, 8 A, 16 A

Input circuit (supply): AC - 230 V

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

RPN-1TMP-A230

Monitoring relays; modular cover

page 553

Single-functions (motor temperature monitoring)

Output circuit - contacts: 1 CO

Rated load: **AC1 - 12 A / 250 V AC; DC1 - 12 A / 24 V DC**

Measuring circuit: accompanied by motor PTC sensors

Input circuit (supply): AC - 230 V

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

MR-EU1W1P

Monitoring relays; modular cover

page 557

Multifunctions (DC and AC voltage monitoring in 1-phase network, with adjustable thresholds) - 2 functions (UNDER, WIN)

Output circuit - contacts: 1 CO

Rated load: **AC1 - 5 A / 250 V AC**

Measuring circuits: AC - 24, 230 V; DC - 24 V

Input circuit (supply) = Measuring circuits (monitoring voltages)

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

MR-EU31UW1P

Monitoring relays; modular cover

page 560

Multifunctions (AC voltage monitoring in 1-phase network and 3-phase - 3(N)~ 400/230 V, with adjustable thresholds)
- 5 functions (UNDER, UNDER+SEQ, WIN, WIN+SEQ, SEQ)

Output circuit - contacts: 1 CO

Rated load: **AC1 - 5 A / 250 V AC**

Measuring circuits: AC - 230 V, 3(N)~ 400/230 V

Input circuit (supply) = Measuring circuits (monitoring voltages)

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

MR-EU3M1P

Monitoring relays; modular cover

page 563

Multifunctions (AC voltage monitoring in 3-phase network - 3(N)~ 400/230 V) - 2 functions (SEQ, ASYM)

Output circuit - contacts: 1 CO

Rated load: **AC1 - 5 A / 250 V AC**

Measuring circuits: AC - 3(N)~ 400/230 V

Input circuit (supply) = Measuring circuits (monitoring voltages)

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

MR-EI1W1P

Monitoring relays; modular cover

page 566

Multifunctions (AC current monitoring in 1-phase network, with adjustable thresholds and adjustable hysteresis)
- 6 functions (OVER, OVER+LATCH, UNDER, UNDER+LATCH, WIN, WIN+LATCH)

Output circuit - contacts: 1 CO

Rated load: **AC1 - 5 A / 250 V AC**

Measuring circuit: AC - 230 V; Monitoring current: max. 10 A / 230 V AC

Input circuit (supply) = Measuring circuit

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

MR-ET1P

Monitoring relays; modular cover

page 569

Single-functions (motor temperature monitoring)

Output circuit - contacts: 1 CO

Rated load: **AC1 - 5 A / 250 V AC**

Measuring circuit: accompanied by motor PTC sensors or thermal switch

Input circuit (supply): AC - 230 V

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

MR-GU32P-TR2

Monitoring relays; industrial cover

page 572

Multifunctions (AC voltages monitoring in phases - 230 V,
3-phase network 3(N)~ 400/230 V, with adjustable thresholds)
- 6 functions (OVER, OVER+LATCH, UNDER, UNDER+LATCH, WIN, WIN+LATCH)

Output circuit - contacts: 2 CO

Rated load: **AC1 - 3 A, 5 A / 250 V AC**

Measuring circuit: AC - 230 V

Input circuit: AC - 12, 24, 42, 48, 110, 127, 230, 400 V AC (supply via TR2 transformer)

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

MR-GU3M2P-TR2

Monitoring relays; industrial cover

page 575

Multifunctions (AC voltage monitoring in 3-phase network,
with adjustable thresholds)
- 6 functions (UNDER, UNDER+SEQ, WIN, WIN+SEQ, SEQ, ASYM)

Output circuit - contacts: 2 CO

Rated load: **AC1 - 3 A, 5 A / 250 V AC**

Measuring circuits: AC - 3(N)~ 400/230 V

Input circuit: AC - 12, 24, 42, 48, 110, 127, 230, 400 V AC (supply via TR2 transformer)

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

MR-GU3M2P

Monitoring relays; industrial cover

page 578

Multifunctions (AC voltage monitoring in 3-phase network)
- 2 functions (SEQ, ASYM)

Output circuit - contacts: 2 CO

Rated load: **AC1 - 3 A, 5 A / 250 V AC**

Measuring circuits: AC - 3(N)~ 400/230 V

Input circuit (supply) = Measuring circuits (monitoring voltage)

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

MR-GI1M2P-TR2

Monitoring relays; industrial cover

page 581

Multifunctions (DC and AC current monitoring in 1-phase network,
with adjustable thresholds)
- 6 functions (OVER, OVER+LATCH, UNDER, UNDER+LATCH, WIN, WIN+LATCH)

Output circuit - contacts: 2 CO

Rated load: **AC1 - 3 A, 5 A / 250 V AC**

Measuring circuits: AC/DC - 0,1 A, 1 A, 10 A

Input circuit: AC - 12, 24, 42, 48, 110, 127, 230, 400 V AC (supply via TR2 transformer)

Indicator: LED diodes; Mounting: direct on 35 mm rail mount

MR-GT2P-TR2	Monitoring relays; industrial cover
 page 584	Single-functions (motor temperature monitoring) CE Output circuit - contacts: 2 CO Rated load: **AC1 - 3 A, 5 A / 250 V AC** Measuring circuit: accompanied by motor PTC sensors Input circuit: AC - 12, 24, 42, 48, 110, 127, 230, 400 V AC (supply via TR2 transformer) Indicator: LED diodes; Mounting: direct on 35 mm rail mount

Signal lamps

- Available versions:
  - in modular covers: RLK series.
- Method of mounting:
  on 35 mm rail mount.

Applications in low voltage systems:

- optic signaling of AC/DC voltage presence in 1-phase network,
- optic signaling of AC voltage presence in 3-phase network.

RLK-1.	Signal lamps; modular cover
 page 589	Optic signaling of AC/DC voltage presence in 1-phase network Input circuit (supply): AC/DC - 130...260 V Control circuit - indicator: **RLK-1G** - LED diode - green **RLK-1R** - LED diode - red **RLK-1Y** - LED diode - yellow Mounting: direct on 35 mm rail mount
RLK-3.	Signal lamps; modular cover
 page 591	Optic signaling of AC voltage presence in 3-phase network - 3(N)~ 400/230 V Input circuit (supply): AC - 3(N)~ 400/230 V Control circuit - indicator: **RLK-3G** - LED diodes - green **RLK-3R** - LED diodes - red **RLK-3K** - LED diodes - red, yellow, green Mounting: direct on 35 mm rail mount

Solid state relays

- I_n currents of outputs: 0,1 ... 80 A.
- Available versions:
  - miniature,
  - single-phase industrial,
  - three-phase industrial,
  - single-phase with heatsinks.
- Methods of mounting:
  THT, on panel mounting,
  on heatsinks, on 35 mm rail mount
  - depending on the type of relay.

Applications:

- suitable for PCB mounted,
- temperature chamber,
  food processing machinery,
  injection molding machine,
  packaging machine,
  incubator, oiling machines,
  HVAC, lighting, fountain controller,
- three phase motor control,
  temperature control, large oven.

relpol® S.A.

RSR32

Single-phase solid state relays, miniature

Switching mode: zero-crossing or random-on
Output circuit: TTL drive compatibile
Rated load: **AC1 - 2 A / 240 V AC**
Input circuit: DC - 5, 12, 24 V
Mounting: for PCB

page 594

RSR35

Solid state relays, miniature

Switching mode: DC
Output circuit: transistor or MOSFET
Rated load: **DC1 - 0,1 A, 3 A / 48 V DC; 4 A / 24 V DC**
Input circuit: DC - 5, 12, 24, 48, 60 V
Mounting: for PCB

page 596

RSR52

Single-phase solid state relays, industrial

Switching mode: zero-crossing or random-on
Output circuit: SCR (thyristors)
Rated load: **AC1 - 10, 25, 40, 60, 80 A / 240, 480, 600 V AC**
Input circuit: DC - 4...32 V; AC - 90...280 V
Indicator: LED diode
Mounting: direct on panel or on heatsinks
Accessories: thermal pads RTP-10, heatsinks RH **(page 615)**

page 599

RSR62

Three-phase solid state relays, industrial

Switching mode: zero-crossing or random-on
Output circuit: SCR (thyristors)
Rated load: **AC3 - 25, 40, 60, 80 A / 480, 600 V AC**
Input circuit: DC - 4...32 V; AC - 90...280 V
Indicator: LED diodes
Mounting: on heatsinks
Accessories: thermal pads RTP-30, heatsinks RH **(page 615)**

page 604

RSR72

Single-phase solid state relays, with heatsinks

Switching mode: zero-crossing or random-on
Output circuit: SCR (thyristors)
Rated load: **AC1 - 10, 20, 30, 40, 75 A / 240, 480, 600 V AC**
Input circuit: DC - 4...32 V; AC - 90...280 V
Indicator: LED diode
Mounting: direct on 35 mm rail mount (integrated with heatsink)

page 609

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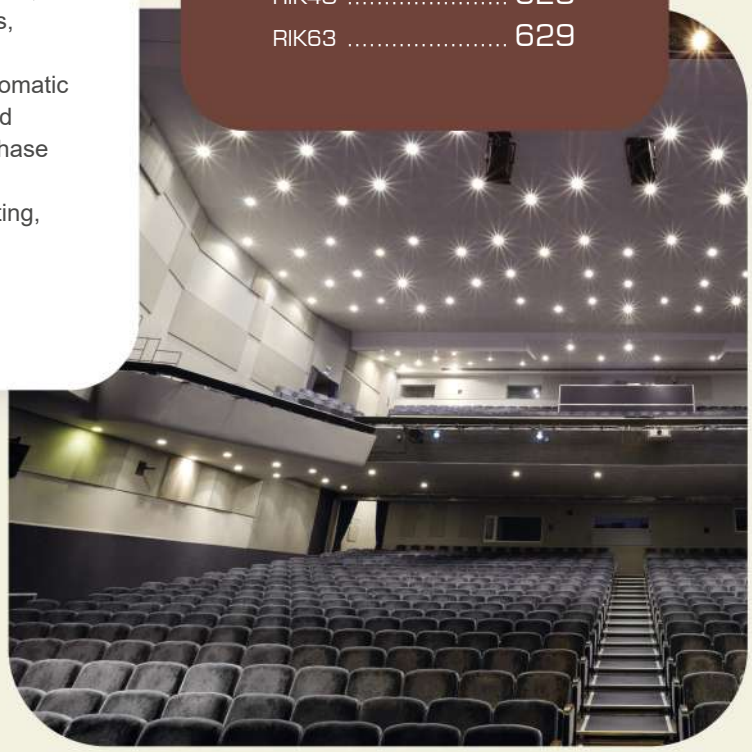
Installation contactors

- I_n currents of outputs: 20 ... 63 A.
- Available versions:
  - in industrial covers: RIK21,
  - in modular covers: RIK20/25/40/63.
- Method of mounting: on 35 mm rail mount.

Applications in low voltage systems:

- are built in consumer devices operating in dwellings, business premises, hotels, hospitals, shopping centres, sport centres, production halls, warehouses, public places,
- for remote switching and automatic control of electric devices and equipment: 1-phase and 3-phase motors, different pumps, air-conditioning, electric heating, lighting.



RIK21

Installation contactors; industrial cover

page 628

Output circuit - contacts: 3 NO + 1 NO (auxiliary), 3 NO + 1 NC (auxiliary)
Rated load: **AC1 - 20 A / 400 V AC; DC1 - 20 A / 24 V DC**
Input circuit: AC - 24, 230 V
Mounting: direct on 35 mm rail mount

RIK20

Installation contactors; modular cover

page 629

Output circuit - contacts: 2 NO, 1 NO + 1 NC, 2 NC
Rated load: **AC1 - 20 A / 230 V AC; DC1 - 20 A / 24 V DC**
Input circuit: AC/DC - 24, 230 V
Indicator: LED diode
Mounting: direct on 35 mm rail mount

RIK25

Installation contactors; modular cover

page 629

Output circuit - contacts: 4 NO, 3 NO + 1 NC, 2 NO + 2 NC
Rated load: **AC1 - 25 A / 400 V AC; DC1 - 25 A / 24 V DC**
Input circuit: AC/DC - 24, 230 V
Indicator: LED diode
Mounting: direct on 35 mm rail mount
Accessories: auxiliary contacts RIKN

RIK40

Installation contactors; modular cover

page 629

Output circuit - contacts: 4 NO, 3 NO + 1 NC, 2 NO + 2 NC, 4 NC
Rated load: **AC1 - 40 A / 400 V AC; DC1 - 40 A / 24 V DC**
Input circuit: AC/DC - 24, 230 V
Indicator: LED diode
Mounting: direct on 35 mm rail mount
Accessories: auxiliary contacts RIKN

RIK63

Installation contactors; modular cover

page 629

Output circuit - contacts: 4 NO, 3 NO + 1 NC, 2 NO + 2 NC, 4 NC
Rated load: **AC1 - 63 A / 400 V AC; DC1 - 63 A / 24 V DC**
Input circuit: AC/DC - 24, 230 V
Indicator: LED diode
Mounting: direct on 35 mm rail mount
Accessories: auxiliary contacts RIKN

Power supplies

- I_n currents of outputs: 0,42 ... 40 A.
- Available versions:
  - in modular covers: RZI...M series,
  - in industrial covers: RZI...P series, RZI...R series, RZI...B series, RZI...UPS.
- Methods of mounting: on 35 mm rail mount, on panel mounting - depending on the type of power supply.

Applications:

- power supplies in modular covers RZI...M: in industrial automation, for supplying household appliances and building automation,
- professional power supplies for industry RZI...P: in industrial automation, for supplying packing machines, construction machinery, weaving machines, etc.,
- redundancy modules RZI...R: for parallel connection of power supplies RZI...P in order to increase power, reliable supply in high efficiency areas, in process engineering and power engineering,
- buffer modules RZI...B: cooperation with power supplies RZI...P in industrial automation, to maintain voltage at momentary supply failures,
- UPS modules RZI...UPS: for control cabinets, adopted to operation in power systems up to 960 W, entire monitoring of the system (three relay outputs).

RZI10-..-M

Power supplies; modular cover

page 640

Output circuit - power: 10 W

Rated load:
RZI10-12-M - **DC1 - 0,83 A / 12 V DC**
RZI10-24-M - **DC1 - 0,42 A / 24 V DC**

Input circuit: DC - 125...375 V; AC - 90...264 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

RZI30-..-M

Power supplies; modular cover

page 643

Output circuit - power: 30 W (RZI30-24-M); 25 W (RZI30-12-M)

Rated load:
RZI30-12-M - **DC1 - 2,1 A / 12 V DC**
RZI30-24-M - **DC1 - 1,25 A / 24 V DC**

Input circuit: DC - 125...375 V; AC - 90...264 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount or on panel

RZI60-..-M

Power supplies; modular cover

page 646

Output circuit - power: 54 W (RZI60-12-M); 60 W (RZI60-24-M)

Rated load:
RZI60-12-M - **DC1 - 4,5 A / 12 V DC**
RZI60-24-M - **DC1 - 2,5 A / 24 V DC**

Input circuit: DC - 125...375 V; AC - 90...264 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount or on panel

RZI100-24-M

Power supplies; modular cover

page 649

Output circuit - power: 91,2 W

Rated load: **DC1 - 3,8 A / 24 V DC**

Input circuit: DC - 125...375 V; AC - 90...264 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount or on panel

RZI60-24-P

Power supplies; industrial cover

page 652

Output circuit - power: 60 W

Rated load: **DC1 - 2,5 A / 24 V DC**

Input circuit: DC - 120...375 V; AC - 85...264 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

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RZI120-24-P

Power supplies; industrial cover

page 655

Output circuit - power: 120 W
Rated load: **DC1 - 5 A / 24 V DC**
Input circuit: DC - 120...375 V; AC - 85...264 V
Indicator: LED diode
Mounting: direct on 35 mm rail mount

CE EAC

RZI240-24-P

Power supplies; industrial cover

page 658

Output circuit - power: 240 W
Rated load: **DC1 - 10 A / 24 V DC**
Input circuit: DC - 120...375 V; AC - 85...264 V
Indicator: LED diode
Mounting: direct on 35 mm rail mount

CE EAC

RZI480-24-P

Power supplies; industrial cover

page 661

Output circuit - power: 480 W
Rated load: **DC1 - 20 A / 24 V DC**
Input circuit: DC - 120...375 V; AC - 85...264 V
Indicator: LED diode
Mounting: direct on 35 mm rail mount

CE EAC

RZI-..R

Power supplies; industrial cover

Redundancy modules: for power supplies RZI...P
Rated load:
RZI-20R - **DC1 - 20 A / 0,65 V DC**
RZI-40R - **DC1 - 40 A / 0,65 V DC**
Input circuit: DC - 22...60 V
Indicator: LED diodes
Mounting: direct on 35 mm rail mount

CE EAC

RZI-..B

Power supplies; industrial cover

Buffer modules: for power supplies RZI...P
Rated load:
RZI-20B - **DC1 - 20 A / 24 V DC**
RZI-40B - **DC1 - 40 A / 24 V DC**
Input circuit: DC - 22,8...28,8 V
Indicator: LED diode
Mounting: direct on 35 mm rail mount

CE EAC

RZI-40UPS

Power supplies; industrial cover

UPS modules: for power supplies RZI...P

Rated load: **DC1 - 40 A / 24 V DC**

Input circuit: DC - 24...28 V

Indicator: LED diode

Mounting: direct on 35 mm rail mount

Relays - basic information

relpol® S.A.

According to USASI (United States of America Standards Institute) a relay may be defined as an electrically controlled device which opens and closes an electrical circuit in order to affect the operation of other devices in the same or another circuit. Relays are a significant element in the contemporary industrial processes.

Dozens of milliards of relays operate nowadays in the world as an interface between control circuits and electrical load. The technological development has brought miniaturization of mono- and bi-stable relays which need a low or even no supply voltage to carry a high power through the contacts.

Relpol S.A. - 60 years of experience in production of highest-quality relays.

Function of the relay

The relay performs two crucial tasks:
1. Galvanic separation (isolation) of the control section and switching section.
2. Switching of high-power loads with high voltage and/or current of high intensity at low energy consumption (low voltage / low current intensity) even at low electrical signals.

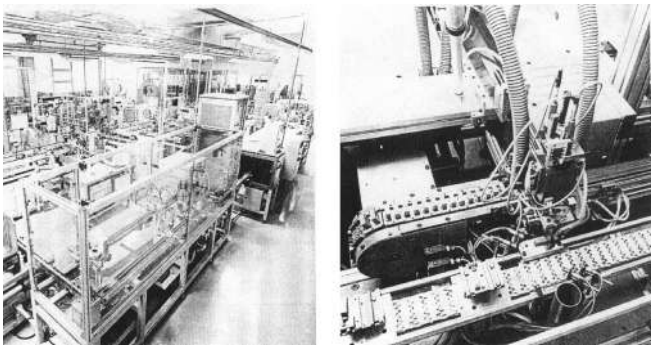
There are numerous applications of relays. Whenever satisfactory operation is needed in electronic and electromechanical conditions, a relay is necessary, e.g. for control equipment, time relays, temperature control, etc.

Main parts of the relay

The electromechanical relay consists of an electromagnetic switch and an electric one.

The former is the control section, and the latter is the switching section which is directly connected to the electrical load.

The electromagnet transforms the electrical current into a magnetic stream that generates the force which moves the switching part.



Electromagnet

Fig. 1. Classic electromagnet unit

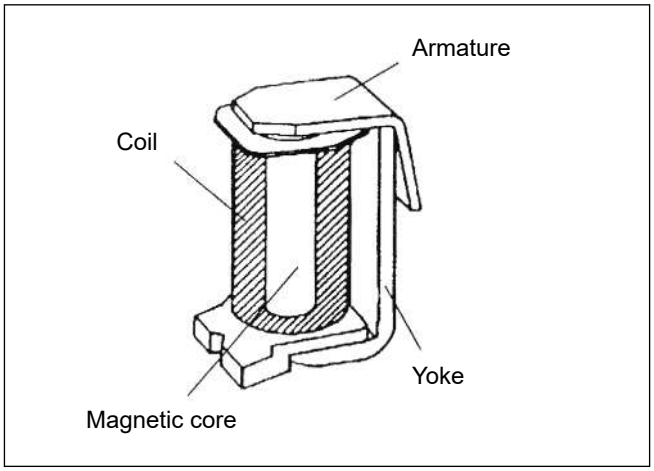


Fig. 2. Classic design of a relay

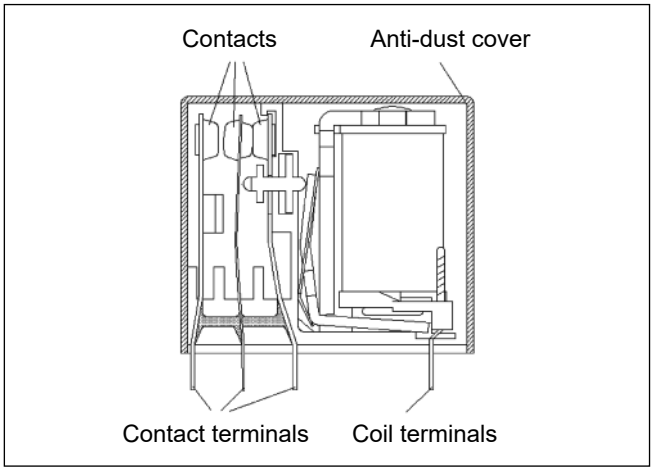


Fig. 1 shows a classic electromagnet unit which consists of four basic parts:
The coil which consists of one or more windings of a copper wire that is usually wound around a spool made of insulating material.
Ferromagnetic core.
Ferromagnetic yoke.
Movable ferromagnetic armature.

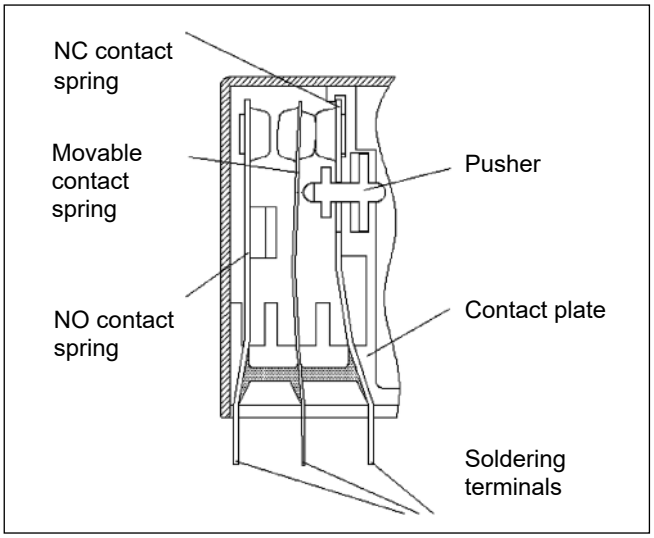
Additional parts:
- Fixed and movable contact springs.
- Contacts.
- Pusher.
- Mounting terminals and coil terminals.
- Contact plate.
- Anti-dust cover.

Switching section

A classic arrangement of the switching section refers to a diagram of one changeover contact. It has been used in the explanation below as it is a basic diagram referred to by all other diagrams.

Fig. 3 shows the switching section of a relay with one changeover contact.
The figure presents the following parts:
- fixed normally closed (NC) contact unit,
- movable contact unit,
- fixed normally open (NO) contact unit,
- pusher,
- contact plate,
- soldering terminals.

Fig. 3. Switching section of a relay

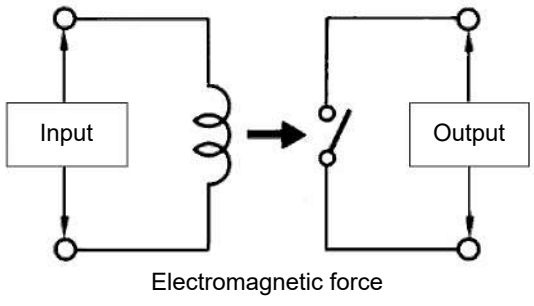


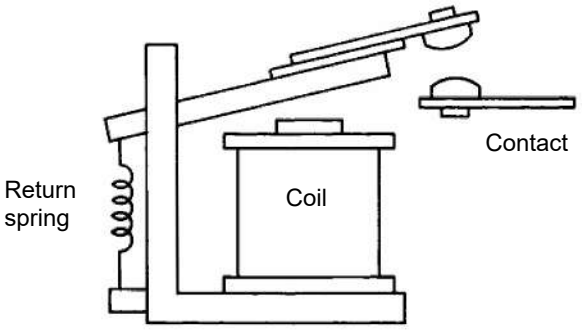
Types of relays

There are two kinds of the device, i.e. electromechanical relay and solid-state relay (SSR).

Electromagnetic and solid-state (SSR) relays

Operation of solid-state relays is very similar to that of electromagnetic relays - it consists in switching the load circuit, which is controlled with a low voltage signal of an insulated input circuit. In an **electromagnetic relay**, the electromagnetic force which moves the yoke and causes switching of the contacts is generated when input voltage is applied to the coil. When the supply voltage is interrupted, the return spring pushes the contacts away from each other, i.e. opens the contacts and disconnetcts the power circuit.



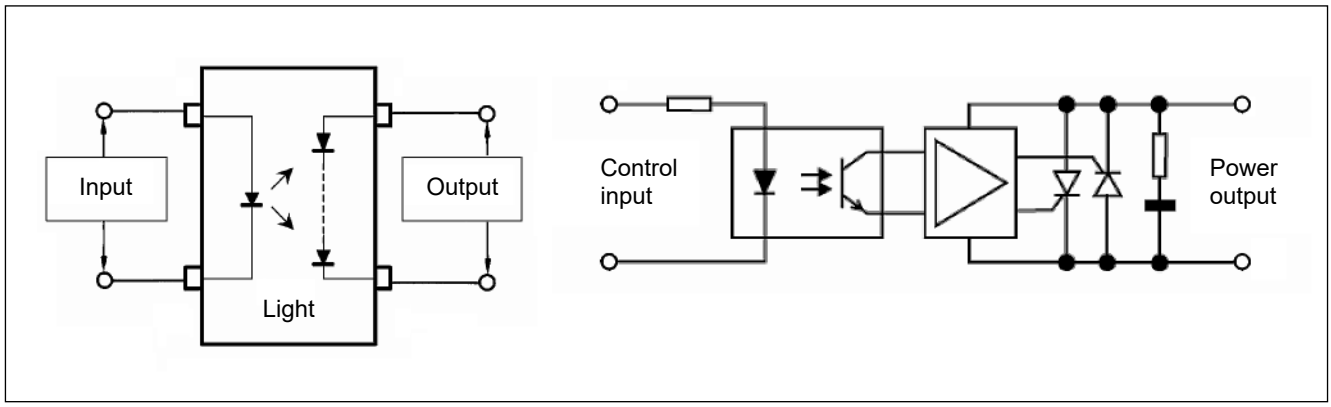


Solid-state relays use an opto-isolator to disconnect the input and output circuits. The opto-isolator changes electrical signal to optic ones and transfers them through the distance which is a galvanic insulation between the input and output sections. SSR's are electronic devices which do not have any movable parts, and the switching elements are thyristors, triacs or transistors.

The input current flows through a light-emitting diode which is usually made of gallium arsenide and it emits radiation in infrared. The diode illuminates the photovoltaic cell which generates voltage to control the output element.

In the opto-isolator, a photodiode, photo-transistor or a photo--thyristor may be be the photodetector.

The opto-isolator carries both direct-current signals and alternating-current ones (analog and digital signals).



Advantages of solid-state relays:

1. Absence of movable parts due to which their operation is completely noiseless, which is of high importance in dwelling rooms, offices, etc.
2. There is no electric arc in the course of switching operation which takes place inside the semiconductor material, the function of making high starting currents, long life and reliable operation.
3. High resistance to shock, vibrations and environmental pollution.
4. No electromagnetic interference owing to completely electronic control.
5. High operation speed and high operation frequency.
6. Low power necessary to control the relay.

Disadvantages:

1. High resistance in switching on state, which causes generation of heat and necessity to use radiators.
2. Considerable voltage drop on the interface (1 - 1,6 V).
3. Sensitivity to overvoltage, necessity to use a varistor or RC circuit.

As compared to solid-state relays, **electromagnetic relays** bear the stamp of negligible small voltage drop (the contact resistance in switching state is on the average about 10 mΩ), and zero leakage current, they are also highly resistant to overvoltage. Due to the mechanical system of contacts and their wear and tear, their life is definitely shorter, and the response time is long and prevents the use of higher operation frequency. The capability of switching surge currents is also considerably smaller.

SSR's provide the possibility of switching at "zero" for resistive load and, then the voltage on the load increases gradually, which, in some cases, e.g. an electric bulb, affects significantly the period of life. This limits surge currents too.
For inductive loads, relays which switch at maximum voltage are useful - conduction occurs at supply voltage peak value, then the surge current is minimized.

Among the basic types of electromechanical relays, monostable and bistable relays should be considered separately.

Mono- and bistable relays

Monostable relays

A monostable relay is an electrical relay which changes its status due to a supply value of the appropriate parameters and returns to the previous status when the parameter ceases or changes.

Bistable relays

A bistable relay changes its status as affected by the appropriate supply value of the appropriate parameters and remains in the changed state even after the value has ceased. Another application of the appropriate supply value is necessary for the relay to change its status again and return to the previous state.

Further classification of relays may be based upon the functions they perform, e.g. all-or-nothing relays, step relays, latching relays, polarized relays, reed relays.

All-or-nothing and step relays

All-or-nothing relays
The term identifies the relays designed for operation at the value that is:
- higher than the make value, or
- lower than the return value.

This type of relays must be supplied by a particular range of voltage (or current). They may be energized by supply or disconnection of voltage (or current) within a given range.

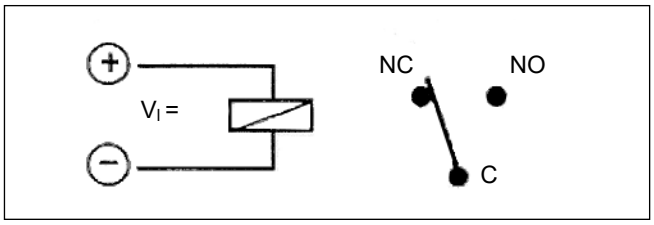
Step relays
The relays have two or more rotational positions, and they move from one step to another in consecutive operations with the use of energizing pulse. They usually move the contacts with the use of cams.

Latching relays

The latching relay is a non-polarized bistable relay. It changes its state at the supply value and remains in the position after the value has ceased. In order to change the state of the relay again, another actuation is necessary. The crucial part of the latching relay is the core made of special magnetic iron which remains magnetized ever after a voltage pulse has been applied. The core consists of a nickel base with aluminum, titanium or niobium added (55-85% Co, 10-12% Ni).

Function
Energizing condition: OFF state
As the wiring is supplied with a voltage pulse of direct current V1 (selected from the recommended supply voltage range) for the duration of ti, the electromagnetic field grows immediately, the core becomes magnetized and the relay is energized (the normally open contact closes). When the pulse declines, the relay remains in the ON state owing to the permanently magnetized core (Fig. 4).

Fig. 4. Latching relay, electrical circuit

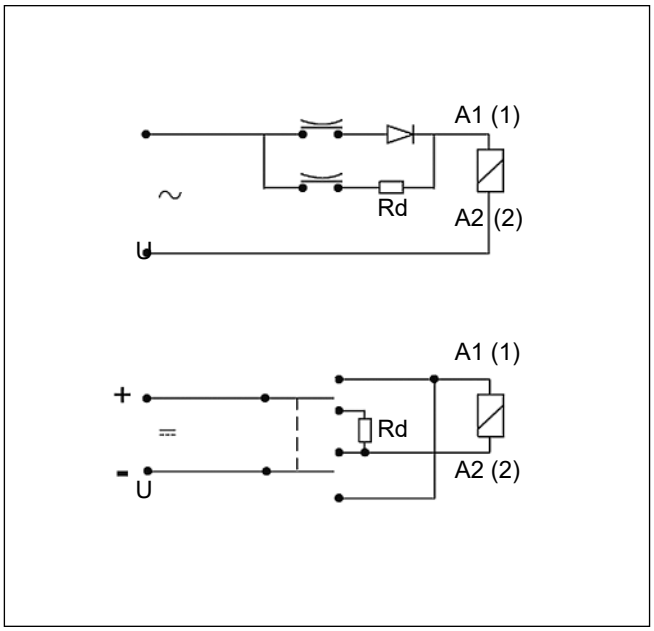


Thus, the magnetic polarization of the relay depends on the polarization of the supply voltage. The relay switches to the OFF state on supply of the voltage of the opposite polarization which changes the magnetic polarization of the core. The sole change of the supply polarization will not cause the release of the relay. This requires a change of the polarization, and the value of the energy supply must be within the range of the actuation (energizing) values.

The circuit applied
There are two different types of the latching relays:

- **single winding** latching relays with the external release resistance to limit the current intensity (Fig. 5).

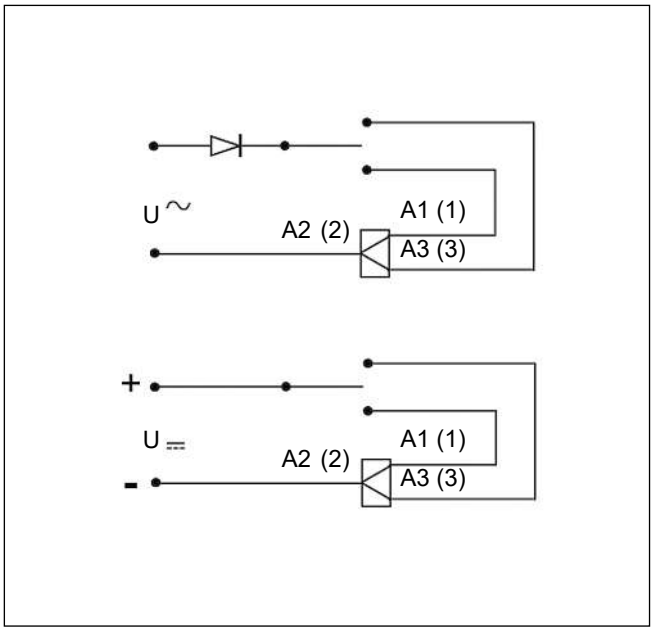
Fig. 5. Circuits with single winding latching relays



- latching relays with **two windings** and two different voltage ranges for ON / OFF operation (Fig. 6).

It is important to bear in mind that for the appropriate operation the relays require a **minimum pulse** of 10 ms. In order to avoid overheating, the maximum time of supply is usually limited, too. The aforementioned relays may also be supplied with alternating voltage owing to the external diode which rectifies the alternating current to the pulses of minimum duration of 10 ms (half of the period). The applications of latching relays are the same as the applications of the normal version relays.

Fig. 6. Circuits with two winding latching relay



Polarized relays

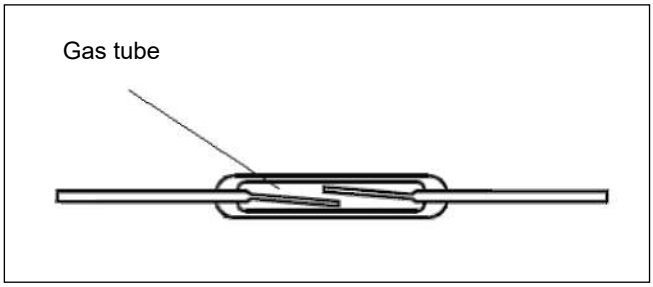
Polarized relay is a relay with permanent magnet which provides additional magnetic force that reduces the energy consumption. The magnetic field required for pulling the armature is partly generated by the coil and partly by the magnet.

The magnetic streams overlap. The supply value must be of the appropriate polarization, i.e. the same as the polarization of the magnet. There are mono- and bistable versions of these relays.

Reed relays

The remarkable advantage of the reed relays is that they are hermetically sealed and, thus, resistant to atmospheric corrosion. They are very fast (10 to 20 times faster than electromechanical relays) and at the range of the rated contact load they offer highly reliable switching operations, and extremely long life. The fundamental part of a reed relay is a hermetic glass tube, commonly called the magnetic (reed) contact.
The magnetic (reed) contact consists of two flat, ferromagnetic lap contacts of the reed relay separated by a small air-clearance, hermetically closed in a glass tube. The contacts of the reed relay are fixed to the ends of the glass tube and, thus, they serve as supports. If the free ends of the reed contacts are exposed to the magnetic field, the stream in the clearance between the reed contacts will make them cooperate.
When the magnetic field ceases, the reed contacts will part from each other as a result of the stress of the spring placed in the contacts. This way, the contacts provide an operating magnetic clearance, and they close and open the electrical circuit.

Fig. 7. Hermetic contact



Terminology

Actuation condition - in case of a monostable relay: specific status of a relay while it is supplied with a given supply value which has been energized; in case of a bistable relay: a status opposite to rest condition indicated by the manufacturer.

Actuation - change from rest condition to actuation condition.

Return - in case of a monostable relay: change from actuation condition to rest condition.

Reset - in case of a bistable relay: change from actuation condition to rest condition.

Constant operation - operation during which a relay remains actuated for the time long enough to reach heat balance.

Cycle operation - operation during which a relay performs several make cycles, where intervals of actuation and absence of actuation are defined; actuation time of the relay is such that heat balance of the relay is impossible to be achieved.

Coil thermal resistance - the ratio of increment of the coil temperature and the input power, measured after the time sufficient for achieving heat balance.

Make voltage - the coil voltage value at which the relay is actuated.

Return voltage - the coil voltage value at which a monostable relay returns to the previous condition.

Reset voltage - the coil voltage value at which a bistable relay is reset.

Normally open contact - a contact which is closed when the relay is actuated, and open when the relay does not operate.

Normally closed contact - a contact which open when the relay operates, and closed when the relay does not operate.

Changeover contact - a set of two contact circuit made of three members of which one is common for two contact circuits; when one of the circuits is open, the other is closed.

Contact gap - a gap between contacts at open contact circuit.

Making capacity - the highest value of electric current which may be connected by a contact when specific conditions are met, e.g. making voltage, number of operations, power factor, time constant.

Maximum continuous current - the maximum value of the current which may flow through a closed contact continuously in specific conditions.

Isolating air gap - the minimum distance in the air between two conductive parts or between a conductive part and exposed surface of the relay.

Isolating surface gap - the minimum distance on the surface of the isolating material between two conductive parts.

PTI - indicator of resistance to creeping current - numerical value of proof voltage expressed in Volts, which may be resisted to by the isolating material without formation of conductive tracks, defined in specific conditions of experiments.

CTI - a comparative indicator of resistance to creeping current - numerical value equal to maximum voltage expressed in Volts, which may be resisted to by the isolating material without formation of conductive tracks, defined in specific conditions of experiments.

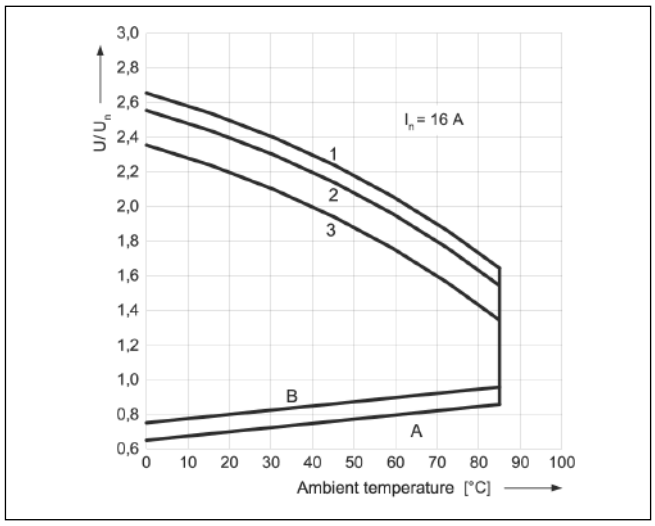
Coil operating voltage range

The admissible operating voltage range for the coil as the function of the ambient temperature is shown in the chart for RM85 relay.

The maximum operating voltage of the coil is limited by the increase of the coil temperature caused by the heating of the winding. The increase shall not exceed the admissible temperature defined for insulation materials.

The make voltage is the minimum operating voltage of the coil. The make voltage grows along with the increase of the winding temperature. Since the resistance of the copper wire changes by 0,4% per Centigrade, the growth of the coil temperature caused by a higher ambient temperature or by contact load results in the drop of the coil current and, thus, the increase of the voltage required for the relay electromagnet to operate.

Fig. 8. Coil operating range - DC



A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

Coils - overvoltage protection

While using electromagnetic relays in electric circuits, it should be borne in mind that coils are the source of significant overvoltage which may disturb the operation of the equipment in which electromagnetic relays are applied. Furthermore, due to overvoltage the equipment in which electromagnetic relays are used may not meet the requirements of electromagnetic compatibility.

Relay coils have high inductance during operation, which causes a rapid increase of the coil voltage on switching off. Such a situation occurs in both DC and AC voltage coils. If, for example, the coil is switched off by a transistor, the latter may be damaged. Moreover, such pulse disturbances my affect negatively the nearby electronic systems.

Fig. 9. DC coil voltage during switching off

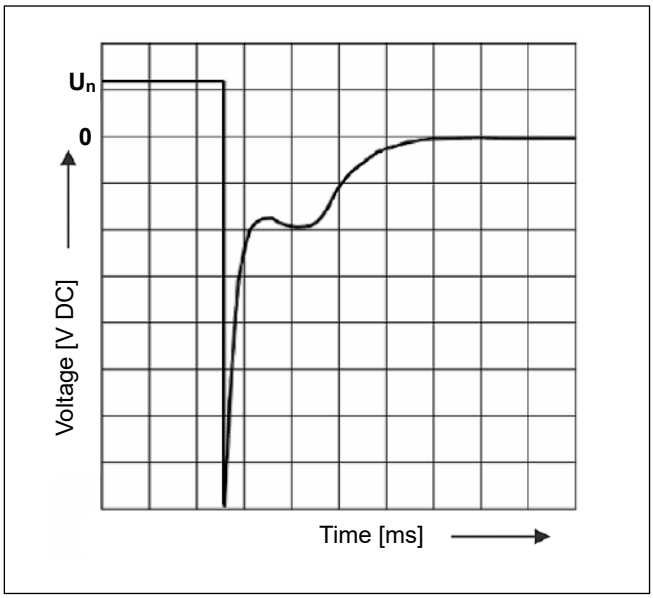
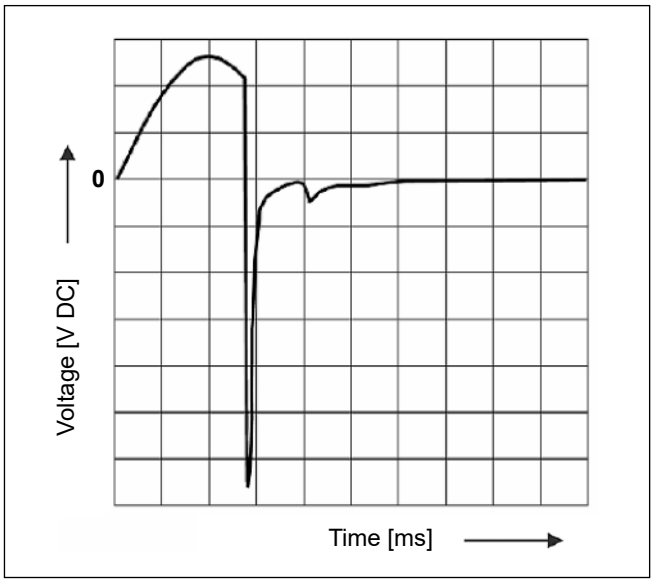


Fig. 10. AC coil voltage during switching off



For coils supplied with DC voltage, the best and simplest solution of the problem is a parallel connection of a standard rectifying diode to the coil terminals. During the current flow, the diode has a reversed bias due to the voltage drop on the coil. On switching off the coil voltage, the diode starts conducting which results in the coil voltage increase merely by the voltage drop on the conducting diode. Designers of electronic systems with electromagnetic relays practically always use suppressing diodes connected in parallel to the relay coil. The 1N4007 diode is a perfect solution in most of such cases. Diodes remove overvoltage extremely efficiently, they are a cost-effective and reliable way of suppressing coil self-induction voltage, which does not involve complicated calculations The only weak point of the diode system is a remarkable (threefold) increase of the relay release time. The release time may be reduced by connecting an additional resistor in serial to the diode in which case, however, the overvoltage value grows while the coil is being switched off.

The **diode protection** cannot obviously be used with AC coil relays. In such cases, two types of protection are commonly used, i.e.:
- varistor protection, and
- R-C two-terminal network protection.

Metal-oxide **varistors** have similar current-voltage characteristics to that of a bidirectional Zener diode. When the voltage between the varistor terminals exceeds a given limit value, it starts conducting, and, thus, it shunts the inductive load (the relay coil) with its differential resistance. The maximum overvoltage value on switching off depends on the limit voltage of the varistor.

Furthermore, when the varistor is supplied from the mains, the varistor protects also the relay coil from being damaged by the voltage pulses that occur in the mains. The varistor protection may be also applied in DC coil relays. However, the overvoltage values on switching off are much higher than in the case of protection with the use of a suppressing diode.

Another way to limit the overvoltage values during coil switching off is a parallel connection of an **R-C two-terminal network** to the coil. The network limits the overvoltage well, it is inexpensive, and it only slightly increases the relay release time.

No ceramic **capacitors** should be used whereas it is recommended to use foil capacitors. On selection of a **resistor**, it should be taken into consideration that quite a large amount of power dissipates on it during the transition process and, thus, the resistor's power shall not be less than 0,5 W.

Relpol S.A. offers both relays with integrated **overvoltage protection elements** (diodes or varistors) and ready-to-use **overvoltage protection modules** to be mounted in plug-in sockets.

R2N, R3N and R4N relays with DC coils are also in the version with suppressing diode mounted inside the relay. However, varistors are not mounted inside these relays. Ready-to-use overvoltage protection modules of M series may be used with the relays and then the modules are mounted in GZT., GZM. and GZMB. series plug-in sockets. Modules with a diode (DC coils) or with a varistor (DC or AC/DC coils) are available.

R15 relays are manufactured solely with the overvoltage protection element integrated, i.e. with the suppressing diodes for DC coils (two-, three-, and four-pole versions) and with varistors for AC coils (two-, and three-pole versions). In the case of a suppressing diode as the overvoltage protection element, the coil supply polarization must be as follows: A1 terminal "+", A2 terminal "-". Note: the specified polarization does not refer to the relays R15 4 CO – four-pole for which the coil supply polarization must be as follows: A1 terminal "-", A2 terminal "+".

Ordering codes of the overvoltage protection elements integrated in the relays (as add-on equipment) are as follows:
D - suppressing diode;
V - varistor.

While using an overvoltage protection element, the user may be assured that the overvoltage that occurs on switching the coil off will not affect negatively the coil control circuits or any other electric and electronic circuits.

Switching section: main diagrams and mechanical solutions

There are various contact configuration diagrams related with different application requirements, i.e. normally open contacts (NO), normally closed contacts (NC) and changeover contacts. These are the basic configurations used for designing all the contact diagrams of relays. With the use of the basic contacts, many relay circuits may be built in order to apply relays successfully. The only theoretical limitations are the dimensions of relays, electromagnetic energy, switching energy and the complexity of drawings. The contact configurations available in a relay are determined by the number of poles, type of the contacts (changeover or normally open/closed), and normal position of the contacts (normally open or normally closed). In table next are listed **symbols depicting exact type of contacts**.

Other manufacturers of relays apply also different ways of defining the configuration of contacts. They may be found in catalogs and catalog cards published by the companies.

Contact type	Marking		
	Relpol S.A.	**Zettler**	**USA**
CO	1	C	SPDT
NO	2	A	SPST-NO
NC	3	B	SPST-NC

SP = single pole
ST = single contact (normally open or normally closed)
NO = normally open contact
NC = normally closed contact
DP = two contacts
DT = changeover contact

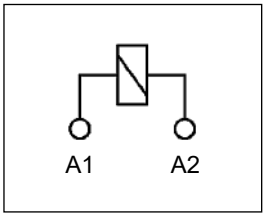
Terminals marking

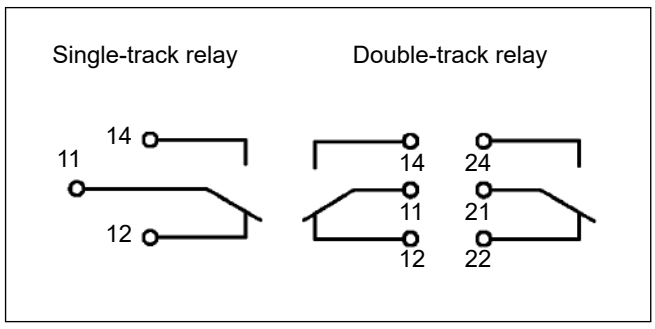
Terminals marking under Polish Standard EN 50005.

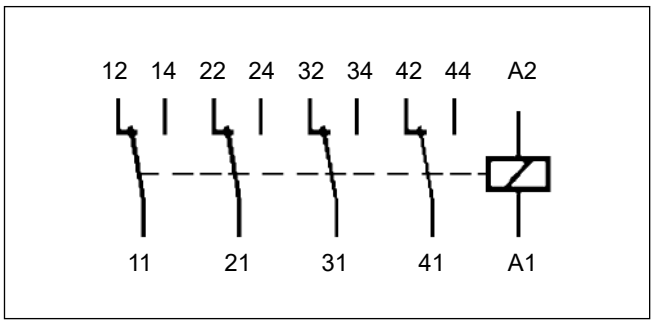
Contacts terminals are always marked numerically with two digits, where:
- the unit digit is the number of functions,
- the decimal digit is the number of sequences.

Coil terminals are always literal--numerical.

The scheme of marking of terminals of contacts and coil for a four-track relay (see below).







Contacts and shapes of contacts

Contact pressure

When two contacts come together to close the electrical circuit, they touch each other within the area that depends on the shape of the contacts. The force (N) with which the contacts push against each other as measured on the contact axis, divided by the area of the contact (mm^2) equals the contact pressure (N/mm^2). It is practically impossible to determine the real contact area as it depends also on the roughness of the contact surface. The contact pressure is determined by the contact force. In order to obtain a large contact area, the contact force must be increased so that the contact area roughness may be deformed. A low force means a few effective contact points and a small area of the contact (i.e. a high contact resistance). On the other hand, a stronger force increases the number of contact points and the total contact area (lower contact resistance). The contact force may be increased only to the limit defined by the mechanical strength of the parts and as much as it is allowed by the supply voltage sensitivity.

Manufacturers of relays use **different shapes** of contacts according to the relay designs and applications.

Fig. 11. Effect of the contact force

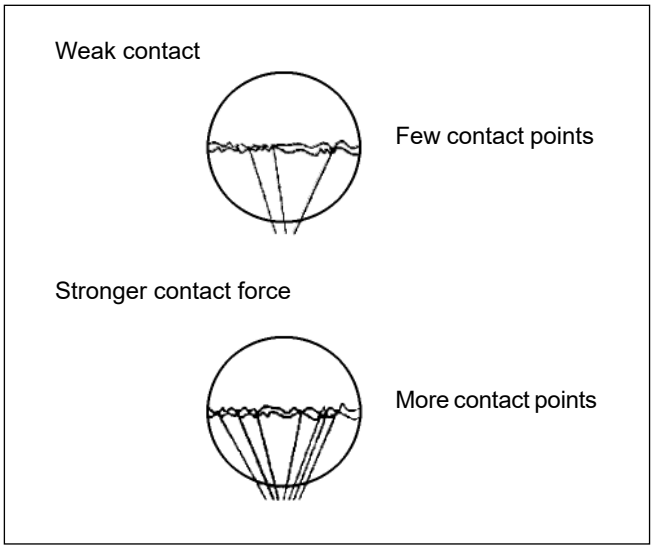
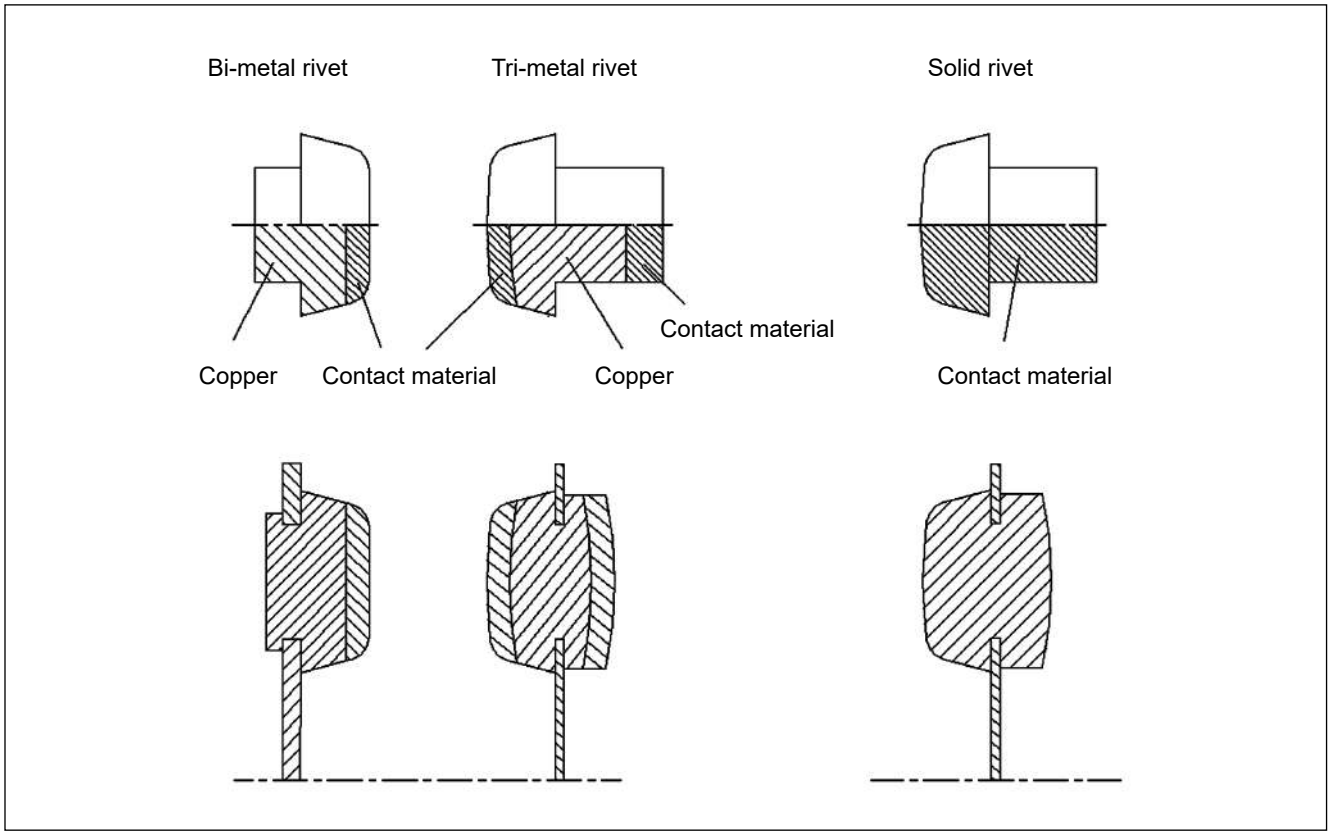


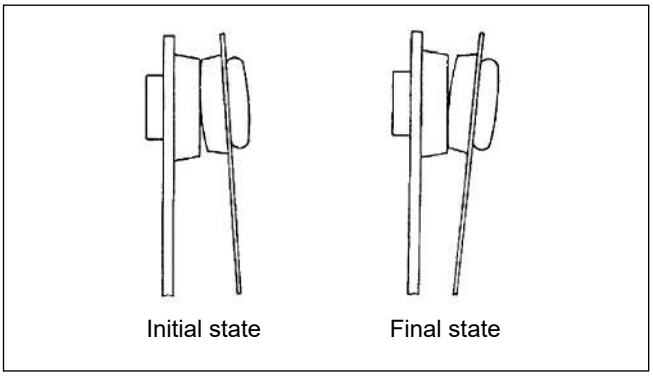
Fig. 12. Shapes of contact rivets



Cylindrical contact rivets

Cylindrical contact rivets are usually used in their bimetallic, solid or other versions, similarly to the contact parts of miniature relays owing to their optimal switching capabilities and easy assembly. Normally, the contacts are connected between the flat surface of the fixed contact and the spherical surface of the movable contact (the common contact). Principally, the common contact is a solid one whereas the fixed contacts (NC and NO, when in switching operation) are bimetallic ones (Fig. 12). The head of the central solid contact is ready to use on one side, and it is shaped during assembly on the other side. The flat-spherical connection between the contact surfaces is necessary for the reduction of the area of connection with the simultaneous increase of the contact pressure. Moreover, relative surface movement (roll) occurs then, which is useful in terms of enhanced contact performance (Fig. 13).

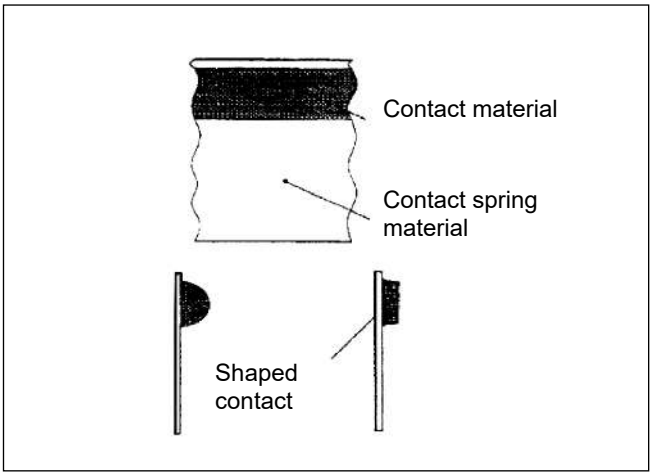
Fig. 13. Contact movement



Small-profile contact

A pressed strip of metal or contact alloy is automatically welded to the spring material prior to the cutting process. During the cutting process, the spring strip is cut together with the contacts, and the contact is formed to the required shape (Fig. 14). This solution is useful as it provides avoiding a dangerous voltage drop on the spring-contact connection. This allows the appropriate selection of the contact shape.

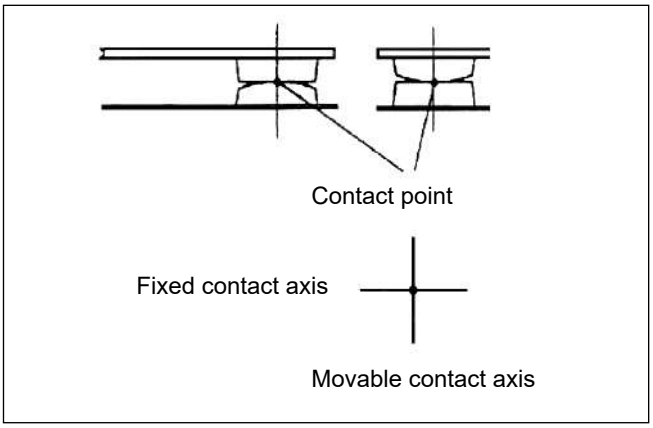
Fig. 14. Small-profile contact



Cross contacts

While using small-profile contacts it is possible to design a contact coupling with cylindrical surfaces and perpendicular axes. This way, a limited contact area and high contact pressure may be obtained. Moreover, during switching, two contacts operate like ”two knives”, thus maintaining a very clean contact surface.

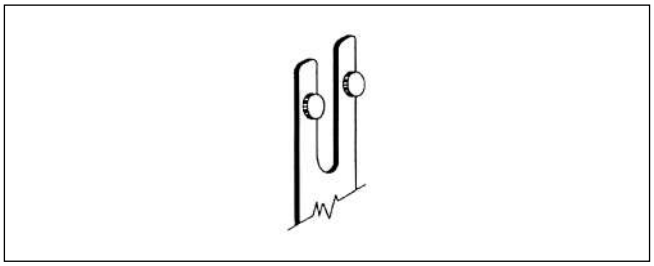
Fig. 15. Cross contact



Twin contacts

For some applications (e.g. low-level signals - safety systems), in order to enhance the contact reliability, twin contacts are used. Small-profile rivets or contacts are placed one next to another on the same forked spring (springs of fixed and movable contacts). Thus, duplication of the contact points may reduce the probability of error occurrence by half.

Fig. 16. Twin contact



Contact materials

In the issues related with switching, contact materials and special alloys play an important role, and each application requires the appropriate assessment of the electric load, ambient conditions and other information in order to make the proper choice.

Surface finishing

Precious contact materials are widely used due to their high conductivity. However, it is silver and its alloys that are exposed to the effects of the surface corrosion caused by sulfur contaminations in the atmosphere (SO_2 - sulfur dioxide). Layers of sulfur deposit on the contact surfaces, which is highly harmful to the contact resistance. The aforementioned materials may be plated with gold or another noble metal (metals that are more resistant to corrosion and/or oxidation, i.e. platinum, palladium, etc.).

Cleaning

Cleanliness is very important for the process of relay assembly due to the necessity to keep the internal parts of relays free of dust and other particles which may affect the area between the contacts and disturb the proper course of switching operations. That is why contacts, working parts and (in some applications) the whole relay without a dust cover are cleaned immediately prior to their enclosing.

Plastic contaminants

Due to temperature, internal parts of the relay made of plastic may produce gases and vapors. If they are not removed from the relay, they may deposit on the contact surface, which will increase the contact resistance. This is often the case in tight relays where it may appear extremely dangerous if the plastic has not been previously treated in a special manner. The treatment consists in high-temperature degassing process in which, at low atmospheric pressure, plastics emit gases and vapors. The process ends with stabilization of the ambient pressure which allows avoiding reactions inside the relay that might occur in the presence of humidity and oxygen.

Contact resistance and influencing factors

The main function of electric contacts is to close an electric circuit to provide flow of current (I) at voltage (U). This "simple" operation requires certain special characteristics of contacts, which depend on materials, shapes, mechanical parameters, etc. When current (I) flows through an electric circuit, the circuit resistance (R) reacts against the current flow according to the following rule: **U = R x I**

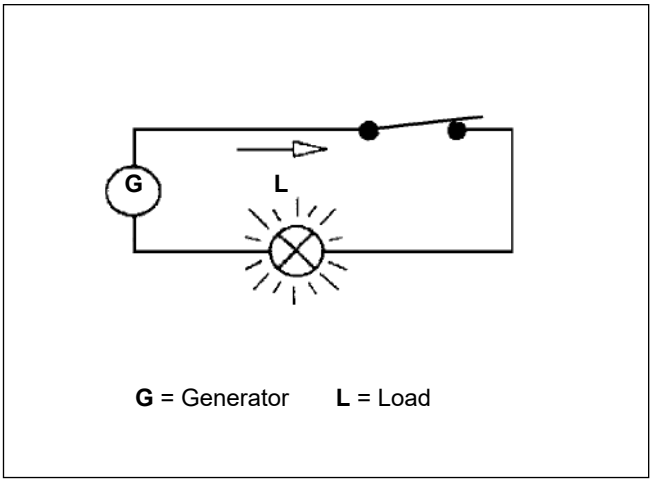
The value of R consists of two different resistances: **circuit resistance R_c and contact resistance R_r**.
Thus:

$$R = R_c + R_r \text{ and } U = I \times (R_c + R_r)$$

The dissipated power **P_w in the entire circuit** equals:

$$P_w = P_c + P_r = (R_c + R_r) \times I^2$$

Fig. 17. Basic circuit



G = Generator **L** = Load

The value of the circuit resistance R_c usually spreads evenly along the length of the circuit (cables, wires, printed circuits, etc.), and P_c dissipates in the same manner (low increase of temperature); on the other hand, however, R_r is entirely concentrated inside the relay (problems related with the temperature rise). This proves the extremely important role of maintaining the relay contact resistance on as low a level as possible. This is important in applications of both high and low power. In the first instance, there is the problem of temperature rise inside the relay whereas in the second case high contact resistance may disturb the proper operation of the device.

Question:
Find the values of power (W) dissipation in the relay contact circuit under the following circumstances:
- electric load: I = 5 A, U = 250 V AC,
- relay contact resistance (mΩ):

a) 10 mΩ
b) 50 mΩ
c) 300 mΩ
Solution:
a) $R_c \times I^2 = 10\ m\Omega \times (5\ A)^2 = 0{,}25\ W$
b) $R_c \times I^2 = 50\ m\Omega \times (5\ A)^2 = 1{,}25\ W$
c) $R_c \times I^2 = 300\ m\Omega \times (5\ A)^2 = 7{,}50\ W$

Based on the above, it may be stated that the power dissipation inside the relay reaches undesirable levels at high contact resistance.

Question:
Find the value of the voltage drop caused by the relay contact resistance in the next circuit under the following circumstances:
- electric load: I = 1 mA, U = 5 mV,
- relay contact resistance (mΩ):

d) 10 mΩ
e) 100 mΩ
f) 400 mΩ
Solution:
The voltage drop on the contact equals:
d) $R_c \times I = 0{,}01 \times 0{,}001 = 0{,}01\ mV$
e) $R_c \times I = 0{,}10 \times 0{,}001 = 0{,}10\ mV$
f) $R_c \times I = 0{,}40 \times 0{,}001 = 0{,}40\ mV$

High values of resistance cause a significant percentage of voltage drop which may be dangerous in some devices. This is important because high contact resistance usually means instability of the contact resistance. In applications of low-level signals (measurements, etc.) the capability of reaction to the contact resistance is a fundamental requirement. The following factors affect the contact resistance:
- contact pressure,
- materials,
- surface finishing,
- cleaning,
- internal contaminations of the plastic relay parts.

Each individual influence must be taken into account.

Alloys and contact materials

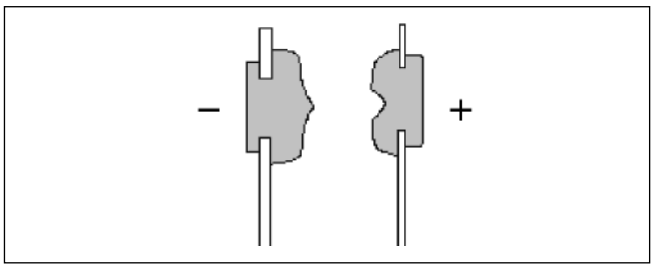
The choice of the contact material depends on the application. The following are the most commonly used materials:

Silver Ag
Pure silver (99% Ag) is of the highest electrical and thermal conductivity as compared to any other known metal, and it proves good resistance to oxidation but it is affected by the presence of sulfur in the atmosphere. The sulfur forms silver sulfide which increases the contact resistance. In order to avoid the problem, the contact surface is plated with gold (5 µm) as the latter remains free of silver sulfide (no chemical reaction). This is a good version of the contact widely used for switching low-level loads from µV to 24 V DC and AC, and from µA to 0,2 A, and in any case with no electric arc as it might damage the layer of gold and expose silver to the harmful presence of sulfur.

Silver - cadmium oxide AgCdO
This compound (90% Ag - 10% CdO) has a wide range off applications in power loads owing to its good resistance to welding and the effect of electric arc suppression. The compound may be used from 12 to 380 V AC and from 100 mA to 30 A. It is used particularly for resistive and inductive applications such as motor loads, heating resistors, lamp loads, solenoids, etc. The material is a standard one to meet most of the requirements of the customers. The problems related to sulfur do affect it but the presence of electric arc and relatively high voltage and intensity of current make the problem imperceptible (the electric arc and voltage pierce the sulfide layers).

Silver - nickel AgNi
The alloy (90% Ag - 10% Ni) is the most suitable one for switching DC loads and avoiding material transfer that appears at DC and at medium voltage and intensity of current (1-10 A; 6-60 V DC). This is a physical phenomenon of moving the material from one contact to the other (from cathode (-) to anode (+)). This results in quick wear of contacts and dangerous reduction of the contact clearance.

Fig. 18. Transfer of contact material



Tungsten
This is the hardest material, highly resistant to sticking. It has, however, a relatively high contact resistance. Because of these characteristics it is usually used in electric circuits where short current peaks appear, and where the material prevents the contacts from welding to each other: leading loads, motor loads, lamp loads (especially fluorescent lamps), etc. The range of applications starts from 60 V and 1 A.

Silver + tin oxide (tin dioxide) - $AgSnO_2$
The $AgSnO_2$ material is of similar properties to those of AgCdO. However, the former has a higher thermal stability and better resistance to transfer of material from one contact to the other, which provides longer life in DC applications. The $AgSnO_2$ contacts wear evenly and they are recommended for applications at the loads that create inrush current and at inductive loads.
The contact ratings depend to a great extent on the level of the oxide in the compound, the manufacture method and the presence of admixtures which are used by contact materials manufacturers mainly to reduce the contact resistance and to enhance the resistance to material transfer.
The $AgSnO_2$ material offered by Relpol S.A. in miniature relays contains a low admixture of indium oxide (In_2O_3) which is a universal material. Apart from good results achieved at lamp loads, the material performs perfectly at resistive loads and switching currents up to 16 A.

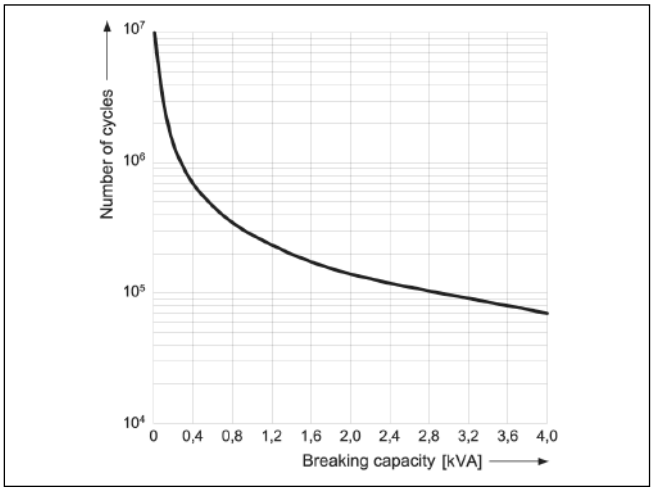
Gilding - Au
Contact gilding with 0,2-0,5 µm gold layer is usually applied in order to protect the basic material from oxidation during product storage. The protective gilding is not resistant to mechanical wear and it is quickly destroyed in course of the relay switching. Contact gilding with 3-5 µm layer of gold is used as protection from corrosion and to enhance signal circuits switching. Thick gilding provides the lack of microscopic pores, perfect resistance to corrosion and to formation of non-conductive layers.
However, gold is very soft, easily becomes mechanically worn, and its low melting point may limit the electric life of the contacts which switch high currents.

Electric life of relays

The electric life or switching capacity is expressed as the minimum number of cycles which the relay may perform at a given load and under certain circumstances. The ”cycle” means a full switching operation from OFF state to ON state and to OFF state again. The electric life ends when the contacts are no longer capable of switching electric load within the range of the contact resistance (or contact voltage drops) which stops the switching operations after it has reached a higher value (the limits depend on the application). The specifications of relays indicate the electric life as the number of cycles at rated current and voltage, and at constant frequency and ambient temperature.

For example, the electric life of the RM85 relay is:
Number of cycles: 7 x 10^4 at 16 A and 250 V AC - 50 Hz, resistive load, 600 cycles/hour - ambient temperature 85 °C.
In practice, customers require electric life also at lower values of current intensity. Thus, on the basis of tests, the curve of electric life is defined and the curve shows the dependence of electric life (number of cycles) on switching capacity (Fig. 19).

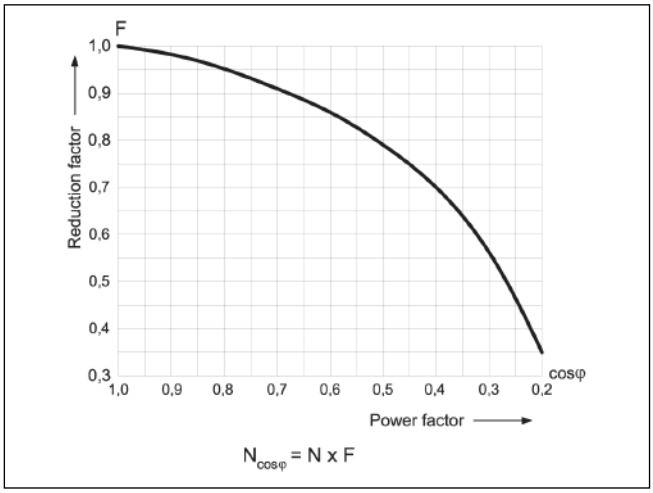
Fig. 19. Chart of electric life of a relay



Inductive loads cause high contact wear which reduces the relay life. The reduction has been defined on the basis of tests, and it is expressed as the correction factor for resistive electric life (depending on the load power factor) which should be used to define the projected life.

Question:
What is electric life of the RM85 type relay for the following electric load: 8 A / cosφ = 0,4 / 250 V AC; 600 cycles/hour. The chart in Figure 19 shows that the projected life is approximately 150 000 cycles at resistive load (cosine = 1).
The chart presented in Fig. 20 proves that at the cosine power factor which equals 0,4 the correction factor is 0,7. Thus, the projected electric life under the aforementioned conditions is 150 000 x 0,7 = 105 000 cycles.

Fig. 20. Ratio of correction coefficient to power coefficient



Reliability

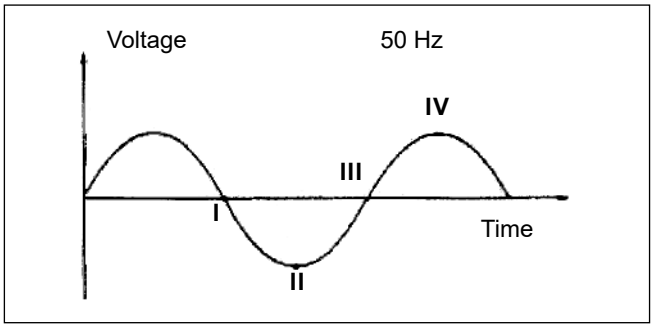
Charts of electric life of a relay in the function of load power are useful in estimating the reliability parameters. The value found in such charts may be used for defining the statistical parameter of B10 life, i.e. the number of cycles following which 10% of the relays population will fail. Electromagnetic relays are unreparable elements and, thus, any damage to them in a device means the necessity of replacement. Given the frequency of operations of a relay in a device and the number of cycles defining its life, the mean time to failure (MTTF) may be estimated, which may then be used for calculation of MTBF for the device.

Switching at alternating and direct current

Various problems occur at switching AC and DC loads of high power, and various aspects shall be taken into account in order to understand the nature of the phenomenon. In AC current circuits (of the frequency approx. 50 - 60 Hz), the relay contacts may open in two possible states of the operating voltage due to the course of the voltage and the phenomenon of the electric arc (see Fig. 21).

Switching at point I:
Voltage value is close to zero.
No electric arc occurs.

Fig. 21. Switching states (I, II) at the frequency of 50 Hz of alternating current



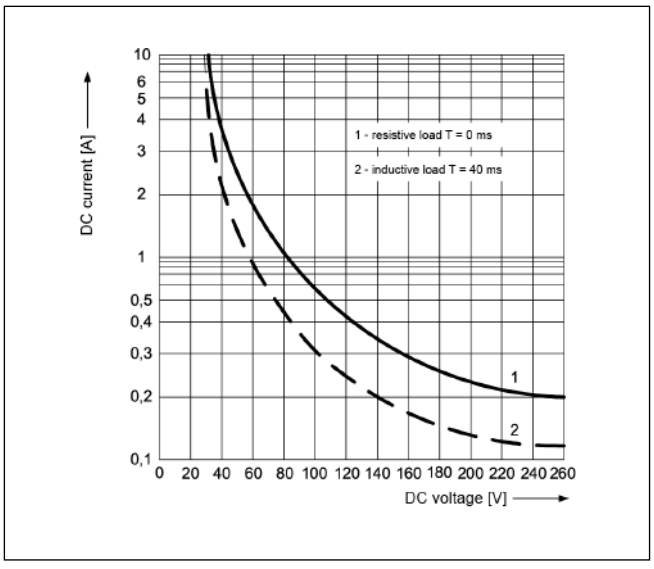
Switching between points I and II:
There may be two situations in which the voltage grows or drops. In both cases, arc discharge occurs but it is suppressed due to the transfer of the voltage via the zero value. The electric arc discharge depends on the voltage value, contact clearance, current intensity, shape of contacts and on materials. Due to these reasons, in miniature relays there are physical limits related to the above parameters, which reduce the maximum AC switching voltage to approximately 380 V. The inductive loads of AC are worse as compared to the resistive loads due to contacts wear since the load inductance grows and, thus, a constant arc appears together with its harmful effects.

Arc breaking

In DC devices, the arc breaking is a crucial problem because the voltage does not transfer via the zero value as it does at alternating current. Thus, when the electric arc appears, only the contact clearance and the properties of the contact materials contribute to the arc suppression. Relays usually have a physical limit that depends on the above parameters which make the relays incapable of switching the load at current intensity and voltage higher than the specified values. The values are expressed in the form of a curve which defines the maximum switching energy (U x I) at the constant time value L/R of resistive and inductive loads while L (inductance) is expressed in henries and R (resistance) in ohms.
L/R is principally expressed as a value that equals 40 ms (miliseconds) for inductive loads, i.e. a mean value for devices.

Example (Fig. 22):
The maximum admissible switching intensity of direct current for the R3N relay at 230 V DC at resistive and impedance loads are 210 mA and 120 mA respectively. The values assure the arc suppression. Suppressing circuits are also useful for alternating current devices.

Fig. 22. Maximum switching capacity at direct current



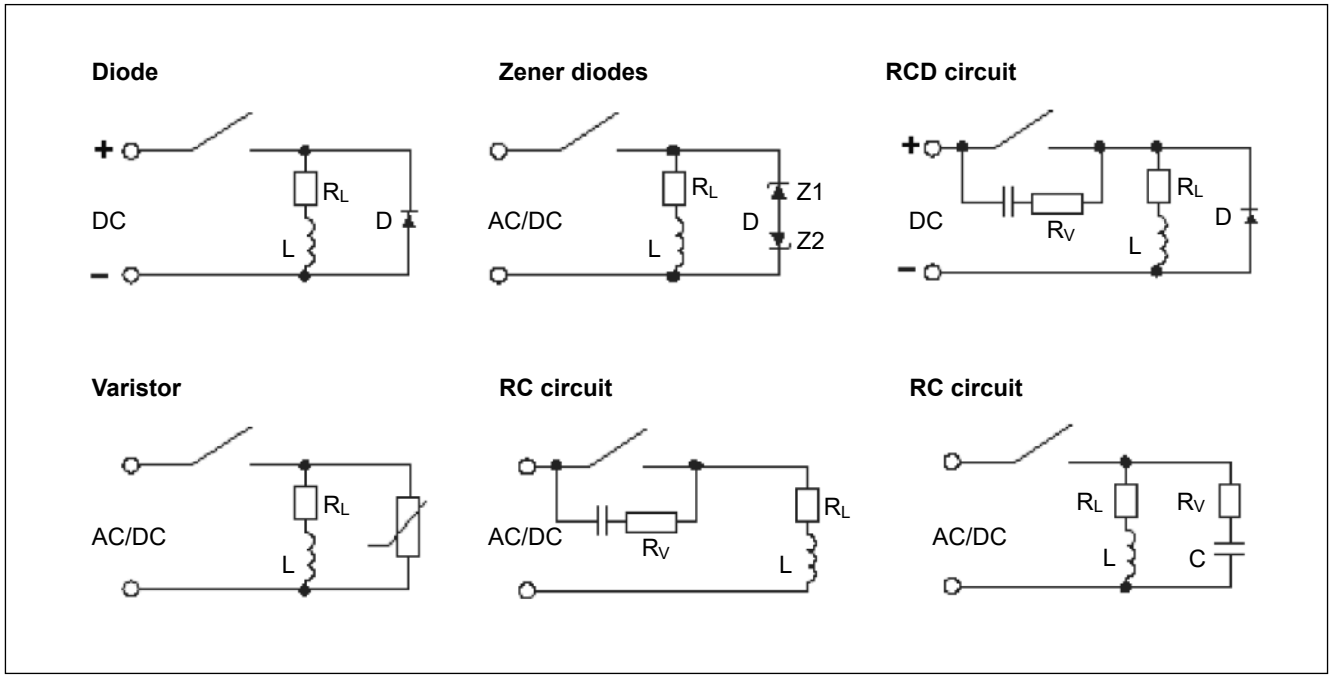
Suppressing circuits

In order to protect contacts against their damage by electric arc, protection circuits are used which are fitted in parallel to contacts of the relay or to the load. Appropriate suppressing elements may also be connected both to the contacts and the load.

The most common method of arc suppression in DC circuits is using a **diode** in parallel to the load. This is an efficient and cost-saving solution applicable at various values of the load. The inverse voltage of the diode should be at least 10 times higher than the rated voltage of the circuit, and the conduction current should be equal to or higher than the load current. It must be emphasized that diodes prolong the time of switching off the relay considerably, which delays opening of the contacts and this is conducive to their burnout.

In order to decrease the effect of the arc suppressing circuit, on switching off the load, **two Zener diodes** may be used instead of the diode parallel to the load. In such a circuit, the inverse voltage is limited by Zener diode do the regulated voltage. The breakdown voltage of the Zener diode must be higher than the supply voltage of the circuit. The disadvantage of this solution is its lower effectiveness and higher cost.

Fig. 23. Protection circuits

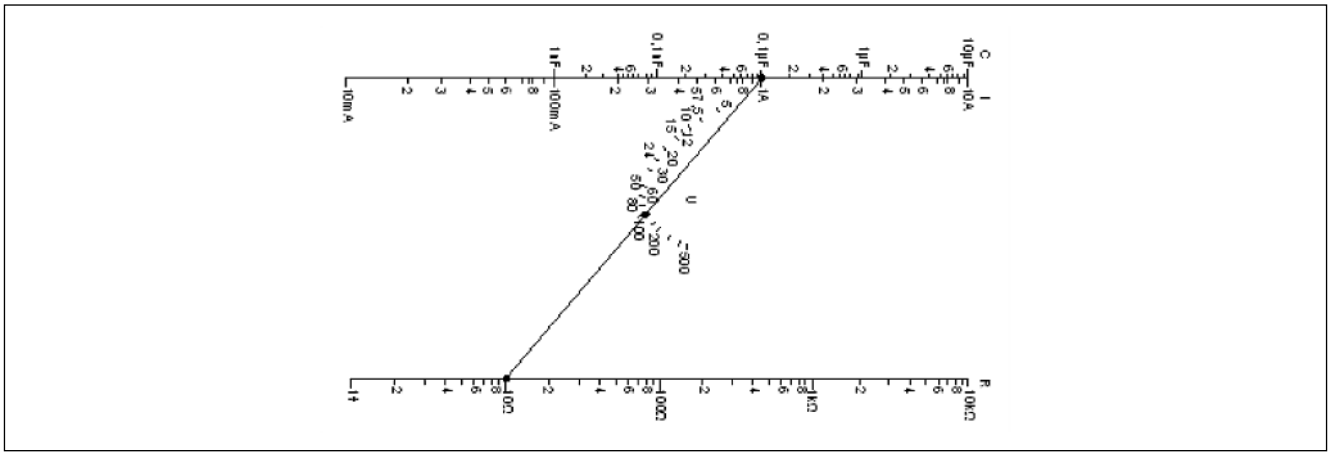


A **varistor** is another protection element of current-voltage ccharacteristics similar to Zener diode. For low voltages it shows high resistance and, then, it is practically disconnected from the circuit whereas when the voltage exceeds certain voltage, characteristic for the given varistor, its resistance decreases quickly and, then, it shunts the inductive load with its internal resistance.

Unlike diode and varistor circuits, **RC circuits** may be connected in parallel both to the load and to the contacts of the relay. When the contact opens, the capacitor connected in parallel starts charging itself and its voltage grows at the time constant of R and C values. This helps to maintain low voltage on the relay contacts and, thus, diminish the effect of the electric arc. Ehen the contact closes, the capacitor connected in parallel to the capacitor consists limitation of current. Thus, the RC circuit optimizes all the intermittent processes in the course of opening and closing of the contacts. At AC voltages the load impedance must be lower than the RC circuit impedance.

In order to enhance the effectiveness of arc suppression in direct current circuits of high inductiveness of the load, **RCD circuits** may be used, where the RC element is connected in parallel to the relay contact and the diode - in parallel to the load.

Fig. 24. Nomogram for defining optimal values of R and C



Special loads

Bulb load

Closing of the contact with bulb loads (a lamp with tungsten fiber) causes problems due to high current peaks related with the low resistance of the fiber when it is cold. For example, a 60 W - 220 V AC bulb has the ”cold” resistance of approximately 60 Ω which corresponds with a current intensity of 3,66 A (for a few milliseconds). On the other hand, the current intensity of a hot bulb is 0,273 A (the ratio is then 1:15). This illustrates the high load that occurs on the contacts during the bulb switching (a hazard of contact welding or sticking).
The following must be taken into account for bulb load switching:
- maximum load of the bulb,
- contact material.

Motor loads

The motor loads are inductive loads which operate in a particular manner while switching on. A current peak occurs as a result of the motor inertia which is related to the mechanical load used in the motor, and which in the starting phase is 5-10 times higher than the current in the steady state. Furthermore, when the motor is being switched off, harmful action related with inductive loads occurs. Thus, the correct choice of contact material is related with the aforementioned load characteristics, especially when the capacitor is connected to the motor. In such particular cases, the contacts are made of tungsten and $AgSnO_2$. The power of electric motors is expressed in kW or in some countries that do not use the metric system in HP (horsepower); 1 kW = 1000 W and 1 HP = 745,69 W.
Example: R15 relay - the rated motor power of the contact is 1/2 HP.

Capacitance loads

This is the worst contact load as for switching on due to a sudden increase of the current intensity peak which occurs when the capacitor is discharged (a phenomenon similar to a short circuit). The current intensity at the peak to be switched on may reach the values of hundreds of Amperes in a very short time (microseconds).

The problem of contact welding may be avoided in two ways:
- via using the $AgSnO_2$ contacts,
- via reduction of the current intensity peak by introduction of a resistor to limit the current.

The same problem occurs at contacts closing with a charged capacitor, i.e. a rapid discharge occurs.

Switching time and contact bounce

On the relay coil supply during opening and/or closing, the operation lasts in time depending on the electric and mechanical inertia of the parts. The delay between the coil supply impulse and the preset closing and/or opening of the contacts is the sum of the effect of the electromagnetic system and the switching section.

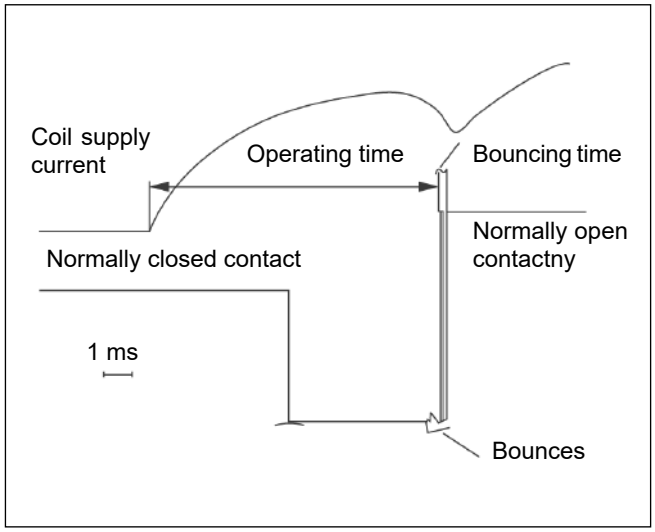
Electromagnetic system

The current flows through the coil with the delay caused by the coil inductance which resists to the current stream. Furthermore, the movable parts such as the armature and the pusher react to the movement due to the action of the magnetic stream.

Switching section

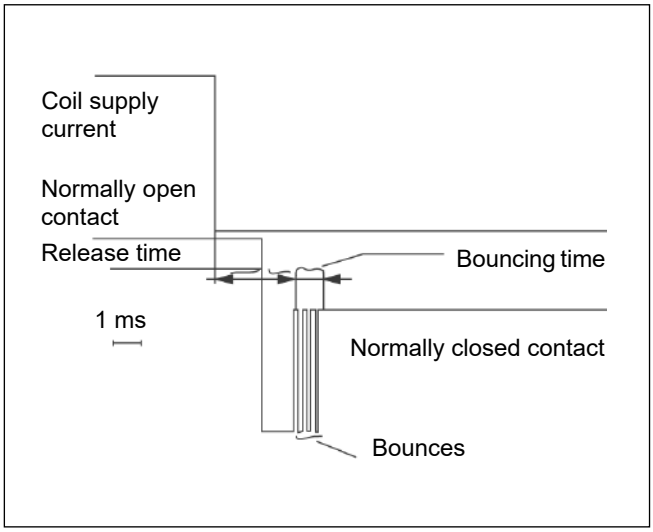
The elastic forces stored in the contacts and springs, and their elastic strain, react to the movement of the relay parts. The phenomenon is also affected by the inertia of the contacts mass. The delay times of the miniature relays usually reach the value of a few milliseconds (5-15 ms) during the switching phase. During the release phase the operating time is shorter due to the absence of the magnetic circuit delay. It is really so that on removing the supply voltage from the terminal, the current that flows through the coil wire stops suddenly and the relay is released with the elastic energy stored in the contacts.

Fig. 25. Switching time



The **operating time** of an inactive relay is the time interval from the moment of the supply of the voltage to the relay coil to the time of the first closing (or opening) of the contact.
If the relay has more than one contact, the time of closing (or opening) of the last of the contacts is taken into account.
The operating time includes the time of opening the normally closed contact and the time of closing the normally open contact.

Fig. 26. Release time



The **release time** of the active relay is the time interval from the absence of the supply voltage to the first opening (or closing) of the contact.
If the relay has more than one contact, the time of opening (or closing) of the last of the contacts is taken into account.
The release time includes the time of opening of the normally open contact and the time of closing the normally closed contact.

Bouncing

In the phases of switching and release, when the contacts close, they never perform the operation at the same time but the clash between two contacts makes the contacts bounce. The ”contact bouncing” cause constant closing and opening of the contacts. This particularly affects the contact ratings such as electric life and signal switching.

Sinusoidal vibrations

The electromechanical relay is strongly affected by dynamic phenomena which may change its projected characteristics constantly or temporarily. The devices in which vibrations occur must be thoroughly tested so that we might find out the quality and essence of the stress. Machine tools, automotive devices, assembly machines, and principally every instrument in which the electronics of the drive is affected by the presence of movable parts (motors, vibrators, valves, etc.), may be exposed to the consequences of the problem. Relpol S.A. usually tests the relays via exposing them to sinusoidal vibrations at the constant acceleration (G) within a particular range of frequency. Moreover, the relays are tested along the main axes (x, y, z) and in two basic directions for each axis. As a rule, the relays are tested with the printed circuit board mounted (sockets, materials, etc.).
The tests are made in two stages, i.e. resonant test and fatigue test. The relays are tested at the states where the coil voltage is on or off. The contact continuity is monitored with an oscilloscope at a low-level load on the contacts. The test allows defining of the frequency range [Hz] and maximum value of the acceleration, at which the relay may operate with no loss of contact continuity (interval of 10 µs) or without any durable damage. The standard values (which meet the requirements of a wide line of devices) for miniature relays reach 10 G at the frequency range from 25 to 100 Hz. The values refer to the worst case which usually occurs in the most critical test conditions (the relay with no supply in a given axis of vibrations). For tests at a low frequency range (a few hertz), instead of the constant acceleration, a constant movement is simulated which corresponds with a given value of acceleration (e.g. from 10 to 25 Hz for the amplitude of 2,5 mm). The tested frequency at which the constant movement changes into the constant acceleration is called the ”transition frequency”, e.g. at 55 Hz 10 G it corresponds with 1,5 mm.

Current surges

The maximum value for miniature relays is 10 G for maximum peak acceleration and 11 ms of the impulse duration. As for the sinusoidal vibrations, the sample shall be subject to an ohm test for surge both at the ON and OFF states within the arrangement of the three main axes (x, y, z), in two basic directions for each axis. Three surges shall be applied to each state. The tested relay shall not open the contacts (10 µs interval), and it must operate perfectly at the end of the test.

Hermetic relays - soldering and cleaning

The necessity to use tightly closed and hermetic parts in devices arises from two different reasons, i.e. protection of the internal parts (contacts, mechanisms, wires) from penetration of the stream in the process of soldering and cleaning, and protection of the internal parts from atmospheric contamination.

Relay handling during PCB assembly, soldering, cleaning and PCB coating

Handle the relays carefully. Any hitting the relay or dropping of the relay, even from a small height onto a hard surface generate very strong mechanical shock, can cause permanent damage, change of mechanical parameters and improper operation. If the relay has fallen, we recommend you reject it and apply a new one.

Mounting the relay: bending the relay pins is forbidden because it can damage the relay.

Manual soldering: soldering iron power max. 60 W, max. iron tip temperature 360 °C, soldering time max. 3 s. Exceeding the given process parameters may damage the relay.

Flux application: it is recommended to use modern fluxes (no-clean type) to eliminate the need to wash the PCB after assembly. Be careful careful when applying flux. Make sure that the flux is applied in the minimum necessary amount, only from the bottom of the PCB on the pin side and does not flow onto the top of PCB. Failure to follow this precaution may result in damage the relay.

Wave soldering: applies to relays with protection class RTII and RTIII. The level of solder wave should be set so that it does not overflow onto the surface of the PCB. The solder temperature must not exceed 270 °C and the soldering time must not exceed 5 seconds. During pre-heating, the temperature on the component side should not exceed 100 °C. After automatic soldering, the PCB with the relays should be cooled down before the washing operation. The cooling speed should not exceed 5 °C/s to not damage the relay sealing due to thermal shock.

The PCB cleaning process: is only allowed for relays with RTIII protection class with a closed vent hole. Avoid cleaning in a cold liquid immediately after the soldering process because thermal shock causes the relay to become unsealed as a result of the pressure difference and the cleaning liquid and/or flux can get into the relay inside. The penetration of the flux into the relay inside may result in sticking of the armature or contamination of the contacts, which leads to incorrect work of the product. Additional care should also be taken to avoid penetration of the liquid inside the relay - too high washing pressure can damage the sealing of the relay. Recommended cleaning solvent temperature max. +40 °C.

It is forbidden to wash in ultrasonic washers, it may cause damage to the coil or welding contacts as a result of ultrasound.

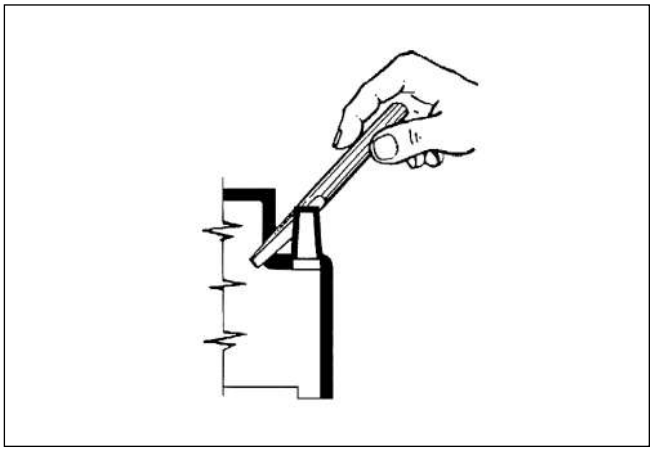
It is recommended to use alcohol-based or aqueous cleaning solvents for PCB cleaning. When using other cleaning solvents, the user should ensure that they do not have a negative impact on the materials from which the relay is built. Unsuitable cleaning solvents include: acetone, ethyl acetate, solutions based on solvents or chlorine.

Application of conformal coatings: applies only to relays with RTIII protection level. Conformal coatings for unsealed relays (including relays with RTII protection level) should not be used. The materials for conformal coatings should be carefully selected - some materials are chemically active and have a desctructive impact on the relays, eg. they can penetrate inside the relay or damage the relay seal, cause the relay to malfunction. Avoid silicone-based coatings.

Environmental contamination

The environment of the relay may adversely affect its operation. Humidity, industrial air, dust and particles that penetrate the inside of the relay may affect the contacts, internal parts and isolation. The environmental conditions in which the relay and the device will be used shall be analyzed in order to avoid such problems as resistance growth and corrosion of the metallic parts.
If the ambient conditions are not arduous and/or the electric load of the contacts is not critical (cleaning presence of the arc), it is better to open the relay following the soldering and cleaning processes to allow the useful exchange of the air with the external atmosphere.
What is important for the thermal exchange (high switching power) is the gas emission caused by the electric arc and the residual contaminations with plastics. As explained before, the process of sealing the relay includes degassing of plastics, filling the relay with inert gas (nitrogen), and the process of label closing or other methods.

Fig. 27. Opening of the relay

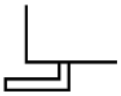
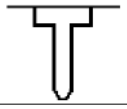
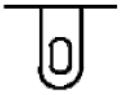
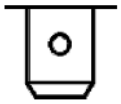


Lead-free soldering

Eliminating of the lead used in the solders required both changing of the material and the production process which had to be adapted to different properties of the lead-free materials. The differences between the physical properties of lead alloys and their lead-free equivalents available on the market are significant and, thus, the applicable features of soldering alloys shall be thoroughly considered, and the flux must be precisely selected in order to provide optimal conditions for the process. Generally, lead-free alloys have slightly higher melting point, higher surface tension and lower moistening than SnPb. This may cause production problem, i.e. damages to components due to thermal impacts, deforming of the PCB's, flux splashes, extending of the operation time to good joining, deforming of plastics, etc.

Sn97Cu3 and Sn99Cu1 are good materials for soldering internal elements and for covering the terminals. They are modern alloys widely applied in electronics owing to their good physical properties. They are also a good and popular alternative for Sn60Pb40 and Sn63Pb37.
In order to provide good tin-plating and soldering of the terminals, it is important to select appropriate flux. Higher melting point of lead-free alloys results in higher oxidation and lower moistening and, thus, appropriate flux must be selected and its quantity shall be adapted to the temperature profile of the process. Too much heat delivered may cause evaporation of flux before it moistens the solder, and use of stronger, aggressive fluxes in higher quantities may require introduction of the operation of washing away the residues of the soldering process.

Types of relay terminals

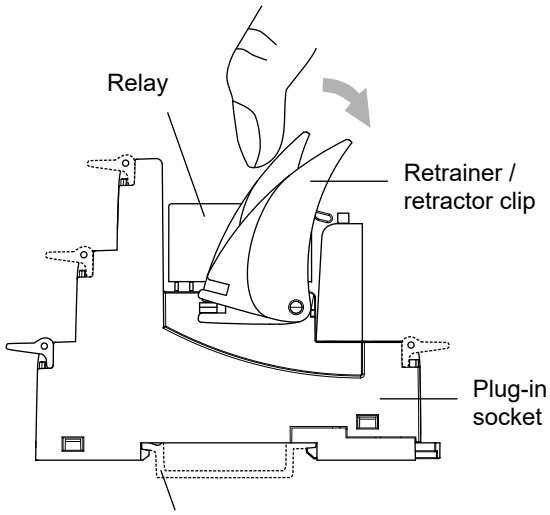
Surface mounted terminals (SMT)	
THT mounted terminals	
Terminals to solder wires and for sockets	
Terminals for flat slide-in (faston) connections	

In miniature relays of high power to be mounted on printed boards universal terminals are made so to provide fitting the relays also in sockets mounted **on 35 mm rail mount**. Then, relay terminals are connected to wires with screw terminals of the socket. This allows mounting miniature relays on a mounting board and enhances technical service of the device. Sockets are fitted with retrainer / retractor clips which facilitate dismounting of the relay and, when it is mounted in the socket, the lever serves as a reliable latch which secures the relay on the mounting board.

Electrical connections to voltage and current sources are made with appropriate joints and wires of cross-sections specified in the table aside.

While mounting relays **on printed boards**, the openings on the board must match the raster of the relay terminals and have appropriate diameter, which shall enable its easy connection. Otherwise, terminals may be bent, contacts deformed or the cover tightness may be disturbed. Printed paths from the relay contacts should be as wide as possible, which results in lower losses in the course of current flow and good removal of heat from the contacts. For the purpose of providing good insulation strength, it is necessary to arrange the circuits appropriately on the board and to apply protection mask.

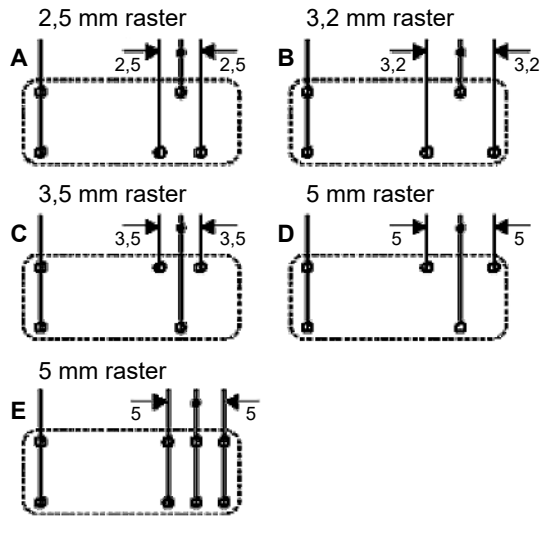
Fig. 28. In course of mounting of the relay in the socket, the clip functions also as a relay protective latch.



35 mm rail mount acc. to EN 60715

Current flowing via terminal [A]		Wire and stranded conductors
above	including up to	cross-section [mm^2]
–	3	0,5
3	6	0,75
6	10	1
10	16	1,5
16	25	2,5
25	32	4
32	40	6
40	63	10

Fig. 29. Typical rasters of terminals of miniature relays



The table shows various **limiting currents** of printed circuits of different thickness of the copper layer and with various conducting paths.

Load current [A]	Width of the copper printed path [mm]			
	Copper thickness 70 µm		Copper thickness 35 µm	
	Single-side path	Double-side path	Single-side path	Double-side path
16	8	5	inadmissible	inadmissible
14	6,5	4	inadmissible	inadmissible
12	5	3	7,5	5
10	3,5	2	6	4
8	2,5	1	4	2,5
6	1,5	is not applied	2,5	1,5
4	1	is not applied	1,5	1
2	0,7	is not applied	1	is not applied

International standards

Relays manufactured by Relpol S.A. are designed and tested in compliance with the requirements of the following international standards:

EN 61810-1 Electromechanical non-specified time all-or-nothing relays. Part 1: General requirements.

EN 61810-7 Electromechanical elementary relays. Part 7: Test and measurement procedures.

EN 60664-1 Insulation coordination for equipment within low--voltage systems. Part 1: Principles, requirements and tests.

EN 61812-1 Adjustable time relays for industrial purposes - Requirements and tests.

EN 61131-2 Programmable controllers. Part 2: Requirements and equipment tests.

Plug-in sockets manufactured by Relpol S.A. are designed and tested in compliance with the requirements of the following international standard:

EN 61984 Connectors - Safety requirements and tests.

Insulation

The classification of insulation groups to define the properties of insulation of the device in compliance with the insulation coordination was previously done according to the VDE 0110 Standard.
Electric devices were classified in insulation categories A, B, C or D due to their application and possible reduction of the insulation properties caused by the impact of the environment, i.e. dust, humidity, aggressive gases, insulation clearance and creepance.
The insulation category was indicated together with the reference voltage which was the basis for defining of the requirements related to the insulation distances for rated voltage up to the reference voltage value.

At present, while dimensioning the insulation distances in accordance with the EN 60664-1 Standard, the overvoltage category and the ambient pollution degree must be defined. The latter indicates the expected pollution of the microenvironment. The transient overvoltage values are the basis for defining the rated surge voltage which determines the minimum contact clearance related with the insulation coordination.

The following **overvoltage categories** are defined:
IV - devices at the front of the installation,
III - devices in fixed installation in cases where reliability and availability of the device is subject to special requirements,
II - receiving devices supplied from the fixed installation,
I - devices connected to circuits where measures have been taken (either in fixed installation or in the equipment) to limit transient overvoltage to the appropriately low level.

Four **pollution degrees** have been defined to estimate the contact creepance and clearance:

1 - no pollution or only dry and non-conducting pollution; the pollution has no effect,

2 - only non-conducting pollution occurs; the vapor condensation, however, may be expected to cause temporary conductivity of the pollution from time to time,

3 - conductive pollution or dry and non-conductive pollution occurs which may become conductive due to condensation,

4 - the pollution proves constant conductivity caused by the conductive dust, rain or snow.

The **rated surge voltage** is defined on the basis of the overvoltage category and the rated voltage of the device.

The rated voltage of the supply system according to PN-IEC 60038		Phase voltage defined on the basis of AC or DC nominal voltages up to the value of	Rated surge voltage			
			Overvoltage category			
Three-phase	Single-phase		I	II	III	IV
	120-240	150	800	1500	2500	4000
230/400		300	1500	2500	4000	6000

The **insulation creepance** are dimensioned on the basis of the following factors:

- root-mean-square value of rated voltage,
- pollution degree,
- group of insulation materials.

Insulation materials are divided into four groups with reference to the value of the indicator of resistance to creeping current:

Group I 600 ≤ CTI
Group II 400 ≤ CTI ≤ 600
Group IIIa 175 ≤ CTI ≤ 400
Group IIIb 100 ≤ CTI ≤ 175

Insulation materials testing

1. Glow wire test

The test simulates exposure to heat originating from such heat sources as glowing parts or overloaded subassemblies in order to assess fire hazard.

The consistency with the requirements for resistance to heat and fire is checked in glow wire test at the temperature of 650 °C.

Some applications of the relay extort more strict requirements. The EN 60335-1 Standard: ”Household and similar electrical appliances”, provides that the insulation parts supporting elements which conduct current higher than 0,2 A must meet the following requirements as for resistance to fire:

a) GWFI (Glow Wire Flammability Index) with a value 850 °C according to the EN 60695-2-12 Standard.

b) GWIT (Glow Wire Ignition Temperature) with a value 775 °C according to the EN 60695-2-13 Standard.

2. Ball pressure test

The purpose of the test is to assess the resistance of the material to mechanical pressure at higher temperature with no significant deformations.

The test is performed in a heating chamber at higher temperature, where a steel ball of 5 mm diameter is pressed to the surface of the sample with the force of 20 N. The diameter of the indentation shall not exceed 2 mm. The test is made under EN 60695-10-2 Standard.

3. Resistance to proof tracking

The test shows relative resistance of solid insulation materials to proof tracking for voltages up to 600 V when the surface of the insulation, at electrical tension, is exposed to contaminated water.

Proof tracking is probable between parts of different potential and between live parts and earthed metal parts.

Compliance with the requirements is checked under the EN 60112 Standard for PTI index.

In case the type of the relay application requires more strict requirements, PTI 250V, PTI 400V or PTI 600V proof tracking resistance indices shall be assumed.

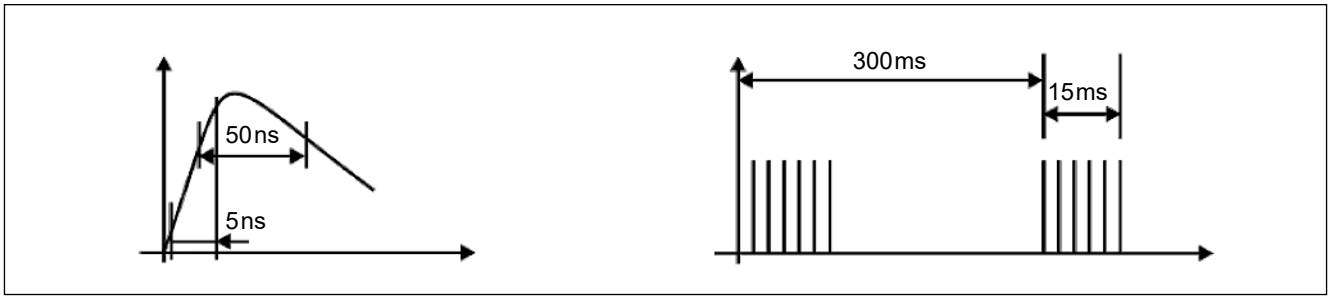
Electromagnetic compatibility

Electromagnetic compatibility is the ability of an electric or electronic appliance to operate correctly in a given electromagnetic environment and not to emit disturbances not tolerated by other appliances which operate in the same environment. The relay is insensitive to high frequency disturbances but presence of high power electromagnetic fields in the proximity of the relay coil may affect making and releasing voltages of the relay. On installation of a relay in the proximity of transformers, electromagnets and electric motors, it is recommended to check making and releasing of the relay.

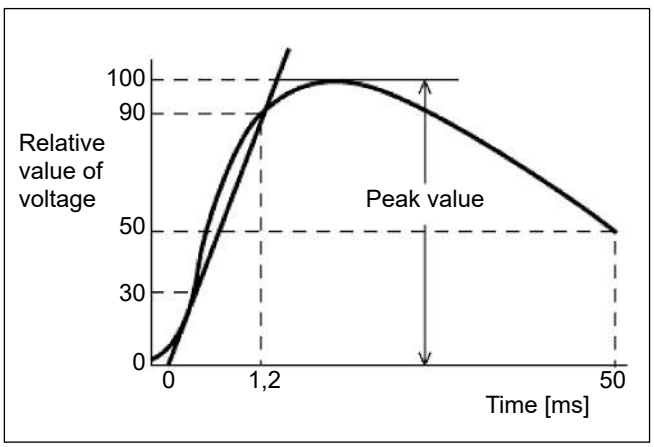
An electromagnetic relay may initiate disturbances, particularly when operating with inductive load of contacts. An electric arc occurring while switching, and overvoltage cause emission of disturbances which may affect the operation of a sensitive electronic appliance in the proximity of the relay. In such cases, circuits of protection of contacts shall be applied, which will allow decreasing the level of disturbances to a safe level. Relays, as components, are not covered with the **EMC** Directive. However, each electric appliance which includes relays is covered with the Directive and subject to its requirements.

EMC test	Standard
Resistance to electrostatic discharges	EN 61000-4-2
Resistance to electromagnetic field of radio frequency	EN 61000-4-3
Resistance to quick pulse beams	EN 61000-4-4
Resistance to surges	EN 61000-4-5
Resistance to conductive disturbances induced by fields of radio frequency	EN 61000-4-6
Resistance to voltage dips, short breaks and changes	EN 61000-4-11
Measurements of radiated and conducted emissions	EN 55011

The most frequent disturbances in installations are quick, repeatable transient states - beams of electric disturbances called **BURST**. These are transient disturbances occurring in supply, signal and control connections. They origin from transient switching states and occur on switching by the contact of inductive loads - electromagnets, motors, etc. They have the form of a beam of high voltage and low power pulses, as the pulse increment time is merely 5 ns and its duration is 50 ns. In tests the duration of a pulse beam is defined as 15 ms, and the period - 300 ms.



Another type of disturbances occurring frequently, due to atmospheric discharges, in low voltage installations are surges (**SURGE**) in supply lines. Similar disturbances may be also caused by connection processes of high power, e.g. switching of leading loads, etc.
Surge pulses are of definitely higher power than burst pulses due to much longer duration - 50 µs.



Protection against ambient effect

As for the protection from **ambient effect**, the EN 61810-7 Standard distinguishes the following types of relays:

RT0 - open relay - a relay without protective cover.

RTI - dust protected relay - a relay with cover to protect its mechanism from dust.

RTII - flux proof relay - a relay adapted to automatic soldering process without allowing the migration of solder fluxes beyond the intended areas.

RTIII - washable relay - a relay adapted to automatic soldering process and then subject to washing process for the purpose to remove flux residues without allowing the ingress of flux or washing solvents. Note: the relays shall not be washed in ultrasonic cleaners. RTIII relay are tested to evaluate sealing acc. to EN 60068-2-17, Qc test.

RTIV - sealed relay - relay provided with a case which has no venting to the outside atmosphere and having a time constant better than 2 x 10^4 s in acc. with EN 60068-2-17.

RTV - hermetic relay - a tight relay of enhanced tightness level, in a metal cover, terminals sealed with glass, gas-filled.

Cover protection degrees according to EN 60529 Standard. The first digit refers to the protection from foreign solids penetration. The second digit refers to the protection from water penetration.

Examples of indications:

IP 20 - protection against solids of the diameter of 12,5 mm and larger, with no protection against water penetration.

IP 40 - protection against penetration of solids of 1 mm diameter and larger, with no protection from water penetration.

IP 50 - protection against dust; dust penetration is not excluded entirely but dust shall not penetrate in quantities which might disturb correct operation of the appliance or reduce safety.

IP 64 - dustproof protection, protection against water splashes - water splashed onto the cover from any direction does not cause harmful effects.

IP 67 - dustproof protection, protection against the effects of momentary submersion in water.

Ambient conditions

Storage and use of the relays is not allowed in the conditions which may cause steam condensation and/or icing.
The relays shall be stored and used at temperatures specified in catalog cards of individual products.
Admissible relative humidity for storage and operation within the range of 5...85% (with no condensation and/or icing).
Atmospheric pressure: 86...106 kPa

Climatic resistance:
Cold: 16 h at minimum temperature defined for the product according to the Standard EN 60068-2-1.
Dry heat: 16 h at maximum temperature defined for the product according to the Standard EN 60068-2-2.
Humid heat: 2 cycles 12 h each at temperature of +25...+55 °C and at humidity 90...95%, according to the Standard EN 60068-2-30.

Electric load

Electromagnetic auxiliary relays manufactured by Relpol S.A. are designed for a wide range of applications and for switching several loads of diversified characteristics.
Electric loads are classified according to their nature (resistive, capacitive or inductive loads), type of supply (DC or AC), load value and the current curve course shape (lamp, motor, electromagnetic, etc. loads).

Contact application categories according to EN 61810-7 Standard

Application category	Voltage [V]	Current [A]
0 (CA 0)	< 0,03	< 0,01
1 (CA 1)	0,03 < U < 60	0,01 < I < 0,1
2 (CA 2)	5 < U < 250	0,1 < I <1
3 (CA 3)	5 < U < 600	0,1 < I < 100

Application categories according to EN 60947-4-1 and EN 60947-5-1 Standards

Application category	Typical application
AC-1	Resistive or slightly inductive loads, resistance furnaces
AC-2	Slip-ring motors: start-up, switching off
AC-3	Squirrel-cage motors: start-up, switching off motors during running time
AC-4	Squirrel-cage motors: start-up, reversing (countercurrent braking), pulsing
AC-5a	Discharge lamps
AC-5b	Electric bulbs
AC-6a	Transfomers
AC-6b	Capacitor banks

Application categories according to EN 60947-4-1 and EN 60947-5-1 Standards

Application category	Typical application
AC-7a	Slightly inductive loads in household appliances and similar applications
AC-7b	Motors in household appliances
AC-8a	Hermetic refrigerant compressor motors with manual overload resetting
AC-8b	Hermetic refrigerant compressor motor control with automatic overload resetting
AC-12	Control of resistive loads and solid state loads with opto-isolators
AC-13	Control of solid state loads with transformer isolation
AC-14	Control of small electromagnetic loads (≤ 72 VA)
AC-15	Control of AC electromagnetic loads (> 72 VA)
DC-1	Resistive or slightly inductive loads
DC-3	Shunt-motors: start-up, breaking
DC-5	Series-motors: start-up, countercurrent braking, pulsing. Dynamic switching-off of DC motors
DC-6	Bulbs
DC-12	Control of resistive loads and solid state loads with opto-isolators
DC-13	Control of DC electromagnets
DC-14	Control of DC resistive loads having economy resistors in the circuit

Certifications

Compliance with national and international standards provides for safe use of the product, and proves high quality and durability of the product. In some countries (e.g. USA, Canada, Russia), the product certification to prove its compliance with the requirements of appropriate national standards is obligatory, and the product must undergo the procedure of compliance assessment at certifying agencies in order to be approved for sale. In other countries it is the manufacturer's responsibility to provide the compliance of the design and production with the requirements of appropriate standards (e.g. the countries of the European Union).
Certification agencies carry out the testing procedure in accordance to applicable standards, and then they regularly audit the production process in order to confirm that the requirements are observed in current production of the certified product. The European Union applies European Standards (EN) as set forth by the European Committee for Electrotechnical Standardization (CENELEC), and international standards set forth by the International Electrotechnical Commission (IEC).
The products manufactured and offered by Relpol S.A. have numerous certifications issued by renowned research institutions such as VDE, UL or CSA International
The electromagnetic relays have been certified to comply with the following standards: EN 61810-1 - VDE, UL 508 - Underwriters Laboratories, C22.2 - CSA International, GB14048.5 - China Quality Certification Centre.
Apart from the certifications which prove the safety and high durability of the products, some of Relpol's products have certifications required for applications of relays in special conditions, e.g. Lloyd's Register certification which acknowledges compliance with the requirements for electrotechnical products to be used on vessels and in devices which operate in adverse climatic conditions, or certificate of Railway Institute to confirm meeting of railway requirements.

Subminiature - signal relays

relpol S.A.

Subminiature relays are applied in e.g. telecommunication devices, office equipment, alarm systems, measurement devices, medical monitoring devices, AV devices, control sensors.

Their major features which provide for their applications in electronic circuits as interface-control units are: miniature dimensions, high switching capacity, high resistance of the cover to difficult operating conditions, wide range of control voltages.

Space-saving of the electronic plates, low power consumption of the control circuits, a few applicable mounting technologies are only few of the advantages offered by the aforementioned features.

They meet the requirements of REACH and RoHS Directive. The relays are recognized and certified by:

← Contents

RSM850
subminiature - signal relays

version THT ❷ **version SMT ❸**

- Polarized, monostable relays
- DC coils of up to 24 V DC, low coil power 0,14 ... 0,20 W
- For PCB • Sealed, for wave soldering and cleaning; for reflow soldering • Dielectric strength 1000 Vrms
- Applications: for telecommunication devices, office equipment, alarm systems, measuring instruments, medical monitoring devices, AV devices, control sensors
- Conforms to FCC Part 68 - 1500 V - lightning surge
- Recognitions, certifications, directives: RoHS, cULus

Contact data

Number and type of contacts		2 CO
Contact material		**AgPd/Au flash gold plating**
Rated / max. switching voltage	AC	125 V / 250 V
Min. switching voltage		10 mV ❶
Rated load	AC1	0,5 A / 125 V AC
	DC1	2 A / 30 V DC
Min. switching current		0,01 mA ❶
Rated current		2 A
Max. breaking capacity	AC1	62,5 VA
Contact resistance		≤ 50 mΩ

Coil data

Rated voltage	DC	3, 5, 6, 9, 12, 24 V
Must release voltage		DC: ≥ 0,1 U_n
Operating range of supply voltage		see Table 1
Rated power consumption	DC	0,14 W 3 ... 12 V 0,20 W 24 V

Insulation according to EN 60664-1

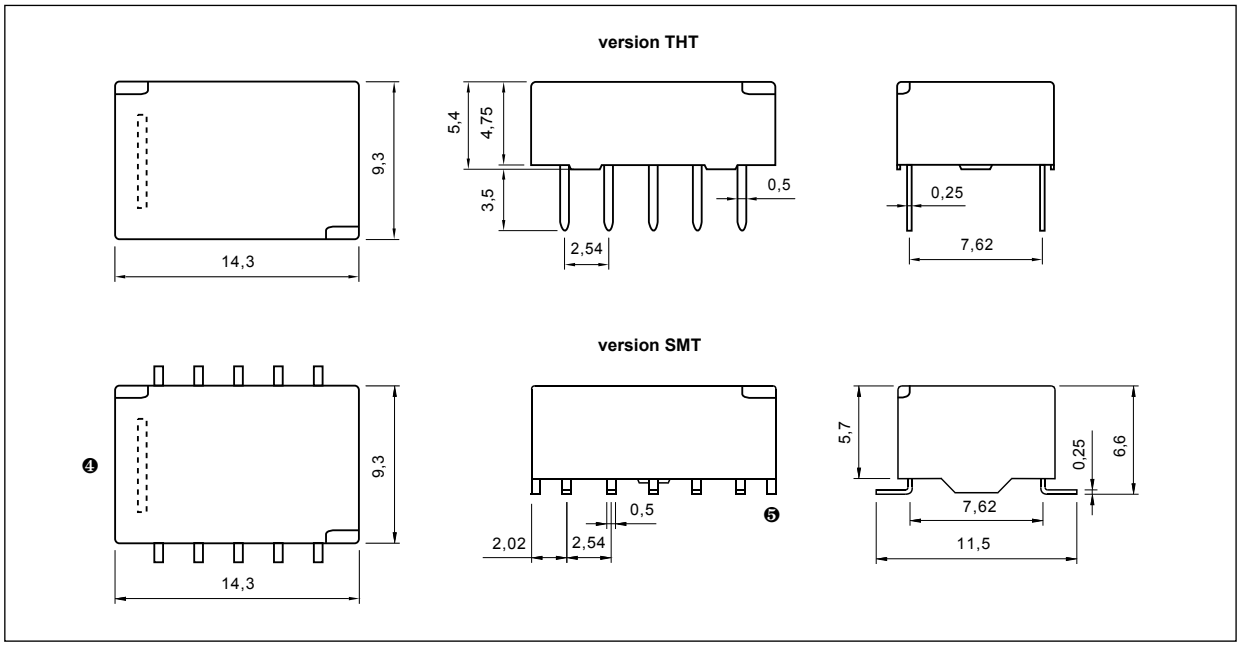
Insulation resistance		1 000 MΩ 500 V DC, 60 s
Dielectric strength		
• between coil and contacts		1 000 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection
• pole - pole		1 000 V AC type of insulation: basic
Contact - coil distance		
• clearance		≥ 0,5 mm
• creepage		≥ 0,9 mm

General data

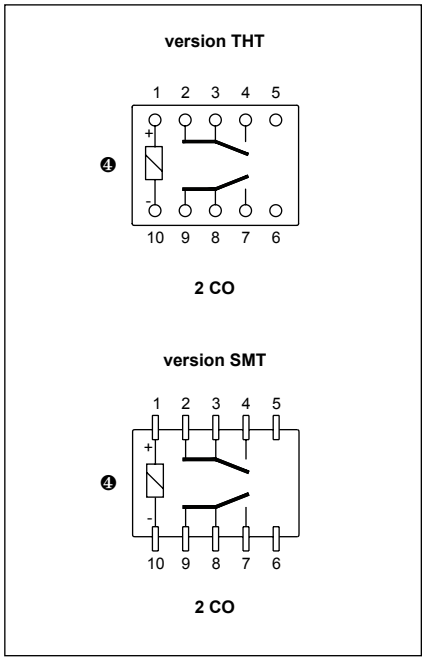
Operating / release time (typical values)		3 ms / 3 ms
Electrical life		
• resistive AC1	1 200 cycles/hour	10^5 0,5 A, 125 V AC
• resistive DC1	1 200 cycles/hour	2×10^5 1 A, 30 V DC
Mechanical life	10 800 cycles/hour	10^8
Dimensions (L x W x H)		THT: 14,3 x 9,3 x 5,4 mm ❷ SMT: 14,3 x 9,3 x 6,6 mm ❸
Weight		1,5 g
Ambient temperature		
(non-condensation and/or icing)	• operating	THT: -40...+70 °C SMT: -40...+85 °C
Cover protection category		IP 67 EN 60529
Environmental protection		RTIII EN 61810-7
Shock resistance		50 g (500 m/s²) 11 ms - functional
Vibration resistance		3 mm DA (constant amplitude) 10...55 Hz
Solder temperature		
• for wave		THT: max. 260 °C
• manual soldering with the tool of max. 60 W		THT: max. 350 °C
• reflow		SMT: see "Reflow soledring profiles"
Soldering time		
• for wave		THT: max. 5 s
• manual soldering with the tool of max. 60 W		THT: max. 3 s
• reflow		SMT: see "Reflow soledring profiles"

The data in bold type relate to the standard versions of the relays. ❶ Values refer to new relays, which have not been used for signals exceeding the maximum 10 mA and/or 6 V (DC or AC). After the current exceeds 10 mA and/or 6 V (DC or AC) relay can not be used for signals with the minimum values indicated in the technical data sheet. ❷ For version THT: cover - black colour. ❸ For version SMT: cover - white colour.

Dimensions

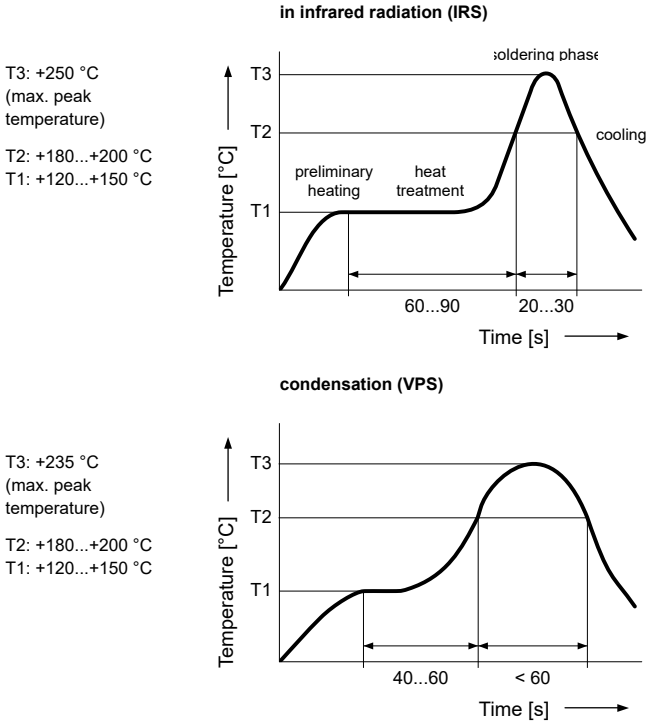


Connection diagrams
(pin side view)



❹ Coil terminals position is indicated by the vertical strip on the relay cover.

SMT reflow soledring profiles



1. Do not exceed the admissible parameters of reflow soldering (otherwise the relay might become damaged). **2.** Following soldering process, the soldering areas shall be cooled as soon as possible in order to avoid relay damage. Cooling rate should not be higher than 5 °C/s. **3.** Following the soldering process, the relays may have the printed board washed. Immediately after soldering, application of cold washing agent should be avoided. The relays shall be cooled to the ambient temperature before they are washed. Mild washing agents, e.g. alcohol-based ones, are recommended. Aggressive washing detergents shall be avoided as they may react with the sealing and housing of the relay and damage it. The relays shall not be washed in ultrasonic cleaners.

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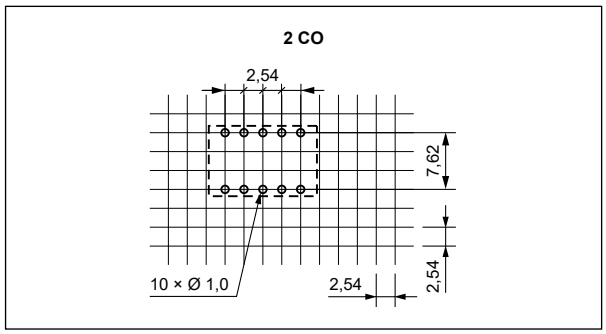
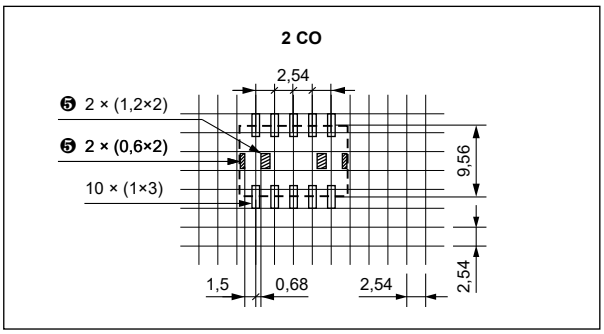
Pinout - version THT (solder side view)



Soldering areas - version SMT (solder side view)



❺ Temporary glue pad on PCB.

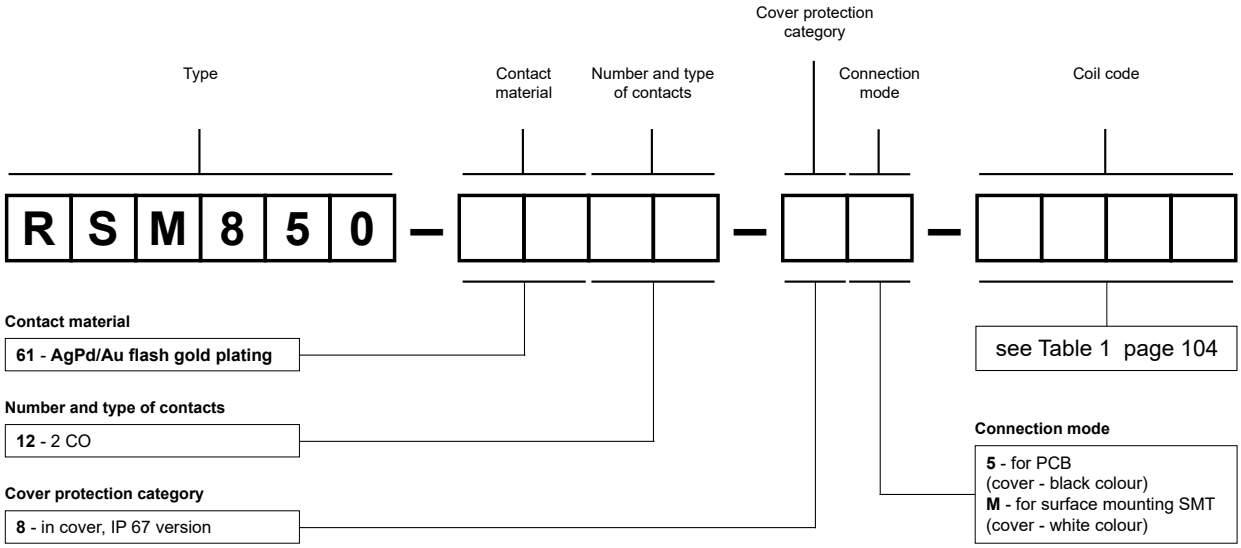
Mounting

Relays **RSM850** are designed for: • direct PCB mounting - THT (Through-Hole Technology) • surface mounting - SMT (Surface Mounting Technology).

Coil data - DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1003	3	64,3	± 10%	2,25	7,5
1005	5	178	± 10%	3,75	12,5
1006	6	257	± 10%	4,50	15,0
1009	9	579	± 10%	6,75	22,5
1012	12	1 028	± 10%	9,00	30,0
1024	24	2 880	± 10%	18,00	48,0

Ordering codes



Examples of ordering codes:

RSM850-6112-85-1012 relay **RSM850**, for PCB, two changeover contacts, contact material AgPd/Au flash gold plating, coil voltage 12 V DC, in cover (black colour) IP 67

RSM850-6112-8M-1048 relay **RSM850**, for surface mounting SMT, two changeover contacts, contact material AgPd/Au flash gold plating, coil voltage 48 V DC, in cover (white colour) IP 67

BISTABLE
1-COIL

- Polarized, bistable relays with one coil
- DC coils of up to 24 V DC, low coil power 0,10 ... 0,15 W
- For PCB • Sealed, for wave soldering and cleaning
- Dielectric strength 1000 Vrms
- Applications: for telecommunication devices, office equipment, alarm systems, measuring instruments, medical monitoring devices, AV devices, control sensors
- Conforms to FCC Part 68 - 1500 V - lightning surge
- Recognitions, certifications, directives: RoHS, cULus

Contact data

Number and type of contacts		2 CO
Contact material		**AgPd/Au flash gold plating**
Rated / max. switching voltage	AC	125 V / 250 V
Min. switching voltage		10 mV ❶
Rated load	AC1	0,5 A / 125 V AC
	DC1	2 A / 30 V DC
Min. switching current		0,01 mA ❶
Rated current		2 A
Max. breaking capacity	AC1	62,5 VA
Contact resistance		≤ 50 mΩ

Coil data

Rated voltage	DC	3, 5, 6, 9, 12, 24 V
Must release voltage		-0,75 U_n ... -$U_{max.}$ ❷
Operating range of supply voltage		see Table 1
Rated power consumption	DC	0,10 W 3 ... 12 V 0,15 W 24 V

Insulation according to EN 60664-1

Insulation resistance		1 000 MΩ 500 V DC, 60 s
Dielectric strength		
• between coil and contacts		1 000 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection
• pole - pole		1 000 V AC type of insulation: basic
Contact - coil distance		
• clearance		≥ 0,5 mm
• creepage		≥ 0,9 mm

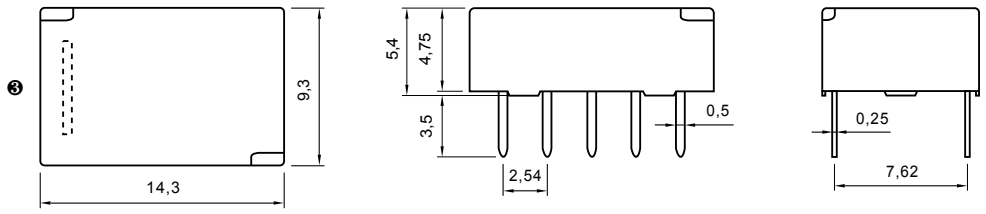
General data

Operating / release time (typical values)		3 ms / 3 ms
Electrical life		
• resistive AC1	1 200 cycles/hour	10^5 0,5 A, 125 V AC
• resistive DC1	1 200 cycles/hour	2 x 10^5 1 A, 30 V DC
Mechanical life	10 800 cycles/hour	10^8
Dimensions (L x W x H)		14,3 x 9,3 x 5,4 mm
Weight		1,5 g
Ambient temperature		
(non-condensation and/or icing)	• operating	-40...+70 °C
Cover protection category		IP 67 EN 60529
Environmental protection		RTIII EN 61810-7
Shock resistance		50 g (500 m/s²) 11 ms - functional
Vibration resistance		3 mm DA (constant amplitude) 10...55 Hz
Solder bath temperature		
• for wave		max. 260 °C
• manual soldering with the tool of 60 W max.		max. 350 °C
Soldering time		
• for wave		max. 5 s
• manual soldering with the tool of 60 W max.		max. 3 s

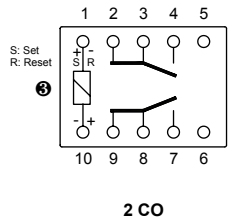
The data in bold type relate to the standard versions of the relays. ❶ Values refer to new relays, which have not been used for signals exceeding the maximum 10 mA and/or 6 V (DC or AC). After the current exceeds 10 mA and/or 6 V (DC or AC) relay can not be used for signals with the minimum values indicated in the technical data sheet. ❷ Must release voltage are the values of the operating supply voltage range of opposite polarization, specified in Table 1. ❸ Coil terminals position is indicated by the vertical strip on the relay cover.

RSM850B
subminiature - signal relays

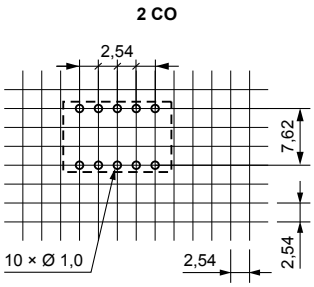
Dimensions



Connection diagram (pin side view)



Pinout (solder side view)



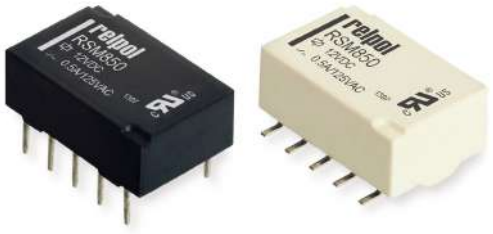
❸ Coil terminals position is indicated by the vertical strip on the relay cover.

Mounting

Relays **RSM850B** are designed for direct PCB mounting - THT (Through-Hole Technology).

Subminiature relays RSM850

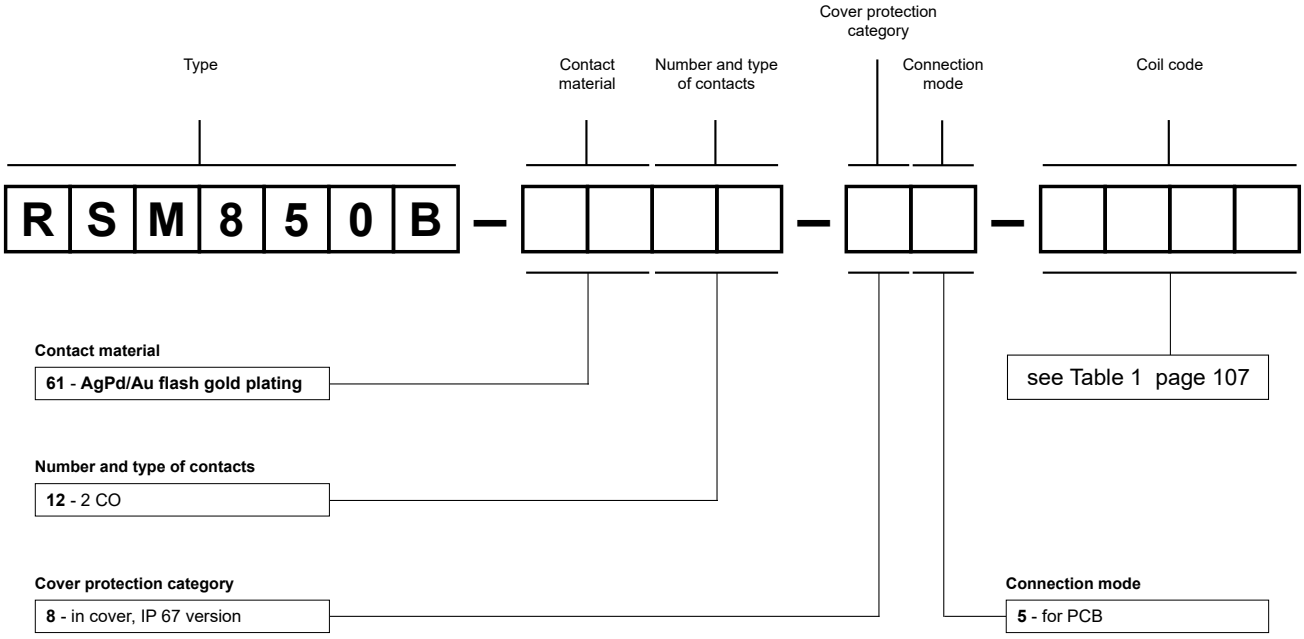
versions: THT, SMT



Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1003	3	90	± 10%	2,25	8,7
1005	5	250	± 10%	3,75	14,5
1006	6	360	± 10%	4,50	17,4
1009	9	810	± 10%	6,75	26,1
1012	12	1 440	± 10%	9,00	34,8
1024	24	3 840	± 10%	18,00	57,6

Ordering codes



Example of ordering code:

RSM850B-6112-85-1012 bistable relay **RSM850B** with one coil, for PCB, two changeover contacts, contact material AgPd/Au flash gold plating, coil voltage 12 V DC, in cover IP 67

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RSM822N
subminiature - signal relays

- Subminiature monostable relays for switching low loads
- DC coils - standard and sensitive of up to 48 V DC, low coil power 0,20 W (sensitive coil) or 0,30 W (standard coil) • For PCB
- Sealed, for wave soldering and cleaning • Double bifurcated contact
- Applications: for telecommunication devices, office equipment, alarm systems, measuring instruments, medical monitoring devices, AV devices, control sensors
- Conforms to FCC Part 68 - 1500 V - lightning surge
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		2 CO
Contact material		**AgNi/Au flash gold plating**
Rated / max. switching voltage	AC	125 V / 250 V
Min. switching voltage		10 mV ❶
Rated load	AC1	0,6 A / 125 V AC
	DC1	3 A / 2 A (NO/NC) / 30 V DC
Min. switching current		1 mA ❶
Rated current		0,6 A / 125 V AC 2 A / 30 V DC
Max. breaking capacity	AC1	125 VA
Contact resistance		≤ 100 mΩ

Coil data

Rated voltage	DC	3, 5, 6, 9, 12, 24 V sensitive coil 48 V standard coil
Must release voltage		DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2
Rated power consumption	DC	0,20 W sensitive coil 0,30 W standard coil

Insulation according to EN 60664-1

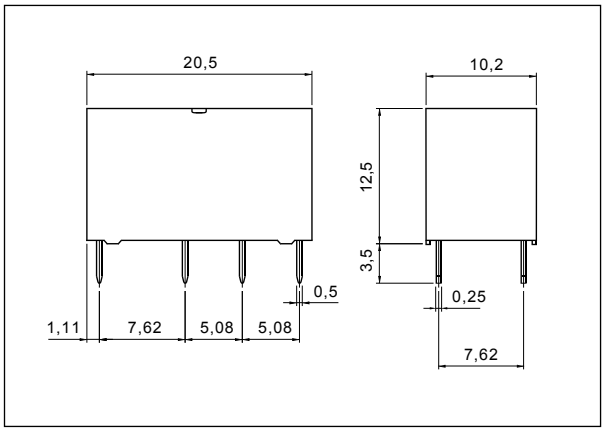
Insulation resistance		> 1 000 MΩ 500 V DC, 60 s
Dielectric strength		
• between coil and contacts		1 000 V AC type of insulation: basic (1500 V AC; 1,2 / 50 µs)
• contact clearance		1 000 V AC type of clearance: micro-disconnection (1500 V AC; 1,2 / 50 µs)
• pole - pole		1 000 V AC type of insulation: basic (1500 V AC; 1,2 / 50 µs)
Contact - coil distance		
• clearance		≥ 1,3 mm
• creepage		≥ 1,5 mm

General data

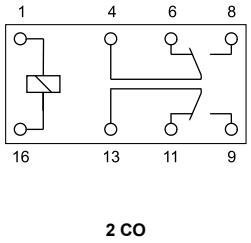
Operating / release time (typical values)		4,5 ms / 1,5 ms
Electrical life (number of cycles)		
• resistive AC1	1 800 cycles/hour	10^5 0,6 A, 125 V AC
• resistive DC1	1 800 cycles/hour	10^5 2 A, 30 V DC
Mechanical life	18 000 cycles/hour	10^8
Dimensions (L x W x H)		20,5 x 10,2 x 12,5 mm
Weight		4,5 g
Ambient temperature		
(non-condensation and/or icing)	• operating	-40...+90 °C sensitive coil -40...+80 °C standard coil
Cover protection category		IP 67 EN 60529
Environmental protection		RTIII EN 61810-7
Shock resistance		10 g
Vibration resistance		1,5 mm DA (constant amplitude) 10...55 Hz
Solder bath temperature		max. 260 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays.
❶ Reference value, relays previously tested and used at the resistance load of more than 10 mA / 6 V DC or at the peak AC voltage are not recommended for later switching of low level signals.

Dimensions

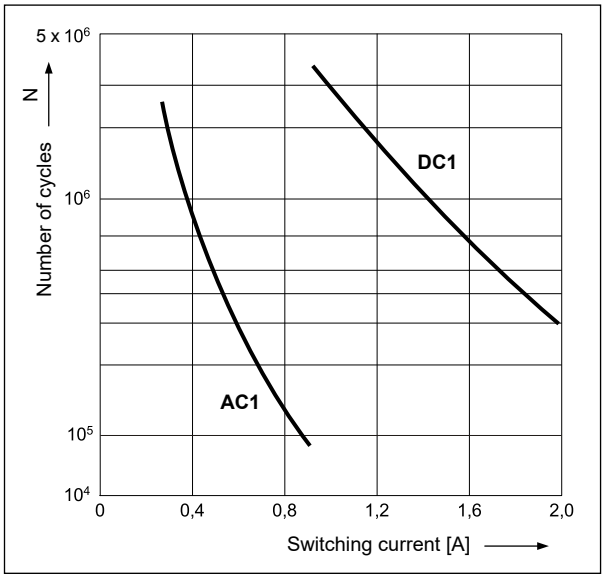


Connection diagram (pin side view)



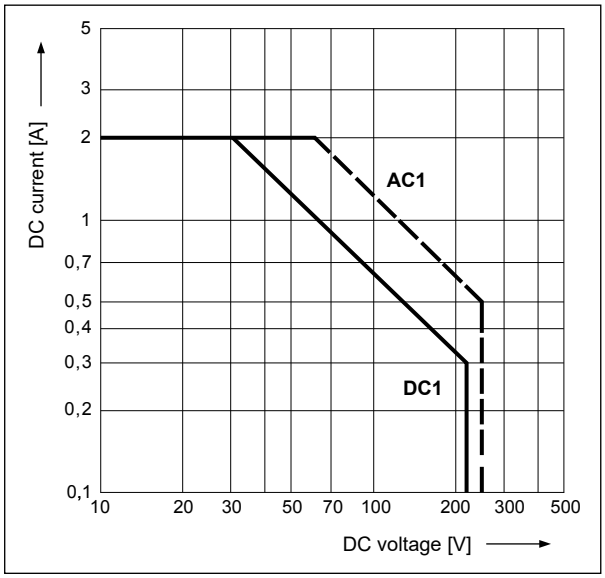
Electrical life at AC resistive current. Switching frequency: 1 800 cycles/hour

Fig. 1

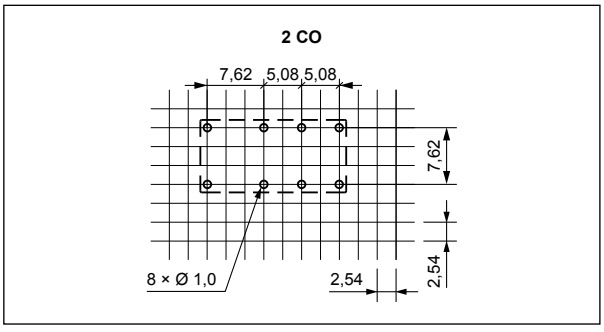


Max. DC resistive load breaking capacity

Fig. 2



Pinout (solder side view)



Mounting

Relays **RSM822N** are designed for direct PCB mounting.

RSM822N
subminiature - signal relays

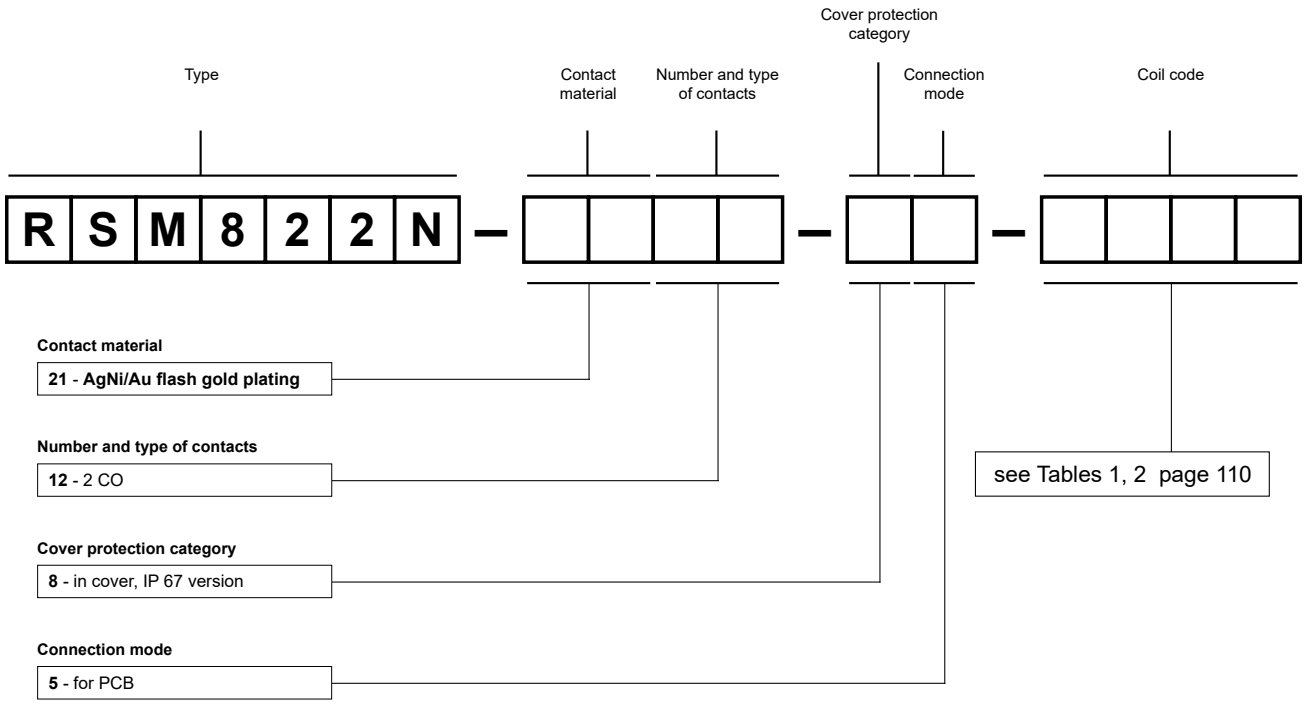
Coil data - DC voltage version, sensitive — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
S003	3	45	± 10%	2,1	6,5
S005	5	125	± 10%	3,5	10,8
S006	6	180	± 10%	4,2	13,0
S009	9	405	± 10%	6,3	19,5
S012	12	720	± 10%	8,4	26,5
S024	24	2 880	± 10%	16,8	52,9

Coil data - DC voltage version, standard — Table 2

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1048	48	7 680	± 10%	33,6	84,9

Ordering codes



Examples of ordering codes:

RSM822N-2112-85-S005 relay **RSM822N**, for PCB, two changeover contacts, contact material AgNi/Au flash gold plating, sensitive coil voltage 5 V DC, in cover IP 67

RSM822N-2112-85-1048 relay **RSM822N**, for PCB, two changeover contacts, contact material AgNi/Au flash gold plating, standard coil voltage 48 V DC, in cover IP 67

- Subminiature monostable relays
- DC coils of up to 24 V DC, low coil power 0,36 W
- For PCB
- Sealed, for wave soldering and cleaning
- Small dimensions, light weight
- Applications: for telecommunication devices, household electrical appliance, office equipment, etc.
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 CO
Contact material		**Ag/Au flash gold plating**
Rated / max. switching voltage	AC	125 V / 220 V
Min. switching voltage		6 V
Rated load	AC1	3 A / 125 V AC
	DC1	3 A / 30 V DC
Min. switching current		50 mA
Rated current		3 A
Max. breaking capacity	AC1	375 VA
Contact resistance		≤ 50 mΩ

Coil data

Rated voltage	DC	3, 5, 6, 9, 12, 24 V
Must release voltage		DC: ≥ 0,1 U_n
Operating range of supply voltage		see Table 1
Rated power consumption	DC	0,36 W

Insulation according to EN 60664-1

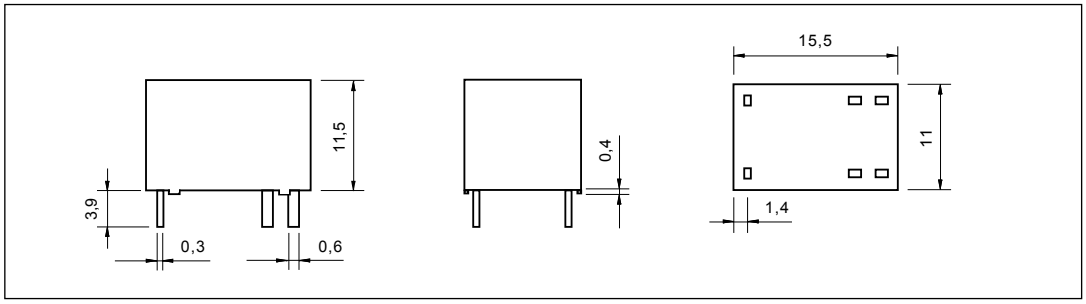
Insulation resistance	100 MΩ	500 V DC, 60 s
Dielectric strength		
• between coil and contacts	1 000 V AC	type of insulation: basic
• contact clearance	500 V AC	type of clearance: micro-disconnection
Contact - coil distance		
• clearance	≥ 1,2 mm	
• creepage	≥ 2 mm	

General data

Operating / release time (typical values)	5 ms / 5 ms	
Electrical life (number of cycles)		
• resistive AC1	1 800 cycles/hour	10^5 3 A, 125 V AC
• resistive DC1	1 800 cycles/hour	10^5 3 A, 30 V DC
Mechanical life	18 000 cycles/hour	10^7
Dimensions (L x W x H)	15,5 x 11 x 11,5 mm	
Weight	3,5 g	
Ambient temperature (non-condensation and/or icing)	• operating	-25...+55 °C
Cover protection category	IP 67	EN 60529
Environmental protection	RTIII	EN 61810-7
Shock resistance	10 g	
Vibration resistance	1,5 mm DA (constant amplitude)	10...55 Hz
Solder bath temperature	max. 260 °C	
Soldering time	max. 5 s	

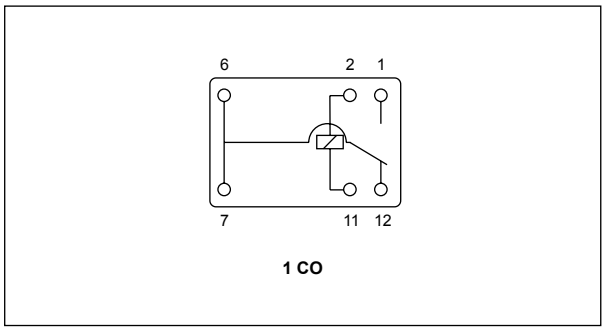
The data in bold type relate to the standard versions of the relays.

Dimensions

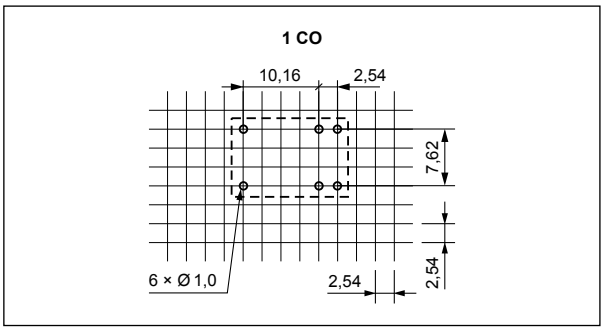


RSM954N
subminiature - signal relays

Connection diagram (pin side view)



Pinout (solder side view)



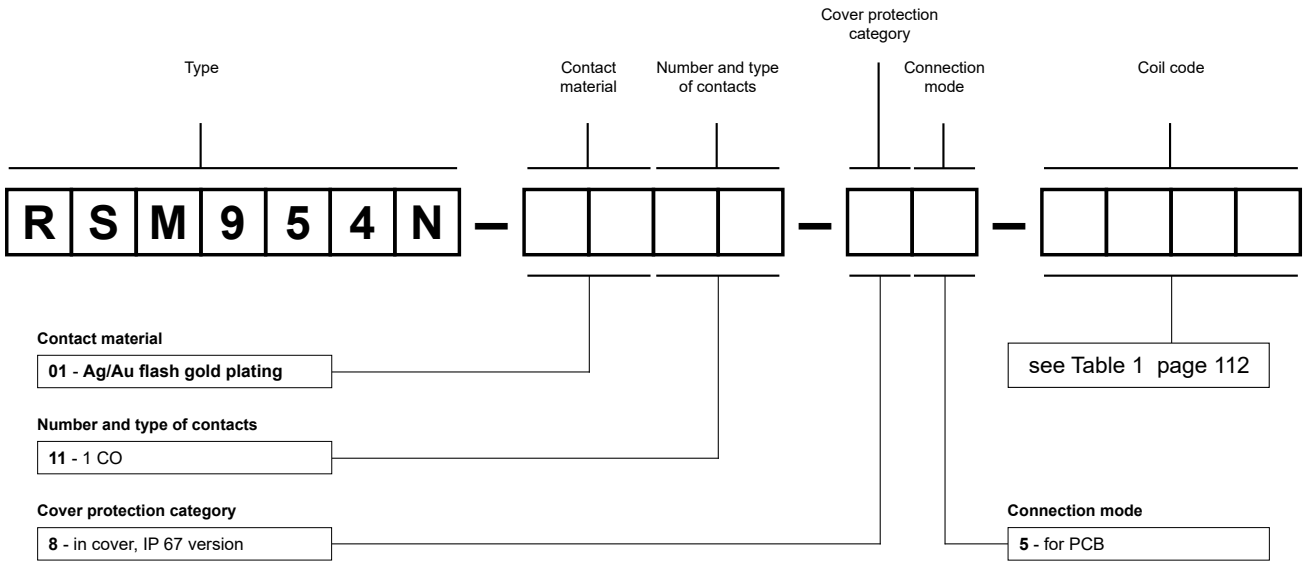
Mounting

Relays **RSM954N** are designed for direct PCB mounting.

Coil data - DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1003	3	25	± 10%	2,25	3,3
1005	5	75	± 10%	3,75	5,5
1006	6	100	± 10%	4,50	6,6
1009	9	225	± 10%	6,75	9,9
1012	12	400	± 10%	9,00	13,2
1024	24	1 600	± 10%	18,00	26,5

Ordering codes



Example of ordering code:

RSM954N-0111-85-1005 relay **RSM954N**, for PCB, one changeover contact, contact material Ag/Au flash gold plating, coil voltage 5 V DC, in cover IP 67

- Subminiature monostable relays
- DC coils - sensitive of up to 24 V DC, low coil power 0,15 W
- For PCB
- Sealed, for wave soldering and cleaning
- Small dimensions, light weight
- Applications: for telecommunication devices, household electrical appliance, office equipment, etc.
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 CO
Contact material		**Ag/Au flash gold plating**
Rated / max. switching voltage	AC	125 V / 220 V
Min. switching voltage		6 V
Rated load	AC1	0,5 A / 125 V AC
	DC1	1 A / 30 V DC
Min. switching current		50 mA
Rated current		1 A
Max. breaking capacity	AC1	62,5 VA
Contact resistance		≤ 100 mΩ

Coil data

Rated voltage	DC	3, 5, 6, 9, 12, 24 V
Must release voltage		DC: ≥ 0,1 U_n
Operating range of supply voltage		see Table 1
Rated power consumption	DC	0,15 W

Insulation according to EN 60664-1

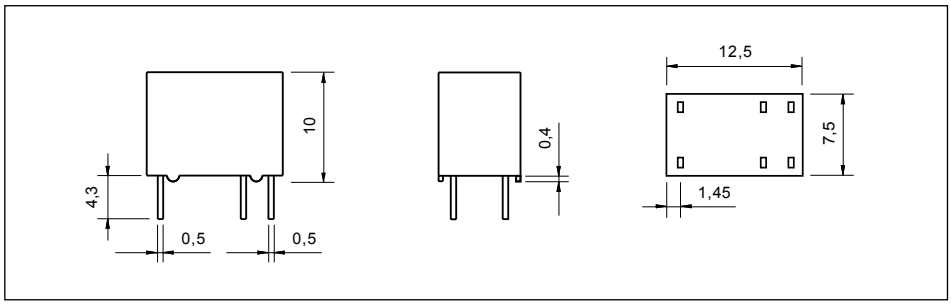
Insulation resistance		> 1 000 MΩ 500 V DC, 60 s
Dielectric strength		
• between coil and contacts		1 000 V AC type of insulation: basic
• contact clearance		400 V AC type of clearance: micro-disconnection
Contact - coil distance		
• clearance		≥ 0,6 mm
• creepage		≥ 0,6 mm

General data

Operating / release time (typical values)		5 ms / 5 ms
Electrical life (number of cycles)		
• resistive AC1	1 800 cycles/hour	10^5 0,5 A, 125 V AC
• resistive DC1	1 800 cycles/hour	10^5 1 A, 30 V DC
Mechanical life	18 000 cycles/hour	5 x 10^6
Dimensions (L x W x H)		12,5 x 7,5 x 10 mm
Weight		2,2 g
Ambient temperature (non-condensation and/or icing)	• operating	-30...+70 °C
Cover protection category		IP 67 EN 60529
Environmental protection		RTIII EN 61810-7
Shock resistance		10 g
Vibration resistance		3,3 mm DA (constant amplitude) 10...55 Hz
Solder bath temperature		max. 260 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays.

Dimensions



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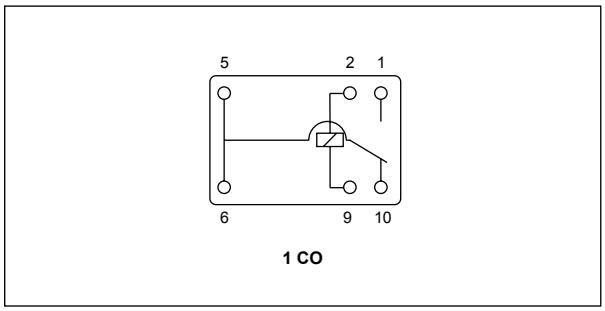
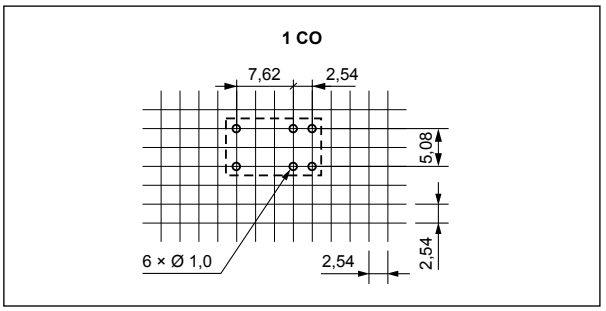
RSM957N
subminiature - signal relays

Connection diagram (pin side view)



Pinout (solder side view)



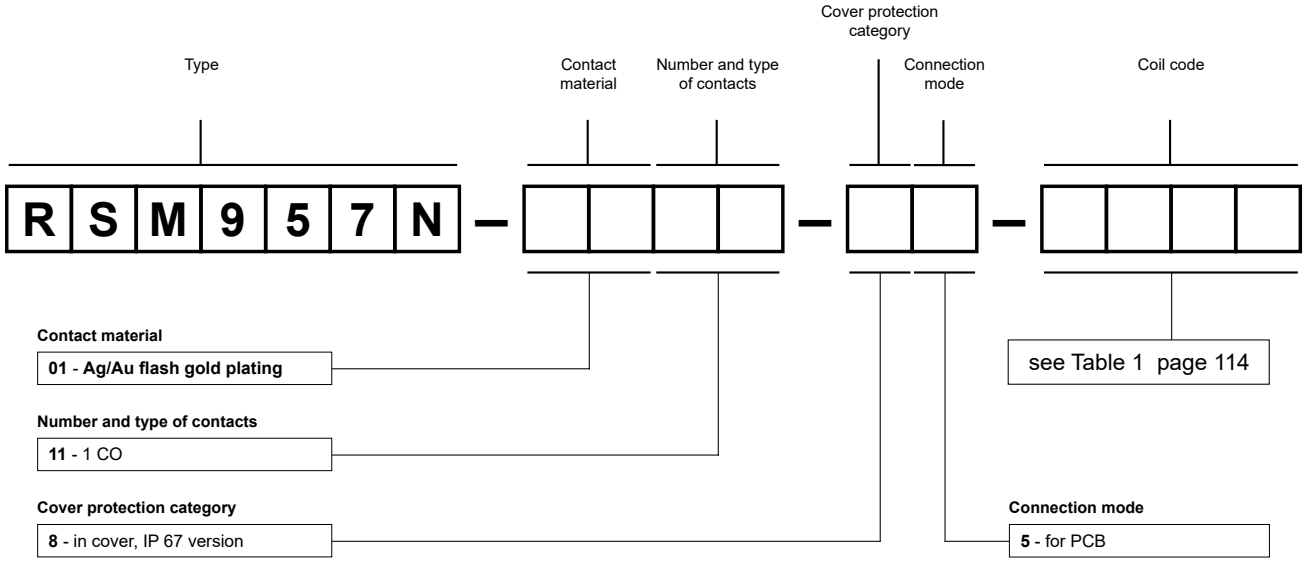
Mounting

Relays **RSM957N** are designed for direct PCB mounting.

Coil data - DC voltage version, sensitive — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
S003	3	60	± 10%	2,4	6
S005	5	166,7	± 10%	4,0	10
S006	6	240	± 10%	4,8	12
S009	9	540	± 10%	7,2	18
S012	12	960	± 10%	9,6	24
S024	24	3 840	± 10%	19,2	48

Ordering codes



Example of ordering code:

RSM957N-0111-85-S005 relay **RSM957N**, for PCB, one changeover contact, contact material Ag/Au flash gold plating, sensitive coil voltage 5 V DC, in cover IP 67

Miniature relays

relpol S.A.

Owing to their universality, miniature relays may be applied in alarm systems, as interface systems in industrial automation, power-electric systems, lighting control systems (e.g. in daylight-saving switches), staircase lighting control systems, emergency lighting control systems, time relays as their output terminals, control systems of household and catering industry equipment, and in numerous electric systems. This type of relay is of high quality and reliability.

The basic features of the miniature relays are: wide range of coil voltages, AC and DC coils, rated contact switching currents up to 20 A (depending on the relay type), height from 10,5 to 26 mm (depending on the relay type), high electric strength of the insulation, possibility of mounting on THT and in plug-in sockets. RM84/RM85 and RMP84/RMP85 relays are the basis for the interface relays of PI84/PI85 and PI84P/PI85P types which are described in the section of ”Interface relays”.

They meet the requirements of REACH and RoHS Directive. The relays are recognized and certified by:

← Contents

RM12 1 CO

RM12 1 NO

- DC coils - of up to 60 V DC, insulation class F: 155 °C
- CTI 250 • Reinforced insulation
- For PCB
- Terminals: 3,2 mm for version 1 CO,
  5,04 mm for version 1 NO
- Compliance with standards: EN 61810-1, EN 60730-1, EN 60335-1, UL 508, CSA 22.2 No.14-95
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 CO, 1 NO
Contact material		**AgNi**, AgNi/Au hard gold plating, $AgSnO_2$, $AgSnO_2$/Au hard gold plating
Rated / max. switching voltage	AC	250 V / 400 V
Min. switching voltage		5 V AgNi, 5 V AgNi/Au hard gold plating 10 V $AgSnO_2$, 5 V $AgSnO_2$/Au hard gold plating
Rated load	AC1 DC1	8 A / 250 V AC 8 A / 24 V DC
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❶
Min. switching current		5 mA AgNi, 2 mA AgNi/Au hard gold plating 10 mA $AgSnO_2$, 2 mA $AgSnO_2$/Au hard gold plating
Max. inrush current		10 A
Rated current		8 A
Max. breaking capacity	AC1	2000 VA
Min. breaking capacity		0,3 W AgNi, 0,05 W AgNi/Au hard gold plating 1 W $AgSnO_2$, 0,05 W $AgSnO_2$/Au hard gold plating
Contact resistance		≤ 100 mΩ 100 mA, 24 V
Max. operating frequency	• at rated load AC1 • no load	360 cycles/hour 18 000 cycles/hour

Coil data

Rated voltage	DC	5, 6, 9, 12, 18, 24, 48, 60 V
Must release voltage		DC: ≥ 0,1 U_n
Operating range of supply voltage		see Table 1
Rated power consumption	DC	0,25 W

Insulation according to EN 60664-1

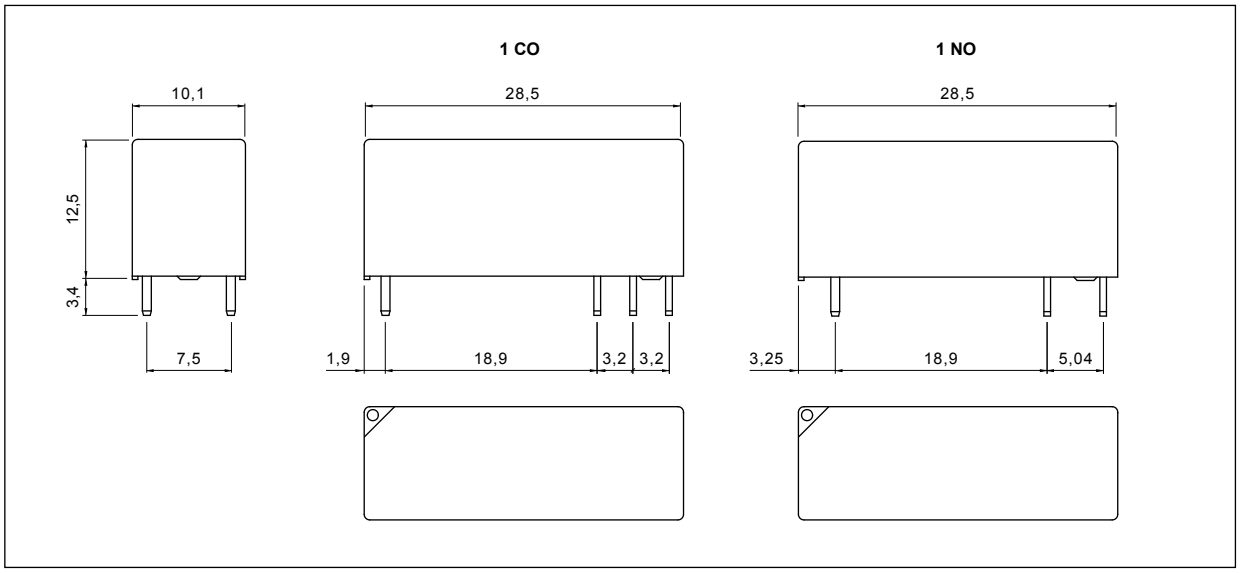
Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III IEC 61810-5
Insulation pollution degree		3
Flammability class		V-0 UL 94
Insulation group (contact plate)		IIIa
Tracking resistance category		2 UL 508
Dielectric strength	• between coil and contacts • contact clearance	5 000 V AC 1 min., type of insulation: reinforced 1 000 V AC 1 min., type of clearance: micro-disconnection
Contact - coil distance	• clearance • creepage	≥ 8 mm ≥ 8 mm

General data

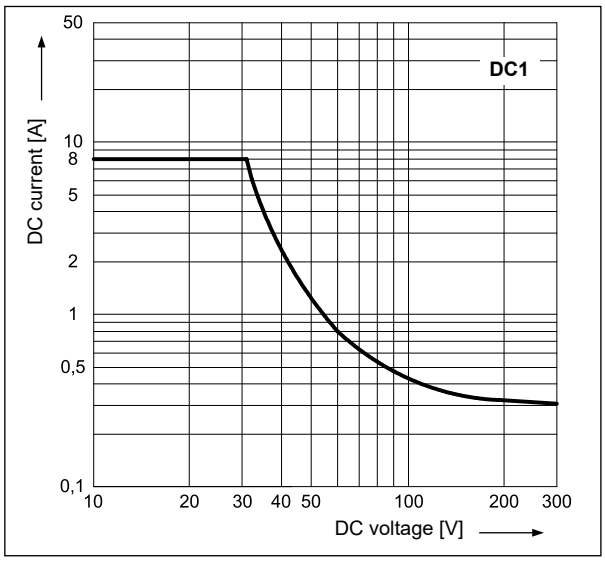
Operating / release time (typical values)		10 ms / 5 ms
Electrical life (number of cycles)	• resistive AC1 • resistive DC1	10^5 1 NO, 8 A, 250 V AC, 70 °C (VDE) $6,5 \times 10^4$ 1 CO (NO side), 8 A, 250 V AC, 70 °C (VDE) 5×10^4 1 NO, 8 A, 250 V AC, 85 °C (VDE) $> 10^5$ 8 A, 24 V DC
Mechanical life	18 000 cycles/hour	10^7
Load according to UL 508		10 A 277 V AC, general purpose B300 inductive load (Pilot Duty)
Dimensions (L x W x H)		28,5 x 10,1 x 12,5 mm
Weight		8 g
Ambient temperature (non-condensation and/or icing)	• storage • operating	-40...+85 °C -40...+85 °C
Cover protection category		IP 40 or **IP 67** EN 60529
Environmental protection		RTII EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g EN 60068-2-27, Test Ea
Vibration resistance	(NO/NC)	10 g / 5 g 10...150 Hz EN 60068-2-6, Test Fc

The data in bold type relate to the standard versions of the relays. ❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

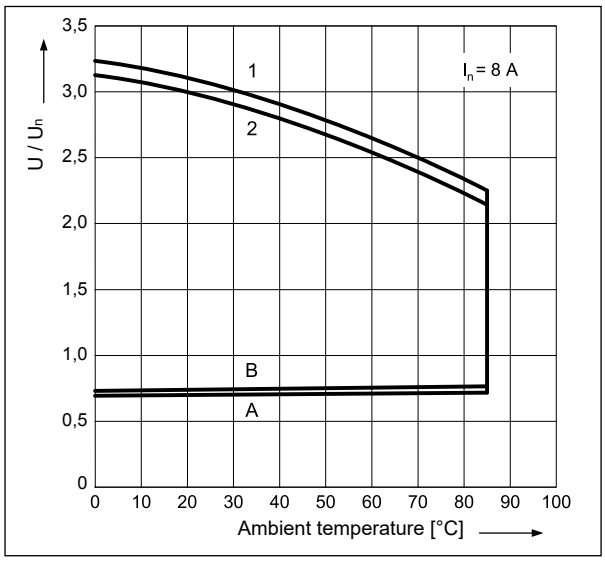
Dimensions



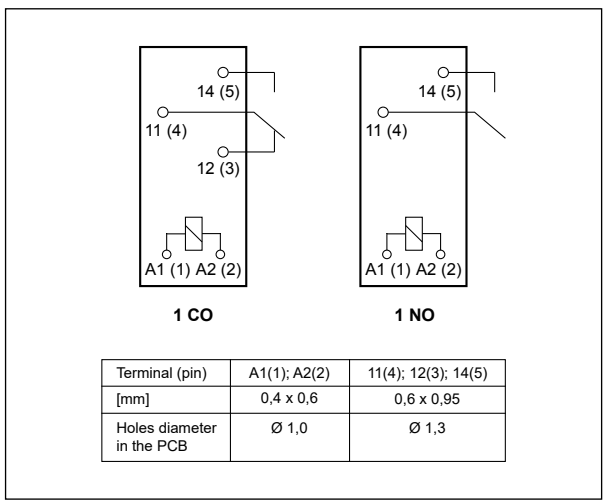
Max. DC resistive load breaking capacity Fig. 1



Coil operating range - DC Fig. 2



Connection diagrams (pin side view)



Terminal (pin)	A1(1); A2(2)	11(4); 12(3); 14(5)
[mm]	0,4 x 0,6	0,6 x 0,95
Holes diameter in the PCB	Ø 1,0	Ø 1,3

Description of Fig. 2

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - rated load

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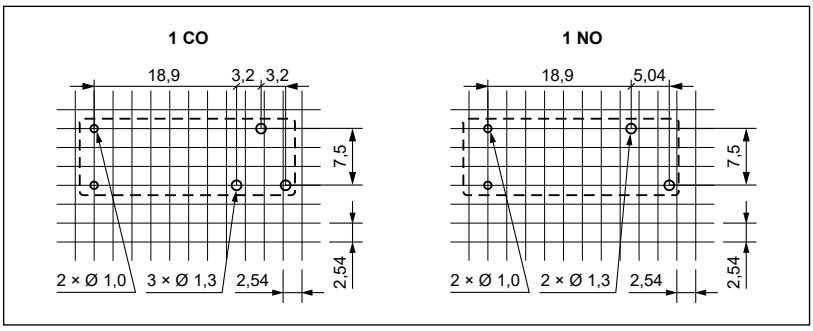
Pinout (solder side view)



Mounting

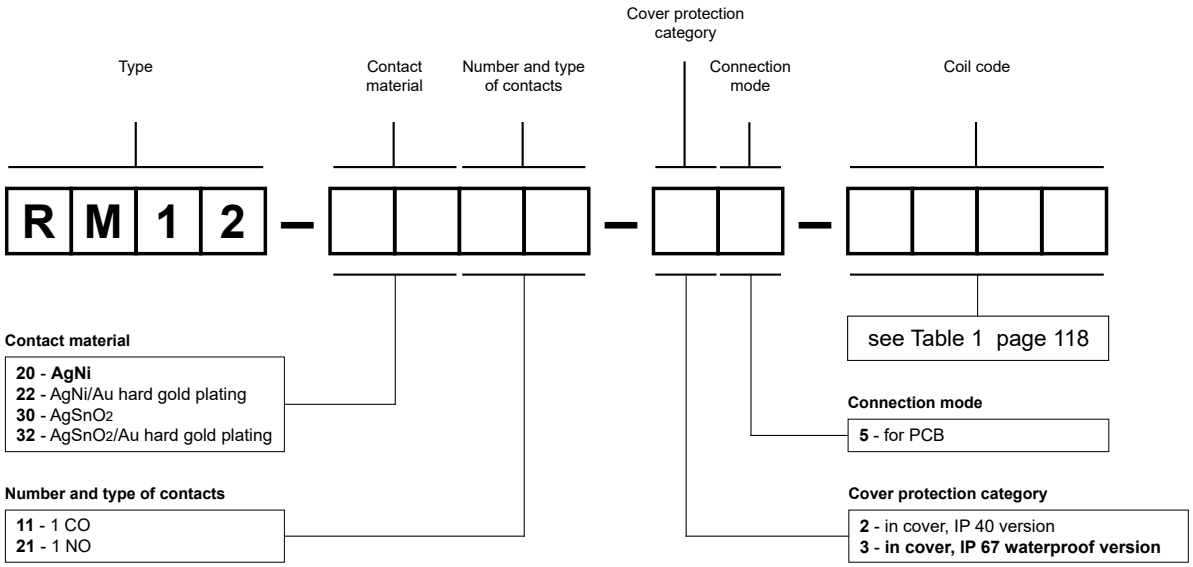
Relays **RM12** are designed for direct PCB mounting.

Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1005	5	102	± 10%	3,5	15,0
1006	6	144	± 10%	4,2	18,0
1009	9	330	± 10%	6,3	27,0
1012	12	580	± 10%	8,4	36,0
1018	18	1 300	± 10%	12,6	54,0
1024	24	2 300	± 10%	16,8	72,0
1048	48	8 800	± 10%	33,6	144,0
1060	60	14 000	± 10%	42,0	180,0

Ordering codes



Examples of ordering codes:

RM12-2011-35-1012 relay **RM12**, for PCB, one changeover contact, contact material AgNi, coil voltage 12 V DC, in cover IP 67

RM12-3021-25-1024 relay **RM12**, for PCB, one normally open contact, contact material $AgSnO_2$, coil voltage 24 V DC, in cover IP 40

- DC coils - of up to 24 V DC, low coil power 0,22 ... 0,29 W
- For PCB
- Small dimensions, light weight
- Applications: for household electrical appliance, automation systems, electrical equipment, instrument and meter, telecommunication devices, remote control facilities
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 CO, 1 NO	
Contact material		**AgNi**, $AgSnO_2$	
Rated / max. switching voltage	AC	250 V / 440 V	
Min. switching voltage		6 V	
Rated load	AC1	1 CO: 8 A / 250 V AC	1 NO: 10 A / 250 V AC
	DC1	1 CO: 8 A / 30 V DC	1 NO: 10 A / 30 V DC
Min. switching current		100 mA	
Rated current		10 A	
Max. breaking capacity	AC1	2 500 VA	
Contact resistance		≤ 100 mΩ	

Coil data

Rated voltage	DC	5, 9, 12, 18, 24, 48 V
Must release voltage		DC: ≥ 0,1 U_n
Operating range of supply voltage		see Table 1
Rated power consumption	DC	0,22 ... 0,29 W

Insulation according to EN 60664-1

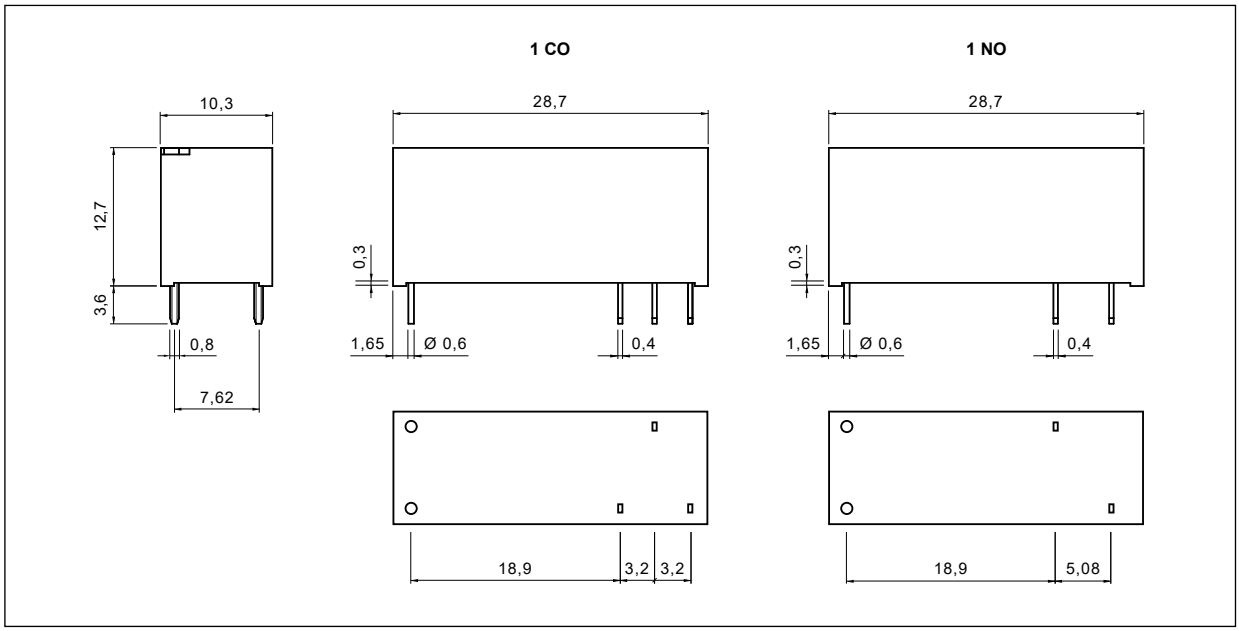
Insulation resistance	> 1 000 MΩ	500 V DC, 60 s
Dielectric strength		
• between coil and contacts	5 000 V AC	type of insulation: reinforced
• contact clearance	1 000 V AC	type of clearance: micro-disconnection
Contact - coil distance		
• clearance	≥ 8 mm	
• creepage	≥ 8 mm	

General data

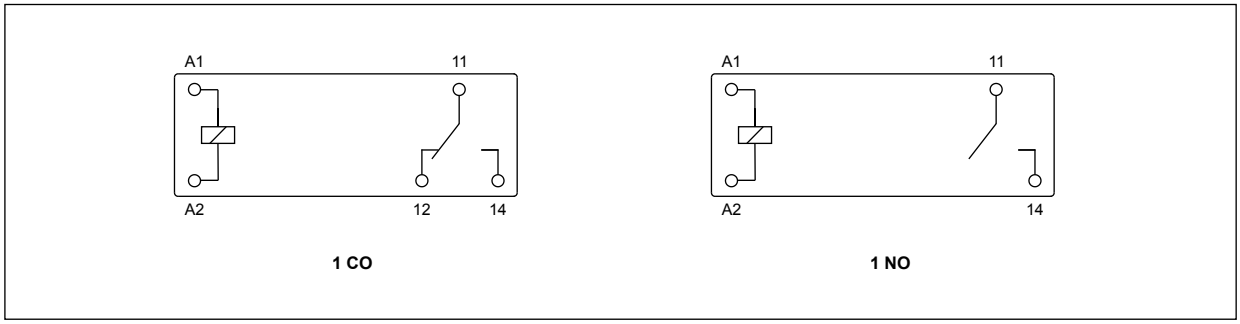
Operating / release time (typical values)		10 ms / 5 ms	
Electrical life (number of cycles)			
• resistive AC1	1 800 cycles/hour	10^5	10 A, 250 V AC
• resistive DC1	1 800 cycles/hour	10^5	10 A, 30 V DC
Mechanical life	18 000 cycles/hour	10^7	
Dimensions (L x W x H)		28,7 x 10,3 x 12,7 mm	
Weight		8 g	
Ambient temperature (non-condensation and/or icing)	• operating	-40...+85 °C	
Cover protection category		IP 40 or **IP 67**	EN 60529
Environmental protection		RTII or **RTIII**	EN 61810-7
Shock resistance		10 g	
Vibration resistance		1 NO: 0,80 mm DA (without coil voltage)	10...55 Hz
		1 NC: 1,65 mm DA (constant amplitude)	10...55 Hz
Solder bath temperature		max. 260 °C	
Soldering time		max. 5 s	

The data in bold type relate to the standard versions of the relays.

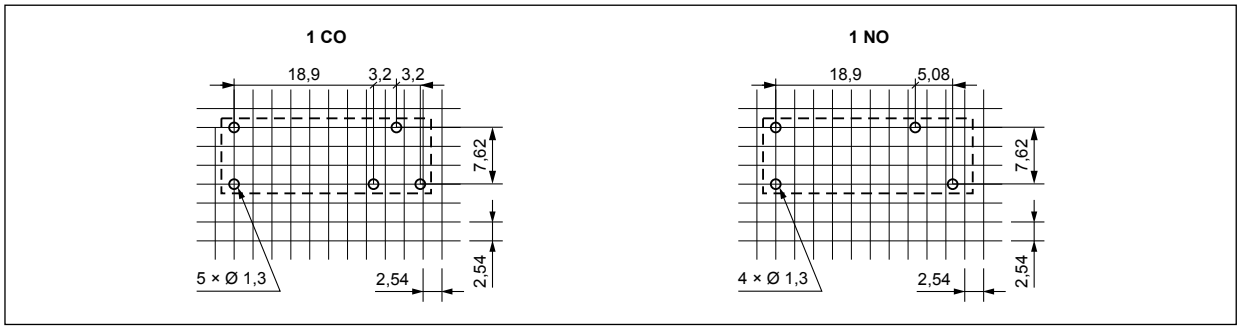
Dimensions



Connection diagrams (pin side view)



Pinout (solder side view)



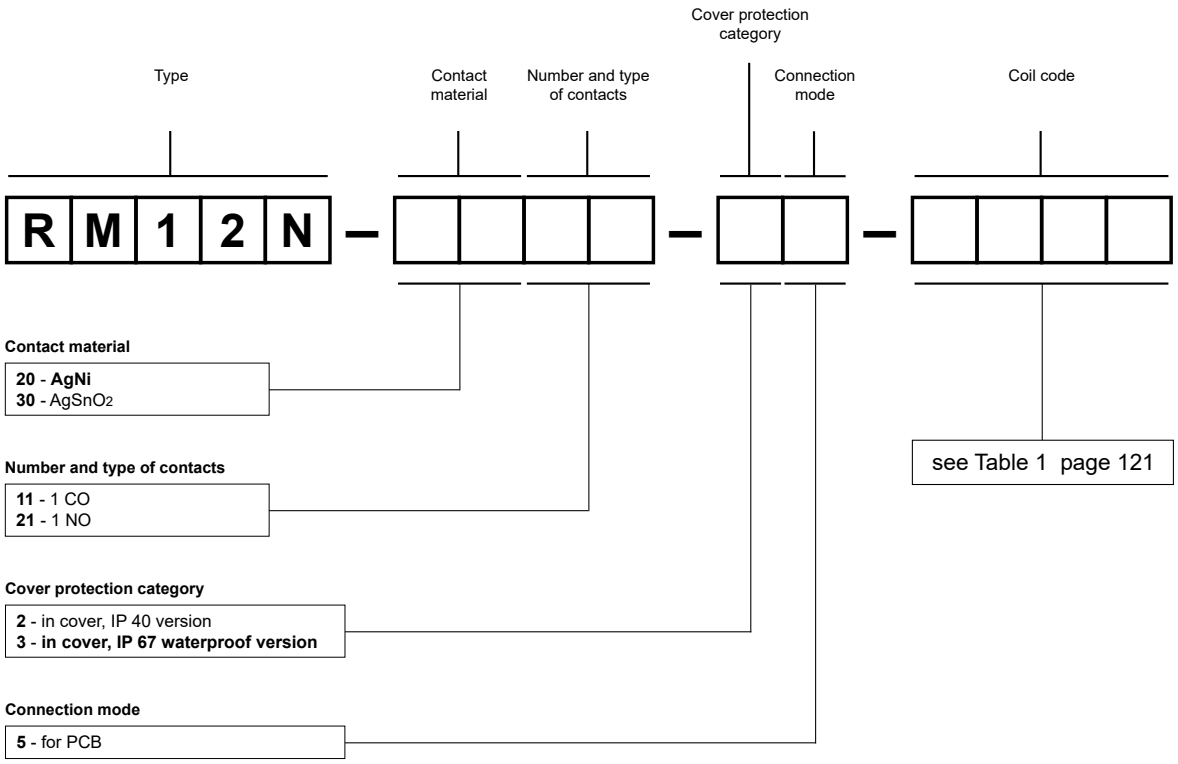
Mounting

Relays **RM12N** are designed for direct PCB mounting.

Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1005	5	113	± 10%	3,5	6,5
1009	9	360	± 10%	6,3	11,7
1012	12	620	± 10%	8,4	15,6
1018	18	1 295	± 10%	12,7	23,4
1024	24	2 350	± 10%	16,8	31,2
1048	48	8 000	± 10%	33,6	62,4

Ordering codes



Examples of ordering codes:

RM12N-2011-35-1012 relay **RM12N**, for PCB, one changeover contact, contact material AgNi, coil voltage 12 V DC, in cover IP 67

RM12N-3021-25-1024 relay **RM12N**, for PCB, one normally open contact, contact material $AgSnO_2$, coil voltage 24 V DC, in cover IP 40

- DC coils - of up to 24 V DC, low coil power 0,20 W (sensitive coil) or 0,45 W (standard coil)
- For PCB • Very small dimensions, light weight
- High load up to 10 A / 125 V AC ❶
- Applications: for household electrical appliance, automation systems, electrical equipment, instrument and meter, telecommunication devices, remote control facilities, light controllers, etc.
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 CO, 1 NO	
Contact material		**$AgSnO_2$**	
Rated / max. switching voltage	AC	250 V / 277 V	
Min. switching voltage		5 V	
Rated load	AC1	1 CO: 5 A / 5 A (NO/NC) / 250 V AC	1 NO: 5 A / 250 V AC
		1 CO: 10 A / 125 V AC ❶	1 NO: 10 A / 125 V AC
	DC1	1 CO: 5 A / 5 A (NO/NC) / 28 V DC	1 NO: 5 A / 28 V DC
Motor load	acc. to UL 508	1/4 HP	250 V AC, single-phase motor
Rated current		5 A	
Max. breaking capacity	AC1	1 250 VA	
Contact resistance		≤ 100 mΩ	

Coil data

Rated voltage	DC	5, 9, 12, 18, 24 V	
Must release voltage		DC: ≥ 0,05 U_n	
Operating range of supply voltage		see Tables 1, 2	
Rated power consumption	DC	0,20 W sensitive coil ❶	0,45 W standard coil

Insulation according to EN 60664-1

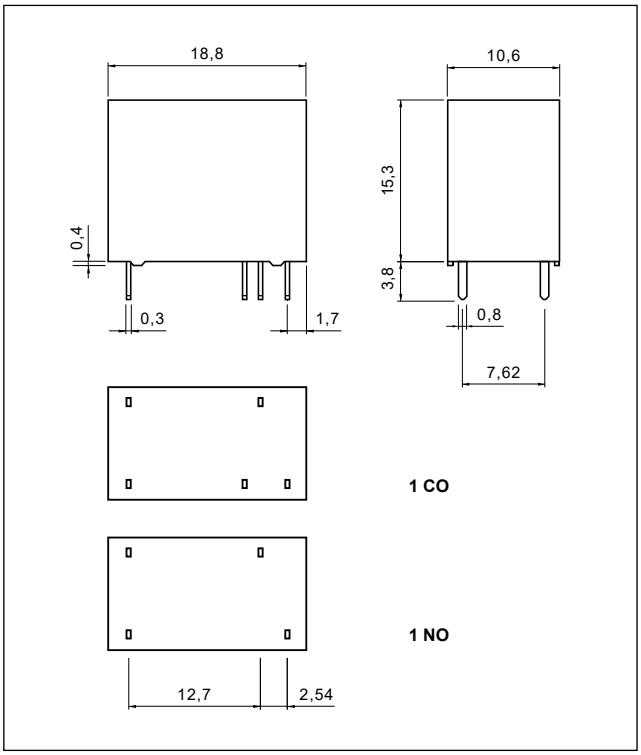
Insulation resistance	100 MΩ	500 V DC, 60 s
Dielectric strength		
• between coil and contacts	2 500 V AC	type of insulation: basic
• contact clearance	1 000 V AC	type of clearance: micro-disconnection

General data

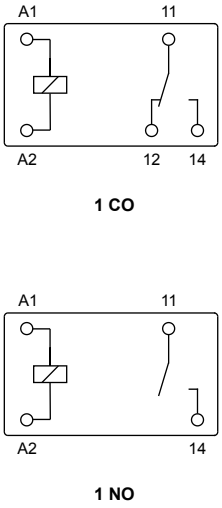
Operating / release time (typical values)		8 ms / 5 ms	
Electrical life (number of cycles)			
• resistive AC1	1 800 cycles/hour	10^5 1 CO: 5 A / 5 A (NO/NC), 250 V AC	1 NO: 5 A, 250 V AC
• resistive DC1	1 800 cycles/hour	10^5 1 CO: 5 A / 5 A (NO/NC), 28 V DC	1 NO: 5 A, 28 V DC
Mechanical life	18 000 cycles/hour	10^7	
Dimensions (L x W x H)		18,8 x 10,6 x 15,3 mm	
Weight		6 g	
Ambient temperature (non-condensation and/or icing)	• operating	-40...+70 °C	
Cover protection category		IP 67	EN 60529
Environmental protection		RTIII	EN 61810-7
Shock resistance		10 g	
Vibration resistance		1,5 mm DA (constant amplitude)	10...55 Hz
Solder bath temperature		max. 260 °C	
Soldering time		max. 5 s	

The data in bold type relate to the standard versions of the relays.
❶ Only for contacts 1 NO

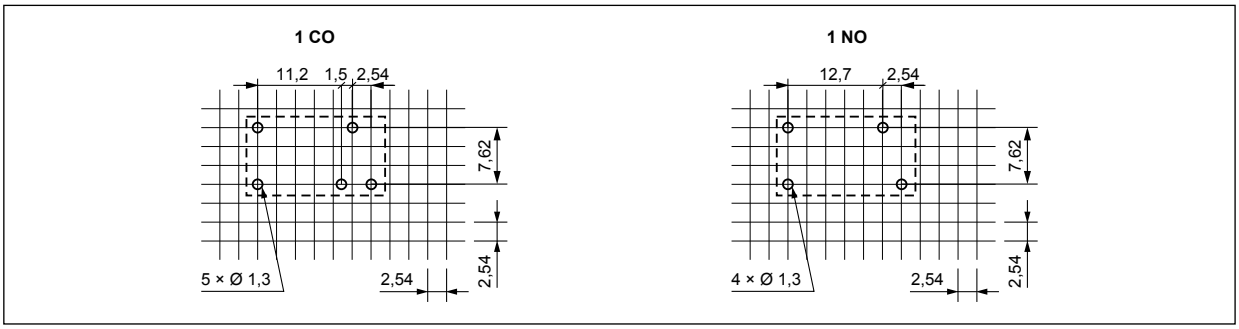
Dimensions



Connection diagrams (pin side view)



Pinout (solder side view)



Mounting

Relays **RM32N** are designed for direct PCB mounting.

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Coil data - DC voltage version, sensitive — Table 1

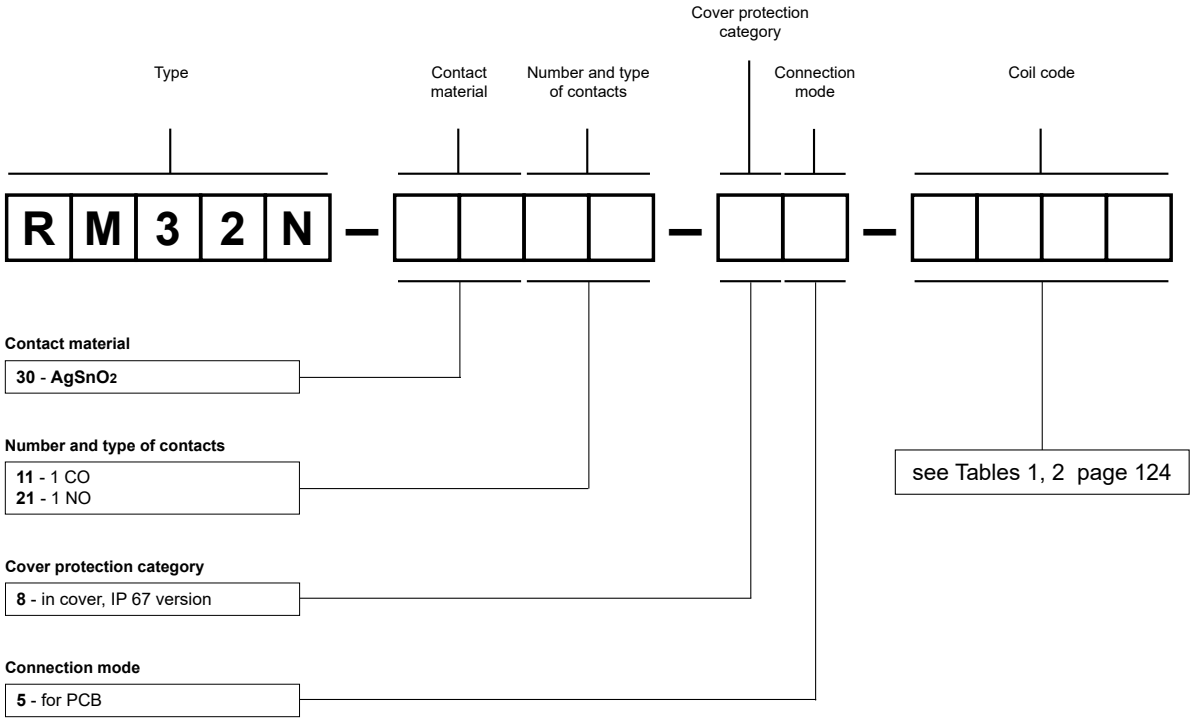
Coil code ❶	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
S005	5	125	± 10%	3,75	6,5
S009	9	405	± 10%	6,75	11,7
S012	12	720	± 10%	9,00	15,6
S018	18	1 620	± 10%	13,50	23,4
S024	24	2 880	± 10%	18,00	31,2

❶ Only for contacts 1 NO

Coil data - DC voltage version, standard — Table 2

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1005	5	56	± 10%	3,75	6,5
1009	9	180	± 10%	6,75	11,7
1012	12	320	± 10%	9,00	15,6
1018	18	720	± 10%	13,50	23,4
1024	24	1 280	± 10%	18,00	31,2

Ordering codes



Examples of ordering codes:

RM32N-3021-85-S018 relay **RM32N**, for PCB, one normally open contact, contact material $AgSnO_2$, sensitive coil voltage 18 V DC, in cover IP 67

RM32N-3011-85-1024 relay **RM32N**, for PCB, one changeover contact, contact material $AgSnO_2$, standard coil voltage 24 V DC, in cover IP 67

- Very small dimensions
- High switching capacity up to 5 A or 8 A
- Sealed, for wave soldering and cleaning
- Available special versions: halogen-free
- Applications: for household equipment, office machines, control devices, alarm systems, in industrial control, monitoring systems, industrial controllers
- Recognitions, certifications, directives ❶: RoHS,

Contact data

Number and type of contacts		1 CO	1 NO
Contact material		1 CO: **AgNi**, AgNi/Au hard gold plating	1 NO: **$AgSnO_2$**
Rated / max. switching voltage	AC	1 CO: 250 V / 380 V	1 NO: 250 V / 440 V
Min. switching voltage		5 V AgNi, 1 V AgNi/Au hard gold plating	5 V $AgSnO_2$
Rated load	AC1	1 CO: 5 A / 250 V AC	1 NO: 8 A / 250 V AC
	DC1	1 CO: 5 A / 30 V DC	1 NO: 8 A / 30 V DC
Min. switching current		10 mA AgNi, 1 mA AgNi/Au hard gold plating	10 mA $AgSnO_2$
Rated current		1 CO: 5 A	1 NO: 8 A
Max. breaking capacity	AC1	1 CO: 1 250 VA	1 NO: 2 000 VA
Min. breaking capacity		50 mW AgNi, 1 mW AgNi/Au hard gold plating	50 mW $AgSnO_2$
Contact resistance		≤ 100 mΩ	

Coil data

Rated voltage	DC	3, 5, 6, 9, 12, 24, 48 V
Must release voltage		DC: ≥ 0,05 U_n
Operating range of supply voltage		see Table 1
Rated power consumption	DC	0,20 W

Insulation according to EN 60664-1

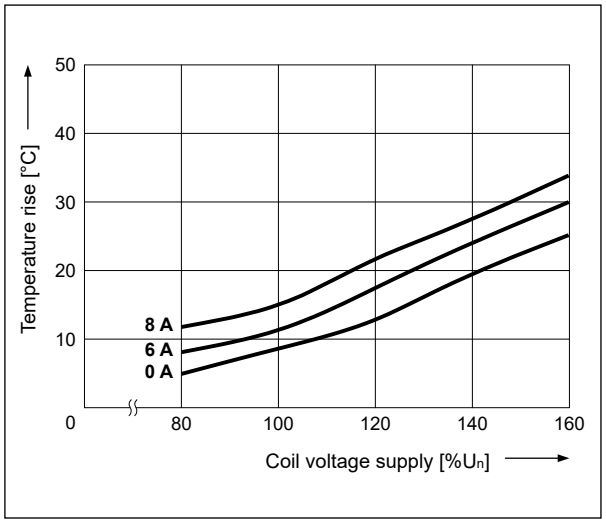
Rated surge voltage		10 000 V 1,2 / 50 µs
Insulation resistance		> 100 MΩ 500 V DC
Dielectric strength		
• between coil and contacts		4 000 V AC type of insulation: reinforced
• contact clearance		1 000 V AC type of clearance: micro-disconnection
Contact - coil distance		
• clearance		≥ 5 mm
• creepage		≥ 5 mm

General data

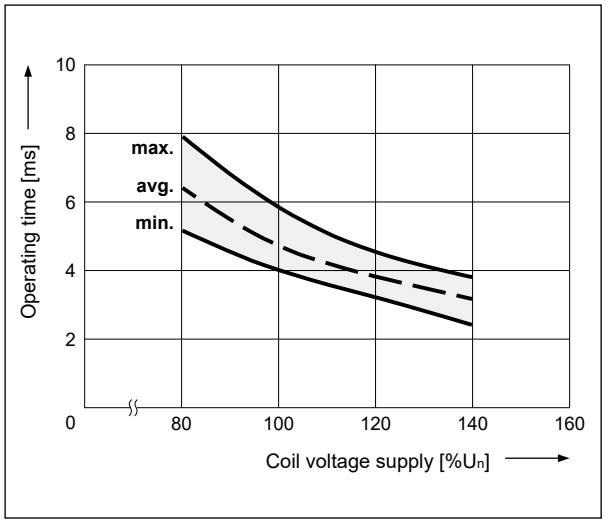
Operating / release time (typical values)		8 ms / 4 ms		
Electrical life (number of cycles)				
• resistive AC1	360 cycles/hour	> 10^5	1 CO: 5 A, 250 V AC	1 NO: 8 A, 250 V AC
• resistive DC1	360 cycles/hour	> 10^5	1 CO: 5 A, 30 V DC	1 NO: 8 A, 30 V DC
Mechanical life	18 000 cycles/hour	> 10^7		
Dimensions (L x W x H)		20 x 10 x 10,5 mm		
Weight		6 g		
Ambient temperature (non-condensation and/or icing)	• operating	-40...+85 °C		
Cover protection category		IP 67 EN 60529		
Environmental protection		RTIII EN 61810-7		
Shock resistance		10 g		
Vibration resistance		1,5 mm DA (double amplitude) 10...55 Hz		
Solder bath temperature		max. 260 °C		
Soldering time		max. 5 s		

The data in bold type relate to the standard versions of the relays.
❶ The VDE certificate includes only standard versions.

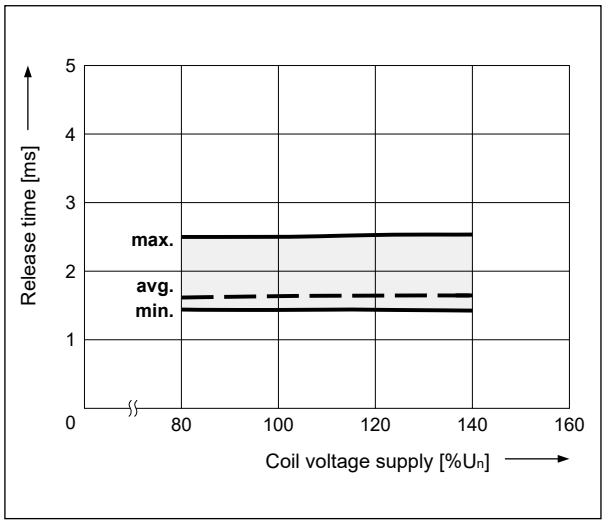
Coil temperature rise at 85 °C — Fig. 1



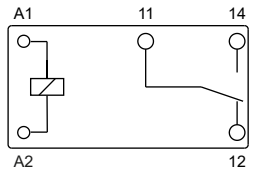
Operating time — Fig. 2



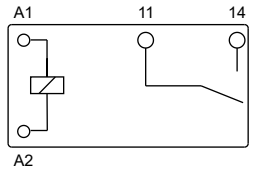
Release time — Fig. 3



Connection diagrams (pin side view)

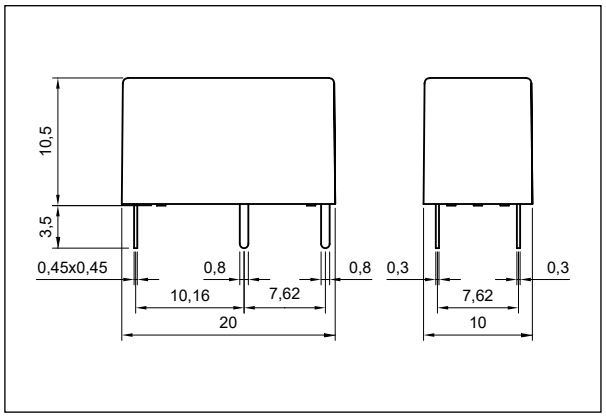


1 CO



1 NO

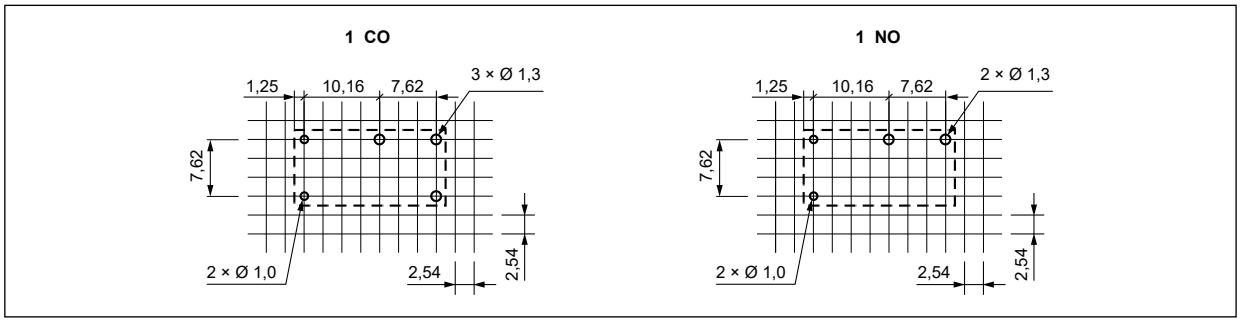
Dimensions



Mounting

Relays **RM40** are designed for direct PCB mounting.

Pinout (solder side view)

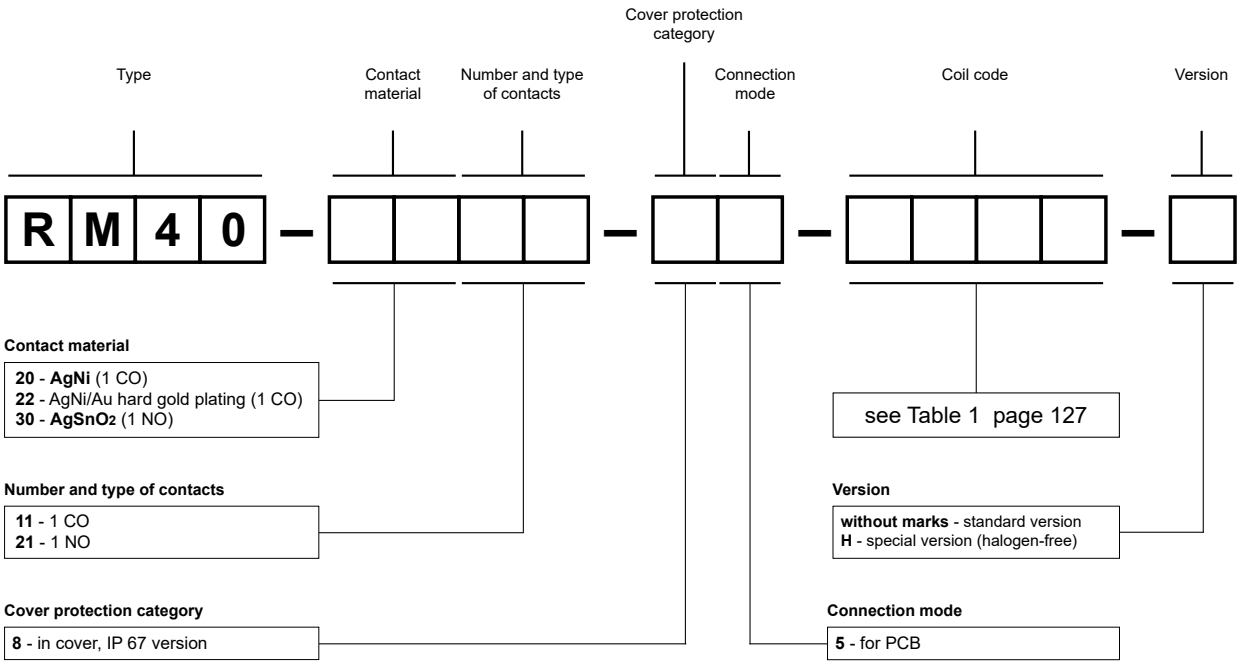


Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1003	3	45	± 10%	2,25	4,5
1005	5	125	± 10%	3,75	7,5
1006	6	180	± 10%	4,50	9,0
1009	9	405	± 10%	6,75	13,5
1012	12	720	± 10%	9,00	18,0
1024	24	2 880	± 10%	18,00	36,0
1048	48	11 520	± 10%	36,00	72,0

Ordering codes



Examples of ordering codes:

RM40-2011-85-1003 relay **RM40**, for PCB, one changeover contact, contact material AgNi, coil voltage 3 V DC, in cover IP 67, standard version

RM40-3021-85-1024-H relay **RM40**, for PCB, one normally open contact, contact material $AgSnO_2$, coil voltage 24 V DC, in cover IP 67, special version (halogen-free)

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- DC coils - of up to 24 V DC, low coil power 0,20 W (sensitive coil) or 0,45 W (standard coil)
- For PCB • Very small dimensions, light weight
- High load up to 10 A / 125 V AC ❶
- Applications: for household electrical appliance, automation systems, electrical equipment, instrument and meter, telecommunication devices, remote control facilities, light controllers, etc.
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 CO, 1 NO	
Contact material		**$AgSnO_2$**	
Rated / max. switching voltage	AC	250 V / 277 V	
Min. switching voltage		5 V	
Rated load	AC1	1 CO: 5 A / 5 A (NO/NC) / 250 V AC	1 NO: 5 A / 250 V AC
		1 CO: 10 A / 125 V AC ❶	1 NO: 10 A / 125 V AC
	DC1	1 CO: 5 A / 5 A (NO/NC) / 28 V DC	1 NO: 5 A / 28 V DC
Motor load	acc. to UL 508	1/4 HP	250 V AC, single-phase motor
Rated current		5 A	
Max. breaking capacity	AC1	1 250 VA	
Contact resistance		≤ 100 mΩ	

Coil data

Rated voltage	DC	5, 9, 12, 24 V	
Must release voltage		DC: ≥ 0,05 U_n	
Operating range of supply voltage		see Tables 1, 2	
Rated power consumption	DC	0,20 W sensitive coil ❶	0,45 W standard coil

Insulation according to EN 60664-1

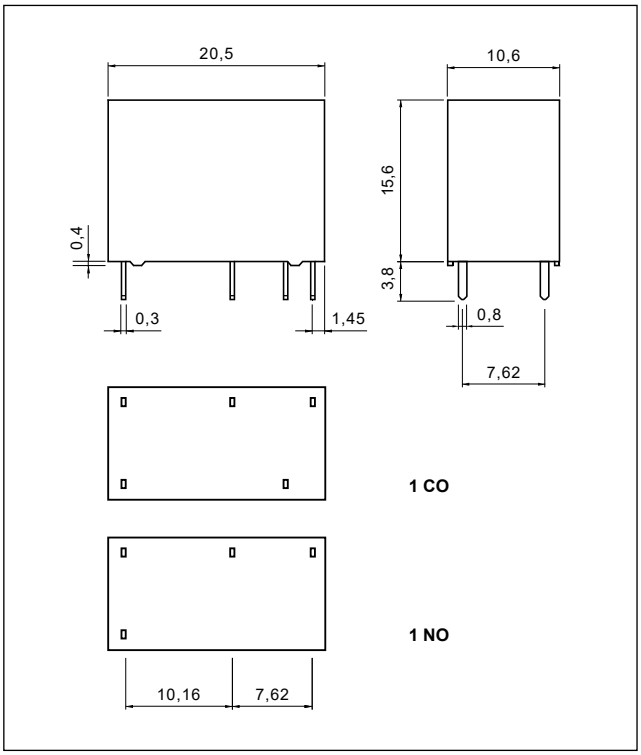
Insulation resistance	100 MΩ	500 V DC, 60 s
Dielectric strength		
• between coil and contacts	4 000 V AC	type of insulation: reinforced
• contact clearance	1 000 V AC	type of clearance: micro-disconnection

General data

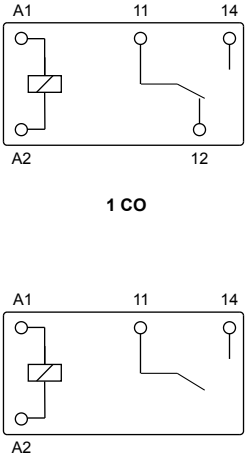
Operating / release time (typical values)		8 ms / 5 ms	
Electrical life (number of cycles)			
• resistive AC1	1 800 cycles/hour	10^5 1 CO: 5 A / 5 A (NO/NC), 250 V AC	1 NO: 5 A, 250 V AC
• resistive DC1	1 800 cycles/hour	10^5 1 CO: 5 A / 5 A (NO/NC), 28 V DC	1 NO: 5 A, 28 V DC
Mechanical life	18 000 cycles/hour	10^7	
Dimensions (L x W x H)		20,5 x 10,6 x 15,6 mm	
Weight		7 g	
Ambient temperature (non-condensation and/or icing)	• operating	-40...+70 °C	
Cover protection category		IP 67	EN 60529
Environmental protection		RTIII	EN 61810-7
Shock resistance		10 g	
Vibration resistance		1,5 mm DA (constant amplitude)	10...55 Hz
Solder bath temperature		max. 260 °C	
Soldering time		max. 5 s	

The data in bold type relate to the standard versions of the relays.
❶ Only for contacts 1 NO

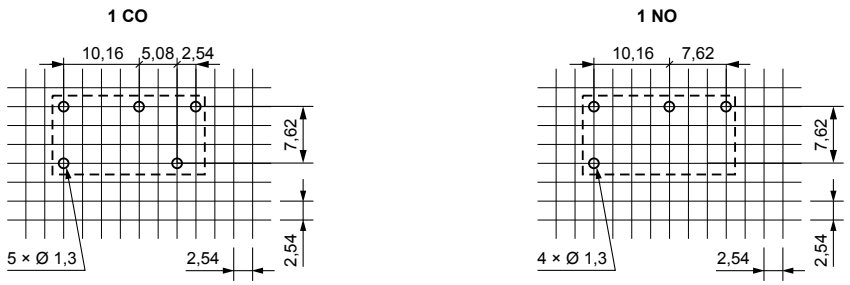
Dimensions



Connection diagrams (pin side view)



Pinout (solder side view)



Mounting

Relays **RM45N** are designed for direct PCB mounting.

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Coil data - DC voltage version, sensitive — Table 1

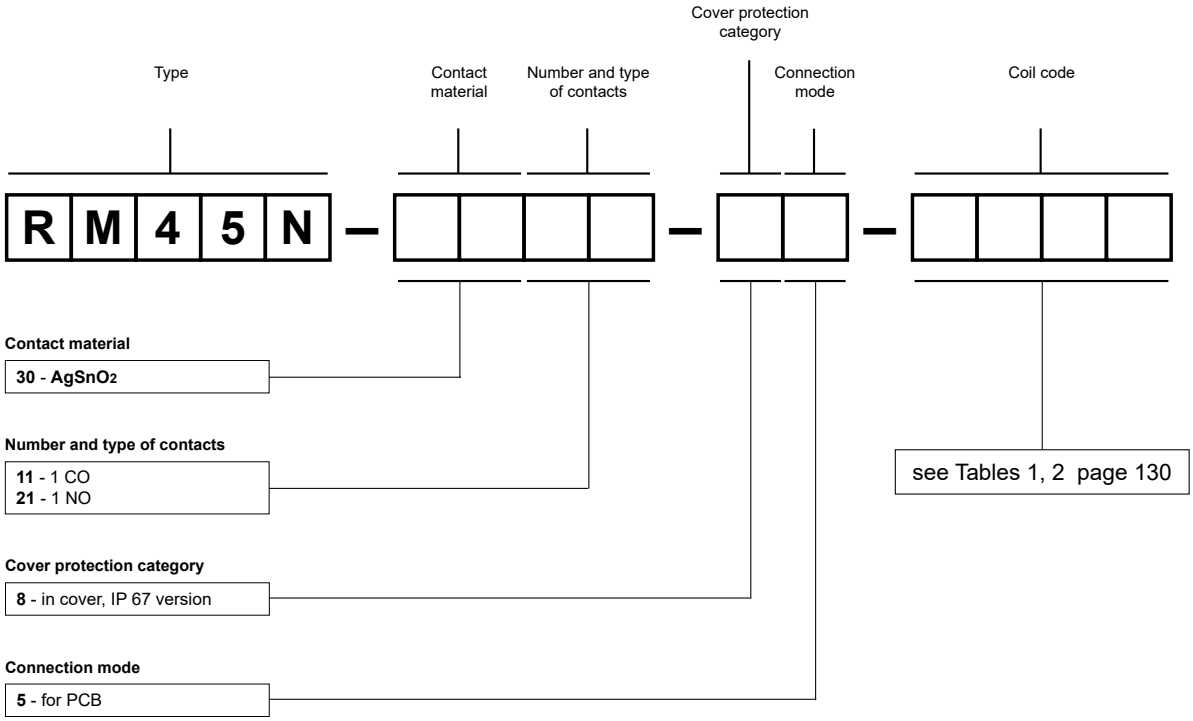
Coil code ❶	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
S005	5	125	± 10%	3,75	5,5
S009	9	405	± 10%	6,75	9,9
S012	12	720	± 10%	9,00	13,2
S024	24	2 880	± 10%	18,00	26,4

❶ Only for contacts 1 NO

Coil data - DC voltage version, standard — Table 2

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1005	5	56	± 10%	3,75	5,5
1009	9	180	± 10%	6,75	9,9
1012	12	320	± 10%	9,00	13,2
1024	24	1 280	± 10%	18,00	26,4

Ordering codes



Examples of ordering codes:

RM45N-3021-85-S012 relay **RM45N**, for PCB, one normally open contact, contact material $AgSnO_2$, sensitive coil voltage 12 V DC, in cover IP 67

RM45N-3011-85-1024 relay **RM45N**, for PCB, one changeover contact, contact material $AgSnO_2$, standard coil voltage 24 V DC, in cover IP 67

- DC coils - of up to 48 V DC, low coil power 0,36 W
- For PCB
- Small dimensions, light weight
- Applications: for household electrical appliance, automation control, telecommunication devices, machinery electrical equipment
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 CO, 1 NO
Contact material		**$AgSnO_2$**, AgCdO ❶
Max. switching voltage	AC	277 V
	DC	110 V
Min. switching voltage		5 V
Rated load	AC1	6 A / 250 V AC
		12 A / 125 V AC
	DC1	12 A / 28 V DC
Motor load	acc. to UL 508	1/3 HP 250 V AC, single-phase motor
Min. switching current		15 mA
Rated current		12 A
Max. breaking capacity	AC1	1 500 VA
Contact resistance		≤ 100 mΩ

Coil data

Rated voltage	DC	5, 9, 12, 24, 48 V
Must release voltage		DC: ≥ 0,1 U_n
Operating range of supply voltage		see Table 1
Rated power consumption	DC	0,36 W

Insulation according to EN 60664-1

Insulation resistance		250 MΩ 500 V DC, 60 s
Dielectric strength		
• between coil and contacts		1 500 V AC type of insulation: basic
• contact clearance		750 V AC type of clearance: micro-disconnection
Contact - coil distance		
• clearance		≥ 1,9 mm
• creepage		≥ 1,9 mm

General data

Operating / release time (typical values)		10 ms / 5 ms
Electrical life (number of cycles)		
• resistive AC1	360 cycles/hour	10^5 6 A, 250 V AC
		10^5 12 A, 125 V AC (UL)
• resistive DC1	360 cycles/hour	10^5 12 A, 28 V DC (UL)
Mechanical life	18 000 cycles/hour	10^7
Dimensions (L x W x H)		19,5 x 15,6 x 15,3 mm
Weight		9,5 g
Ambient temperature		
(non-condensation and/or icing)	• operating	-55...+85 °C
Cover protection category		IP 67 EN 60529
Environmental protection		RTIII EN 61810-7
Shock resistance		10 g
Vibration resistance		1,5 mm DA (constant amplitude) 10...55 Hz
Solder bath temperature		max. 260 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays. ❶ AgCdO contact material in electrical contacts is only for use in electrical and electronic equipment (EEE) in compliance with directive RoHS2 2011/65/EU in restricted categories of EEE covered by this directive. Relpol S.A. is not responsible for usage relays with AgCdO contact material in categories of EEE where it is prohibited by the directive RoHS2 2011/65/EU.

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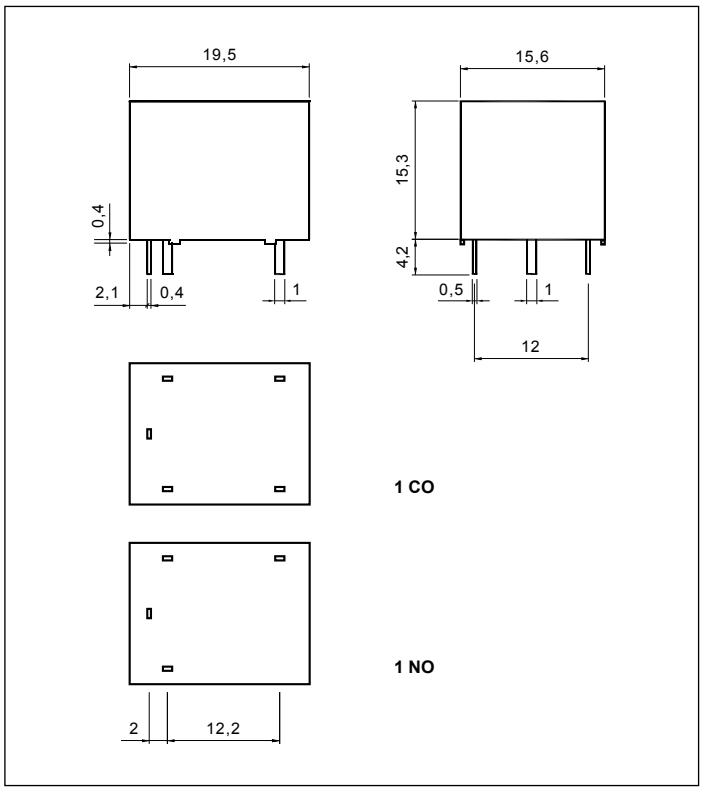
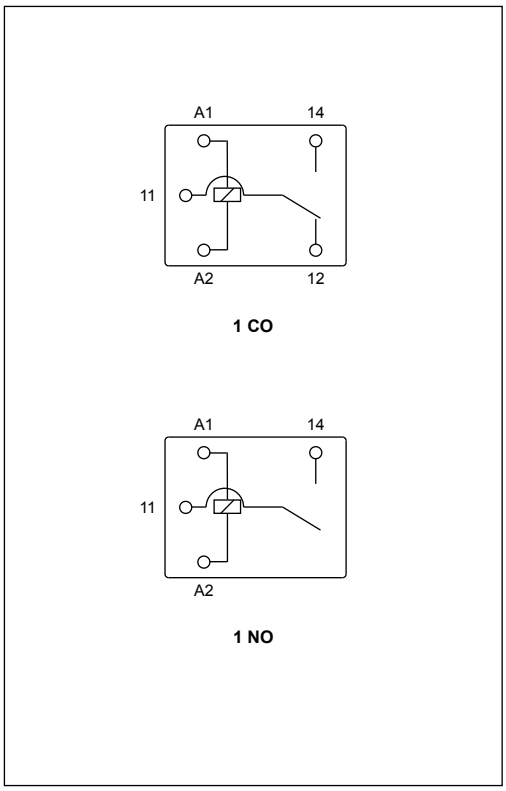
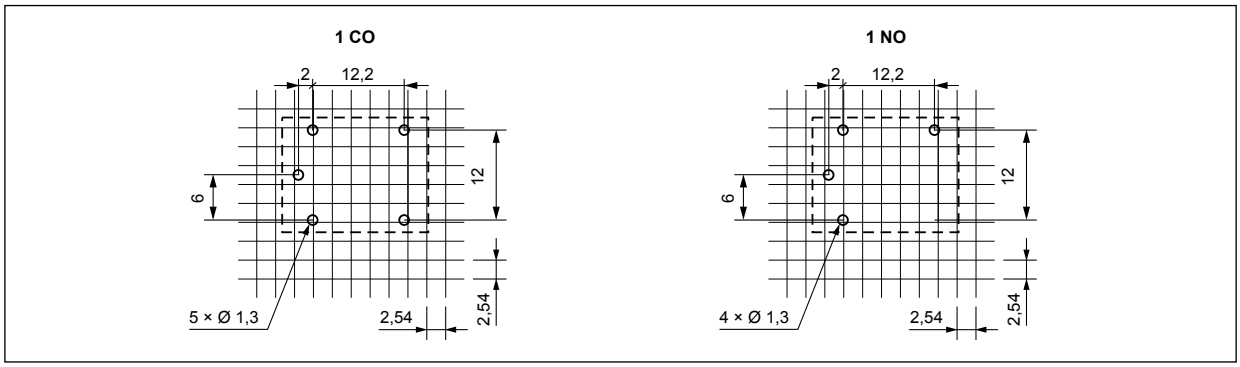
Dimensions



Connection diagrams (pin side view)



Pinout (solder side view)



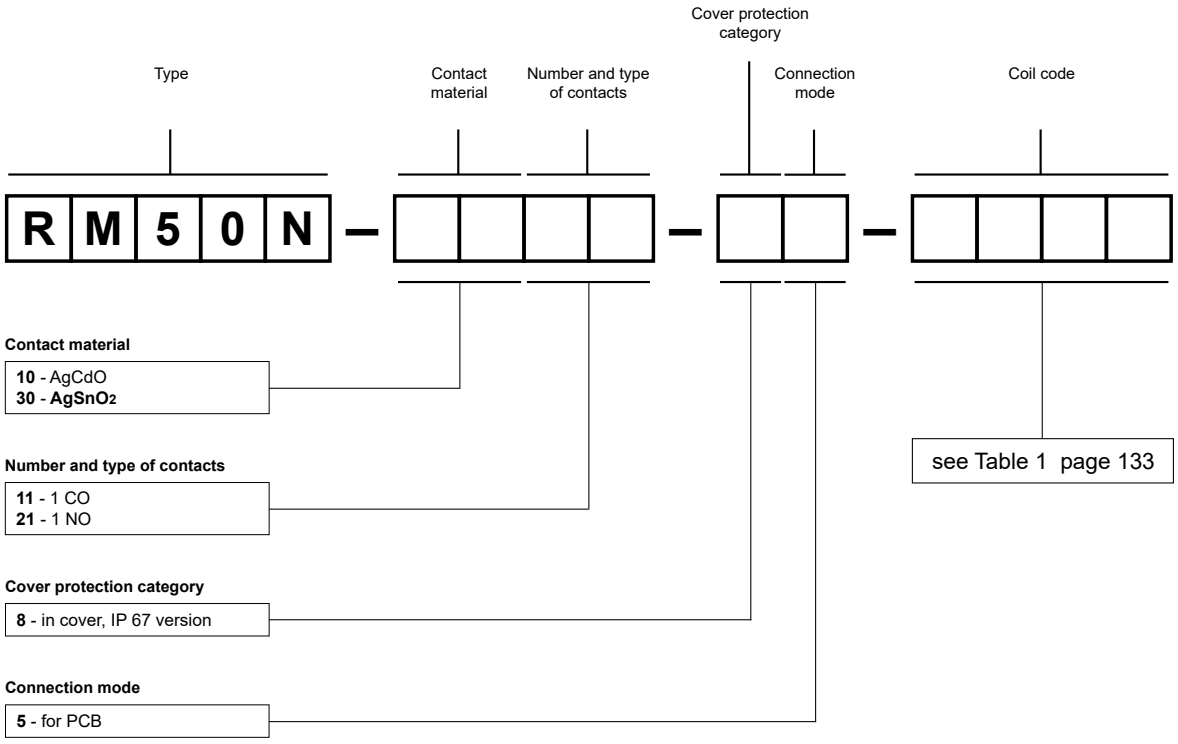
Mounting

Relays **RM50N** are designed for direct PCB mounting.

Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1005	5	70	± 10%	3,75	6,5
1009	9	225	± 10%	6,75	11,7
1012	12	400	± 10%	9,00	15,6
1024	24	1 600	± 10%	18,00	31,2
1048	48	6 400	± 10%	36,00	62,4

Ordering codes



Examples of ordering codes:

RM50N-3011-85-1012 relay **RM50N**, for PCB, one changeover contact, contact material $AgSnO_2$, coil voltage 12 V DC, in cover IP 67

RM50N-1021-85-1024 relay **RM50N**, for PCB, one normally open contact, contact material AgCdO, coil voltage 24 V DC, in cover IP 67

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- DC coils - of up to 48 V DC, insulation class F: 155 °C
- For PCB
- Small dimensions
- High switching capacity
- Applications: for household electrical appliance, automation systems, electronic equipment, instrument and meter, telecommunication devices, remote control facilities
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 CO, 1 NO	
Contact material		**$AgSnO_2$**	
Rated / max. switching voltage	AC	250 V / 277 V	
Min. switching voltage		5 V	
Rated load	AC1	1 CO: 10 A / 7 A (NO/NC) / 250 V AC	1 NO: 10 A / 250 V AC
		1 CO: 20 A / 20 A (NO/NC) / 125 V AC	1 NO: 20 A / 125 V AC
	DC1	1 CO: 10 A / 7 A (NO/NC) / 30 V DC	1 NO: 10 A / 30 V DC
Motor load	acc. to UL 508	1 CO: 1 HP / 1/2 HP	250 V AC, (NO/NC), single-phase motor
		1 NO: 1 HP	250 V AC, single-phase motor
	AC3 acc. to IEC 60947-4-1	1 CO: 0,75 kW / 0,375 kW	250 V AC, (NO/NC), single-phase motor
		1 NO: 0,75 kW	250 V AC, single-phase motor
Min. switching current		15 mA	
Rated current		10 A	
Max. breaking capacity	AC1	3 000 VA	
Contact resistance		≤ 100 mΩ	

Coil data

Rated voltage	DC	5, 9, 12, 24, 48 V
Must release voltage		DC: ≥ 0,05 U_n
Operating range of supply voltage		see Table 1
Rated power consumption	DC	0,36 W

Insulation according to EN 60664-1

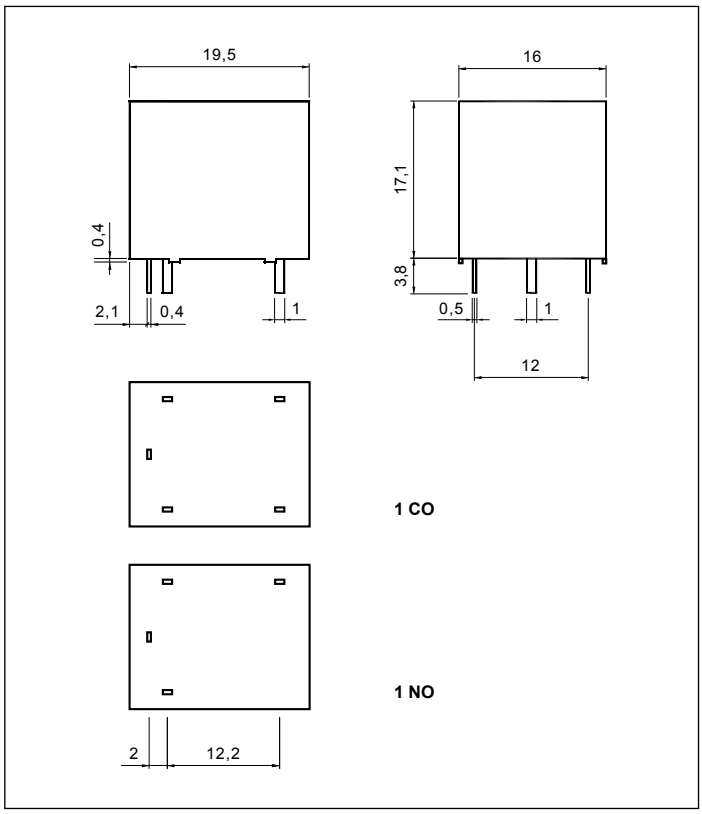
Rated surge voltage		4 000 V 1,2 / 50 µs
Insulation resistance		250 MΩ 500 V DC, 60 s
Dielectric strength		
• between coil and contacts		2 500 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection
Contact - coil distance		
• clearance		≥ 1,9 mm
• creepage		≥ 1,9 mm

General data

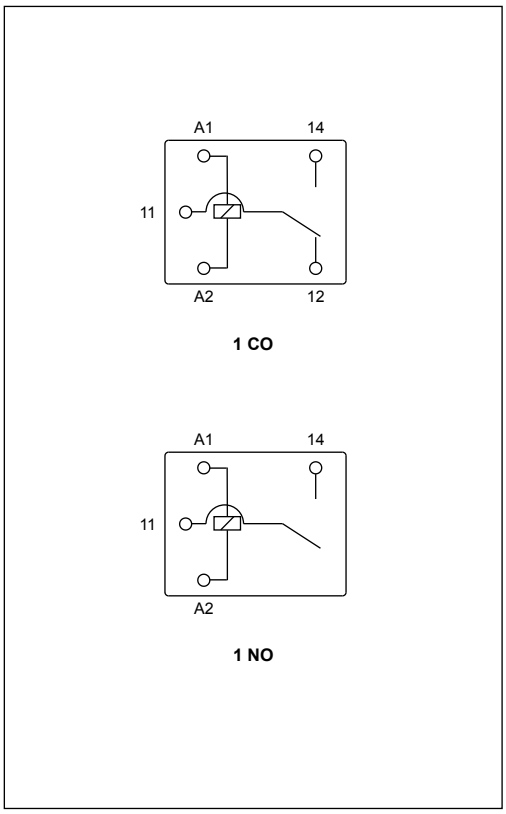
Operating / release time (typical values)		15 ms / 10 ms	
Electrical life (number of cycles)			
• resistive AC1	360 cycles/hour	10^5 1 CO: 10 A / 7 A (NO/NC), 250 V AC	1 NO: 10 A, 250 V AC
• resistive DC1	360 cycles/hour	10^5 1 CO: 10 A / 7 A (NO/NC), 30 V DC	1 NO: 10 A, 30 V DC
Mechanical life	18 000 cycles/hour	10^7	
Dimensions (L x W x H)		19,5 x 16 x 17,1 mm	
Weight		10 g	
Ambient temperature (non-condensation and/or icing)	• operating	-40...+85 °C	
Cover protection category		IP 67 EN 60529	
Environmental protection		RTIII EN 61810-7	
Shock resistance		10 g	
Vibration resistance		1,0 mm DA (constant amplitude) 10...55 Hz	
Solder bath temperature		max. 260 °C	
Soldering time		max. 5 s	

The data in bold type relate to the standard versions of the relays.

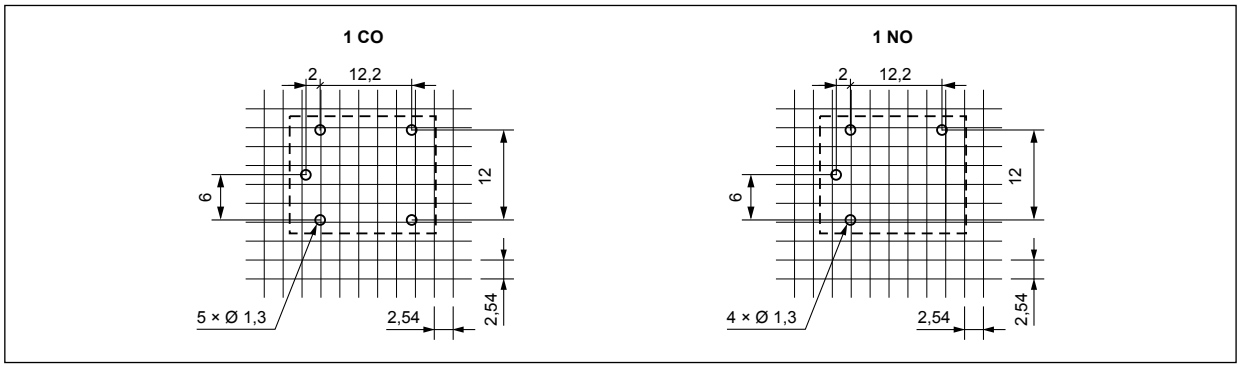
Dimensions



Connection diagrams (pin side view)



Pinout (solder side view)



Mounting

Relays **RM51** are designed for direct PCB mounting.

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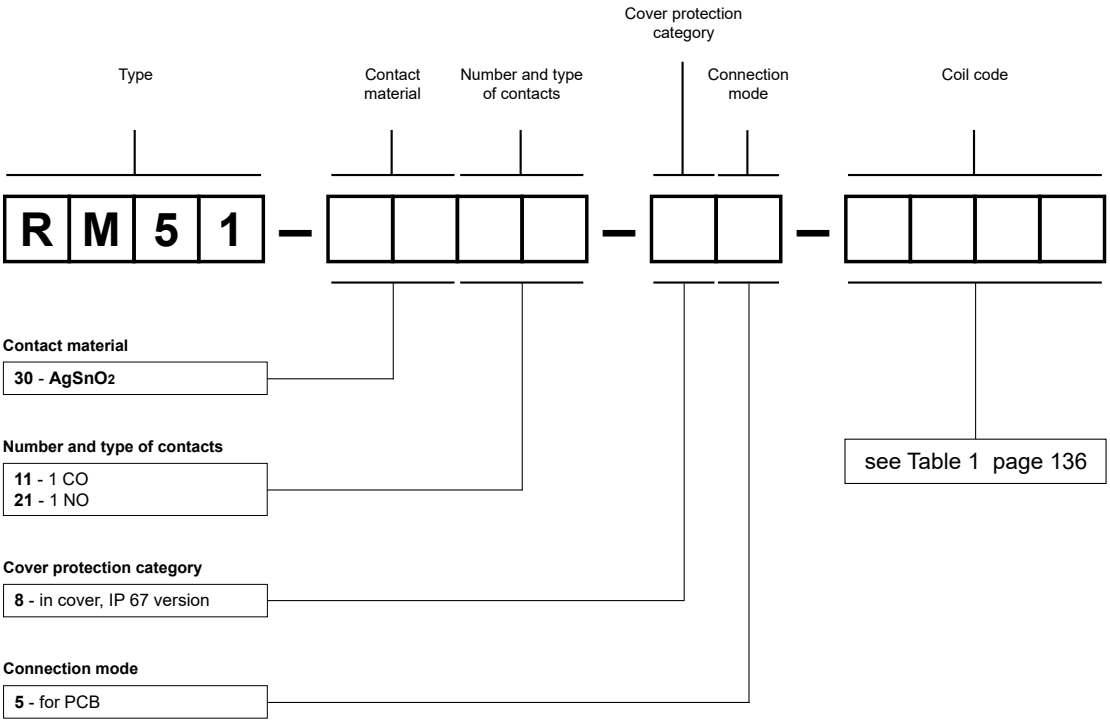
Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1005	5	69	± 10%	3,75	6,5
1009	9	225	± 10%	6,75	11,7
1012	12	400	± 10%	9,00	15,6
1024	24	1 600	± 10%	18,00	31,2
1048	48	6 400	± 10%	36,00	62,4

Ordering codes



Examples of ordering codes:

RM51-3011-85-1012 relay **RM51**, for PCB, one changeover contact, contact material $AgSnO_2$, coil voltage 12 V DC, in cover IP 67

RM51-3021-85-1048 relay **RM51**, for PCB, one normally open contact, contact material $AgSnO_2$, coil voltage 48 V DC, in cover IP 67

version (V)

version (H)

- Cover width only 5 mm
- Sealed for soldering and cleaning
- **Terminals arrangement: vertical version (V) and horizontal version (H)**
- Applications: for PLC's, industrial machinery, time relays, counters, temperature adjusters, measurement instruments, office equipment, etc.
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 CO, 1 NO	
Contact material		**$AgSnO_2$**, AgNi	$AgSnO_2$/Au hard gold plating ❶ AgNi/Au hard gold plating ❶
Max. switching voltage		400 V AC / 250 V DC	30 V AC / 36 V DC ❶
Min. switching voltage		10 V	5 V
Rated load (capacity)	AC1	6 A / 250 V AC	0,05 A / 30 V AC ❶
	AC15	3 A / 120 V; 1,5 A / 240 V (B300)	–
	DC1	6 A / 30 V DC; 0,15 A / 250 V DC	0,05 A / 36 V DC ❶
	DC13	0,22 A / 120 V; 0,1 A / 250 V (R300)	–
Motor load	acc. to UL 508	1/4 HP 240 V AC ❷	–
	AC3 acc. to IEC 60947-4-1	0,186 kW 240 V AC ❷	–
Min. switching current		100 mA	10 mA
Max. inrush current		10 A 20 ms	0,1 A 20 ms ❶
Rated current		6 A	0,05 A ❶
Max. breaking capacity	AC1	1 500 VA	1,2 VA ❶
Min. breaking capacity		1 W	0,05 W
Contact resistance		≤ 100 mΩ 100 mA, 24 V	≤ 30 mΩ 10 mA, 5 V
Max. operating frequency			
• at rated load	AC1	360 cycles/hour	
• no load		72 000 cycles/hour	

Coil data

Rated voltage	DC	5, 6, 9, 12, 24, 48, 60 V
Must release voltage		DC: ≥ 0,05 U_n
Range of supply voltage		see Table 1
Rated power consumption	DC	0,17 W 5 ... 24 V 0,21 W 48, 60 V

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		6 000 V 1,2 / 50 µs
Overvoltage category		III
Dielectric strength	• between coil and contacts	4 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 6 mm
	• creepage	≥ 8 mm

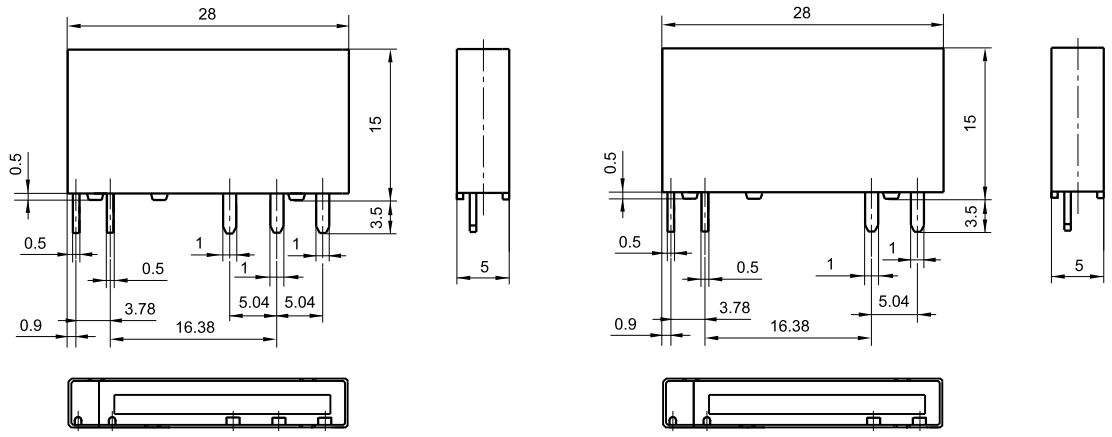
General data

Operating / release time (typical values)		8 ms / 4 ms
Electrical life (number of cycles)		
• resistive AC1		the NO and NC contact loaded (bilateral load): see Fig. 1 the NO contact loaded: > 3 x 10^4 6 A, 250 V AC
• inductive AC3		6 x 10^3 186 W (single-phase motor), AgNi
Mechanical life (cycles)		> 10^7
Dimensions (L x W x H)		28 x 5 x 15 mm
Weight		5 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+85 °C
Cover protection category		IP 67 EN 60529
Environmental protection		RTIII EN 61810-7
Relative humidity		5...85%
Shock resistance		5 g
Vibration resistance		5 g 10...55 Hz
Solder bath temperature		max. 260 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays. ❶ For gold-plated contacts - when the maximum values given have been exceeded, the gold layer is destroyed. Then, the advantages of gold-plating disappear and the values are as for $AgSnO_2$, AgNi contacts (see beside), and electrical life of these contacts may be shorter than of normal contacts. ❷ Contact 1 NO, single-phase motor.

Dimensions

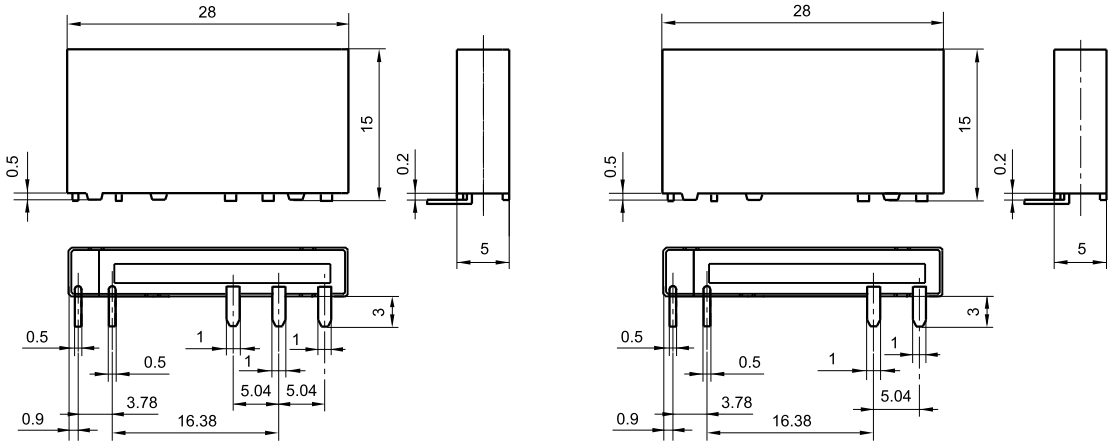
vertical version (V)



1 CO

1 NO

horizontal version (H)

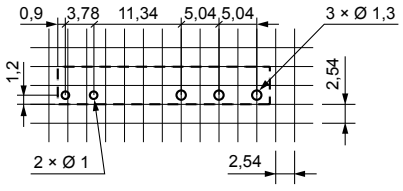


1 CO

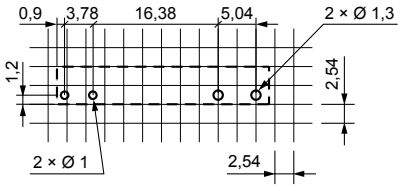
1 NO

Pinout (solder side view)

vertical version (V)

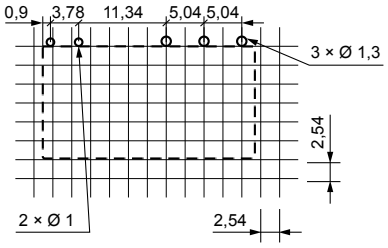


1 CO

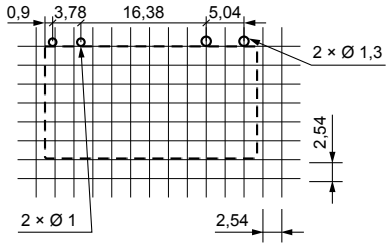


1 NO

horizontal version (H)

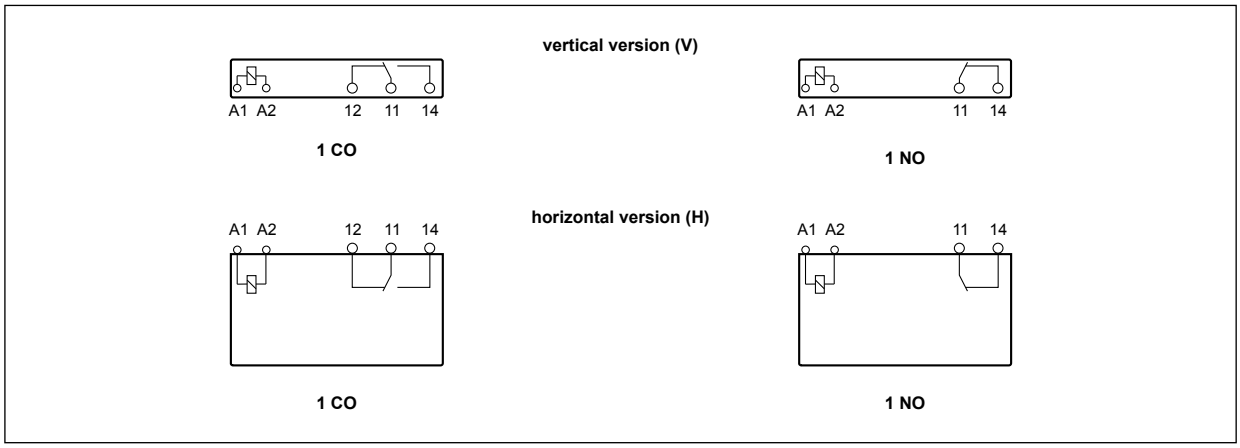


1 CO



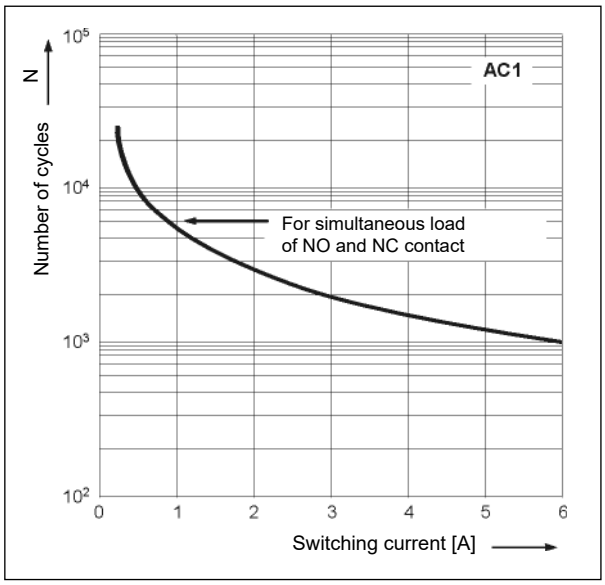
1 NO

Connection diagrams (pin side view)



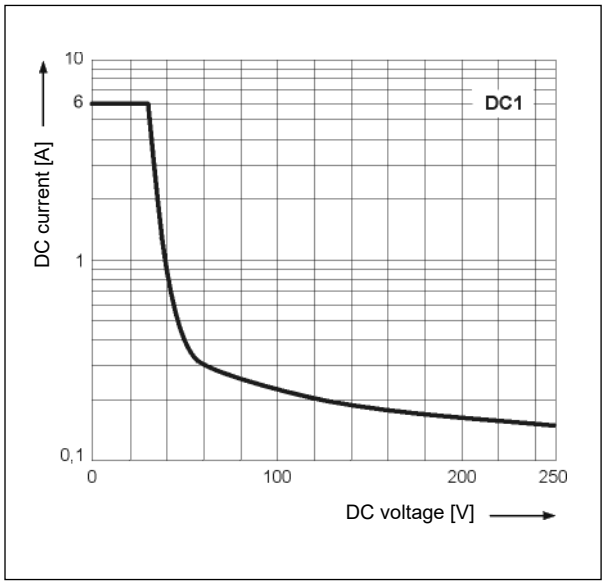
Electrical life at AC resistive current. Switching frequency: 360 cycles/hour

Fig. 1



Max. DC resistive load breaking capacity

Fig. 2



Mounting

Relays **RM699B horizontal version (H)** are designed for direct PCB mounting.
Relays **RM699B vertical version (V)** are designed for: • direct PCB mounting • plug-in sockets.

Sockets for RM699BV	Accessories		
	Description plates	Interconnection strips	Separators
Screw terminals sockets, 35 mm rail mount (EN 60715)			
PI6W ❸	PI6W-1246	ZG20 ❺	–
6W ❸	MP6-C ❹	JB20 ❺	6W-SEP
Spring terminals sockets, 35 mm rail mount (EN 60715)			
PI6WB ❸	PI6W-1246	ZG20 ❺	–
6WB ❸	MP6-C ❹	JB20 ❺	6W-SEP
Sockets for PCB			
GD699	MP6-C ❹	–	–

❸ Sockets with electronic PI6W., 6W.: version codes and selection of relays for sockets can be found in the data sheets of interface relays PIR6W., SIR6W. - see pages 321, 325, 329, 333, 337. ❹ Cards MP6-C: for automatic printing, containing 64 description plates. ❺ Colours of strips: ZG20-1, JB20-1 red; ZG20-2, JB20-2 black; ZG20-3, JB20-3 blue.

Export Sales Department: phone +48 68 47 90 832, 951, export@relpol.com.pl

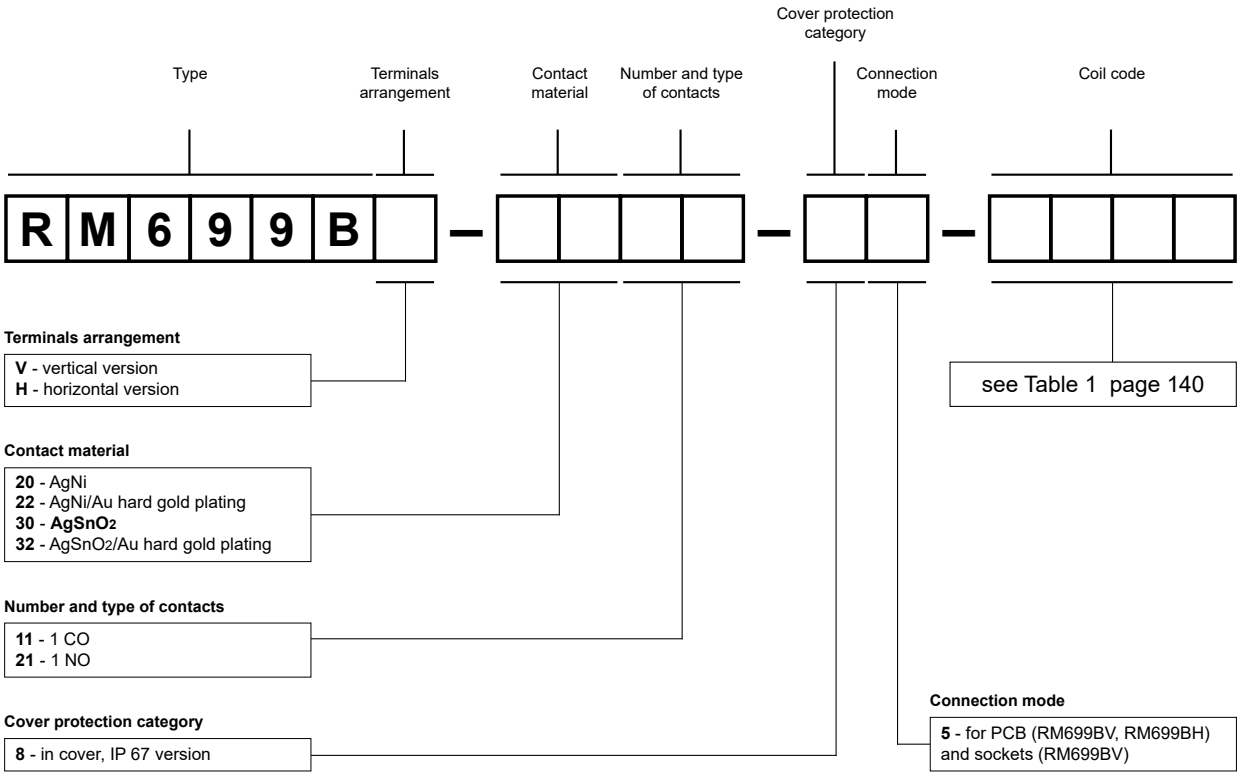
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil range V DC ❻	
				min. (at 20 °C)	max. (at 20 °C)
1005	5	147	± 10%	3,75	7,5
1006	6	212	± 10%	4,5	9,0
1009	9	476	± 10%	6,75	13,0
1012	12	848	± 10%	9,0	18,0
1024	24	3 390	± 15%	18,0	36,0
1048	48 ❼	10 600	± 15%	36,0	72,0
1060	60 ❼	16 600	± 15%	45,0	90,0

❻ The maximum value of the supply voltage is the value that may occur on the coil of the relay for a short while. Permanent supply of RM699B relay with the maximum voltage may damage the relay coil. ❼ For relays with the rated voltage of coils 48 V DC and 60 V DC, it is necessary to stabilize the supply voltage at the level of the rated voltage in order to protect the coils of relays from damage.

Ordering codes



Examples of ordering code:

RM699BV-3011-85-1012 relay **RM699B**, vertical version, for PCB and sockets, one changeover contact, contact material $AgSnO_2$, coil voltage 12 V DC, in cover IP 67

RM699BH-2021-85-1005 relay **RM699B**, horizontal version, for PCB, one normally open contact, contact material AgNi, coil voltage 5 V DC, in cover IP 67

RM84 | RM84-...-01 (AC) ❶ | RM84-...-01 (DC) ❶



- CTI 250 • Reinforced insulation
- For PCB and plug-in sockets
- AC and DC coils, insulation class F: 155 °C
- Available special versions: in transparent cover ❶; with the increased dielectric strength of the contact clearance ❷ • Compliance with standards EN 60335-1, EN 45545-2 • Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		2 CO, 2 NO ❷
Contact material		**AgNi**, AgNi/Au hard gold plating, $AgSnO_2$
Rated / max. switching voltage	AC	250 V / 400 V
Min. switching voltage		5 V AgNi, 5 V AgNi/Au hard gold plating, 10 V $AgSnO_2$
Rated load (capacity)	AC1	8 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	8 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/3 HP 240 V AC, 3,6 FLA, single-phase motor ❸
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		5 mA AgNi, 2 mA AgNi/Au hard gold plating, 10 mA $AgSnO_2$
Max. inrush current		15 A $AgSnO_2$
Rated current		8 A
Max. breaking capacity	AC1	2 000 VA
Min. breaking capacity		0,3 W AgNi, 0,05 W AgNi/Au hard gold plating, 1 W $AgSnO_2$
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	600 cycles/hour
	• no load	72 000 cycles/hour

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 48, 60, 110, 115, 120, 220, **230**, 240 V
	DC	3, 5, 6, 9, **12**, 18, **24**, 36, 48, 60, 110 V
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2 and Fig. 4, 5
Rated power consumption	AC	0,75 VA
	DC	0,4 ... 0,48 W

Insulation according to EN 60664-1

Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Flammability class		V-0 for standard cover (no transparent), UL 94
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
		2 000 V AC contacts 2 NO, type of clearance: full-disconnection ❷
	• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance		clearance: ≥ 10 mm creepage: ≥ 10 mm

General data

Operating / release time (typical values)		7 ms / 3 ms
Electrical life	• resistive AC1	$> 10^5$ 8 A, 250 V AC
(number of cycles)	• cosφ	see Fig. 2
	• DC L/R=40 ms	$> 10^5$ 0,15 A, 220 V DC
Mechanical life (cycles)		$> 3 \times 10^7$
Dimensions (L x W x H) / Weight		29 x 12,7 x 15,7 mm / 14 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	AC: -40...+70 °C DC: -40...+85 °C -20...+70 °C ❶
Cover protection category		IP 40 ❶ or **IP 67** EN 60529
Environmental protection		RTII ❶ or **RTIII** EN 61810-7
Shock resistance		20 g
Vibration resistance	(NO/NC)	10 g / 5 g 10...150 Hz
Solder bath temperature		max. 270 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays. ❶ Special versions - relays in transparent cover (certifications cULus, EAC), only available with IP 40 and RTII, operating temperature -20...+70 °C. See "Ordering codes". ❷ Special versions - relays with two normally open contacts 2 NO, with increased contact gap - dielectric strength 2000 V AC, only available with DC coils. See "Ordering codes". ❸ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

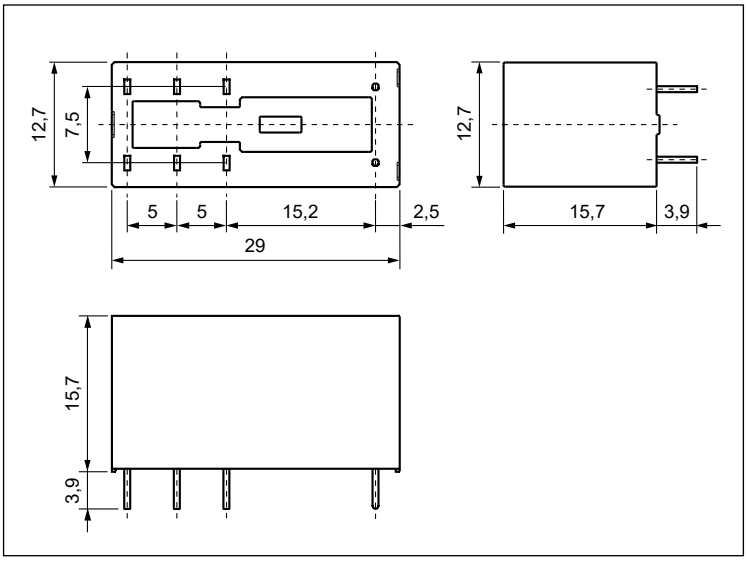
Mounting, sockets and accessories for relays

Relays **RM84** ❹ are designed for: • direct PCB mounting • plug-in sockets.

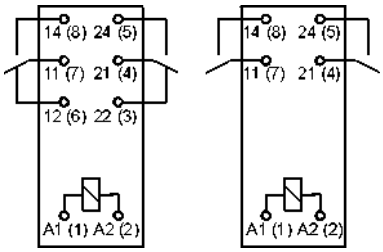
Sockets for RM84	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZT80	GZT80-0040	GZM80-0041	GZT80-0035	M... ❻, ZGGZ80 ❼
GZM80	GZT80-0040	GZM80-0041	GZT80-0035	M... ❻, ZGGZ80 ❼
GZS80	GZS-0040	GZM80-0041	TR	M... ❻, ZGGZ80 ❼
GZF80	–	GZM80-0041	–	–
Push-in terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZP80 ❺	GZP80-0400, GZT80-0040	GZM80-0041	MP15	M... ❻, ZGZP80-8, ZGZP80-2, ZGZP-2 ❼
Sockets for PCB				
PW80	–	MH16-2	–	–
EC 50	–	MP16-2 ❽, MH16-2	–	–
GD50	–	MP16-2 ❽, MH16-2, GD-0016	–	–

❹ For relays in transparent cover: the distance at least 5 mm between the relays mounted side by side. ❺ Sockets GZP80: wire connection - see page 383. ❻ Signalling / protecting modules type M... - see page 399. ❼ Interconnection strips ZGGZ80, ZGZP... - see pages 400, 402. ❽ Plastic clips MP16-2.

Dimensions



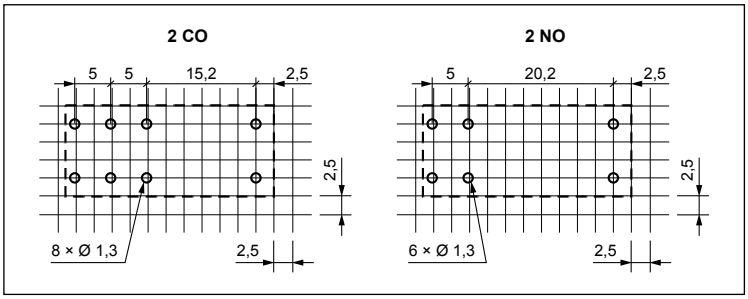
Connection diagrams (pin side view)



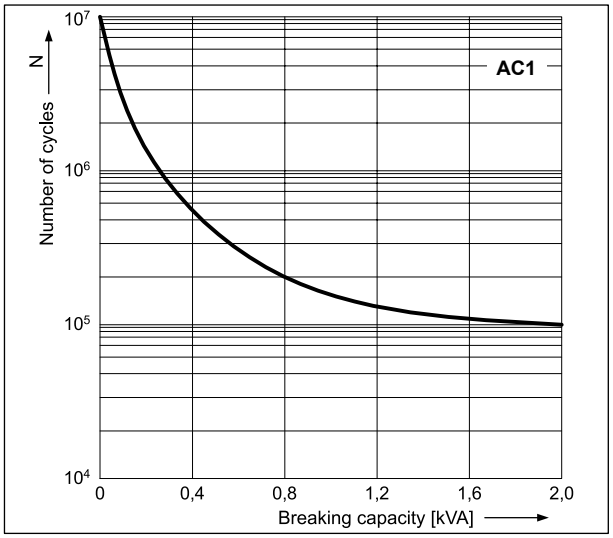
2 CO **2 NO**

Terminal (pin)	A1(1); A2(2)	22(3); 21(4); 24(5); 12(6); 11(7); 14(8)
[mm]	Ø 0,6	0,5 x 0,9
Drilling hole: • for relays • for sockets	Ø 1,3 + 0,1 mm Ø 1,5 + 0,1 mm	

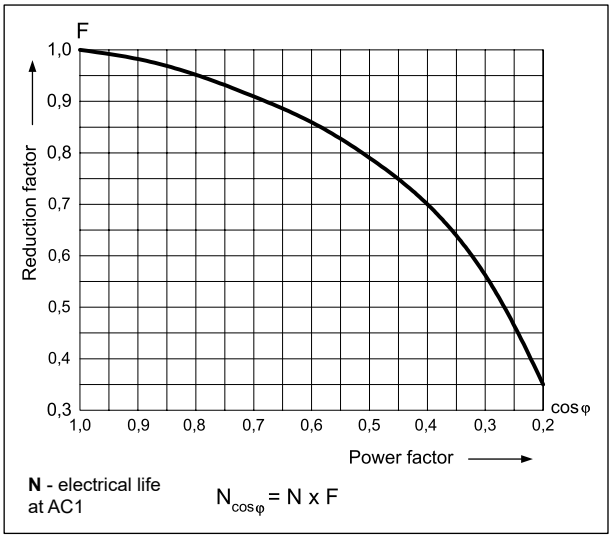
Pinout (solder side view)



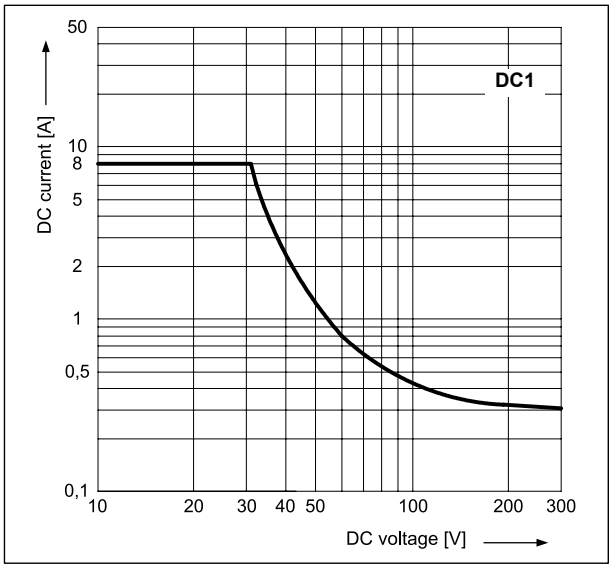
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



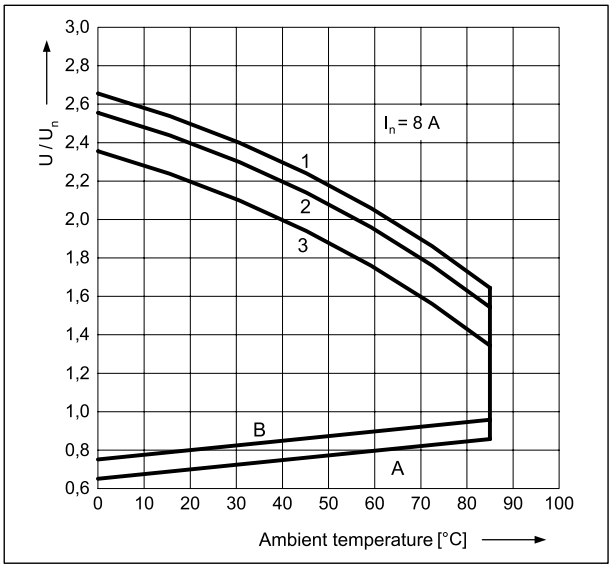
Electrical life reduction factor at AC inductive load Fig. 2



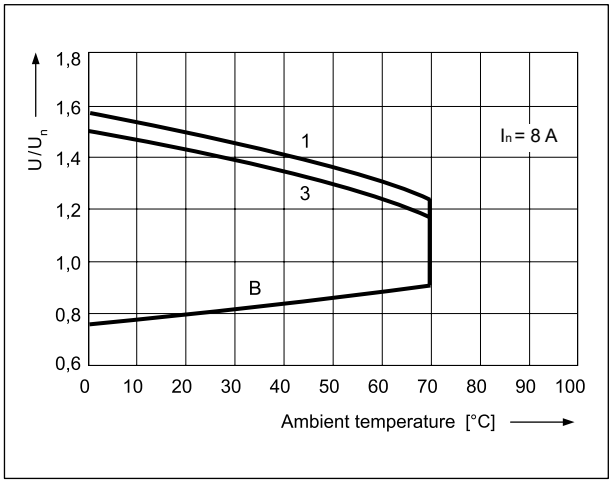
Max. DC resistive load breaking capacity Fig. 3



Coil operating range - DC Fig. 4



Coil operating range - AC 50 Hz Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

Coil data - DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1003	3	22	± 10%	2,1	7,6
1005	5	60	± 10%	3,5	12,7
1006	6	90	± 10%	4,2	15,3
1009	9	200	± 10%	6,3	22,9
1012	**12**	**360**	**± 10%**	**8,4**	**30,6**
1018	18	710	± 10%	12,6	45,9
1024	**24**	**1 440**	**± 10%**	**16,8**	**61,2**
1036	36	3 140	± 10%	25,2	91,8
1048	48	5 700	± 10%	33,6	122,4
1060	60	7 500	± 10%	42,0	153,0
1110	110	25 200	± 10%	77,0	280,0

The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version — Table 2

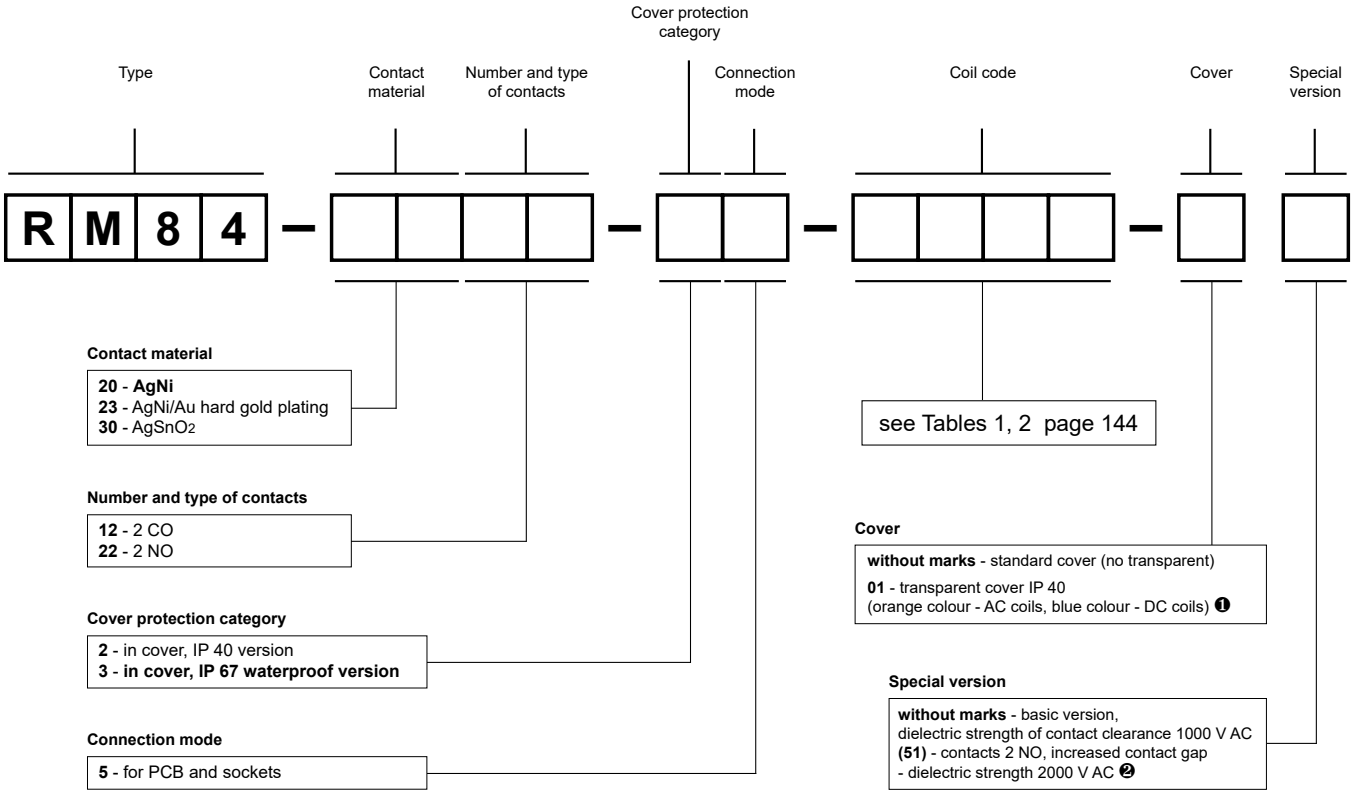
Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (at 20 °C)	max. (at 20 °C)
5012	12	100	± 10%	9,6	13,2
5024	**24**	**400**	**± 10%**	**19,2**	**28,8**
5048	48	1 550	± 10%	38,4	57,6
5060	60	2 600	± 10%	48,0	72,0
5110	110	8 900	± 10%	88,0	132,0
5115	115	9 600	± 10%	92,0	138,0
5120	120	10 200	± 10%	96,0	144,0
5220	220	35 500	± 10%	176,0	264,0
5230	**230**	**38 500**	**± 10%**	**184,0**	**276,0**
5240	240	42 500	± 15%	192,0	288,0

The data in bold type relate to the standard versions of the relays.

Interface relays PI84 (PI85)

set: relay RM84 (RM85) + socket GZT80 (GZM80, GZP80)

Ordering codes



❶ **01**: special version - relay in transparent cover (certifications cULus, EAC), only available with IP 40 and RTII, operating temperature -20...+70 °C
❷ **(51)**: special version - relay with two normally open contacts 2 NO, with increased contact gap - dielectric strength 2000 V AC, only available with DC coil

Examples of ordering code:

RM84-3012-25-5024 relay **RM84**, for PCB and sockets, two changeover contacts, contact material $AgSnO_2$, coil voltage 24 V AC 50/60 Hz, in standard cover (no transparent) IP 40

RM84-2012-25-1012-01 relay **RM84**, for PCB and sockets, two changeover contacts, contact material AgNi, coil voltage 12 V DC, in transparent cover (blue colour) IP 40

RM84-2322-35-1024 (51) relay **RM84**, special version with increased contact gap, for PCB and sockets, two normally open contacts, contact material AgNi/Au hard gold plating, coil voltage 24 V DC, in standard cover (no transparent) IP 67

RM84

Transparent cover IP 40, certifications cULus, EAC (orange colour - AC coils, blue colour - DC coils)

NEW

RM85 **RM85-...-01 (AC) ❶** **RM85-...-01 (DC) ❶**



- CTI 250 • Reinforced insulation
- For PCB and plug-in sockets
- AC and DC coils, insulation class F: 155 °C
- Available special versions: in transparent cover ❶; with the increased dielectric strength of the contact clearance ❷ • Compliance with standards EN 60335-1, EN 45545-2 • Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts			1 CO, 1 NO ❷
Contact material			**AgNi**, AgNi/Au hard gold plating, $AgSnO_2$
Rated / max. switching voltage		AC	250 V / 400 V
Min. switching voltage			5 V AgNi, 5 V AgNi/Au hard gold plating, 10 V $AgSnO_2$
Rated load (capacity)		AC1	16 A / 250 V AC
		AC15	3 A / 120 V 1,5 A / 240 V (B300)
		DC1	16 A / 24 V DC (see Fig. 3)
		DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load		acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❸
		AC3 acc. to IEC 60947-4-1	0,5 kW 240 V AC, single-phase motor
Min. switching current			5 mA AgNi, 2 mA AgNi/Au hard gold plating, 10 mA $AgSnO_2$
Max. inrush current			30 A $AgSnO_2$
Rated current			16 A
Max. breaking capacity		AC1	4 000 VA
Min. breaking capacity			0,3 W AgNi, 0,05 W AgNi/Au hard gold plating, 1 W $AgSnO_2$
Contact resistance			≤ 100 mΩ
Max. operating frequency	• at rated load AC1		600 cycles/hour
	• no load		72 000 cycles/hour

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 48, 60, 110, 115, 120, 220, **230**, 240 V
	DC	3, 5, 6, 9, **12**, 18, **24**, 36, 48, 60, 110 V
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2 and Fig. 4, 5
Rated power consumption	AC	0,75 VA
	DC	0,4 ... 0,48 W

Insulation according to EN 60664-1

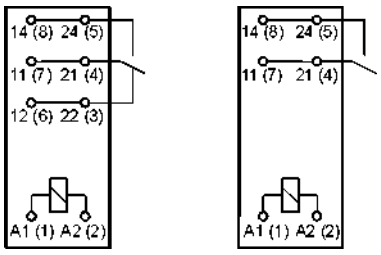
Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Flammability class		V-0 for standard cover (no transparent), UL 94
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
		2 000 V AC contact 1 NO, type of clearance: full-disconnection ❷
Contact - coil distance		clearance: ≥ 10 mm creepage: ≥ 10 mm

General data

Operating / release time (typical values)		7 ms / 3 ms
Electrical life (number of cycles)	• resistive AC1	> 0,7 x 10^5 16 A, 250 V AC
		> 10^4 20 A, 250 V AC, 85 °C (RM85-3021-25-1...)
	• motor load acc. to UL 508	10^5 5 FLA / 7 LRA, 240 V AC, 65 °C (RM85-3021-.5-1...)
		10^5 5 FLA / 12 LRA, 24 V DC, 65 °C (RM85-3021-.5-1...)
		3 x 10^4 5 FLA / 30 LRA, 240 V AC, 70 °C (RM85-2021-.5-1...)
	• cosφ	see Fig. 2
	• DC L/R=40 ms	> 10^5 0,15 A, 220 V DC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H) / Weight		29 x 12,7 x 15,7 mm / 14 g
Ambient temperature (non-condensation and/or icing)	• storage	-40...+85 °C
	• operating	AC: -40...+70 °C DC: -40...+85 °C -20...+70 °C ❶
Cover protection category		IP 40 ❶ or **IP 67** EN 60529
Environmental protection		RTII ❶ or **RTIII** EN 61810-7
Shock / vibration resistance		30 g / 10 g 10...150 Hz
Solder bath temperature / Soldering time		max. 270 °C / max. 5 s

The data in bold type relate to the standard versions of the relays. ❶ Special versions - relays in transparent cover (certifications cULus, EAC), only available with IP 40 and RTII, operating temperature -20...+70 °C. See "Ordering codes". ❷ Special versions - relays with one normally open contact 1 NO, with increased contact gap - dielectric strength 2000 V AC, only available with DC coils. See "Ordering codes". ❸ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Connection diagrams (pin side view)

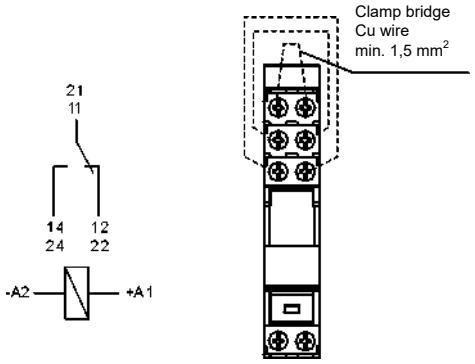


1 CO 1 NO

Terminal (pin)	A1(1); A2(2)	22(3); 21(4); 24(5); 12(6); 11(7); 14(8)
[mm]	Ø 0,6	0,5 x 0,9
Drilling hole: • for relays • for sockets	 Ø 1,3 + 0,1 mm Ø 1,5 + 0,1 mm	

RM85 terminals are doubled for each contact.
Both terminals are to be used while connecting to load.

Connection of GZ.80 sockets



Note: loads above 12 A (GZT80, GZM80, GZP80) or 10 A (GZS80, GZF80) require bridging pairs of terminals: 11 with 21, 12 with 22, 14 with 24. Loads up to 12 A or 10 A do not require bridging of common terminals (such bridges may be fixed, however).

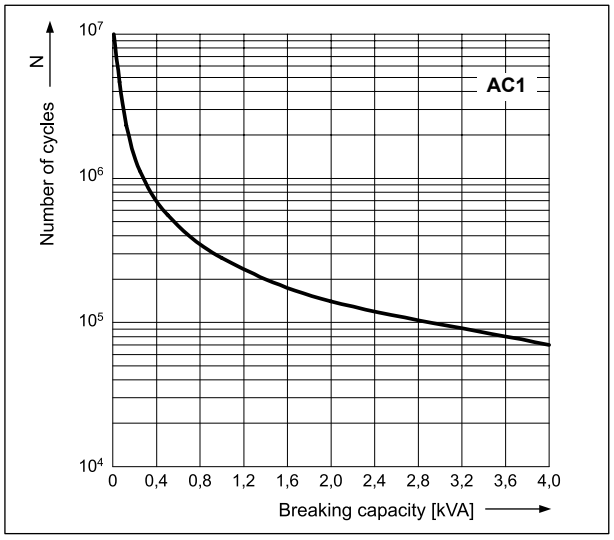
Mounting, sockets and accessories for relays

Relays **RM85** ❹ are designed for: • direct PCB mounting • plug-in sockets.

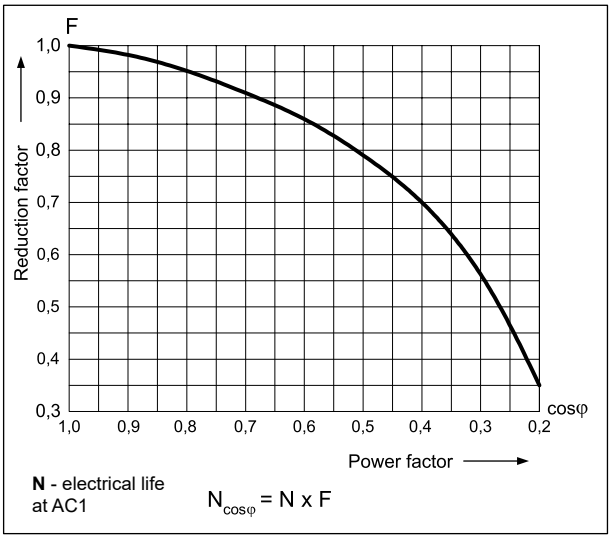
Sockets for RM85	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZT80 ❺	GZT80-0040	GZM80-0041	GZT80-0035	M... ❼, ZGGZ80 ❽
GZM80 ❺	GZT80-0040	GZM80-0041	GZT80-0035	M... ❼, ZGGZ80 ❽
GZS80 ❺	GZS-0040	GZM80-0041	TR	M... ❼, ZGGZ80 ❽
GZF80 ❺	–	GZM80-0041	–	–
Push-in terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZP80 ❺ ❻	GZP80-0400, GZT80-0040	GZM80-0041	MP15	M... ❼, ZGZP80-8, ZGZP80-2, ZGZP-2 ❽
Sockets for PCB				
PW80	–	MH16-2	–	–
EC 50	–	MP16-2 ❽, MH16-2	–	–
GD50	–	MP16-2 ❾, MH16-2, GD-0016	–	–

❹ For relays in transparent cover: the distance at least 5 mm between the relays mounted side by side. ❺ Sockets GZ.80: load connection - see page 147. ❻ Sockets GZP80: wire connection - see page 383. ❼ Signalling / protecting modules type M... - see page 399. ❽ Interconnection strips ZGGZ80, ZGZP.. - see pages 400, 402. ❾ Plastic clips MP16-2.

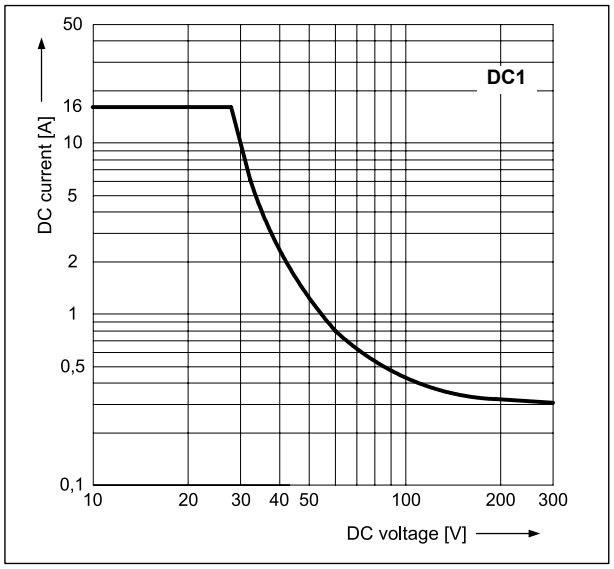
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



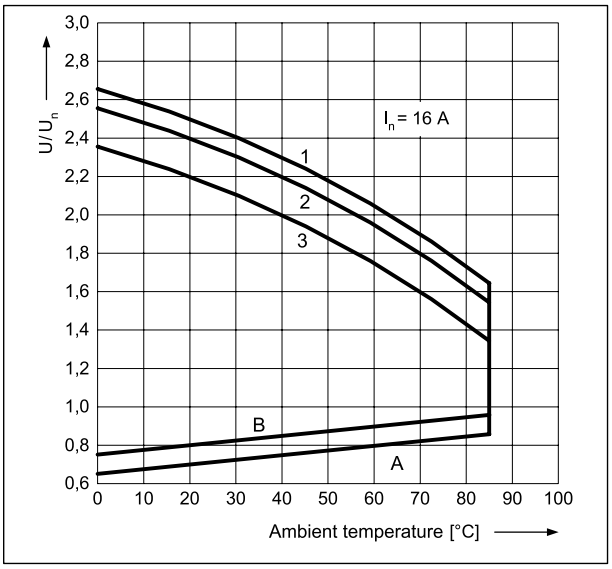
Electrical life reduction factor at AC inductive load Fig. 2



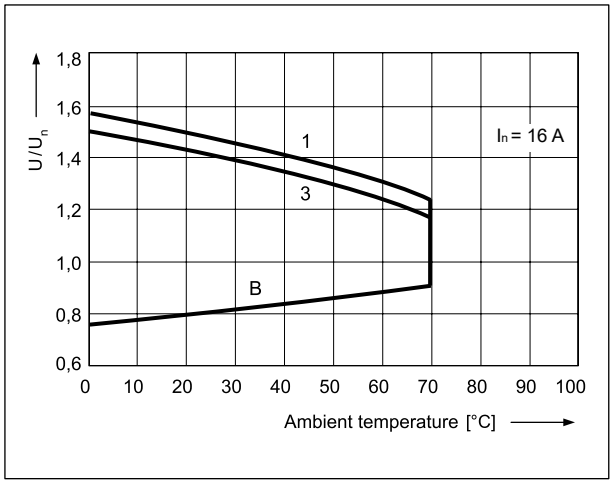
Max. DC resistive load breaking capacity Fig. 3



Coil operating range - DC Fig. 4



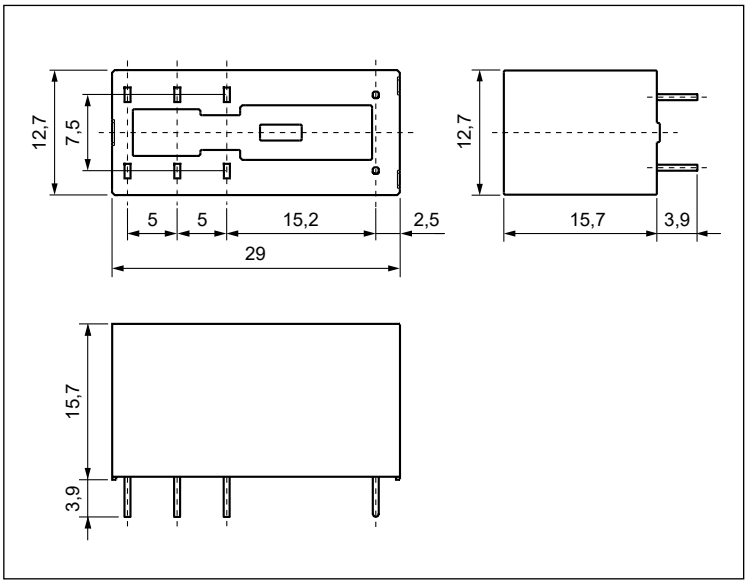
Coil operating range - AC 50 Hz Fig. 5



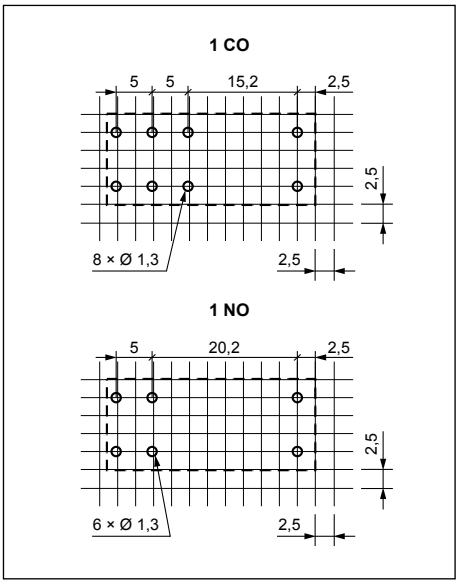
Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

Dimensions



Pinout (solder side view)



Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1003	3	22	± 10%	2,1	7,6
1005	5	60	± 10%	3,5	12,7
1006	6	90	± 10%	4,2	15,3
1009	9	200	± 10%	6,3	22,9
1012	**12**	**360**	**± 10%**	**8,4**	**30,6**
1018	18	710	± 10%	12,6	45,9
1024	**24**	**1 440**	**± 10%**	**16,8**	**61,2**
1036	36	3 140	± 10%	25,2	91,8
1048	48	5 700	± 10%	33,6	122,4
1060	60	7 500	± 10%	42,0	153,0
1110	110	25 200	± 10%	77,0	280,0

The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version

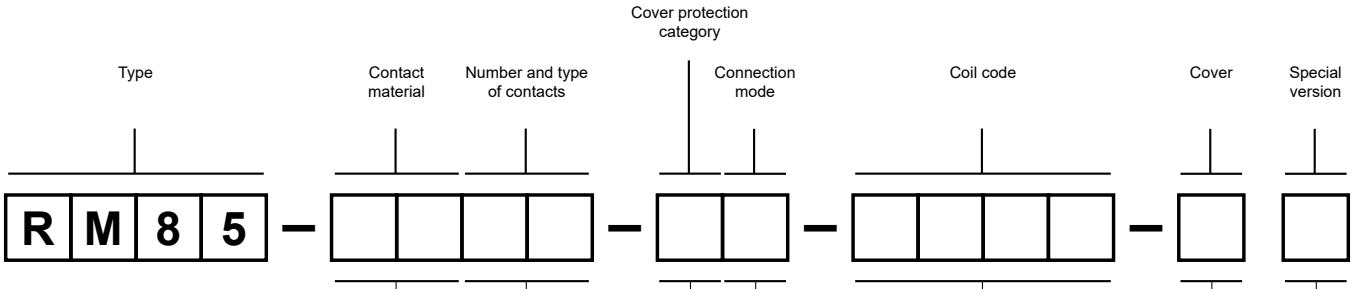
Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (at 20 °C)	max. (at 20 °C)
5012	12	100	± 10%	9,6	13,2
5024	**24**	**400**	**± 10%**	**19,2**	**28,8**
5048	48	1 550	± 10%	38,4	57,6
5060	60	2 600	± 10%	48,0	72,0
5110	110	8 900	± 10%	88,0	132,0
5115	115	9 600	± 10%	92,0	138,0
5120	120	10 200	± 10%	96,0	144,0
5220	220	35 500	± 10%	176,0	264,0
5230	**230**	**38 500**	**± 10%**	**184,0**	**276,0**
5240	240	42 500	± 15%	192,0	288,0

The data in bold type relate to the standard versions of the relays.

Export Sales Department: phone +48 68 47 90 832, 951, export@relpol.com.pl

Ordering codes



Contact material

20 - **AgNi**
23 - AgNi/Au hard gold plating
30 - $AgSnO_2$

Number and type of contacts

11 - 1 CO
21 - 1 NO

Cover protection category

2 - in cover, IP 40 version
3 - **in cover, IP 67 waterproof version**

Connection mode

5 - for PCB and sockets

see Tables 1, 2 page 149

Cover

without marks - standard cover (no transparent)
01 - transparent cover IP 40
(orange colour - AC coils, blue colour - DC coils) ❶

Special version

without marks - basic version,
dielectric strength of contact clearance 1000 V AC
(51) - contact 1 NO, increased contact gap
- dielectric strength 2000 V AC ❷

❶ **01**: special version - relay in transparent cover (certifications cULus, EAC), only available with IP 40 and RTII, operating temperature -20...+70 °C
❷ **(51)**: special version - relay with one normally open contact 1 NO, with increased contact gap - dielectric strength 2000 V AC, only available with DC coil

Examples of ordering code:

RM85-3011-25-5024 relay **RM85**, for PCB and sockets, one changeover contact, contact material $AgSnO_2$, coil voltage 24 V AC 50/60 Hz, in standard cover (no transparent) IP 40

RM85-2011-25-1012-01 relay **RM85**, for PCB and sockets, one changeover contact, contact material AgNi, coil voltage 12 V DC, in transparent cover (blue colour) IP 40

RM85-2321-35-1024 (51) relay **RM85**, special version with increased contact gap, for PCB and sockets, one normally open contact, contact material AgNi/Au hard gold plating, coil voltage 24 V DC, in standard cover (no transparent) IP 67

RM85

Transparent cover IP 40, certifications cULus, EAC (orange colour - AC coils, blue colour - DC coils)

NEW

- **Switching voltage 480 V AC**
- Contact gap: 0,6 mm
- CTI 250
- Reinforced insulation
- For PCB
- DC coils, insulation class F: 155 °C
- Compliance with standard EN 60335-1
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 NO	
Contact material		**$AgSnO_2$**	
Rated / max. switching voltage	AC	250 V / 480 V	
Min. switching voltage		10 V	
Rated load (capacity)	AC1	5 A / 480 V AC	16 A / 250 V AC
	AC15	3 A / 120 V	1,5 A / 240 V (B300)
	DC1	16 A / 24 V DC	
	DC13	0,22 A / 120 V	0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP	240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,5 kW	240 V AC, single-phase motor
Min. switching current		10 mA	
Max. inrush current		30 A	
Rated current		16 A / 250 V AC	
Max. breaking capacity	AC1	2 400 VA	
Min. breaking capacity		1 W	
Contact resistance		≤ 100 mΩ	100 mA, 24 V
Max. operating frequency			
• at rated load	AC1	360 cycles/hour	
• no load		3 600 cycles/hour	

Coil data

Rated voltage	DC	3, 5, 6, 9, **12**, 18, **24**, 36, 48, 60, 110 V
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		see Table 1
Rated power consumption	DC	0,4 ... 0,48 W

Insulation according to EN 60664-1

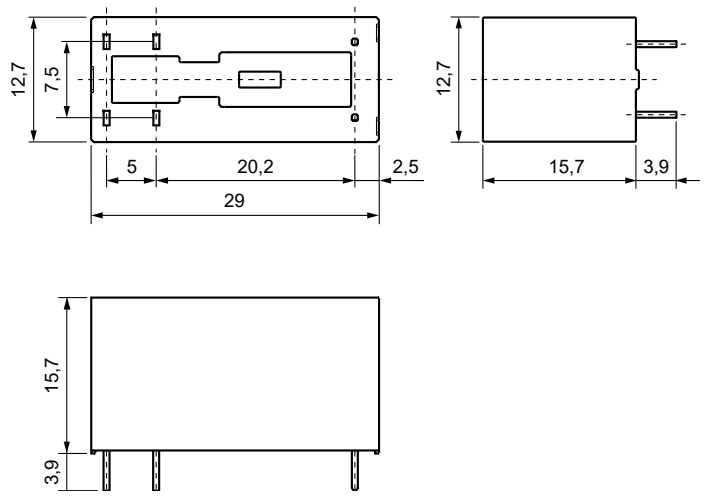
Insulation rated voltage		480 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength		
• between coil and contacts		5 000 V AC type of insulation: reinforced
• contact clearance		2 000 V AC type of clearance: full-disconnection
Contact - coil distance		
• clearance		≥ 10 mm
• creepage		≥ 10 mm

General data

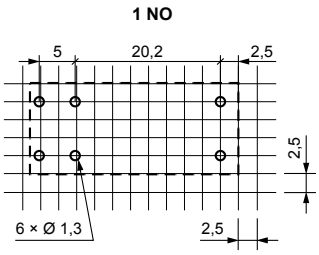
Operating / release time (typical values)		7 ms / 3 ms
Electrical life (number of cycles)		
• resistive AC1		> 4 x 10^4 5 A, 480 V AC
• motor load acc. to UL 508		10^5 5 FLA / 7 LRA, 240 V AC, 65 °C
		10^5 5 FLA / 12 LRA, 24 V DC, 65 °C
Mechanical life	3 600 cycles/hour	> 3 x 10^7
Electromagnetic load according to UL 508		Heavy Pilot Duty 480 V AC, 15 A make / 1,5 A break
Dimensions (L x W x H)		29 x 12,7 x 15,7 mm
Weight		14 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+85 °C
Cover protection category		IP 40 or **IP 67** EN 60529
Environmental protection		RTIII EN 61810-7
Shock resistance		30 g
Vibration resistance		10 g 10...150 Hz
Solder bath temperature		max. 270 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays. ❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Dimensions



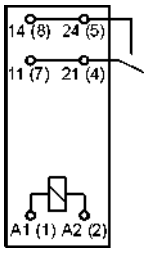
Pinout (solder side view)



Mounting

Relays **RM85 for switching higher voltages** are designed for direct PCB mounting.

Connection diagram (pin side view)



1 NO

Terminal (pin)	A1(1); A2(2)	21(4); 24(5); 11(7); 14(8)
[mm]	Ø 0,6	0,5 x 0,9
Drilling hole: • for relays	Ø 1,3 + 0,1 mm	

RM85 for switching higher voltages terminals are doubled for each contact. Both terminals are to be used while connecting to load.

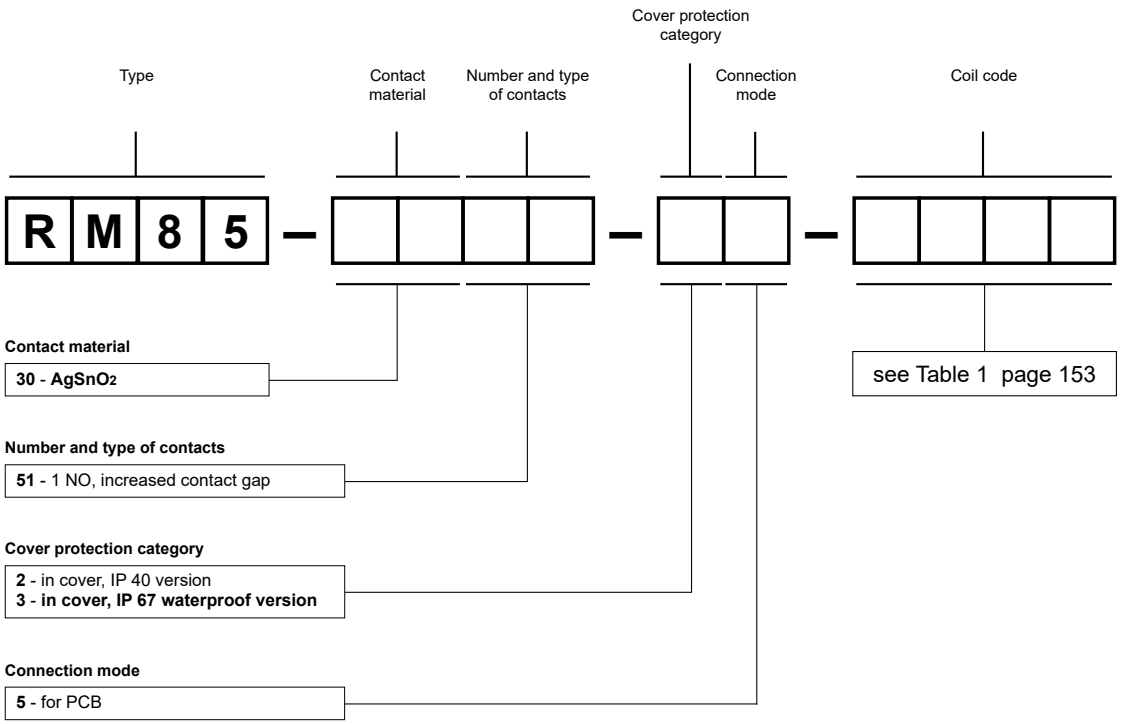
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1003	3	22	± 10%	2,1	7,6
1005	5	60	± 10%	3,5	12,7
1006	6	90	± 10%	4,2	15,3
1009	9	200	± 10%	6,3	22,9
1012	**12**	**360**	**± 10%**	**8,4**	**30,6**
1018	18	710	± 10%	12,6	45,9
1024	**24**	**1 440**	**± 10%**	**16,8**	**61,2**
1036	36	3 140	± 10%	25,2	91,8
1048	48	5 700	± 10%	33,6	122,4
1060	60	7 500	± 10%	42,0	153,0
1110	110	25 200	± 10%	77,0	280,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



Example of ordering code:

RM85-3051-35-1012 relay **RM85**, with increased contact gap, for PCB, one normally open contact, contact material $AgSnO_2$, coil voltage 12 V DC, in cover IP 67

RM85 inrush
miniature relays

- **Resistance to inrush current 80 A (20 ms)**
- CTI 250 • Reinforced insulation
- For PCB and plug-in sockets
- DC coils, insulation class F: 155 °C
- Applications: for motor operation control, lighting, electromagnetic valves, and many other applications
- Compliance with standard EN 60335-1
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 NO
Contact material		**$AgSnO_2$**
Rated / max. switching voltage	AC	250 V / 400 V
Min. switching voltage		10 V
Rated load (capacity)	AC1	16 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	16 A / 24 V DC (see Fig. 2)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1 HP 240 V AC, 8 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,75 kW 240 V AC, single-phase motor
Min. switching current		10 mA
Max. inrush current		80 A 20 ms
Rated current		16 A
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		1 W
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	600 cycles/hour
• no load		72 000 cycles/hour

Coil data

Rated voltage	DC	3, 5, 6, 9, **12**, 18, **24**, 36, 48, 60, 110 V
Must release voltage		DC: ≥ 0,1 U_n
Operating range of supply voltage		see Table 1 and Fig. 3
Rated power consumption	DC	0,4 ... 0,48 W

Insulation according to EN 60664-1

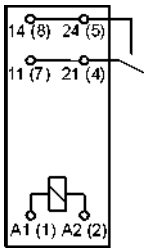
Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength		
• between coil and contacts		5 000 V AC type of insulation: reinforced
• contact clearance		1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 10 mm
	• creepage	≥ 10 mm

General data

Operating / release time (typical values)		8 ms / 3 ms
Electrical life (number of cycles)		
• resistive AC1	600 cycles/hour	> 10^5 16 A, 250 V AC
• cosφ		see Fig. 1
• resistive DC1	600 cycles/hour	> 10^5 16 A, 24 V DC
• inductive AC3, I = 3,5 A		> 2,5 x 10^5
• at incandescent lamp load, 1000 W		> 0,9 x 10^5
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		29 x 12,7 x 15,7 mm
Weight		14 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+85 °C
Cover protection category		IP 40 EN 60529
Environmental protection		RTII EN 61810-7
Shock resistance		30 g
Vibration resistance		10 g 10...150 Hz
Solder bath temperature		max. 270 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays. ❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Connection diagram (pin side view)

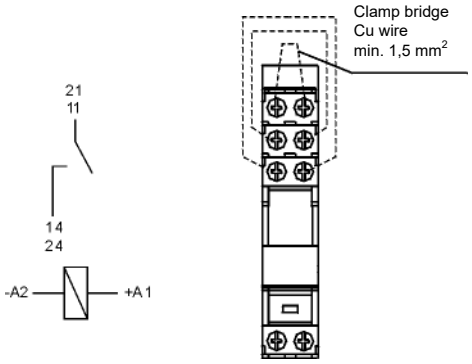


1 NO

Terminal (pin)	A1(1); A2(2)	21(4); 24(5); 11(7); 14(8)
[mm]	Ø 0,6	0,5 x 0,9
Drilling hole: • for relays • for sockets	 Ø 1,3 + 0,1 mm Ø 1,5 + 0,1 mm	

RM85 inrush terminals are doubled for each contact. Both terminals are to be used while connecting to load.

Connection of GZ.80 sockets



Note: loads above 12 A (GZT80, GZM80, GZP80) or 10 A (GZS80, GZF80) require bridging pairs of terminals: 11 with 21, 12 with 22, 14 with 24. Loads up to 12 A or 10 A do not require bridging of common terminals (such bridges may be fixed, however).

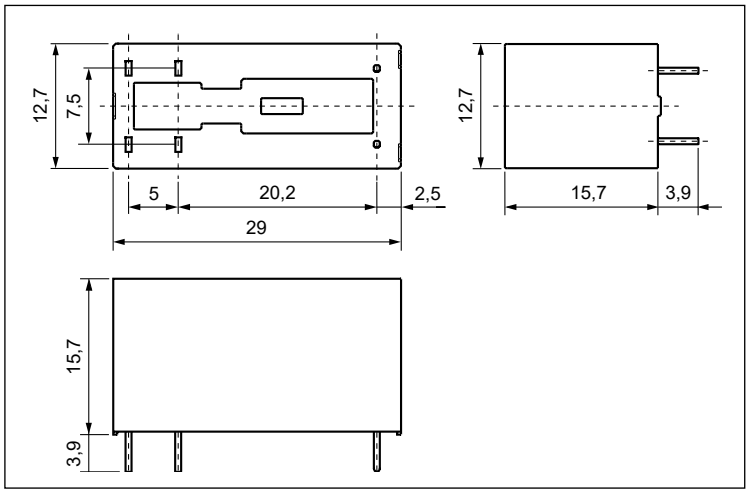
Mounting, sockets and accessories for relays

Relays **RM85 inrush** are designed for: • direct PCB mounting • plug-in sockets.

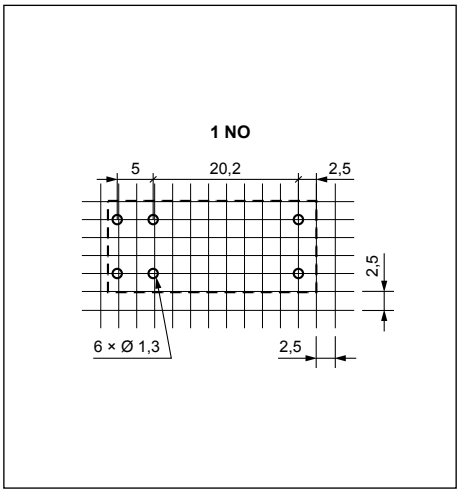
Sockets for RM85 inrush	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZT80 ❷	GZT80-0040	GZM80-0041	GZT80-0035	M... ❹, ZGGZ80 ❺
GZM80 ❷	GZT80-0040	GZM80-0041	GZT80-0035	M... ❹, ZGGZ80 ❺
GZS80 ❷	GZS-0040	GZM80-0041	TR	M... ❹, ZGGZ80 ❺
GZF80 ❷	–	GZM80-0041	–	–
Push-in terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZP80 ❷ ❸	GZP80-0400, GZT80-0040	GZM80-0041	MP15	M... ❹, ZGZP80-8, ZGZP80-2, ZGZP-2 ❺
Sockets for PCB				
PW80	–	MH16-2	–	–
EC 50	–	MP16-2 ❸, MH16-2	–	–
GD50	–	MP16-2 ❻, MH16-2, GD-0016	–	–

❷ Sockets GZ.80: load connection - see page 155. ❸ Sockets GZP80: wire connection - see page 383. ❹ Signalling / protecting modules type M... - see page 399. ❺ Interconnection strips ZGGZ80, ZGZP... - see pages 400, 402. ❻ Plastic clips MP16-2.

Dimensions

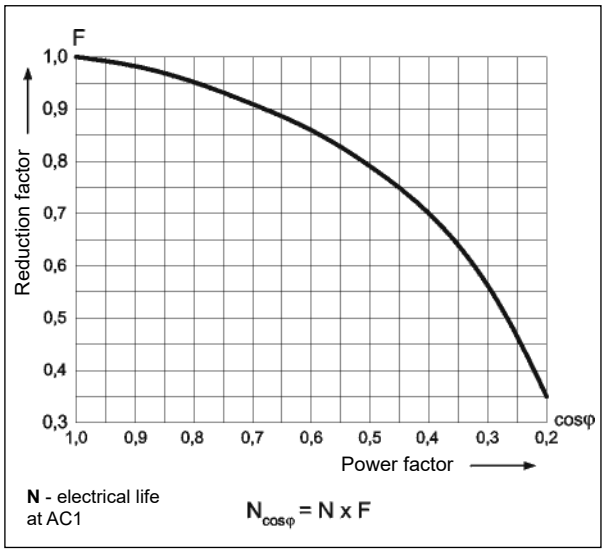


Pinout (solder side view)



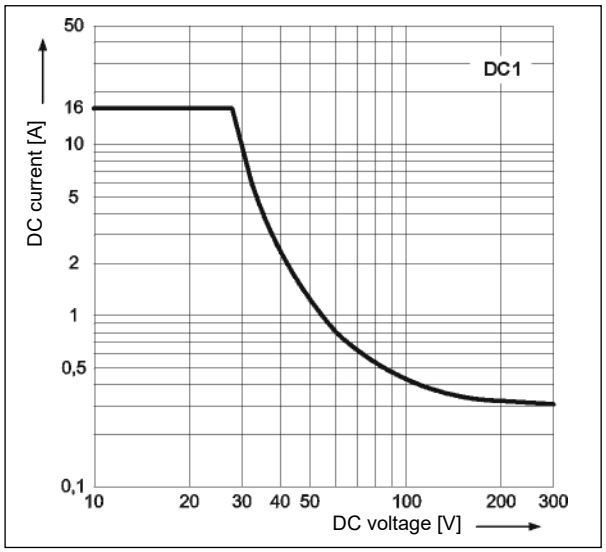
Electrical life reduction factor at AC inductive load

Fig. 1



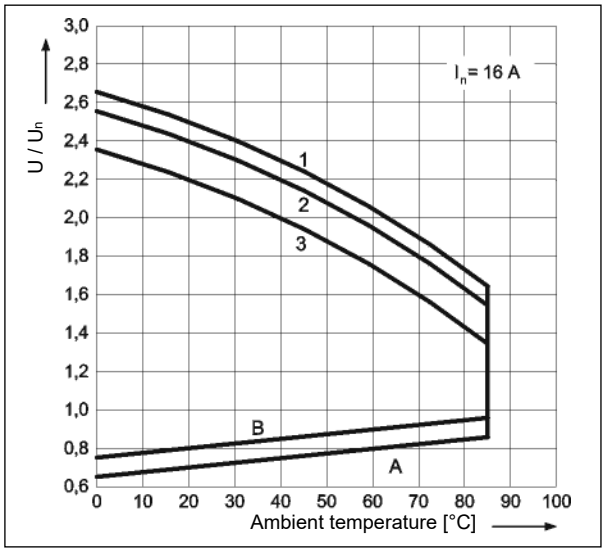
Max. DC resistive load breaking capacity

Fig. 2



Coil operating range - DC

Fig. 3



Description of Fig. 3

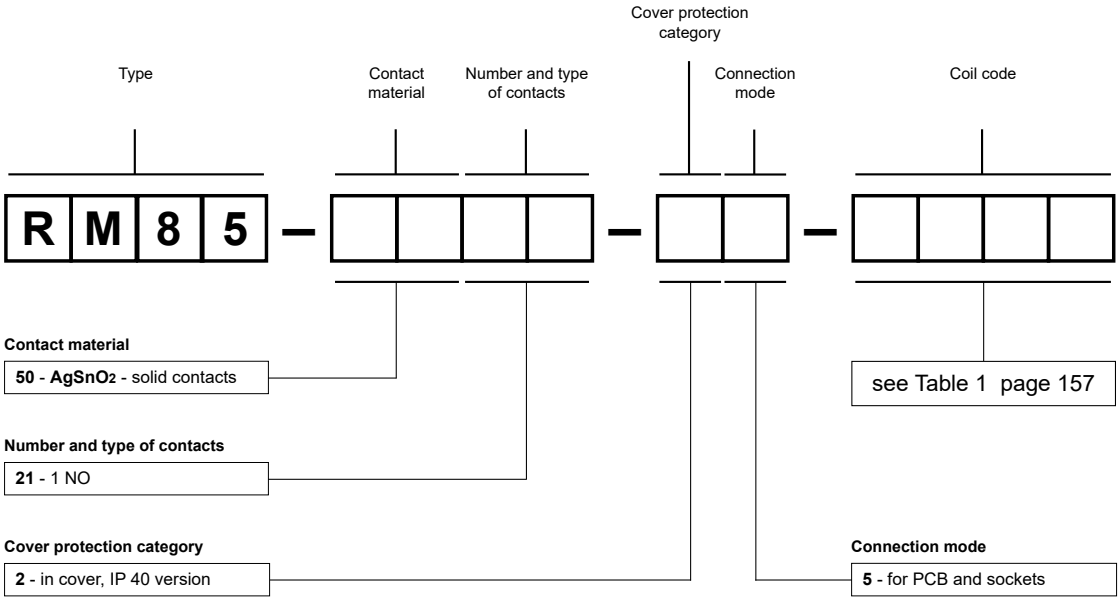
A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, **2**, **3** - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1003	3	22	± 10%	2,1	7,6
1005	5	60	± 10%	3,5	12,7
1006	6	90	± 10%	4,2	15,3
1009	9	200	± 10%	6,3	22,9
1012	**12**	**360**	**± 10%**	**8,4**	**30,6**
1018	18	710	± 10%	12,6	45,9
1024	**24**	**1 440**	**± 10%**	**16,8**	**61,2**
1036	36	3 140	± 10%	25,2	91,8
1048	48	5 700	± 10%	33,6	122,4
1060	60	7 500	± 10%	42,0	153,0
1110	110	25 200	± 10%	77,0	280,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



Example of ordering code:

RM85-5021-25-1012 relay **RM85 inrush**, for PCB and sockets, one normally open contact, contact material $AgSnO_2$ - solid contacts, coil voltage 12 V DC, in cover IP 40

PI84T, PI85T

Relays for railroad industry - interface, contacts 1 CO, 2 CO

RM85 105 °C sensitive
miniature relays

- **Ambient temperature up to 105 °C**
- CTI 250
- For PCB and plug-in sockets
- DC coils - sensitive 0,25 W, insulation class F: 155 °C
- Applications: in household equipment, in temperature controlers
- Compliance with standard EN 60335-1
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 NO
Contact material		AgNi, AgNi/Au hard gold plating, **$AgSnO_2$**
Rated / max. switching voltage	AC	250 V / 400 V
Min. switching voltage		5 V AgNi, 5 V AgNi/Au hard gold plating, 10 V $AgSnO_2$
Rated load (capacity)	AC1	16 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	16 A / 24 V DC (see Fig. 2)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,5 kW 240 V AC, single-phase motor
Min. switching current		5 mA AgNi, 2 mA AgNi/Au hard gold plating, 10 mA $AgSnO_2$
Max. inrush current		30 A $AgSnO_2$
Rated current		16 A
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		0,3 W AgNi, 0,05 W AgNi/Au hard gold plating, 1 W $AgSnO_2$
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	600 cycles/hour
• no load		72 000 cycles/hour

Coil data

Rated voltage	DC	5, 6, 9, 10, 12, 18, 24, 48 V
Must release voltage		DC: ≥ 0,1 U_n
Operating range of supply voltage		see Table 1 and Fig. 3
Rated power consumption	DC	0,25 W

Insulation according to EN 60664-1

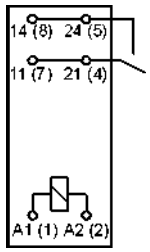
Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 10 mm
	• creepage	≥ 10 mm

General data

Operating / release time (typical values)		8 ms / 3 ms
Electrical life (number of cycles)	• resistive AC1	$> 10^5$ 16 A, 230 V AC, 70 °C
		$> 2 \times 10^4$ 16 A, 230 V AC, 105 °C
		$> 1,7 \times 10^5$ 10 A, 230 V AC, 105 °C
		$> 2,8 \times 10^5$ 8 A, 230 V AC, 105 °C
		$> 3,2 \times 10^5$ 6 A, 230 V AC, 105 °C
	• cosφ	see Fig. 1
	• DC L/R=40 ms	$> 10^5$ 0,15 A, 220 V DC
Mechanical life (cycles)		$> 3 \times 10^7$
Dimensions (L x W x H)		29 x 12,7 x 15,7 mm
Weight		14 g
Ambient temperature	• storage	-40...+105 °C
(non-condensation and/or icing)	• operating	-40...+105 °C
Cover protection category		IP 40 EN 60529
Environmental protection		RTII EN 61810-7
Shock resistance		30 g
Vibration resistance		10 g 10...150 Hz
Solder bath temperature		max. 270 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays. ❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Connection diagram (pin side view)

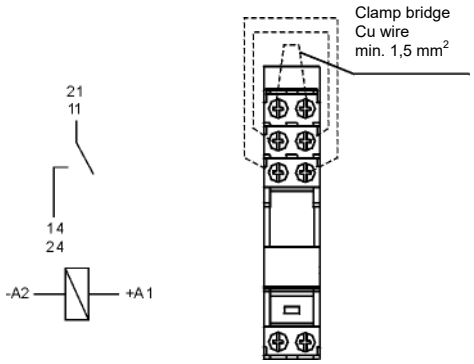


1 NO

Terminal (pin)	A1(1); A2(2)	21(4); 24(5); 11(7); 14(8)
[mm]	Ø 0,6	0,5 x 0,9
Drilling hole: • for relays • for sockets	 Ø 1,3 + 0,1 mm Ø 1,5 + 0,1 mm	

RM85 105 °C sensitive terminals are doubled for each contact. Both terminals are to be used while connecting to load.

Connection of GZ.80 sockets



Note: loads above 12 A (GZT80, GZM80, GZP80) or 10 A (GZS80, GZF80) require bridging pairs of terminals: 11 with 21, 12 with 22, 14 with 24. Loads up to 12 A or 10 A do not require bridging of common terminals (such bridges may be fixed, however).

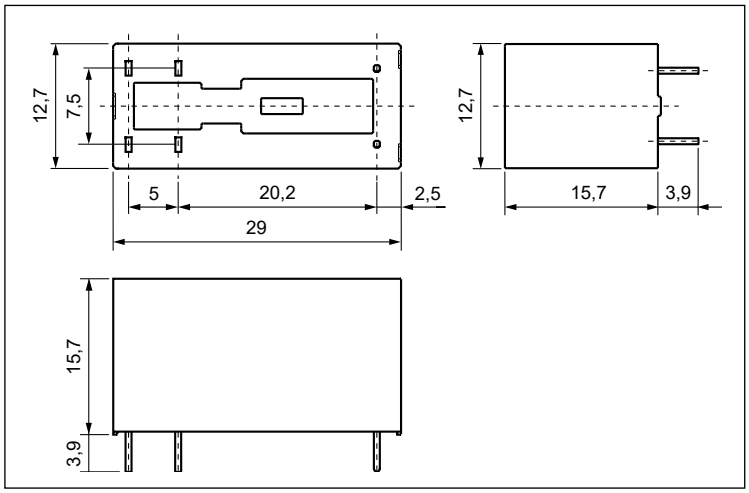
Mounting, sockets and accessories for relays

Relays **RM85 105 °C sensitive** are designed for: • direct PCB mounting • plug-in sockets.

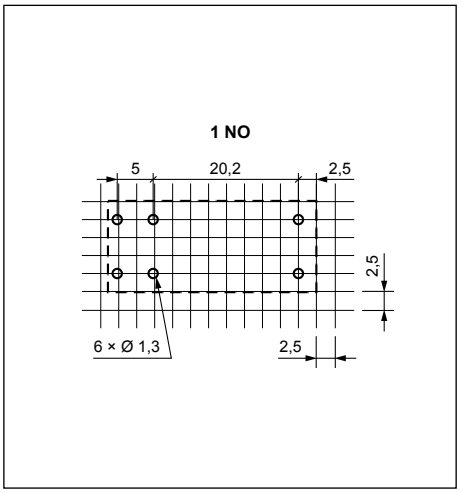
Sockets for RM85 105 °C sensitive	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZT80 ❷	GZT80-0040	GZM80-0041	GZT80-0035	M... ❹, ZGGZ80 ❺
GZM80 ❷	GZT80-0040	GZM80-0041	GZT80-0035	M... ❹, ZGGZ80 ❺
GZS80 ❷	GZS-0040	GZM80-0041	TR	M... ❹, ZGGZ80 ❺
GZF80 ❷	–	GZM80-0041	–	–
Push-in terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZP80 ❷ ❸	GZP80-0400, GZT80-0040	GZM80-0041	MP15	M... ❹, ZGZP80-8, ZGZP80-2, ZGZP-2 ❺
Sockets for PCB				
PW80	–	MH16-2	–	–
EC 50	–	MP16-2 ❽, MH16-2	–	–
GD50	–	MP16-2 ❻, MH16-2, GD-0016	–	–

❷ Sockets GZ.80: load connection - see page 159. ❸ Sockets GZP80: wire connection - see page 383. ❹ Signalling / protecting modules type M... - see page 399. ❺ Interconnection strips ZGGZ80, ZGZP... - see pages 400, 402. ❻ Plastic clips MP16-2.

Dimensions

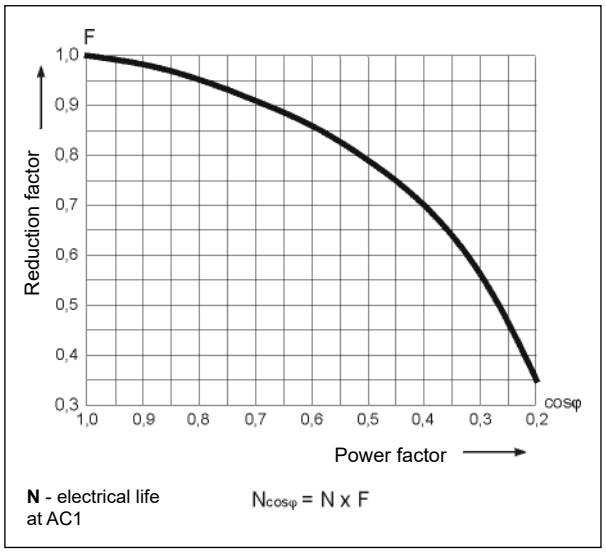


Pinout (solder side view)



Electrical life reduction factor at AC inductive load

Fig. 1

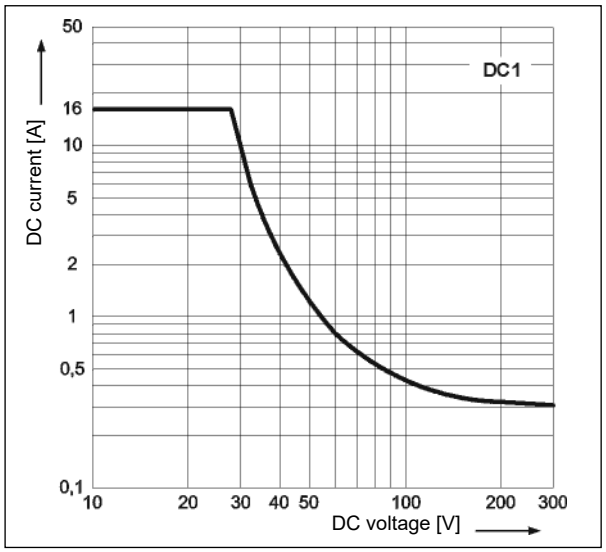


N - electrical life at AC1

$N_{cos\varphi} = N \times F$

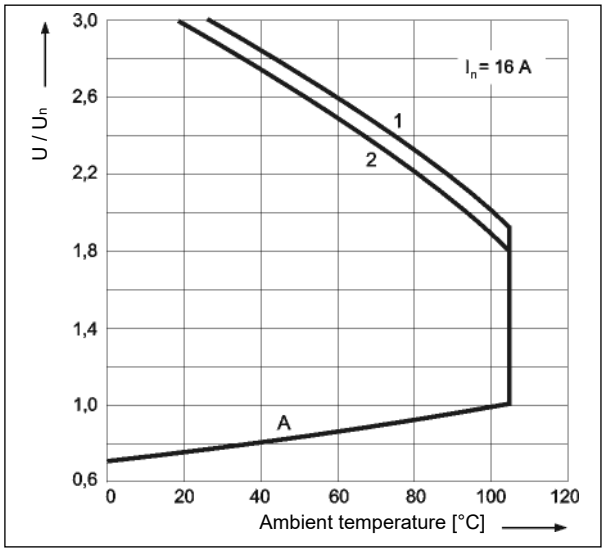
Max. DC resistive load breaking capacity

Fig. 2



Coil operating range - DC

Fig. 3



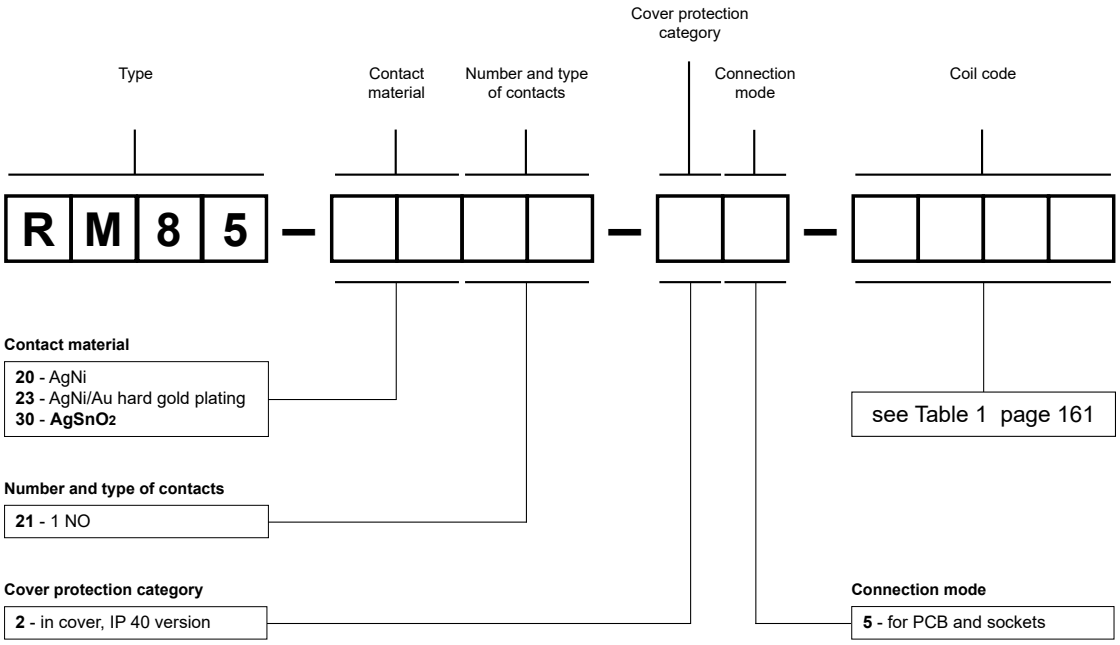
Description of Fig. 3

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, **2** - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - rated load

Coil data - DC voltage version, sensitive Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
S005	5	102	± 10%	3,75	15,0
S006	6	144	± 10%	4,50	18,0
S009	9	330	± 10%	6,75	27,0
S010	10	380	± 10%	7,50	30,0
S012	12	580	± 10%	9,00	36,0
S018	18	1 300	± 10%	13,50	54,0
S024	24	2 300	± 10%	18,00	72,0
S048	48	9 340	± 10%	36,00	144,0

Ordering codes



Examples of ordering code:

RM85-3021-25-S012 relay **RM85 105 ºC sensitive**, for PCB and sockets, one normally open contact, contact material $AgSnO_2$, sensitive coil voltage 12 V DC, in cover IP 40

RM85-2321-25-S005 relay **RM85 105 ºC sensitive**, for PCB and sockets, one normally open contact, contact material AgNi/Au hard gold plating, sensitive coil voltage 5 V DC, in cover IP 40

version (V) version (H)

- **Coil terminals for PCB, contacts terminals for PCB and flat insert connectors - faston 250 (6,3 x 0,8 mm), faston arrangement: vertical version (V) and horizontal version (H)**
- Ambient temperature up to 105 °C • CTI 250 • Reinforced insulation
- DC coils - sensitive, insulation class F: 155 °C • Applications: for control of operation of heating elements and motors of household equipment and catering industry devices, for control of electromagnetic valves, in many other applications • Compliance with standard EN 60335-1
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 NO	
Contact material		**$AgSnO_2$**	
Rated / max. switching voltage	AC	250 V / 400 V	
Min. switching voltage		10 V	
Rated load (capacity)	AC1	20 A / 250 V AC	
	AC15	3 A / 120 V	1,5 A / 240 V (B300)
	DC1	20 A / 24 V DC	
	DC13	0,22 A / 120 V	0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP	240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,5 kW	240 V AC, single-phase motor
Min. switching current		10 mA	
Max. inrush current		30 A	
Rated current		20 A	
Max. breaking capacity	AC1	5 000 VA	
Min. breaking capacity		1 W	
Contact resistance		≤ 100 mΩ	100 mA, 24 V
Max. operating frequency			
• at rated load	AC1	600 cycles/hour	
• no load		72 000 cycles/hour	

Coil data

Rated voltage	DC	5, 6, 9, 10, **12**, 18, **24**, 48 V
Must release voltage		DC: ≥ 0,1 U_n
Operating range of supply voltage		see Table 1
Rated power consumption	DC	0,25 W

Insulation according to EN 60664-1

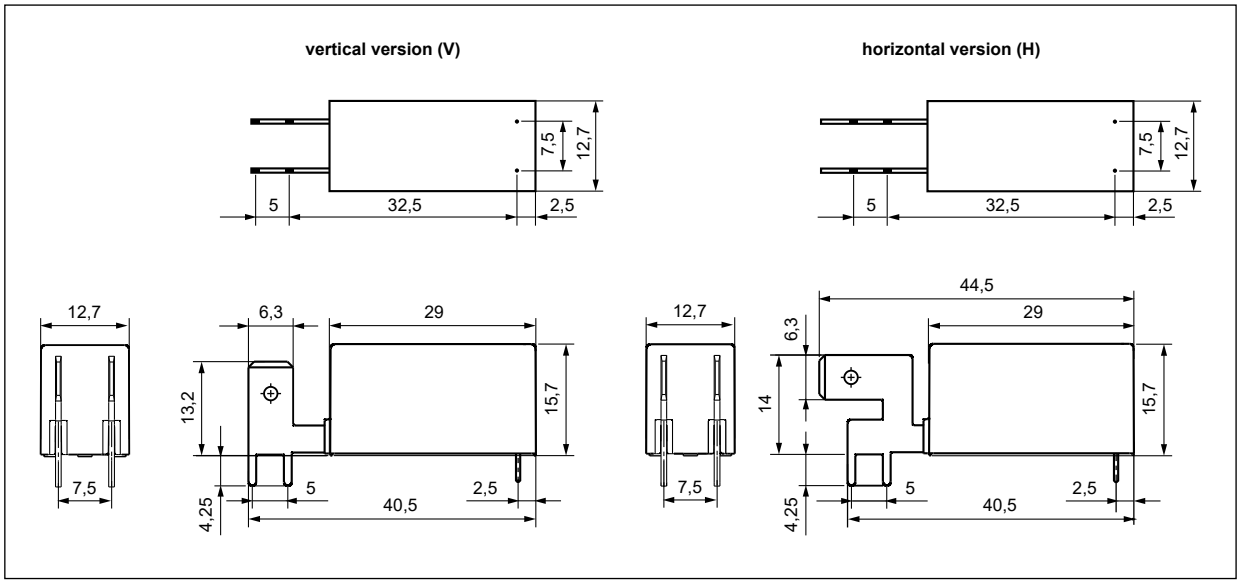
Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength		
• between coil and contacts		5 000 V AC type of insulation: reinforced
• contact clearance		1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 10 mm
	• creepage	≥ 10 mm

General data

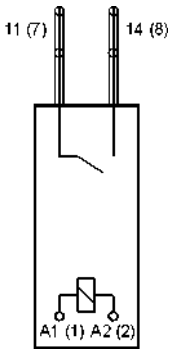
Operating / release time (typical values)		8 ms / 3 ms
Electrical life (number of cycles)		
• resistive AC1		> 10^4 20 A, 250 V AC, 85 °C
		> 1,5 x 10^5 10 A, 250 V AC, 105 °C
• cosφ		see Fig. 1
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		vertical version (V): 40,5 x 12,7 x 15,7 mm
		horizontal version (H): 44,5 x 12,7 x 15,7 mm
Weight		16 g
Ambient temperature	• storage	-40...+105 °C
(non-condensation and/or icing)	• operating	-40...+105 °C
Cover protection category		IP 40 EN 60529
Environmental protection		RTII EN 61810-7
Shock resistance		30 g
Vibration resistance		10 g 10...150 Hz
Solder bath temperature		max. 270 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays. ❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Dimensions



Connection diagram (pin side view)

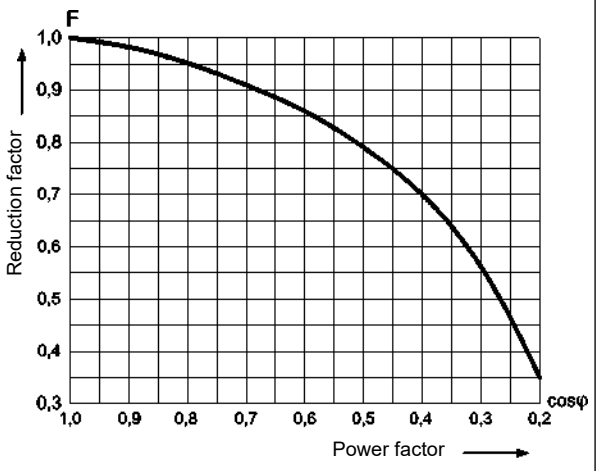


1 NO

Terminal (pin)	A1(1); A2(2)	11(7); 14(8)
[mm]	Ø 0,6	1,2 x 0,8 faston 6,3 x 0,8
Drilling hole: • for relays	Ø 1,3 + 0,1 mm	

Electrical life reduction factor at AC inductive load

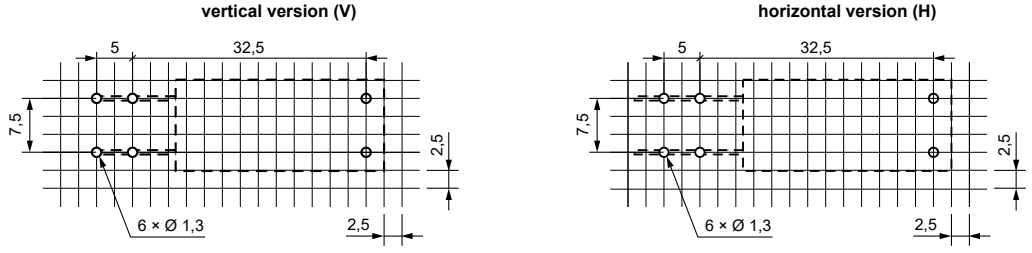
Fig. 1



N - electrical life at AC1

$N_{cos\varphi} = N \times F$

Pinout (solder side view)



1 NO

1 NO

Export Sales Department: phone +48 68 47 90 832, 951, export@relpol.com.pl

Mounting

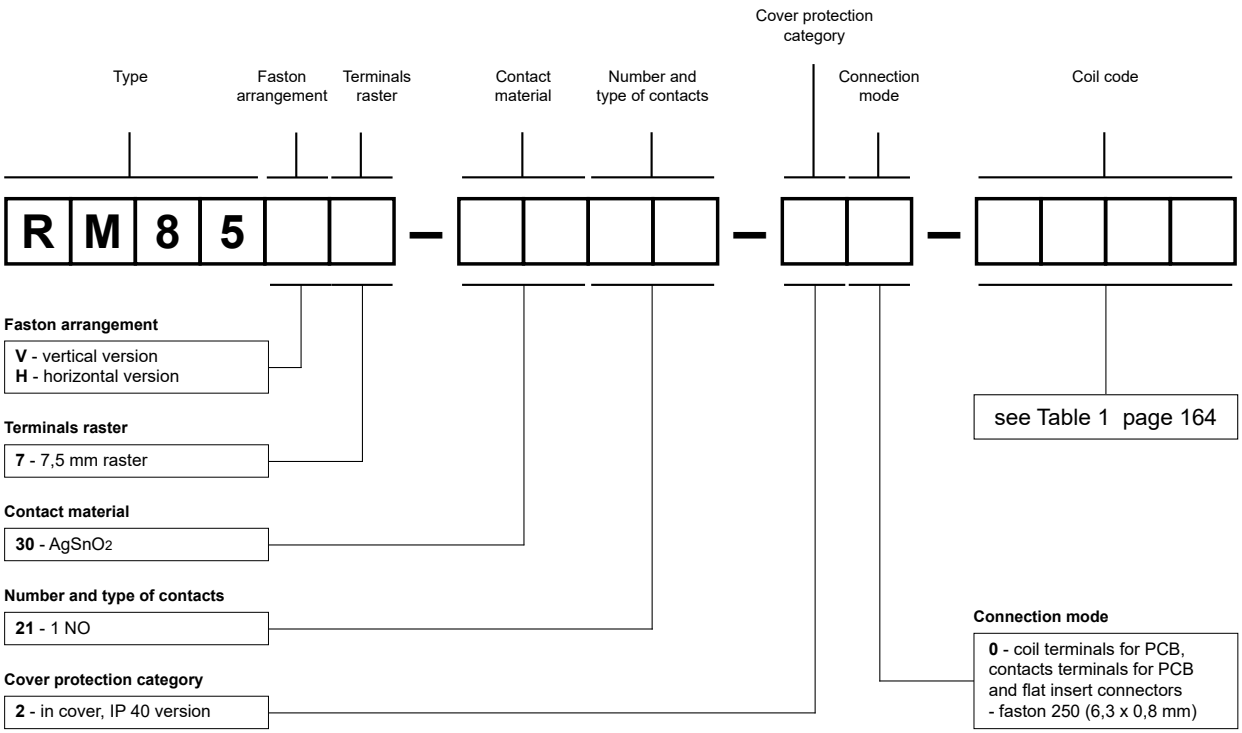
Relays **RM85 faston** are designed for: • direct PCB mounting • connection of load with flat insert connectors - faston 250 (6,3 x 0,8 mm).

Coil data - DC voltage version, sensitive — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
S005	5	102	± 10%	3,75	15,0
S006	6	144	± 10%	4,50	18,0
S009	9	330	± 10%	6,75	27,0
S010	10	380	± 10%	7,50	30,0
S012	**12**	**580**	**± 10%**	**9,00**	**36,0**
S018	18	1 300	± 10%	13,50	54,0
S024	**24**	**2 300**	**± 10%**	**18,00**	**72,0**
S048	48	9 340	± 10%	36,00	144,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



Example of ordering code:

RM85V7-3021-20-S012 relay **RM85 faston**, vertical version, coil terminals for PCB, contacts terminals for PCB and flat insert connectors - faston 250 (6,3 x 0,8 mm), 7,5 mm terminals raster, one normally open contact, contact material $AgSnO_2$, sensitive coil voltage 12 V DC, in cover IP 40

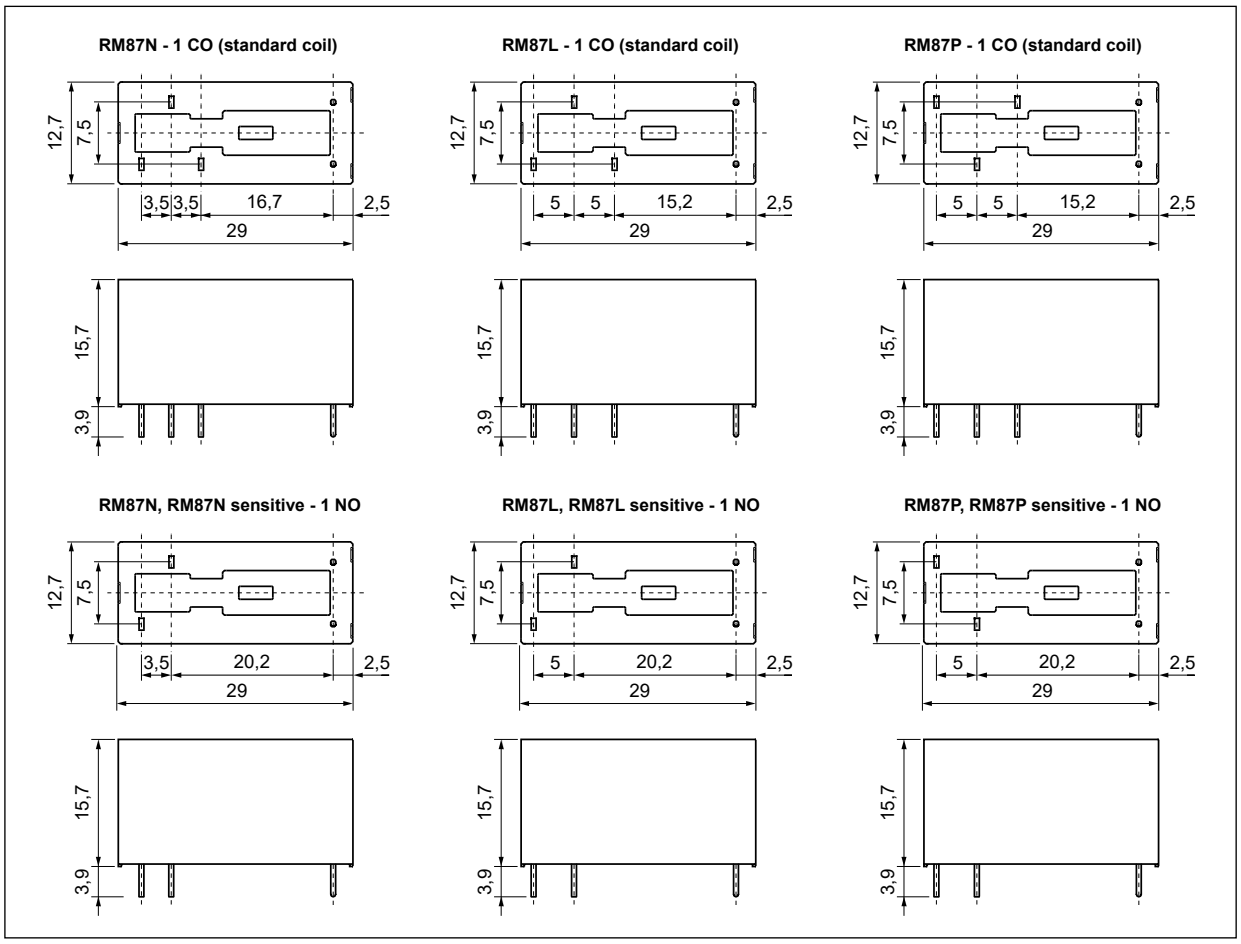
RM87N **RM87N-...-01 (AC) ❶** **RM87N-...-01 (DC) ❶**

- CTI 250 • Reinforced insulation • For PCB and plug-in sockets • **AC and DC coils - standard (RM87), DC coils - sensitive (RM87 sensitive)**, insulation class F: 155 °C
- Available special versions: in transparent cover ❶; with the increased dielectric strength of the contact clearance ❷ • Compliance with standard EN 60335-1
- Recognitions, certifications, directives: RoHS,

Contact data		**RM87** - standard coil	**RM87 sensitive** - sensitive coil
Number and type of contacts		1 CO, 1 NO ❷	1 NO
Contact material		**AgNi**, AgNi/Au hard gold plating, $AgSnO_2$	
Rated / max. switching voltage	AC	250 V / 400 V	
Min. switching voltage		5 V AgNi, 5 V AgNi/Au hard gold plating, 10 V $AgSnO_2$	
Rated load (capacity)	AC1	12 A / 250 V AC	10 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)	
	DC1	12 A / 24 V DC (see Fig. 3)	10 A / 24 V DC (see Fig. 4)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)	
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❸	
	AC3 acc. to IEC 60947-4-1	0,5 kW 240 V AC, single-phase motor	
Min. switching current		5 mA AgNi, 2 mA AgNi/Au hard gold plating, 10 mA $AgSnO_2$	
Max. inrush current		25 A $AgSnO_2$	20 A $AgSnO_2$
Rated current		12 A	10 A
Max. breaking capacity	AC1	3 000 VA	2 500 VA
Min. breaking capacity		0,3 W AgNi, 0,05 W AgNi/Au hard gold plating, 1 W $AgSnO_2$	
Contact resistance		≤ 100 mΩ	
Max. operating frequency	• at rated load AC1	600 cycles/hour	
	• no load	72 000 cycles/hour	
Coil data			
Rated voltage	50/60 Hz AC	12, **24**, 48, 60, 110, 115, 120, 220, **230**, 240 V	—
	DC	3, 5, 6, 9, **12**, 18, **24**, 36, 48, 60, 110 V	5, 6, 9, 10, 12, 18, 24, 48 V
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n	
Operating range of supply voltage		see Tables 1, 3 and Fig. 5, 7	see Table 2 and Fig. 6
Rated power consumption	AC	0,75 VA	–
	DC	0,4 ... 0,48 W	0,25 W
Insulation according to EN 60664-1			
Insulation rated voltage		400 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		3	
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced	
	• contact clearance	1 000 V AC type of clearance: micro-disconnection	
		2 000 V AC contact 1 NO, type of clearance: full-disconnection ❷	
Contact - coil distance	• clearance	≥ 10 mm	
	• creepage	≥ 10 mm	
General data			
Operating / release time (typical values)		7 ms / 3 ms	
Electrical life	• resistive AC1	> 10^5 12 A, 250 V AC	> 1,7 x 10^5 10 A, 250 V AC
(number of cycles)	• cosφ	see Fig. 2	
	• DC L/R=40 ms	> 10^5 0,15 A, 220 V DC	
Mechanical life (cycles)		> 3 x 10^7	
Dimensions (L x W x H) / Weight		29 x 12,7 x 15,7 mm / 14 g	
Ambient temperature	• storage	-40...+85 °C	
(non-condensation and/or icing)	• operating	AC: -40...+70 °C DC: -40...+85 °C -20...+70 °C ❶	
Cover protection category		IP 40 ❶ or **IP 67** EN 60529	
Environmental protection		RTII ❶ or **RTIII** EN 61810-7	
Shock / vibration resistance		30 g / 10 g 10...150 Hz	
Solder bath temperature / Soldering time		max. 270 °C / max. 5 s	

The data in bold type relate to the standard versions of the relays. ❶ Special versions - relays in transparent cover (certifications cULus, EAC), only available with IP 40 and RTII, operating temperature -20...+70 °C. See "Ordering codes". ❷ Special versions - relays with one normally open contact 1 NO, with increased contact gap - dielectric strength 2000 V AC, only available with standard DC coils. See "Ordering codes". ❸ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Dimensions



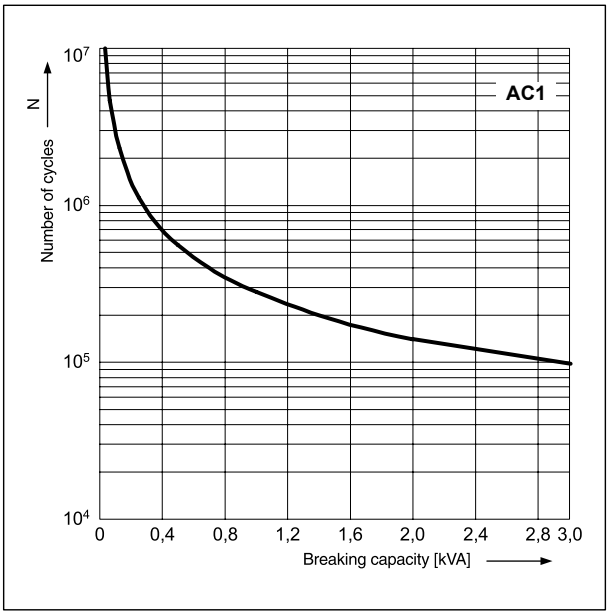
Mounting, sockets and accessories for relays

Relays **RM87N ❹, RM87N sensitive** and **RM87L ❹**, **RM87L sensitive**, **RM87P ❹**, **RM87P sensitive** are designed for: • direct PCB mounting • plug-in sockets.

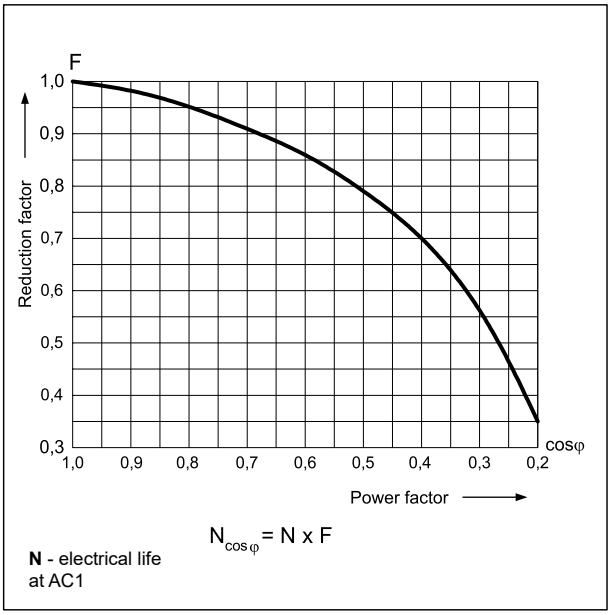
Sockets for RM87N ...	Sockets for RM87L ..., RM87P ...	Accessories			Additional equipment
		Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)					
GZT92	GZT80	GZT80-0040	GZM80-0041	GZT80-0035	M... ❻, ZGGZ80 ❼
GZM92	GZM80	GZT80-0040	GZM80-0041	GZT80-0035	M... ❻, ZGGZ80 ❼
GZS92	GZS80	GZS-0040	GZM80-0041	TR	M... ❻, ZGGZ80 ❼
–	GZF80	–	GZM80-0041	–	–
Push-in terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)					
–	GZP80 ❺	GZP80-0400, GZT80-0040	GZM80-0041	MP15	M... ❻, ZGZP80-8, ZGZP80-2, ZGZP-2 ❼
Sockets for PCB					
–	PW80	–	MH16-2	–	–
EC 35	EC 50	–	MP16-2 ❽, MH16-2	–	–
GD35	GD50	–	MP16-2 ❽, MH16-2, GD-0016	–	–

❹ For relays in transparent cover: the distance at least 5 mm between the relays mounted side by side. ❺ Sockets GZP80: wire connection - see page 383. ❻ Signalling / protecting modules type M... - see page 399. ❼ Interconnection strips ZGGZ80, ZGZP... - see pages 400, 402. ❽ Plastic clips MP16-2.

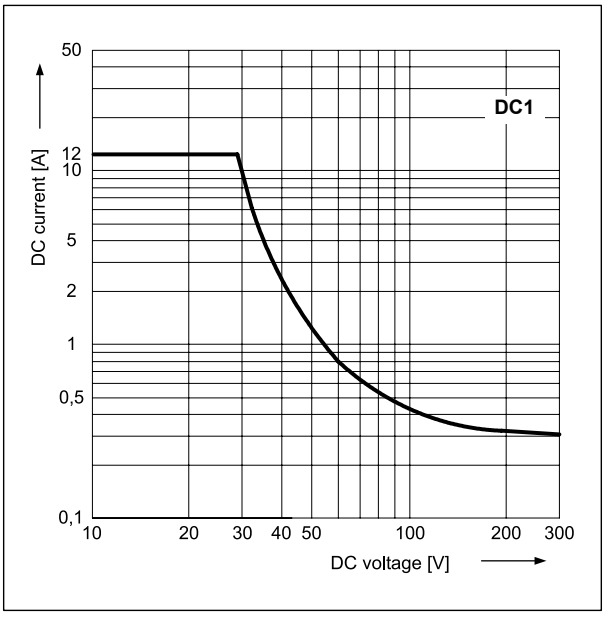
Electrical life at AC resistive load.
Switching frequency: 600 cycles/hour Fig. 1



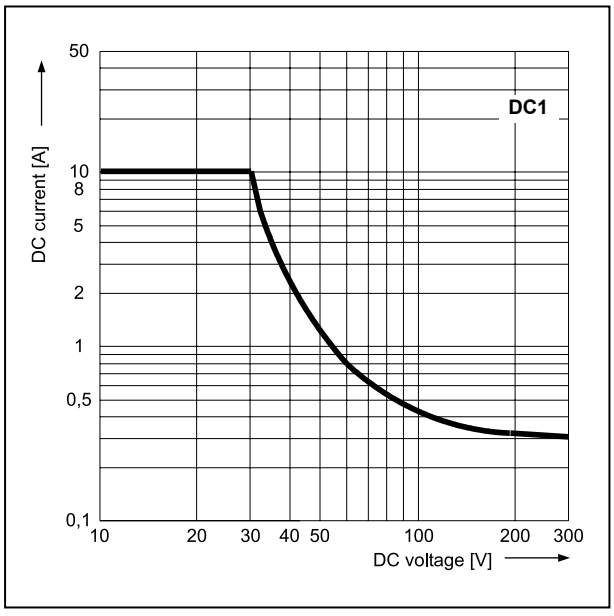
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC resistive load breaking capacity
- standard coil Fig. 3



Max. DC resistive load breaking capacity
- sensitive coil Fig. 4



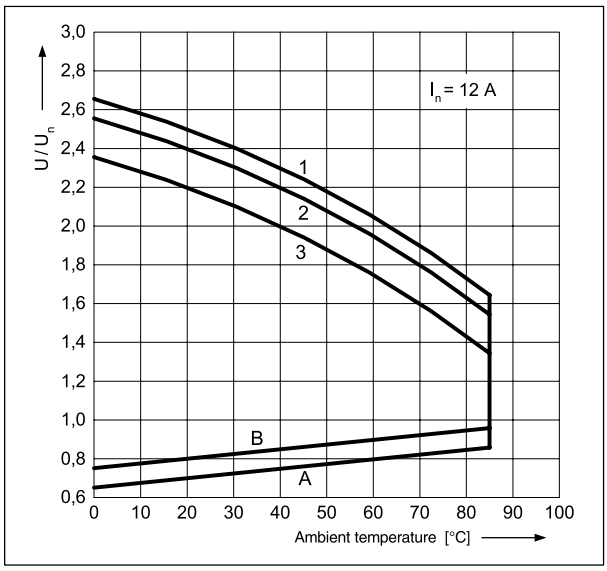
RM87

Transparent cover IP 40, certifications cULus, EAC (orange colour - AC coils, blue colour - DC coils)

NEW

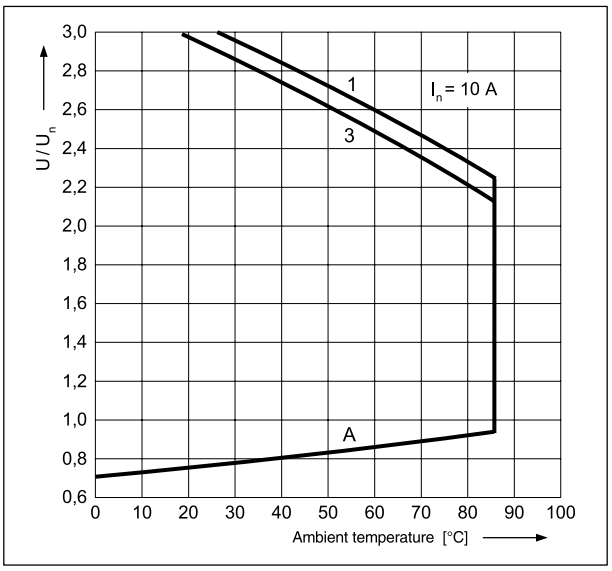
Coil operating range - DC
- standard coil

Fig. 5



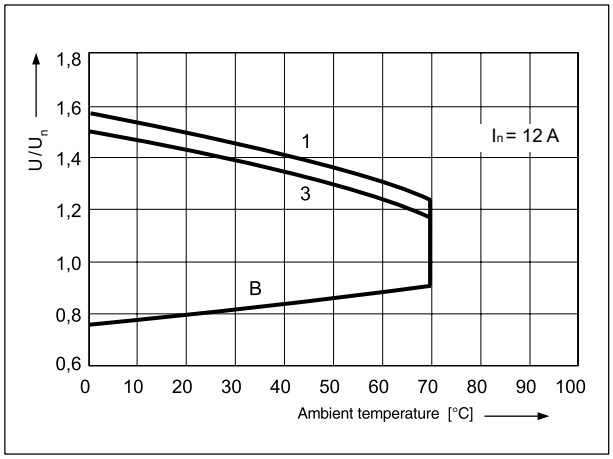
Coil operating range - DC
- sensitive coil

Fig. 6



Coil operating range - AC 50 Hz

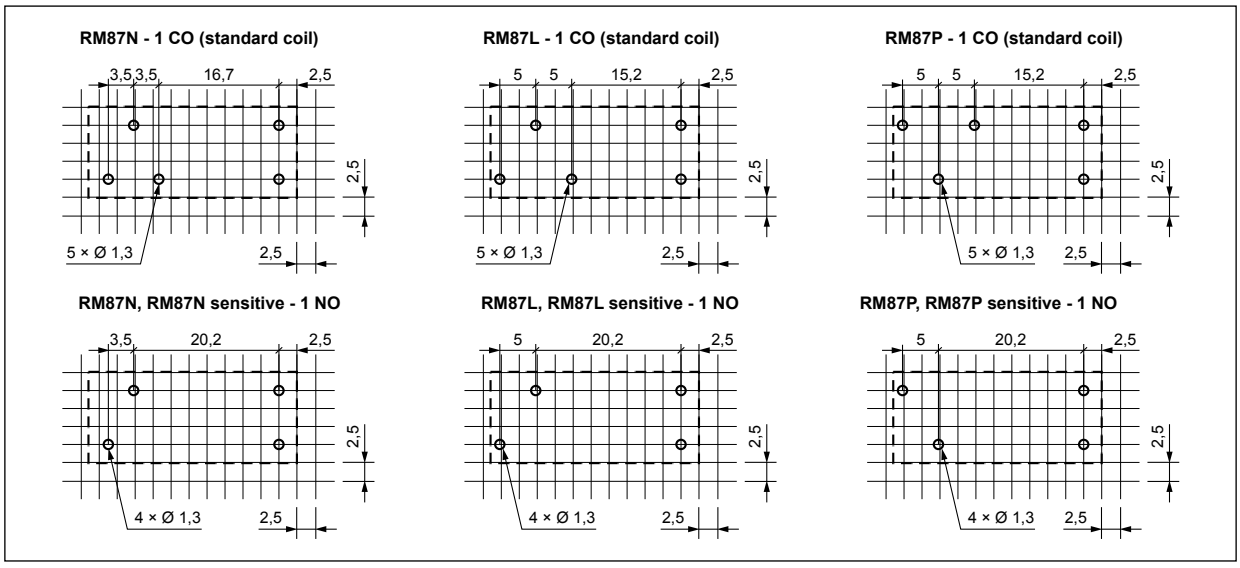
Fig. 7



Description of Fig. 5, 6 and 7

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

Pinout (solder side view)



Coil data - DC voltage version, standard (**RM87**) Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1003	3	22	± 10%	2,1	7,6
1005	5	60	± 10%	3,5	12,7
1006	6	90	± 10%	4,2	15,3
1009	9	200	± 10%	6,3	22,9
1012	**12**	**360**	**± 10%**	**8,4**	**30,6**
1018	18	710	± 10%	12,6	45,9
1024	**24**	**1 440**	**± 10%**	**16,8**	**61,2**
1036	36	3 140	± 10%	25,2	91,8
1048	48	5 700	± 10%	33,6	122,4
1060	60	7 500	± 10%	42,0	153,0
1110	110	25 200	± 10%	77,0	280,0

The data in bold type relate to the standard versions of the relays.

Coil data - DC voltage version, sensitive (**RM87 sensitive**) Table 2

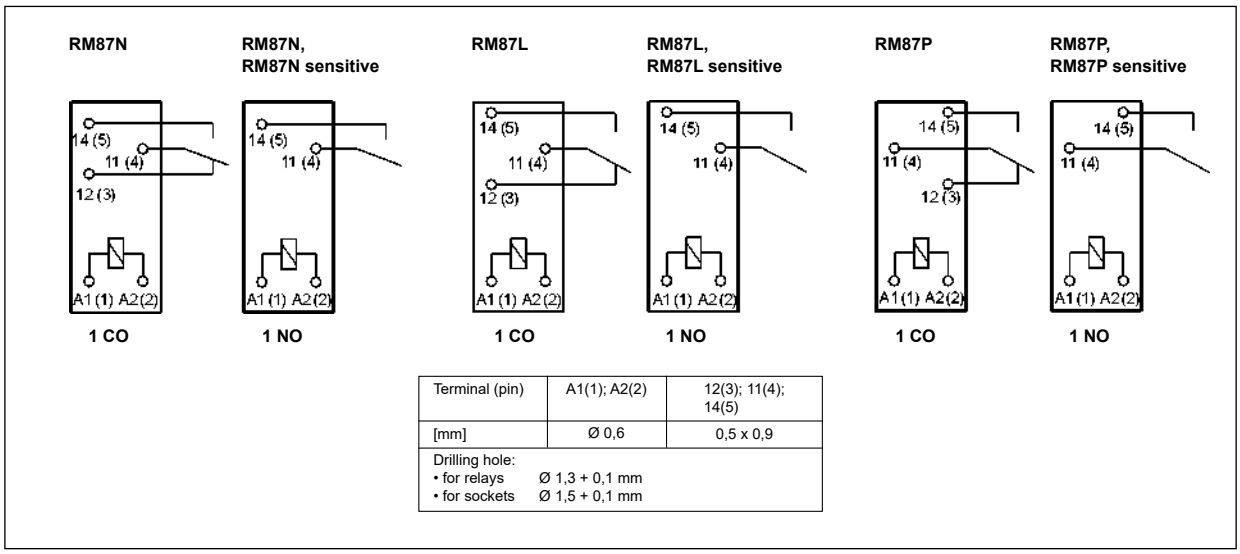
Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
S005	5	102	± 10%	3,75	15,0
S006	6	144	± 10%	4,50	18,0
S009	9	330	± 10%	6,75	27,0
S010	10	400	± 10%	7,50	30,0
S012	12	580	± 10%	9,00	36,0
S018	18	1 300	± 10%	13,50	54,0
S024	24	2 300	± 10%	18,00	72,0
S048	48	9 340	± 10%	36,00	144,0

Coil data - AC 50/60 Hz voltage version (**RM87**) Table 3

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (at 20 °C)	max. (at 20 °C)
5012	12	100	± 10%	9,6	13,2
5024	**24**	**400**	**± 10%**	**19,2**	**28,8**
5048	48	1 550	± 10%	38,4	57,6
5060	60	2 600	± 10%	48,0	72,0
5110	110	8 900	± 10%	88,0	132,0
5115	115	9 600	± 10%	92,0	138,0
5120	120	10 200	± 10%	96,0	144,0
5220	220	35 500	± 10%	176,0	264,0
5230	**230**	**38 500**	**± 10%**	**184,0**	**276,0**
5240	240	42 500	± 15%	192,0	288,0

The data in bold type relate to the standard versions of the relays.

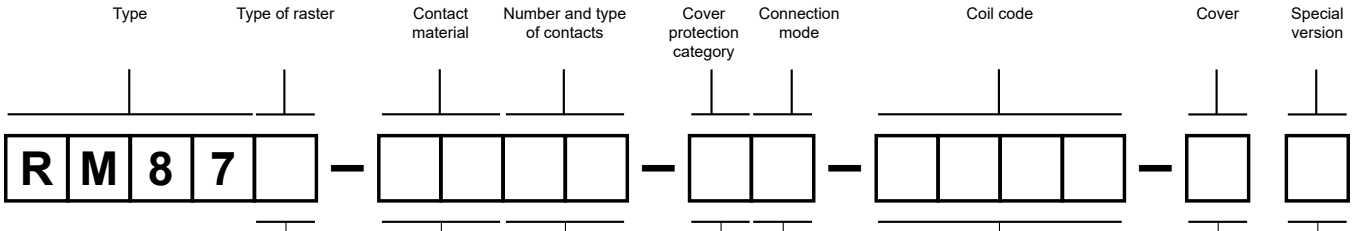
Connection diagrams (pin side view)



Terminal (pin)	A1(1); A2(2)	12(3); 11(4); 14(5)
[mm]	Ø 0,6	0,5 x 0,9
Drilling hole: • for relays • for sockets	 Ø 1,3 + 0,1 mm Ø 1,5 + 0,1 mm	

Ordering codes

RM87 sensitive - sensitive coil: relays only available with one normally open contact.



Type of raster

N - 3,5 mm raster
L - 5,0 mm left raster
P - 5,0 mm right raster

Contact material

20 - **AgNi**
23 - AgNi/Au hard gold plating
30 - $AgSnO_2$

Number and type of contacts

11 - 1 CO
21 - 1 NO

Cover protection category

2 - in cover, IP 40 version
3 - **in cover, IP 67 waterproof version**

Connection mode

5 - for PCB and sockets

see Tables 1, 2, 3 page 169

Cover

without marks - standard cover (no transparent)
01 - transparent cover IP 40
(orange colour - AC coils, blue colour - DC coils) ❶

Special version

without marks - basic version,
dielectric strength of contact clearance 1000 V AC
(51) - contact 1 NO, increased contact gap
- dielectric strength 2000 V AC ❷

❶ **01**: special version - relay in transparent cover, only available with IP 40 and RTII, operating temperature -20...+70 °C ❷ **(51)**: special version - relay with one normally open contact 1 NO, with increased contact gap - dielectric strength 2000 V AC, only available with standard DC coil

Examples of ordering code:

RM87N-2011-25-1024-01 relay **RM87N**, 3,5 mm raster, for PCB and sockets, one changeover contact, contact material AgNi, coil voltage 24 V DC, in transparent cover (blue colour) IP 40

RM87P-3021-35-S012 relay **RM87P sensitive**, 5 mm right raster, for PCB and sockets, one normally open contact, contact material $AgSnO_2$, sensitive coil voltage 12 V DC, in standard cover (no transparent) IP 67

RM96 1 CO **RM96 1 NO / 1 NC**

- Height 16,2 mm • IP 40 and IP 67
- For PCB (1 CO, 1 NO, 1 NC) and plug-in sockets (1 CO)
- Accessories: sockets and modules for 1 CO
- DC coils, insulation class F: 155 °C
- Recyclable packing
- Terminals: 3,2 mm for version 1 CO,
  5,0 mm for version 1 NO and 1 NC
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 CO, 1 NO, 1 NC
Contact material		**$AgSnO_2$**, $AgSnO_2$/Au hard gold plating
Rated / max. switching voltage	AC	250 V / 400 V
Min. switching voltage		10 V $AgSnO_2$, 5 V $AgSnO_2$/Au hard gold plating
Rated load (capacity)	AC1	8 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	8 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		10 mA $AgSnO_2$, 2 mA $AgSnO_2$/Au hard gold plating
Max. inrush current		15 A
Rated current		8 A
Max. breaking capacity	AC1	2 000 VA
Min. breaking capacity		1 W $AgSnO_2$, 0,05 W $AgSnO_2$/Au hard gold plating
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	600 cycles/hour
• no load		72 000 cycles/hour

Coil data

Rated voltage	DC	5, 6, 9, **12**, 18, **24**, 48 V
Must release voltage		DC: ≥ 0,1 U_n
Operating range of supply voltage		see Table 1 and Fig. 4
Rated power consumption	DC	0,22...0,3 W

Insulation according to EN 60664-1

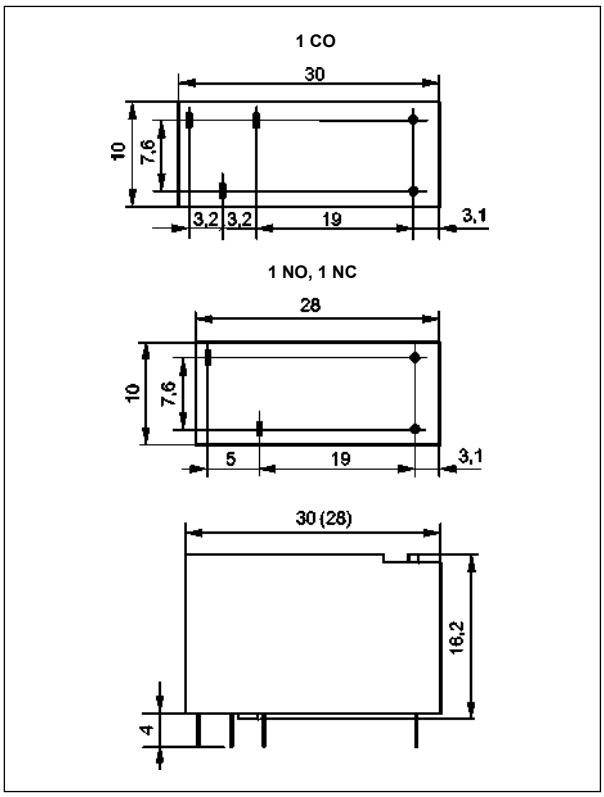
Insulation rated voltage	400 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Dielectric strength	
• between coil and contacts	4 000 V AC type of insulation: reinforced
• contact clearance	1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	
• clearance	≥ 8 mm
• creepage	≥ 8 mm

General data

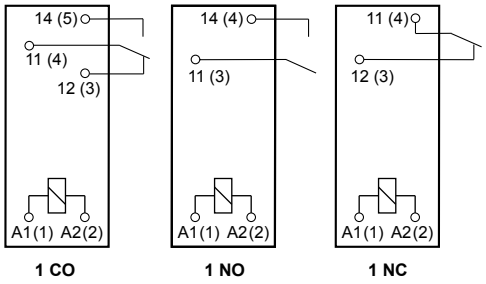
Operating / release time (typical values)		10 ms / 5 ms
Electrical life (number of cycles)		
• resistive AC1		$> 10^5$ 8 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		$> 2 \times 10^7$
Dimensions (L x W x H)		1 CO: 30 x 10 x 16,2 mm
		1 NO, 1 NC: 28 x 10 x 16,2 mm
Weight		11 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+80 °C
Cover protection category		IP 40 or **IP 67** EN 60529
Environmental protection		RTII EN 61810-7
Shock resistance		20 g
Vibration resistance		10 g 10...150 Hz
Solder bath temperature		max. 270 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Dimensions

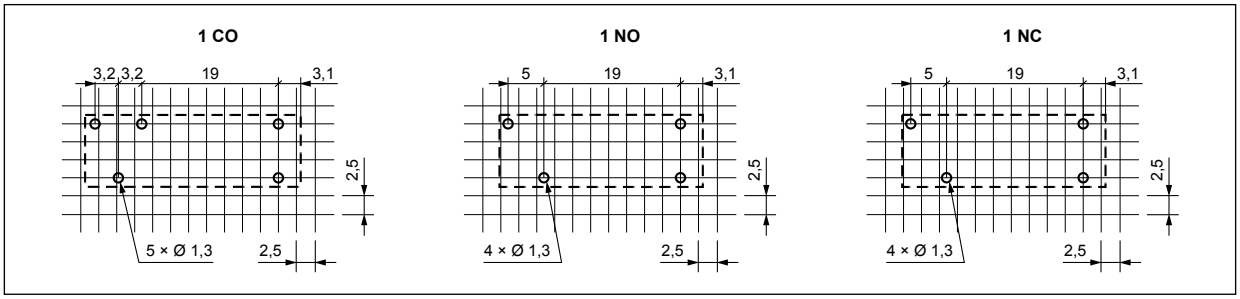


Connection diagrams (pin side view)



Terminal (pin)	A1(1); A2(2)	12(3); 11(4); 14(5)
[mm]	0,6 x 0,9	0,6 x 0,1
Drilling hole: • for relays	Ø 1,3 + 0,1 mm	

Pinout (solder side view)



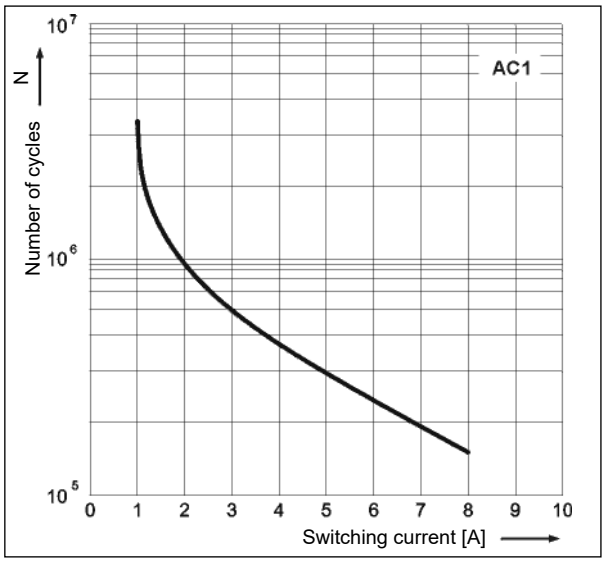
Mounting

Relays **RM96 1 NO** (one normally open contact) and **RM96 1 NC** (one normally closed contact) are designed for direct PCB mounting.
Relays **RM96 1 CO** (one changeover contact) are designed for: • direct PCB mounting • plug-in sockets.

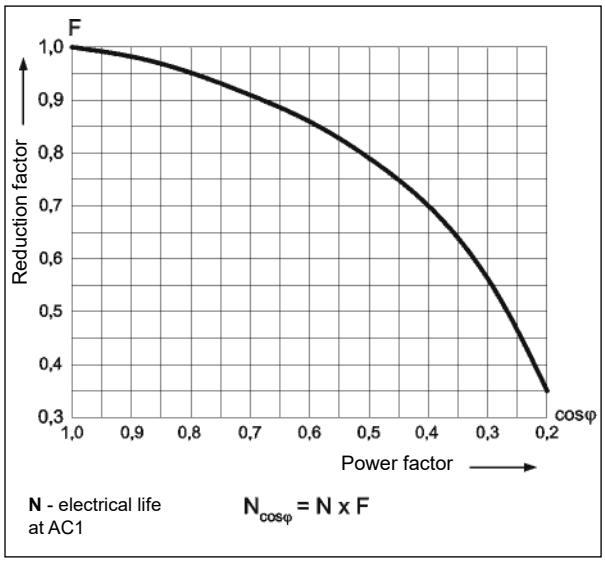
Sockets for RM96 1 CO	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
ES 32	MS 16	GZM80-0041	TR	M... ❷, ZGGZ80 ❸

❷ Signalling / protecting modules type M... - see page 399. ❸ Interconnection strips ZGGZ80 - see page 400.

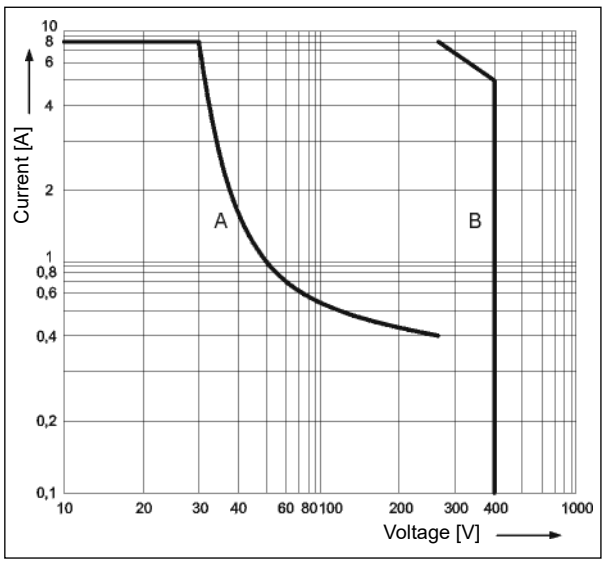
Electrical life at AC resistive current. Fig. 1
U_n = 230 V AC - version 1 NO



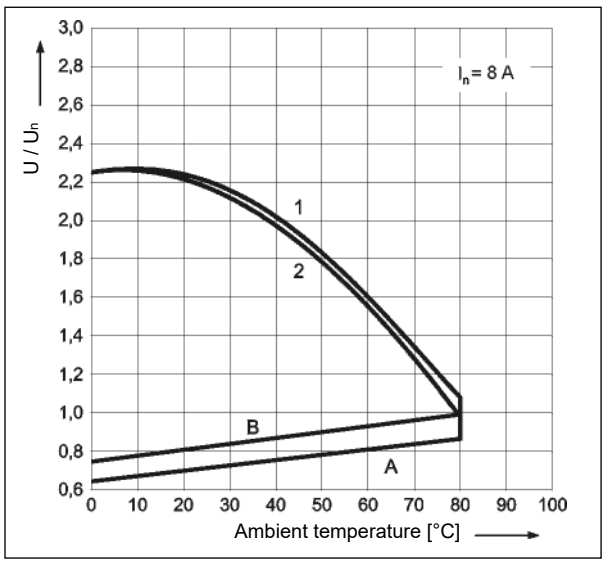
Electrical life reduction factor at AC inductive load Fig. 2



Max. breaking capacity
A - resistive load DC1
B - resistive load AC1 Fig. 3



Coil operating range - DC Fig. 4



Description of Fig. 4

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - rated load

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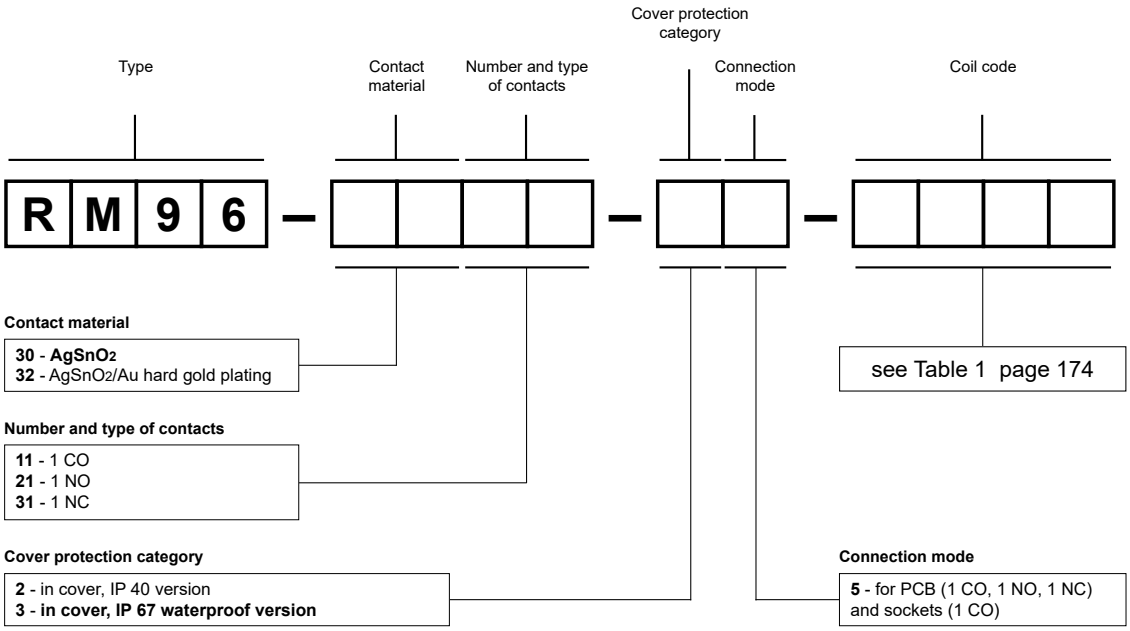
Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1005	5	110	± 10%	3,5	12,0
1006	6	160	± 10%	4,2	14,5
1009	9	360	± 10%	6,3	22,0
1012	**12**	**660**	**± 10%**	**8,4**	**29,5**
1018	18	1 500	± 10%	12,6	44,0
1024	**24**	**2 200**	**± 10%**	**16,8**	**54,0**
1048	48	8 000	± 10%	33,6	102,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



Examples of ordering codes:

RM96-3011-35-1012 relay **RM96**, for PCB and sockets, one changeover contact, contact material $AgSnO_2$, coil voltage 12 V DC, in cover IP 67

RM96-3021-25-1024 relay **RM96**, for PCB, one normally open contact, contact material $AgSnO_2$, coil voltage 24 V DC, in cover IP 40

ES 32

Screw terminals plug-in sockets for RM96 1 CO - see page 385.

RM83 **RM83-...-01**

- Miniature dimensions • General purpose relays
- **Version 1 NO $AgSnO_2$ - for special loads: resistance to inrush current 120 A (20 ms)**
- Protection category IP 40 or IP 67
- For PCB and plug-in sockets
- DC coils - standard and sensitive, insulation class F: 155 °C
- Available special versions: in transparent cover
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 CO, 1 NO, 1 NC	
Contact material		**$AgSnO_2$**	
Rated / max. switching voltage	AC	250 V / 400 V	
Min. switching voltage		10 V	
Rated load (capacity)	AC1	16 A / 250 V AC	
	AC15	6 A / 120 V	3 A / 240 V (A300)
	DC1	16 A / 24 V DC	(see Fig. 3)
	DC13	0,22 A / 120 V	0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP	240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,65 kW	240 V AC, single-phase motor
Min. switching current		10 mA	
Max. inrush current		30 A 1 NO, $AgSnO_2$	
Rated current		16 A	
Max. breaking capacity	AC1	4 000 VA	
Min. breaking capacity		1 W	
Contact resistance		≤ 100 mΩ	
Max. operating frequency			
• at rated load	AC1	600 cycles/hour	
• no load		72 000 cycles/hour	

Coil data

Rated voltage	DC	5, 6, 9, 12, 18, 24, 36, 48, 60, 110 V	standard coil
		110 V	sensitive coil
Must release voltage		DC: ≥ 0,1 U_n	
Operating range of supply voltage		see Table 1	
Rated power consumption	DC	0,6 W	5 ... 60 V standard coil
		0,6 W	110 V sensitive coil
		0,9 W	110 V standard coil

Insulation according to EN 60664-1

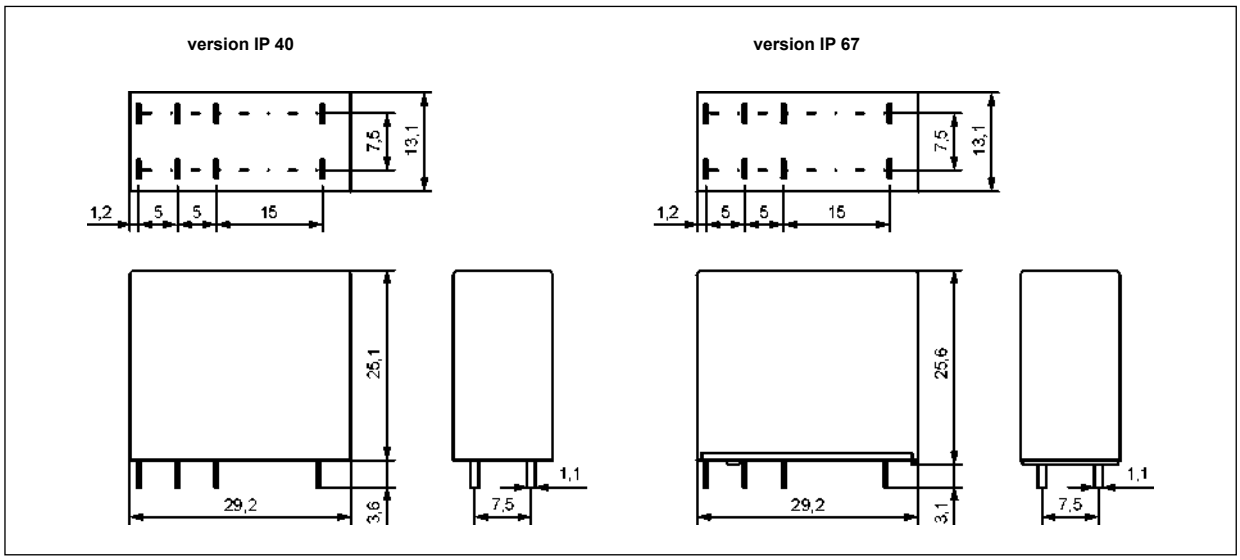
Insulation rated voltage		400 V AC	
Dielectric strength			
• between coil and contacts		4 000 V AC	type of insulation: reinforced
• contact clearance		1 000 V AC	type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 8 mm	
	• creepage	≥ 8 mm	

General data

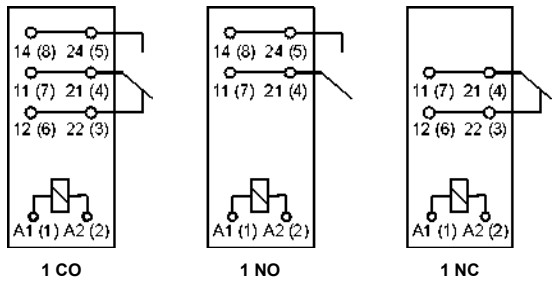
Operating / release time (typical values)		7 ms / 3 ms	
Electrical life (number of cycles)			
• resistive AC1		> 10^5	16 A, 250 V AC
• at incandescent lamp load		> 10^5	1000 W, 230 V AC, 1 NO, $AgSnO_2$
		> 3 x 10^4	3000 W, 230 V AC, 1 NO, $AgSnO_2$
• at halogen lamp load		> 10^4	2500 W, 230 V AC, 1 NO, $AgSnO_2$
• cosφ		see Fig. 2	
• L/R=40 ms		> 10^5	0,12 A, 220 V DC
Mechanical life (cycles)		> 3 x 10^7	
Dimensions (L x W x H)		IP 40: 29,2 x 13,1 x 25,1 mm	
		IP 67: 29,2 x 13,1 x 25,6 mm	
Weight		18 g	
Ambient temperature	• storage	-40...+85 °C	
(non-condensation and/or icing)	• operating	-40...+70 °C	
Cover protection category		**IP 40** or IP 67	EN 60529
Environmental protection		**RTI** or RTII	EN 61810-7
Shock / vibration resistance		20 g / 10 g	10...150 Hz
Solder bath temperature / Soldering time		max. 270 °C / max. 5 s	

The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Dimensions



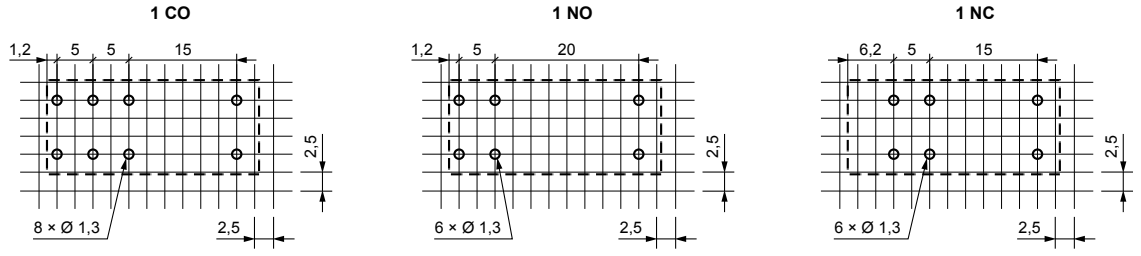
Connection diagrams (pin side view)



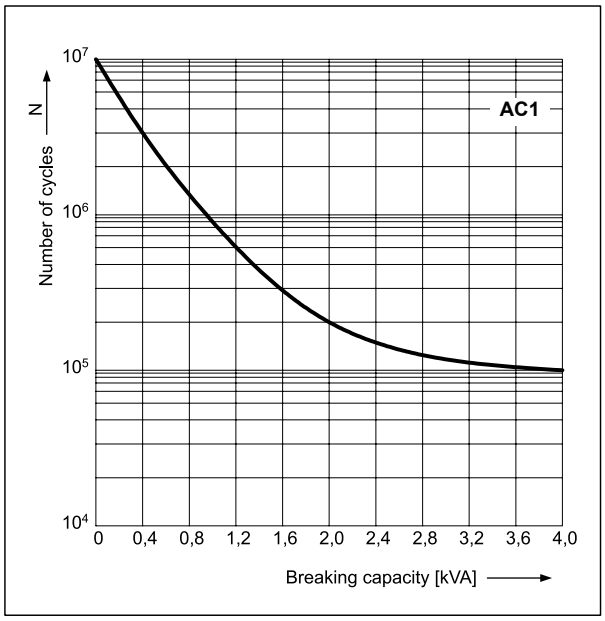
Terminal (pin)	A1(1); A2(2)	21(4); 11(7)	22 (3); 24 (5); 12 (6); 14 (8)
[mm]	0,4 x 1,1	0,2 x 1,1	0,4 x 1,1
Drilling hole: • for relays • for sockets	 Ø 1,3 + 0,1 mm Ø 1,5 + 0,1 mm		

RM83 terminals are doubled for each contact.
Both terminals are to be used while connecting to load.

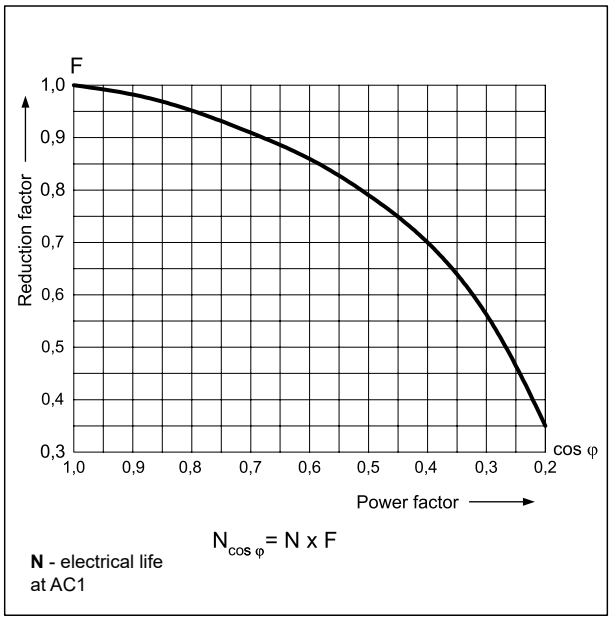
Pinout (solder side view)



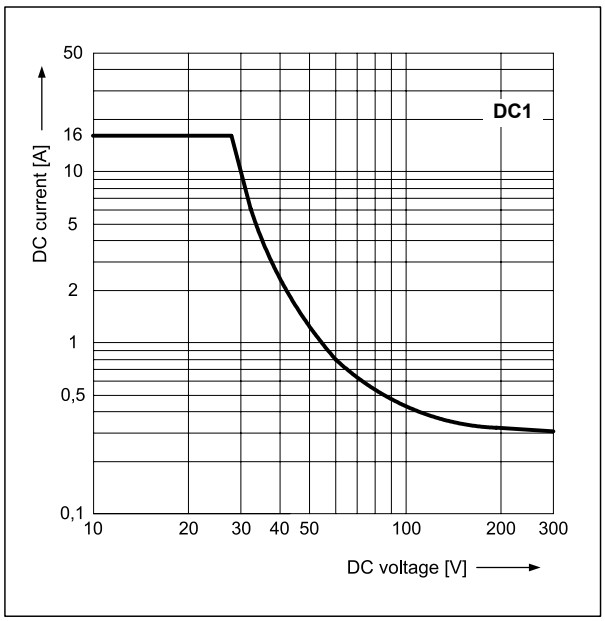
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



Electrical life reduction factor at AC inductive load Fig. 2



Max. DC resistive load breaking capacity Fig. 3



Mounting, sockets and accessories for relays

Relays **RM83** are designed for: • direct PCB mounting • plug-in sockets.

Sockets for RM83	**Accessories**
	Spring wire clips
Sockets for PCB	
PW80	MH25-2
EC 50	MP25-2 ❷, MH25-2
GD50	MP25-2 ❷, MH25-2

❷ Plastic clips MP25-2.

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Coil data - DC voltage version, standard

Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1005	5	49	± 10%	3,5	8,9
1006	6	68	± 10%	4,2	10,6
1009	9	110	± 10%	6,3	15,9
1012	**12**	**260**	**± 10%**	**8,4**	**21,2**
1018	18	550	± 10%	12,6	31,8
1024	**24**	**1 100**	**± 10%**	**16,8**	**42,5**
1036	36	2 100	± 10%	25,2	63,7
1048	48	4 400	± 10%	33,6	85,0
1060	60	7 000	± 10%	42,0	106,2
1110	110	13 000	± 10%	77,0	140,0

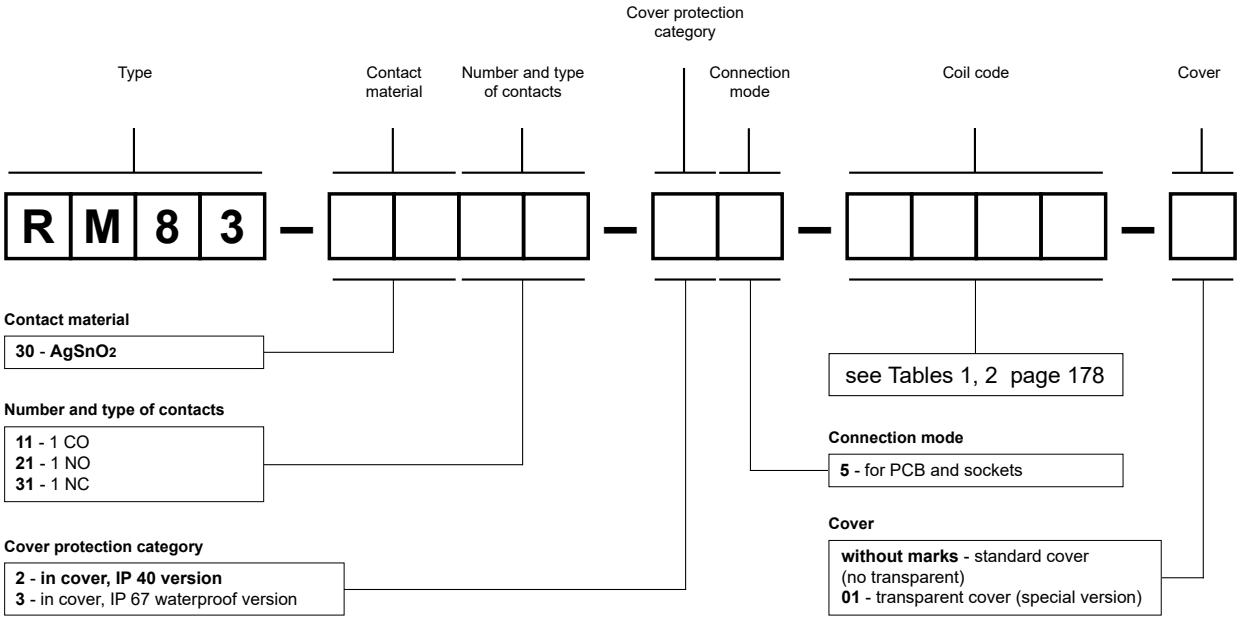
The data in bold type relate to the standard versions of the relays.

Coil data - DC voltage version, sensitive

Table 2

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
S110	110	20 500	± 10%	77,0	188,0

Ordering codes



Examples of ordering code:

RM83-3011-25-1024 relay **RM83**, for PCB and sockets, one changeover contact, contact material $AgSnO_2$, coil voltage 24 V DC, in standard cover (no transparent) IP 40

RM83-3011-25-S110 relay **RM83**, for PCB and sockets, one changeover contact, contact material $AgSnO_2$, sensitive coil voltage 110 V DC, in standard cover (no transparent) IP 40

RM83-3021-35-1012-01 relay **RM83**, for PCB and sockets, one normally open contact, contact material $AgSnO_2$, coil voltage 12 V DC, in transparent cover (special version) IP 67

RMP84 (AC) **RMP84 (DC)**

- Cadmium - free contacts • Height 25,5 mm
- Reinforced insulation
- For plug-in sockets
- Accessories: sockets and modules
- AC and DC coils
- WT (mechanical indicator + lockable front test button) - standard equipment of relays
- Recognitions, certifications, directives: RoHS, CE

Contact data

Number and type of contacts		2 CO
Contact material		**AgNi**
Rated / max. switching voltage	AC	250 V / 440 V
Min. switching voltage		12 V 10 mA
Rated load	AC1	8 A / 250 V AC
Min. switching current		10 mA 12 V
Max. inrush current		16 A 20 ms
Rated current		8 A
Max. breaking capacity	AC1	2 000 VA
Min. breaking capacity		0,12 W 10 mA / 12 V
Contact resistance		≤ 100 mΩ 1 A / 6 V DC
Max. operating frequency		
• at rated load	AC1	360 cycles/hour
• no load		18 000 cycles/hour

Coil data

Rated voltage	50 Hz AC	**24**, 115, **230** V
	DC	**12**, **24**, 48, 110 V
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2
Rated power consumption	AC	0,75 VA ❶
	DC	0,4 ... 0,48 W ❶

Insulation according to EN 60664-1

Insulation rated voltage		440 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Insulation resistance		1 000 MΩ 500 V DC
Dielectric strength		
• between coil and contacts		5 000 V AC type of insulation: reinforced
• contact clearance		1 000 V AC type of clearance: micro-disconnection
• pole - pole		2 500 V AC type of insulation: basic
Contact - coil distance		
• clearance		≥ 8 mm
• creepage		≥ 8 mm

General data

Operating / release time (typical values)		15 ms / 8 ms
Electrical life (number of cycles)	• resistive AC1	> 3 x 10^4 AC coils, 8 A, 250 V AC, ON for 5 s / OFF for 5 s
		> 10^4 DC coils, 8 A, 250 V AC, ON for 5 s / OFF for 5 s
		> 5 x 10^4 8 A, 250 V AC, 70 °C, ON for 1 s / OFF for 9 s
Mechanical life (cycles)		> 10^6 AC coils
		> 5 x 10^6 DC coils
Dimensions (L x W x H)		29 x 13 x 25,5 mm
Weight		16 g
Ambient temperature	• storage	-40...+70 °C
(non-condensation and/or icing)	• operating	-40...+70 °C ❷ ❸
Cover protection category		IP 40 EN 60529
Environmental protection		RTII EN 61810-7
Relative humidity		5...85%
Shock resistance		10 g
Vibration resistance	(NO/NC)	10 g / 5 g length direction: 10 g / 2 g ❸ 10...150 Hz
Solder bath temperature		max. 270 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays. ❶ The data don't include the power of electronic indicating circuit when the relay picks-up. ❷ Operating temperature for relays mounted in sockets on 35 mm rail mount: -40...+55 °C. ❸ The distance between the relays mounted side by side: min. 5 mm for versions AC; min. 1,5 mm for versions DC.

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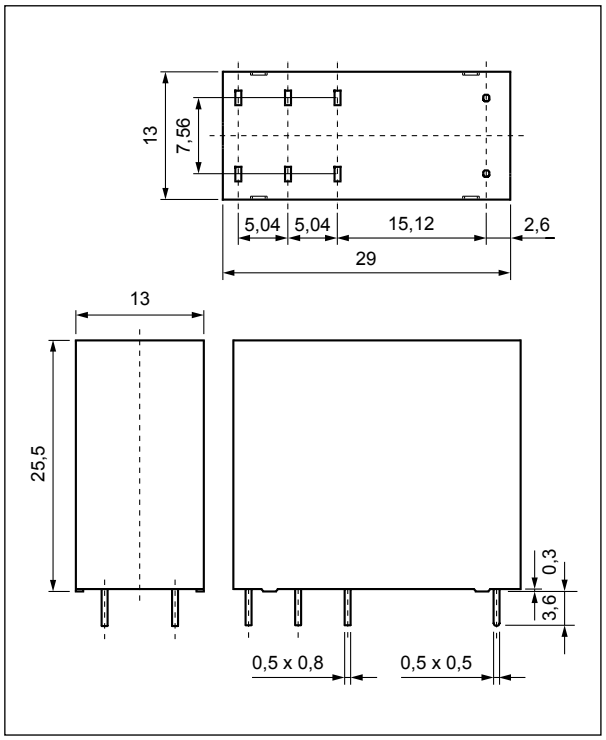
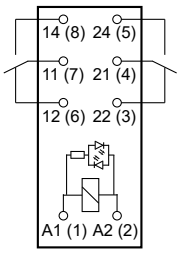
Dimensions



Connection diagram (pin side view)



2 CO

Terminal (pin)	A1(1); A2(2)	22(3); 21(4); 24(5); 12(6); 11(7); 14(8)
[mm]	0,5 x 0,5	0,5 x 0,8
Drilling hole: • for sockets	Ø 1,5 + 0,1 mm	

Test buttons type T

orange
(AC coils)

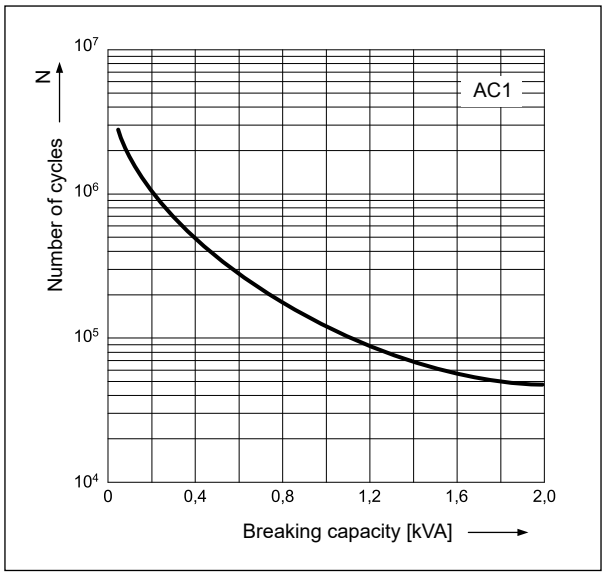
blue
(DC coils)

Note: normally open contacts may be closed with the blocking function of the test button of the T type (it shall be bent by 90° to vertical position). When the button is drawn back, the normally open contacts are opened.

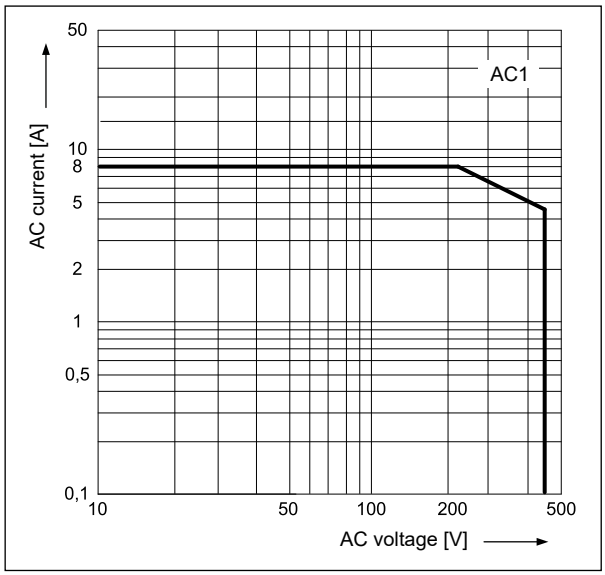
GZF80, GZP80, EC 50, GD50

Plug-in sockets
for relays
RMP84, RMP85
- see pages 383, 384.

Electrical life at AC resistive load. Switching frequency: 360 cycles/hour Fig. 1



Max. AC 50 Hz resistive load breaking capacity Fig. 2



Mounting, sockets and accessories for relays

Relays **RMP84** ❸ are designed for mounting in plug-in sockets.

Sockets for RMP84	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZF80	–	GZ80-1001	–	–
Push-in terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZP80 ❹	GZP80-0400	GZ80-1001	MP15	M... ❺, ZGZP80-8, ZGZP80-2, ZGZP-2 ❻
Sockets for PCB				
EC 50	–	MH25-2	–	–
GD50	–	MH25-2	–	–

❸ The distance between the relays mounted side by side: min. 5 mm for versions AC; min. 1,5 mm for versions DC. ❹ Sockets GZP80: wire connection - see page 383. ❺ Signalling / protecting modules type M... - see page 399. ❻ Interconnection strips ZGZP... - see page 402.

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Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC	Coil resistance at 23 °C Ω	Acceptable resistance	Coil operating range V DC ❼	
				min. (0...+70 °C)	max. (0...+70 °C)
1012	**12**	**360**	**± 10%**	**8,4**	**18,0**
1024	**24**	**1 440**	**± 10%**	**16,8**	**36,0**
1048	48	5 760	± 15%	33,6	72,0
1110	110	25 200	± 15%	77,0	165,0

The data in bold type relate to the standard versions of the relays. ❼ The max. allowable voltage is coil overdrive voltage, it is the instantaneous max. voltage which the relay coil could endure in very short time. Relays with 48 V DC and 110 V DC coils shall be absolutely protected against any possibility of operation at voltages higher than the rated voltage.

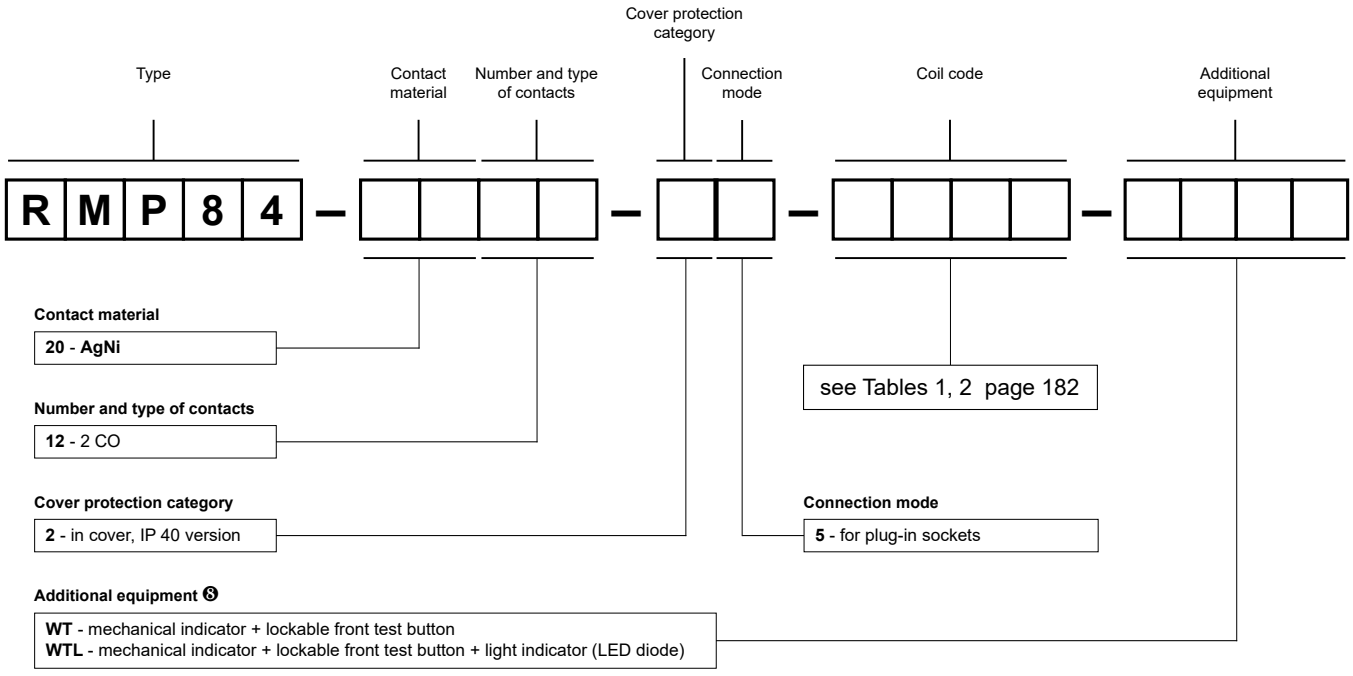
Coil data - AC 50 Hz voltage version

Table 2

Coil code	Rated voltage V AC	Coil resistance at 23 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (0...+70 °C)	max. (0...+70 °C)
5024	**24**	**350**	**± 10%**	**18,0**	**26,4**
5115	115	8 100	± 15%	86,3	126,5
5230	**230**	**32 500**	**± 15%**	**172,5**	**253,0**

The data in bold type relate to the standard versions of the relays.

Ordering codes



❽ **WT** - standard equipment of relays. Test buttons type T - see page 180.

Examples of ordering code:

RMP84-2012-25-1024-WT relay **RMP84**, for plug-in sockets, two changeover contacts, contact material AgNi, coil voltage 24 V DC, with mechanical indicator and lockable front test button, in cover IP 40

RMP84-2012-25-5230-WTL relay **RMP84**, for plug-in sockets, two changeover contacts, contact material AgNi, coil voltage 230 V AC 50 Hz, with mechanical indicator and lockable front test button and light indicator (LED diode), in cover IP 40

RMP85 (AC)

RMP85 (DC)

- Cadmium - free contacts • Height 25,5 mm
- Reinforced insulation
- For plug-in sockets
- Accessories: sockets and modules
- AC and DC coils
- WT (mechanical indicator + lockable front test button) - standard equipment of relays
- Recognitions, certifications, directives: RoHS, CE

Contact data

Number and type of contacts		1 CO
Contact material		**AgNi**
Rated / max. switching voltage	AC	250 V / 440 V
Min. switching voltage		12 V 10 mA
Rated load	AC1	16 A / 250 V AC
Min. switching current		10 mA 12 V
Max. inrush current		32 A 20 ms
Rated current		16 A
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		0,12 W 10 mA / 12 V
Contact resistance		≤ 100 mΩ 1 A / 6 V DC
Max. operating frequency		
• at rated load	AC1	360 cycles/hour
• no load		18 000 cycles/hour

Coil data

Rated voltage	50 Hz AC	**24**, 115, **230** V
	DC	**12**, **24**, 48, 110 V
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2
Rated power consumption	AC	0,75 VA ❶
	DC	0,4 ... 0,48 W ❶

Insulation according to EN 60664-1

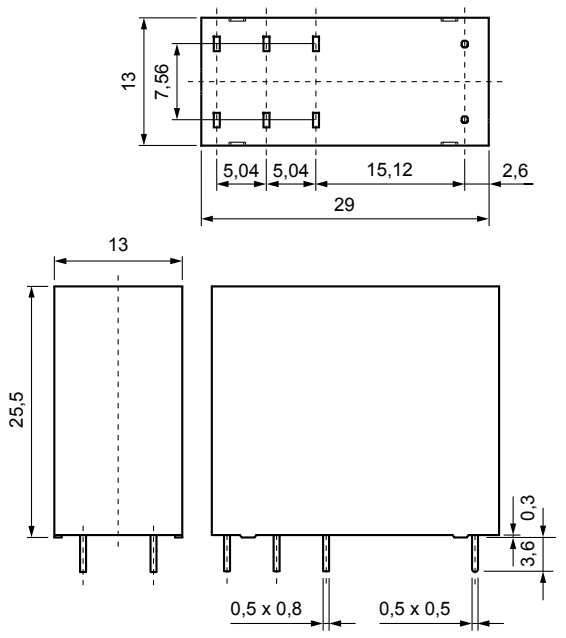
Insulation rated voltage		440 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Insulation resistance		1 000 MΩ 500 V DC
Dielectric strength		
• between coil and contacts		5 000 V AC type of insulation: reinforced
• contact clearance		1 000 V AC type of clearance: micro-disconnection
Contact - coil distance		
• clearance		≥ 8 mm
• creepage		≥ 8 mm

General data

Operating / release time (typical values)		15 ms / 8 ms
Electrical life (number of cycles)	• resistive AC1	> 3 x 10^4 AC coils, 16 A, 250 V AC, ON for 5 s / OFF for 5 s
		> 10^4 DC coils, 16 A, 250 V AC, ON for 5 s / OFF for 5 s
		> 3 x 10^4 16 A, 250 V AC, 70 °C, ON for 1 s / OFF for 9 s
Mechanical life (cycles)		> 10^6 AC coils
		> 5 x 10^6 DC coils
Dimensions (L x W x H)		29 x 13 x 25,5 mm
Weight		16 g
Ambient temperature	• storage	-40...+70 °C
(non-condensation and/or icing)	• operating	-40...+70 °C ❷ ❸
Cover protection category		IP 40 EN 60529
Environmental protection		RTII EN 61810-7
Relative humidity		5...85%
Shock resistance		10 g
Vibration resistance	(NO/NC)	10 g / 5 g length direction: 10 g / 2 g ❸ 10...150 Hz
Solder bath temperature		max. 270 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays. ❶ The data don't include the power of electronic indicating circuit when the relay picks-up. ❷ Operating temperature for relays mounted in sockets on 35 mm rail mount: -40...+55 °C. ❸ The distance between the relays mounted side by side: min. 5 mm for versions AC; min. 1,5 mm for versions DC.

Dimensions



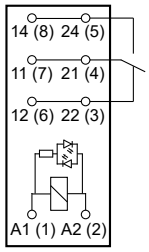
Test buttons type T

orange
(AC coils)

blue
(DC coils)

Note: normally open contacts may be closed with the blocking function of the test button of the T type (it shall be bent by 90° to vertical position). When the button is drawn back, the normally open contacts are opened.

Connection diagram (pin side view)

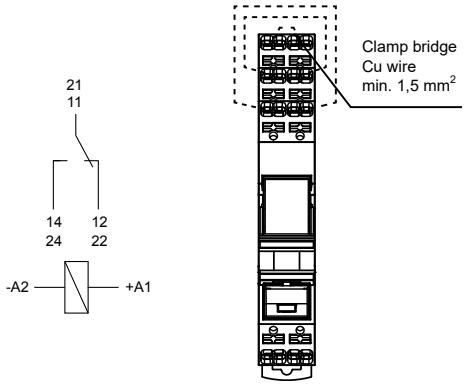


1 CO

Terminal (pin)	A1(1); A2(2)	22(3); 21(4); 24(5); 12(6); 11(7); 14(8)
[mm]	0,5 x 0,5	0,5 x 0,8
Drilling hole: • for sockets	Ø 1,5 + 0,1 mm	

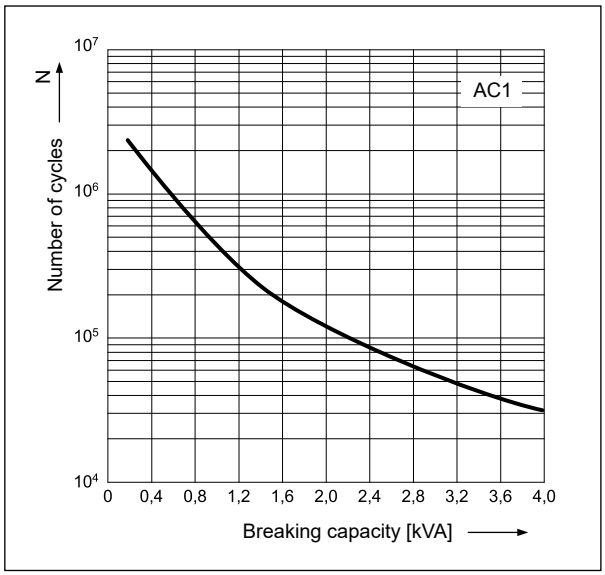
RMP85 terminals are doubled for each contact.
Both terminals are to be used while connecting to load.

Connection of GZ.80 sockets

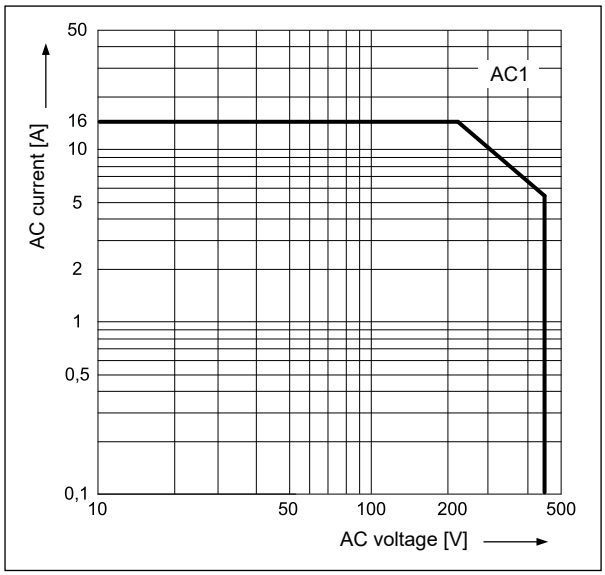


Note: loads above 12 A (GZP80) or 10 A (GZF80) require bridging pairs of spring terminals: 11 with 21, 12 with 22, 14 with 24. Loads up to 10 A do not require bridging of common terminals (such bridges may be fixed, however).

Electrical life at AC resistive load. Switching frequency: 360 cycles/hour Fig. 1



Max. AC 50 Hz resistive load breaking capacity Fig. 2



Mounting, sockets and accessories for relays

Relays **RMP85** ❸ are designed for mounting in plug-in sockets.

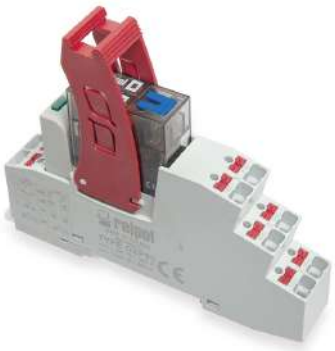
Sockets for RMP85	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZF80 ❹	–	GZ80-1001	–	–
Push-in terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZP80 ❹ ❺	GZP80-0400	GZ80-1001	MP15	M... ❻, ZGZP80-8, ZGZP80-2, ZGZP-2 ❼
Sockets for PCB				
EC 50	–	MH25-2	–	–
GD50	–	MH25-2	–	–

❸ The distance between the relays mounted side by side: min. 5 mm for versions AC; min. 1,5 mm for versions DC. ❹ Sockets GZ.80: load connection - see page 184. ❺ Sockets GZP80: wire connection - see page 383. ❻ Signalling / protecting modules type M... - see page 399. ❼ Interconnection strips ZGZP... - see page 402.

GZP80

Push-in terminals plug-in sockets for RM84, RM85..., RM87L, RM87P, RMP84, RMP85 - see page 383.

NEW



Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC	Coil resistance at 23 °C Ω	Acceptable resistance	Coil operating range V DC ❽	
				min. (0...+70 °C)	max. (0...+70 °C)
1012	**12**	**360**	**± 10%**	**8,4**	**18,0**
1024	**24**	**1 440**	**± 10%**	**16,8**	**36,0**
1048	48	5 760	± 15%	33,6	72,0
1110	110	25 200	± 15%	77,0	165,0

The data in bold type relate to the standard versions of the relays. ❽ The max. allowable voltage is coil overdrive voltage, it is the instantaneous max. voltage which the relay coil could endure in very short time. Relays with 48 V DC and 110 V DC coils shall be absolutely protected against any possibility of operation at voltages higher than the rated voltage.

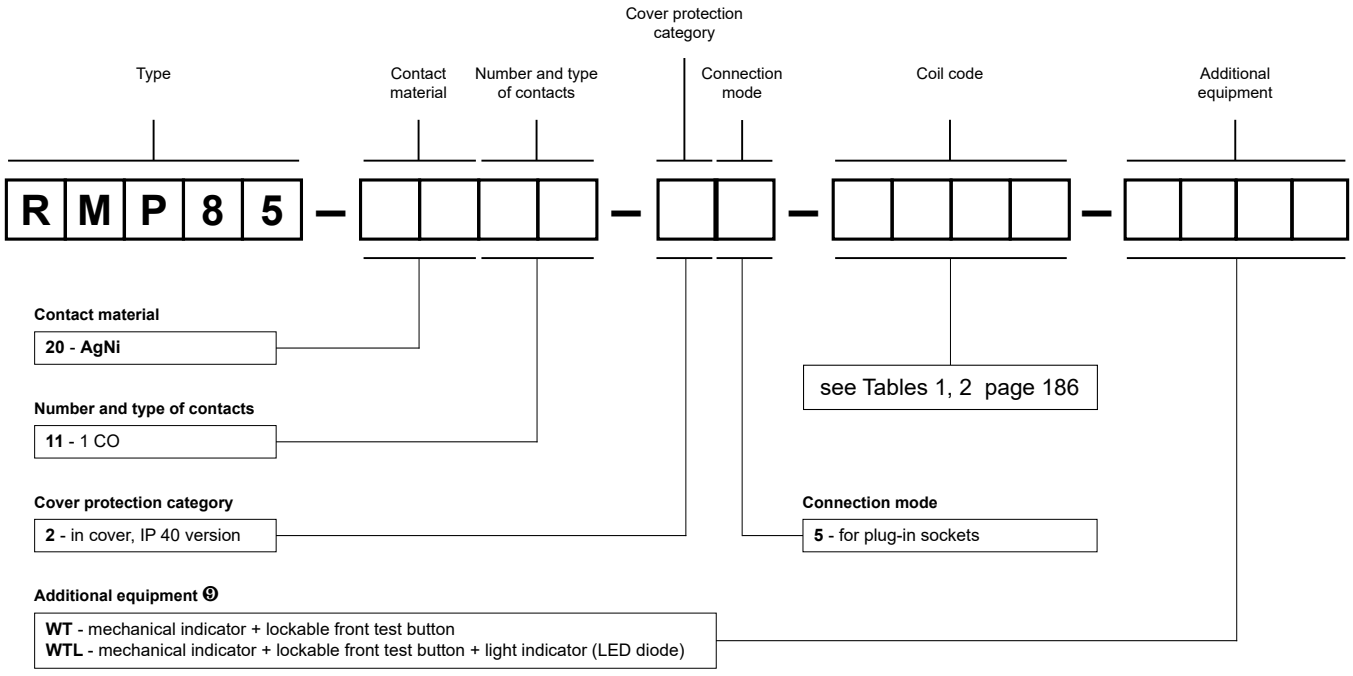
Coil data - AC 50 Hz voltage version

Table 2

Coil code	Rated voltage V AC	Coil resistance at 23 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (0...+70 °C)	max. (0...+70 °C)
5024	**24**	**350**	**± 10%**	**18,0**	**26,4**
5115	115	8 100	± 15%	86,3	126,5
5230	**230**	**32 500**	**± 15%**	**172,5**	**253,0**

The data in bold type relate to the standard versions of the relays.

Ordering codes



❾ **WT** - standard equipment of relays. Test buttons type T - see page 184.

Examples of ordering code:

RMP85-2011-25-1024-WT relay **RMP85**, for plug-in sockets, one changeover contact, contact material AgNi, coil voltage 24 V DC, with mechanical indicator and lockable front test button, in cover IP 40

RMP85-2011-25-5230-WTL relay **RMP85**, for plug-in sockets, one changeover contact, contact material AgNi, coil voltage 230 V AC 50 Hz, with mechanical indicator and lockable front test button and light indicator (LED diode), in cover IP 40

- Cadmium - free contacts • Miniature dimensions
- Automotive applications
- High resistance to inrush current
- For PCB
- Following relays versions are available:
  RA2 - standard design
  RAW2 - narrow pin layout design
- Recognitions, certifications, directives: RoHS

Contact data

Number and type of contacts		1 CO, 1 NO, 2 NO
Contact material		**$AgSnO_2$**
Rated / max. switching voltage	DC	50 V / 50 V
Min. switching voltage		1 V
Min. switching current		10 mA
Max. inrush current		1 CO: 110 A / 50 A (NO/NC) 1 NO: 110 A 2 NO: 2 x 110 A
Rated current		1 CO: 20 A / 12 A (NO/NC) 1 NO: 20 A 2 NO: 2 x 12,5 A
Max. breaking capacity		1 CO: 270 W / 162 W (NO/NC) 1 NO: 270 W 2 NO: 2 x 168 W
Min. breaking capacity		1 W
Contact resistance		≤ 3 mΩ
Max. operating frequency • at rated load • at motor load • at incandescent lamp load • no load	 AC1	 900 cycles/hour 2 s ON / 2 s OFF 450 cycles/hour 2 s ON / 6 s OFF 120 cycles/hour 2 s ON / 30 s OFF 36 000 cycles/hour

Coil data

Rated voltage	DC	5, 6, 9, **12**, 15, 18, 24, 48 V
Must release voltage		DC: ≥ 0,15 U_n
Operating range of supply voltage		see Table 1
Must operate voltage		≤ 0,6 U_n
Rated power consumption	DC	1,44 W

Insulation

Insulation rated voltage	50 V AC
Dielectric strength • between coil and contacts • contact clearance	 500 V AC 500 V AC
Contact - coil distance • clearance • creepage	 ≥ 1 mm ≥ 1 mm

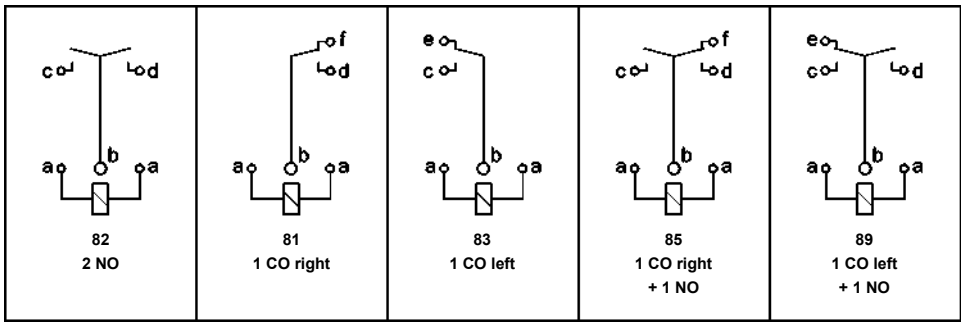
General data

Operating / release time (typical values)		10 ms / 3 ms
Electrical life • resistive DC1		 1 CO: > 10^5 20 A / 12 A (NO/NC), 13,5 V DC 1 NO: > 10^5 20 A, 13,5 V DC 2 NO: > 10^5 2 x 12,5 A, 13,5 V DC
Mechanical life (cycles)		> 10^7
Dimensions (L x W x H)		IP 00: 18,6 x 13,0 x 18,5 mm IP 40: 20,5 x 15,3 x 19,7 mm
Weight		12 g
Ambient temperature (non-condensation and/or icing)	• storage • operating	-40...+100 °C -40...+85 °C
Cover protection category		IP 40 or **IP 00 (without cover)** EN 60529
Environmental protection		RTI EN 61810-7
Solder bath temperature		max. 270 °C
Soldering time		max. 5 s

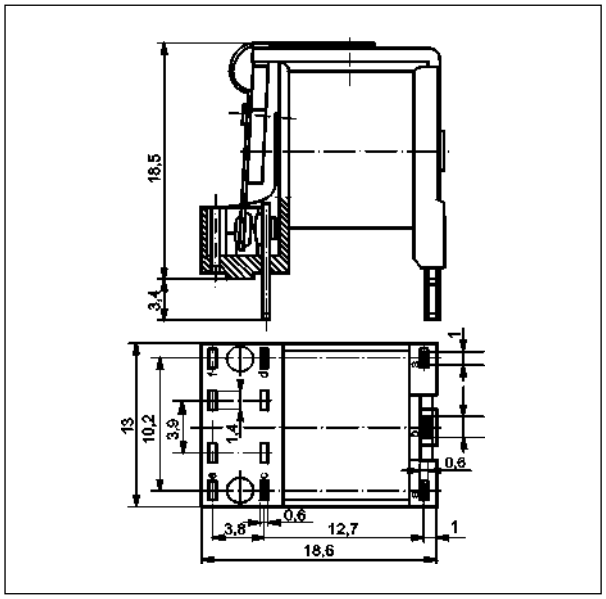
The data in bold type relate to the standard versions of the relays.

Connection diagrams (pin side view)

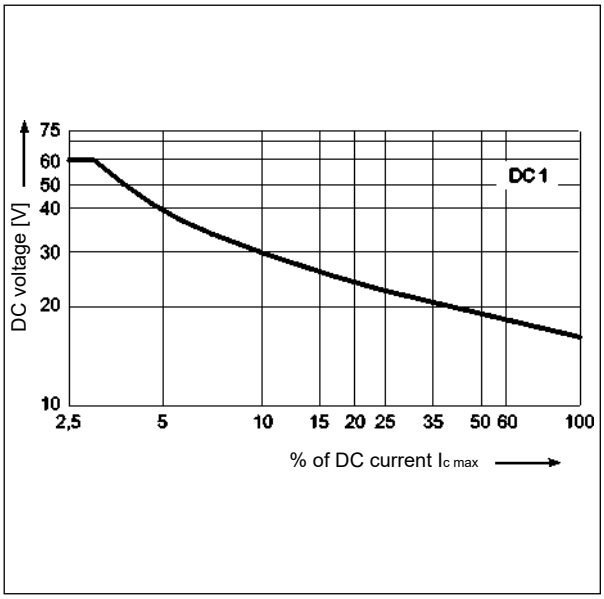
Relay terminals:
c, d, e, f - 0,6 x 1,4 mm **a** - 0,6 x 1,0 mm **b** - 1,0 x 1,5 mm



Dimensions



Max. DC resistive load breaking capacity Fig. 1



Mounting

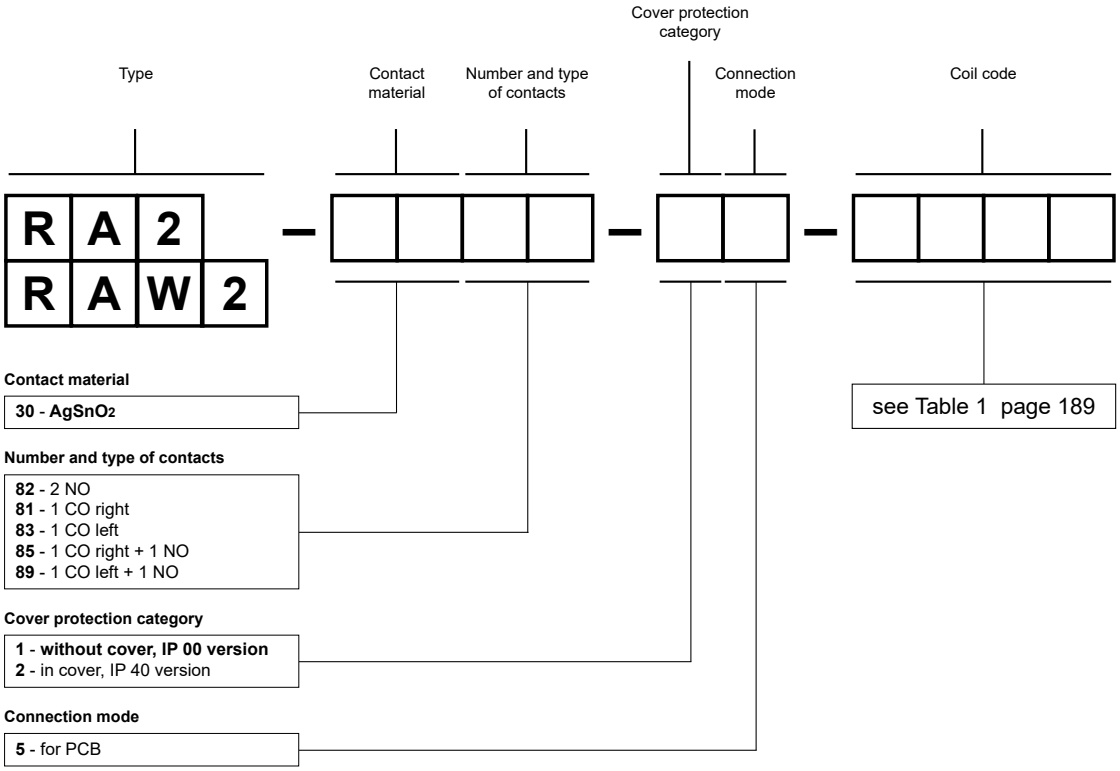
Relays **RA2** are designed for direct PCB mounting.

Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1005	5	18	± 10%	4,0	6,6
1006	6	24	± 10%	4,8	8,0
1009	9	55	± 10%	7,2	12,0
1012	**12**	**100**	**± 10%**	**9,6**	**16,0**
1015	15	152	± 10%	12,0	20,0
1018	18	230	± 10%	14,4	23,9
1024	24	390	± 10%	19,2	31,9
1048	48	1 590	± 10%	38,4	63,8

The data in bold type relate to the standard versions of the relays.

Ordering codes



Examples of ordering codes:

RA2-3081-15-1012 relay **RA2**, for PCB, one right changeover contact, contact material $AgSnO_2$, coil voltage 12 V DC, without cover IP 00

RAW2-3082-25-1024 relay **RAW2** with narrow pin layout design, for PCB, two normally open contacts, contact material $AgSnO_2$, coil voltage 24 V DC, in cover IP 40

Industrial relays

relpol S.A.

Industrial relays are applied mainly in industrial and power automation systems, in signaling and protection systems, in other control and electric drives systems. The main products of Relpol S.A. have been successfully applied in industrial automation for many years. Their reliability and quality have been acknowledged by numerous prizes and awards, and by the Customers' satisfaction.

The basic features of industrial relays are: contact number: from 1 to 4, rated contact switching currents up to 48 A (depending on the relay type), versions with coil overvoltage suppression, versions with flag indicators and manual relay test pushbuttons with the possibility of latching the normally open contacts closed, mounting on THT, plug-in sockets, 35 mm rails; screw and spring terminals of plug-in sockets, and via flat connecting inserts. R2N, R3N and R4N relays are the basis for the interface relays of PIR2, PIR3 and PIR4 types which are described in the section of "Interface relays".

They meet the requirements of REACH and RoHS Directive. The relays are recognized and certified by:

miniature industrial

industrial of small dimensions

← Contents

R2N (AC) R2N (DC)

12 A / 250 V AC

- Relays of general application
- For plug-in sockets: on 35 mm rail mount acc. to EN 60715; on panel mounting; with terminals for soldering
- AC and DC coils, insulation class F: 155 °C
- WT (mechanical indicator + lockable front test button) - standard equipment of relays. Relays may be provided with the test buttons (no latching) and plugs - page 405
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		2 CO
Contact material		**AgNi**, AgNi/Au flash gold plating
Rated / max. switching voltage	AC	250 V / 440 V
Min. switching voltage		10 V
Rated load (capacity)	AC1	12 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	12 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		5 mA
Max. inrush current		24 A
Rated current		12 A
Max. breaking capacity	AC1	3 000 VA
Min. breaking capacity		0,3 W
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	1 200 cycles/hour
	• no load	12 000 cycles/hour

Coil data

Rated voltage	50/60 Hz AC	6, 12, **24**, 42, 48, 60, 80, 110, 115, 120, 127, 220, **230**, 240 V
	DC	5, 6, **12**, **24**, 48, 60, 80, 110, 125, **220** V
Must release voltage		AC: ≥ 0,2 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2 and Fig. 4, 5
Rated power consumption	AC	1,6 VA
	DC	0,9 W

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	2 500 V AC type of insulation: basic
	• contact clearance	1 500 V AC type of clearance: micro-disconnection
	• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 2,5 mm
	• creepage	≥ 4 mm

General data

Operating / release time (typical values)		AC: 10 ms / 8 ms DC: 13 ms / 3 ms
Electrical life	• resistive AC1	> 10^5 12 A, 250 V AC
	• cosφ	see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		27,4 x 21 x 35,5 mm
Weight		35 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	AC: -40...+55 °C DC: -40...+70 °C
Cover protection category		IP 40 EN 60529
Environmental protection		RTI EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g
Vibration resistance		5 g 10...150 Hz

The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

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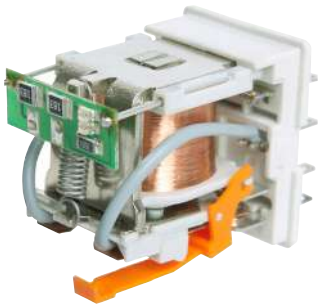
Design

Improvement of the functionality of the mechanical indicator (W): it is mounted on an insulation base of the unit of the movable contacts; the changes provide the appropriate position in the window in the upper side of the housing irrespectively of the number of operations performed by the relay.

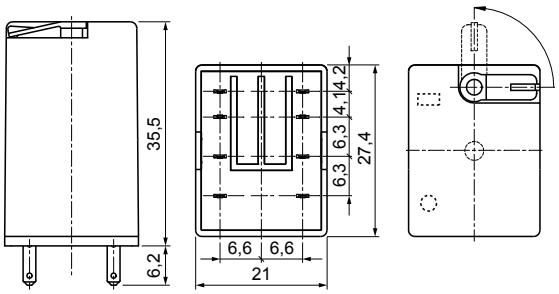


Application of electronics made in the SMD technology: additional equipment L (LED diode) and D (diode) are located on the printed circuit board; the change of the position of the LED diode and optimization of the quality and intensity of its light provide certainty that the relay is in operation status when the LED is on.

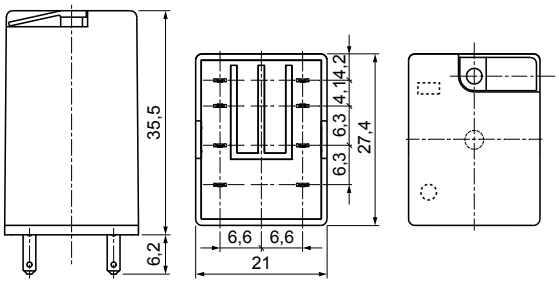
Improvement of the efficiency of the electromagnet: an innovational technology of connecting elements has been introduced, which guarantees more reliable operation of the relay.

Strengthening of the insulation in the area of the contact plate: polyamide PA66 has been applied; it has very good mechanical and electrical parameters and best thermal properties.

Dimensions - plug-in version (WT), with lockable front test button type T

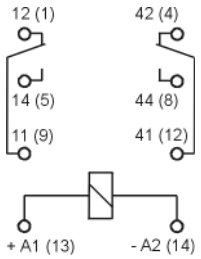


Dimensions - plug-in version, with test button (no latching) or with plug (no manual operation)



Test buttons R4P-0001 and **plugs R4W-0003** need to ordered saparately. They substitute buttons type T. To exchange by Customer themselves. Information on test buttons (no latching) and plugs - page 405.

Connection diagram (pin side view)



2 CO

Note: the indicated polarization of the supply refers to the relays with extra equipment **D** - surge suppression element (diode) - for DC coils only.

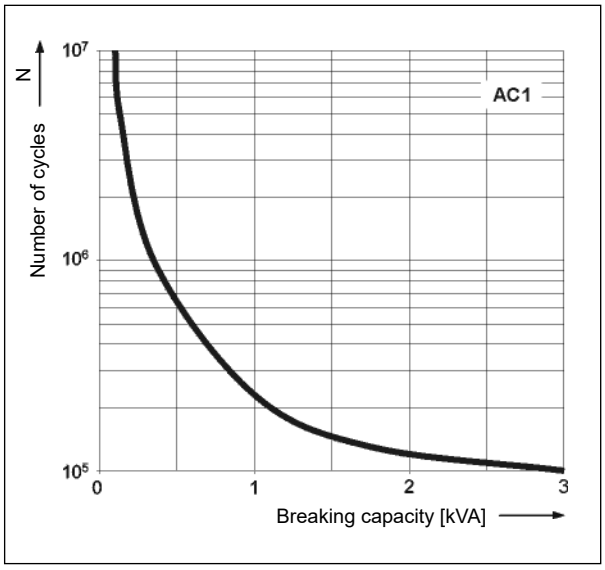
Mounting, sockets and accessories for relays

Relays **R2N** are designed for mounting in plug-in sockets. **With WT equipment as standard** (**W** - mechanical indicator + **T** - lockable front test button). In these relays is **possibility self-exchange of button type T for test button R4P-0001** (no latching) **or on plug R4W-0003** (no manual operation). The buttons **R4P-0001** and the plugs **R4W-0003 need to ordered saparately**.

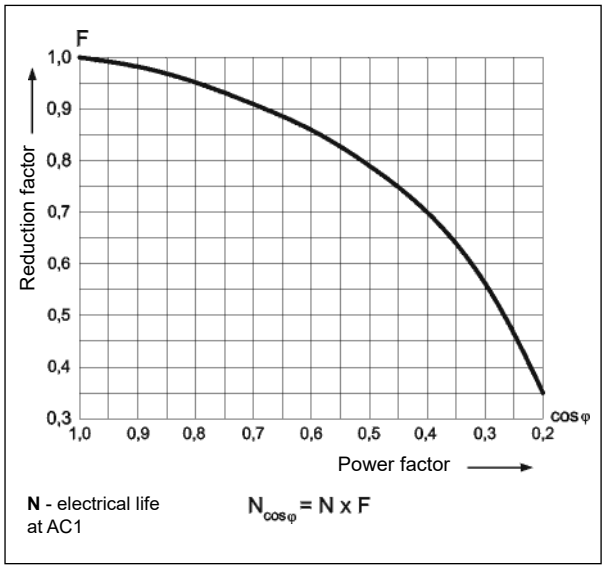
Sockets for R2N	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)				
GZT2	GZT4-0040	G4 1052	GZT4-0035	M... ❸, ZGGZ4 ❹
GZM2	GZT4-0040	G4 1052	GZT4-0035	M... ❸, ZGGZ4 ❹
Push-in terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)				
GZP4 ❷	GZP4-0400, GZT4-0040	G4 1052	MP15	M... ❸, ZGZP4-8, ZGZP4-2, ZGZP-2 ❹
Sockets for PCB				
SU4/2D	–	G4 1053	–	–
Solder terminals sockets				
SU4/2L	–	G4 1053	–	G4 1040 ❺
G4/2	–	G4 1053	–	–

❷ Sockets GZP4: wire connection - see page 389. ❸ Signalling / protecting modules type M... - see page 399.
❹ Interconnection strips ZGGZ4, ZGZP... - see pages 401, 403. ❺ Spring clamps G4 1040.

Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



Electrical life reduction factor at AC inductive load Fig. 2



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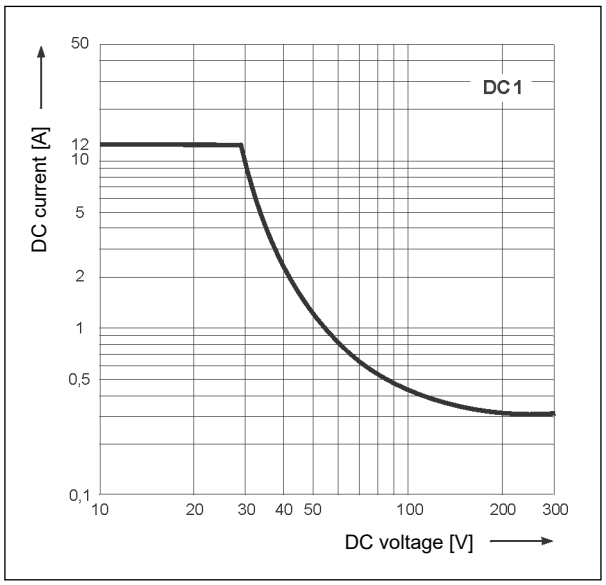
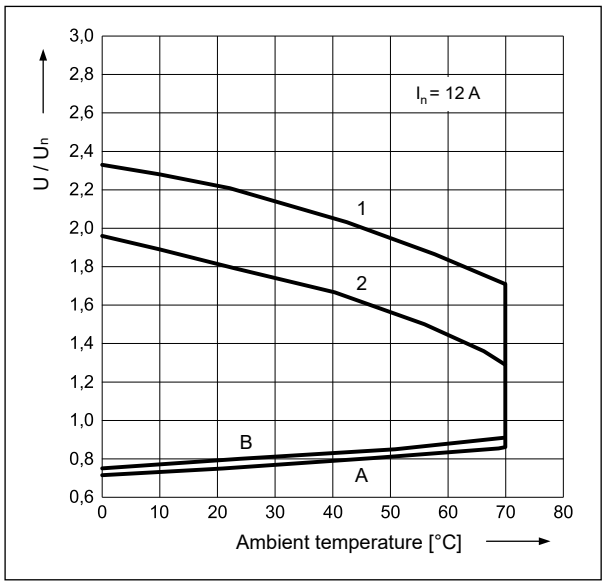
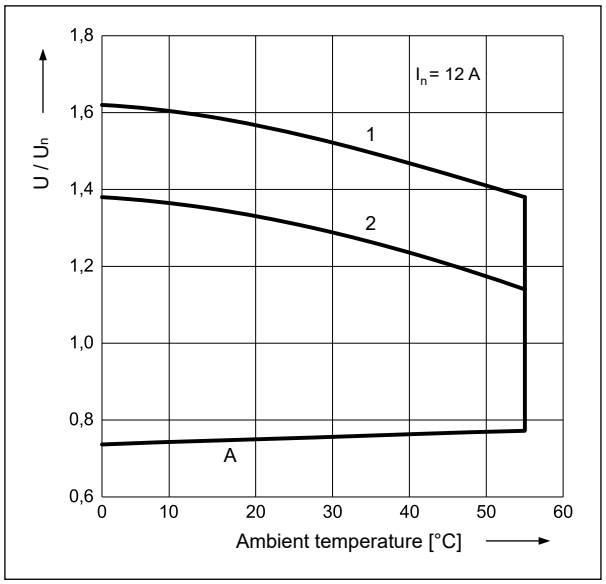
Max. DC resistive load breaking capacity Fig. 3



Coil operating range - DC Fig. 4



Coil operating range - AC 50 Hz Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, **2** - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - rated load

Contact material selection for different load types

- **AgNi** - for resistive or inductive loads,
- **AgNi/Au flash gold plating** - Au protects the contact surface during storage.

Coil data - DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 70 °C)
1005	5	28	± 10%	4,0	5,5
1006	6	40	± 10%	4,8	6,6
1012	12	160	± 10%	9,6	13,2
1024	**24**	**640**	**± 10%**	**19,2**	**26,4**
1048	48	2 600	± 10%	38,4	52,8
1060	60	4 000	± 10%	48,0	66,0
1080	80	7 100	± 10%	64,0	88,0
1110	110	13 600	± 10%	88,0	121,0
1125	125	16 000	± 10%	100,0	137,5
1220	**220**	**54 000**	**± 10%**	**176,0**	**242,0**

The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version — Table 2

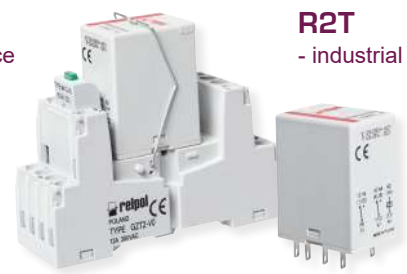
Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
5006	6	9,8	± 10%	4,8	6,6
5012	12	39,5	± 10%	9,6	13,2
5024	**24**	**158**	**± 10%**	**19,2**	**26,4**
5042	42	470	± 10%	33,6	46,2
5048	48	640	± 10%	38,4	52,8
5060	60	930	± 10%	48,0	66,0
5080	80	1 720	± 10%	64,0	88,0
5110	110	3 450	± 10%	88,0	121,0
5115	115	3 610	± 10%	92,0	127,0
5120	120	3 770	± 10%	96,0	132,0
5127	127	4 000	± 10%	101,6	139,0
5220	220	15 400	± 10%	176,0	242,0
5230	**230**	**16 100**	**± 10%**	**184,0**	**253,0**
5240	240	16 800	± 10%	192,0	264,0

The data in bold type relate to the standard versions of the relays.

Relays for railroad industry

PIR2T
- interface

R2T
- industrial



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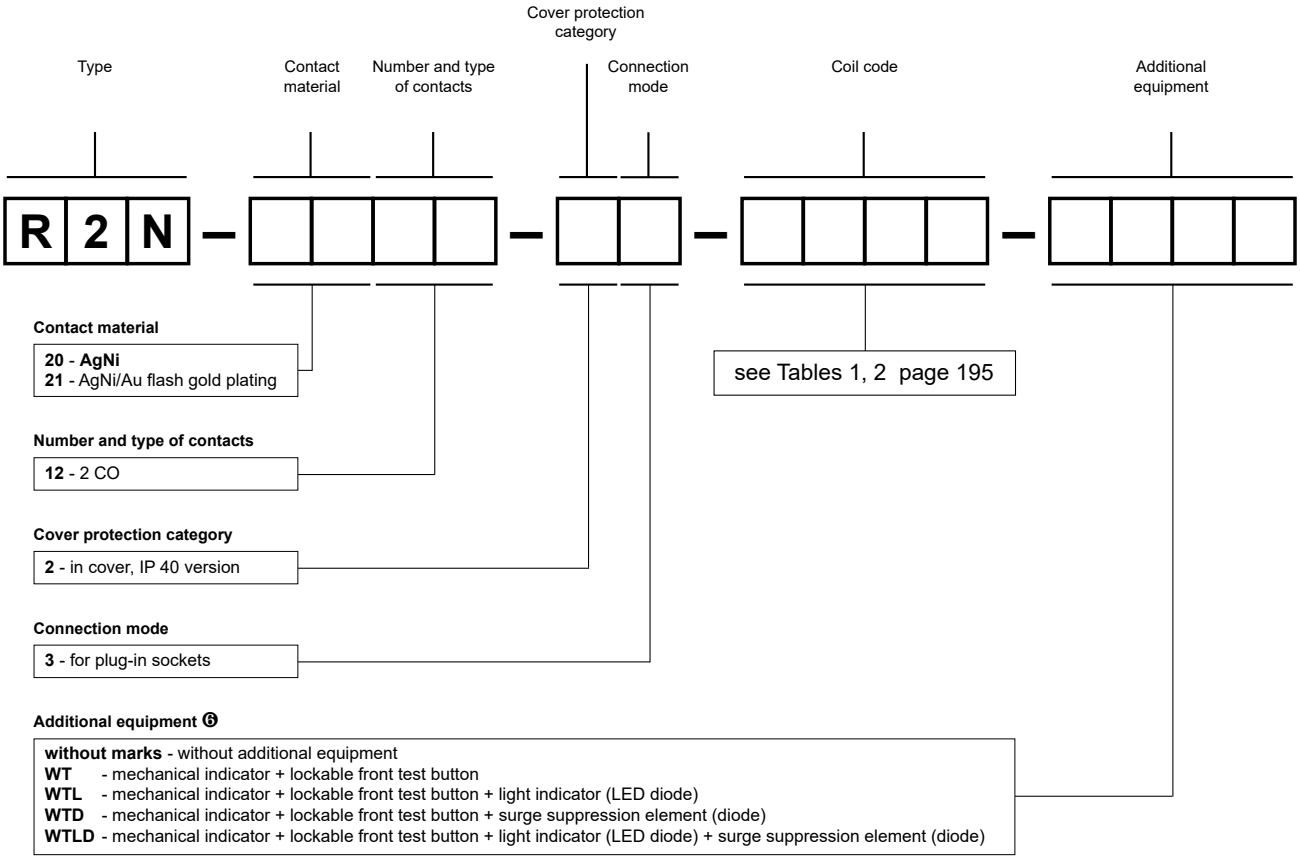
Ordering codes



⑥ **T** - orange colour (AC coils), green (DC coils). **WT** - standard equipment of relays. **WTD, WTLD** - available only in relays with DC coils.

Test buttons (no latching) and plugs need to ordered saparately. They substitute buttons type T. To exchange by Customer themselves. Information on test buttons (no latching) and plugs - page 405.

- Button R4P-0001-A - orange colour (AC coils)
- Button R4P-0001-D - green colour (DC coils)
- Plug R4W-0003-A - orange colour (AC coils)
- Plug R4W-0003-D - green colour (DC coils)

Note:

While the relay operates, the test button of the **T** type becomes heated. In order to push the test button manually, you should first turn the supply voltage off, and wait some time until the button becomes colder (or push the button immediately using a protective glove or an insulated tool). The button shall be pushed smoothly and quickly. The normally open contacts are closed with the button for the time during which the button is pushed. Releasing the button opens the normally open contacts. Normally open contacts may be closed with the blocking function of the button (it shall be turned by 90°). When the button is turned back, the normally open contacts are opened.

For relays with additional equipment **D** - surge suppression element (diode) (versions WTD and WTLD) - fixed supply polarization compulsory for the DC load of coils: +A1(13) / -A2(14). The polarization is indicated on the relay cover. For other versions of the relays with DC coils any polarization is possible.

Example of ordering codes:

R2N-2012-23-1024-WT relay **R2N**, for plug-in sockets, two changeover contacts, contact material AgNi, coil voltage 24 V DC, with mechanical indicator and lockable front test button, in cover IP 40

R3N (AC) R3N (DC)

10 A / 250 V AC

- Relays of general application
- For plug-in sockets: on 35 mm rail mount acc. to EN 60715; on panel mounting
- AC and DC coils, insulation class F: 155 °C
- WT (mechanical indicator + lockable front test button) - standard equipment of relays. Relays may be provided with the test buttons (no latching) and plugs - page 405
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		3 CO
Contact material		**AgNi**, AgNi/Au flash gold plating
Rated / max. switching voltage	AC	250 V / 440 V
Min. switching voltage		10 V
Rated load (capacity)	AC1	10 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	10 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		5 mA
Max. inrush current		20 A
Rated current		10 A
Max. breaking capacity	AC1	2 500 VA
Min. breaking capacity		0,3 W
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	1 200 cycles/hour
	• no load	18 000 cycles/hour

Coil data

Rated voltage	50/60 Hz AC	6, 12, **24**, 42, 48, 60, 80, 110, 115, 120, 127, 220, **230**, 240 V
	DC	5, 6, **12**, **24**, 48, 60, 80, 110, 125, **220** V
Must release voltage		AC: ≥ 0,2 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2
Rated power consumption	AC	1,6 VA
	DC	0,9 W

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2
Dielectric strength	• between coil and contacts	2 500 V AC type of insulation: basic
	• contact clearance	1 500 V AC type of clearance: micro-disconnection
	• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 2,5 mm
	• creepage	≥ 4 mm

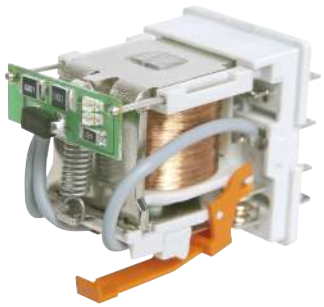
General data

Operating / release time (typical values)		AC: 10 ms / 8 ms DC: 13 ms / 3 ms
Electrical life	• resistive AC1	> 10^5 10 A, 250 V AC
	• cosφ	see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		27,4 x 21 x 35,5 mm
Weight		35 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	AC: -40...+55 °C DC: -40...+70 °C
Cover protection category		IP 40 EN 60529
Environmental protection		RTI EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g
Vibration resistance		5 g 10...150 Hz

The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Design

Improvement of the functionality of the mechanical indicator (W): it is mounted on an insulation base of the unit of the movable contacts; the changes provide the appropriate position in the window in the upper side of the housing irrespectively of the number of operations performed by the relay.

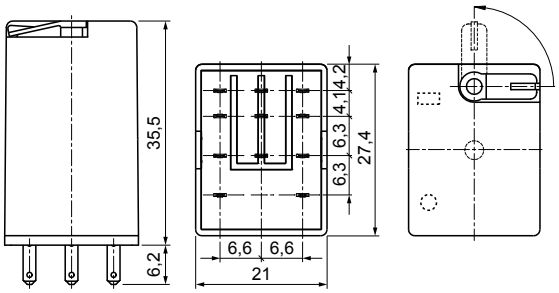


Application of electronics made in the SMD technology: additional equipment L (LED diode) and D (diode) are located on the printed circuit board; the change of the position of the LED diode and optimization of the quality and intensity of its light provide certainty that the relay is in operation status when the LED is on.

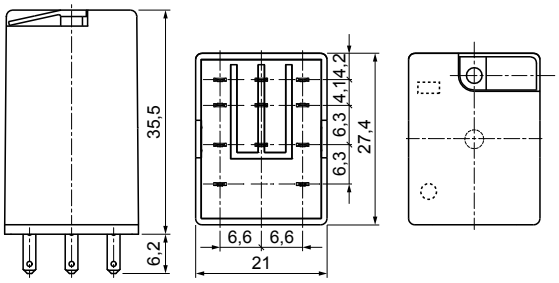
Improvement of the efficiency of the electromagnet: an innovational technology of connecting elements has been introduced, which guarantees more reliable operation of the relay.

Strengthening of the insulation in the area of the contact plate: polyamide PA66 has been applied; it has very good mechanical and electrical parameters and best thermal properties.

Dimensions - plug-in version (WT), with lockable front test button type T

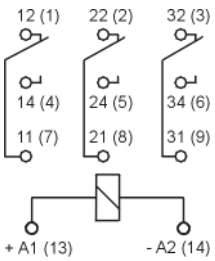


Dimensions - plug-in version, with test button (no latching) or with plug (no manual operation)



Test buttons R4P-0001 and **plugs R4W-0003** need to ordered saparately. They substitute buttons type T. To exchange by Customer themselves. Information on test buttons (no latching) and plugs - page 405.

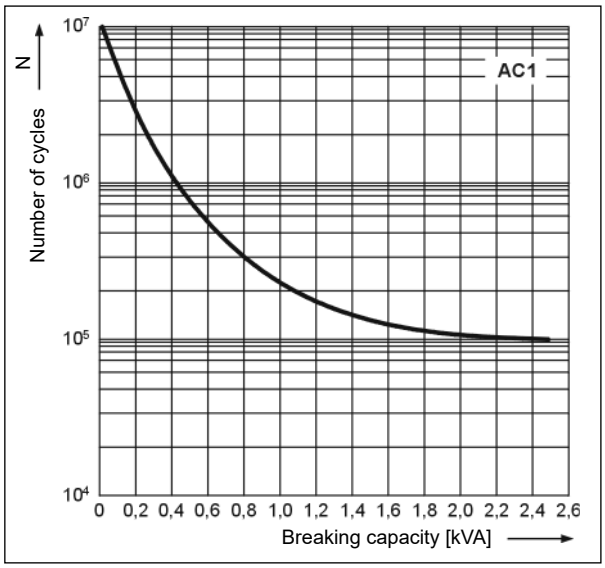
Connection diagram (pin side view)



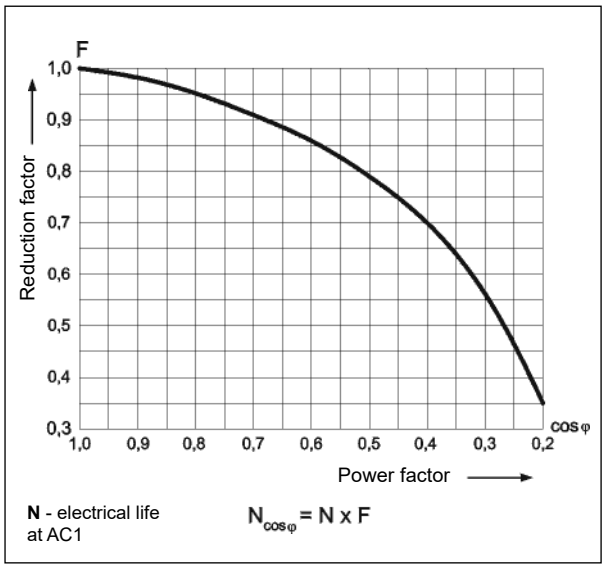
3 CO

Note: the indicated polarization of the supply refers to the relays with extra equipment **D** - surge suppression element (diode) - for DC coils only.

Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



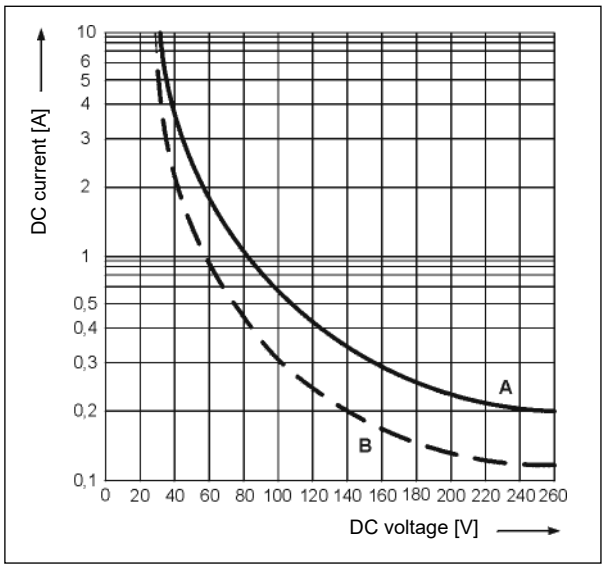
Electrical life reduction factor at AC inductive load Fig. 2



Contact material selection for different load types

- **AgNi** - for resistive or inductive loads,
- **AgNi/Au flash gold plating** - Au protects the contact surface during storage.

Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Mounting, sockets and accessories for relays

Relays **R3N** are designed for mounting in plug-in sockets. **With WT equipment as standard** (**W** - mechanical indicator + **T** - lockable front test button). In these relays is **possibility self-exchange of button type T for test button R4P-0001** (no latching) **or on plug R4W-0003** (no manual operation). The buttons **R4P-0001** and the plugs **R4W-0003 need to ordered saparately**.

Sockets for R3N	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)				
GZT3	GZT4-0040	G4 1052	GZT4-0035	M... ❷, ZGGZ4 ❸
GZM3	GZT4-0040	G4 1052	GZT4-0035	M... ❷, ZGGZ4 ❸

❷ Signalling / protecting modules type M... - see page 399. ❸ Interconnection strips ZGGZ4 - see page 401.

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Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 70 °C)
1005	5	28	± 10%	4,0	5,5
1006	6	40	± 10%	4,8	6,6
1012	12	160	± 10%	9,6	13,2
1024	**24**	**640**	**± 10%**	**19,2**	**26,4**
1048	48	2 600	± 10%	38,4	52,8
1060	60	4 000	± 10%	48,0	66,0
1080	80	7 100	± 10%	64,0	88,0
1110	110	13 600	± 10%	88,0	121,0
1125	125	16 000	± 10%	100,0	137,5
1220	**220**	**54 000**	**± 10%**	**176,0**	**242,0**

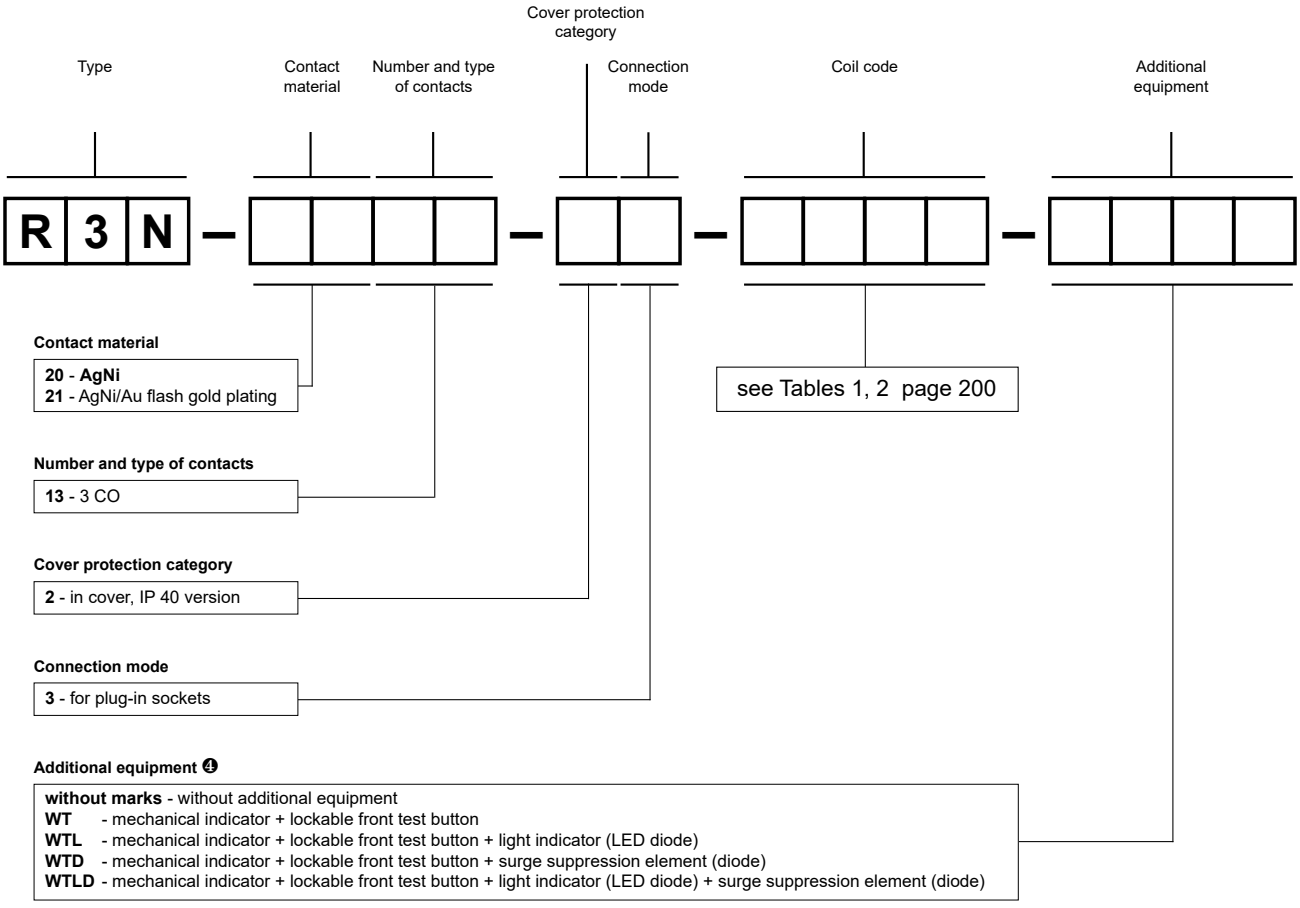
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
5006	6	9,8	± 10%	4,8	6,6
5012	12	39,5	± 10%	9,6	13,2
5024	**24**	**158**	**± 10%**	**19,2**	**26,4**
5042	42	470	± 10%	33,6	46,2
5048	48	640	± 10%	38,4	52,8
5060	60	930	± 10%	48,0	66,0
5080	80	1 720	± 10%	64,0	88,0
5110	110	3 450	± 10%	88,0	121,0
5115	115	3 610	± 10%	92,0	127,0
5120	120	3 770	± 10%	96,0	132,0
5127	127	4 000	± 10%	101,6	139,0
5220	220	15 400	± 10%	176,0	242,0
5230	**230**	**16 100**	**± 10%**	**184,0**	**253,0**
5240	240	16 800	± 10%	192,0	264,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



❹ **T** - orange colour (AC coils), green (DC coils). **WT** - standard equipment of relays. **WTD, WTLD** - available only in relays with DC coils.

Test buttons (no latching) and plugs need to ordered saparately. They substitute buttons type T. To exchange by Customer themselves. Information on test buttons (no latching) and plugs - page 405.

- Button R4P-0001-A - orange colour (AC coils)
- Button R4P-0001-D - green colour (DC coils)
- Plug R4W-0003-A - orange colour (AC coils)
- Plug R4W-0003-D - green colour (DC coils)

Note:

While the relay operates, the test button of the **T** type becomes heated. In order to push the test button manually, you should first turn the supply voltage off, and wait some time until the button becomes colder (or push the button immediately using a protective glove or an insulated tool). The button shall be pushed smoothly and quickly. The normally open contacts are closed with the button for the time during which the button is pushed. Releasing the button opens the normally open contacts. Normally open contacts may be closed with the blocking function of the button (it shall be turned by 90°). When the button is turned back, the normally open contacts are opened.

For relays with additional equipment **D** - surge suppression element (diode) (versions WTD and WTLD) - fixed supply polarization compulsory for the DC load of coils: +A1(13) / -A2(14). The polarization is indicated on the relay cover. For other versions of the relays with DC coils any polarization is possible.

Example of ordering code:

R3N-2013-23-1024-WT relay **R3N**, for plug-in sockets, three changeover contacts, contact material AgNi, coil voltage 24 V DC, with mechanical indicator and lockable front test button, in cover IP 40

R4N (AC) **R4N (DC)**

7 A / 230 V AC

- Relays of general application
- For plug-in sockets: on 35 mm rail mount acc. to EN 60715; on panel mounting; with terminals for soldering
- PCB version available • AC and DC coils, insulation class F: 155 °C
- WT (mechanical indicator + lockable front test button) - standard equipment of relays. Relays may be provided with the test buttons (no latching) and plugs - page 405
- **Have obtained LR Type Approval Certificate (Lloyd's Register)**
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		4 CO
Contact material		**AgNi**, AgNi/Au flash gold plating, AgNi/Au hard gold plating
Rated / max. switching voltage	AC	250 V / 250 V
Min. switching voltage		10 V AgNi, 10 V AgNi/Au flash gold plating 5 V AgNi/Au hard gold plating
Rated load (capacity)	AC1	7 A / 230 V AC (VDE) 6 A / 250 V AC
	AC15	1,5 A / 120 V 0,75 A / 240 V (C300)
	DC1	6 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/3 HP 240 V AC, 3,6 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,125 kW 240 V AC, single-phase motor
Min. switching current		5 mA
Max. inrush current		12 A
Rated current		7 A
Max. breaking capacity	AC1	1 500 VA
Min. breaking capacity		0,3 W AgNi, 0,3 W AgNi/Au flash gold plating 0,1 W AgNi/Au hard gold plating
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	1 200 cycles/hour
	• no load	18 000 cycles/hour

Coil data

Rated voltage	50/60 Hz AC	6, 12, **24**, 42, 48, 60, 80, 110, 115, 120, 127, 220, **230**, 240 V
	DC	5, 6, **12**, **24**, 48, 60, 80, 110, 125, **220** V
Must release voltage		AC: ≥ 0,2 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2 and Fig. 4, 5
Rated power consumption	AC	1,6 VA
	DC	0,9 W

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		2 500 V 1,2 / 50 µs
Overvoltage category		II
Insulation pollution degree		2
Dielectric strength	• between coil and contacts	2 500 V AC type of insulation: basic
	• contact clearance	1 500 V AC type of clearance: micro-disconnection
	• pole - pole	2 000 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 1,6 mm
	• creepage	≥ 3,2 mm

General data

Operating / release time (typical values)		AC: 10 ms / 8 ms DC: 13 ms / 3 ms
Electrical life	• resistive AC1	$> 5 \times 10^4$ 7 A, 230 V AC (VDE) $> 10^5$ 6 A, 250 V AC
	• cosφ	see Fig. 2
Mechanical life (cycles)		$> 2 \times 10^7$
Dimensions (L x W x H)		27,4 x 21 x 35,5 mm
Weight		35 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	AC: -40...+55 °C DC: -40...+70 °C
Cover protection category		IP 40 EN 60529
Environmental protection		RTI EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g
Vibration resistance		5 g 10...150 Hz

The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Design

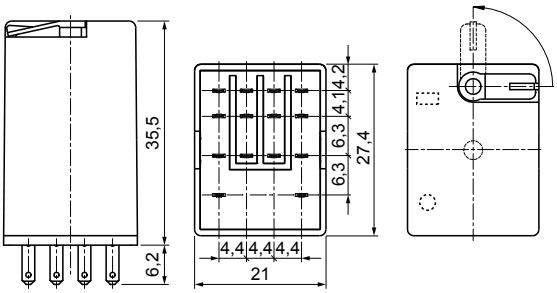
Improvement of the functionality of the mechanical indicator (W): it is mounted on an insulation base of the unit of the movable contacts; the changes provide the appropriate position in the window in the upper side of the housing irrespectively of the number of operations performed by the relay.

Application of electronics made in the SMD technology: additional equipment L (LED diode) and D (diode) are located on the printed circuit board; the change of the position of the LED diode and optimization of the quality and intensity of its light provide certainty that the relay is in operation status when the LED is on.

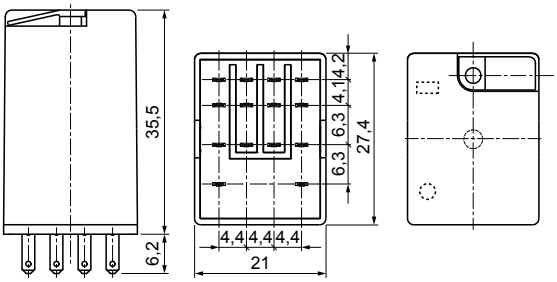
Improvement of the efficiency of the electromagnet: an innovational technology of connecting elements has been introduced, which guarantees more reliable operation of the relay.

Strengthening of the insulation in the area of the contact plate: polyamide PA66 has been applied; it has very good mechanical and electrical parameters and best thermal properties.

Dimensions - plug-in version (WT), with lockable front test button type T

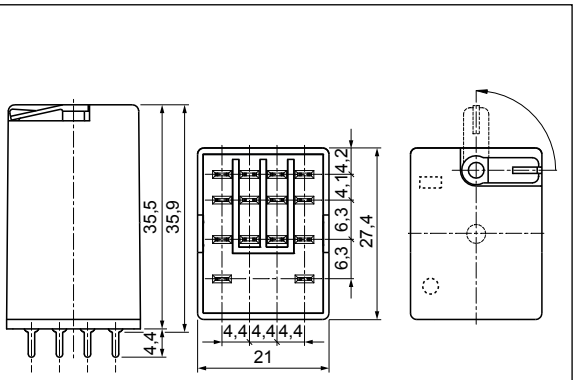


Dimensions - plug-in version, with test button (no latching) or with plug (no manual operation)



Test buttons R4P-0001 and **plugs R4W-0003** need to ordered saparately. They substitute buttons type T. To exchange by Customer themselves. Information on test buttons (no latching) and plugs - page 405.

Dimensions - PCB version (WT), with lockable front test button type T



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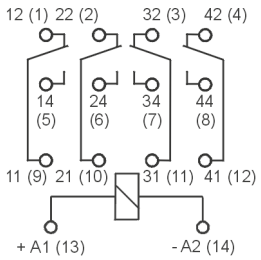
Mounting, sockets and accessories for relays

Relays **R4N** are offered in versions: • for plug-in sockets • for PCB. **With WT equipment as standard** (**W** - mechanical indicator + **T** - lockable front test button). In these relays is **possibility self-exchange of button type T for test button R4P-0001** (no latching) **or on plug R4W-0003** (no manual operation). The buttons **R4P-0001** and the plugs **R4W-0003 need to ordered saparately**.

Sockets for R4N	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)				
GZT4	GZT4-0040	G4 1052	GZT4-0035	M... ❸, ZGGZ4 ❹
GZM4	GZT4-0040	G4 1052	GZT4-0035	M... ❸, ZGGZ4 ❹
GZ4	–	G4 1052	–	–
GS4	–	GS4-0036	GS4-0035	–
Push-in terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)				
GZP4 ❷	GZP4-0400, GZT4-0040	G4 1052	MP15	M... ❸, ZGZP4-8, ZGZP4-2, ZGZP-2 ❹
Sockets for PCB				
SU4D	–	G4 1053	–	–
Solder terminals sockets				
SU4L	–	G4 1053	–	G4 1040 ❺
G4	–	G4 1053	–	–

❷ Sockets GZP4: wire connection - see page 389. ❸ Signalling / protecting modules type M... - see page 399.
❹ Interconnection strips ZGGZ4, ZGZP... - see pages 401, 403. ❺ Spring clamps G4 1040.

Connection diagram (pin side view)

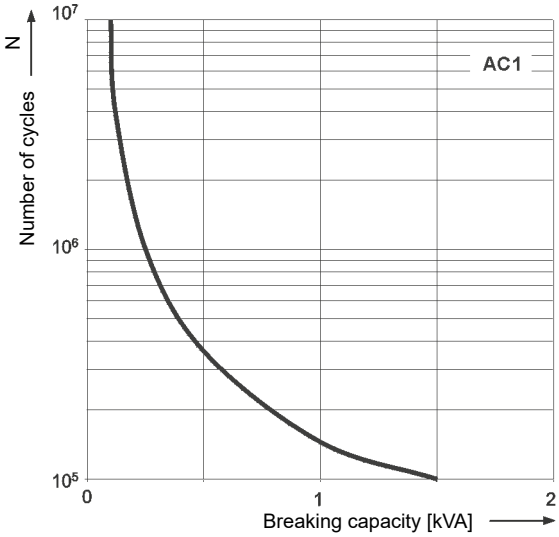


4 CO

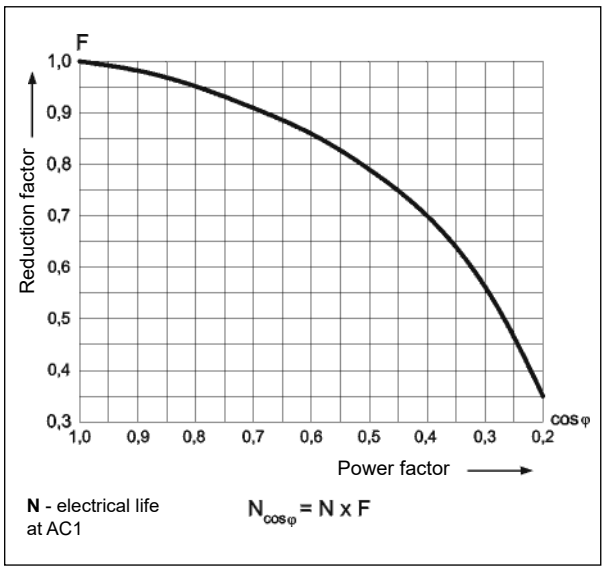
Note: the indicated polarization of the supply refers to the relays with extra equipment **D** - surge suppression element (diode) - for DC coils only.

Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour

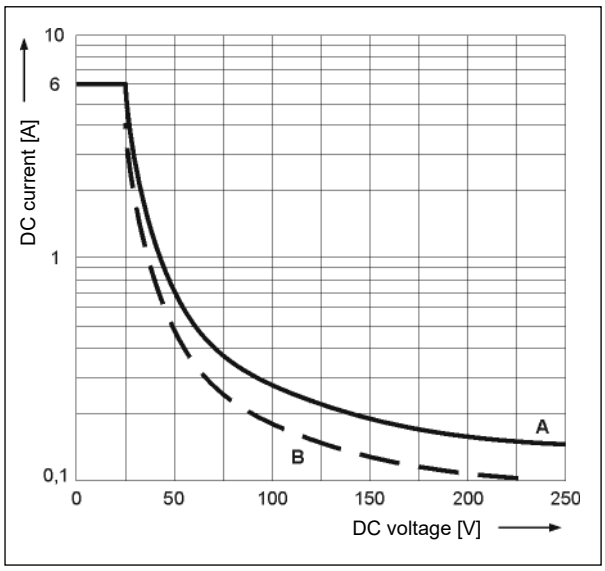
Fig. 1



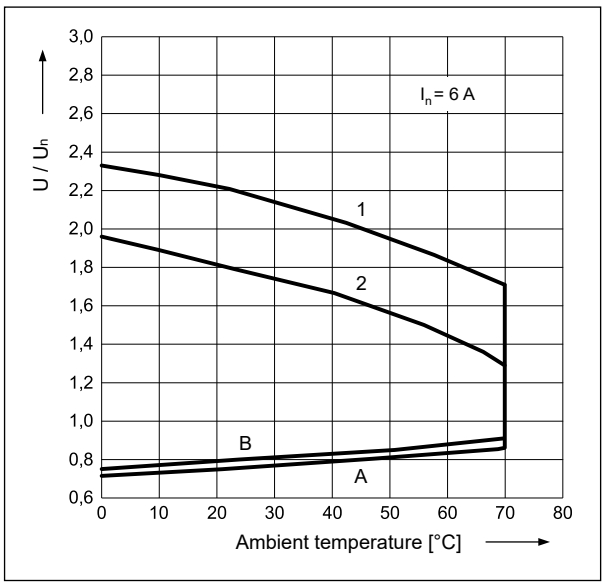
Electrical life reduction factor at AC inductive load Fig. 2



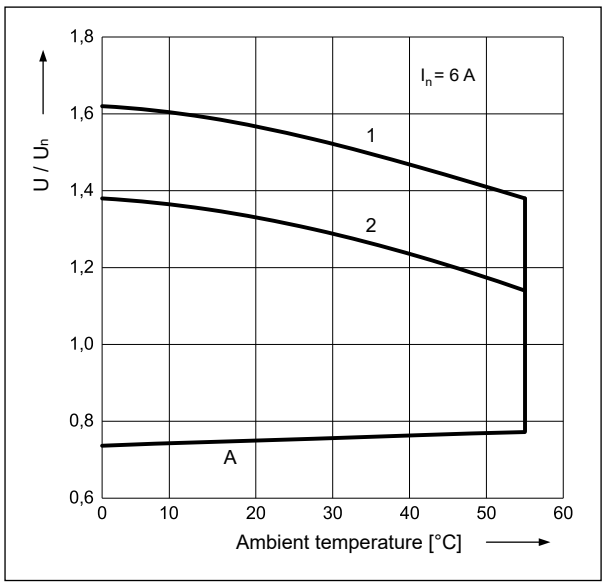
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Coil operating range - DC Fig. 4



Coil operating range - AC 50 Hz Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).

1, **2** - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - rated load

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Contact material selection for different load types

- **AgNi** - for resistive or inductive loads,
- **AgNi/Au flash gold plating** - Au protects the contact surface during storage,
- **AgNi/Au hard gold plating** - for small resistive loads in control circuits.

Coil data - DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 70 °C)
1005	5	28	± 10%	4,0	5,5
1006	6	40	± 10%	4,8	6,6
1012	**12**	**160**	**± 10%**	**9,6**	**13,2**
1024	**24**	**640**	**± 10%**	**19,2**	**26,4**
1048	48	2 600	± 10%	38,4	52,8
1060	60	4 000	± 10%	48,0	66,0
1080	80	7 100	± 10%	64,0	88,0
1110	110	13 600	± 10%	88,0	121,0
1125	125	16 000	± 10%	100,0	137,5
1220	**220**	**54 000**	**± 10%**	**176,0**	**242,0**

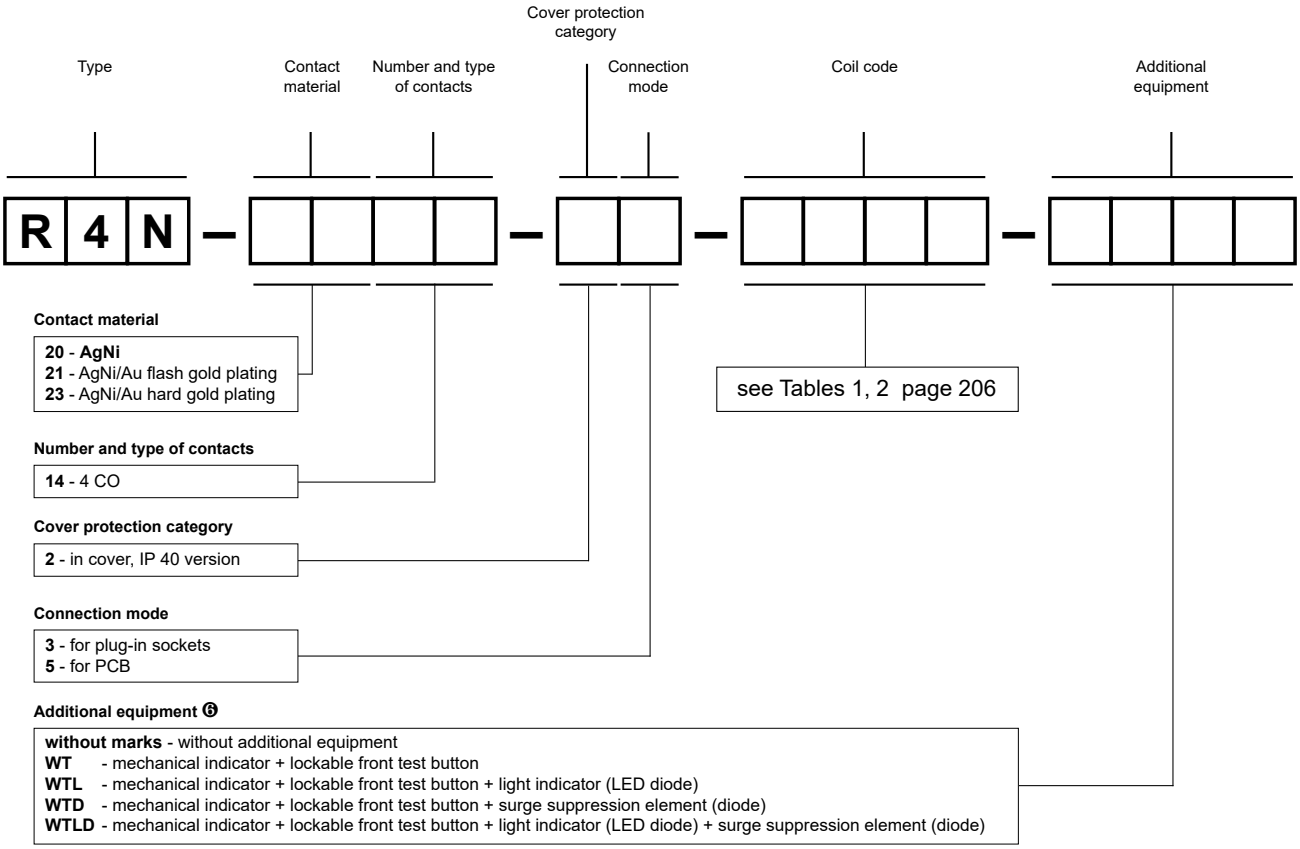
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version — Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
5006	6	9,8	± 10%	4,8	6,6
5012	12	39,5	± 10%	9,6	13,2
5024	**24**	**158**	**± 10%**	**19,2**	**26,4**
5042	42	470	± 10%	33,6	46,2
5048	48	640	± 10%	38,4	52,8
5060	60	930	± 10%	48,0	66,0
5080	80	1 720	± 10%	64,0	88,0
5110	110	3 450	± 10%	88,0	121,0
5115	115	3 610	± 10%	92,0	127,0
5120	120	3 770	± 10%	96,0	132,0
5127	127	4 000	± 10%	101,6	139,0
5220	220	15 400	± 10%	176,0	242,0
5230	**230**	**16 100**	**± 10%**	**184,0**	**253,0**
5240	240	16 800	± 10%	192,0	264,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



⑥ **T** - orange colour (AC coils), green (DC coils). **WT** - standard equipment of relays. **WTD, WTLD** - available only in relays with DC coils.

Test buttons (no latching) and plugs need to ordered saparately. They substitute buttons type T. To exchange by Customer themselves. Information on test buttons (no latching) and plugs - page 405.

- Button R4P-0001-A - orange colour (AC coils)
- Button R4P-0001-D - green colour (DC coils)
- Plug R4W-0003-A - orange colour (AC coils)
- Plug R4W-0003-D - green colour (DC coils)

Note:

While the relay operates, the test button of the **T** type becomes heated. In order to push the test button manually, you should first turn the supply voltage off, and wait some time until the button becomes colder (or push the button immediately using a protective glove or an insulated tool). The button shall be pushed smoothly and quickly. The normally open contacts are closed with the button for the time during which the button is pushed. Releasing the button opens the normally open contacts. Normally open contacts may be closed with the blocking function of the button (it shall be turned by 90°). When the button is turned back, the normally open contacts are opened.

For relays with additional equipment **D** - surge suppression element (diode) (versions WTD and WTLD) - fixed supply polarization compulsory for the DC load of coils: +A1(13) / -A2(14). The polarization is indicated on the relay cover. For other versions of the relays with DC coils any polarization is possible.

Examples of ordering codes:

R4N-2014-23-5230-WTL	relay **R4N**, for plug-in sockets, four changeover contacts, contact material AgNi, coil voltage 230 V AC 50/60 Hz, with mechanical indicator and lockable front test button and light indicator (LED diode), in cover IP 40
R4N-2014-25-1024-WT	relay **R4N**, for PCB, four changeover contacts, contact material AgNi, coil voltage 24 V DC, with mechanical indicator and lockable front test button, in cover IP 40

- Relays of general application
- For plug-in sockets: on 35 mm rail mount acc. to EN 60715; on panel mounting
- For direct mounting on panel - cover with mounting flange
- Flat insert connectors - faston 187 (4,8 x 0,5 mm)
- AC and DC coils, insulation class F: 155 °C
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		2 CO
Contact material		**AgNi**
Rated / max. switching voltage	AC	250 V / 440 V
Min. switching voltage		5 V
Rated load	AC1	12 A / 250 V AC
	DC1	12 A / 30 V DC
Min. switching current		5 mA
Max. inrush current		20 A
Rated current		12 A
Max. breaking capacity	AC1	3 000 VA
Min. breaking capacity		0,3 W
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	1 200 cycles/hour
• no load		18 000 cycles/hour

Coil data

Rated voltage	50/60 Hz AC	6, 12, 24, 42, 48, 60, 80, 110, 120, 127, 220, 230, 240 V
	DC	5, 6, 12, 24, 48, 60, 80, 110, 125, 220 V
Must release voltage		AC: ≥ 0,2 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2
Rated power consumption	AC	1,6 VA
	DC	0,9 W

Insulation according to EN 60664-1

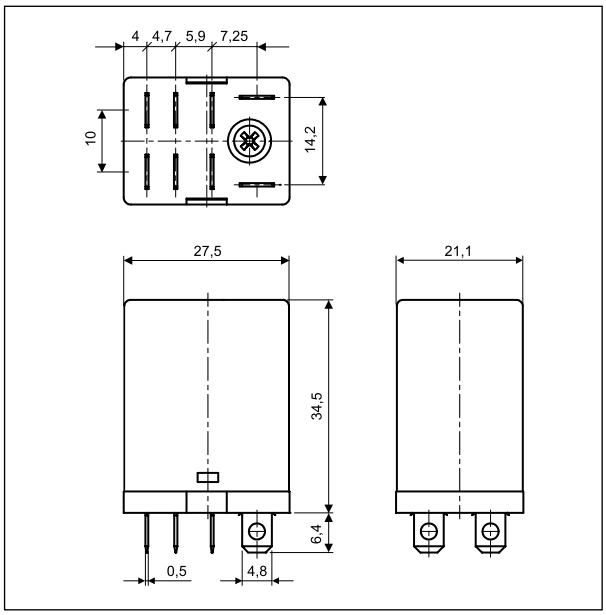
Insulation rated voltage	250 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Dielectric strength	
• between coil and contacts	2 500 V AC type of insulation: basic
• contact clearance	1 000 V AC type of clearance: micro-disconnection
• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	
• clearance	≥ 2,6 mm
• creepage	≥ 4 mm

General data

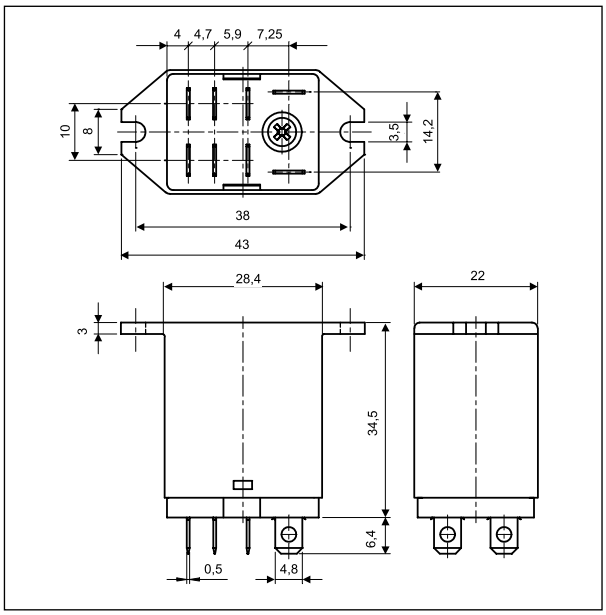
Operating / release time (typical values)		15 ms / 10 ms
Electrical life		
• resistive AC1		> 10^5 12 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 10^7
Dimensions (L x W x H)		27,5 x 21,1 x 34,5 mm ❶
Weight		35 g
Ambient temperature	• storage	-40...+70 °C
(non-condensation and/or icing)	• operating	-40...+55 °C
Cover protection category		IP 40 EN 60529
Environmental protection		RTI EN 61810-7
Shock resistance		10 g
Vibration resistance		5 g 15...150 Hz

The data in bold type relate to the standard versions of the relays.
❶ For plug-in sockets version: standard

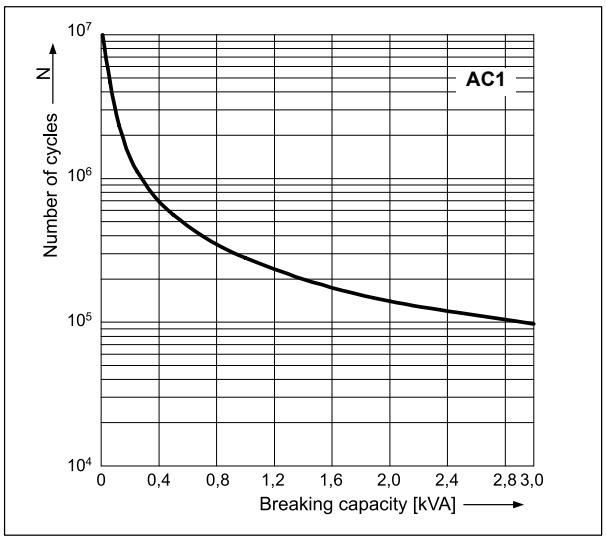
Dimensions - plug-in version (standard)



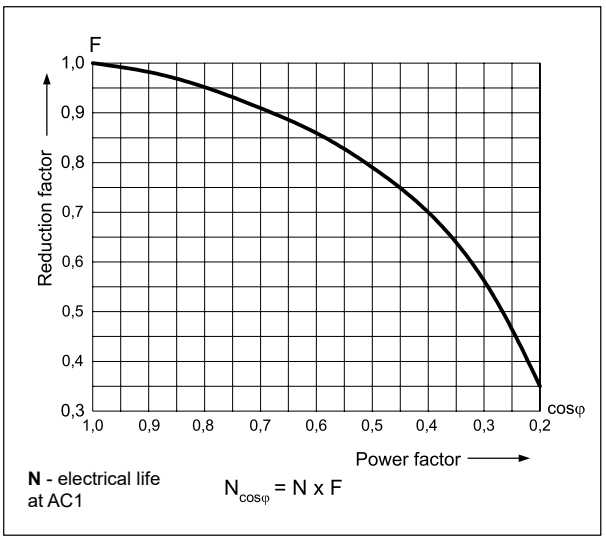
Dimensions - version with mounting flange in the upper wall of the cover



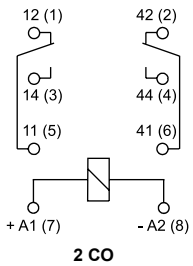
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



Electrical life reduction factor at AC inductive load Fig. 2



Connection diagram (pin side view)



Note: the indicated polarization of the supply refers to the relays with extra equipment **D** - surge suppression element (diode) - for DC coils only.

Mounting, sockets and accessories for relays

Sockets for RY2	Accessories
	Spring wire clips
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)	
GZY2G	GZY2G-0041 ❷

Relays **RY2** are offered in versions: • standard, for plug-in sockets • with mounting flange in the upper wall of the cover, on panel mounting with two M3 screws, flat insert connectors - faston 187 (4,8 x 0,5 mm).

❷ For each GZY2G socket a set GZY2G-0041 shall be ordered.

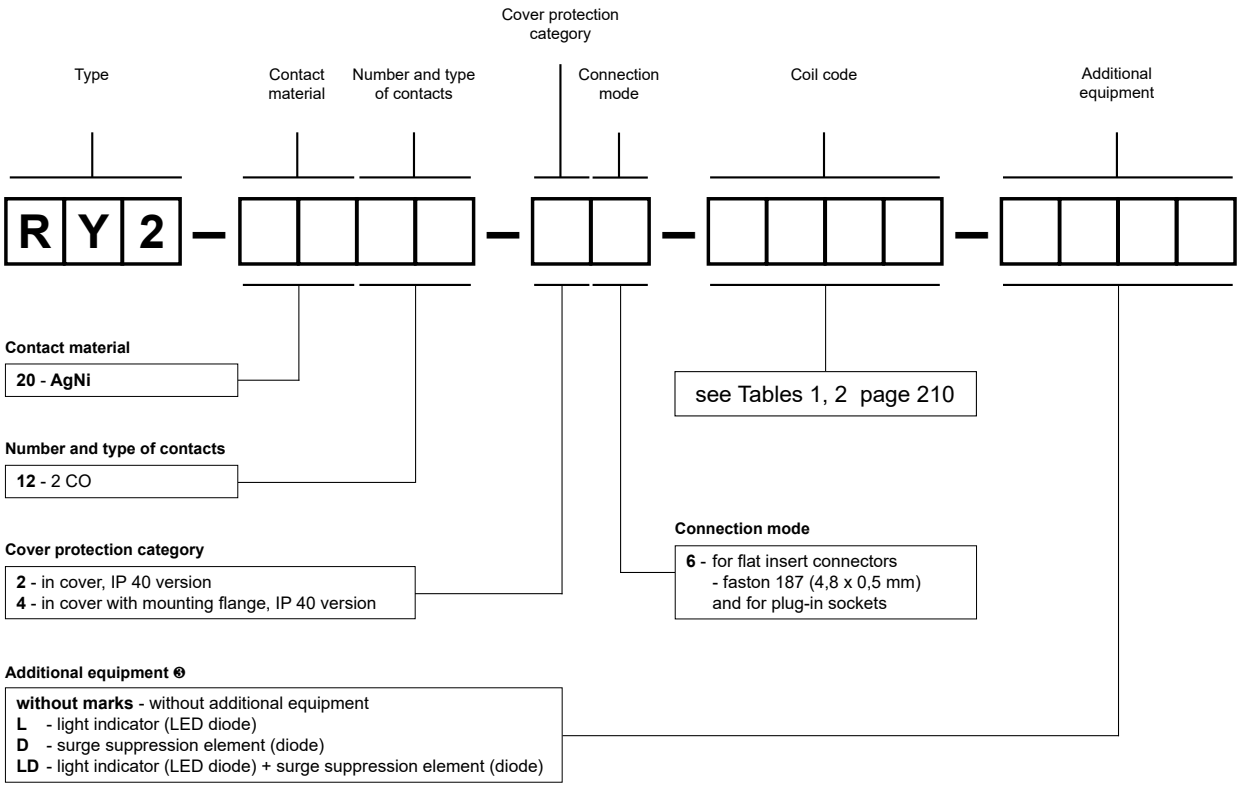
Coil data - DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 55 °C)
1005	5	28	± 10%	4,0	5,5
1006	6	40	± 10%	4,8	6,6
1012	12	160	± 10%	9,6	13,2
1024	24	640	± 10%	19,2	26,4
1048	48	2 600	± 10%	38,4	52,8
1060	60	4 000	± 10%	48,0	66,0
1080	80	7 100	± 10%	64,0	88,0
1110	110	13 600	± 10%	88,0	121,0
1125	125	16 000	± 10%	100,0	137,5
1220	220	54 000	± 10%	176,0	242,0

Coil data - AC 50/60 Hz voltage version — Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
5006	6	9,8	± 10%	4,8	6,6
5012	12	39,5	± 10%	9,6	13,2
5024	24	158	± 10%	19,2	26,4
5042	42	470	± 10%	33,6	46,2
5048	48	640	± 10%	38,4	52,8
5060	60	930	± 10%	48,0	66,0
5080	80	1 720	± 10%	64,0	88,0
5110	110	3 450	± 10%	88,0	121,0
5120	120	3 770	± 10%	96,0	132,0
5127	127	4 000	± 10%	101,6	139,7
5220	220	15 400	± 10%	176,0	242,0
5230	230	16 100	± 10%	184,0	253,0
5240	240	16 800	± 10%	192,0	264,0

Ordering codes



❸ **D, LD** - only for DC coils

Note:
For relays with additional equipment **D** - surge suppression element (diode) (versions D and LD) - fixed supply polarization compulsory for the DC load of coils: +A1(7) / -A2(8). The polarization is indicated on the relay cover. For other versions of the relays with DC coils any polarization is possible.

Examples of ordering codes:

RY2-2012-26-1024	relay **RY2**, for plug-in sockets, two changeover contacts, contact material AgNi, coil voltage 24 V DC, in cover IP 40
RY2-2012-26-5230-L	relay **RY2**, for plug-in sockets, two changeover contacts, contact material AgNi, coil voltage 230 V AC 50/60 Hz, with light indicator (LED diode), in cover IP 40

GZY2G

Screw terminals
plug-in sockets
for RY2
- see page 390.

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- Relays of general application
- For plug-in sockets: on 35 mm rail mount acc. to EN 60715; on panel mounting
- For PCB and for soldering connections
- AC and DC coils, insulation class F: 155 °C
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		2 CO
Contact material		**AgNi** ❶, AgNi/Au flash gold plating, $AgSnO_2$
Rated / max. switching voltage	AC	250 V / 250 V
Min. switching voltage		5 V AgNi, 5 V AgNi/Au flash gold plating, 10 V $AgSnO_2$
Rated load	AC1	5 A / 250 V AC
	DC1	5 A / 24 V DC
Min. switching current		5 mA AgNi, 5 mA AgNi/Au flash gold plating, 10 mA $AgSnO_2$
Rated current		5 A
Max. breaking capacity	AC1	1 250 VA
Min. breaking capacity		0,3 W AgNi, 0,3 W AgNi/Au flash gold plating, 1 W $AgSnO_2$
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	1 200 cycles/hour
• no load		36 000 cycles/hour

Coil data

Rated voltage	50/60 Hz AC	6, 12, **24**, 50, 100, 110, 115, 120, 220, **230**, 240 V
	DC	6, **12**, **24**, 48, 60, 80, 110 V
Must release voltage		≥ 0,05 U_n
Operating range of supply voltage		see Tables 1, 2
Rated power consumption	AC	1,5 VA
	DC	0,9 W

Insulation according to EN 60664-1

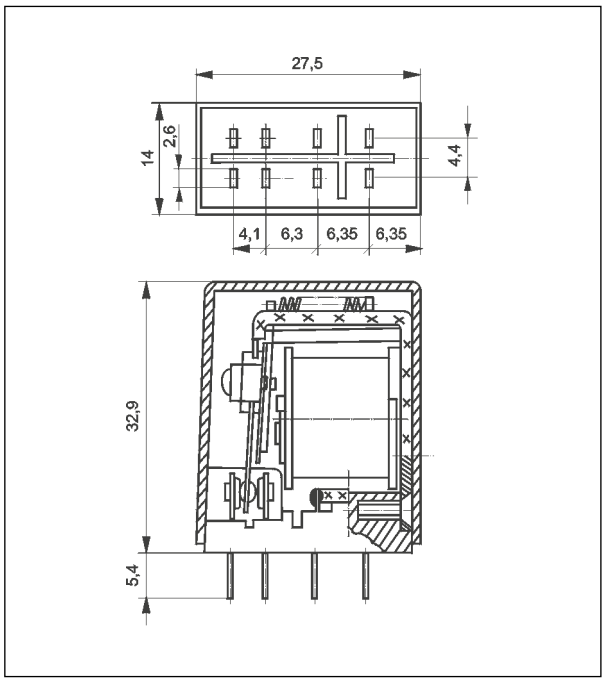
Insulation rated voltage		250 V AC
Rated surge voltage		2 500 V 1,2 / 50 µs
Overvoltage category		II
Insulation pollution degree		3
Dielectric strength		
• between coil and contacts		2 000 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection
• pole - pole		2 000 V AC type of insulation: basic
Contact - coil distance		
• clearance		≥ 3 mm
• creepage		≥ 4 mm

General data

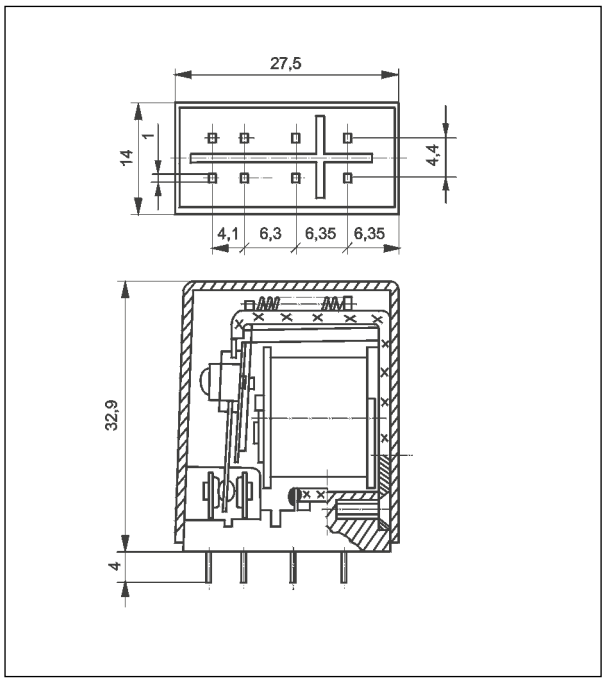
Operating / release time (typical values)		AC: 8 ms / 7 ms DC: 10 ms / 3 ms
Electrical life		
• resistive AC1		> 2 x 10^5 5 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 10^7
Dimensions (L x W x H)		27,5 x 14 x 32,9 mm
Weight		22 g
Ambient temperature	• storage	-40...+70 °C
(non-condensation and/or icing)	• operating	-40...+55 °C
Cover protection category		IP 40 EN 60529
Environmental protection		RTI EN 61810-7
Shock resistance		10 g
Vibration resistance		5 g 10...150 Hz
Solder bath temperature		max. 270 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays.
❶ Relays with AgNi contacts can be used up to 5 A at resistive and inductive load.

Dimensions - plug-in version



Dimensions - PCB version



Mounting, sockets and accessories for relays

Relays **R2M** are designed for: • plug-in sockets • direct PCB mounting.

Sockets for R2M	**Accessories**	**Additional equipment**
	Spring wire clips	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)		
GZ2	GZ2 1060 ❷	–
Sockets for PCB		
S2M	G4 1050	–
Solder terminals sockets		
G2M	G4 1050	G2M 1020 ❸

❷ Set GZ2 1060: spring wire clip and two spring clamps. ❸ Spring clamps G2M 1020.

GZ2

Screw terminals
plug-in sockets
for R2M
- see page 390.

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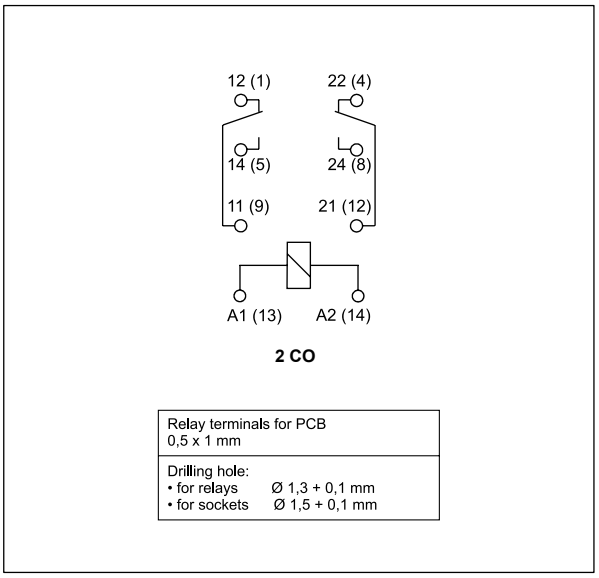
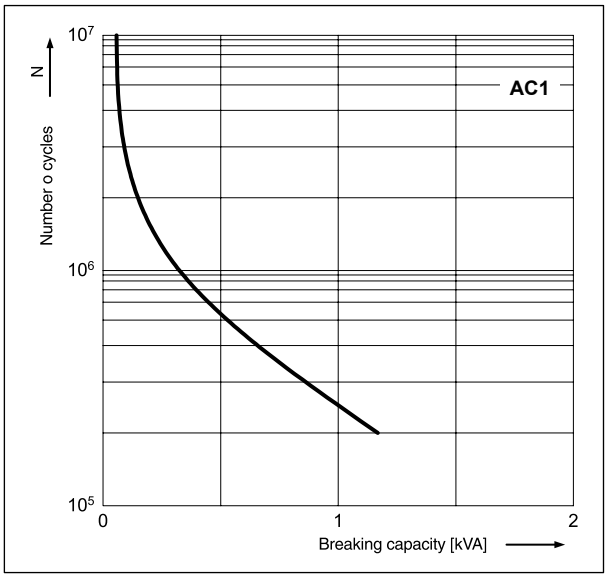
Connection diagram (pin side view)



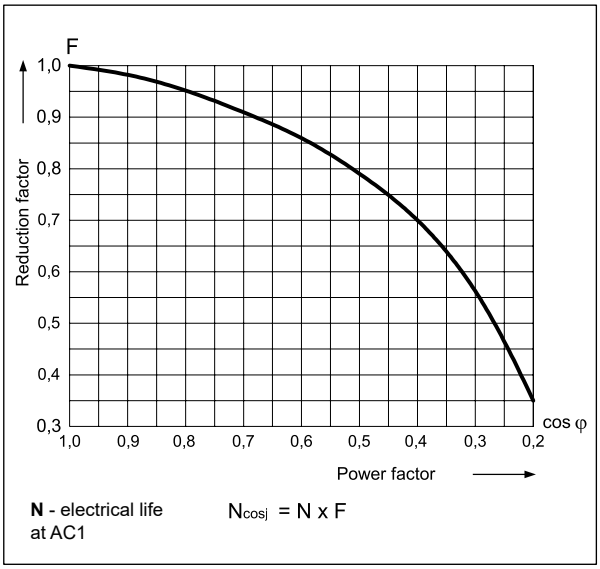
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour

Fig. 1



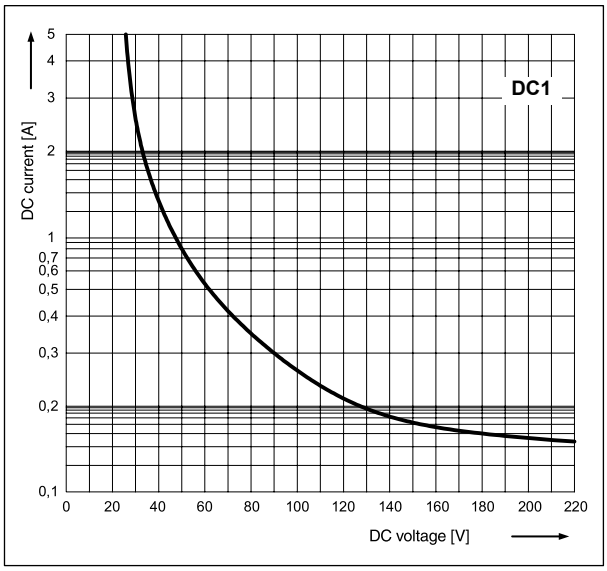
Electrical life reduction factor at AC inductive load

Fig. 2



Max. DC resistive load breaking capacity

Fig. 3



Contact material selection for different load types

- **AgNi** - for resistive or inductive loads,
- **AgNi/Au flash gold plating** - Au protects the contact surface during storage,
- **AgSnO$_2$** - for capacitive loads or incandescent lamp loads.

Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 55 °C)
1006	6	47	± 10%	4,8	6,6
1012	**12**	**188**	**± 10%**	**9,6**	**13,2**
1024	**24**	**750**	**± 10%**	**19,2**	**26,4**
1048	48	2 660	± 10%	38,4	52,8
1060	60	4 000	± 10%	48,0	66,0
1080	80	7 100	± 10%	64,0	88,0
1110	110	13 480	± 10%	88,0	121,0

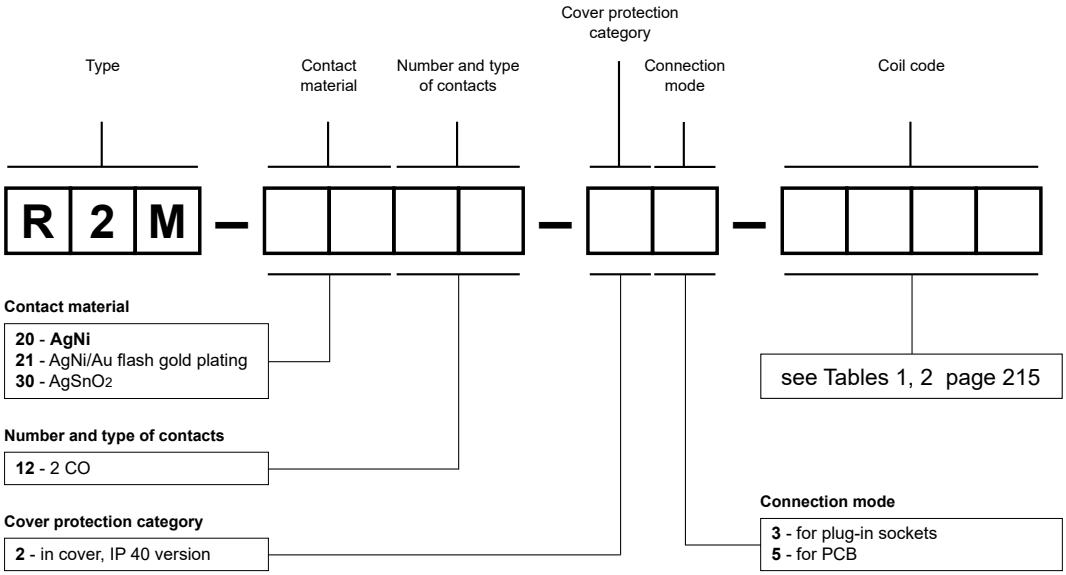
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
5006	6	16	± 10%	4,8	6,6
5012	12	68	± 10%	9,6	13,2
5024	**24**	**270**	**± 10%**	**19,2**	**26,4**
5050	50	1 150	± 10%	40,0	55,0
5100	100	5 590	± 10%	80,0	110,0
5110	110	5 670	± 10%	88,0	121,0
5115	115	5 990	± 10%	92,0	126,0
5120	120	6 390	± 10%	96,0	132,0
5220	220	21 470	± 10%	176,0	242,0
5230	**230**	**21 470**	**± 10%**	**184,0**	**253,0**
5240	240	25 390	± 10%	192,0	264,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



Examples of ordering codes:

R2M-2012-23-5230 relay **R2M**, for plug-in sockets, two changeover contacts, contact material AgNi, coil voltage 230 V AC 50/60 Hz, in cover IP 40

R2M-2012-25-1024 relay **R2M**, for PCB, two changeover contacts, contact material AgNi, coil voltage 24 V DC, in cover IP 40

R15 - 2 CO, 3 CO
industrial relays of small dimensions

R15 - 2 CO (AC) **R15 - 3 CO (DC)**

- Relays of general application
- For plug-in sockets: on 35 mm rail mount acc. to EN 60715; on panel mounting; with terminals for soldering
- Coils AC and DC, insulation class F: 155 °C
- WT (mechanical indicator + lockable front test button) - standard equipment of relays in cover, for plug-in sockets. Relays may be provided with the test buttons (no latching) and plugs - page 405
- **Have obtained LR Type Approval Certificate (Lloyd's Register)**
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		2 CO, 3 CO
Contact material		**AgNi**, AgNi/Au flash gold plating, AgNi/Au hard gold plating
Rated / max. switching voltage	AC	250 V / 440 V
Min. switching voltage		10 V AgNi, 10 V AgNi/Au flash gold plating 5 V AgNi/Au hard gold plating
Rated load (capacity)	AC1	10 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	10 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		5 mA
Max. inrush current		20 A
Rated current		10 A
Max. breaking capacity	AC1	2 500 VA
Min. breaking capacity		0,3 W AgNi, 0,3 W AgNi/Au flash gold plating 0,05 W AgNi/Au hard gold plating
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	1 200 cycles/hour
	• no load	12 000 cycles/hour

Coil data

Rated voltage	50/60 Hz AC	6, 12, **24**, 48, 60, 115, 120, 220, **230**, 240 V
	DC	6, **12**, **24**, 40, 48, 60, 110, 120, **220** V
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2
Rated power consumption	AC	2,8 VA 50 Hz 2,5 VA 60 Hz
	DC	1,5 W

Insulation according to EN 60664-1

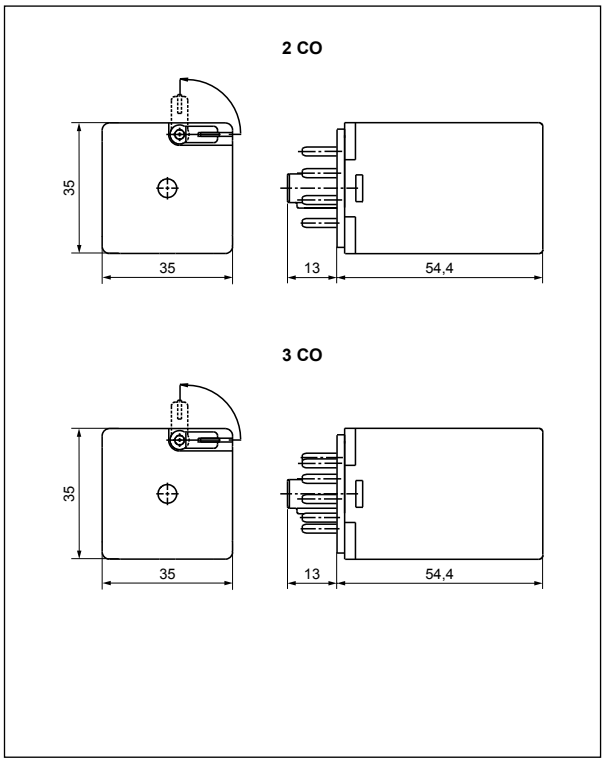
Insulation rated voltage		250 V AC
Rated surge voltage		2 500 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	2 500 V AC type of insulation: basic
	• contact clearance	1 500 V AC type of clearance: micro-disconnection
	• pole - pole	2 000 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 3 mm
	• creepage	≥ 4,2 mm

General data

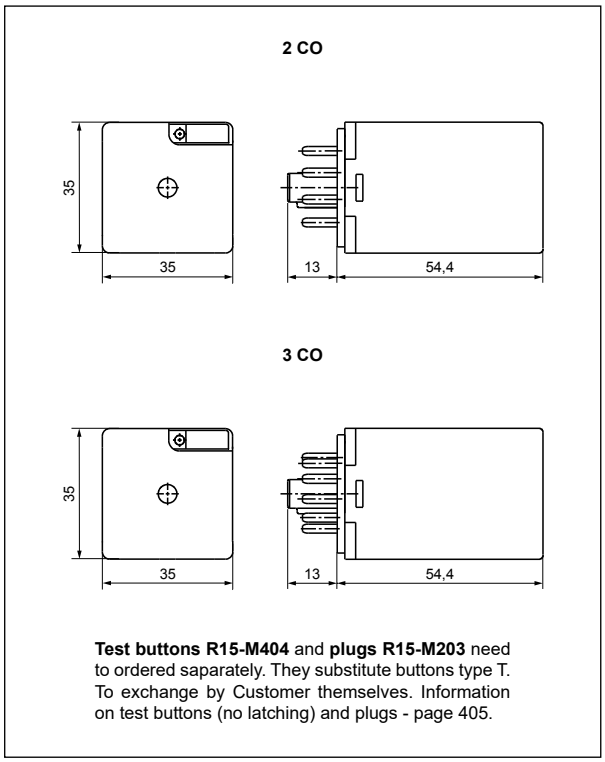
Operating / release time (typical values)		AC: 12 ms / 10 ms DC: 18 ms / 7 ms
Electrical life	• resistive AC1	≥ 2 x 10^5 10 A, 250 V AC
	• cosφ	see Fig. 2
Mechanical life (cycles)		≥ 2 x 10^7
Dimensions (L x W x H) / Weight		35 x 35 x 54,4 mm / 83 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	AC: -40...+55 °C DC: -40...+70 °C
Cover protection category		IP 20 (with socket PZ8, PZ11) EN 60529
Environmental protection		RTI EN 61810-7
Shock resistance		10 g
Vibration resistance		5 g 10...150 Hz
Solder bath temperature		max. 270 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Dimensions - plug-in version (WT), with lockable front test button type T



Dimensions - plug-in version, with test button (no latching) or with plug (no manual operation)



Test buttons R15-M404 and **plugs R15-M203** need to ordered saparately. They substitute buttons type T. To exchange by Customer themselves. Information on test buttons (no latching) and plugs - page 405.

Mounting, sockets and accessories for relays

Relays **R15 - 2 CO, 3 CO** are designed for mounting in plug-in sockets. **With WT equipment as standard** (**W** - mechanical indicator + **T** - lockable front test button). In these relays is **possibility self-exchange of button type T for test button R15-M404** (no latching) **or on plug R15-M203** (no manual operation). The buttons **R15-M404** and the plugs **R15-M203 need to ordered saparately**.

Sockets for R15 - 2 CO	Sockets for R15 - 3 CO	Accessories		Additional equipment
		Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)				
PZ8	PZ11	PZ11 0031	–	–
GZP8	GZP11	GZP-0054	GZP-0035	21, 41 ❷, COM3 ❸
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715)				
GZU8	GZU11	GZU 1052	–	–
Screw terminals sockets, on panel mounting (two M3 screws)				
GZ8	GZ11	GZ 1050	–	–
Solder terminals sockets				
GOP8	GOP11	R159 1051 ❹	–	–

❷ Signalling / protecting modules type 21, 41 - see page 399. ❸ Time modules COM3 - see page 528.
❹ Set R159 1051: spring wire clip and two spring clamps.

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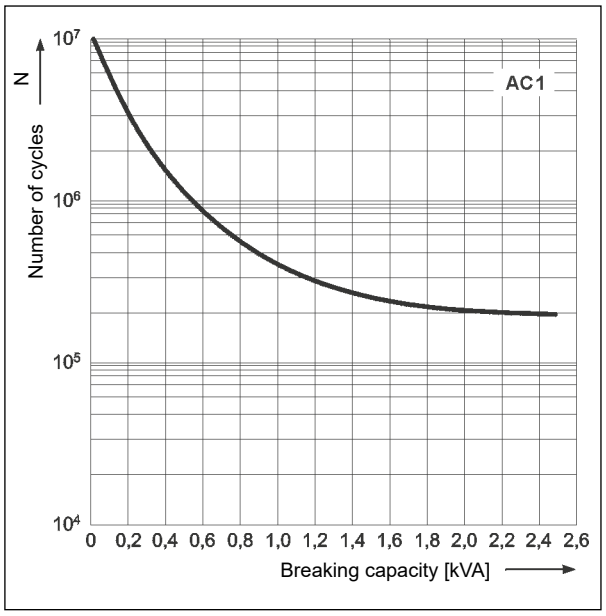
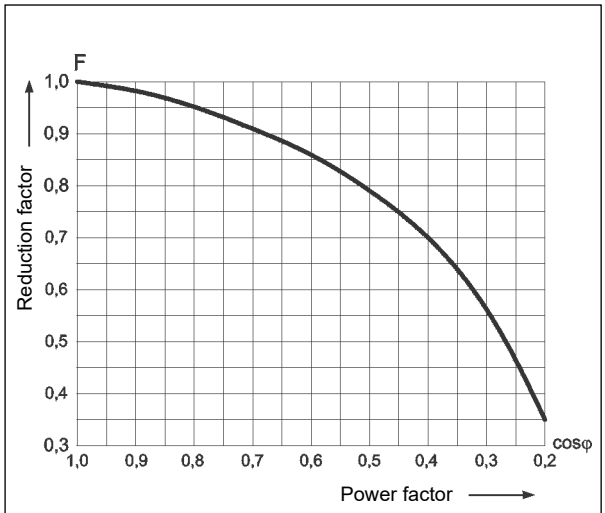
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



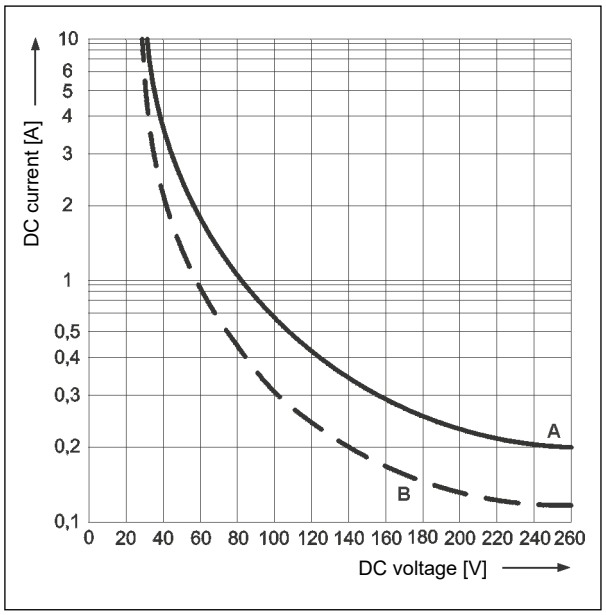
Electrical life reduction factor at AC inductive load Fig. 2



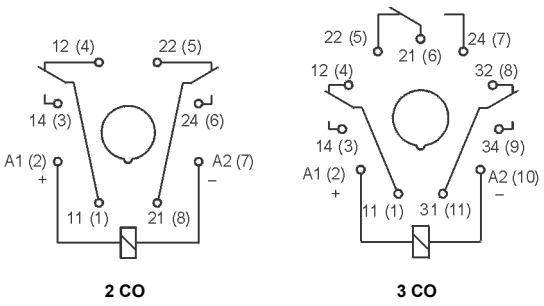
N - electrical life at AC1

$N_{\cos\varphi} = N \times F$

Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Connection diagrams (pin side view)



Note: the indicated polarization of the supply refers to the relays with extra equipment **D** - surge suppression element (diode) - for DC coils only.

Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 70 °C)
1006	6	28	± 10%	4,8	6,6
1012	**12**	**110**	**± 10%**	**9,6**	**13,2**
1024	**24**	**430**	**± 10%**	**19,2**	**26,4**
1040	40	1 340	± 10%	32,0	44,0
1048	48	1 750	± 10%	38,4	52,8
1060	60	2 700	± 10%	48,0	66,0
1110	110	9 200	± 10%	88,0	121,0
1120	120	11 000	± 10%	96,0	132,0
1220	**220**	**37 000**	**± 10%**	**176,0**	**242,0**

The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
5006	6	4,3	± 15%	4,8	6,6
5012	12	18,5	± 15%	9,6	13,2
5024	**24**	**75**	**± 15%**	**19,2**	**26,4**
5048	48	305	± 15%	38,4	52,8
5060	60	475	± 15%	48,0	66,0
5115	115	1 840	± 15%	92,0	126,5
5120	120	1 910	± 15%	96,0	132,0
5220	220	6 980	± 15%	176,0	242,0
5230	**230**	**7 080**	**± 15%**	**184,0**	**253,0**
5240	240	7 760	± 15%	192,0	264,0

The data in bold type relate to the standard versions of the relays.

Relays for railroad industry

PIR15.T
- interface

R15T
- industrial

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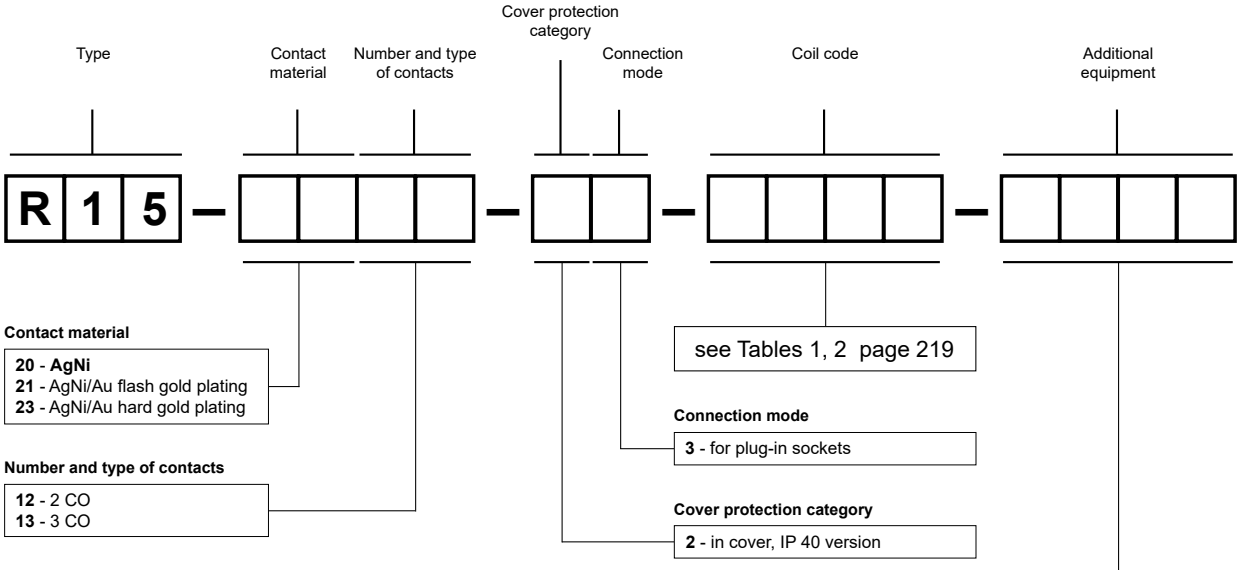
Ordering codes



Contact material

20 - **AgNi**
21 - AgNi/Au flash gold plating
23 - AgNi/Au hard gold plating

Number and type of contacts

12 - 2 CO
13 - 3 CO

see Tables 1, 2 page 219

Connection mode

3 - for plug-in sockets

Cover protection category

2 - in cover, IP 40 version

Additional equipment ❺

WT	- mechanical indicator + lockable front test button
WTL	- mechanical indicator + lockable front test button + light indicator (LED diode)
WTD	- mechanical indicator + lockable front test button + surge suppression element (diode)
WTLD	- mechanical indicator + lockable front test button + light indicator (LED diode) + surge suppression element (diode)
WTV	- mechanical indicator + lockable front test button + surge suppression element (varistor)
WTLV	- mechanical indicator + lockable front test button + light indicator (LED diode) + surge suppression element (varistor)

❺ **T** - orange colour (AC coils), green (DC coils). **WT** - standard equipment of relays for plug-in sockets.
WTD, WTLD - available only in relays with DC coils. **WTV, WTLV** - only with AC coils.

Test buttons (no latching) and plugs need to ordered separately. They substitute buttons type T. To exchange by Customer themselves. Information on test buttons (no latching) and plugs - page 405.

- Button R15-M404-A - orange colour (AC coils)
- Button R15-M404-D - green colour (DC coils)
- Plug R15-M203-A - orange colour (AC coils)
- Plug R15-M203-D - green colour (DC coils)

Note:

While the relay operates, the test button of the **T** type becomes heated. In order to push the test button manually, you should first turn the supply voltage off, and wait some time until the button becomes colder (or push the button immediately using a protective glove or an insulated tool). The button shall be pushed smoothly and quickly. The normally open contacts are closed with the button for the time during which the button is pushed. Releasing the button opens the normally open contacts. Normally open contacts may be closed with the blocking function of the button (it shall be turned by 90°). When the button is turned back, the normally open contacts are opened.

For relays with additional equipment **D** - surge suppression element (diode) (versions WTD and WTLD) - fixed supply polarization compulsory for the DC load of coils: +A1(2) / -A2(7) for R15 - 2 CO and +A1(2) / -A2(10) for R15 - 3 CO. The polarization is indicated on the relay cover. For other versions of the relays with DC coils any polarization is possible.

Examples of ordering codes:

R15-2012-23-1024-WT relay **R15**, for plug-in sockets, two changeover contacts, contact material AgNi, coil voltage 24 V DC, with mechanical indicator and lockable front test button, in cover IP 40

R15-2013-23-5230-WTL relay **R15**, for plug-in sockets, three changeover contacts, contact material AgNi, coil voltage 230 V AC 50/60 Hz, with mechanical indicator and lockable front test button and light indicator (LED diode), in cover IP 40

R15 - 4 CO **R15-...-K - 4 CO (AC)** **R15-...-K - 4 CO (DC)**



- Relays of general application
- For plug-in sockets: on 35 mm rail mount acc. to EN 60715; on panel mounting; with terminals for soldering
- Coils AC and DC, insulation class F: 155 °C
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		4 CO
Contact material		**$AgSnO_2$**, AgNi, AgNi/Au flash gold plating, AgNi/Au hard gold plating
Rated / max. switching voltage	AC	250 V / 440 V
Min. switching voltage		10 V $AgSnO_2$, 10 V AgNi, 10 V AgNi/Au flash gold plating 5 V AgNi/Au hard gold plating
Rated load (capacity)	AC1	10 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	10 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		10 mA $AgSnO_2$, 5 mA AgNi, 5 mA AgNi/Au flash gold plating 5 mA AgNi/Au hard gold plating
Max. inrush current		20 A
Rated current		10 A
Max. breaking capacity	AC1	2 500 VA
Min. breaking capacity		0,5 W $AgSnO_2$, 0,3 W AgNi, 0,3 W AgNi/Au flash gold plating 0,05 W AgNi/Au hard gold plating
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	1 200 cycles/hour
	• no load	12 000 cycles/hour

Coil data

Rated voltage	50 Hz AC	6, 12, 24, 48, 60, 115, 120, 220, 230, 240, 400 V basic version
	60 Hz AC	6, 12, 24, 48, 60, 110, 120, 220, 230, 240 V special version
	DC	6, **12**, **24**, 48, 60, 110, 120, **220** V
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2, 3
Rated power consumption	AC	2,8 VA
	DC	1,5 W

Insulation according to EN 60664-1

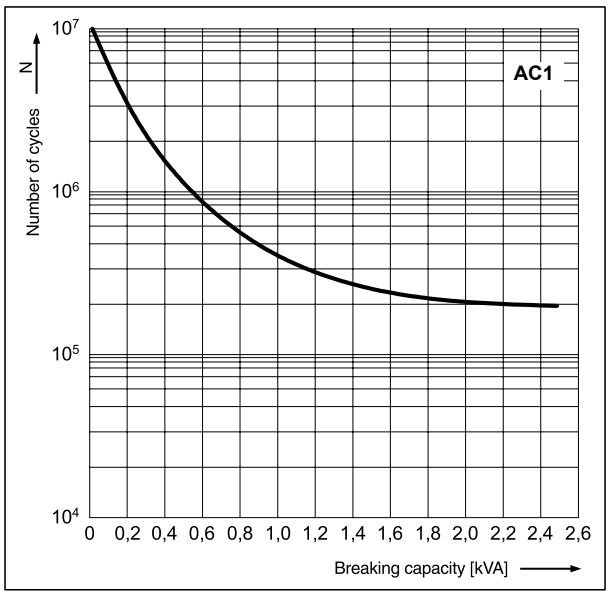
Insulation rated voltage		250 V AC
Rated surge voltage		2 500 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	2 500 V AC type of insulation: basic
	• contact clearance	1 500 V AC type of clearance: micro-disconnection
	• pole - pole	2 000 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 3 mm
	• creepage	≥ 3,2 mm

General data

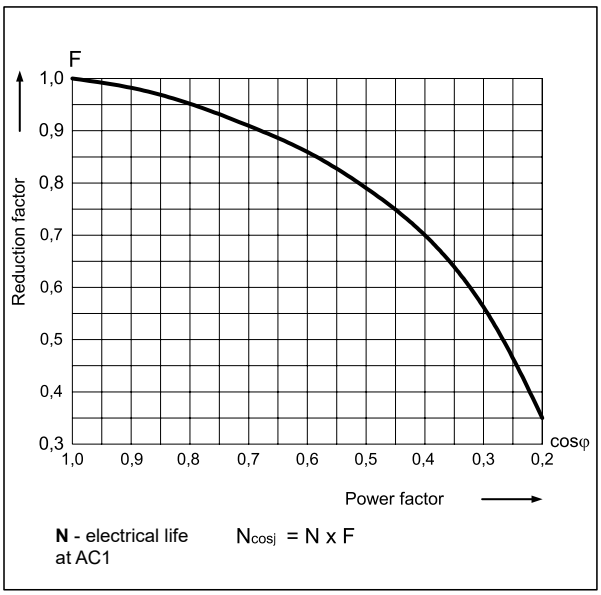
Operating / release time (typical values)		AC: 12 ms / 10 ms DC: 18 ms / 7 ms
Electrical life	• resistive AC1	≥ 10^5 10 A, 250 V AC
	• cosφ	see Fig. 2
Mechanical life (cycles)		≥ 2 x 10^7
Dimensions (L x W x H) / Weight		35 x 42,5 x 54,5 mm / 95 g
Ambient temperature (non-condensation and/or icing)	• storage	-40...+85 °C
	• operating	AC: -40...+55 °C DC: -40...+70 °C
Cover protection category		IP 20 (with socket GZ14U, GZ14) EN 60529
Environmental protection		RTI EN 61810-7
Shock resistance		10 g
Vibration resistance		5 g 10...150 Hz
Solder temperature		max. 350 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



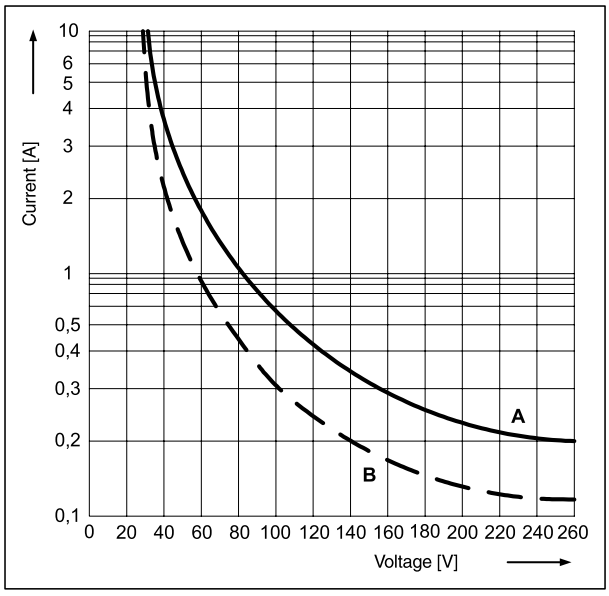
Electrical life reduction factor at AC inductive load Fig. 2



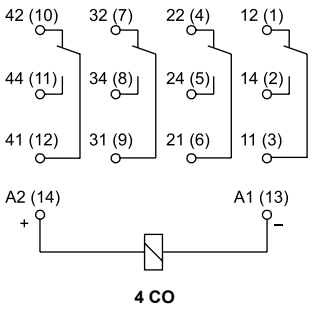
N - electrical life at AC1

$N_{cosj} = N \times F$

Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3

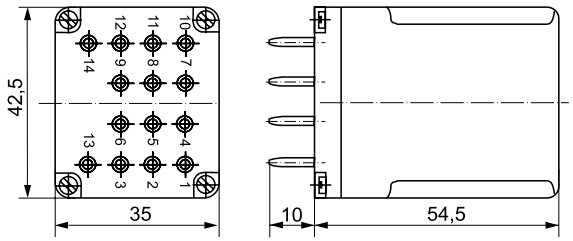


Connection diagram (pin side view)



Note: the indicated polarization of the supply refers to the relays with extra equipment **D** - surge suppression element (diode) - for DC coils only.

Dimensions



GZ14P

Push-in terminals
plug-in sockets
for R15 - 4 CO
for connection
behind panel mounting
- see page 395.

NEW

Contact material selection for different load types

- **$AgSnO_2$** - for DC and AC current loads (good resistance to inrush currents), for inductive loads.
- **AgNi** - for AC and DC current loads (good resistance when disconnecting the electric arc), for resistive and slightly inductive loads,
- **AgNi/Au flash gold plating** - Au protects the contact surface during storage,
- **AgNi/Au hard gold plating** - for small resistive loads in control circuits.

Coil data - DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 70 °C)
1006	6	28	± 10%	5,1	6,6
1012	**12**	**110**	**± 10%**	**10,2**	**13,2**
1024	**24**	**430**	**± 10%**	**20,4**	**26,4**
1048	48	1 750	± 10%	40,8	52,8
1060	60	2 700	± 10%	51,0	66,0
1110	110	9 200	± 10%	93,5	121,0
1120	120	11 000	± 10%	102,0	132,0
1220	**220**	**37 000**	**± 10%**	**187,0**	**242,0**

The data in bold type relate to the standard versions of the relays.

Coil data - AC 50 Hz voltage version, basic — Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
3006	6	4,8	± 15%	5,1	6,6
3012	12	20	± 15%	10,2	13,2
3024	24	72	± 15%	20,4	26,4
3048	48	360	± 15%	40,8	52,8
3060	60	520	± 15%	51,0	66,0
3115	115	2 100	± 15%	97,7	126,5
3120	120	2 300	± 15%	102,0	132,0
3220	220	7 000	± 15%	187,0	242,0
3230	230	7 900	± 15%	195,5	253,0
3240	240	8 300	± 15%	204,0	264,0
3400	400	21 500	± 15%	340,0	440,0

Coil data - AC 60 Hz voltage version, special — Table 3

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
6006	6	4,8	± 15%	5,1	6,6
6012	12	17	± 15%	10,2	13,2
6024	24	65	± 15%	20,4	26,4
6048	48	310	± 15%	40,8	52,8
6060	60	490	± 15%	51,0	66,0
6110	110	1 760	± 15%	93,5	121,0
6120	120	2 000	± 15%	102,0	132,0
6220	220	6 900	± 15%	187,0	242,0
6230	230	7 000	± 15%	195,5	253,0
6240	240	7 100	± 15%	204,0	264,0

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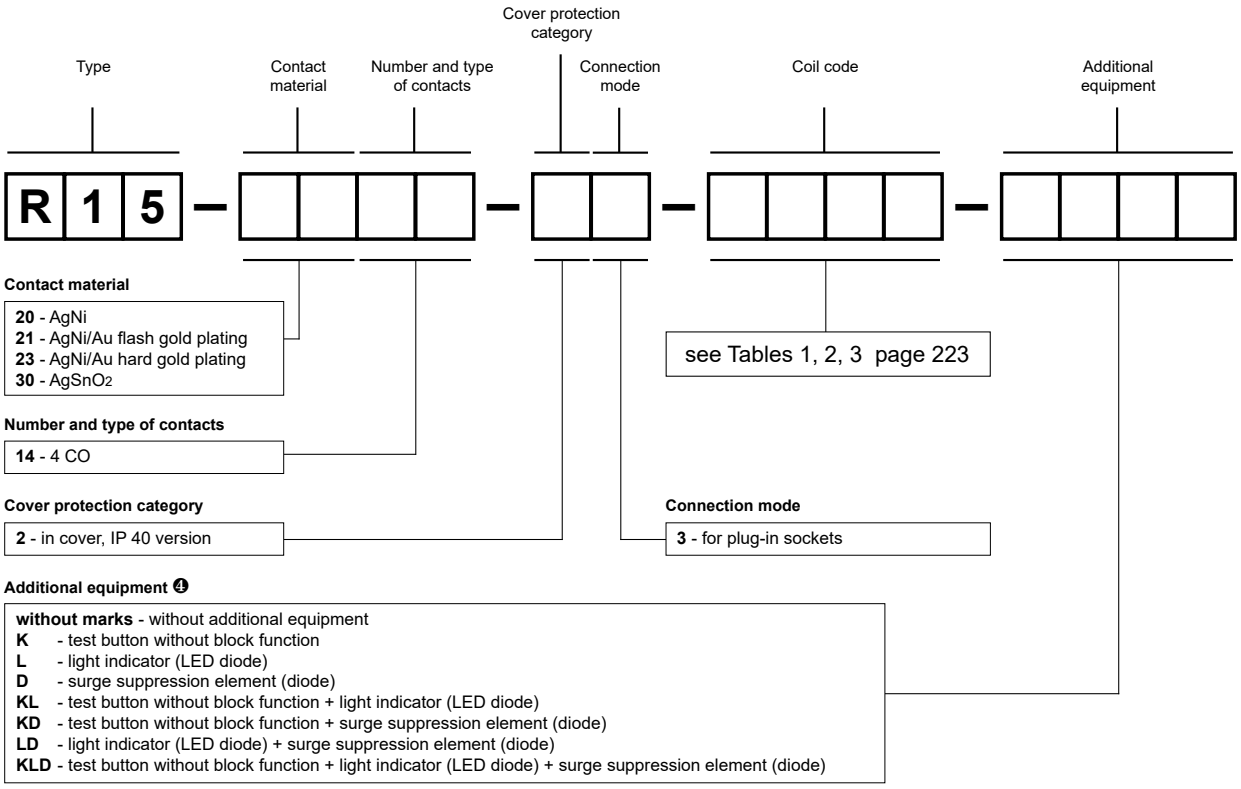
Mounting, sockets and accessories for relays

Relays **R15 4 - CO** are designed for mounting in plug-in sockets.

Sockets for R15 - 4 CO	**Accessories** Spring wire clips	**Additional equipment**
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715)		
GZ14U	GZ14 0737	–
Screw terminals sockets, on panel mounting (two M3 screws)		
GZ14	GZ14 0737	–
GZ14Z ❷	GZ14 0737	–
Push-in terminals sockets, on panel mounting (two M3 screws)		
GZ14P ❷	GZ14 0737	–
Solder terminals sockets		
GOP14	R15 0736	R15 5922 ❸

❷ Sockets GZ14Z, GZ14P: for connection behind panel mounting - see page 395. ❸ Spring clamps R15 5922.

Ordering codes



❹ **K** - orange colour (AC coils), green (DC coils). **D, KD, LD, KLD** - available only in relays with DC coils.

Note:
For relays with additional equipment **D** - surge suppression element (diode) (versions D, KD, LD, KLD) - fixed supply polarization compulsory for the DC load of coils: -A1(13) / +A2(14). The polarization is indicated on the relay cover. For other versions of the relays with DC coils any polarization is possible.

Examples of ordering codes:

R15-2014-23-1024-KD relay **R15**, for plug-in sockets, four changeover contacts, contact material AgNi, coil voltage 24 V DC, with test button without block function and surge suppression element (diode), in cover IP 40

R15-3014-23-3230 relay **R15**, for plug-in sockets, four changeover contacts, contact material $AgSnO_2$, coil voltage 230 V AC 50 Hz, in cover IP 40

with adaptor (V) with adaptor (H)

- Relays of general application • For plug-in sockets: on 35 mm rail mount acc. to EN 60715; on panel mounting • AC and DC coils, insulation class F: 155 °C • Versions: PCB; faston 187 (4,8 x 0,5 mm); faston 250 (6,3 x 0,8 mm) • Contact gap: 3 mm (option - only in versions with normally open contacts)
- Additional equipment: K - test button; L - light indicator (LED)
- Applications: control of electromagnets; systems of heating, cooling, ventillation, air conditioning; control with single-phase and three-phase motors; catering industry machines and equipment; automation systems; photoelectric systems; etc.
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		2 CO, 3 CO, 2 NO, 3 NO 2 NO, 3 NO with contact gap ≥ 3 mm	
Contact material		AgNi, **$AgSnO_2$**	
Rated / max. switching voltage	AC	250 V / 440 V	230 V / 250 V ❶
Min. switching voltage		5 V AgNi, 10 V $AgSnO_2$	
Rated load	AC1	16 A / 250 V AC or 10 A / 400 V AC	16 A / 250 V AC ❶
	DC1	16 A / 24 V DC (see Fig. 3)	
Motor load	acc. to UL 508	1/3 HP	120 V AC, 7,2 FLA, single-phase motor
		3/4 HP	240 V AC, 6,9 FLA, single-phase motor
		1 HP	400 V AC, 2,3 FLA, three-phase motor, (only 3 NO)
Min. switching current		5 mA AgNi, 10 mA $AgSnO_2$	
Max. inrush current		40 A	
Rated current		16 A	
Max. breaking capacity	AC1	4 000 VA	
Min. breaking capacity		0,3 W AgNi, 1 W $AgSnO_2$	
Contact resistance		≤ 100 mΩ	
Max. operating frequency			
• at rated load	AC1	1 200 cycles/hour	
• no load		12 000 cycles/hour	

Coil data

Rated voltage	50/60 Hz AC	6, 12, 24, 115, 120, 220, 230, 240 V	
	50 Hz AC	400 V ❶	
	DC	6, **12**, 24, 42, 48, 60, 110, 120, 220 V	standard coil
	DC	12, 24, 48, 110, 220 V	reinforced coil
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2, 3, 4	
Rated power consumption	AC	2,8 VA 50 Hz	2,5 VA 60 Hz
	DC	1,5 W	1,7 W with contact gap ≥ 3 mm

Insulation according to EN 60664-1

Insulation rated voltage	400 V AC	
Rated surge voltage	4 000 V 1,2 / 50 µs	
Overvoltage category	III	
Insulation pollution degree	2	
Dielectric strength		
• between coil and contacts	2 500 V AC	type of insulation: basic
• contact clearance	1 500 V AC	type of clearance: micro-disconnection, with contact gap ≥ 0,4 mm
	2 500 V AC	type of clearance: full-disconnection, with contact gap ≥ 3 mm
• pole - pole	2 500 V AC	type of insulation: basic

Contact - coil distance		
• clearance	≥ 5 mm 2 CO, 2 NO	≥ 4 mm 3 CO, 3 NO
• creepage	≥ 8 mm 2 CO, 2 NO	≥ 5 mm 3 CO, 3 NO
Pole - pole distance		
• clearance	≥ 15,6 mm 2 CO, 2 NO	≥ 6,3 mm 3 CO, 3 NO
• creepage	≥ 22 mm 2 CO, 2 NO	≥ 8 mm 3 CO, 3 NO

The data in bold type relate to the standard versions of the relays.
❶ For RUC faston 4,8 x 0,5 with GUC11S-V0 socket, max. switching voltages and coil voltages of relays are limited to 250 V AC / DC.

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General data

Operating / release time (typical values)	20 ms / 15 ms	
Electrical life		
• resistive AC1	> 10^5	16 A, 250 V AC
	> 10^5	10 A, 400 V AC
• cosφ	see Fig. 2	
Mechanical life (cycles)	> 10^7	
Dimensions (L x W x H) / Weight		
• RUC faston 4,8 x 0,5	36,1 x 38,6 x 52,65 mm / 80 g	for plug-in sockets
	36,1 x 38,6 x 56,5 mm / 80 g	for PCB
	45,9 x 38,6 x 58,75 mm / 85 g	with adaptor (V)
	46,8 x 38,6 x 62,45 mm / 85 g	with adaptor (H)
	36,1 x 38,6 x 66,3 mm / 85 g	with mounting flange
Dimensions (L x W x H) / Weight		
• RUC faston 6,3 x 0,8	45,9 x 38,6 x 62,4 mm / 85 g	with adaptor (V)
	46,8 x 38,6 x 66,1 mm / 85 g	with adaptor (H)
	36,1 x 38,6 x 66,3 mm / 85 g	with mounting flange
Ambient temperature • storage	-40...+85 °C	
(non-condensation and/or icing) • operating	AC: -40...+55 °C	3 CO, 3 NO / 16 A
	AC: -40...+70 °C	2 CO, 2 NO / 16 A
	DC: -40...+55 °C	3 CO, 3 NO / 16 A
	DC: -40...+70 °C	3 CO, 3 NO / 10 A; 2 CO, 2 NO / 16 A
Cover protection category	IP 00	EN 60529
Environmental protection	RTI	EN 61810-7
Shock resistance	10 g	
Vibration resistance	5 g	10...150 Hz
Solder bath temperature	max. 270 °C	
Soldering time	max. 5 s	

Mounting, sockets and accessories for relays

Relays **RUC** are offered in versions: • standard, for plug-in sockets • with mounting flange in the wall of the cover, on panel mounting with two M4 screws, flat insert connectors - faston 187 (4,8 x 0,5 mm) or faston 250 (6,3 x 0,8 mm) • with vertical (V) or horizontal (H) adaptors for direct mounting on 35 mm rail mount acc. to EN 60715, flat insert connectors - faston 187 (4,8 x 0,5 mm) or faston 250 (6,3 x 0,8 mm) • for direct PCB mounting ❷.

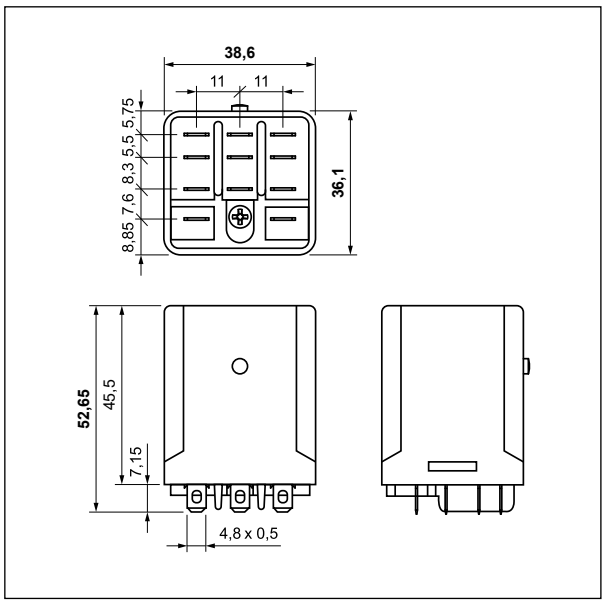
Sockets for RUC faston 4,8 x 0,5	**Accessories**
	Spring wire clips
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715)	
GUC11S-V0 ❶	MBA

❶ For RUC faston 4,8 x 0,5 with GUC11S-V0 socket, max. switching voltages and coil voltages of relays are limited to 250 V AC / DC. ❷ Relays unavailable with (V) or (H) adaptor, and cover with mounting flange.

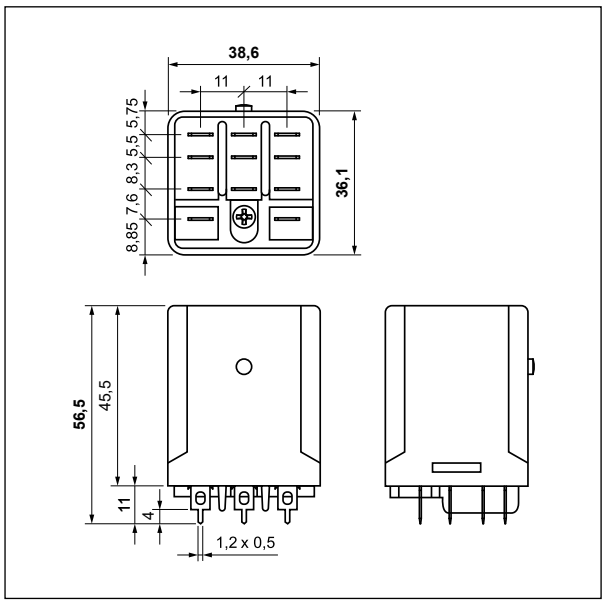
GUC11S-V0

Screw terminals plug-in sockets for RUC faston 4,8 x 0,5, RUC-M
- see page 394.

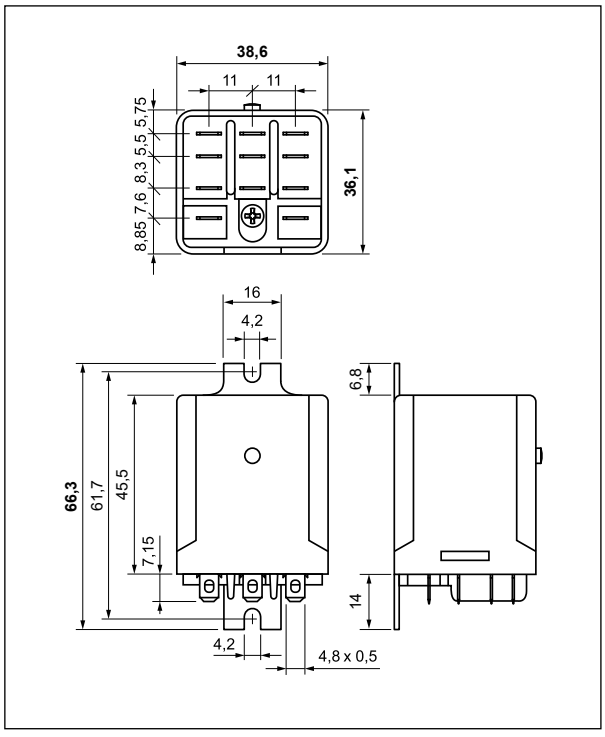
Dimensions - RUC faston 4,8 x 0,5
- plug-in version (standard)



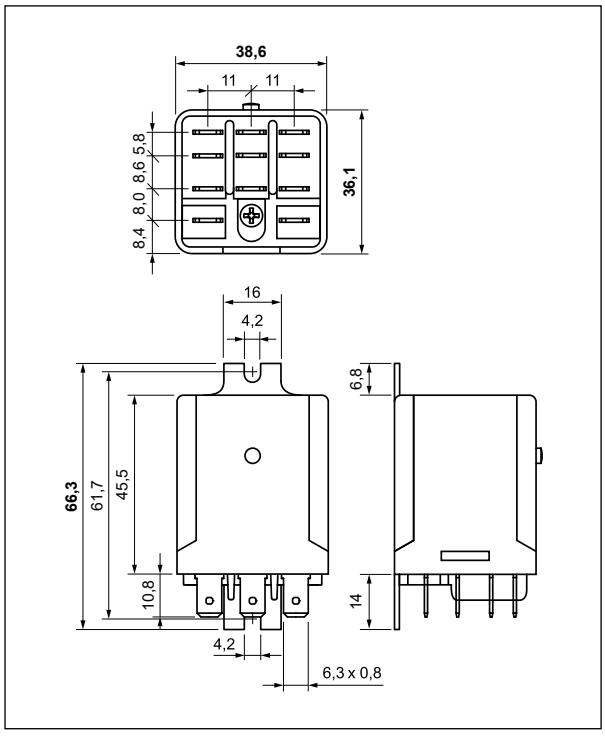
Dimensions - RUC faston 4,8 x 0,5
- PCB version



Dimensions - RUC faston 4,8 x 0,5
- version with mounting flange in the wall of the cover



Dimensions - RUC faston 6,3 x 0,8
- version with mounting flange in the wall of the cover



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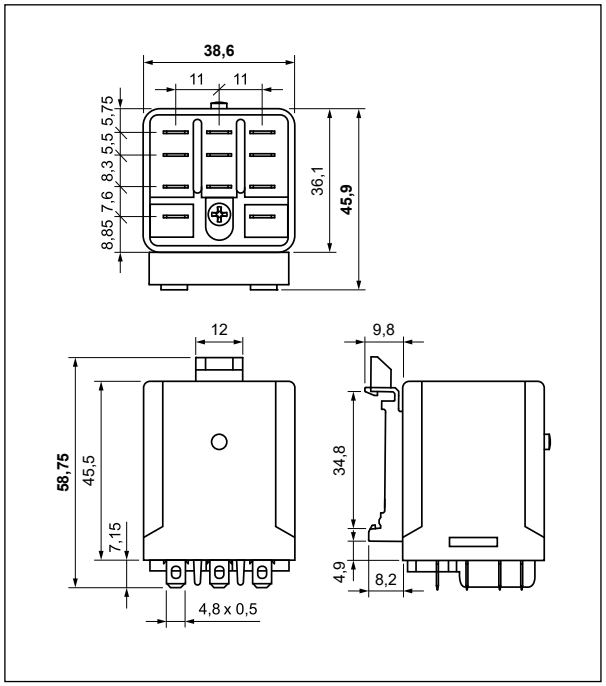
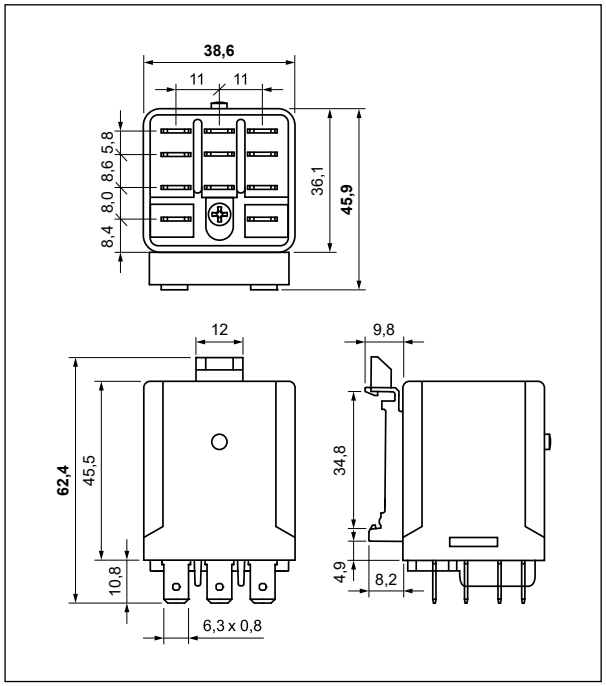
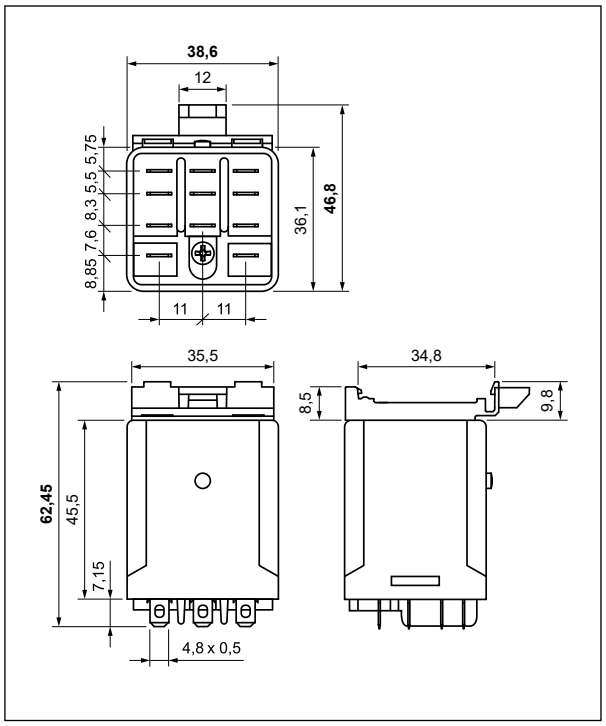
Dimensions - RUC faston 4,8 x 0,5
- version with vertical adaptor (V)



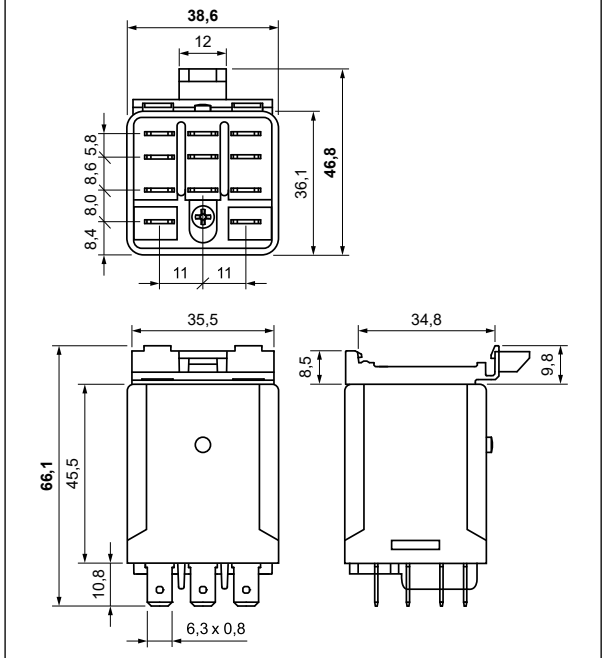
Dimensions - RUC faston 6,3 x 0,8
- version with vertical adaptor (V)



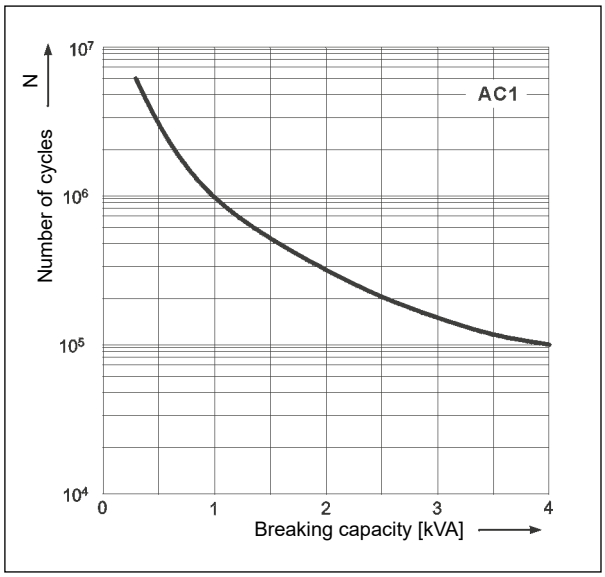
Dimensions - RUC faston 4,8 x 0,5
- version with horizontal adaptor (H)



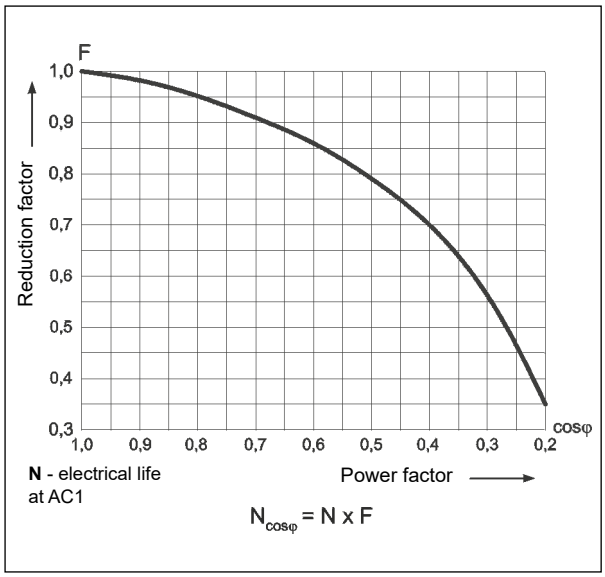
Dimensions - RUC faston 6,3 x 0,8
- version with horizontal adaptor (H)



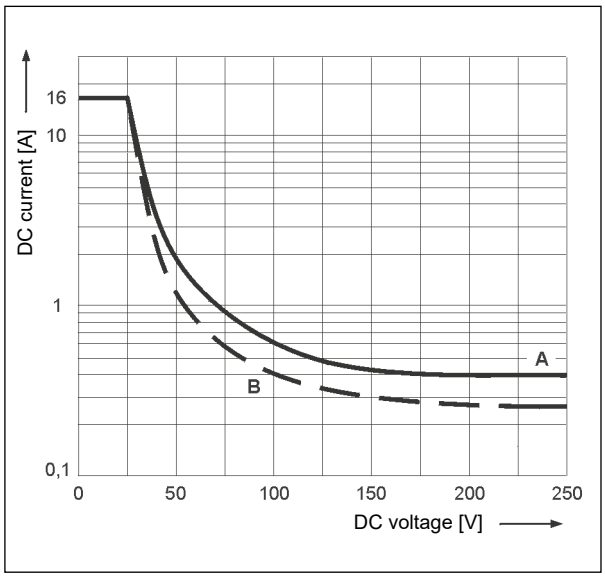
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



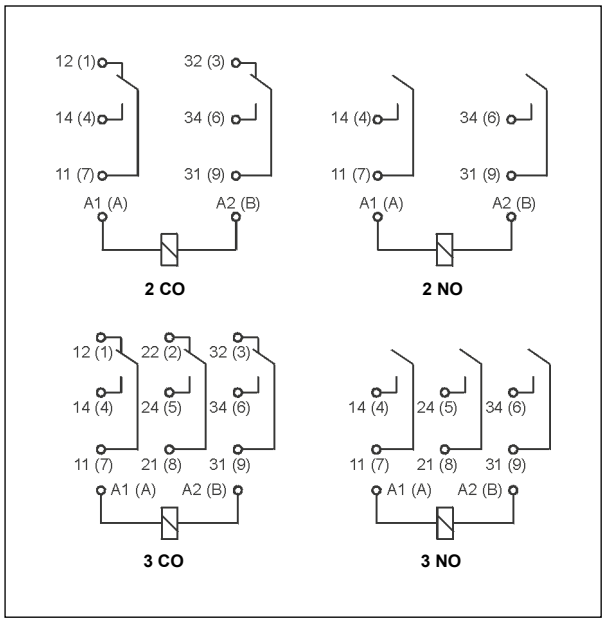
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



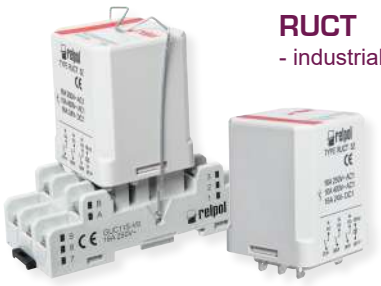
Connection diagrams (pin side view)



Relays for railroad industry

PRUCT
- interface

RUCT
- industrial



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Coil data - DC voltage version, standard Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 55 °C) ❸
1006	6	28	± 10%	4,8	6,6
1012	**12**	**110**	**± 10%**	**9,6**	**13,2**
1024	24	430	± 10%	19,2	26,4
1042	42	1 340	± 10%	33,6	46,2
1048	48	1 750	± 10%	38,4	52,8
1060	60	2 700	± 10%	48,0	66,0
1110	110	9 200	± 10%	88,0	121,0
1120	120	11 000	± 10%	96,0	132,0
1220	220	37 000	± 10%	176,0	242,0

The data in bold type relate to the standard versions of the relays.

Coil data - DC voltage version, reinforced Table 2

Coil code ❹	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 55 °C) ❸
W012	12	85	± 10%	9,6	13,2
W024	24	345	± 10%	19,2	26,4
W048	48	1 370	± 10%	38,4	52,8
W110	110	7 300	± 10%	88,0	121,0
W220	220	30 000	± 10%	176,0	242,0

❸ Max. (at 70 °C) for versions: 3 CO, 3 NO / 10 A; 2 CO, 2 NO / 16 A
❹ For version with contact gap ≥ 3 mm.

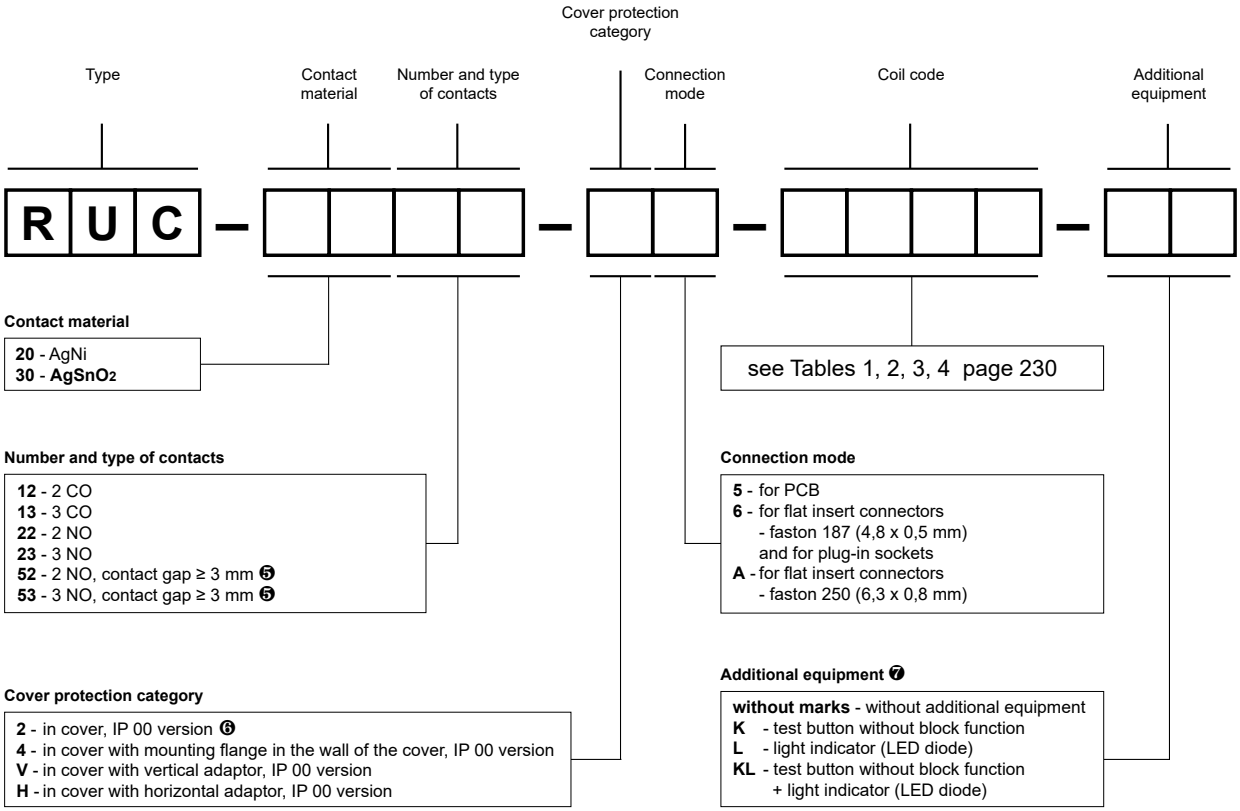
Coil data - AC 50/60 Hz voltage version Table 3

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
5006	6	4,3	± 15%	4,8	6,6
5012	12	18,5	± 15%	9,6	13,2
5024	24	75	± 15%	19,2	26,4
5115	115	1 840	± 15%	92,0	126,5
5120	120	1 910	± 15%	96,0	132,0
5220	220	6 980	± 15%	176,0	242,0
5230	230	7 080	± 15%	184,0	253,0
5240	240	7 760	± 15%	192,0	264,0

Coil data - AC 50 Hz voltage version Table 4

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
3400	400	21 500	± 15%	320,0	440,0

Ordering codes



❺ For versions with reinforced DC coils: W012, W024, W048, W110, W220 and with AC coils.
❻ For relays RUC: for plug-in sockets; for PCB. ❼ **K** - orange colour (AC coils), green (DC coils).

Examples of ordering codes:

RUC-3053-26-W024 relay **RUC**, faston 187 (4,8 x 0,5 mm), for plug-in sockets, three normally open contacts, with contact gap ≥ 3 mm, contact material $AgSnO_2$, reinforced coil voltage 24 V DC, in cover IP 00

RUC-2013-V6-3400-KL relay **RUC**, faston 187 (4,8 x 0,5 mm), for flat insert connectors, with vertical adaptor (V), three changeover contacts, contact material AgNi, coil voltage 400 V AC 50 Hz, with test button without block function and light indicator (LED diode), in cover IP 00

RUC-2052-HA-W220-L relay **RUC**, faston 250 (6,3 x 0,8 mm), for flat insert connectors, with horizontal adaptor (H), two normally open contacts, with contact gap ≥ 3 mm, contact material AgNi, reinforced coil voltage 220 V DC, with light indicator (LED diode), in cover IP 00

RUC-3022-25-5024 relay **RUC**, for PCB, two normally open contacts, contact material $AgSnO_2$, coil voltage 24 V AC 50/60 Hz, in cover IP 00

RUC-M
industrial relays for DC loads

with adaptor (V) with adaptor (H)

- **Relays with permanent magnet whose magnetic field blows the electric arc between the contacts; for high DC loads**
- For plug-in sockets: on 35 mm rail mount acc. to EN 60715; on panel mounting • AC and DC coils, insulation class F: 155 °C
- Versions: PCB; faston 187 (4,8 x 0,5 mm)
- Contact gap: 3 mm (version 2 NO); 6 mm (version 1 NO)
- Additional equipment: L - light indicator (LED)
- Applications: control of electromagnets; systems of heating, cooling, ventillation, air conditioning; control with single-phase motors; catering industry machines and equipment; automation systems; photoelectric systems; etc.
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 NO (double-break)	2 NO
Contact material		AgNi, **$AgSnO_2$**	
Rated / max. switching voltage		250 V DC; 250 V AC / 350 V DC; 440 V AC ❶	
Min. switching voltage		5 V AgNi, 10 V $AgSnO_2$	
Rated load	DC1	16 A / 24 V DC; 14 A / 110 V DC 12 A / 220 V DC	16 A / 24 V DC; 10,5 A / 110 V DC 4,5 A / 220 V DC
	DC L/R=40 ms	16 A / 24 V DC; 5,4 A / 110 V DC 3 A / 220 V DC	16 A / 24 V DC; 1,35 A / 110 V DC 0,45 A / 220 V DC
	AC1	16 A / 250 V AC	16 A / 250 V AC
Min. switching current		5 mA AgNi, 10 mA $AgSnO_2$	
Max. inrush current		40 A 20 ms	
Rated current		16 A	
Max. breaking capacity	AC1	4 000 VA	
Min. breaking capacity		0,3 W AgNi, 1 W $AgSnO_2$	
Contact resistance		≤ 100 mΩ	
Max. operating frequency			
• at rated load	AC1	1 200 cycles/hour	
• no load		12 000 cycles/hour	

Coil data

Rated voltage	50/60 Hz AC	12, 24, 48, 115, 120, 230, 240 V		
	DC	12, 24, 48, 110, 220 V reinforced coil		
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,1 U_n	
Operating range of supply voltage		AC: 0,85...1,1 U_n	DC: 0,8...1,1 U_n	see Tables 1, 2
Rated power consumption	AC	2,8 VA		
	DC	1,7 W		

Insulation according to EN 60664-1

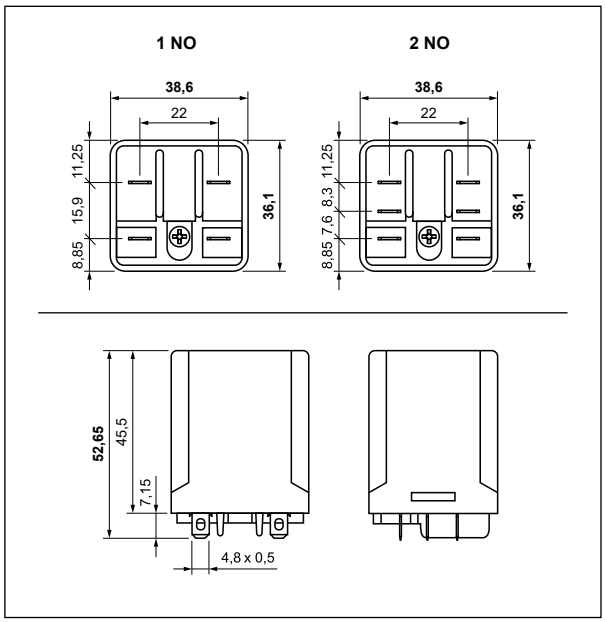
Insulation rated voltage	400 V AC	
Rated surge voltage	4 000 V 1,2 / 50 µs	
Overvoltage category	III	
Insulation pollution degree	3	
Dielectric strength		
• between coil and contacts	2 500 V AC	type of insulation: basic
• contact clearance	4 000 V AC	contact 1 NO, type of clearance: full-disconnection
	2 000 V AC	contacts 2 NO, type of clearance: full-disconnection
• pole - pole	2 500 V AC	contacts 2 NO, type of insulation: basic
Contact - coil distance		
• clearance	≥ 6,3 mm	
• creepage	≥ 8 mm	

The data in bold type relate to the standard versions of the relays.
❶ For RUC-M with GUC11S-V0 socket, max. switching voltages and coil voltages of relays are limited to 250 V AC / DC.

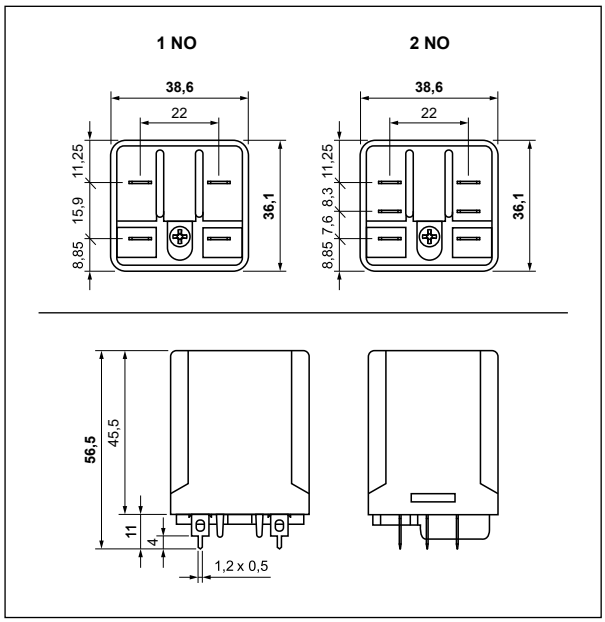
General data

Operating / release time (typical values)	20 ms / 15 ms	
Electrical life		
• resistive DC1	> 2 x 10^5	contact 1 NO, 12 A, 220 V DC
	> 2 x 10^5	contacts 2 NO, 4,5 A, 220 V DC
• DC L/R=40 ms	> 2 x 10^5	contact 1 NO, 3 A, 220 V DC
	> 2 x 10^5	contacts 2 NO, 0,45 A, 220 V DC
Mechanical life (cycles)	> 2 x 10^7	
Dimensions (L x W x H) / Weight	36,1 x 38,6 x 52,65 mm / 80 g	for plug-in sockets
	36,1 x 38,6 x 56,5 mm / 80 g	for PCB
	45,9 x 38,6 x 58,75 mm / 85 g	with adaptor (V)
	46,8 x 38,6 x 62,45 mm / 85 g	with adaptor (H)
	36,1 x 38,6 x 66,3 mm / 85 g	with mounting flange
Ambient temperature (non-condensation and/or icing) • storage	-40...+85 °C	
Ambient temperature (non-condensation and/or icing) • operating	-40...+70 °C	
Cover protection category	IP 00	EN 60529
Environmental protection	RTI	EN 61810-7
Shock resistance	10 g	
Vibration resistance	5 g	10...150 Hz
Solder bath temperature	max. 270 °C	
Soldering time	max. 5 s	

Dimensions - plug-in version (standard)



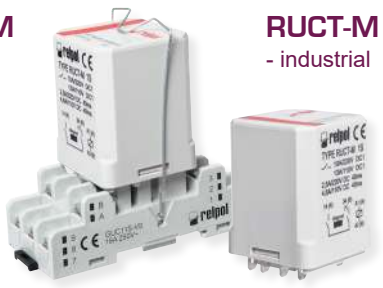
Dimensions - PCB version



Relays for railroad industry

PRUCT-M
- interface

RUCT-M
- industrial



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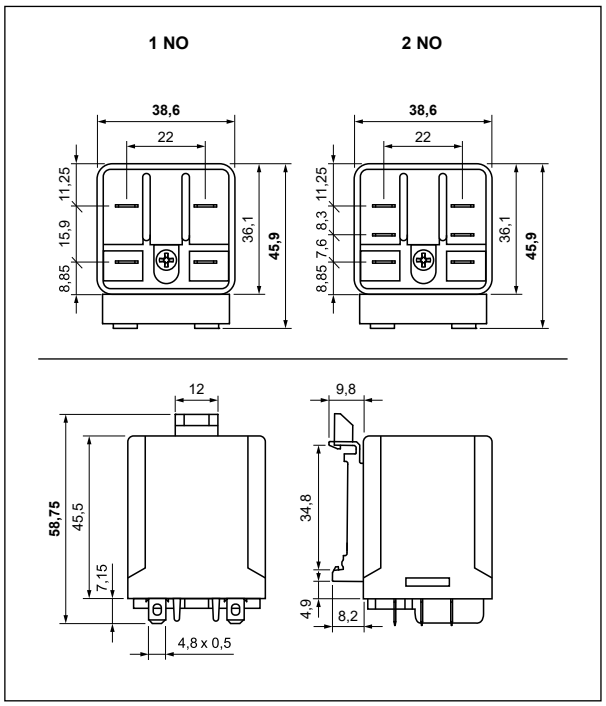
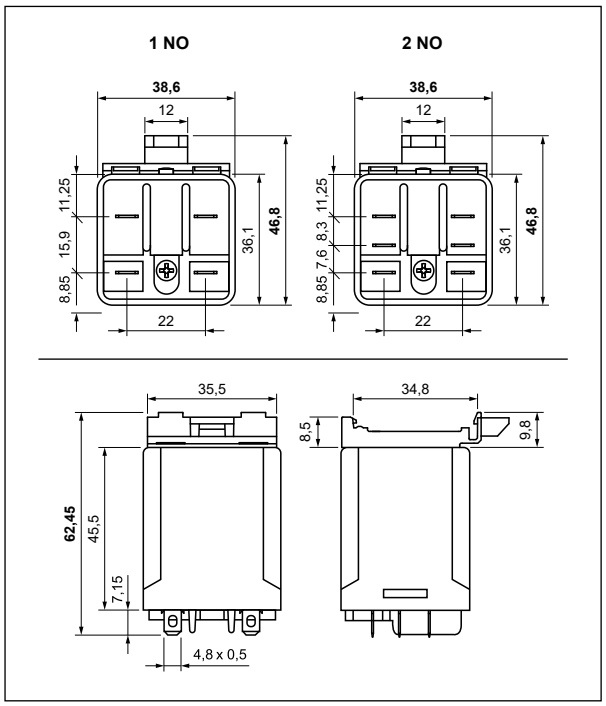
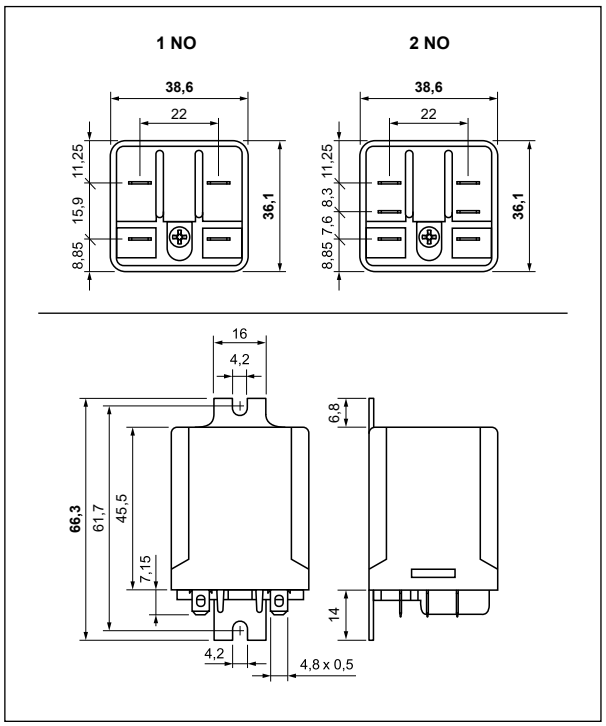
Dimensions - version with vertical adaptor (V)



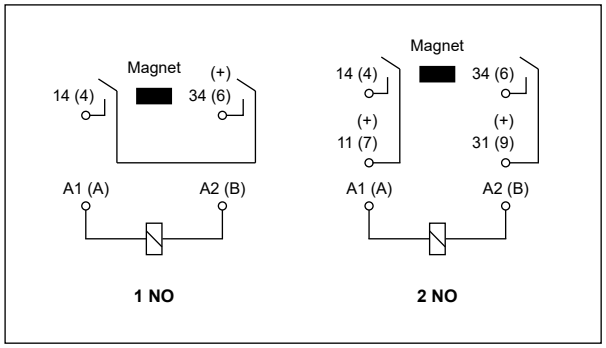
Dimensions - version with horizontal adaptor (H)



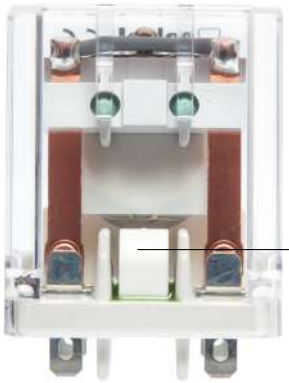
Dimensions - version with mounting flange in the wall of the cover



Connection diagrams (pin side view)

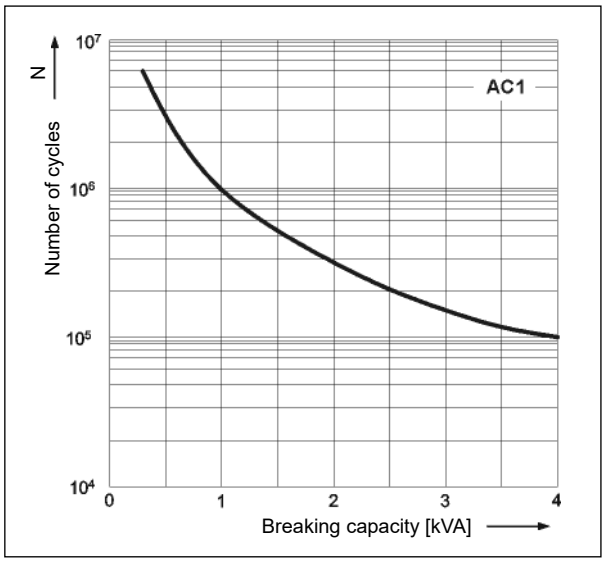


Design

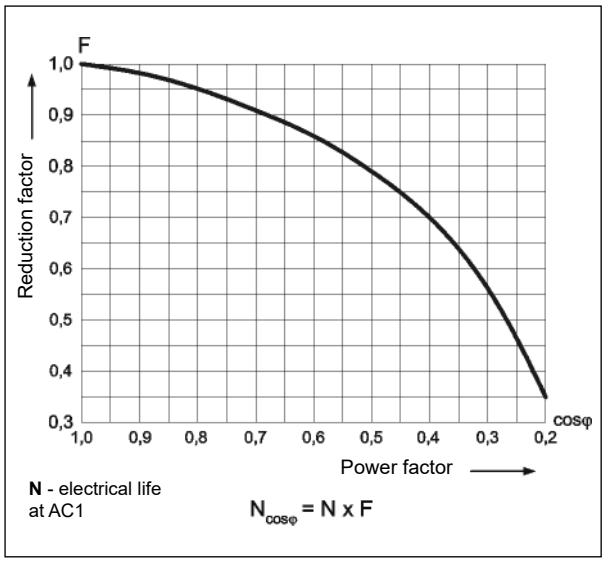


The permanent magnet is fixed on the contact plate. Its magnetic field is directed to the contacts and it blows the electric arc which occurs when the DC load is switched off.

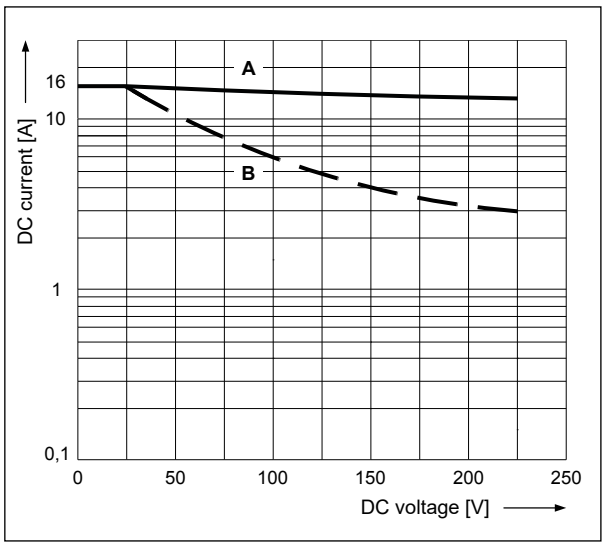
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



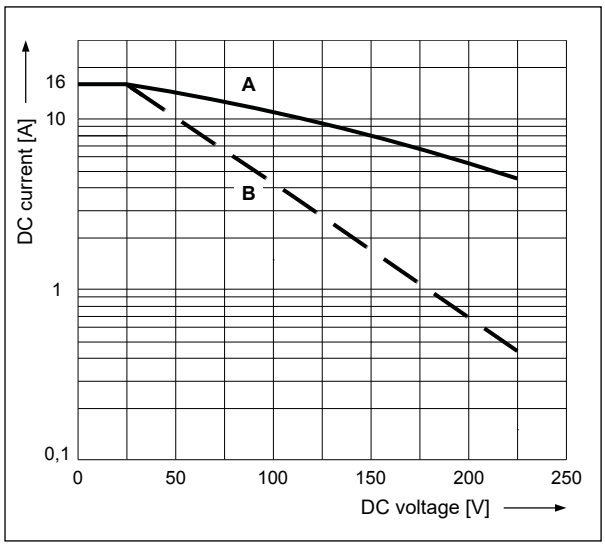
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms
U_n = 24 V DC - version 1 NO (6 mm) Fig. 3



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms
U_n = 24 V DC - version 2 NO (3 mm) Fig. 4



Mounting, sockets and accessories for relays

Relays **RUC-M** are offered in versions: • standard, for plug-in sockets • with mounting flange in the wall of the cover, on panel mounting with two M4 screws, flat insert connectors - faston 187 (4,8 x 0,5 mm) • with vertical (V) or horizontal (H) adaptors for direct mounting on 35 mm rail mount acc. to EN 60715, flat insert connectors - faston 187 (4,8 x 0,5 mm) • for direct PCB mounting ❷.

Sockets for RUC-M	**Accessories**
	Spring wire clips
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715)	
GUC11S-V0 ❶	MBA

❶ For RUC-M with GUC11S-V0 socket, max. switching voltages and coil voltages of relays are limited to 250 V AC / DC. ❷ Relays unavailable with (V) or (H) adaptor, and cover with mounting flange.

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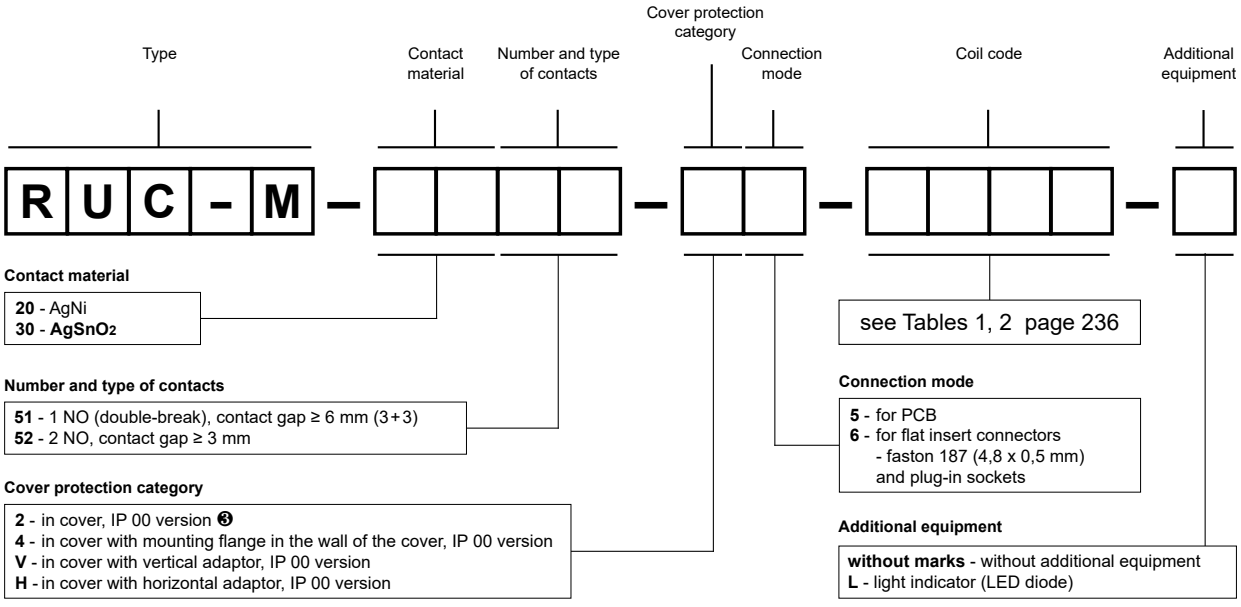
Coil data - DC voltage version, reinforced Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 70 °C)
W012	12	85	± 10%	9,6	13,2
W024	24	345	± 10%	19,2	26,4
W048	48	1 370	± 10%	38,4	52,8
W110	110	7 300	± 10%	88,0	121,0
W220	220	30 000	± 10%	176,0	242,0

Coil data - AC 50/60 Hz voltage version Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
5012	12	18,5	± 15%	9,6	13,2
5024	24	75	± 15%	19,2	26,4
5048	48	305	± 15%	38,4	52,8
5115	115	1 840	± 15%	92,0	126,5
5120	120	1 910	± 15%	96,0	132,0
5230	230	7 080	± 15%	184,0	253,0
5240	240	7 760	± 15%	192,0	264,0

Ordering codes



❸ For relays RUC-M: for plug-in sockets; for PCB.

Examples of ordering codes:

RUC-M-3051-26-W024 relay **RUC-M**, faston 187 (4,8 x 0,5 mm), for plug-in sockets, one normally open contact (double-break), with contact gap ≥ 6 mm (3+3), contact material $AgSnO_2$, reinforced coil voltage 24 V DC, in cover IP 00

RUC-M-2052-V6-5230-L relay **RUC-M**, faston 187 (4,8 x 0,5 mm), for flat insert connectors, with vertical adaptor (V), two normally open contacts, with contact gap ≥ 3 mm, contact material AgNi, coil voltage 230 V AC 50/60 Hz, with light indicator (LED diode), in cover IP 00

RUC-M-2051-25-5024 relay **RUC-M**, for PCB, one normally open contact (double-break), with contact gap ≥ 6 mm (3+3), contact material AgNi, coil voltage 24 V AC 50/60 Hz, in cover IP 00

- Power relays of general application • AC and DC coils, insulation class F: 155 °C • High breaking capacity: AC1 - 10 kVA
- 35 mm rail mount acc. to EN 60715 • High insulation dielectric strength
- Applications: control of electromagnets; systems of heating, cooling, ventillation, air conditioning; control with single-phase motors; catering industry machines and equipment; automation systems; photoelectric systems; etc.
- Recognitions, certifications, directives: RoHS, CE EAC

Contact data

Number and type of contacts		2 NO
Contact material		**$AgSnO_2$**
Rated / max. switching voltage	AC	400 V / 440 V
Min. switching voltage		10 V
Rated load (capacity)	AC1	25 A / 400 V AC
	DC1	25 A / 24 V DC (see Fig. 3)
	DC13	0,3 A / 120 V 0,15 A / 250 V (R300)
Motor load	acc. to UL 508	3/4 HP 240 V AC, 6,9 FLA, single-phase motor ❶
Min. switching current		10 mA
Max. inrush current		40 A
Rated current		25 A
Max. breaking capacity	AC1	10 000 VA
Min. breaking capacity		1 W
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	600 cycles/hour
	AC3	600 cycles/hour
• no load		3 600 cycles/hour

Coil data

Rated voltage	50 Hz AC	12, **24**, 110, **230**, 400 V
	DC	12, **24**, 48, 110, 220 V
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2
Rated power consumption	AC	3,0 VA
	DC	1,7 W

Insulation according to EN 60664-1

Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength		
• between coil and contacts		5 000 V AC type of insulation: reinforced
• contact clearance		1 500 V AC type of clearance: micro-disconnection
• pole - pole		5 000 V AC type of insulation: reinforced
Contact - coil distance	• clearance	≥ 6 mm
	• creepage	≥ 8 mm

General data

Operating / release time (typical values)		20 ms / 20 ms
Electrical life		
• resistive AC1		> 10^5 25 A, 400 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 10^6
Dimensions (L x W x H)		26 x 53,7 x 75,5 mm
Weight		130 g
Ambient temperature	• storage	-25...+85 °C
(non-condensation and/or icing)	• operating	-25...+85 °C
Cover protection category		IP 20 EN 60529
Environmental protection		RTI EN 61810-7
Shock resistance		10 g
Vibration resistance		5 g 10...150 Hz

The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

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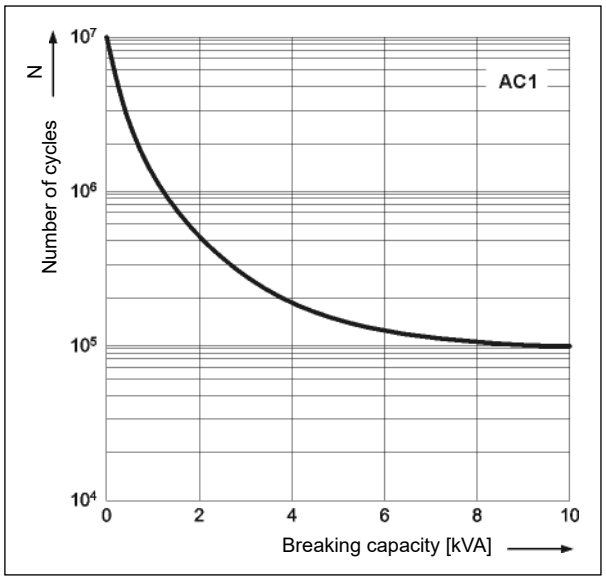
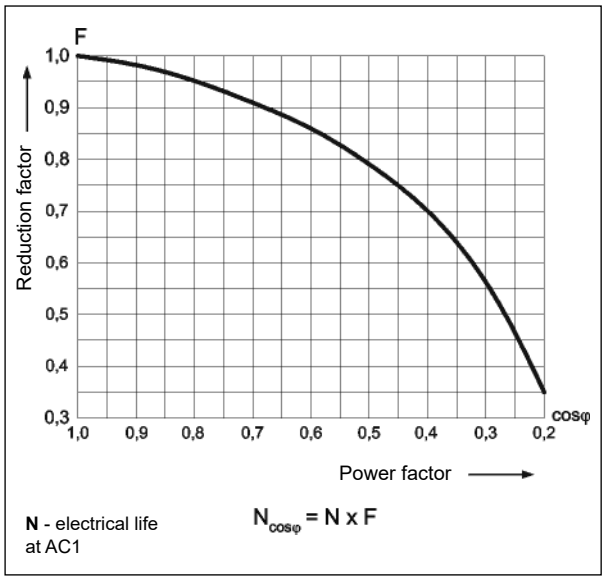
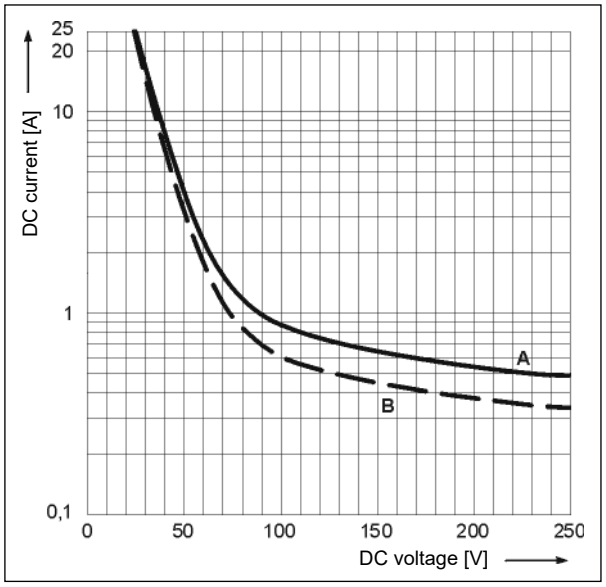
Electrical life at AC resistive load.
Switching frequency: 600 cycles/hour Fig. 1



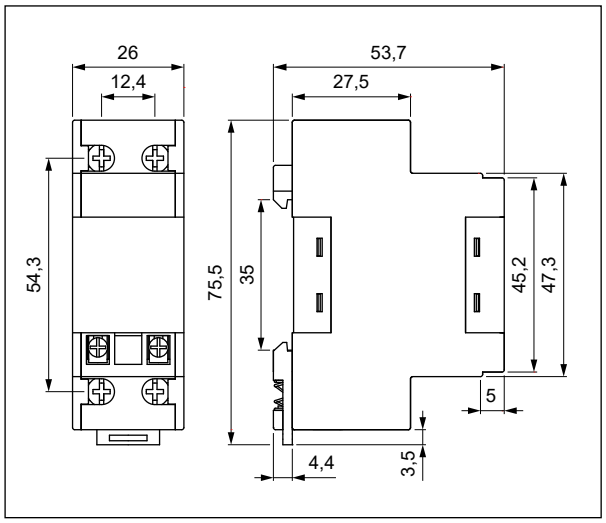
Electrical life reduction factor at AC inductive load Fig. 2



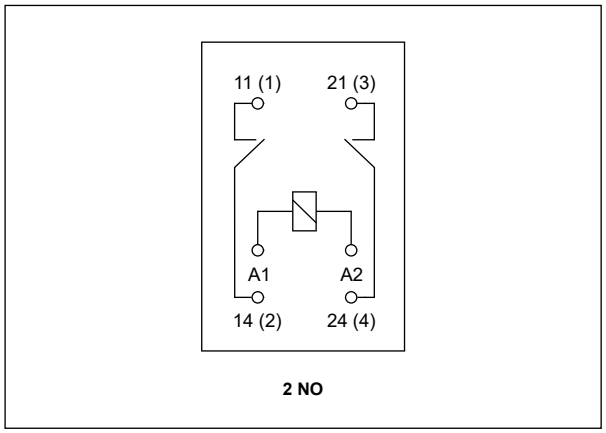
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Dimensions



Connection diagram
(screw terminals side view)



Mounting

Relays **RG25** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - coil terminals downwards. **Connections:** max. cross section of the cables: 2 x 2,5 mm² (2 x 14 AWG), stripping length: 9 mm, max. tightening moment for the terminal: 0,7 Nm.

Test button

Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 55 °C)
1012	12	85	± 10%	9,6	13,2
1024	**24**	**340**	**± 10%**	**19,2**	**26,4**
1048	48	1 350	± 10%	38,4	52,8
1110	110	7 600	± 10%	88,0	121,0
1220	220	30 000	± 10%	176,0	242,0

The data in bold type relate to the standard versions of the relays.

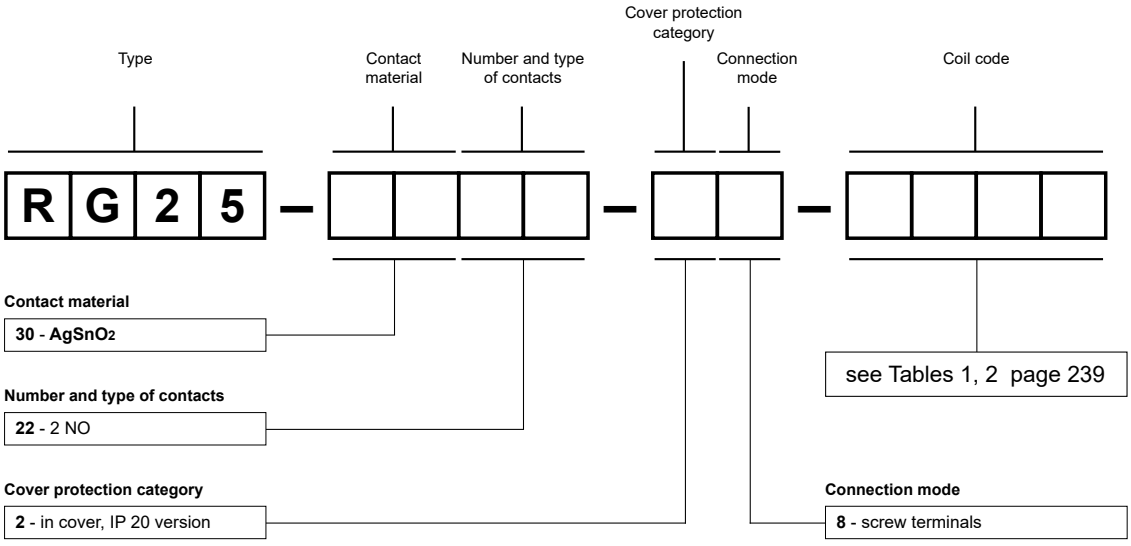
Coil data - AC 50 Hz voltage version

Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
3012	12	17	± 10%	8,4	13,2
3024	**24**	**76**	**± 10%**	**16,8**	**26,4**
3110	110	1 600	± 10%	77,0	121,0
3230	**230**	**6 800**	**± 10%**	**161,0**	**253,0**
3400	400	18 600	± 10%	280,0	440,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



Example of ordering code:

RG25-3022-28-3230 relay **RG25**, screw terminals, two normally open contacts, contact material $AgSnO_2$, coil voltage 230 V AC 50 Hz, in cover IP 20

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R20
industrial relays of small dimensions

version 1 NO

version 2 NO

- High switching capacity up to 30 A
- ”Bridge” type contacts which open the circuit with double break
- Flat insert connectors - faston faston 250 (6,3 x 0,8 mm)
- High resistance to interference • High strength of insulation
- Applications: household equipment; air-conditioning and ventilation systems; audio equipment; control devices; automation systems; photoelectric systems; etc.
- Recognitions, certifications, directives: RoHS, CE

Contact data

Number and type of contacts		1 NO, 2 NO	
Contact material		**$AgSnO_2$**	
Rated / max. switching voltage	AC	250 V / 440 V	
Min. switching voltage		10 V	
Rated load	AC1	1 NO: 30 A / 250 V AC	2 NO: 25 A / 250 V AC
Min. switching current		10 mA	10 mA
Rated current		1 NO: 30 A	2 NO: 25 A
Max. breaking capacity	AC1	1 NO: 7 000 VA	2 NO: 6 250 VA
Min. breaking capacity		0,1 W	
Contact resistance		≤ 100 mΩ	

Coil data

Rated voltage	50/60 Hz AC	24, 48, 115, 230 V	
	DC	12, 24, 110 V	
Must release voltage		DC: ≥ 0,1 U_n	
Operating range of supply voltage		see Tables 1, 2	
Rated power consumption	AC	1,7 VA 24, 48 V	2,5 VA 115, 230 V
	DC	1,9 W	

Insulation according to EN 60664-1

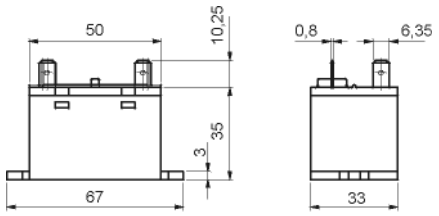
Insulation rated voltage	250 V AC	
Dielectric strength		
• between coil and contacts	4 000 V AC	type of insulation: reinforced
• contact clearance	2 000 V AC	type of clearance: full-disconnection
Contact - coil distance		
• clearance	≥ 9 mm	
• creepage	≥ 11 mm	

General data

Operating / release time (typical values)		30 ms / 30 ms	
Electrical life			
• resistive AC1	1 200 cycles/hour	10^5 1Z: 30 A, 250 V AC	2Z: 25 A, 250 V AC
Mechanical life (cycles)		> 10^7	
Dimensions (L x W x H)		67 x 33 x 35 mm	
Weight		90 g	
Ambient temperature			
(non-condensation and/or icing)	• operating	-25...+75 °C	
Cover protection category		IP 50 EN 60529	
Environmental protection		RTI EN 61810-7	
Shock resistance		10 g	
Vibration resistance		1,5 mm DA (constant amplitude) 10...55 Hz	

The data in bold type relate to the standard versions of the relays.

Dimensions



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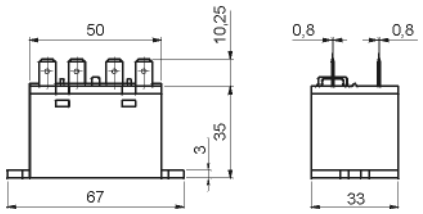
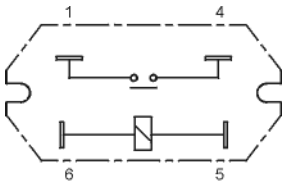


2 NO

Connection diagrams (pin side view)



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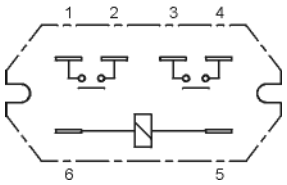
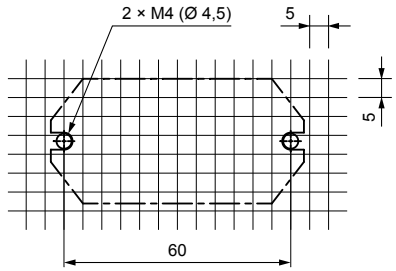


2 NO

Pinout



Mounting

Relays **R20** are designed for flat insert connectors - faston 250 (6,3 x 0,8 mm), relays are direct on panel mounting with two M4 screws.

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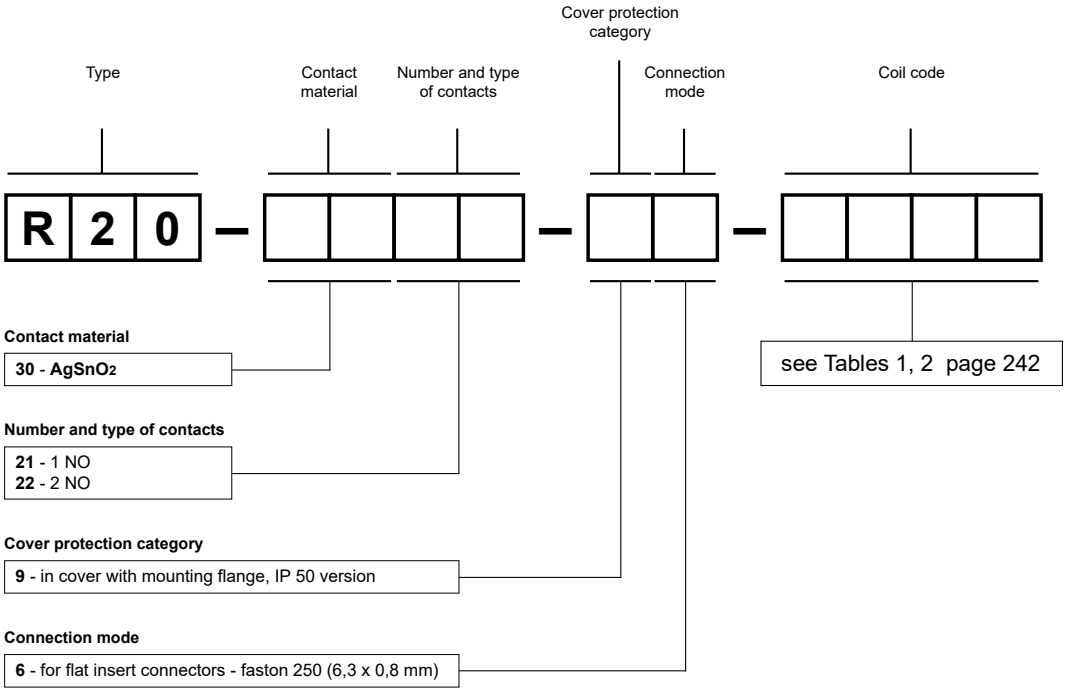
Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1012	12	75,8	± 10%	9,0	13,2
1024	24	303	± 10%	18,0	26,4
1110	110	6 400	± 10%	82,5	121,0

Coil data - AC 50/60 Hz voltage version Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 20 °C)
5024	24	338	± 10%	18,0	26,4
5048	48		± 10%	36,0	52,8
5115	115	5 260	± 10%	86,3	126,5
5230	230	21 000	± 10%	172,5	253,0

Ordering codes



Example of ordering code:

R20-3021-96-1012 relay **R20**, for flat insert connectors - faston 250 (6,3 x 0,8 mm), one normally open contact, contact material $AgSnO_2$, coil voltage 12 V DC, in cover with mounting flange IP 50

- High load 30 A • DC coils - of up to 110 V DC, low coil power 0,9 W, insulation class F: 155 °C
- For PCB • Small dimensions, light weight
- High shock and vibration resistance
- High quality, long life
- Applications: for automobile, machine, electronic equipment, air conditioner, household appliance
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 CO, 1 NO	
Contact material		**$AgSnO_2$**, AgCdO ❶	
Rated / max. switching voltage	AC	240 V / 300 V	
	DC	110 V / 110 V	
Min. switching voltage		10 V	
Rated load	AC1	1 CO: 30 A / 20 A (NO/NC) / 240 V AC	1 NO: 30 A / 240 V AC
	DC1	1 CO: 30 A / 20 A (NO/NC) / 14 V DC	1 NO: 30 A / 14 V DC
Rated current		30 A	
Max. breaking capacity	AC1	1 CO: 7 200 VA / 4 800 VA (NO/NC)	1 NO: 7 200 VA
Contact resistance		≤ 30 mΩ	

Coil data

Rated voltage	DC	**5**, **12**, **24**, 48, 110 V	
Must release voltage		DC: ≥ 0,1 U_n	
Operating range of supply voltage		see Table 1	
Must operate voltage		≤ 0,75 U_n	
Rated power consumption	DC	0,9 W	

Insulation according to EN 60664-1

Insulation rated voltage	500 V AC	
Overvoltage category	II	
Flammability class	V-0	UL 94
Insulation resistance	> 1 000 MΩ	500 V DC, 60 s
Dielectric strength		
• between coil and contacts	2 500 V AC	type of insulation: basic
• contact clearance	1 500 V AC	type of clearance: micro-disconnection

General data

Operating / release time (typical values)		15 ms / 10 ms	
Electrical life			
• resistive AC1	1 200 cycles/hour	10^5 1 CO: 30 A / 20 A (NO/NC), 240 V AC	1 NO: 30 A, 240 V AC
• resistive DC1	1 200 cycles/hour	10^5 1 CO: 30 A / 20 A (NO/NC), 14 V DC	1 NO: 30 A, 14 V DC
Mechanical life (cykle)		10^7	
Dimensions (L x W x H)		32,5 x 27,6 x 20,5 mm	
Weight		30 g	
Ambient temperature (non-condensation and/or icing)	• operating	-55...+100 °C	
Cover protection category		IP 64 or **IP 67**	EN 60529
Environmental protection		RTII or **RTIII**	EN 61810-7
Shock resistance		20 g	
Vibration resistance		1,5 mm DA (constant amplitude)	10...55 Hz
Solder bath temperature		max. 260 °C	
Soldering time		max. 5 s	

The data in bold type relate to the standard versions of the relays. ❶ AgCdO contact material in electrical contacts is only for use in electrical and electronic equipment (EEE) in compliance with directive RoHS2 2011/65/EU in restricted categories of EEE covered by this directive. Relpol S.A. is not responsible for usage relays with AgCdO contact material in categories of EEE where it is prohibited by the directive RoHS2 2011/65/EU.

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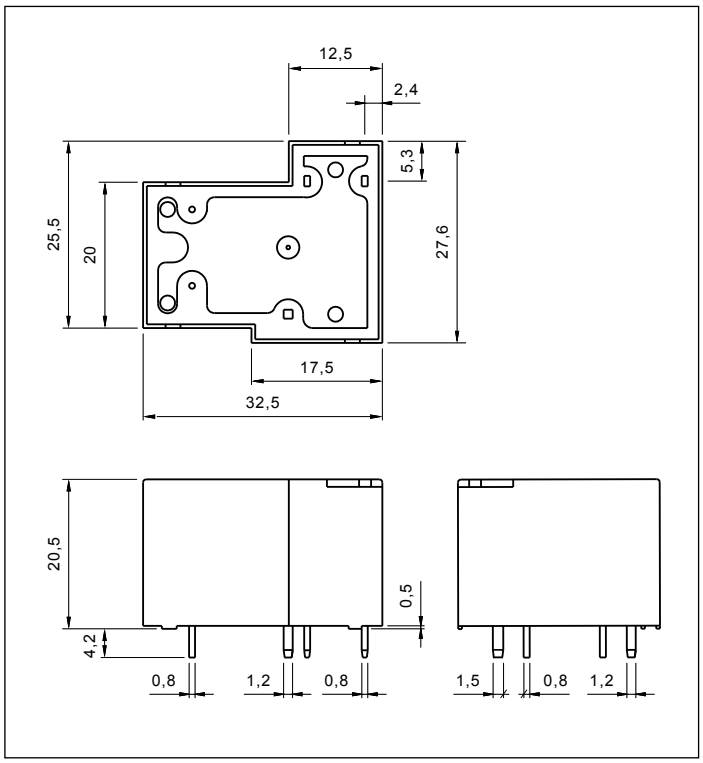
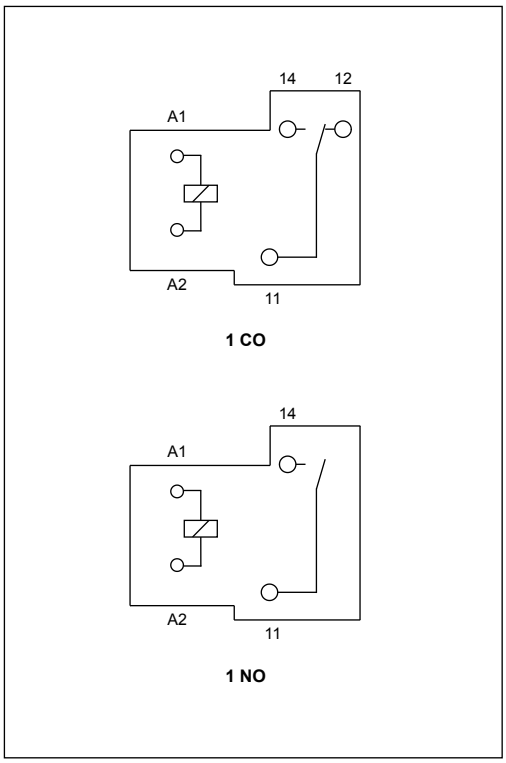
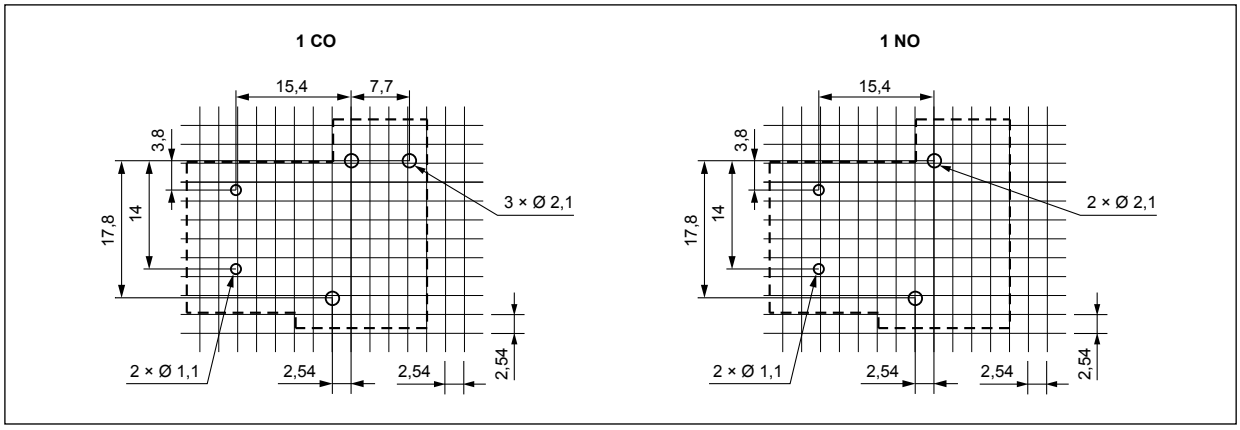
Dimensions



Connection diagrams (pin side view)



Pinout (solder side view)



Mounting

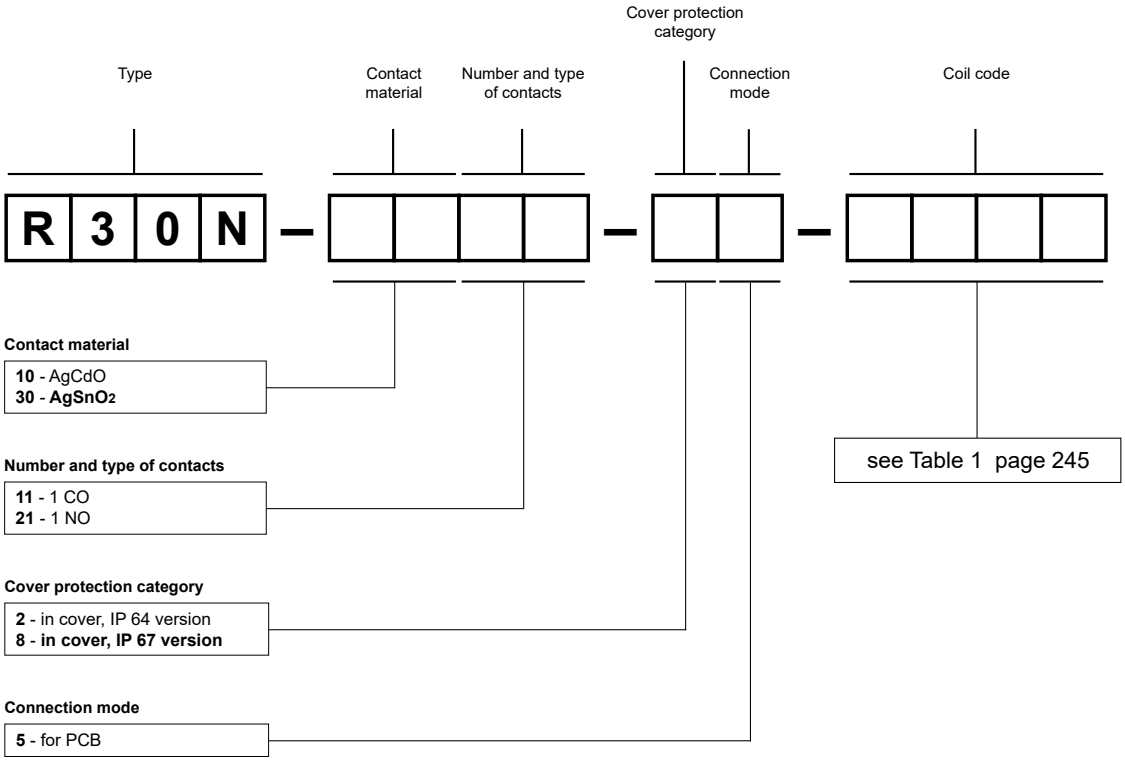
Relays **R30N** are designed for direct PCB mounting.

Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1005	**5**	**28**	**± 10%**	**3,8**	**6,5**
1012	**12**	**160**	**± 10%**	**9,0**	**15,6**
1024	**24**	**640**	**± 10%**	**18,0**	**31,2**
1048	48	2 560	± 10%	36,0	62,4
1110	110	13 445	± 10%	82,5	143,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



Examples of ordering codes:

R30N-3011-85-1012 relay **R30N**, for PCB, one changeover contact, contact material $AgSnO_2$, coil voltage 12 V DC, in cover IP 67

R30N-1021-25-1024 relay **R30N**, for PCB, one normally open contact, contact material AgCdO, coil voltage 24 V DC, in cover IP 64

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R40N
industrial relays of small dimensions

- High load 40 A • AC coils - of up to 220 V AC, DC coils - of up to 110 V DC, insulation class F: 155 °C
- For PCB • Small dimensions, light weight
- High shock and vibration resistance
- High quality, long life
- Applications: for automobile, machine, electronic equipment, air conditioner, household appliance
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		1 CO, 1 NO	
Contact material		**$AgSnO_2$**, AgCdO ❶	
Rated / max. switching voltage	AC	240 V / 300 V	
	DC	110 V / 110 V	
Min. switching voltage		10 V	
Rated load	AC1	1 CO: 40 A / 30 A (NO/NC) / 240 V AC	1 NO: 40 A / 240 V AC
	DC1	1 CO: 40 A / 30 A (NO/NC) / 30 V DC	1 NO: 40 A / 30 V DC
Motor load	acc. to UL 508	1 CO: 2 HP / 1,5 HP	250 V AC, (NO/NC), single-phase motor
		1 NO: 2 HP	250 V AC, single-phase motor
	AC3 acc. to IEC 60947-4-1	1 CO: 1,5 kW / 1,1 kW	250 V AC, (NO/NC), single-phase motor
		1 NO: 1,5 kW	250 V AC, single-phase motor
Rated current		40 A	
Max. breaking capacity	AC1	1 CO: 9 600 VA / 7 200 VA (NO/NC)	1 NO: 9 600 VA
	DC1	1 CO: 1 200 W / 900 W (NO/NC)	1 NO: 1 200 W
Contact resistance		≤ 30 mΩ	

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 110, 120, **220** V	
	DC	**5**, **12**, **24**, 48, 110 V	
Must release voltage		DC: ≥ 0,1 U_n	
Operating range of supply voltage		see Tables 1, 2	
Must operate voltage		≤ 0,75 U_n	
Rated power consumption	AC	2,0 VA	
	DC	0,9 W	

Insulation according to EN 60664-1

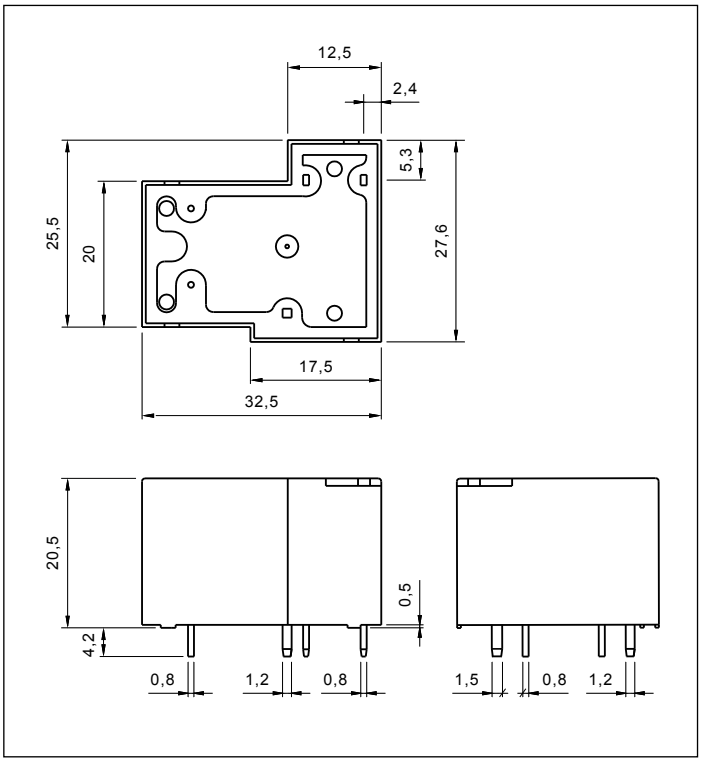
Insulation rated voltage	500 V AC	
Overvoltage category	II	
Flammability class	V-0	UL 94
Insulation resistance	> 1 000 MΩ	500 V DC, 60 s
Dielectric strength		
• between coil and contacts	4 000 V AC	type of insulation: reinforced
• contact clearance	1 500 V AC	type of clearance: micro-disconnection

General data

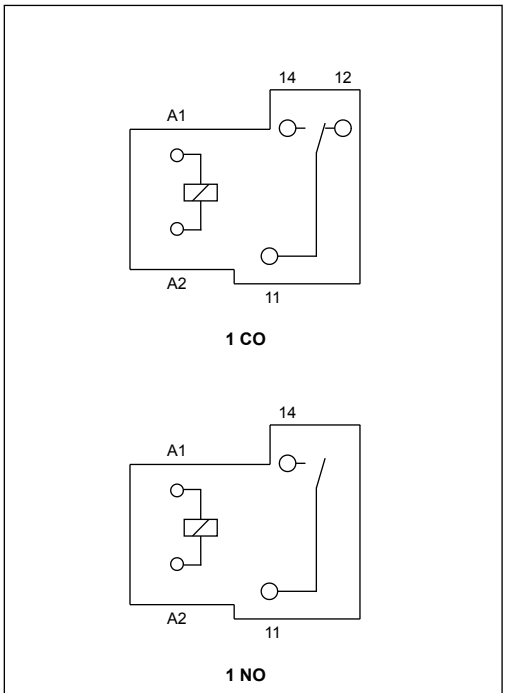
Operating / release time (typical values)		15 ms / 10 ms	
Electrical life			
• resistive AC1	1 200 cycles/hour	10^5 1 CO: 40 A / 30 A (NO/NC), 240 V AC	1 NO: 40 A, 240 V AC
• resistive DC1	1 200 cycles/hour	10^5 1 CO: 40 A / 30 A (NO/NC), 30 V DC	1 NO: 40 A, 30 V DC
Mechanical life (cykle)		10^7	
Dimensions (L x W x H)		32,5 x 27,6 x 20,5 mm	
Weight		30 g	
Ambient temperature (non-condensation and/or icing)	• operating	-55...+100 °C	
Cover protection category		IP 64 or **IP 67**	EN 60529
Environmental protection		RTII or **RTIII**	EN 61810-7
Shock resistance		20 g	
Vibration resistance		1,5 mm DA (constant amplitude)	10...55 Hz
Solder bath temperature		max. 260 °C	
Soldering time		max. 5 s	

The data in bold type relate to the standard versions of the relays. ❶ AgCdO contact material in electrical contacts is only for use in electrical and electronic equipment (EEE) in compliance with directive RoHS2 2011/65/EU in restricted categories of EEE covered by this directive. Relpol S.A. is not responsible for usage relays with AgCdO contact material in categories of EEE where it is prohibited by the directive RoHS2 2011/65/EU.

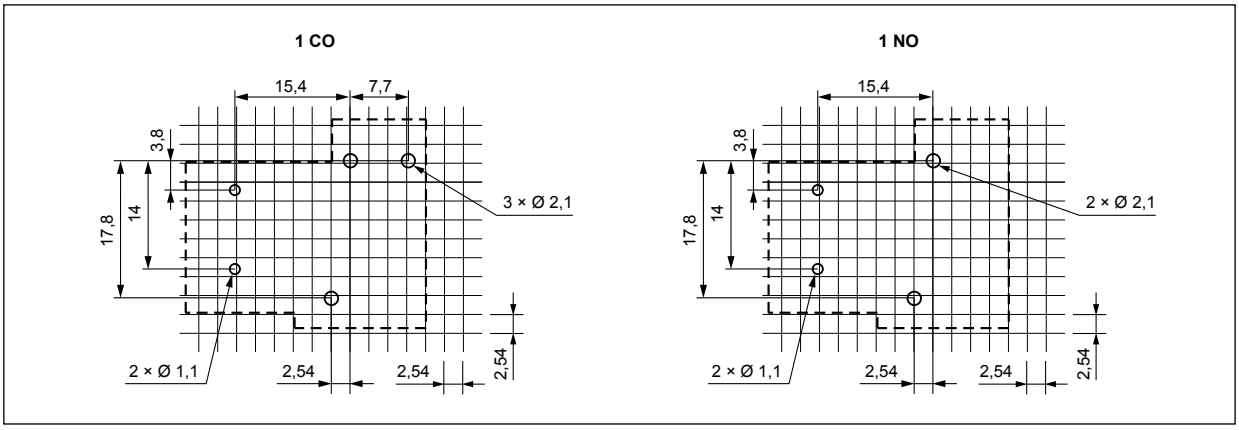
Dimensions



Connection diagrams (pin side view)



Pinout (solder side view)



Mounting

Relays **R40N** are designed for direct PCB mounting.

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Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1005	**5**	**28**	**± 10%**	**3,8**	**6,5**
1012	**12**	**160**	**± 10%**	**9,0**	**15,6**
1024	**24**	**640**	**± 10%**	**18,0**	**31,2**
1048	48	2 560	± 10%	36,0	62,4
1110	110	13 445	± 10%	82,5	143,0

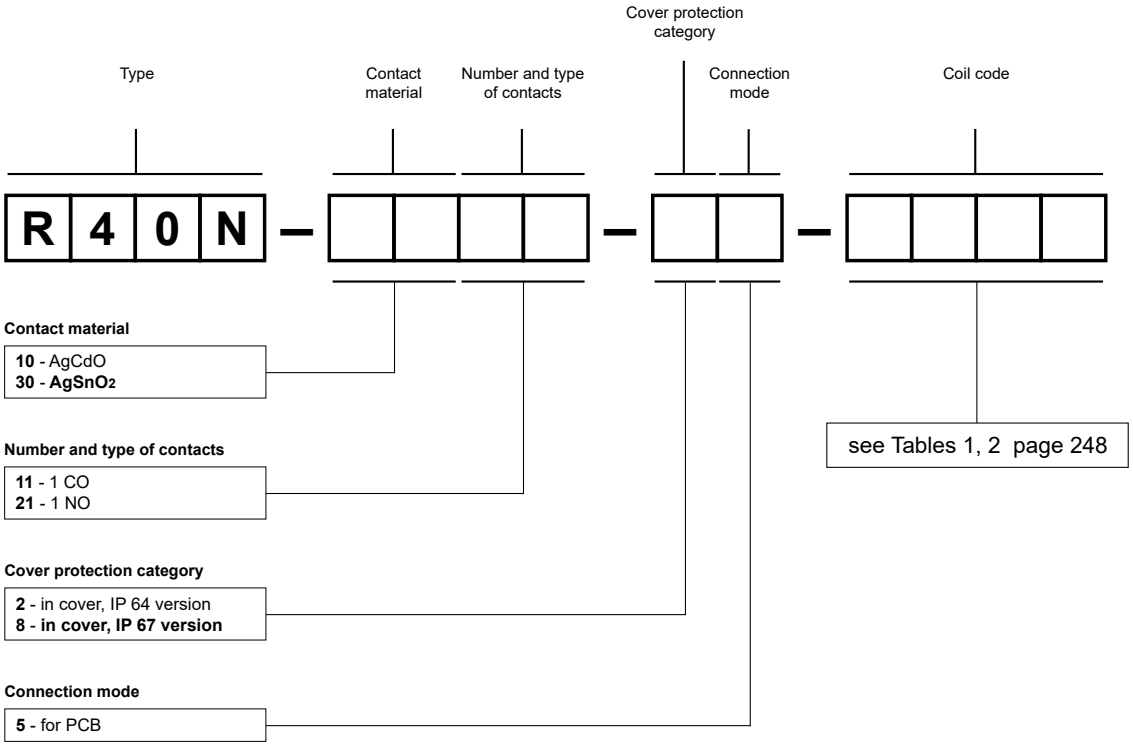
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (at 20 °C)	max. (at 20 °C)
5012	12	27	± 10%	9,0	15,6
5024	**24**	**120**	**± 10%**	**18,0**	**31,2**
5110	110	2 360	± 10%	82,5	143,0
5120	120	3 040	± 10%	90,0	156,0
5220	**220**	**13 490**	**± 10%**	**165,0**	**286,0**

The data in bold type relate to the standard versions of the relays.

Ordering codes



Examples of ordering codes:

R40N-3011-85-1012 relay **R40N**, for PCB, one changeover contact, contact material $AgSnO_2$, coil voltage 12 V DC, in cover IP 67

R40N-1021-25-5024 relay **R40N**, for PCB, one normally open contact, contact material AgCdO, coil voltage 24 V AC 50/60 Hz, in cover IP 64

- **Relays to control power in photovoltaic systems which generate electric energy** • Max. switching current: 35 A (RS35); 50 A (RS50); 80 A (RS80) • 5000 V / 10 mm reinforced insulation
- Contact gap: ≥ 2,2 mm (RS35); ≥ 1,85 mm (RS50); ≥ 2,05 mm (RS80)
- Holding power 0,1 W • For PCB
- DC coils, insulation class F: 155 °C • Reinforced insulation, acc. EN 60730-1 (VDE 0631, part 1); EN 60335-1 (VDE 0700, part 1)
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		RS35: 2 NO	RS50: 1 NO, 2 NO	RS80: 1 NO
Contact material		**$AgSnO_2$**		
Rated / max. switching voltage	AC	250 V / 440 V		
Min. switching voltage		10 V		
Rated load		RS35:	RS50:	RS80:
	AC1	35 A / 250 V AC	50 A / 250 V AC	80 A / 250 V AC
	DC1	35 A / 24 V DC	50 A / 24 V DC	80 A / 24 V DC
Min. switching current		10 mA	10 mA	10 mA
Rated current		35 A	50 A	80 A
Max. breaking capacity	AC1	8 750 VA	12 500 VA	20 000 VA
	DC1	90 W 0,3 A / 300 V	90 W 0,3 A / 300 V	90 W 0,3 A / 300 V
Min. breaking capacity		1 W		
Contact resistance		≤ 50 mΩ		
Max. operating frequency	• at rated load AC1	360 cycles/hour		
	• no load	3 600 cycles/hour		

Coil data

Rated voltage	DC	RS35, RS50: 5, 9, 12, 18, 24, 110 V	RS80: 12, 24 V ❶
Must release voltage		DC: ≥ 0,05 U_n	
Operating range of supply voltage		0,75...2,0 U_n ❷ see Table 1	
Rated power consumption	DC	0,48 W	
Power consumption at pickup voltage		0,27 W	
Max. continuous dissipation		1,9 W 20 °C	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Overvoltage category		III
Insulation pollution degree		3
Insulation resistance		1000 MΩ
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	2 500 V AC type of clearance: full-disconnection
	• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 10 mm
	• creepage	≥ 10 mm

General data

Operating / release time (typical values)		RS35, RS50: 30 ms / 5 ms RS80: 40 ms / 5 ms
Electrical life	• resistive AC1	5×10^4 RS35: 35 A, RS50: 50 A, 250 V AC, 20 °C
		6×10^3 RS35: 35 A, RS50: 50 A, 277 V AC, 85 °C (UL)
		10^3 RS80: 80 A, 277 V AC, 85 °C (UL, VDE)
	• AC7a	3×10^4 RS35: 35 A, 263 V AC, 85 °C (VDE)
		$1,5 \times 10^4$ RS50: 50 A, 263 V AC, 85 °C (VDE)
		3×10^4 RS80: 30 A, 263 V AC, 85 °C (VDE)
Mechanical life (cycles)		10^6
Dimensions (L x W x H)		40 x 25 x 49,2 mm
Weight		105 g
Ambient temperature	• storage	-40...+105 °C
(non-condensation and/or icing)	• operating	-40...+85 °C ❷
Cover protection category		IP 40 EN 60529
Environmental protection		RTII EN 61810-7
Shock resistance		10 g
Vibration resistance		1,5 mm DA (constant amplitude) 10...55 Hz
Solder bath temperature		max. 270 °C
Soldering time		max. 5 s

The data in bold type relate to the standard versions of the relays. ❶ Rest coil voltages like for RS35, RS50 available on request (outside the scope of the certificates UL, VDE). ❷ At 85 °C permissible max. coil supply voltage not higher than 10% over nominal coil voltage.

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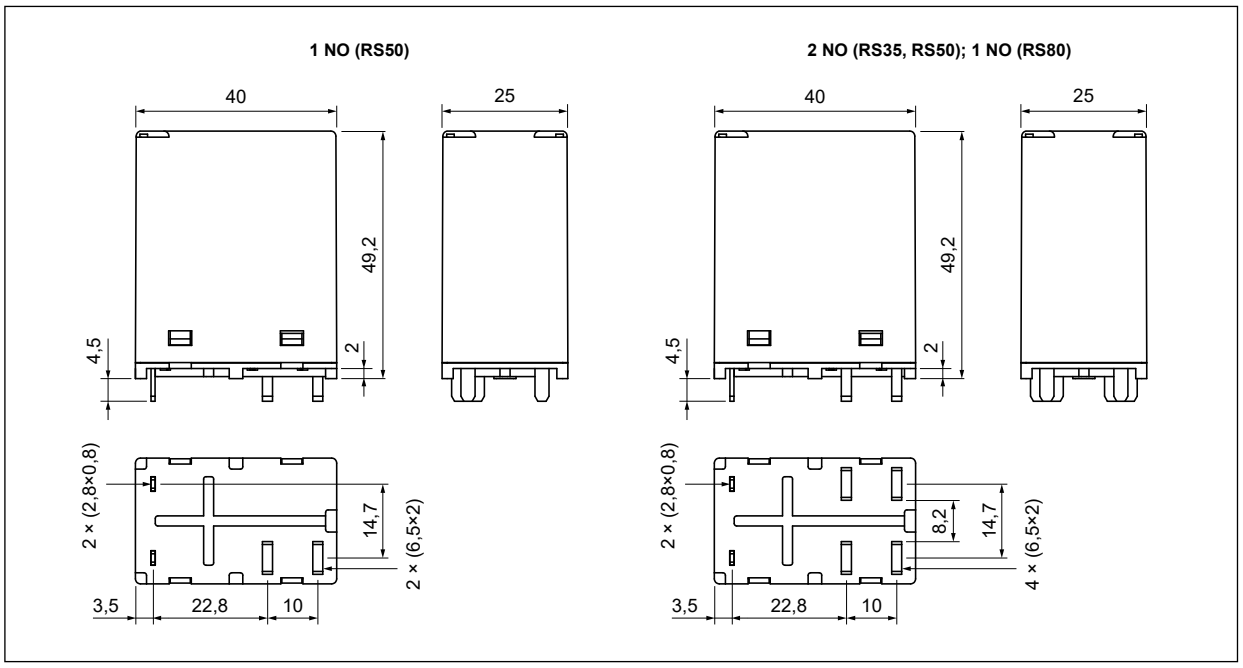
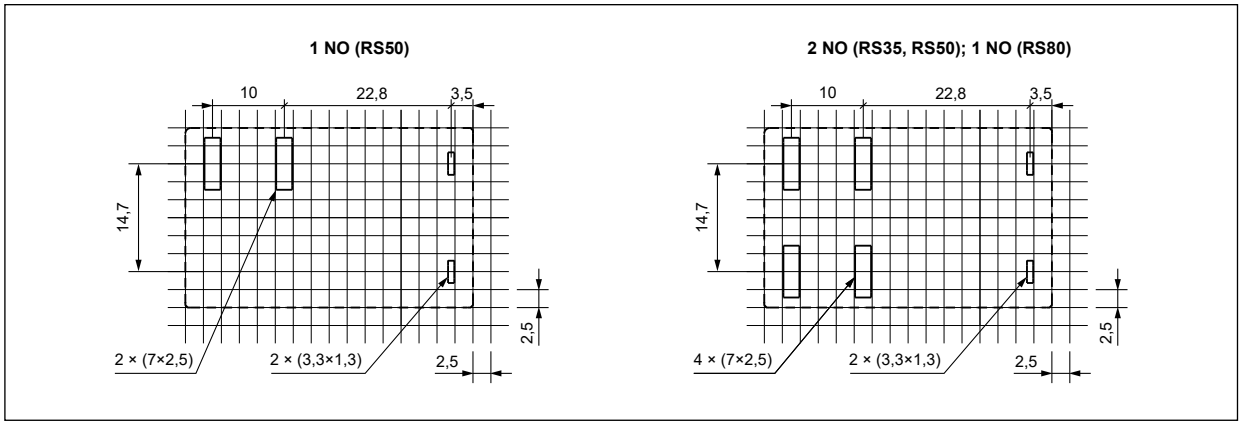
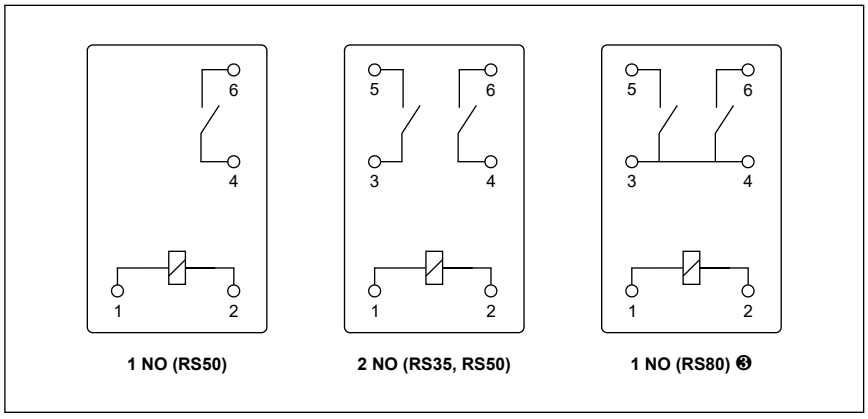
Dimensions



Pinout (solder side view)



Connection diagrams (pin side view)



❸ To ensure proper operation of the relay, it is required to use multi-layer boards and make a connection on the PCB of pins 3-4 and also of pins 5-6.

Mounting

Relays **RS35**, **RS50**, **RS80** are designed for direct PCB mounting ❹.

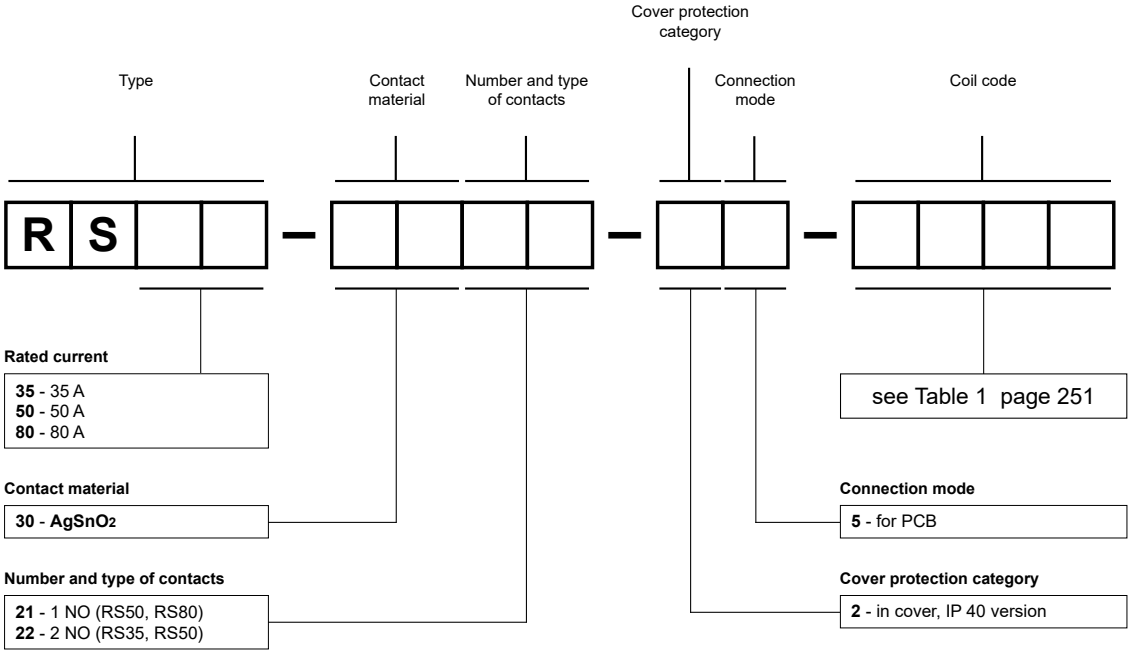
❹ An appropriate cross-section of the PCB must be provided in accordance with design standards, to ensure proper heat dissipation from the contact terminals under load.

Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC ❶	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
1005	5	50	± 10%	3,75	10
1009	9	170	± 10%	6,75	18
1012	12	300	± 10%	9,00	24
1018	18	675	± 10%	13,50	36
1024	24	1 200	± 10%	18,00	48
1110	110	25 000	± 10%	82,50	220

❶ For RS80: only 12, 24 V DC; rest coil voltages like for RS35, RS50 available on request (outside the scope of the certificates UL, VDE).

Ordering codes



Examples of ordering code:

RS35-3022-25-1005 relay **RS35**, rated current 35 A, for PCB, two normally open contacts, contact material $AgSnO_2$, coil voltage 5 V DC, in cover IP 40

RS50-3022-25-1110 relay **RS50**, rated current 50 A, for PCB, two normally open contacts, contact material $AgSnO_2$, coil voltage 110 V DC, in cover IP 40

RS80-3021-25-1024 relay **RS80**, rated current 80 A, for PCB, one normally open contact, contact material $AgSnO_2$, coil voltage 24 V DC, in cover IP 40

Interface relays

relpol S.A.

The interface relays perform the function of input/output separation in the applications with PLC controllers, and they are applied in numerous other electric devices as interface and output elements.

The basic features of the relays are: quick mounting, separation of control circuits from output circuits, coil overvoltage suppression devices, light indicators of operation, number of contacts: from 1 to 4.

The high quality and reliability of the interface relays have been proved by their numerous successful applications. Miniature and industrial relays of the types: RM699BV, RM84, RM85, RMP84, RMP85, R2N, R3N, R4N are the basis for these relays.

They meet the requirements of REACH and RoHS Directive. The relays are recognized and certified by:

with plug-in sockets

in narrow-profile covers

← Contents

RM84 + GZT80

- Interface relay **PI84 with socket GZT80** consists of: electromagnetic relay **RM84**, grey plug-in socket **GZT80**, signalling / protecting module type **M...**, retainer / retractor clip **GZT80-0040** (plastic), white description plate **GZT80-0035**
- 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw • May be linked with interconnection strip type **ZGGZ80**
- Recognitions, certifications, directives: recognitions RM84, RoHS,

CE EAC

Contact data

Number and type of contacts		2 CO
Contact material		**AgNi**, AgNi/Au hard gold plating, $AgSnO_2$
Rated / max. switching voltage	AC	250 V / 300 V
Min. switching voltage		5 V AgNi, 5 V AgNi/Au hard gold plating, 10 V $AgSnO_2$
Rated load (capacity)	AC1	8 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	8 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/3 HP 240 V AC, 3,6 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		5 mA AgNi, 2 mA AgNi/Au hard gold plating, 10 mA $AgSnO_2$
Max. inrush current		15 A
Rated current		8 A
Max. breaking capacity	AC1	2 000 VA
Min. breaking capacity		0,3 W AgNi, 0,05 W AgNi/Au hard gold plating, 1 W $AgSnO_2$
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	600 cycles/hour
	• no load	72 000 cycles/hour

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 48, 120, **230**, 240 V
	DC	12, **24**, 48, 110 V
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2 and Fig. 4, 5
Rated power consumption	AC	0,75 VA
	DC	0,4 ... 0,48 W

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
	• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 10 mm
	• creepage	≥ 10 mm

General data

Operating / release time (typical values)		7 ms / 3 ms
Electrical life	• resistive AC1	> 10^5 8 A, 250 V AC
	• cosφ	see Fig. 2
	• DC L/R=40 ms	> 10^5 0,15 A, 220 V DC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		80 x 15,6 x 67 mm
Weight		61 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	AC: -40...+70 °C DC: -40...+85 °C
Cover protection category		IP 20 EN 60529
Environmental protection		RM84: RTII GZT80: RT0 EN 61810-7
Shock resistance		20 g
Vibration resistance	(NO/NC)	10 g / 5 g 10...150 Hz

The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

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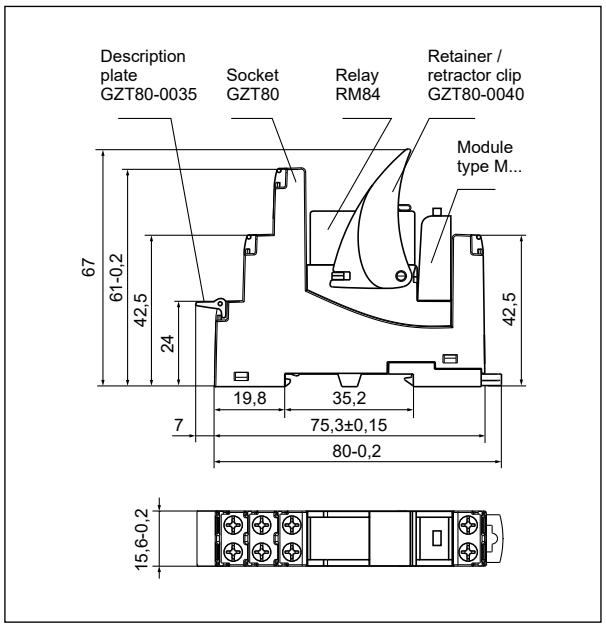
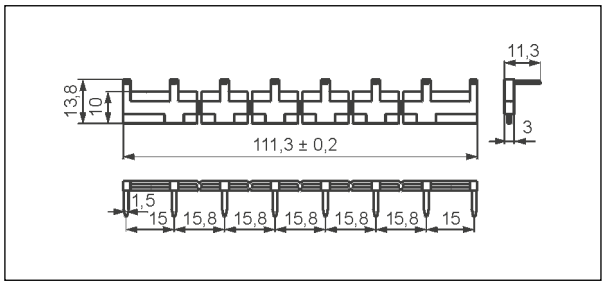
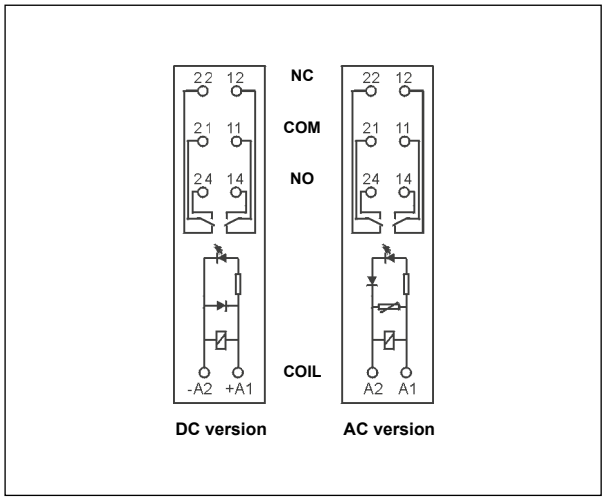
Dimensions



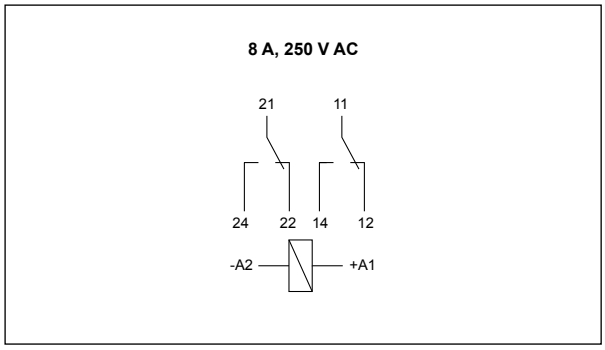


Interconnection strip type **ZGGZ80**

Connection diagrams
(screw terminals side view)

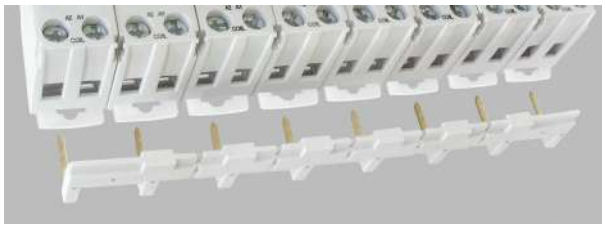


Connection of GZT80 socket



Mounting

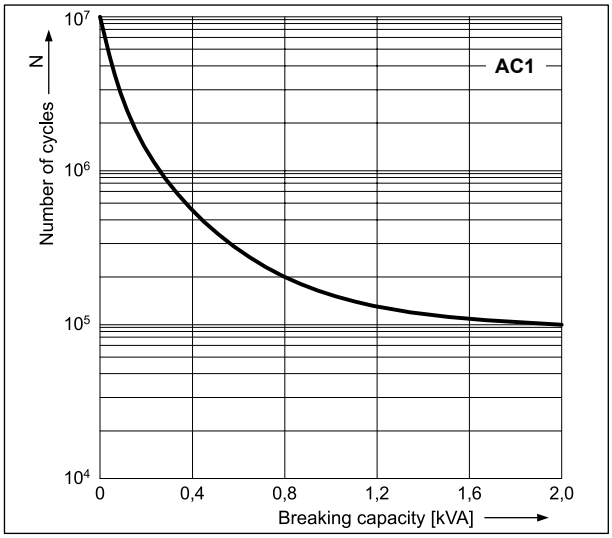
Relays **PI84 with socket GZT80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm.
Plug-in sockets **GZT80** may be linked with interconnection strip type **ZGGZ80**. Strip **ZGGZ80** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets. Colours of strips: **ZGGZ80-1** grey, **ZGGZ80-2** black (see page 400).



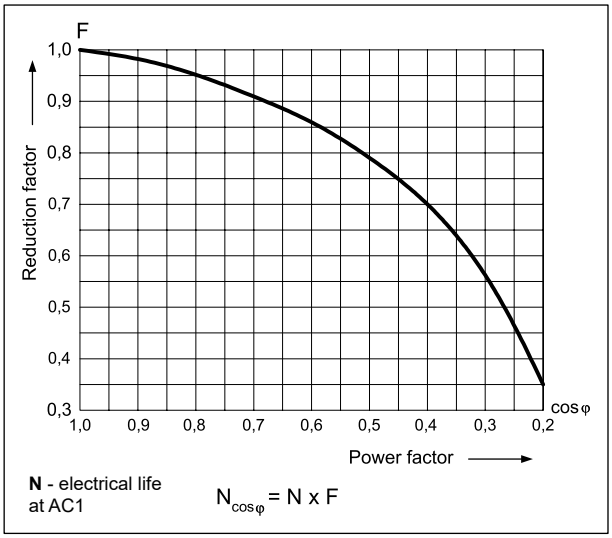
ZGGZ80

Interconnection strip ZGGZ80:
bridging of common input signals.

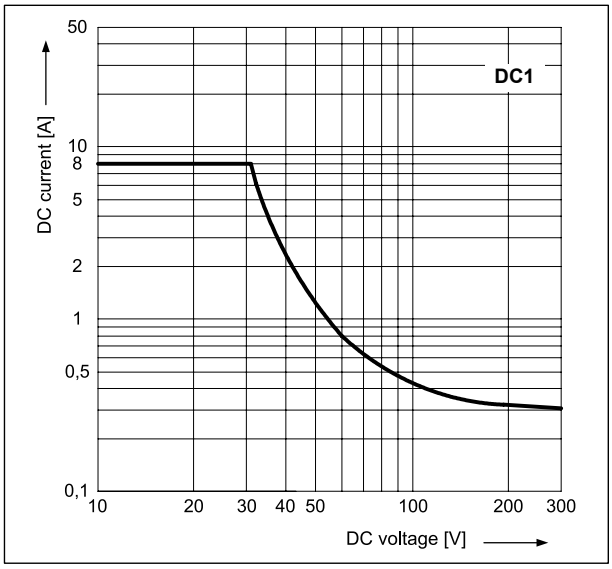
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



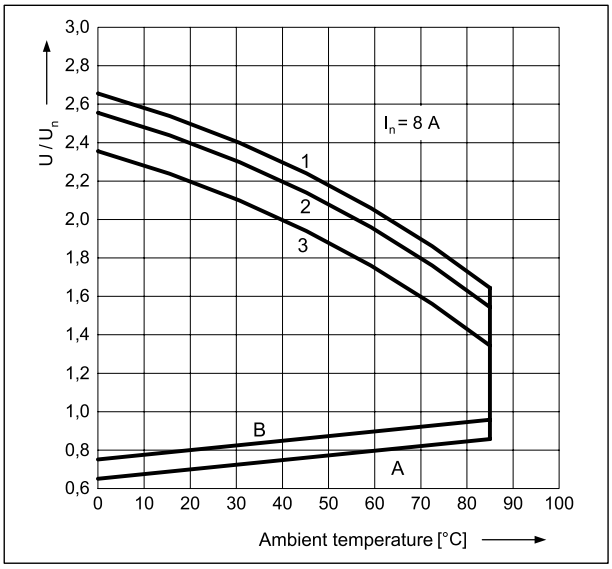
Electrical life reduction factor at AC inductive load Fig. 2



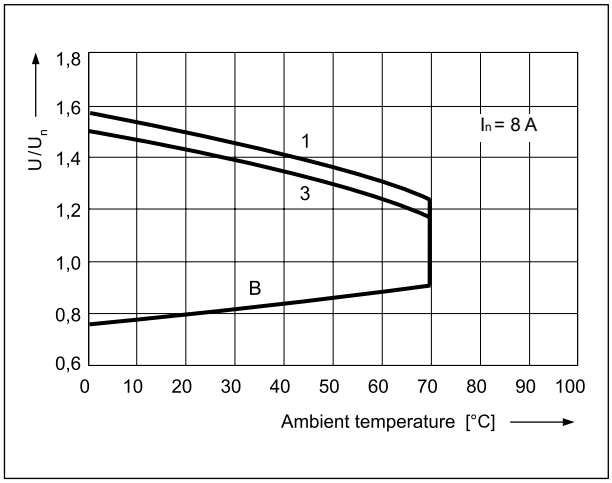
Max. DC resistive load breaking capacity Fig. 3



Coil operating range - DC Fig. 4



Coil operating range - AC 50 Hz Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

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Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
012DC	12	360	± 10%	8,4	30,6
024DC	**24**	**1 440**	**± 10%**	**16,8**	**61,2**
048DC	48	5 700	± 10%	33,6	122,4
110DC	110	25 200	± 10%	77,0	280,0

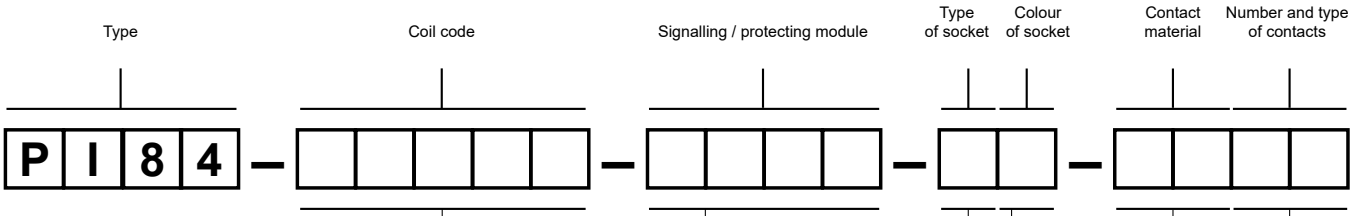
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (at 20 °C)	max. (at 20 °C)
012AC	12	100	± 10%	9,6	13,2
024AC	**24**	**400**	**± 10%**	**19,2**	**28,8**
048AC	48	1 550	± 10%	38,4	57,6
120AC	120	10 200	± 10%	96,0	144,0
230AC	**230**	**38 500**	**± 10%**	**184,0**	**276,0**
240AC	240	42 500	± 15%	192,0	288,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



see Tables 1, 2 page 256

Type of socket
T - GZT80

Colour of socket
S - grey

Signalling / protecting module ❷
M21N - module D (diode D, polarization N: +A1/-A2), 6/230 V DC
M41G - module LD (LED green + diode D, polarization N: +A1/-A2), 6/24 V DC
M42G - module LD (LED green + diode D, polarization N: +A1/-A2), 24/60 V DC
M43G - module LD (LED green + diode D, polarization N: +A1/-A2), 110/230 V DC
M51 - module RC, 6/24 V AC/DC
M52 - module RC, 24/60 V AC/DC
M53 - module RC, 110/240 V AC/DC
M91G - module LV (LED green + varistor), 6/24 V AC/DC
M92G - module LV (LED green + varistor), 24/60 V AC/DC
M93G - module LV (LED green + varistor), 110/240 V AC/DC

Contact material
20 - **AgNi**
23 - AgNi/Au hard gold plating
30 - $AgSnO_2$

Number and type of contacts
12 - 2 CO

❷ Modules D, RC - only for versions with contacts AgNi

Examples of ordering codes:

PI84-012DC-M41G-TS-2012 interface relay **PI84** consists of: relay **RM84** (two changeover contacts, contact material AgNi, coil voltage 12 V DC), socket **GZT80** (grey, screw terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZT80-0040** (plastic), description plate **GZT80-0035** (white)

PI84-230AC-M93G-TS-3012 interface relay **PI84** consists of: relay **RM84** (two changeover contacts, contact material $AgSnO_2$, coil voltage 230 V AC 50/60 Hz), socket **GZT80** (grey, screw terminals), signalling / protecting module **M93G** (version LV), retainer / retractor clip **GZT80-0040** (plastic), description plate **GZT80-0035** (white)

RM84 + GZM80

- Interface relay **PI84 with socket GZM80** consists of: electromagnetic relay **RM84**, grey plug-in socket **GZM80**, signalling / protecting module type **M...**, retainer / retractor clip **GZT80-0040** (plastic), white description plate **GZT80-0035**
- 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw • May be linked with interconnection strip type **ZGGZ80**
- Recognitions, certifications, directives: recognitions RM84, RoHS,

CE EAC

Contact data

Number and type of contacts		2 CO
Contact material		**AgNi**, AgNi/Au hard gold plating, $AgSnO_2$
Rated / max. switching voltage	AC	250 V / 300 V
Min. switching voltage		5 V AgNi, 5 V AgNi/Au hard gold plating, 10 V $AgSnO_2$
Rated load (capacity)	AC1	8 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	8 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/3 HP 240 V AC, 3,6 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		5 mA AgNi, 2 mA AgNi/Au hard gold plating, 10 mA $AgSnO_2$
Max. inrush current		15 A
Rated current		8 A
Max. breaking capacity	AC1	2 000 VA
Min. breaking capacity		0,3 W AgNi, 0,05 W AgNi/Au hard gold plating, 1 W $AgSnO_2$
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	600 cycles/hour
	• no load	72 000 cycles/hour

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 120, **230**, 240 V
	DC	12, **24**, 48 , 60, 110 V
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2 and Fig. 4, 5
Rated power consumption	AC	0,75 VA
	DC	0,4 ... 0,48 W

Insulation according to EN 60664-1

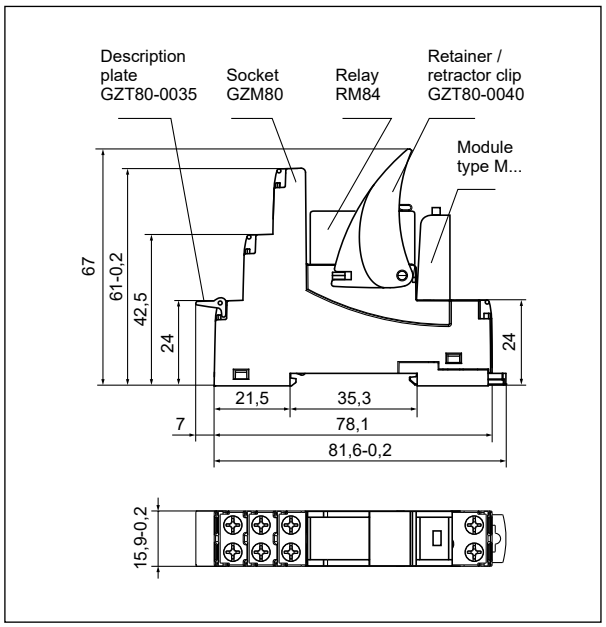
Insulation rated voltage		300 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
	• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 10 mm
	• creepage	≥ 10 mm

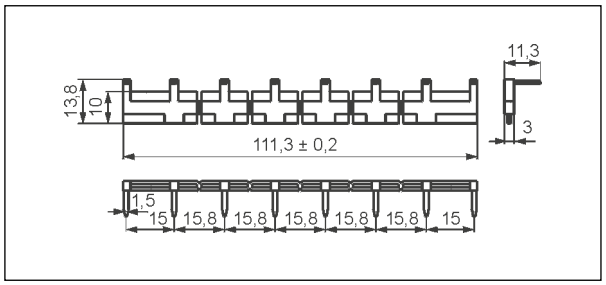
General data

Operating / release time (typical values)		7 ms / 3 ms
Electrical life	• resistive AC1	> 10^5 8 A, 250 V AC
	• cosφ	see Fig. 2
	• cosφ = 0,4	> 10^5 3 A, 250 V AC
	• DC L/R=40 ms	> 10^5 0,15 A, 220 V DC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		81,6 x 15,9 x 67 mm
Weight		60 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	AC: -40...+70 °C DC: -40...+85 °C
Cover protection category		IP 20 EN 60529
Environmental protection		RM84: RTII GZM80: RT0 EN 61810-7
Shock resistance		20 g
Vibration resistance	(NO/NC)	10 g / 5 g 10...150 Hz

The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

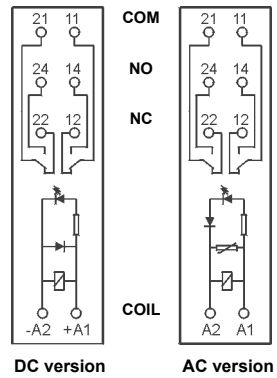
Dimensions



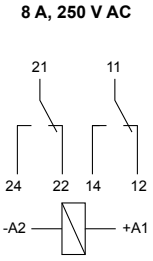


Interconnection strip type **ZGGZ80**

Connection diagrams
(screw terminals side view)

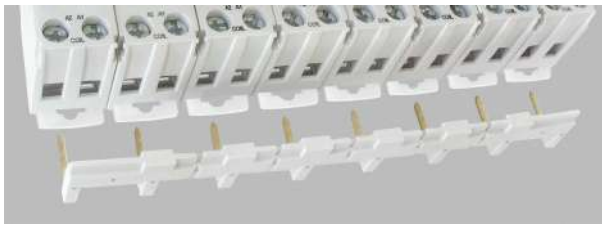


Connection of GZM80 socket



Mounting

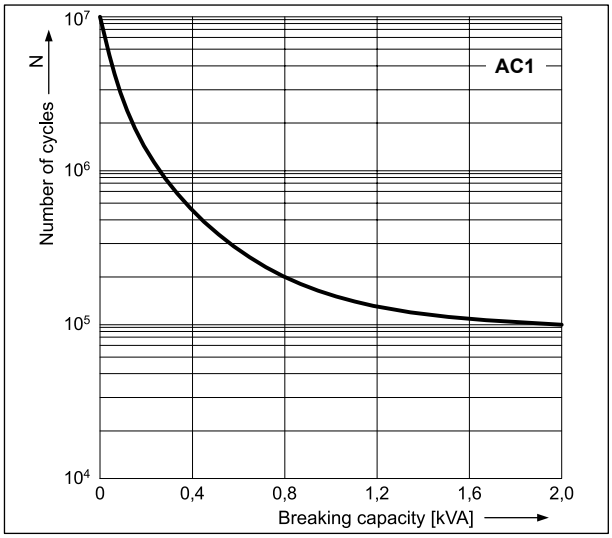
Relays **PI84 with socket GZM80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm.
Plug-in sockets **GZM80** may be linked with interconnection strip type **ZGGZ80**. Strip **ZGGZ80** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets. Colours of strips: **ZGGZ80-1** grey, **ZGGZ80-2** black (see page 400).



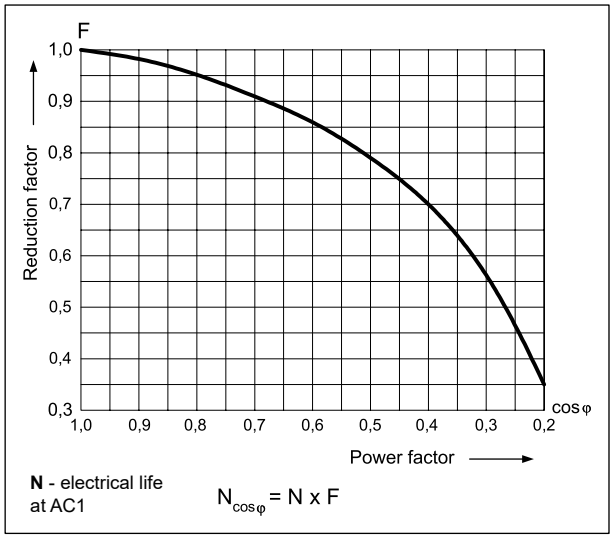
ZGGZ80

Interconnection strip ZGGZ80:
bridging of common input signals.

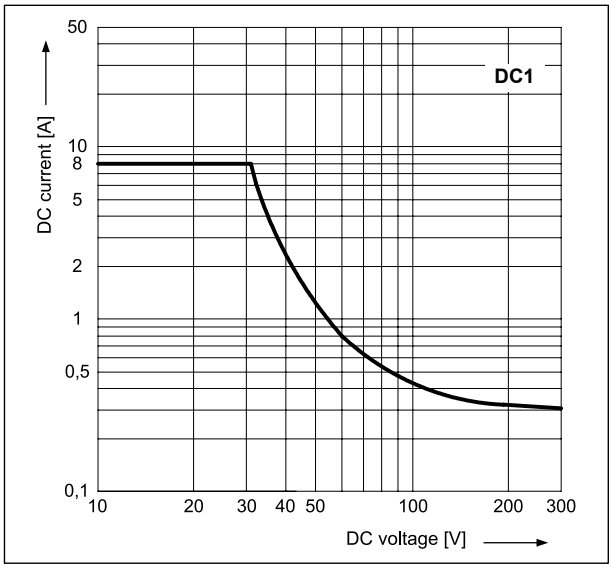
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



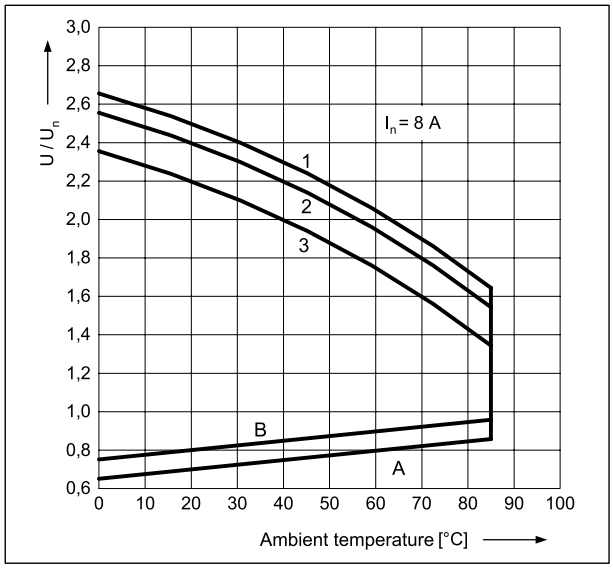
Electrical life reduction factor at AC inductive load Fig. 2



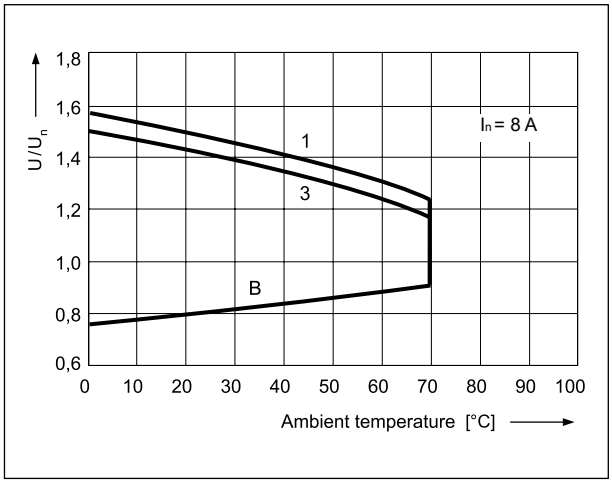
Max. DC resistive load breaking capacity Fig. 3



Coil operating range - DC Fig. 4



Coil operating range - AC 50 Hz Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

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Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
012DC	12	360	± 10%	8,4	30,6
024DC	**24**	**1 440**	**± 10%**	**16,8**	**61,2**
048DC	48	5 700	± 10%	33,6	122,4
060DC	60	7 500	± 10%	42,0	153,0
110DC	110	25 200	± 10%	77,0	280,0

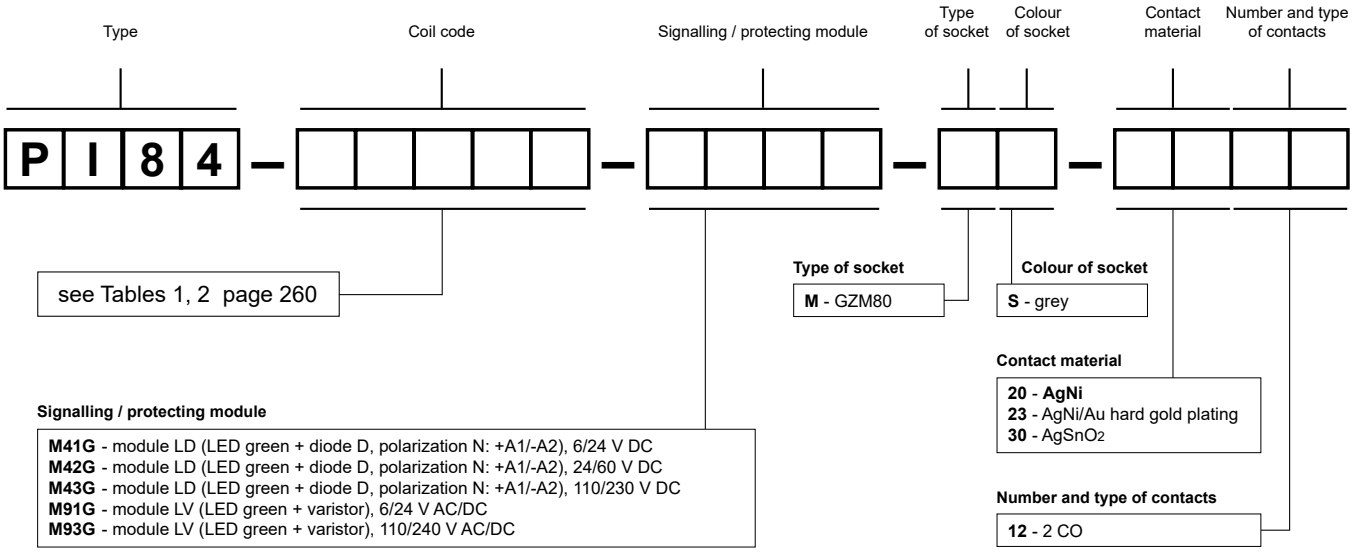
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (at 20 °C)	max. (at 20 °C)
012AC	12	100	± 10%	9,6	13,2
024AC	**24**	**400**	**± 10%**	**19,2**	**28,8**
120AC	120	10 200	± 10%	96,0	144,0
230AC	**230**	**38 500**	**± 10%**	**184,0**	**276,0**
240AC	240	42 500	± 15%	192,0	288,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



Examples of ordering codes:

PI84-012DC-M41G-MS-2012 interface relay **PI84** consists of: relay **RM84** (two changeover contacts, contact material AgNi, coil voltage 12 V DC), socket **GZM80** (grey, screw terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZT80-0040** (plastic), description plate **GZT80-0035** (white)

PI84-230AC-M93G-MS-3012 interface relay **PI84** consists of: relay **RM84** (two changeover contacts, contact material $AgSnO_2$, coil voltage 230 V AC 50/60 Hz), socket **GZM80** (grey, screw terminals), signalling / protecting module **M93G** (version LV), retainer / retractor clip **GZT80-0040** (plastic), description plate **GZT80-0035** (white)

RM84 + GZP80 | RM84 (AC) ❶ + GZP80 | RM84 (DC) ❶ + GZP80

NEW

- Interface relay **PI84 with socket GZP80** consists of: electromagnetic relay **RM84** (standard white or option transparent: AC orange, DC blue ❶), grey plug-in socket **GZP80**, signalling / protecting module type **M...**, retainer / retractor clip **GZP80-0400** (plastic)
- 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw • May be linked with interconnection strips type **ZGZP...**
- Recognitions, certifications, directives: recognitions RM84, RoHS,

Contact data

Number and type of contacts		2 CO	
Contact material		**AgNi**, AgNi/Au hard gold plating	
Rated / max. switching voltage	AC	250 V / 300 V	
Min. switching voltage		5 V	
Rated load (capacity)	AC1	8 A / 250 V AC	
	AC15	3 A / 120 V	1,5 A / 240 V (B300)
	DC1	8 A / 24 V DC (see Fig. 3)	
	DC13	0,22 A / 120 V	0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/3 HP	240 V AC, 3,6 FLA, single-phase motor ❷
	AC3 acc. to IEC 60947-4-1	0,37 kW	240 V AC, single-phase motor
Min. switching current		5 mA AgNi, 2 mA AgNi/Au hard gold plating	
Max. inrush current		15 A	
Rated current		8 A	
Max. breaking capacity	AC1	2 000 VA	
Min. breaking capacity		0,3 W AgNi, 0,05 W AgNi/Au hard gold plating	
Contact resistance		≤ 100 mΩ	
Max. operating frequency	• at rated load AC1	600 cycles/hour	
	• no load	72 000 cycles/hour	

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 48, 120, **230** V	
	DC	12, **24**, 48, 110 V	
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2 and Fig. 4, 5	
Rated power consumption	AC	0,75 VA	
	DC	0,4 ... 0,48 W	

Insulation according to EN 60664-1

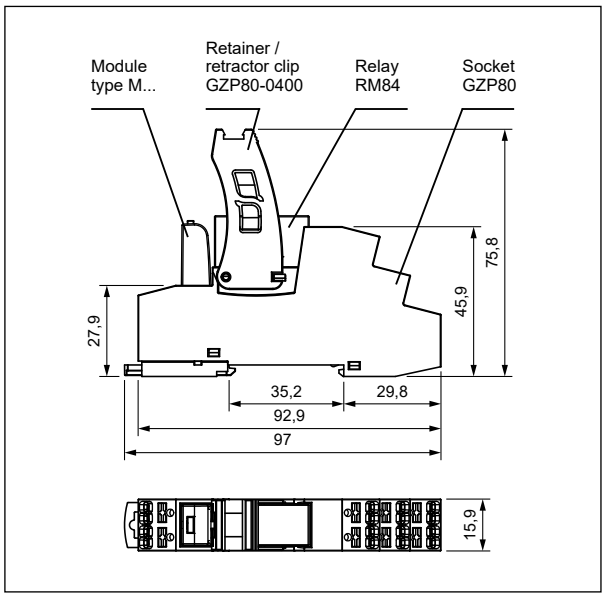
Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		3	
Dielectric strength	• between coil and contacts	5 000 V AC	type of insulation: reinforced
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection
	• pole - pole	2 500 V AC	type of insulation: basic
Contact - coil distance	• clearance	≥ 10 mm	
	• creepage	≥ 10 mm	

General data

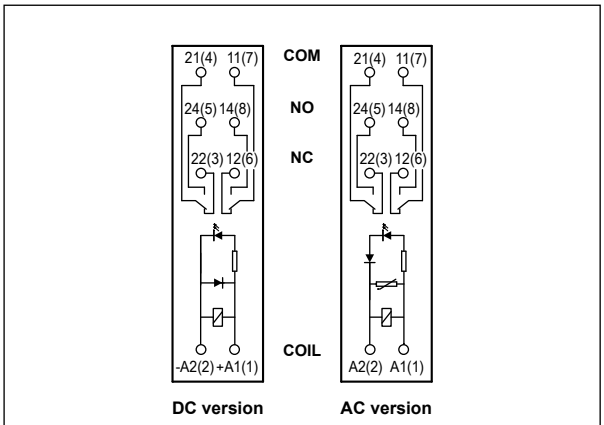
Operating / release time (typical values)		7 ms / 3 ms	
Electrical life	• resistive AC1	> 10^5	8 A, 250 V AC
	• cosφ	see Fig. 2	
	• DC L/R=40 ms	> 10^5	0,15 A, 220 V DC
Mechanical life (cycles)		> 3 x 10^7	
Dimensions (L x W x H)		97 x 15,9 x 75,8 mm	
Weight		65 g	
Ambient temperature	• storage	-40...+85 °C	
(non-condensation and/or icing)	• operating	AC: -40...+70 °C	DC: -40...+85 °C -20...+70 °C ❶
Cover protection category		IP 20	EN 60529
Environmental protection		RM84: RTII	GZP80: RT0 EN 61810-7
Shock resistance		20 g	
Vibration resistance	(NO/NC)	10 g / 5 g 10...150 Hz	

The data in bold type relate to the standard versions of the relays. ❶ Special versions - relays in transparent cover, operating temperature -20...+70 °C. See "Ordering codes". ❷ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Dimensions

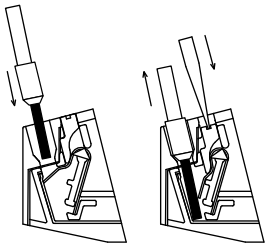


Connection diagrams
(Push-in terminals side view)

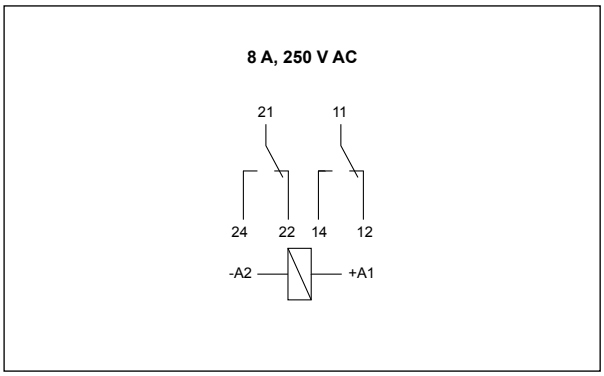


Wire connection

The drawings present inserting wire into the Push-in terminal and removing wire using the button releasing a clamp (assembly without tools).



Connection of GZP80 socket



Connecting accessories

- see page 402

ZGZP80-8 GY grey
ZGZP80-8 BK black
ZGZP80-8 RD red
ZGZP80-8 BE blue

ZGZP80-2 GY grey
ZGZP80-2 BK black
ZGZP80-2 RD red
ZGZP80-2 BE blue

ZGZP-2 GY grey
ZGZP-2 BK black
ZGZP-2 RD red
ZGZP-2 BE blue

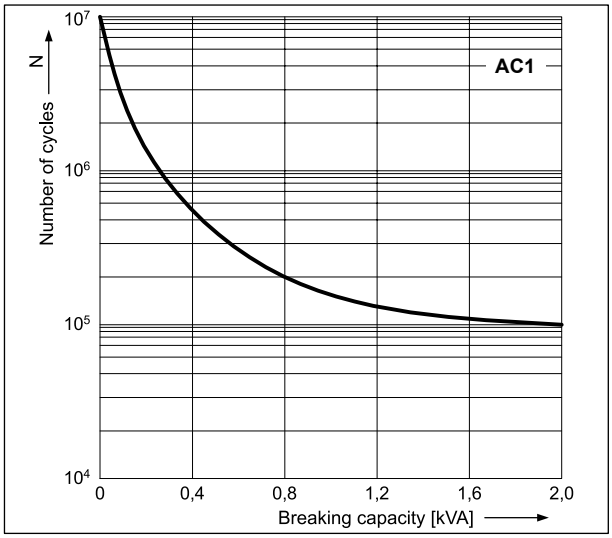
NEW

Strips 8-poles ZGZP80-8: unlimited possibilities of connection configurations (bridging of: A1, A2, A1 & A2 together), fast, safe and easy bridging of signals on the coil.

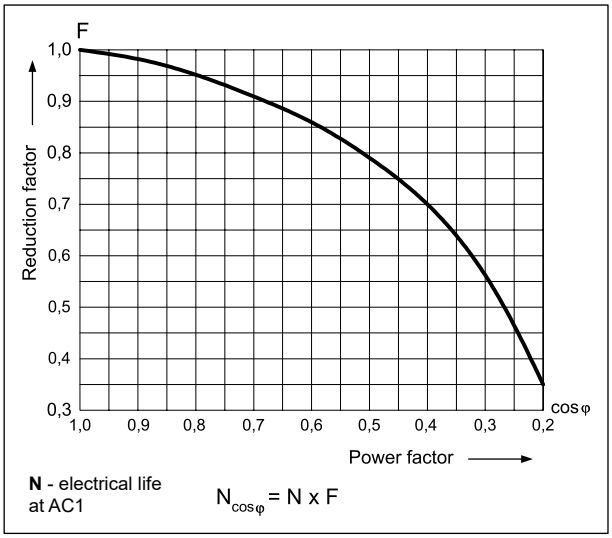
Strips 2-poles ZGZP80-2: free bridging of common input signals and terminals on the contact side, creating parallel connections of outputs in redundancy systems.

Jumpers 2-poles ZGZP-2: parallel connections of neighbouring poles in one socket GZP80 or GZP4 without use additional wiring, increasing the load capacity from 12 A to 16 A (PI85, PI85P).

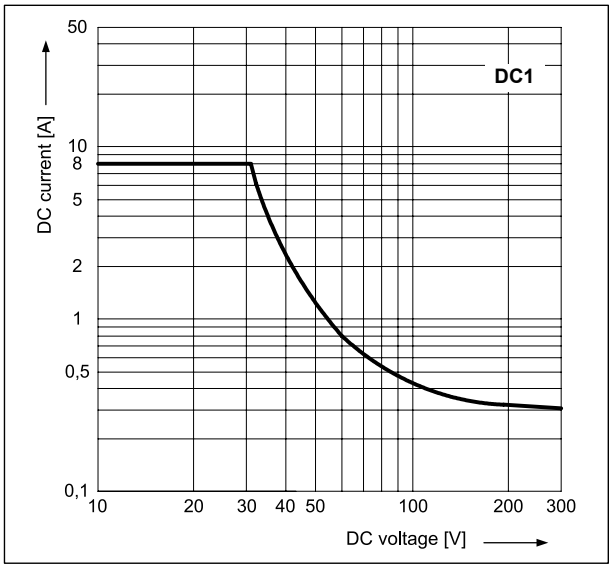
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



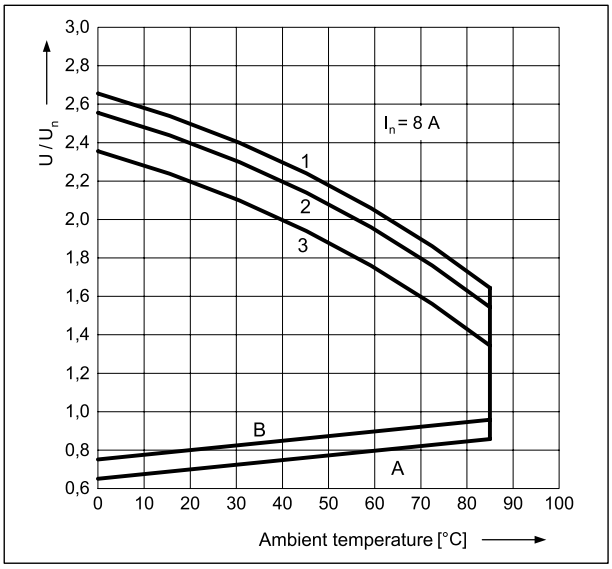
Electrical life reduction factor at AC inductive load Fig. 2



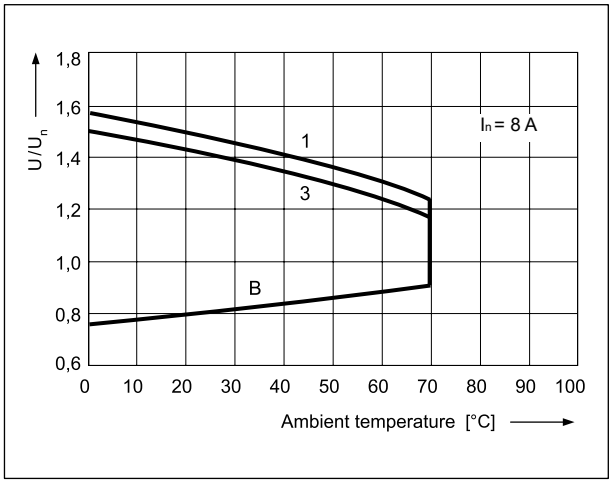
Max. DC resistive load breaking capacity Fig. 3



Coil operating range - DC Fig. 4



Coil operating range - AC 50 Hz Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

Mounting

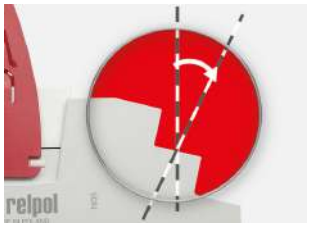
Relays **PI84 with socket GZP80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables: 2 x 1,5 mm^2 (ferrules without insulation), 2 x 1 mm^2 (ferrules with insulation), stripping length: 8...10 mm.
Plug-in sockets **GZP80** may be linked with interconnection strips type **ZGZP...** Strip **ZGZP80-8** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets. Strip **ZGZP80-2** bridges common input or output signals, possibility of connection of 2+n sockets. Jumper **ZGZP-2** bridges the neighboring poles of single socket **GZP80**. Colours of strips: **ZGZP...GY** grey, **ZGZP...BK** black, **ZGZP...RD** red, **ZGZP...BE** blue (see page 402).
Description plates **MP15**, snap into tall marker groove, compatible with the standard for DIN rail terminal blocks, should be ordered separately.

ZGZP80-8

ZGZP80-2

ZGZP-2

MP15



Terminals directed to wiring ducts: esthetic cabling management, easier content reading from markers on wires.

Holes for test probes: ergonomic, stable position of the probe in the socket, freedom to perform measurements and control.

Space for label: for self-adhesive paper, foil or polyester tapes (max. width 9 mm).

Coil data - DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
012DC	12	360	± 10%	8,4	30,6
024DC	**24**	**1 440**	**± 10%**	**16,8**	**61,2**
048DC	48	5 700	± 10%	33,6	122,4
110DC	110	25 200	± 10%	77,0	280,0

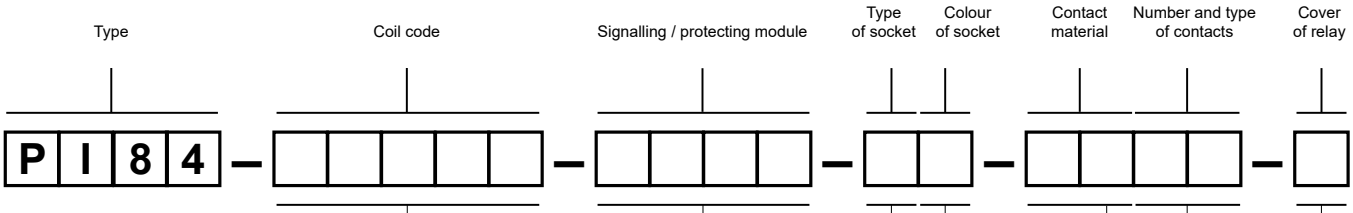
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version — Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (at 20 °C)	max. (at 20 °C)
012AC	12	100	± 10%	9,6	13,2
024AC	**24**	**400**	**± 10%**	**19,2**	**28,8**
048AC	48	1 550	± 10%	38,4	57,6
120AC	120	10 200	± 10%	96,0	144,0
230AC	**230**	**38 500**	**± 10%**	**184,0**	**276,0**

The data in bold type relate to the standard versions of the relays.

Ordering codes



see Tables 1, 2 page 264

Type of socket
P - GZP80

Colour of socket
S - grey

Signalling / protecting module

M41G - module LD (LED green + diode D, polarization N: +A1/-A2), 6/24 V DC
M42G - module LD (LED green + diode D, polarization N: +A1/-A2), 24/60 V DC
M43G - module LD (LED green + diode D, polarization N: +A1/-A2), 110/230 V DC
M91G - module LV (LED green + varistor), 6/24 V AC/DC
M92G - module LV (LED green + varistor), 24/60 V AC/DC
M93G - module LV (LED green + varistor), 110/240 V AC/DC

Contact material

20 - **AgNi**
23 - AgNi/Au hard gold plating

Number and type of contacts

12 - 2 CO

Cover of relay

without marks - standard cover (no transparent, white colour)
01 - transparent cover (orange colour - AC coils, blue colour - DC coils) ❶

❶ **01**: special version - relay in transparent cover, operating temperature -20...+70 °C

Examples of ordering codes:

PI84-230AC-M93G-PS-2012 interface relay **PI84** consists of: relay **RM84** (white, two changeover contacts, contact material AgNi, coil voltage 230 V AC 50/60 Hz), socket **GZP80** (grey, Push-in terminals), signalling / protecting module **M93G** (version LV), retainer / retractor clip **GZP80-0400** (red, plastic)

PI84-024AC-M91G-PS-2312-01 interface relay **PI84** consists of: relay **RM84** (orange, two changeover contacts, contact material AgNi/Au hard gold plating, coil voltage 24 V AC 50/60 Hz), socket **GZP80** (grey, Push-in terminals), signalling / protecting module **M91G** (version LV), retainer / retractor clip **GZP80-0400** (red, plastic)

PI84-024DC-M41G-PS-2012-01 interface relay **PI84** consists of: relay **RM84** (blue, two changeover contacts, contact material AgNi, coil voltage 24 V DC), socket **GZP80** (grey, Push-in terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZP80-0400** (red, plastic)

PI84-230AC-M93G-PS-2012
(standard white)

PI84-024AC-M91G-PS-2312-01
(option transparent: AC orange)

PI84-024DC-M41G-PS-2012-01
(option transparent: DC blue)

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RM85 + GZT80

- Interface relay **PI85 with socket GZT80** consists of: electromagnetic relay **RM85**, grey plug-in socket **GZT80**, signalling / protecting module type **M...**, retainer / retractor clip **GZT80-0040** (plastic), white description plate **GZT80-0035**
- 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw • May be linked with interconnection strip type **ZGGZ80**
- Recognitions, certifications, directives: recognitions RM85, RoHS,

CE EAC

Contact data

Number and type of contacts		1 CO
Contact material		**AgNi**, AgNi/Au hard gold plating, $AgSnO_2$
Rated / max. switching voltage	AC	250 V / 300 V
Min. switching voltage		5 V AgNi, 5 V AgNi/Au hard gold plating, 10 V $AgSnO_2$
Rated load (capacity)	AC1	16 A / 250 V AC ❶
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	16 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❷
	AC3 acc. to IEC 60947-4-1	0,5 kW 240 V AC, single-phase motor
Min. switching current		5 mA AgNi, 2 mA AgNi/Au hard gold plating, 10 mA $AgSnO_2$
Max. inrush current		30 A
Rated current		16 A
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		0,3 W AgNi, 0,05 W AgNi/Au hard gold plating, 1 W $AgSnO_2$
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	600 cycles/hour
	• no load	72 000 cycles/hour

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 48, 120, **230**, 240 V
	DC	12, **24**, 48, 110 V
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2 and Fig. 4, 5
Rated power consumption	AC	0,75 VA
	DC	0,4 ... 0,48 W

Insulation according to EN 60664-1

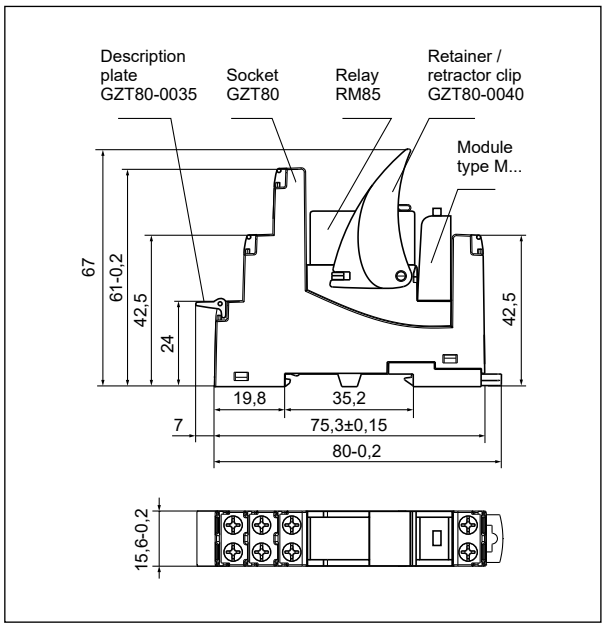
Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 10 mm
	• creepage	≥ 10 mm

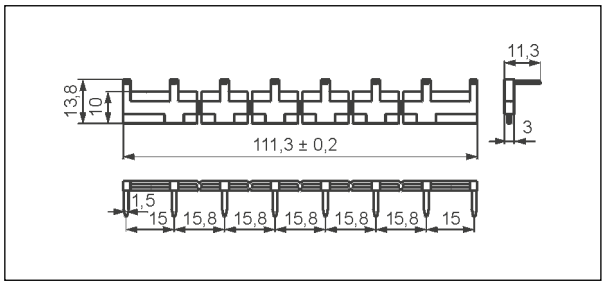
General data

Operating / release time (typical values)		7 ms / 3 ms
Electrical life	• resistive AC1	> 0,7 x 10^5 16 A, 250 V AC
	• cosφ	see Fig. 2
	• DC L/R=40 ms	> 10^5 0,15 A, 220 V DC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		80 x 15,6 x 67 mm
Weight		61 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	AC: -40...+70 °C DC: -40...+85 °C
Cover protection category		IP 20 EN 60529
Environmental protection		RM85: RTII GZT80: RT0 EN 61810-7
Shock resistance		30 g
Vibration resistance		10 g 10...150 Hz

The data in bold type relate to the standard versions of the relays. ❶ Loads above 12 A require bridging pairs of screw terminals: 11 with 21, 12 with 22, 14 with 24 - see page 267. ❷ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

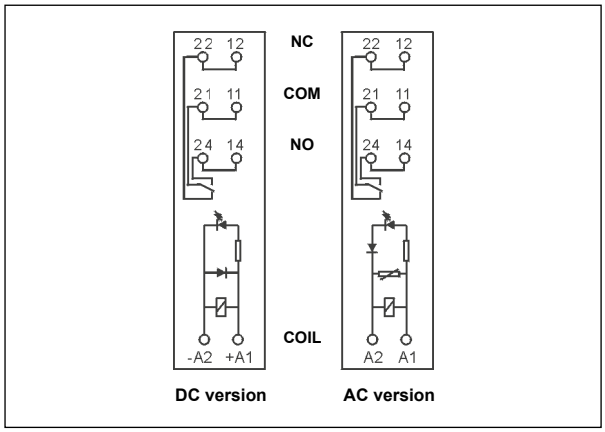
Dimensions



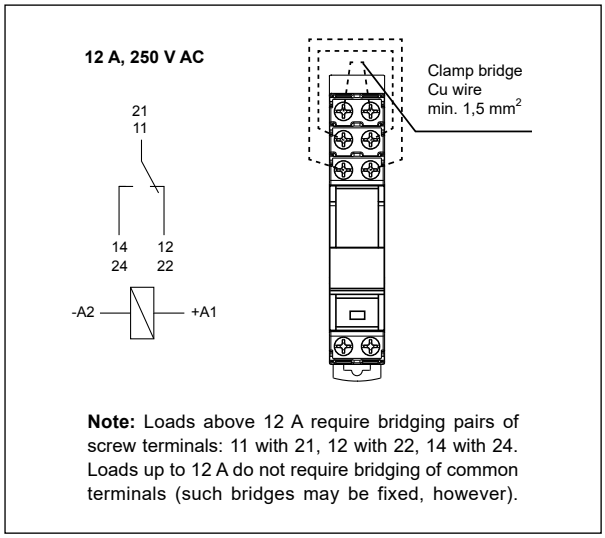


Interconnection strip type **ZGGZ80**

Connection diagrams
(screw terminals side view)



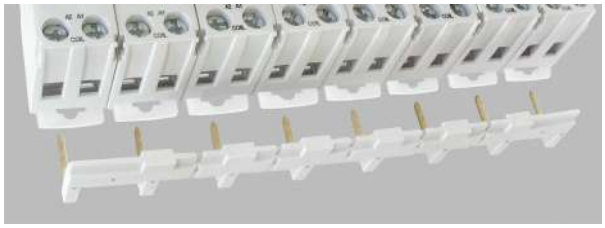
Connection of GZT80 socket



Note: Loads above 12 A require bridging pairs of screw terminals: 11 with 21, 12 with 22, 14 with 24. Loads up to 12 A do not require bridging of common terminals (such bridges may be fixed, however).

Mounting

Relays **PI85 with socket GZT80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm.
Plug-in sockets **GZT80** may be linked with interconnection strip type **ZGGZ80**. Strip **ZGGZ80** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets. Colours of strips: **ZGGZ80-1** grey, **ZGGZ80-2** black (see page 400).

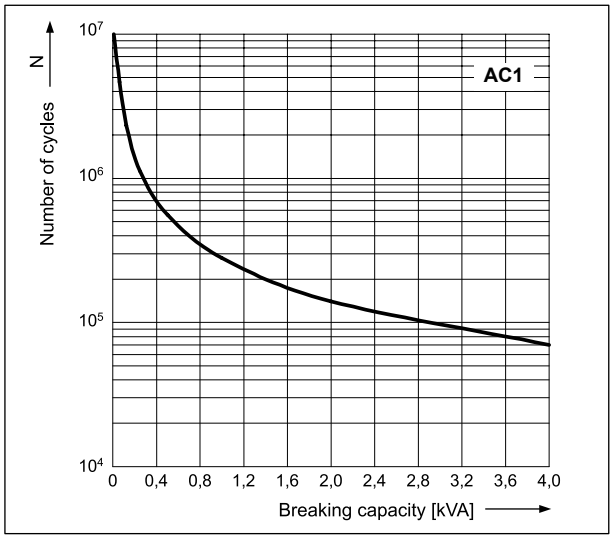


ZGGZ80

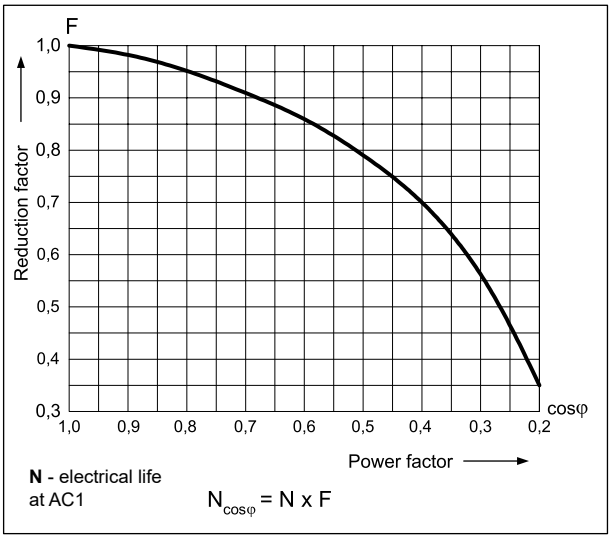
Interconnection strip ZGGZ80:
bridging of common input signals.

Export Sales Department: phone +48 68 47 90 832, 951, export@relpol.com.pl

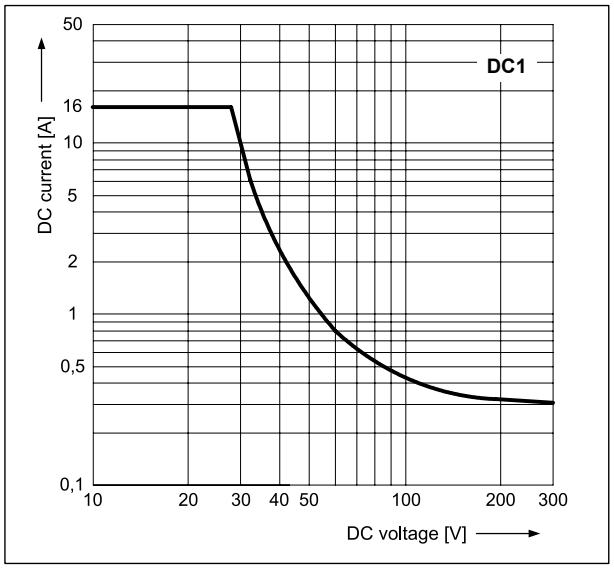
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



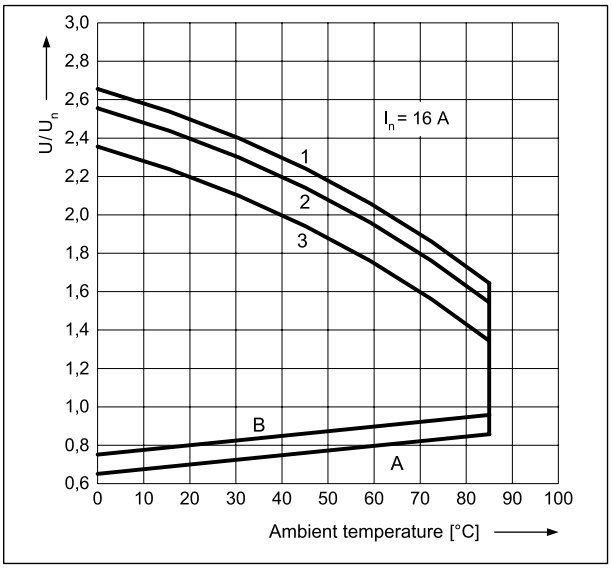
Electrical life reduction factor at AC inductive load Fig. 2



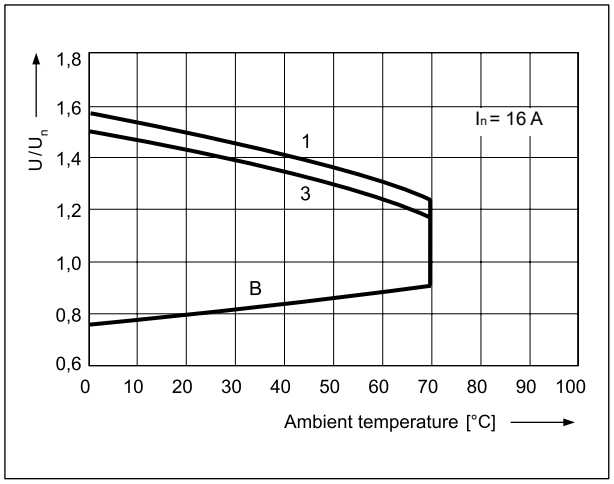
Max. DC resistive load breaking capacity Fig. 3



Coil operating range - DC Fig. 4



Coil operating range - AC 50 Hz Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
012DC	12	360	± 10%	8,4	30,6
024DC	**24**	**1 440**	**± 10%**	**16,8**	**61,2**
048DC	48	5 700	± 10%	33,6	122,4
110DC	110	25 200	± 10%	77,0	280,0

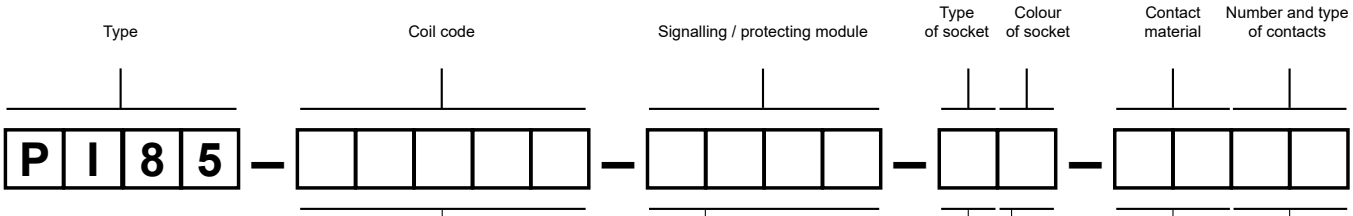
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (at 20 °C)	max. (at 20 °C)
012AC	12	100	± 10%	9,6	13,2
024AC	**24**	**400**	**± 10%**	**19,2**	**28,8**
048AC	48	1 550	± 10%	38,4	57,6
120AC	120	10 200	± 10%	96,0	144,0
230AC	**230**	**38 500**	**± 10%**	**184,0**	**276,0**
240AC	240	42 500	± 15%	192,0	288,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



see Tables 1, 2 page 269

Type of socket
T - GZT80

Colour of socket
S - grey

Signalling / protecting module ❸
M21N - module D (diode D, polarization N: +A1/-A2), 6/230 V DC
M41G - module LD (LED green + diode D, polarization N: +A1/-A2), 6/24 V DC
M42G - module LD (LED green + diode D, polarization N: +A1/-A2), 24/60 V DC
M43G - module LD (LED green + diode D, polarization N: +A1/-A2), 110/230 V DC
M51 - module RC, 6/24 V AC/DC
M52 - module RC, 24/60 V AC/DC
M53 - module RC, 110/240 V AC/DC
M91G - module LV (LED green + varistor), 6/24 V AC/DC
M92G - module LV (LED green + varistor), 24/60 V AC/DC
M93G - module LV (LED green + varistor), 110/240 V AC/DC

Contact material
20 - **AgNi**
23 - AgNi/Au hard gold plating
30 - $AgSnO_2$

Number and type of contacts
11 - 1 CO

❸ Modules D, RC - only for versions with contacts AgNi

Examples of ordering codes:

PI85-012DC-M41G-TS-2011 interface relay **PI85** consists of: relay **RM85** (one changeover contact, contact material AgNi, coil voltage 12 V DC), socket **GZT80** (grey, screw terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZT80-0040** (plastic), description plate **GZT80-0035** (white)

PI85-230AC-M93G-TS-3011 interface relay **PI85** consists of: relay **RM85** (one changeover contact, contact material $AgSnO_2$, coil voltage 230 V AC 50/60 Hz), socket **GZT80** (grey, screw terminals), signalling / protecting module **M93G** (version LV), retainer / retractor clip **GZT80-0040** (plastic), description plate **GZT80-0035** (white)

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RM85 + GZM80

- Interface relay **PI85 with socket GZM80** consists of: electromagnetic relay **RM85**, grey plug-in socket **GZM80**, signalling / protecting module type **M...**, retainer / retractor clip **GZT80-0040** (plastic), white description plate **GZT80-0035**
- 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw • May be linked with interconnection strip type **ZGGZ80**
- Recognitions, certifications, directives: recognitions RM85, RoHS,

CE EAC

Contact data

Number and type of contacts		1 CO
Contact material		**AgNi**, AgNi/Au hard gold plating, $AgSnO_2$
Rated / max. switching voltage	AC	250 V / 300 V
Min. switching voltage		5 V AgNi, 5 V AgNi/Au hard gold plating, 10 V $AgSnO_2$
Rated load (capacity)	AC1	16 A / 250 V AC ❶
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	16 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❷
	AC3 acc. to IEC 60947-4-1	0,5 kW 240 V AC, single-phase motor
Min. switching current		5 mA AgNi, 2 mA AgNi/Au hard gold plating, 10 mA $AgSnO_2$
Max. inrush current		30 A
Rated current		16 A
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		0,3 W AgNi, 0,05 W AgNi/Au hard gold plating, 1 W $AgSnO_2$
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	600 cycles/hour
	• no load	72 000 cycles/hour

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 120, **230**, 240 V
	DC	12, **24**, 48 , 60, 110 V
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2 and Fig. 4, 5
Rated power consumption	AC	0,75 VA
	DC	0,4 ... 0,48 W

Insulation according to EN 60664-1

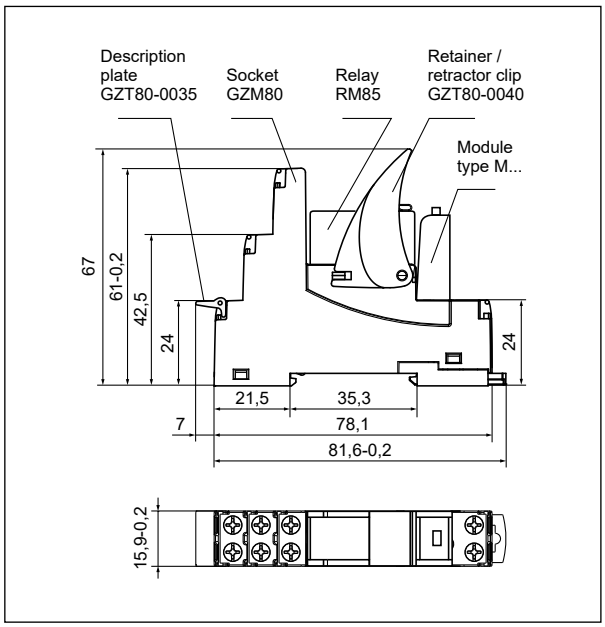
Insulation rated voltage		300 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 10 mm
	• creepage	≥ 10 mm

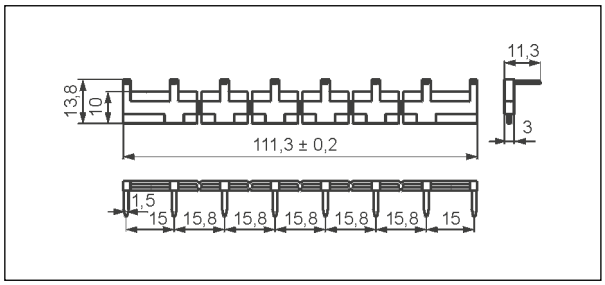
General data

Operating / release time (typical values)		7 ms / 3 ms
Electrical life	• resistive AC1	> 0,7 x 10^5 16 A, 250 V AC
	• cosφ	see Fig. 2
	• DC L/R=40 ms	> 10^5 0,15 A, 220 V DC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		81,6 x 15,9 x 67 mm
Weight		60 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	AC: -40...+70 °C DC: -40...+85 °C
Cover protection category		IP 20 EN 60529
Environmental protection		RM85: RTII GZM80: RT0 EN 61810-7
Shock resistance		30 g
Vibration resistance		10 g 10...150 Hz

The data in bold type relate to the standard versions of the relays. ❶ Loads above 12 A require bridging pairs of screw terminals: 11 with 21, 12 with 22, 14 with 24 - see page 271. ❷ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

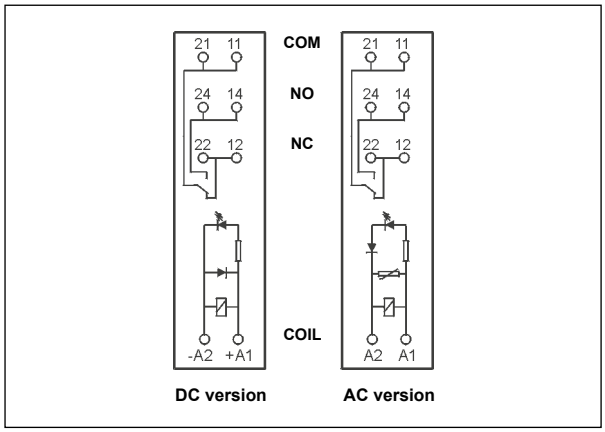
Dimensions



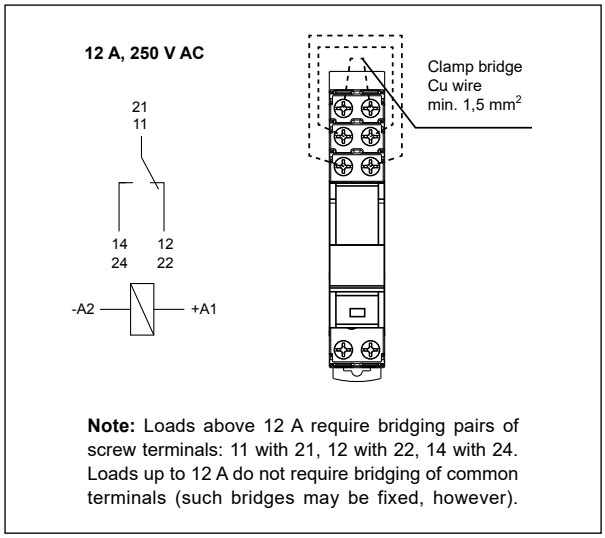


Interconnection strip type **ZGGZ80**

Connection diagrams
(screw terminals side view)



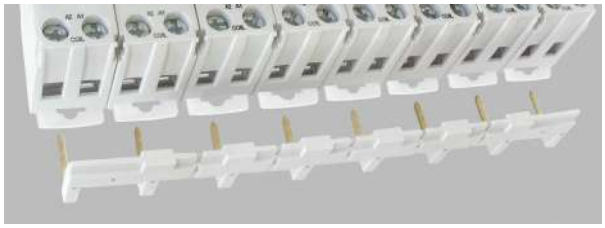
Connection of GZM80 socket



Note: Loads above 12 A require bridging pairs of screw terminals: 11 with 21, 12 with 22, 14 with 24. Loads up to 12 A do not require bridging of common terminals (such bridges may be fixed, however).

Mounting

Relays **PI85 with socket GZM80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm.
Plug-in sockets **GZM80** may be linked with interconnection strip type **ZGGZ80**. Strip **ZGGZ80** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets. Colours of strips: **ZGGZ80-1** grey, **ZGGZ80-2** black (see page 400).



ZGGZ80

Interconnection strip ZGGZ80:
bridging of common input signals.

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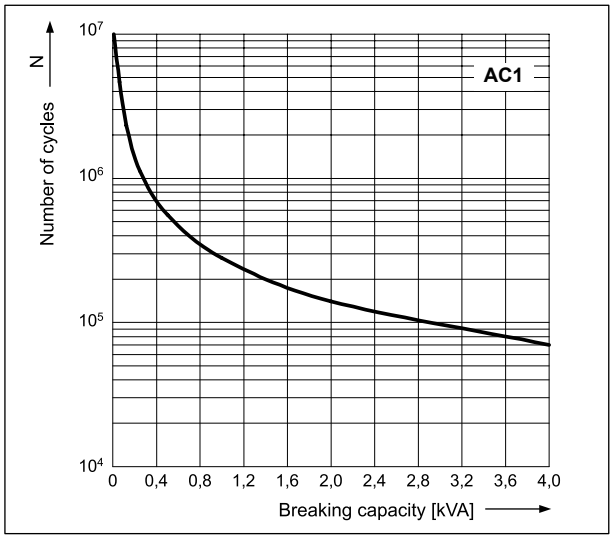
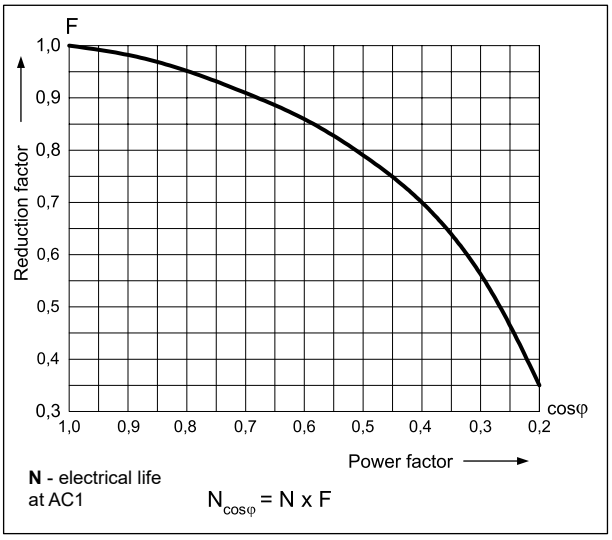
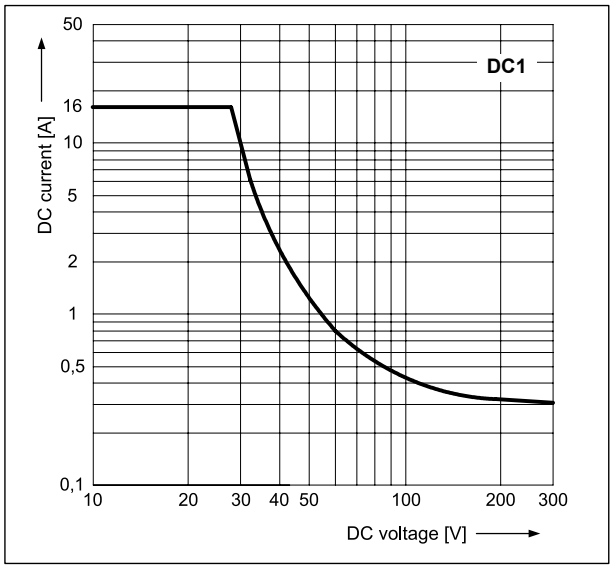
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



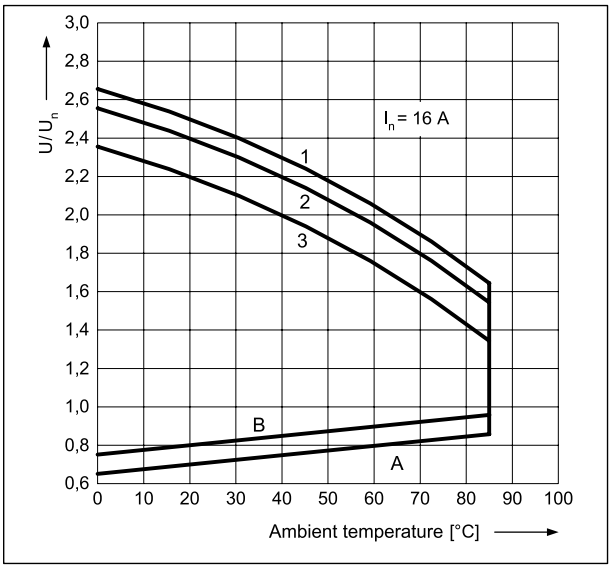
Electrical life reduction factor at AC inductive load Fig. 2



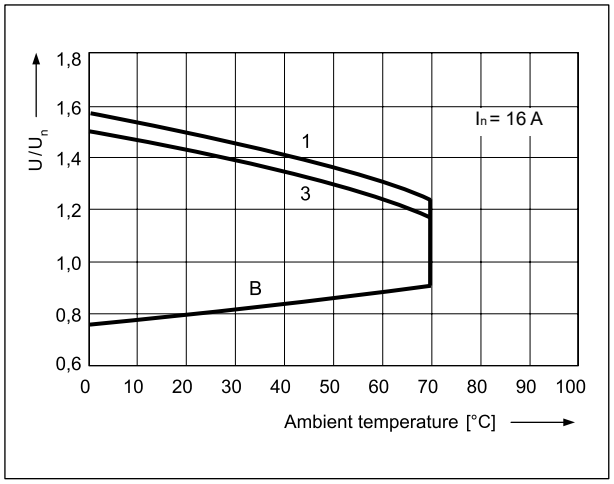
Max. DC resistive load breaking capacity Fig. 3



Coil operating range - DC Fig. 4



Coil operating range - AC 50 Hz Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

Coil data - DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
012DC	12	360	± 10%	8,4	30,6
024DC	**24**	**1 440**	**± 10%**	**16,8**	**61,2**
048DC	48	5 700	± 10%	33,6	122,4
060DC	60	7 500	± 10%	42,0	153,0
110DC	110	25 200	± 10%	77,0	280,0

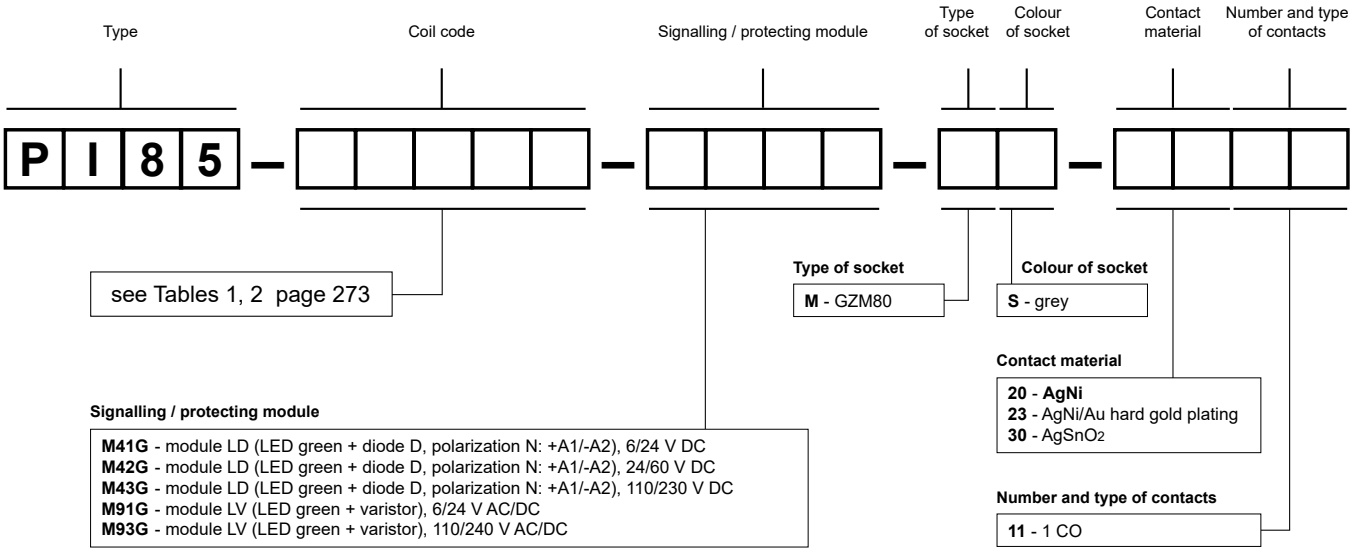
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version — Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (at 20 °C)	max. (at 20 °C)
012AC	12	100	± 10%	9,6	13,2
024AC	**24**	**400**	**± 10%**	**19,2**	**28,8**
120AC	120	10 200	± 10%	96,0	144,0
230AC	**230**	**38 500**	**± 10%**	**184,0**	**276,0**
240AC	240	42 500	± 15%	192,0	288,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



Examples of ordering codes:

PI85-012DC-M41G-MS-2011 — interface relay **PI85** consists of: relay **RM85** (one changeover contact, contact material AgNi, coil voltage 12 V DC), socket **GZM80** (grey, screw terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZT80-0040** (plastic), description plate **GZT80-0035** (white)

PI85-230AC-M93G-MS-3011 — interface relay **PI85** consists of: relay **RM85** (one changeover contact, contact material $AgSnO_2$, coil voltage 230 V AC 50/60 Hz), socket **GZM80** (grey, screw terminals), signalling / protecting module **M93G** (version LV), retainer / retractor clip **GZT80-0040** (plastic), description plate **GZT80-0035** (white)

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PI85 with socket GZP80
interface relays with Push-in terminals

RM85 + GZP80 | RM85 (AC) ❶ + GZP80 | RM85 (DC) ❶ + GZP80

NEW

- Interface relay **PI85 with socket GZP80** consists of: electromagnetic relay **RM85** (standard white or option transparent: AC orange, DC blue ❶), grey plug-in socket **GZP80**, signalling / protecting module type **M...**, retainer / retractor clip **GZP80-0400** (plastic)
- 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw • May be linked with interconnection strips type **ZGZP...**
- Recognitions, certifications, directives: recognitions RM85, RoHS,

Contact data

Number and type of contacts		1 CO	
Contact material		**AgNi**, AgNi/Au hard gold plating	
Rated / max. switching voltage	AC	250 V / 300 V	
Min. switching voltage		5 V	
Rated load (capacity)	AC1	16 A / 250 V AC ❷	
	AC15	3 A / 120 V	1,5 A / 240 V (B300)
	DC1	16 A / 24 V DC (see Fig. 3)	
	DC13	0,22 A / 120 V	0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP	240 V AC, 4,9 FLA, single-phase motor ❸
	AC3 acc. to IEC 60947-4-1	0,5 kW	240 V AC, single-phase motor
Min. switching current		5 mA AgNi, 2 mA AgNi/Au hard gold plating	
Max. inrush current		30 A	
Rated current		16 A	
Max. breaking capacity	AC1	4 000 VA	
Min. breaking capacity		0,3 W AgNi, 0,05 W AgNi/Au hard gold plating	
Contact resistance		≤ 100 mΩ	
Max. operating frequency	• at rated load AC1	600 cycles/hour	
	• no load	72 000 cycles/hour	

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 48, 120, **230** V	
	DC	12, **24**, 48, 110 V	
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2 and Fig. 4, 5	
Rated power consumption	AC	0,75 VA	
	DC	0,4 ... 0,48 W	

Insulation according to EN 60664-1

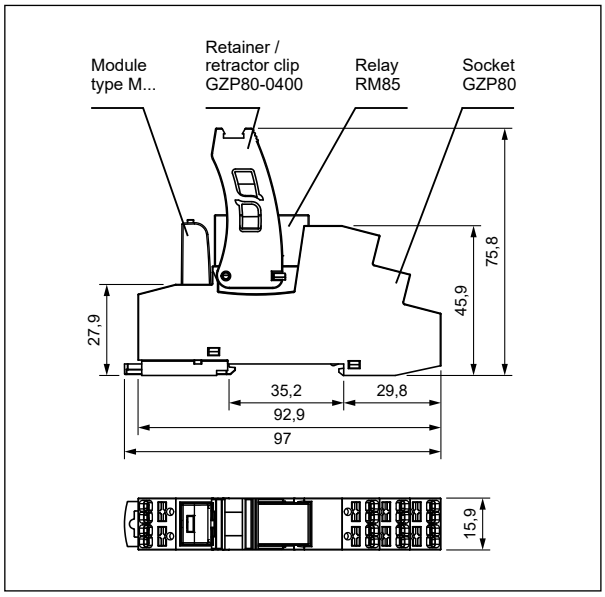
Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		3	
Dielectric strength	• between coil and contacts	5 000 V AC	type of insulation: reinforced
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 10 mm	
	• creepage	≥ 10 mm	

General data

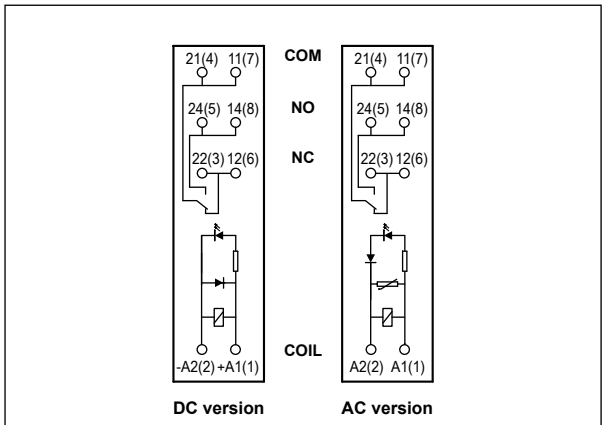
Operating / release time (typical values)		7 ms / 3 ms	
Electrical life	• resistive AC1	> 0,7 x 10^5	16 A, 250 V AC
	• cosφ	see Fig. 2	
	• DC L/R=40 ms	> 10^5	0,15 A, 220 V DC
Mechanical life (cycles)		> 3 x 10^7	
Dimensions (L x W x H)		97 x 15,9 x 75,8 mm	
Weight		65 g	
Ambient temperature	• storage	-40...+85 °C	
(non-condensation and/or icing)	• operating	AC: -40...+70 °C	DC: -40...+85 °C -20...+70 °C ❶
Cover protection category		IP 20	EN 60529
Environmental protection		RM85: RTII	GZP80: RT0 EN 61810-7
Shock resistance		30 g	
Vibration resistance		10 g 10...150 Hz	

The data in bold type relate to the standard versions of the relays. ❶ Special versions - relays in transparent cover, operating temperature -20...+70 °C. See "Ordering codes". ❷ Loads above 12 A require bridging pairs of Push-in terminals: 11 with 21, 12 with 22, 14 with 24 - see page 275. ❸ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Dimensions

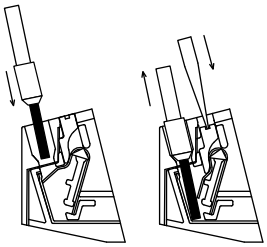


Connection diagrams
(Push-in terminals side view)

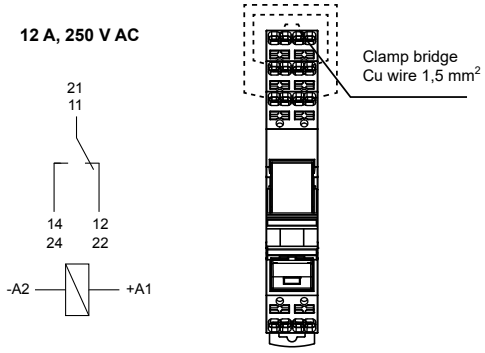


Wire connection

The drawings present inserting wire into the Push-in terminal and removing wire using the button releasing a clamp (assembly without tools).



Connection of GZP80 socket



Note: Loads above 12 A require bridging pairs of Push-in terminals: 11 with 21, 12 with 22, 14 with 24. Loads up to 12 A do not require bridging of common terminals (such bridges may be fixed, however).

Connecting accessories

- see page 402

ZGZP80-8 GY grey
ZGZP80-8 BK black
ZGZP80-8 RD red
ZGZP80-8 BE blue

ZGZP80-2 GY grey
ZGZP80-2 BK black
ZGZP80-2 RD red
ZGZP80-2 BE blue

ZGZP-2 GY grey
ZGZP-2 BK black
ZGZP-2 RD red
ZGZP-2 BE blue

NEW

Strips 8-poles ZGZP80-8: unlimited possibilities of connection configurations (bridging of: A1, A2, A1 & A2 together), fast, safe and easy bridging of signals on the coil.

Strips 2-poles ZGZP80-2: free bridging of common input signals and terminals on the contact side, creating parallel connections of outputs in redundancy systems.

Jumpers 2-poles ZGZP-2: parallel connections of neighbouring poles in one socket GZP80 or GZP4 without use additional wiring, increasing the load capacity from 12 A to 16 A (PI85, PI85P).

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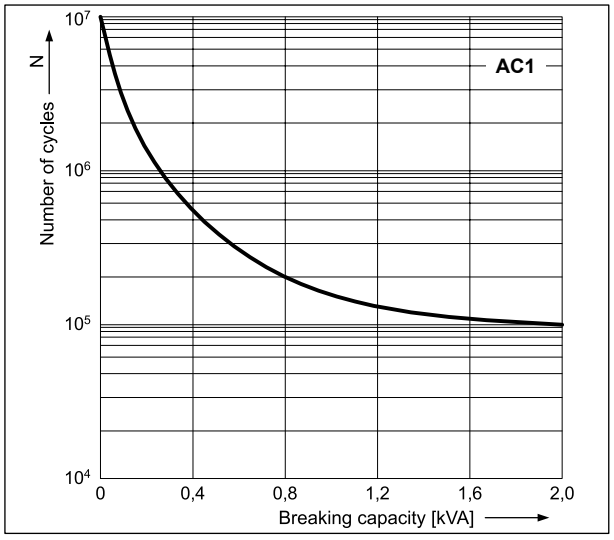
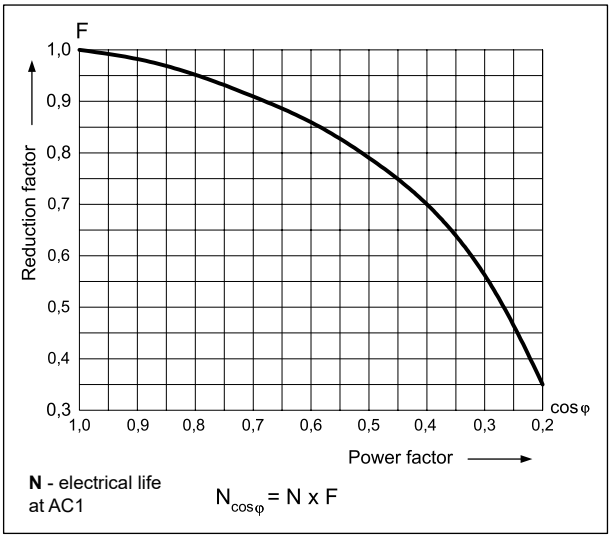
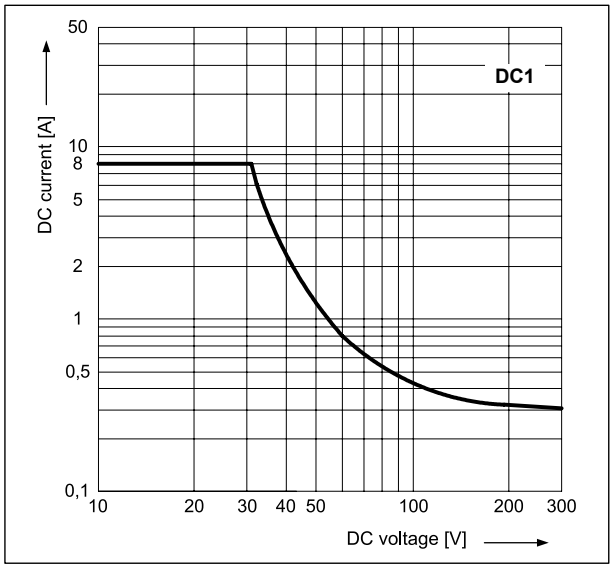
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



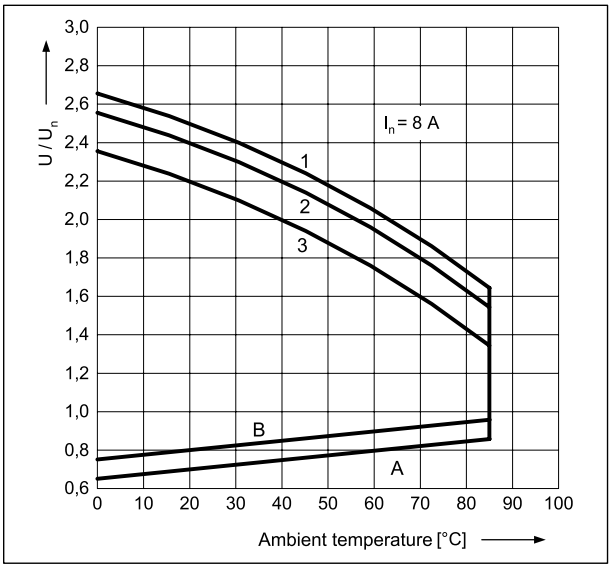
Electrical life reduction factor at AC inductive load Fig. 2



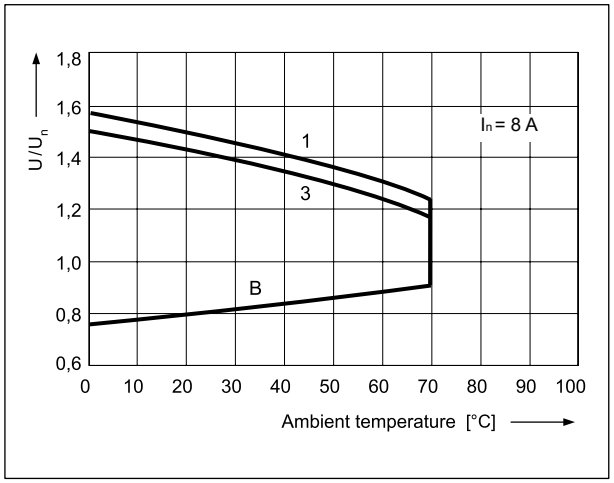
Max. DC resistive load breaking capacity Fig. 3



Coil operating range - DC Fig. 4



Coil operating range - AC 50 Hz Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

Mounting

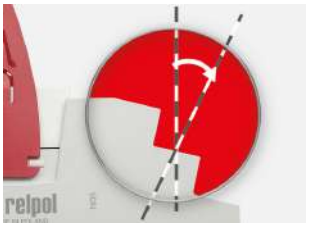
Relays **PI85 with socket GZP80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables: 2 x 1,5 mm^2 (ferrules without insulation), 2 x 1 mm^2 (ferrules with insulation), stripping length: 8...10 mm.
Plug-in sockets **GZP80** may be linked with interconnection strips type **ZGZP...** Strip **ZGZP80-8** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets. Strip **ZGZP80-2** bridges common input or output signals, possibility of connection of 2+n sockets. Jumper **ZGZP-2** bridges the neighboring poles of single socket **GZP80**. Colours of strips: **ZGZP...GY** grey, **ZGZP...BK** black, **ZGZP...RD** red, **ZGZP...BE** blue (see page 402).
Description plates **MP15**, snap into tall marker groove, compatible with the standard for DIN rail terminal blocks, should be ordered separately.


ZGZP80-8


ZGZP80-2


ZGZP-2


MP15



Terminals directed to wiring ducts: esthetic cabling management, easier content reading from markers on wires.

Holes for test probes: ergonomic, stable position of the probe in the socket, freedom to perform measurements and control.

Space for label: for self-adhesive paper, foil or polyester tapes (max. width 9 mm).

Coil data - DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
012DC	12	360	± 10%	8,4	30,6
024DC	**24**	**1 440**	**± 10%**	**16,8**	**61,2**
048DC	48	5 700	± 10%	33,6	122,4
110DC	110	25 200	± 10%	77,0	280,0

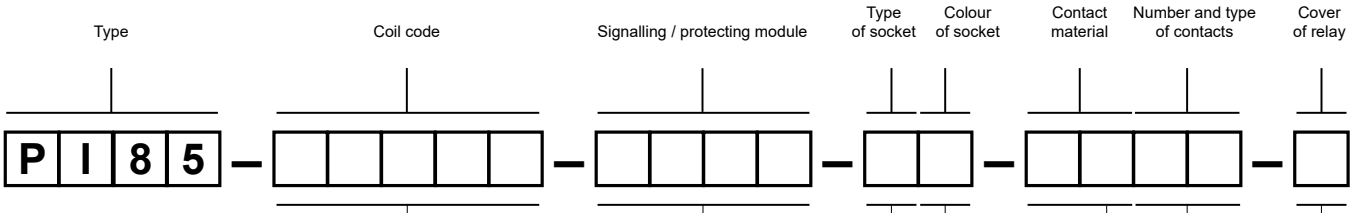
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version — Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (at 20 °C)	max. (at 20 °C)
012AC	12	100	± 10%	9,6	13,2
024AC	**24**	**400**	**± 10%**	**19,2**	**28,8**
048AC	48	1 550	± 10%	38,4	57,6
120AC	120	10 200	± 10%	96,0	144,0
230AC	**230**	**38 500**	**± 10%**	**184,0**	**276,0**

The data in bold type relate to the standard versions of the relays.

Ordering codes



see Tables 1, 2 page 277

Type of socket
P - GZP80

Colour of socket
S - grey

Signalling / protecting module
M41G - module LD (LED green + diode D, polarization N: +A1/-A2), 6/24 V DC
M42G - module LD (LED green + diode D, polarization N: +A1/-A2), 24/60 V DC
M43G - module LD (LED green + diode D, polarization N: +A1/-A2), 110/230 V DC
M91G - module LV (LED green + varistor), 6/24 V AC/DC
M92G - module LV (LED green + varistor), 24/60 V AC/DC
M93G - module LV (LED green + varistor), 110/240 V AC/DC

Contact material
20 - **AgNi**
23 - AgNi/Au hard gold plating

Number and type of contacts
11 - 1 CO

Cover of relay
without marks - standard cover (no transparent, white colour)
01 - transparent cover (orange colour - AC coils, blue colour - DC coils) ❶

❶ **01**: special version - relay in transparent cover, operating temperature -20...+70 °C

Examples of ordering codes:

PI85-230AC-M93G-PS-2011 interface relay **PI85** consists of: relay **RM85** (white, one changeover contact, contact material AgNi, coil voltage 230 V AC 50/60 Hz), socket **GZP80** (grey, Push-in terminals), signalling / protecting module **M93G** (version LV), retainer / retractor clip **GZP80-0400** (red, plastic)

PI85-024AC-M91G-PS-2311-01 interface relay **PI85** consists of: relay **RM85** (orange, one changeover contact, contact material AgNi/Au hard gold plating, coil voltage 24 V AC 50/60 Hz), socket **GZP80** (grey, Push-in terminals), signalling / protecting module **M91G** (version LV), retainer / retractor clip **GZP80-0400** (red, plastic)

PI85-024DC-M41G-PS-2011-01 interface relay **PI85** consists of: relay **RM85** (blue, one changeover contact, contact material AgNi, coil voltage 24 V DC), socket **GZP80** (grey, Push-in terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZP80-0400** (red, plastic)

PI85-230AC-M93G-PS-2011
(standard white)

PI85-024AC-M91G-PS-2311-01
(option transparent: AC orange)

PI85-024DC-M41G-PS-2011-01
(option transparent: DC blue)

RM85 inrush + GZT80

- Interface relay **PI85 inrush with socket GZT80** consists of: electromagnetic relay **RM85 inrush**, grey plug-in socket **GZT80**, signalling / protecting module type **M...**, retainer / retractor clip **GZT80-0040** (plastic), white description plate **GZT80-0035**
- 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw • May be linked with interconnection strip type **ZGGZ80**
- **Resistance to inrush current 80 A (20 ms)**
- Recognitions, certifications, directives: recognitions RM85 inrush, RoHS,

CE EAC

Contact data

Number and type of contacts		1 NO
Contact material		**$AgSnO_2$**
Rated / max. switching voltage	AC	250 V / 300 V
Min. switching voltage		10 V
Rated load (capacity)	AC1	16 A / 250 V AC ❶
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	16 A / 24 V DC (see Fig. 2)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1 HP 240 V AC, 8 FLA, single-phase motor ❷
	AC3 acc. to IEC 60947-4-1	0,75 kW 240 V AC, single-phase motor
Min. switching current		10 mA
Max. inrush current		80 A 20 ms
Rated current		16 A
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		1 W
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	600 cycles/hour
	• no load	72 000 cycles/hour

Coil data

Rated voltage	DC	12, **24**, 110 V
Must release voltage		DC: ≥ 0,1 U_n
Operating range of supply voltage		see Table 1 and Fig. 3
Rated power consumption	DC	0,4 ... 0,48 W

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 10 mm
	• creepage	≥ 10 mm

General data

Operating / release time (typical values)		8 ms / 3 ms
Electrical life		
• resistive AC1	600 cycles/hour	> 10^5 16 A, 250 V AC
• cosφ		see Fig. 1
• resistive DC1	600 cycles/hour	> 10^5 16 A, 24 V DC
• inductive AC3, I = 3,5 A		> 2,5 x 10^5
• at incandescent lamp load, 1000 W		> 0,9 x 10^5
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		80 x 15,6 x 67 mm
Weight		62 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+85 °C
Cover protection category		IP 20 EN 60529
Environmental protection		RM85 inrush: RTII GZT80: RT0 EN 61810-7
Shock resistance		30 g
Vibration resistance		10 g 10...150 Hz

The data in bold type relate to the standard versions of the relays. ❶ Loads above 12 A require bridging pairs of screw terminals: 11 with 21, 14 with 24 - see page 280. ❷ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

INTERFACE

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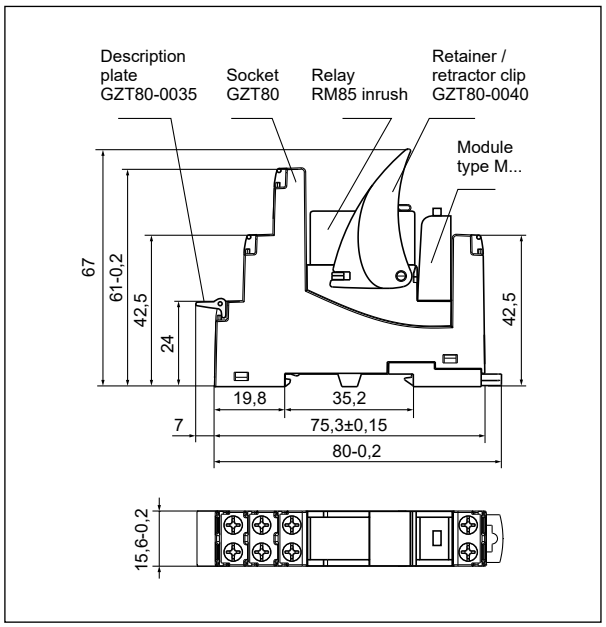
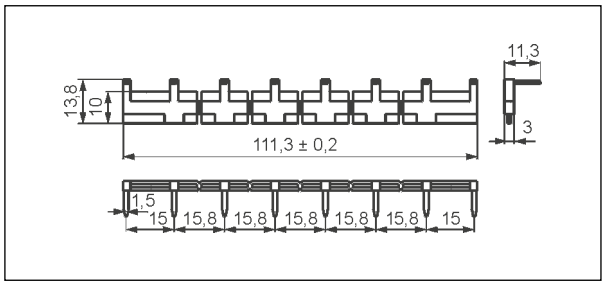
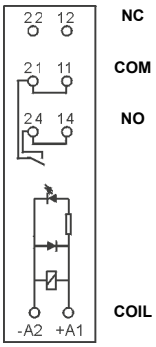
Dimensions





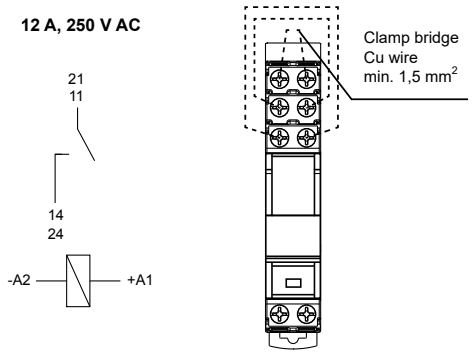
Interconnection strip type **ZGGZ80**

Connection diagram
(screw terminals side view)



DC version

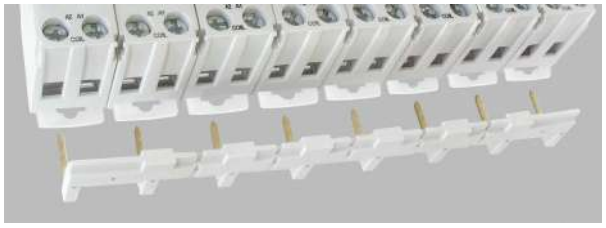
Connection of GZT80 socket



Note: Loads above 12 A require bridging pairs of screw terminals: 11 with 21, 14 with 24. Loads up to 12 A do not require bridging of common terminals (such bridges may be fixed, however).

Mounting

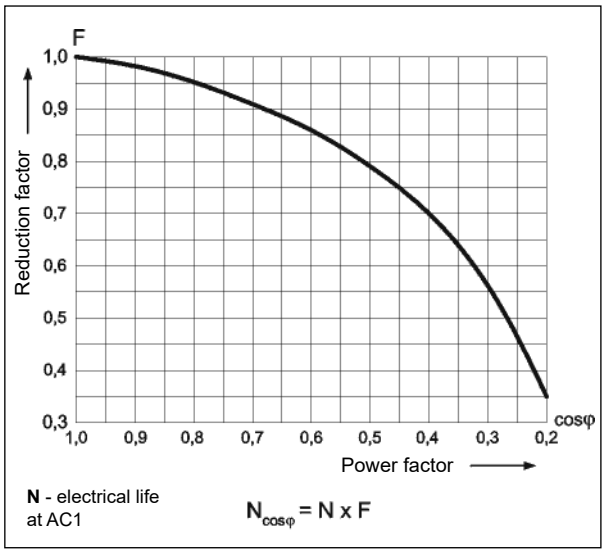
Relays **PI85 inrush with socket GZT80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm.
Plug-in sockets **GZT80** may be linked with interconnection strip type **ZGGZ80**. Strip **ZGGZ80** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets. Colours of strips: **ZGGZ80-1** grey, **ZGGZ80-2** black (see page 400).



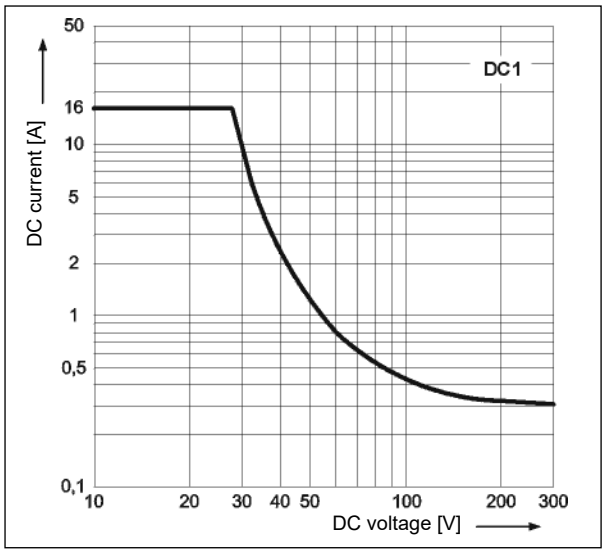
ZGGZ80

Interconnection strip ZGGZ80:
bridging of common input signals.

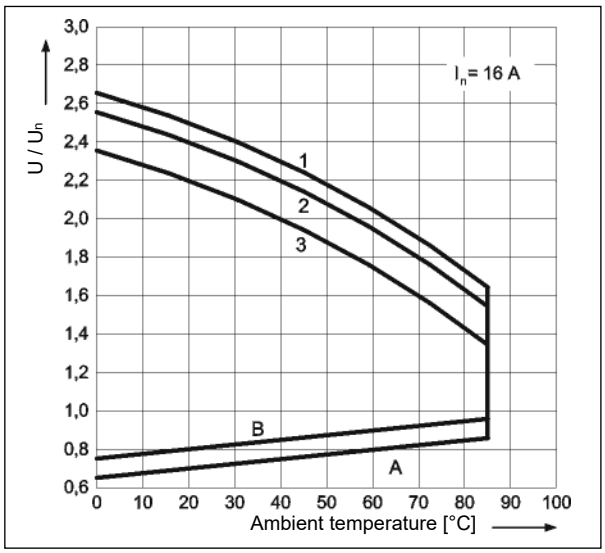
Electrical life reduction factor at AC inductive load Fig. 1



Max. DC resistive load breaking capacity Fig. 2



Coil operating range - DC Fig. 3



Description of Fig. 3

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, **2**, **3** - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

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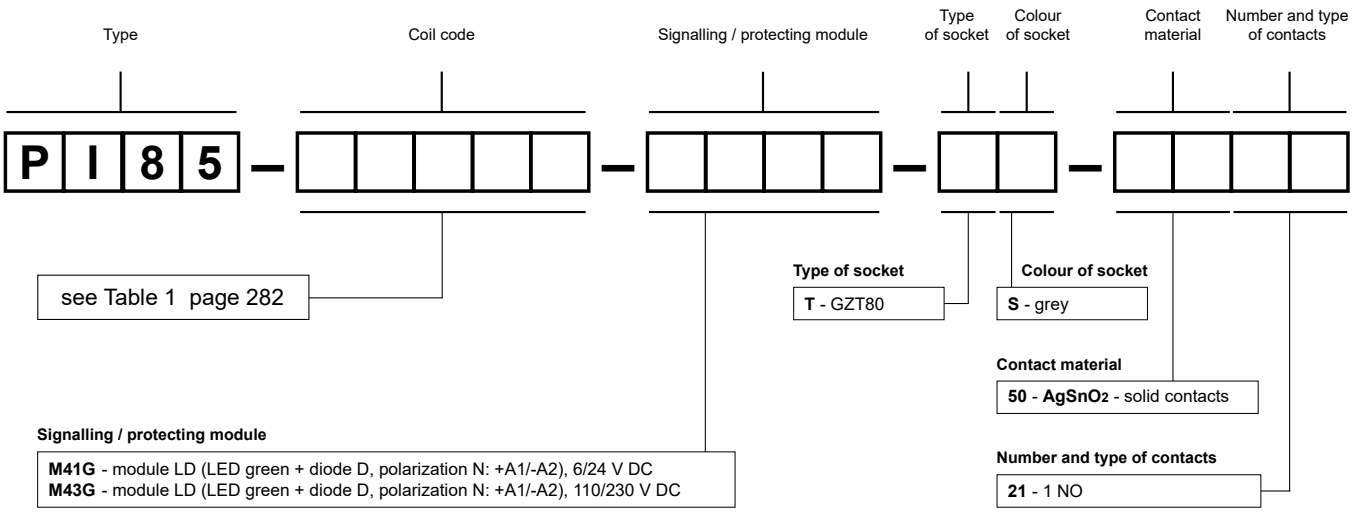
Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
012DC	12	360	± 10%	8,4	30,6
024DC	**24**	**1 440**	**± 10%**	**16,8**	**61,2**
110DC	110	25 200	± 10%	77,0	280,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



Example of ordering code:

PI85-012DC-M41G-TS-5021 interface relay **PI85 inrush** consists of: relay **RM85 inrush** (one normally open contact, contact material $AgSnO_2$ - solid contacts, coil voltage 12 V DC), socket **GZT80** (grey, screw terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZT80-0040** (plastic), description plate **GZT80-0035** (white)

RMP84 (AC) + GZP80

RMP84 (DC) + GZP80

- Interface relay **PI84P with socket GZP80** consists of: electromagnetic relay **RMP84**, grey plug-in socket **GZP80**, signalling / protecting module type **M...**, retainer / retractor clip **GZP80-0400** (plastic)
- 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw
- May be linked with interconnection strips type **ZGZP...**
- Recognitions, certifications, directives: recognitions RMP84, RoHS,

NEW

Contact data

Number and type of contacts		2 CO
Contact material		**AgNi**
Rated / max. switching voltage	AC	250 V / 300 V
Min. switching voltage		12 V 10 mA
Rated load	AC1	8 A / 250 V AC
Min. switching current		10 mA 12 V
Max. inrush current		16 A 20 ms
Rated current		8 A
Max. breaking capacity	AC1	2 000 VA
Min. breaking capacity		0,12 W 10 mA / 12 V
Contact resistance		≤ 100 mΩ 1 A / 6 V DC
Max. operating frequency	• at rated load AC1	360 cycles/hour
	• no load	18 000 cycles/hour

Coil data

Rated voltage	50 Hz AC	**24**, 115, **230** V
	DC	12, **24**, 48, 110 V
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2
Rated power consumption	AC	0,75 VA
	DC	0,4 ... 0,48 W

Insulation according to EN 60664-1

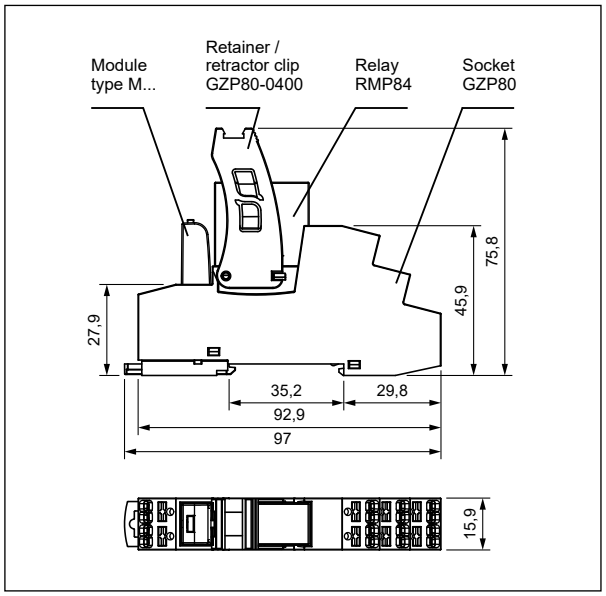
Insulation rated voltage		300 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
	• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 8 mm
	• creepage	≥ 8 mm

General data

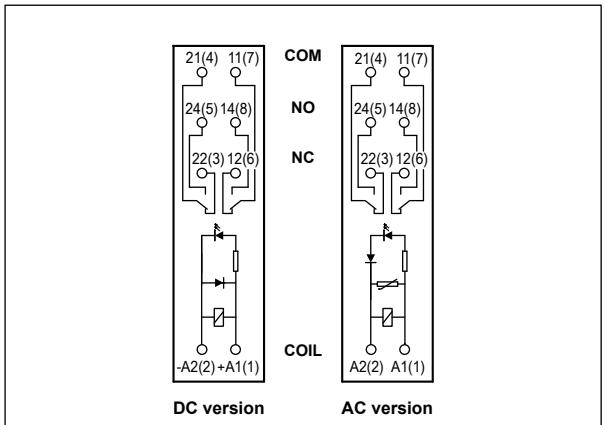
Operating / release time (typical values)		15 ms / 8 ms
Electrical life (number of cycles)	• resistive AC1	> 3 x 10^4 AC coils, 8 A, 250 V AC, ON for 5 s / OFF for 5 s
		> 10^4 DC coils, 8 A, 250 V AC, ON for 5 s / OFF for 5 s
		> 5 x 10^4 8 A, 250 V AC, 70 °C, ON for 1 s / OFF for 9 s
Mechanical life (cycles)		> 10^6 AC coils
		> 5 x 10^6 DC coils
Dimensions (L x W x H)		97 x 15,9 x 75,8 mm
Weight		67 g
Ambient temperature (non-condensation and/or icing)	• storage	-40...+70 °C
	• operating	-40...+55 °C
Cover protection category		IP 20 EN 60529
Environmental protection		RMP84: RTII GZP80: RT0 EN 61810-7
Shock resistance		10 g
Vibration resistance	(NO/NC)	10 g / 5 g length direction: 10 g / 2 g 10...150 Hz

The data in bold type relate to the standard versions of the relays.

Dimensions

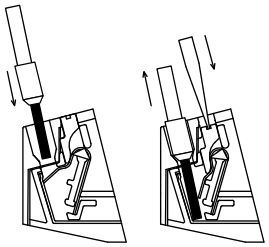


Connection diagrams
(Push-in terminals side view)

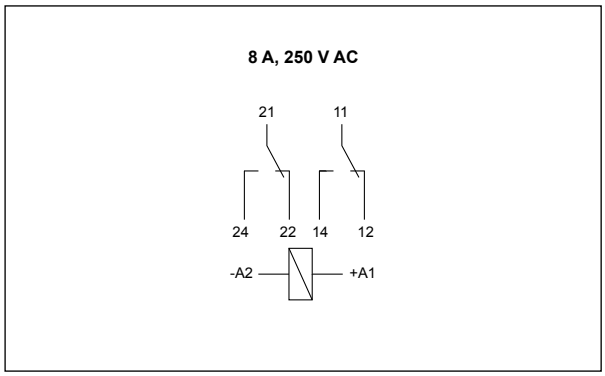


Wire connection

The drawings present inserting wire into the Push-in terminal and removing wire using the button releasing a clamp (assembly without tools).



Connection of GZP80 socket



Connecting accessories

- see page 402

ZGZP80-8 GY grey
ZGZP80-8 BK black
ZGZP80-8 RD red
ZGZP80-8 BE blue

ZGZP80-2 GY grey
ZGZP80-2 BK black
ZGZP80-2 RD red
ZGZP80-2 BE blue

ZGZP-2 GY grey
ZGZP-2 BK black
ZGZP-2 RD red
ZGZP-2 BE blue

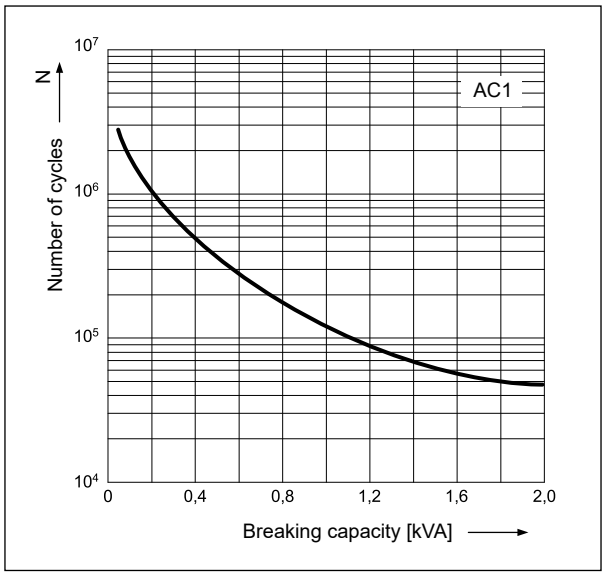
NEW

Strips 8-poles ZGZP80-8: unlimited possibilities of connection configurations (bridging of: A1, A2, A1 & A2 together), fast, safe and easy bridging of signals on the coil.

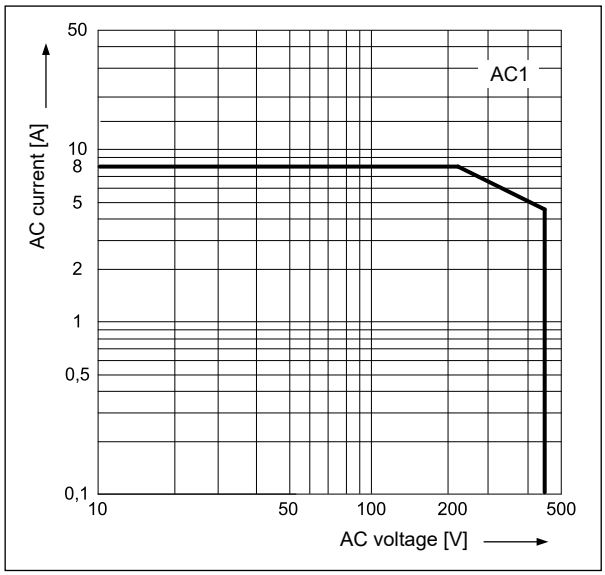
Strips 2-poles ZGZP80-2: free bridging of common input signals and terminals on the contact side, creating parallel connections of outputs in redundancy systems.

Jumpers 2-poles ZGZP-2: parallel connections of neighbouring poles in one socket GZP80 or GZP4 without use additional wiring, increasing the load capacity from 12 A to 16 A (PI85, PI85P).

Electrical life at AC resistive load. Switching frequency: 360 cycles/hour Fig. 1



Max. AC 50 Hz resistive load breaking capacity Fig. 2



Mounting

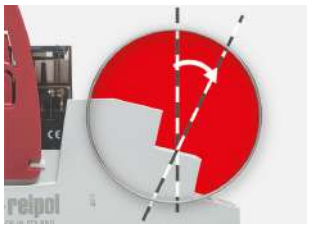
Relays **PI84P with socket GZP80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables: 2 x 1,5 mm² (ferrules without insulation), 2 x 1 mm² (ferrules with insulation), stripping length: 8...10 mm.
Plug-in sockets **GZP80** may be linked with interconnection strips type **ZGZP...** Strip **ZGZP80-8** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets. Strip **ZGZP80-2** bridges common input or output signals, possibility of connection of 2+n sockets. Jumper **ZGZP-2** bridges the neighboring poles of single socket **GZP80**. Colours of strips: **ZGZP...GY** grey, **ZGZP...BK** black, **ZGZP...RD** red, **ZGZP...BE** blue (see page 402).
Description plates **MP15**, snap into tall marker groove, compatible with the standard for DIN rail terminal blocks, should be ordered separately.


ZGZP80-8


ZGZP80-2


ZGZP-2


MP15



Terminals directed to wiring ducts: esthetic cabling management, easier content reading from markers on wires.

Holes for test probes: ergonomic, stable position of the probe in the socket, freedom to perform measurements and control.

Space for label: for self-adhesive paper, foil or polyester tapes (max. width 9 mm).

Coil data - DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance at 23 °C Ω	Acceptable resistance	Coil operating range V DC ❶	
				min. (0...+70 °C)	max. (0...+70 °C)
012DC	12	360	± 10%	8,4	18,0
024DC	**24**	**1 440**	**± 10%**	**16,8**	**36,0**
048DC	48	5 760	± 15%	33,6	72,0
110DC	110	25 200	± 15%	77,0	165,0

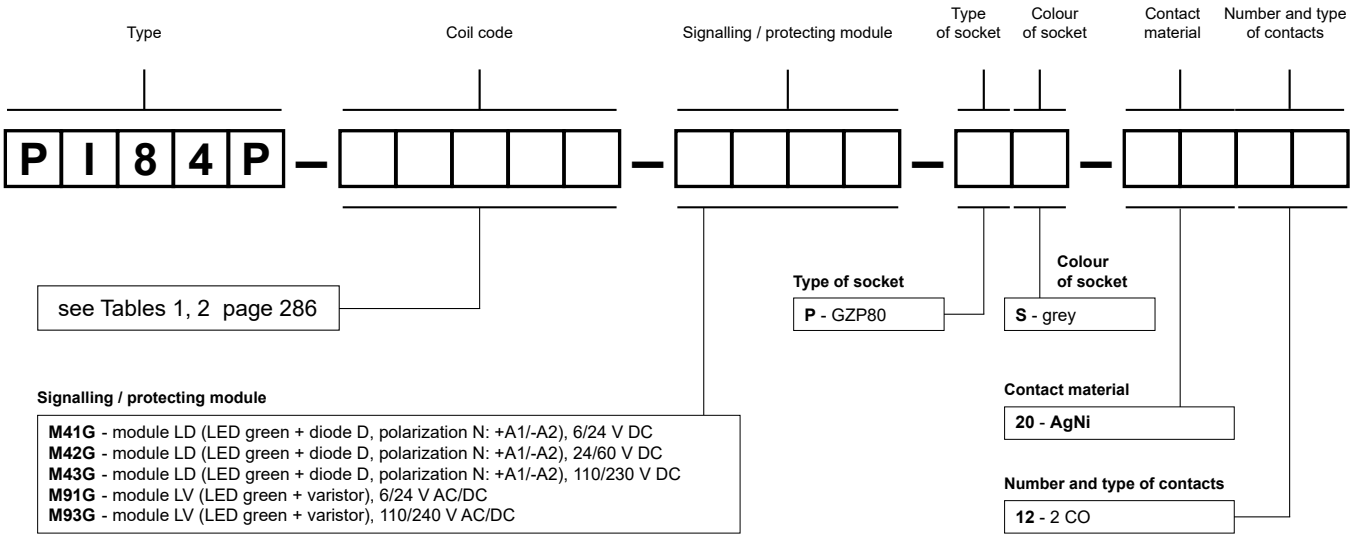
The data in bold type relate to the standard versions of the relays. ❶ The max. allowable voltage is coil overdrive voltage, it is the instantaneous max. voltage which the relay coil could endure in very short time. Relays with 48 V DC and 110 V DC coils shall be absolutely protected against any possibility of operation at voltages higher than the rated voltage.

Coil data - AC 50 Hz voltage version — Table 2

Coil code	Rated voltage V AC	Coil resistance at 23 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (0...+70 °C)	max. (0...+70 °C)
024AC	**24**	**350**	**± 10%**	**18,0**	**26,4**
115AC	115	8 100	± 15%	86,3	126,5
230AC	**230**	**32 500**	**± 15%**	**172,5**	**253,0**

The data in bold type relate to the standard versions of the relays.

Ordering codes



Examples of ordering codes:

PI84P-024DC-M41G-PS-2012 interface relay **PI84P** consists of: relay **RMP84** (two changeover contacts, contact material AgNi, coil voltage 24 V DC), socket **GZP80** (grey, Push-in terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZP80-0400** (red, plastic)

PI84P-230AC-M93G-PS-2012 interface relay **PI84P** consists of: relay **RMP84** (two changeover contacts, contact material AgNi, coil voltage 230 V AC 50 Hz), socket **GZP80** (grey, Push-in terminals), signalling / protecting module **M93G** (version LV), retainer / retractor clip **GZP80-0400** (red, plastic)

RMP85 (AC) + GZP80

RMP85 (DC) + GZP80

- Interface relay **PI85P with socket GZP80** consists of: electromagnetic relay **RMP85**, grey plug-in socket **GZP80**, signalling / protecting module type **M...**, retainer / retractor clip **GZP80-0400** (plastic)
- 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw
- May be linked with interconnection strips type **ZGZP...**
- Recognitions, certifications, directives: recognitions RMP85, RoHS,

NEW

Contact data

Number and type of contacts		1 CO
Contact material		**AgNi**
Rated / max. switching voltage	AC	250 V / 300 V
Min. switching voltage		12 V 10 mA
Rated load	AC1	16 A / 250 V AC ❶
Min. switching current		10 mA 12 V
Max. inrush current		32 A 20 ms
Rated current		16 A
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		0,12 W 10 mA / 12 V
Contact resistance		≤ 100 mΩ 1 A / 6 V DC
Max. operating frequency	• at rated load AC1	360 cycles/hour
	• no load	18 000 cycles/hour

Coil data

Rated voltage	50 Hz AC	**24**, 115, **230** V
	DC	12, **24**, 48, 110 V
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1, 2
Rated power consumption	AC	0,75 VA
	DC	0,4 ... 0,48 W

Insulation according to EN 60664-1

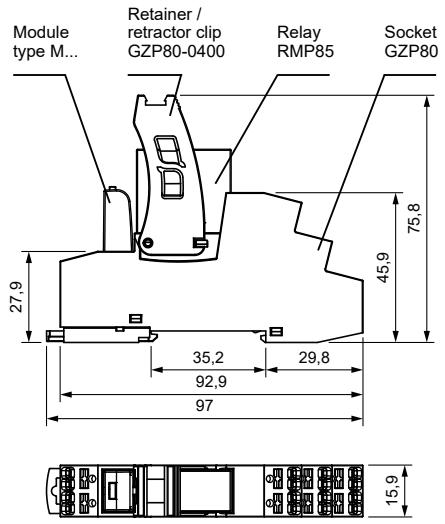
Insulation rated voltage		300 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 8 mm
	• creepage	≥ 8 mm

General data

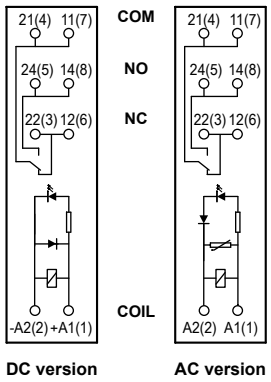
Operating / release time (typical values)		15 ms / 8 ms
Electrical life (number of cycles)	• resistive AC1	> 3 x 10^4 AC coils, 16 A, 250 V AC, ON for 5 s / OFF for 5 s
		> 10^4 DC coils, 16 A, 250 V AC, ON for 5 s / OFF for 5 s
		> 3 x 10^4 16 A, 250 V AC, 70 °C, ON for 1 s / OFF for 9 s
Mechanical life (cycles)		> 10^6 AC coils
		> 5 x 10^6 DC coils
Dimensions (L x W x H)		97 x 15,9 x 75,8 mm
Weight		67 g
Ambient temperature (non-condensation and/or icing)	• storage	-40...+70 °C
	• operating	-40...+55 °C
Cover protection category		IP 20 EN 60529
Environmental protection		RMP85: RTII GZP80: RT0 EN 61810-7
Shock resistance		10 g
Vibration resistance	(NO/NC)	10 g / 5 g length direction: 10 g / 2 g 10...150 Hz

The data in bold type relate to the standard versions of the relays.
❶ Loads above 12 A require bridging pairs of Push-in terminals: 11 with 21, 12 with 22, 14 with 24 - see page 288.

Dimensions

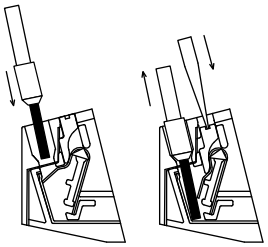


Connection diagrams
(Push-in terminals side view)



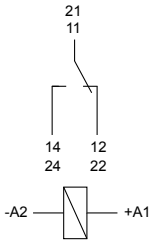
Wire connection

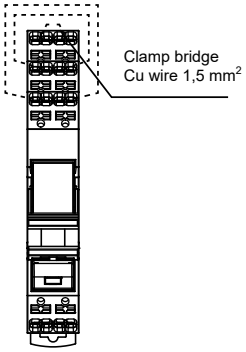
The drawings present inserting wire into the Push-in terminal and removing wire using the button releasing a clamp (assembly without tools).



Connection of GZP80 socket

12 A, 250 V AC





Note: Loads above 12 A require bridging pairs of Push-in terminals: 11 with 21, 12 with 22, 14 with 24. Loads up to 12 A do not require bridging of common terminals (such bridges may be fixed, however).

Connecting accessories

- see page 402

ZGZP80-8 GY grey
ZGZP80-8 BK black
ZGZP80-8 RD red
ZGZP80-8 BE blue

ZGZP80-2 GY grey
ZGZP80-2 BK black
ZGZP80-2 RD red
ZGZP80-2 BE blue

ZGZP-2 GY grey
ZGZP-2 BK black
ZGZP-2 RD red
ZGZP-2 BE blue

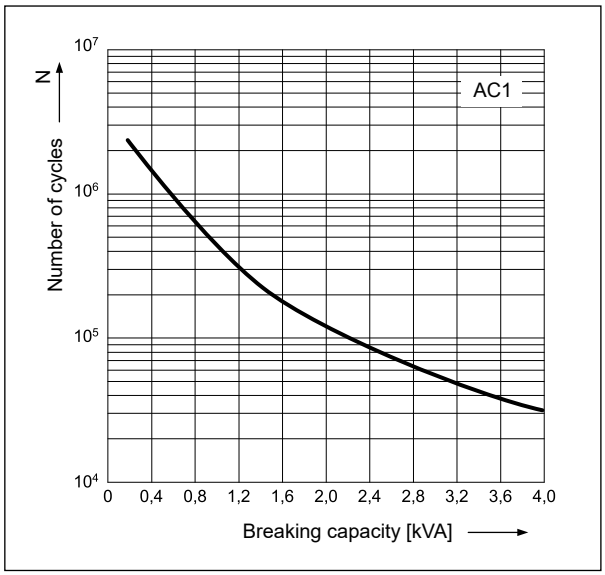
NEW

Strips 8-poles ZGZP80-8: unlimited possibilities of connection configurations (bridging of: A1, A2, A1 & A2 together), fast, safe and easy bridging of signals on the coil.

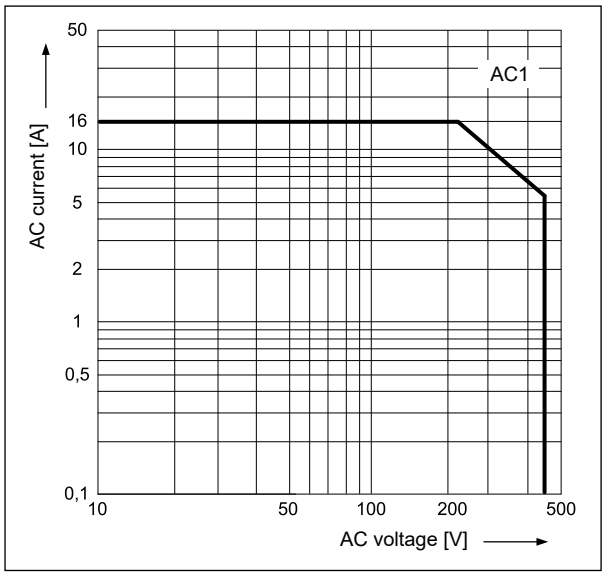
Strips 2-poles ZGZP80-2: free bridging of common input signals and terminals on the contact side, creating parallel connections of outputs in redundancy systems.

Jumpers 2-poles ZGZP-2: parallel connections of neighbouring poles in one socket GZP80 or GZP4 without use additional wiring, increasing the load capacity from 12 A to 16 A (PI85, PI85P).

Electrical life at AC resistive load. Switching frequency: 360 cycles/hour Fig. 1



Max. AC 50 Hz resistive load breaking capacity Fig. 2



Mounting

Relays **PI85P with socket GZP80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables: 2 x 1,5 mm² (ferrules without insulation), 2 x 1 mm² (ferrules with insulation), stripping length: 8...10 mm.
Plug-in sockets **GZP80** may be linked with interconnection strips type **ZGZP...** Strip **ZGZP80-8** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets. Strip **ZGZP80-2** bridges common input or output signals, possibility of connection of 2+n sockets. Jumper **ZGZP-2** bridges the neighboring poles of single socket **GZP80**. Colours of strips: **ZGZP...GY** grey, **ZGZP...BK** black, **ZGZP...RD** red, **ZGZP...BE** blue (see page 402).
Description plates **MP15**, snap into tall marker groove, compatible with the standard for DIN rail terminal blocks, should be ordered separately.


ZGZP80-8


ZGZP80-2


ZGZP-2


MP15

Terminals directed to wiring ducts: esthetic cabling management, easier content reading from markers on wires.

Holes for test probes: ergonomic, stable position of the probe in the socket, freedom to perform measurements and control.

Space for label: for self-adhesive paper, foil or polyester tapes (max. width 9 mm).

Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC	Coil resistance at 23 °C Ω	Acceptable resistance	Coil operating range V DC ❷	
				min. (0...+70 °C)	max. (0...+70 °C)
012DC	12	360	± 10%	8,4	18,0
024DC	**24**	**1 440**	**± 10%**	**16,8**	**36,0**
048DC	48	5 760	± 15%	33,6	72,0
110DC	110	25 200	± 15%	77,0	165,0

The data in bold type relate to the standard versions of the relays. ❷ The max. allowable voltage is coil overdrive voltage, it is the instantaneous max. voltage which the relay coil could endure in very short time. Relays with 48 V DC and 110 V DC coils shall be absolutely protected against any possibility of operation at voltages higher than the rated voltage.

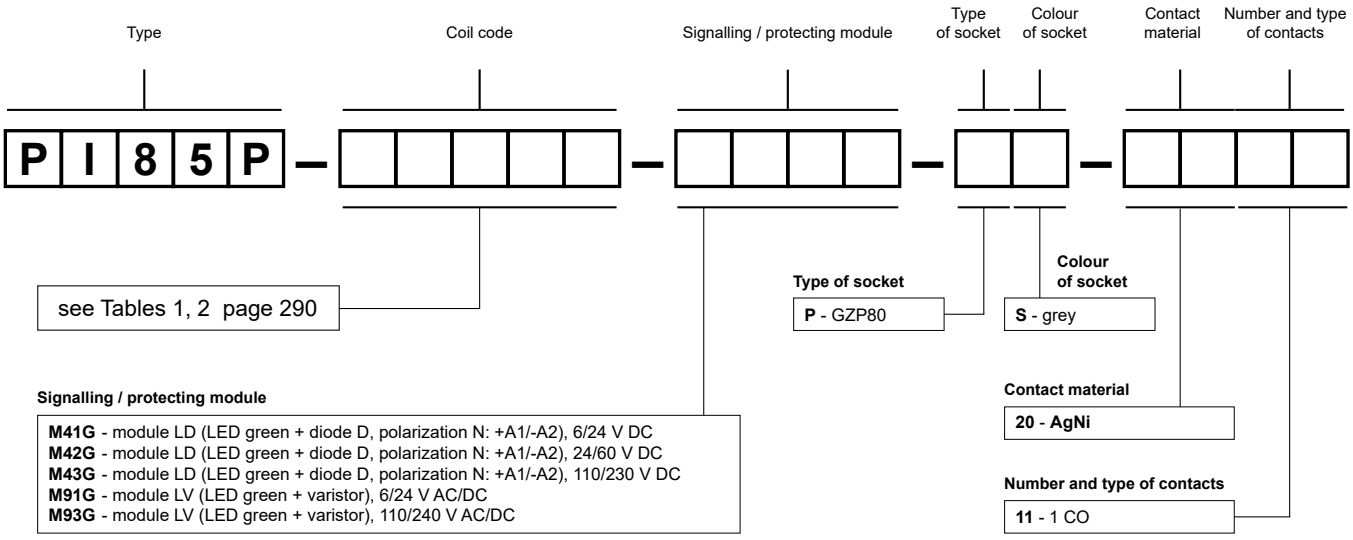
Coil data - AC 50 Hz voltage version

Table 2

Coil code	Rated voltage V AC	Coil resistance at 23 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (0...+70 °C)	max. (0...+70 °C)
024AC	**24**	**350**	**± 10%**	**18,0**	**26,4**
115AC	115	8 100	± 15%	86,3	126,5
230AC	**230**	**32 500**	**± 15%**	**172,5**	**253,0**

The data in bold type relate to the standard versions of the relays.

Ordering codes



Examples of ordering codes:

PI85P-024DC-M41G-PS-2011 interface relay **PI85P** consists of: relay **RMP85** (one changeover contact, contact material AgNi, coil voltage 24 V DC), socket **GZP80** (grey, Push-in terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZP80-0400** (red, plastic)

PI85P-230AC-M93G-PS-2011 interface relay **PI85P** consists of: relay **RMP85** (one changeover contact, contact material AgNi, coil voltage 230 V AC 50 Hz), socket **GZP80** (grey, Push-in terminals), signalling / protecting module **M93G** (version LV), retainer / retractor clip **GZP80-0400** (red, plastic)

R2N (AC) + GZM2

R2N (DC) + GZM2

- Interface relay **PIR2 with socket GZM2** consists of: electromagnetic relay **R2N**, grey plug-in socket **GZM2**, signalling / protecting module type **M...**, retainer / retractor clip **GZT4-0040** (plastic), white description plate **GZT4-0035**
- 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws • May be linked with interconnection strip type **ZGGZ4**
- Recognitions, certifications, directives: recognitions R2N, RoHS,

CE EAC

Contact data

Number and type of contacts		2 CO	
Contact material		**AgNi**	
Rated / max. switching voltage	AC	250 V / 300 V	
Min. switching voltage		5 V	
Rated load (capacity)	AC1	12 A / 250 V AC	
	AC15	3 A / 120 V	1,5 A / 240 V (B300)
	DC1	12 A / 24 V DC (see Fig. 3)	
	DC13	0,22 A / 120 V	0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP	240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,37 kW	240 V AC, single-phase motor
Min. switching current		5 mA	
Max. inrush current		24 A	
Rated current		12 A	
Max. breaking capacity	AC1	3 000 VA	
Min. breaking capacity		0,3 W	
Contact resistance		≤ 100 mΩ	
Max. operating frequency	• at rated load AC1	1 200 cycles/hour	
	• no load	18 000 cycles/hour	

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 48, 120, **230** V	
	DC	12, **24**, 48, 110 V	
Must release voltage		AC: ≥ 0,2 U_n	DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1,2 and Fig. 4, 5	
Rated power consumption	AC	50 Hz: 1,6 VA	60 Hz: 1,3 VA
	DC	0,9 W	

Insulation according to EN 60664-1

Insulation rated voltage		300 V AC	
Rated surge voltage		4 000 V	1,2 / 50 µs
Overvoltage category		III	
Insulation pollution degree		3	
Dielectric strength	• between coil and contacts	2 500 V AC	type of insulation: basic
	• contact clearance	1 500 V AC	type of clearance: micro-disconnection
	• pole - pole	2 500 V AC	type of insulation: basic
Contact - coil distance	• clearance	≥ 2,5 mm	
	• creepage	≥ 4 mm	

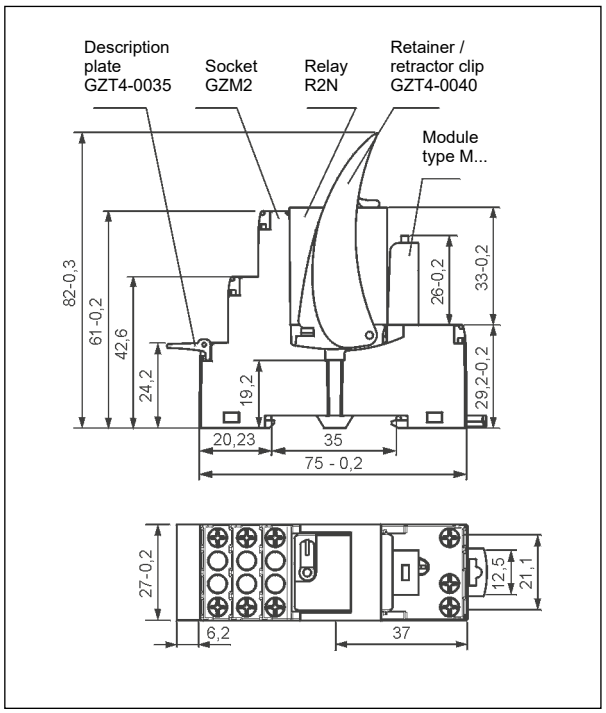
General data

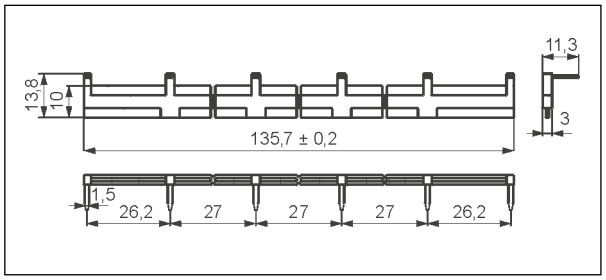
Operating / release time (typical values)		AC: 10 ms / 8 ms	DC: 13 ms / 3 ms
Electrical life	• resistive AC1	> 10^5	12 A, 250 V AC
	• cosφ	see Fig. 2	
Mechanical life (cycles)		> 2 x 10^7	
Dimensions (L x W x H)		75 x 27 x 82 mm	
Weight		97 g	
Ambient temperature	• storage	-40...+85 °C	
(non-condensation and/or icing)	• operating	AC: -40...+55 °C	DC: -40...+70 °C
Cover protection category		IP 20	EN 60529
Environmental protection		R2N: RTI	GZM2: RT0 EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g	
Vibration resistance		5 g	10...150 Hz

The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Export Sales Department: phone +48 68 47 90 832, 951, export@relpol.com.pl

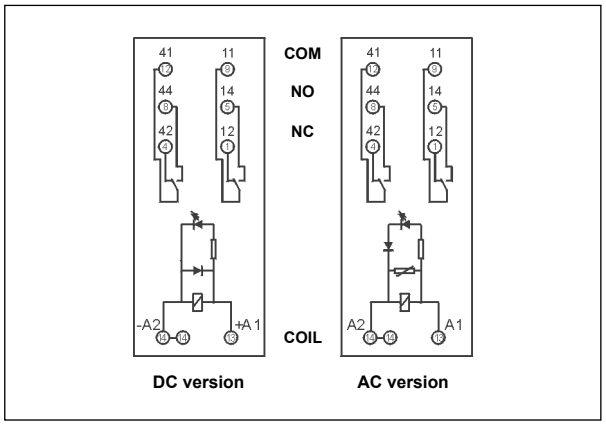
Dimensions





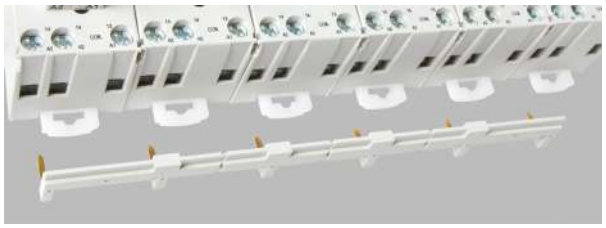
Interconnection strip type **ZGGZ4**

Connection diagrams
(screw terminals side view)



Mounting

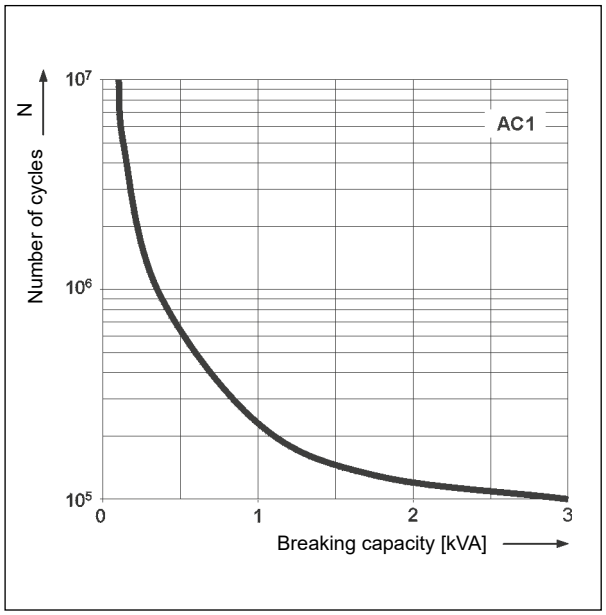
Relays **PIR2 with socket GZM2** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm^2 (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm.
Plug-in sockets **GZM2** may be linked with interconnection strip type **ZGGZ4**. Strip **ZGGZ4** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 6 sockets. Colours of strips: **ZGGZ4-1** grey, **ZGGZ4-2** black (see page 401).



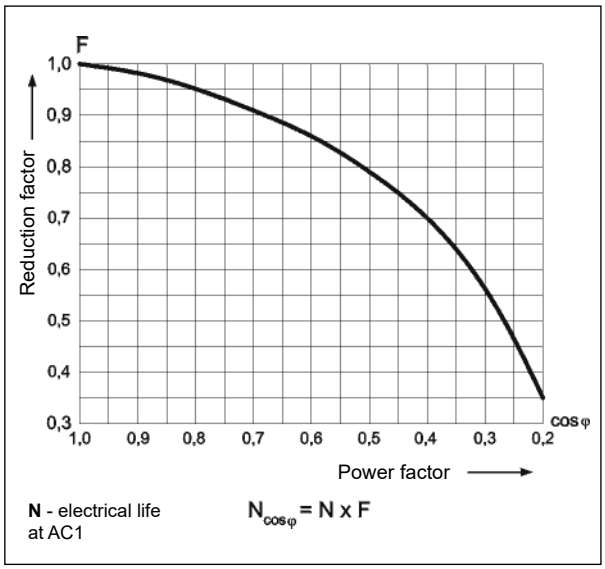
Interconnection strip ZGGZ4:
bridging of common input signals.

ZGGZ4

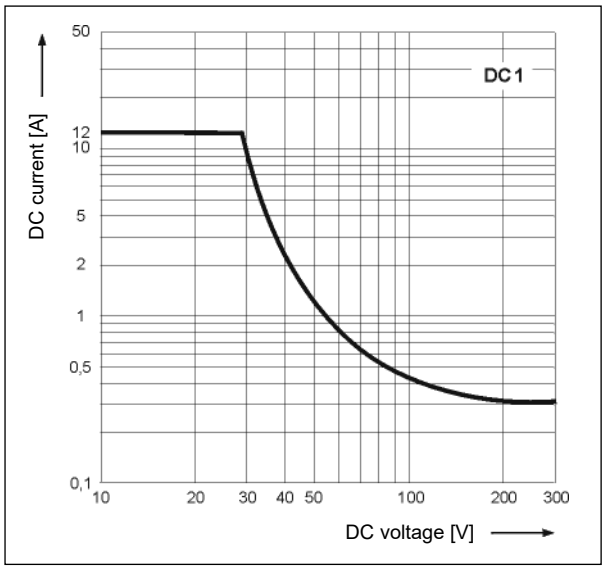
Electrical life at AC resistive load. Fig. 1
Switching frequency: 1 200 cycles/hour



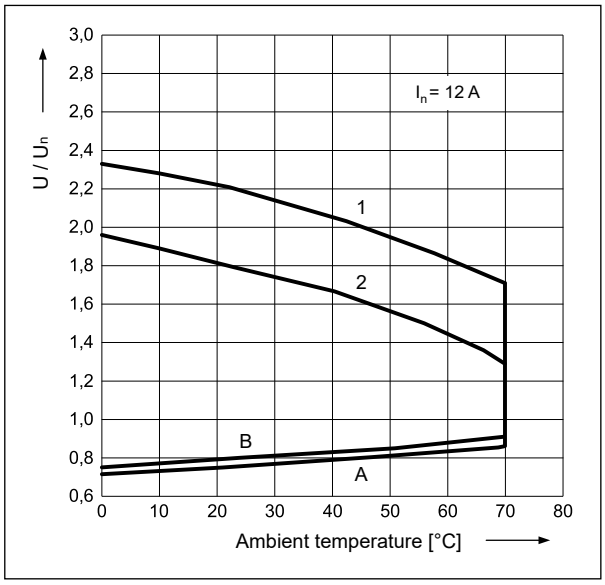
Electrical life reduction factor at AC inductive load Fig. 2



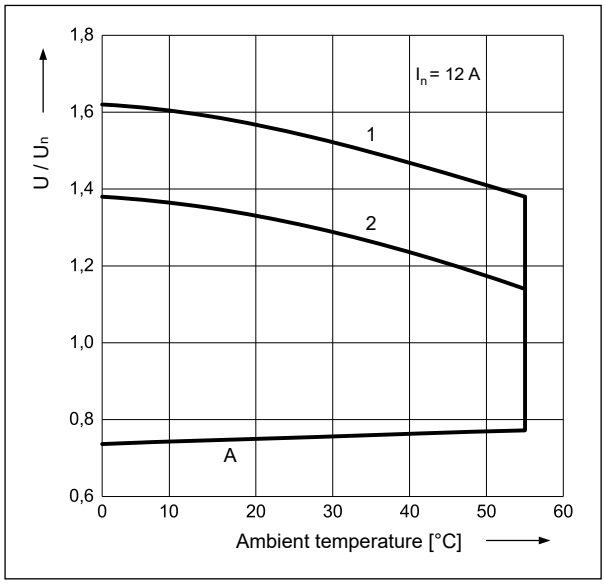
Max. DC resistive load breaking capacity Fig. 3



Coil operating range - DC Fig. 4



Coil operating range - AC 50 Hz Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).

1, **2** - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - rated load

Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 70 °C)
012DC	12	160	± 10%	9,6	13,2
024DC	**24**	**640**	**± 10%**	**19,2**	**26,4**
048DC	48	2 600	± 10%	38,4	52,8
110DC	110	13 600	± 10%	88,0	121,0

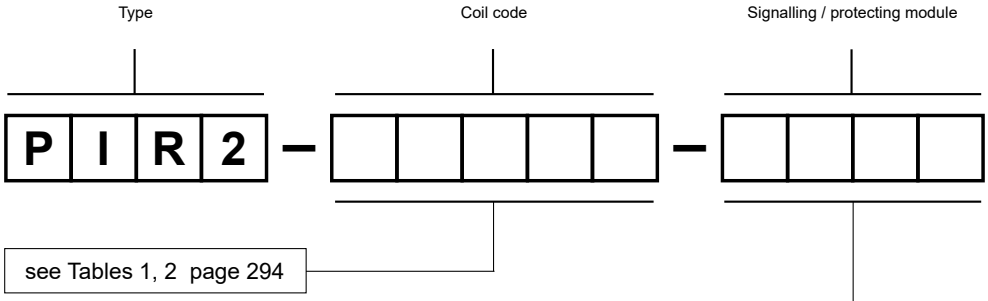
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
012AC	12	39,5	± 10%	9,6	13,2
024AC	**24**	**158**	**± 10%**	**19,2**	**26,4**
048AC	48	640	± 10%	38,4	52,8
120AC	120	3 770	± 10%	96,0	132,0
230AC	**230**	**16 100**	**± 10%**	**184,0**	**253,0**

The data in bold type relate to the standard versions of the relays.

Ordering codes



Signalling / protecting module

00LD - M41G - module LD (LED green + diode D, polarization N: +A1/-A2), 6/24 V DC
00LD - M42G - module LD (LED green + diode D, polarization N: +A1/-A2), 24/60 V DC
00LD - M43G - module LD (LED green + diode D, polarization N: +A1/-A2), 110/230 V DC
00LV - M91G - module LV (LED green + varistor), 6/24 V AC/DC
00LV - M92G - module LV (LED green + varistor), 24/60 V AC/DC
00LV - M93G - module LV (LED green + varistor), 110/240 V AC/DC

Examples of ordering codes:

PIR2-012DC-00LD interface relay **PIR2** consists of: relay **R2N** (two changeover contacts, contact material AgNi, coil voltage 12 V DC), socket **GZM2** (grey, screw terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZT4-0040** (plastic), description plate **GZT4-0035** (white)

PIR2-230AC-00LV interface relay **PIR2** consists of: relay **R2N** (two changeover contacts, contact material AgNi, coil voltage 230 V AC 50/60 Hz), socket **GZM2** (grey, screw terminals), signalling / protecting module **M93G** (version LV), retainer / retractor clip **GZT4-0040** (plastic), description plate **GZT4-0035** (white)

R2N (AC) + GZP4

R2N (DC) + GZP4

- Interface relay **PIR2 with socket GZP4** consists of: electromagnetic relay **R2N**, grey plug-in socket **GZP4**, signalling / protecting module type **M...**, retainer / retractor clip **GZP4-0400** (plastic)
- 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws
- May be linked with interconnection strips type **ZGZP...**
- Recognitions, certifications, directives: recognitions R2N, RoHS,

NEW

Contact data

Number and type of contacts		2 CO
Contact material		**AgNi**
Rated / max. switching voltage	AC	250 V / 300 V
Min. switching voltage		5 V
Rated load (capacity)	AC1	12 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	12 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		5 mA
Max. inrush current		24 A
Rated current		12 A
Max. breaking capacity	AC1	3 000 VA
Min. breaking capacity		0,3 W
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	1 200 cycles/hour
	• no load	18 000 cycles/hour

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 48, 120, **230** V
	DC	12, **24**, 48, 110 V
Must release voltage		AC: ≥ 0,2 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1,2 and Fig. 4, 5
Rated power consumption	AC	50 Hz: 1,6 VA 60 Hz: 1,3 VA
	DC	0,9 W

Insulation according to EN 60664-1

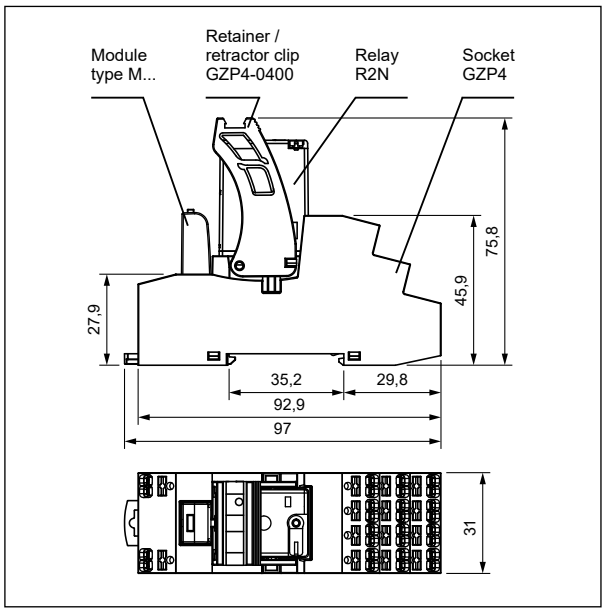
Insulation rated voltage		300 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	2 500 V AC type of insulation: basic
	• contact clearance	1 500 V AC type of clearance: micro-disconnection
	• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 2,5 mm
	• creepage	≥ 4 mm

General data

Operating / release time (typical values)		AC: 10 ms / 8 ms DC: 13 ms / 3 ms
Electrical life	• resistive AC1	> 10^5 12 A, 250 V AC
	• cosφ	see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		97 x 31 x 75,8 mm
Weight		117 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	AC: -40...+55 °C DC: -40...+70 °C
Cover protection category		IP 20 EN 60529
Environmental protection		R2N: RTI GZP4: RT0 EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g
Vibration resistance		5 g 10...150 Hz

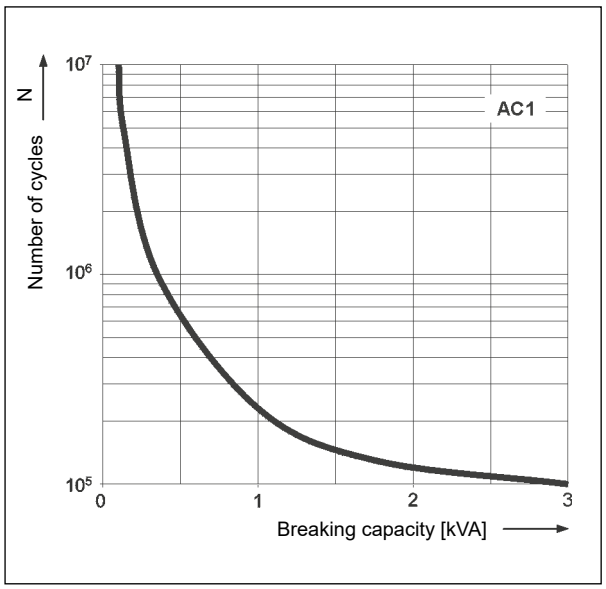
The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Dimensions

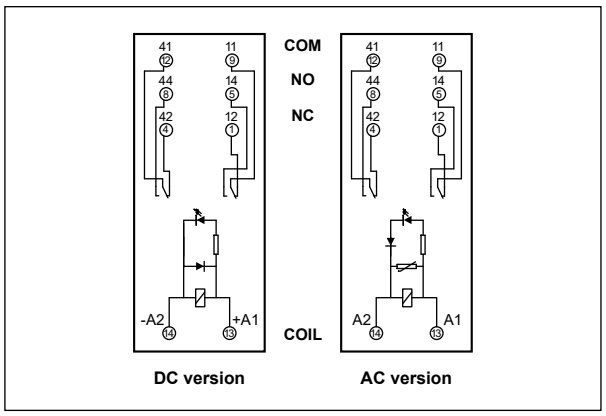


Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour

Fig. 1

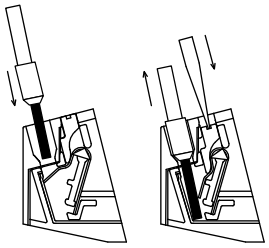


Connection diagrams
(Push-in terminals side view)



Wire connection

The drawings present inserting wire into the Push-in terminal and removing wire using the button releasing a clamp (assembly without tools).



Connecting accessories

- see page 403

ZGZP4-8 GY grey
ZGZP4-8 BK black
ZGZP4-8 RD red
ZGZP4-8 BE blue

ZGZP4-2 GY grey
ZGZP4-2 BK black
ZGZP4-2 RD red
ZGZP4-2 BE blue

ZGZP-2 GY grey
ZGZP-2 BK black
ZGZP-2 RD red
ZGZP-2 BE blue

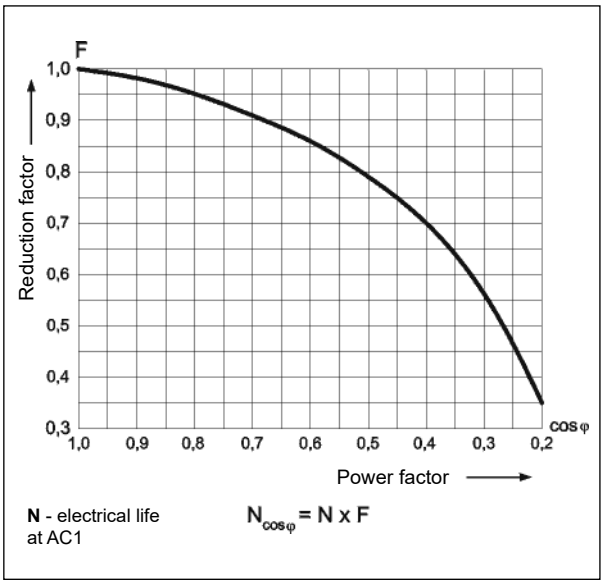
NEW

Strips 8-poles ZGZP4-8: unlimited possibilities of connection configurations (bridging of: A1, A2, A1 & A2 together), fast, safe and easy bridging of signals on the coil.

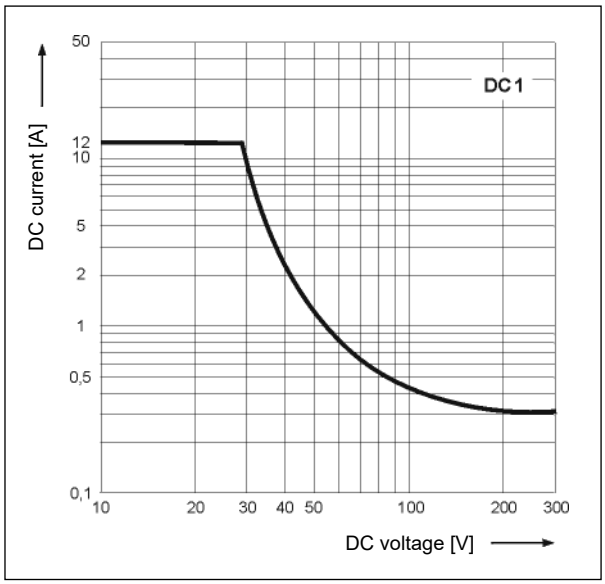
Strips 2-poles ZGZP4-2: free bridging of common input signals and terminals on the contact side, creating parallel connections of outputs in redundancy systems.

Jumpers 2-poles ZGZP-2: parallel connections of neighbouring poles in one socket GZP80 or GZP4 without use additional wiring, increasing the load capacity from 12 A to 16 A (PI85, PI85P).

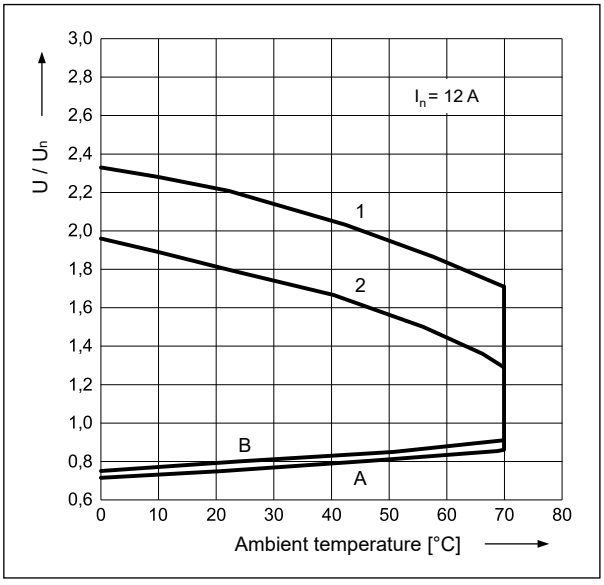
Electrical life reduction factor at AC inductive load Fig. 2



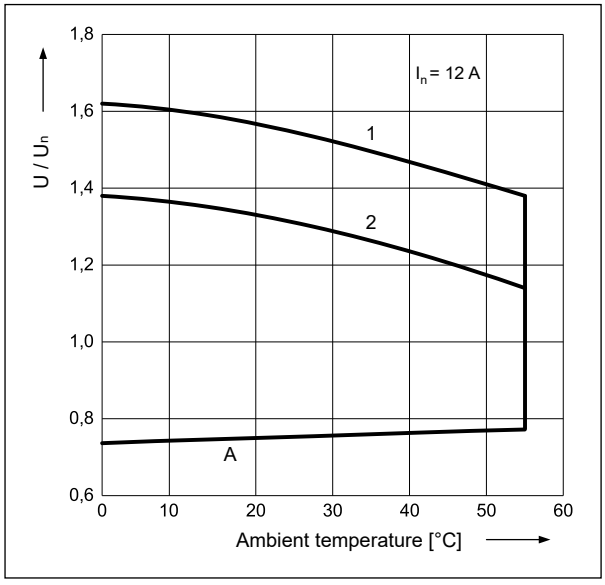
Max. DC resistive load breaking capacity Fig. 3



Coil operating range - DC Fig. 4



Coil operating range - AC 50 Hz Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).

1, **2** - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - rated load

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Mounting

Relays **PIR2 with socket GZP4** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws. **Connections:** max. cross section of the cables: 2 x 1,5 mm^2 (ferrules without insulation), 2 x 1 mm^2 (ferrules with insulation), stripping length: 8...10 mm.
Plug-in sockets **GZP4** may be linked with interconnection strips type **ZGZP...** Strip **ZGZP4-8** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets. Strip **ZGZP4-2** bridges common input or output signals, possibility of connection of 2+n sockets. Jumper **ZGZP-2** bridges the neighboring poles of single socket **GZP4**. Colours of strips: **ZGZP...GY** grey, **ZGZP...BK** black, **ZGZP...RD** red, **ZGZP...BE** blue (see page 403).
Description plates **MP15**, snap into tall marker groove, compatible with the standard for DIN rail terminal blocks, should be ordered separately.

ZGZP4-8

ZGZP4-2

ZGZP-2

MP15

Terminals directed to wiring ducts: esthetic cabling management, easier content reading from markers on wires.

Holes for test probes: ergonomic, stable position of the probe in the socket, freedom to perform measurements and control.

Space for label: for self-adhesive paper, foil or polyester tapes (max. width 9 mm).

Coil data - DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 70 °C)
012DC	12	160	± 10%	9,6	13,2
024DC	**24**	**640**	**± 10%**	**19,2**	**26,4**
048DC	48	2 600	± 10%	38,4	52,8
110DC	110	13 600	± 10%	88,0	121,0

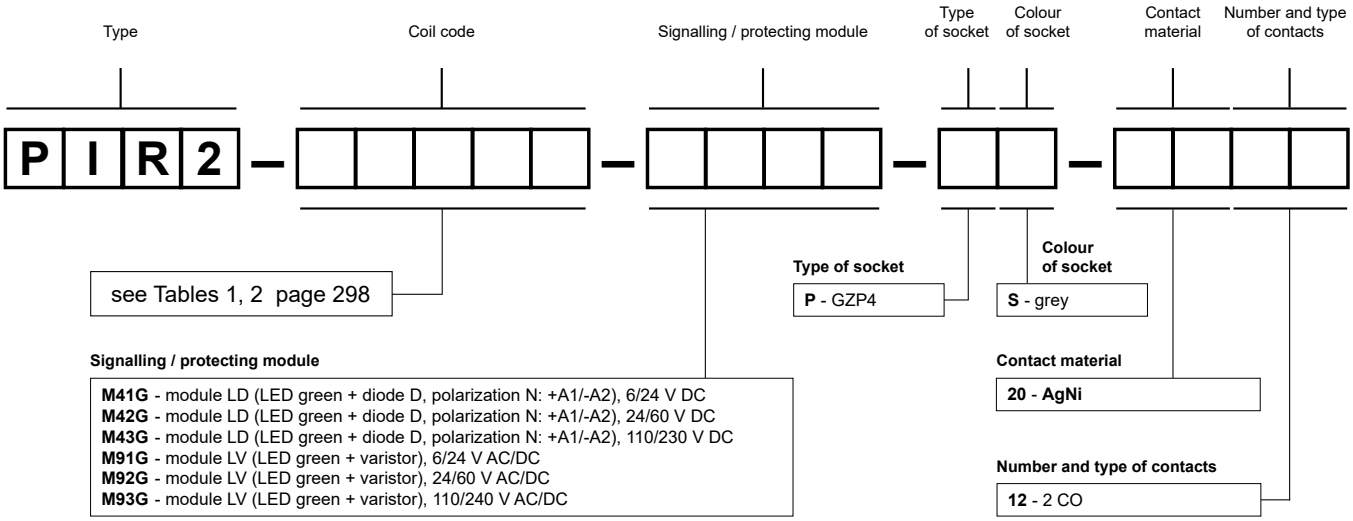
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version — Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
012AC	12	39,5	± 10%	9,6	13,2
024AC	**24**	**158**	**± 10%**	**19,2**	**26,4**
048AC	48	640	± 10%	38,4	52,8
120AC	120	3 770	± 10%	96,0	132,0
230AC	**230**	**16 100**	**± 10%**	**184,0**	**253,0**

The data in bold type relate to the standard versions of the relays.

Ordering codes



Examples of ordering codes:

PIR2-024DC-M41G-PS-2012 interface relay **PIR2** consists of: relay **R2N** (two changeover contacts, contact material AgNi, coil voltage 24 V DC), socket **GZP4** (grey, Push-in terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZP4-0400** (red, plastic)

PIR2-230AC-M93G-PS-2012 interface relay **PIR2** consists of: relay **R2N** (two changeover contacts, contact material AgNi, coil voltage 230 V AC 50/60 Hz), socket **GZP4** (grey, Push-in terminals), signalling / protecting module **M93G** (version LV), retainer / retractor clip **GZP4-0400** (red, plastic)

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R3N (AC) + GZM3

R3N (DC) + GZM3

- Interface relay **PIR3 with socket GZM3** consists of: electromagnetic relay **R3N**, grey plug-in socket **GZM3**, signalling / protecting module type **M...**, retainer / retractor clip **GZT4-0040** (plastic), white description plate **GZT4-0035**
- 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws • May be linked with interconnection strip type **ZGGZ4**
- Recognitions, certifications, directives: recognitions R3N, RoHS,

CE EAC

Contact data

Number and type of contacts		3 CO	
Contact material		**AgNi**	
Rated / max. switching voltage	AC	250 V / 300 V	
Min. switching voltage		5 V	
Rated load (capacity)	AC1	10 A / 250 V AC	
	AC15	3 A / 120 V	1,5 A / 240 V (B300)
	DC1	10 A / 24 V DC (see Fig. 3)	
	DC13	0,22 A / 120 V	0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP	240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,37 kW	240 V AC, single-phase motor
Min. switching current		5 mA	
Max. inrush current		20 A	
Rated current		10 A	
Max. breaking capacity	AC1	2 500 VA	
Min. breaking capacity		0,3 W	
Contact resistance		≤ 100 mΩ	
Max. operating frequency	• at rated load AC1	1 200 cycles/hour	
	• no load	18 000 cycles/hour	

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 48, 120, **230** V	
	DC	12, **24**, 48, 110 V	
Must release voltage		AC: ≥ 0,2 U_n	DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1,2	
Rated power consumption	AC	50 Hz: 1,6 VA	60 Hz: 1,3 VA
	DC	0,9 W	

Insulation according to EN 60664-1

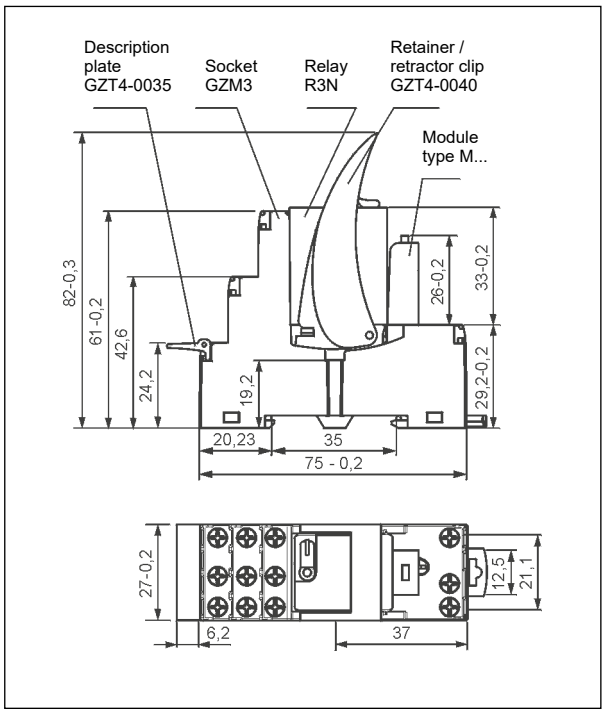
Insulation rated voltage		300 V AC	
Rated surge voltage		4 000 V	1,2 / 50 µs
Overvoltage category		III	
Insulation pollution degree		2	
Dielectric strength	• between coil and contacts	2 500 V AC	type of insulation: basic
	• contact clearance	1 500 V AC	type of clearance: micro-disconnection
	• pole - pole	2 500 V AC	type of insulation: basic
Contact - coil distance	• clearance	≥ 2,5 mm	
	• creepage	≥ 4 mm	

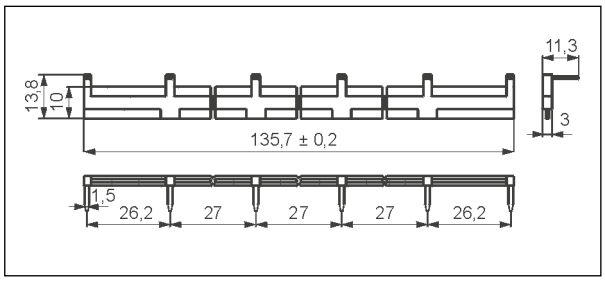
General data

Operating / release time (typical values)		AC: 10 ms / 8 ms	DC: 13 ms / 3 ms
Electrical life	• resistive AC1	> 10^5	10 A, 250 V AC
	• cosφ	see Fig. 2	
Mechanical life (cycles)		> 2 x 10^7	
Dimensions (L x W x H)		75 x 27 x 82 mm	
Weight		105 g	
Ambient temperature	• storage	-40...+85 °C	
(non-condensation and/or icing)	• operating	AC: -40...+55 °C	DC: -40...+70 °C
Cover protection category		IP 20	EN 60529
Environmental protection		R3N: RTI	GZM3: RT0 EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g	
Vibration resistance		5 g	10...150 Hz

The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Dimensions

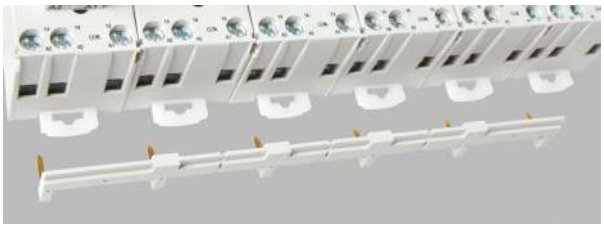




Interconnection strip type **ZGGZ4**

Mounting

Relays **PIR3 with socket GZM3** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm^2 (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm.
Plug-in sockets **GZM3** may be linked with interconnection strip type **ZGGZ4**. Strip **ZGGZ4** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 6 sockets. Colours of strips: **ZGGZ4-1** grey, **ZGGZ4-2** black (see page 401).



Interconnection strip ZGGZ4:
bridging of common input signals.

ZGGZ4

Interface relays PIR2 (PIR3, PIR4)

set: relay R2N (R3N, R4N)
+ socket GZM2 (GZM3, GZM4)

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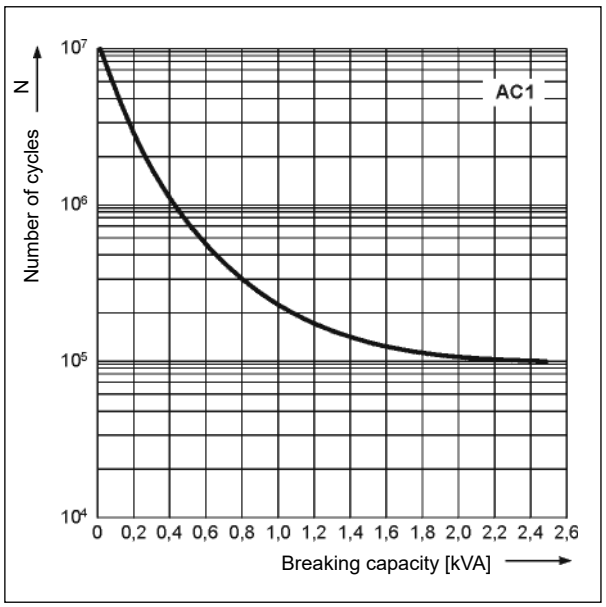
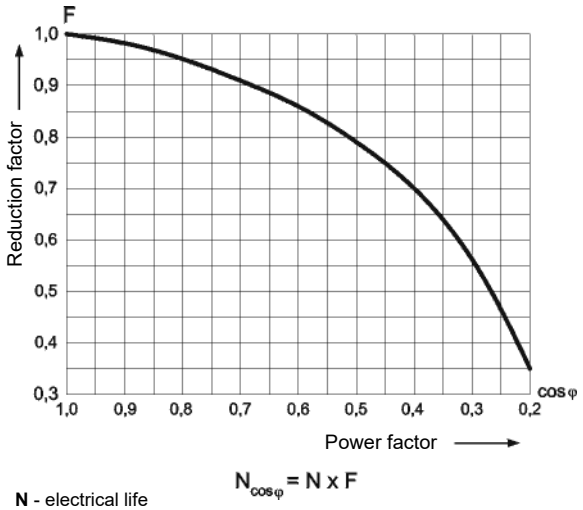
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1

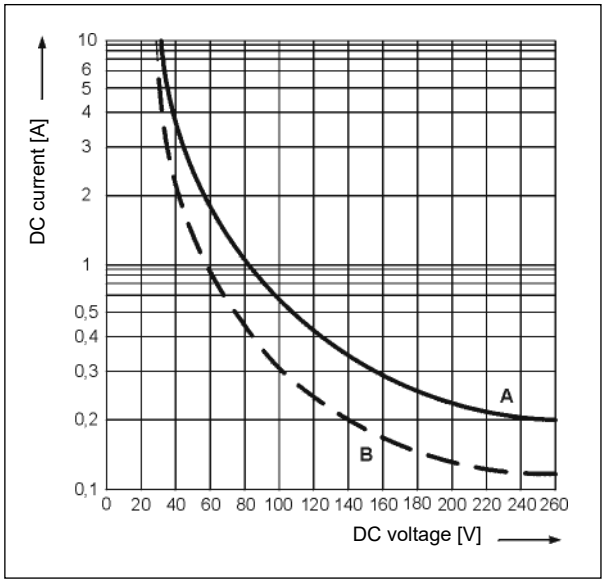


Electrical life reduction factor at AC inductive load Fig. 2

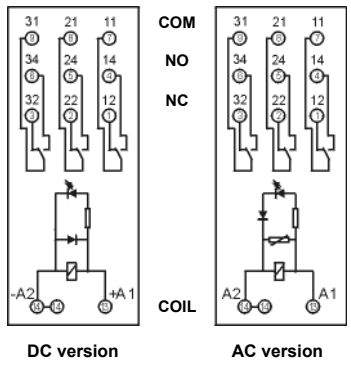


N - electrical life at AC1

Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Connection diagrams
(screw terminals side view)



Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 70 °C)
012DC	12	160	± 10%	9,6	13,2
024DC	**24**	**640**	**± 10%**	**19,2**	**26,4**
048DC	48	2 600	± 10%	38,4	52,8
110DC	110	13 600	± 10%	88,0	121,0

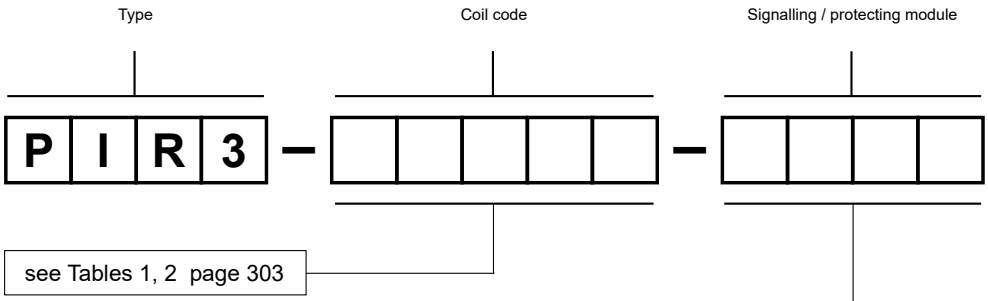
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
012AC	12	39,5	± 10%	9,6	13,2
024AC	**24**	**158**	**± 10%**	**19,2**	**26,4**
048AC	48	640	± 10%	38,4	52,8
120AC	120	3 770	± 10%	96,0	132,0
230AC	**230**	**16 100**	**± 10%**	**184,0**	**253,0**

The data in bold type relate to the standard versions of the relays.

Ordering codes



see Tables 1, 2 page 303

Signalling / protecting module

00LD - M41G - module LD (LED green + diode D, polarization N: +A1/-A2), 6/24 V DC
00LD - M42G - module LD (LED green + diode D, polarization N: +A1/-A2), 24/60 V DC
00LD - M43G - module LD (LED green + diode D, polarization N: +A1/-A2), 110/230 V DC
00LV - M91G - module LV (LED green + varistor), 6/24 V AC/DC
00LV - M92G - module LV (LED green + varistor), 24/60 V AC/DC
00LV - M93G - module LV (LED green + varistor), 110/240 V AC/DC

Examples of ordering codes:

PIR3-012DC-00LD interface relay **PIR3** consists of: relay **R3N** (three changeover contacts, contact material AgNi, coil voltage 12 V DC), socket **GZM3** (grey, screw terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZT4-0040** (plastic), description plate **GZT4-0035** (white)

PIR3-230AC-00LV interface relay **PIR3** consists of: relay **R3N** (three changeover contacts, contact material AgNi, coil voltage 230 V AC 50/60 Hz), socket **GZM3** (grey, screw terminals), signalling / protecting module **M93G** (version LV), retainer / retractor clip **GZT4-0040** (plastic), description plate **GZT4-0035** (white)

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R4N (AC) + GZM4

R4N (DC) + GZM4

- Interface relay **PIR4 with socket GZM4** consists of: electromagnetic relay **R4N**, grey plug-in socket **GZM4**, signalling / protecting module type **M...**, retainer / retractor clip **GZT4-0040** (plastic), white description plate **GZT4-0035**
- 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws • May be linked with interconnection strip type **ZGGZ4**
- Recognitions, certifications, directives: recognitions R4N, RoHS,

CE EAC

Contact data

Number and type of contacts		4 CO		
Contact material		**AgNi**		
Rated / max. switching voltage	AC	250 V / 300 V		
Min. switching voltage		5 V		
Rated load (capacity)	AC1	7 A / 230 V AC (VDE)	6 A / 250 V AC	
	AC15	1,5 A / 120 V	0,75 A / 240 V (C300)	
	DC1	6 A / 24 V DC (see Fig. 3)		
	DC13	0,22 A / 120 V	0,1 A / 250 V (R300)	
Motor load	acc. to UL 508	1/3 HP	240 V AC, 3,6 FLA, single-phase motor ❶	
	AC3 acc. to IEC 60947-4-1	0,125 kW	240 V AC, single-phase motor	
Min. switching current		5 mA		
Max. inrush current		12 A		
Rated current		6 A		
Max. breaking capacity	AC1	1 500 VA		
Min. breaking capacity		0,3 W		
Contact resistance		≤ 100 mΩ		
Max. operating frequency	• at rated load AC1	1 200 cycles/hour		
	• no load	18 000 cycles/hour		

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 48, 120, **230** V		
	DC	12, **24**, 48, 110 V		
Must release voltage		AC: ≥ 0,2 U_n	DC: ≥ 0,1 U_n	
Operating range of supply voltage		see Tables 1,2 and Fig. 4, 5		
Rated power consumption	AC	50 Hz: 1,6 VA	60 Hz: 1,3 VA	
	DC	0,9 W		

Insulation according to EN 60664-1

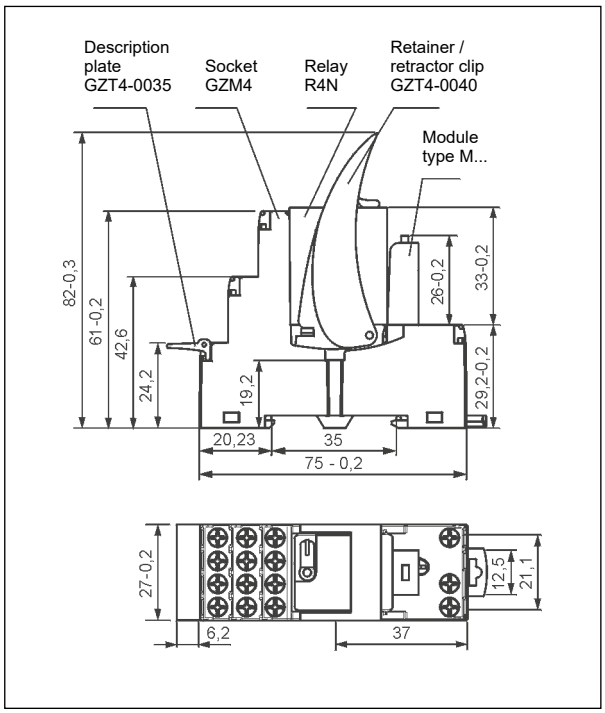
Insulation rated voltage		300 V AC		
Rated surge voltage		2 500 V	1,2 / 50 µs	
Overvoltage category		II		
Insulation pollution degree		2		
Dielectric strength	• between coil and contacts	2 500 V AC	type of insulation: basic	
	• contact clearance	1 500 V AC	type of clearance: micro-disconnection	
	• pole - pole	2 000 V AC	type of insulation: basic	
Contact - coil distance	• clearance	≥ 1,6 mm		
	• creepage	≥ 3,2 mm		

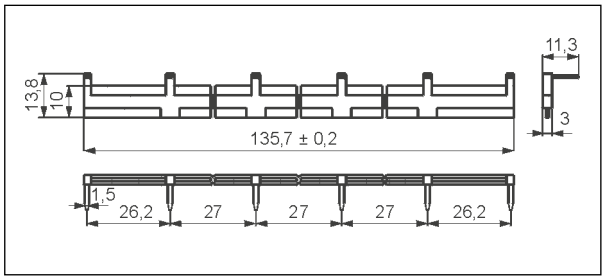
General data

Operating / release time (typical values)		AC: 10 ms / 8 ms	DC: 13 ms / 3 ms	
Electrical life	• resistive AC1	> 10^5	6 A, 250 V AC	
	• cosφ	see Fig. 2		
Mechanical life (cycles)		> 2 x 10^7		
Dimensions (L x W x H)		75 x 27 x 82 mm		
Weight		108 g		
Ambient temperature	• storage	-40...+85 °C		
(non-condensation and/or icing)	• operating	AC: -40...+55 °C	DC: -40...+70 °C	
Cover protection category		IP 20	EN 60529	
Environmental protection		R4N: RTI	GZM4: RT0	EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g		
Vibration resistance		5 g	10...150 Hz	

The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

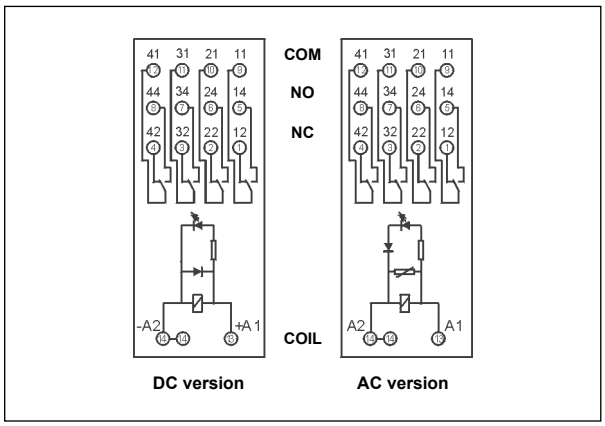
Dimensions





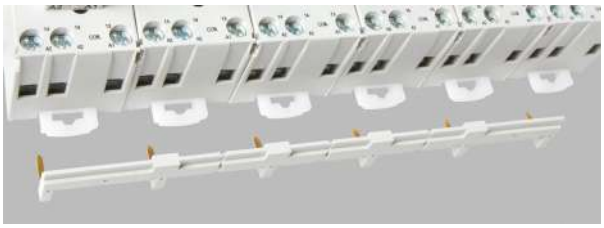
Interconnection strip type **ZGGZ4**

Connection diagrams
(screw terminals side view)



Mounting

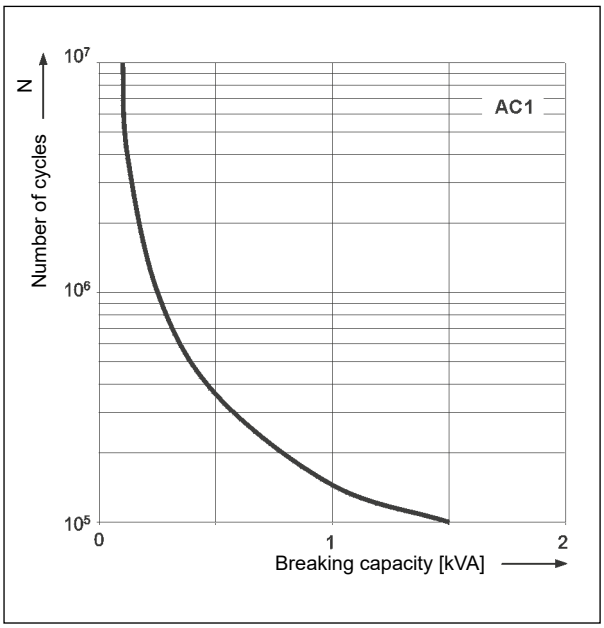
Relays **PIR4 with socket GZM4** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm^2 (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm.
Plug-in sockets **GZM4** may be linked with interconnection strip type **ZGGZ4**. Strip **ZGGZ4** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 6 sockets. Colours of strips: **ZGGZ4-1** grey, **ZGGZ4-2** black (see page 401).



Interconnection strip ZGGZ4:
bridging of common input signals.

ZGGZ4

Electrical life at AC resistive load. Fig. 1
Switching frequency: 1 200 cycles/hour



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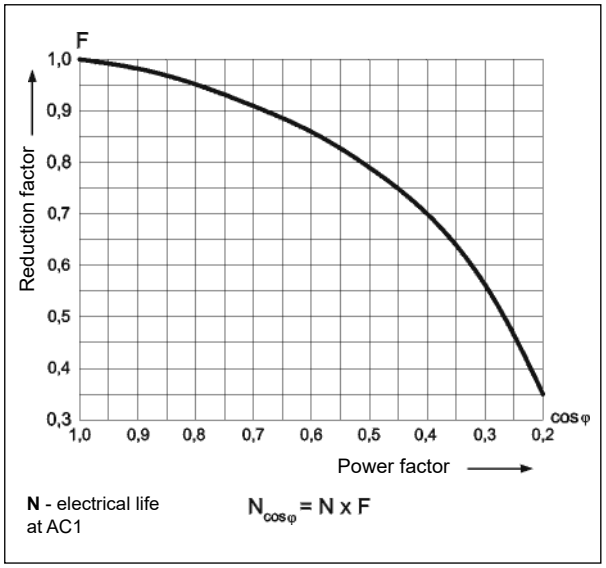
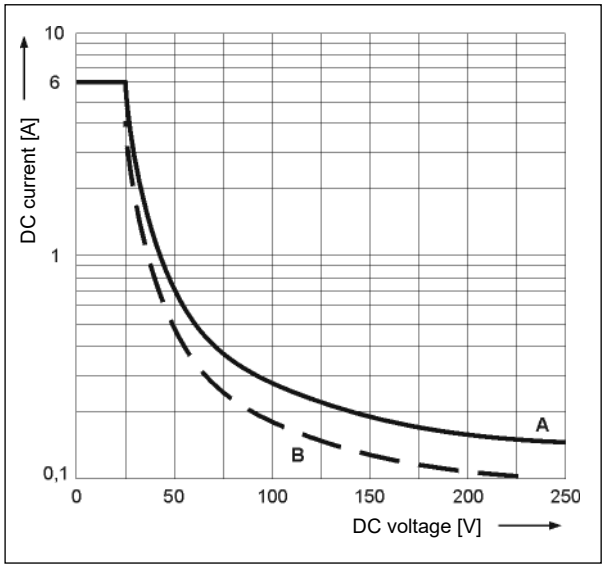
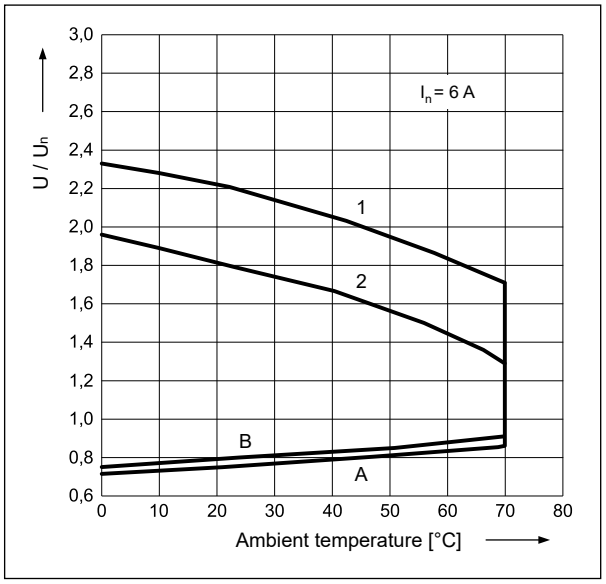
Electrical life reduction factor at AC inductive load Fig. 2



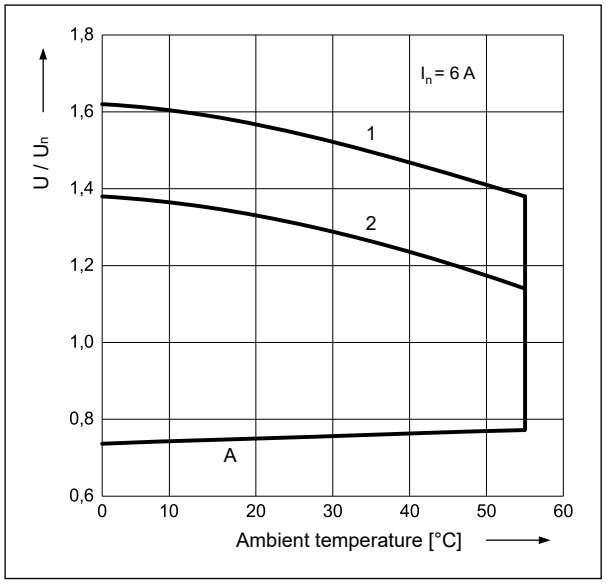
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Coil operating range - DC Fig. 4



Coil operating range - AC 50 Hz Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).

1, **2** - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - rated load

Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 70 °C)
012DC	12	160	± 10%	9,6	13,2
024DC	**24**	**640**	**± 10%**	**19,2**	**26,4**
048DC	48	2 600	± 10%	38,4	52,8
110DC	110	13 600	± 10%	88,0	121,0

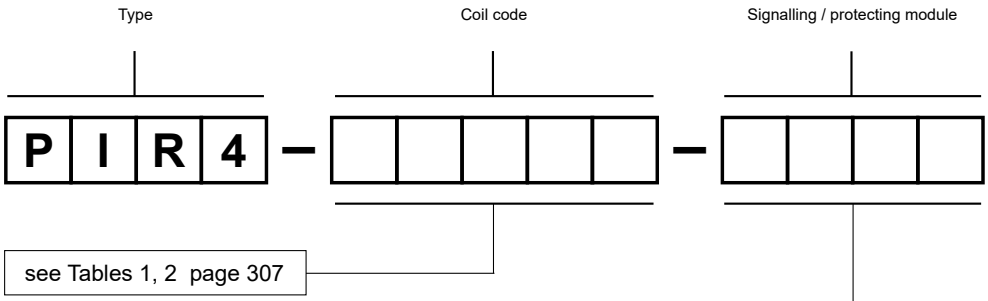
The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
012AC	12	39,5	± 10%	9,6	13,2
024AC	**24**	**158**	**± 10%**	**19,2**	**26,4**
048AC	48	640	± 10%	38,4	52,8
120AC	120	3 770	± 10%	96,0	132,0
230AC	**230**	**16 100**	**± 10%**	**184,0**	**253,0**

The data in bold type relate to the standard versions of the relays.

Ordering codes



Signalling / protecting module

00LD - M41G - module LD (LED green + diode D, polarization N: +A1/-A2), 6/24 V DC
00LD - M42G - module LD (LED green + diode D, polarization N: +A1/-A2), 24/60 V DC
00LD - M43G - module LD (LED green + diode D, polarization N: +A1/-A2), 110/230 V DC
00LV - M91G - module LV (LED green + varistor), 6/24 V AC/DC
00LV - M92G - module LV (LED green + varistor), 24/60 V AC/DC
00LV - M93G - module LV (LED green + varistor), 110/240 V AC/DC

Examples of ordering codes:

PIR4-012DC-00LD interface relay **PIR4** consists of: relay **R4N** (four changeover contacts, contact material AgNi, coil voltage 12 V DC), socket **GZM4** (grey, screw terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZT4-0040** (plastic), description plate **GZT4-0035** (white)

PIR4-230AC-00LV interface relay **PIR4** consists of: relay **R4N** (four changeover contacts, contact material AgNi, coil voltage 230 V AC 50/60 Hz), socket **GZM4** (grey, screw terminals), signalling / protecting module **M93G** (version LV), retainer / retractor clip **GZT4-0040** (plastic), description plate **GZT4-0035** (white)

PIR4 with socket GZP4
interface relays with Push-in terminals

R4N (AC) + GZP4

R4N (DC) + GZP4

- Interface relay **PIR4 with socket GZP4** consists of: electromagnetic relay **R4N**, grey plug-in socket **GZP4**, signalling / protecting module type **M...**, retainer / retractor clip **GZP4-0400** (plastic)
- 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws
- May be linked with interconnection strips type **ZGZP...**
- Recognitions, certifications, directives: recognitions R4N, RoHS,

NEW

Contact data

Number and type of contacts		4 CO	
Contact material		**AgNi**, AgNi/Au hard gold plating	
Rated / max. switching voltage	AC	250 V / 300 V	
Min. switching voltage		5 V	
Rated load (capacity)	AC1	7 A / 230 V AC (VDE)	6 A / 250 V AC
	AC15	1,5 A / 120 V	0,75 A / 240 V (C300)
	DC1	6 A / 24 V DC (see Fig. 3)	
	DC13	0,22 A / 120 V	0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/3 HP	240 V AC, 3,6 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,125 kW	240 V AC, single-phase motor
Min. switching current		5 mA	
Max. inrush current		12 A	
Rated current		6 A	
Max. breaking capacity	AC1	1 500 VA	
Min. breaking capacity		0,3 W AgNi, 0,1 W AgNi/Au hard gold plating	
Contact resistance		≤ 100 mΩ	
Max. operating frequency	• at rated load AC1	1 200 cycles/hour	
	• no load	18 000 cycles/hour	

Coil data

Rated voltage	50/60 Hz AC	12, **24**, 48, 120, **230** V	
	DC	12, **24**, 48, 110 V	
Must release voltage		AC: ≥ 0,2 U_n	DC: ≥ 0,1 U_n
Operating range of supply voltage		see Tables 1,2 and Fig. 4, 5	
Rated power consumption	AC	50 Hz: 1,6 VA	60 Hz: 1,3 VA
	DC	0,9 W	

Insulation according to EN 60664-1

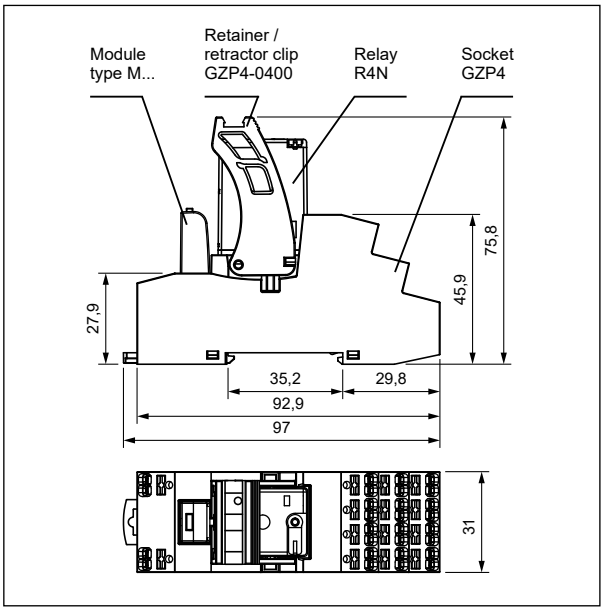
Insulation rated voltage		300 V AC	
Rated surge voltage		2 500 V 1,2 / 50 µs	
Overvoltage category		II	
Insulation pollution degree		2	
Dielectric strength	• between coil and contacts	2 500 V AC	type of insulation: basic
	• contact clearance	1 500 V AC	type of clearance: micro-disconnection
	• pole - pole	2 000 V AC	type of insulation: basic
Contact - coil distance	• clearance	≥ 1,6 mm	
	• creepage	≥ 3,2 mm	

General data

Operating / release time (typical values)		AC: 10 ms / 8 ms	DC: 13 ms / 3 ms
Electrical life	• resistive AC1	> 10^5	6 A, 250 V AC
	• cosφ	see Fig. 2	
Mechanical life (cycles)		> 2 x 10^7	
Dimensions (L x W x H)		97 x 31 x 75,8 mm	
Weight		117 g	
Ambient temperature	• storage	-40...+85 °C	
(non-condensation and/or icing)	• operating	AC: -40...+55 °C	DC: -40...+70 °C
Cover protection category		IP 20	EN 60529
Environmental protection		R4N: RTI	GZP4: RT0 EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g	
Vibration resistance		5 g 10...150 Hz	

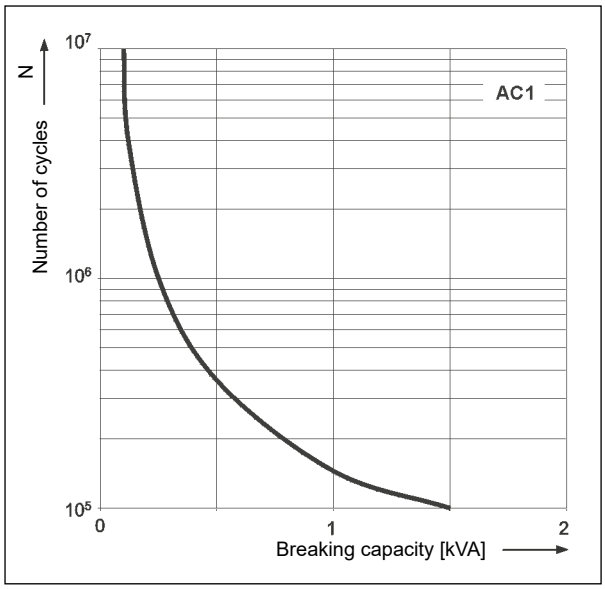
The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Dimensions

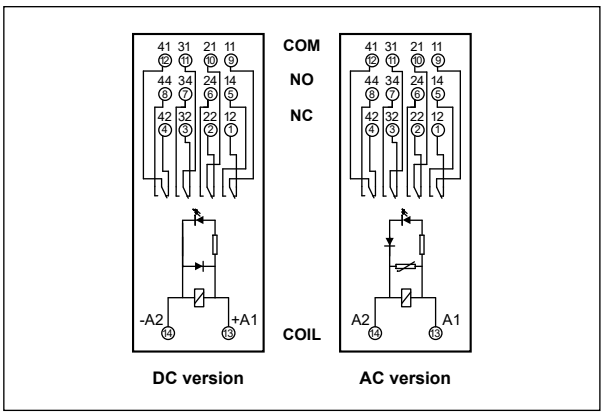


Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour

Fig. 1

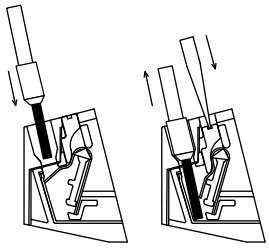


Connection diagrams
(Push-in terminals side view)



Wire connection

The drawings present inserting wire into the Push-in terminal and removing wire using the button releasing a clamp (assembly without tools).



Connecting accessories

- see page 403

ZGZP4-8 GY grey
ZGZP4-8 BK black
ZGZP4-8 RD red
ZGZP4-8 BE blue

ZGZP4-2 GY grey
ZGZP4-2 BK black
ZGZP4-2 RD red
ZGZP4-2 BE blue

ZGZP-2 GY grey
ZGZP-2 BK black
ZGZP-2 RD red
ZGZP-2 BE blue

NEW

Strips 8-poles ZGZP4-8: unlimited possibilities of connection configurations (bridging of: A1, A2, A1 & A2 together), fast, safe and easy bridging of signals on the coil.

Strips 2-poles ZGZP4-2: free bridging of common input signals and terminals on the contact side, creating parallel connections of outputs in redundancy systems.

Jumpers 2-poles ZGZP-2: parallel connections of neighbouring poles in one socket GZP80 or GZP4 without use additional wiring, increasing the load capacity from 12 A to 16 A (PI85, PI85P).

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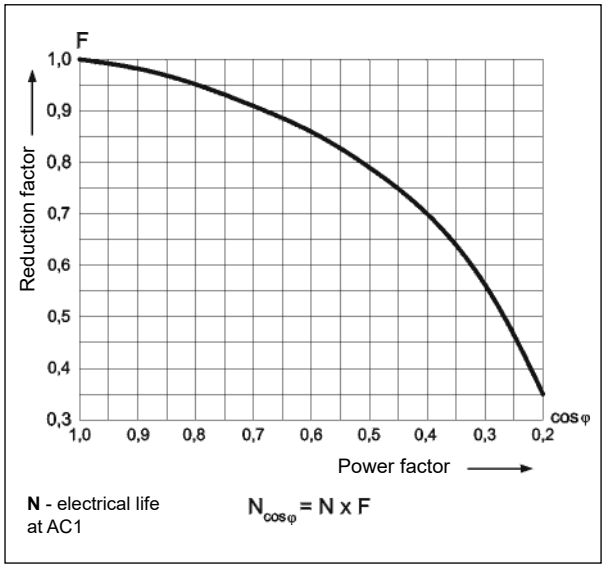
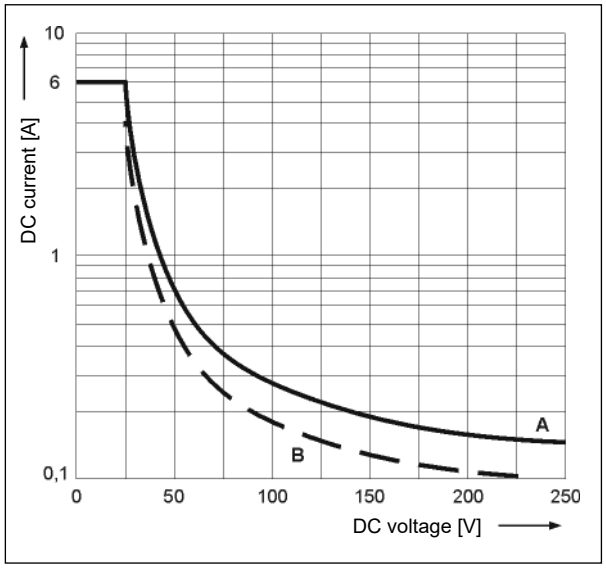
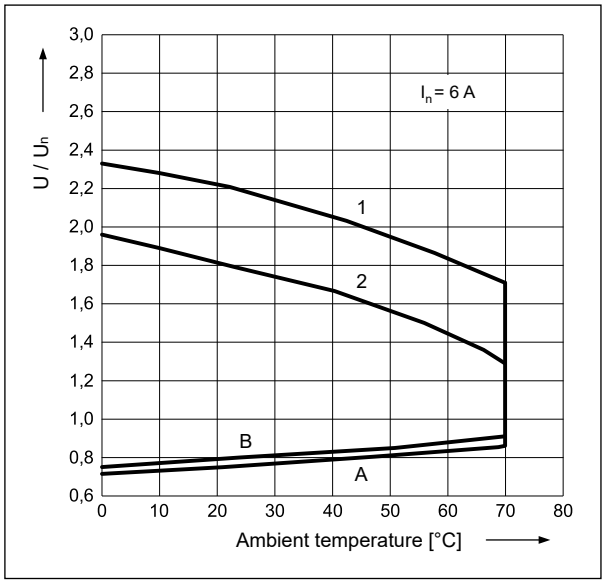
Electrical life reduction factor at AC inductive load Fig. 2



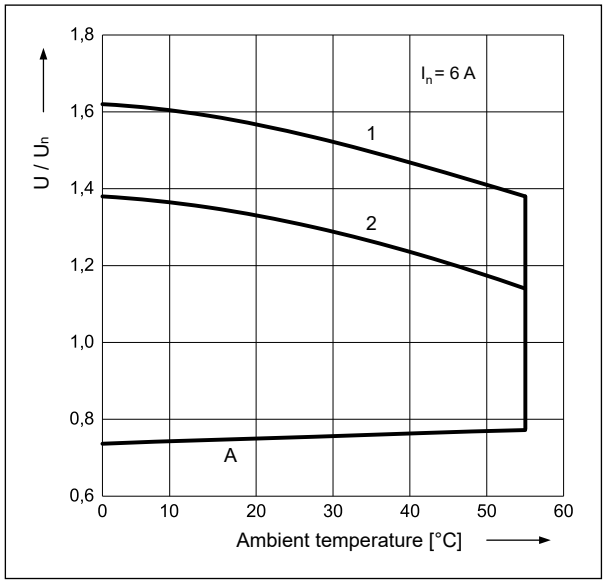
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Coil operating range - DC Fig. 4



Coil operating range - AC 50 Hz Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).

1, **2** - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - rated load

Mounting

Relays **PIR4 with socket GZP4** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws. **Connections:** max. cross section of the cables: 2 x 1,5 mm^2 (ferrules without insulation), 2 x 1 mm^2 (ferrules with insulation), stripping length: 8...10 mm.
Plug-in sockets **GZP4** may be linked with interconnection strips type **ZGZP...** Strip **ZGZP4-8** bridges common input signals, maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets. Strip **ZGZP4-2** bridges common input or output signals, possibility of connection of 2+n sockets. Jumper **ZGZP-2** bridges the neighboring poles of single socket **GZP4**. Colours of strips: **ZGZP...GY** grey, **ZGZP...BK** black, **ZGZP...RD** red, **ZGZP...BE** blue (see page 403).
Description plates **MP15**, snap into tall marker groove, compatible with the standard for DIN rail terminal blocks, should be ordered separately.


ZGZP4-8


ZGZP4-2


ZGZP-2


MP15

Terminals directed to wiring ducts: esthetic cabling management, easier content reading from markers on wires.

Holes for test probes: ergonomic, stable position of the probe in the socket, freedom to perform measurements and control.

Space for label: for self-adhesive paper, foil or polyester tapes (max. width 9 mm).

Coil data - DC voltage version — Table 1

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 70 °C)
012DC	12	160	± 10%	9,6	13,2
024DC	**24**	**640**	**± 10%**	**19,2**	**26,4**
048DC	48	2 600	± 10%	38,4	52,8
110DC	110	13 600	± 10%	88,0	121,0

The data in bold type relate to the standard versions of the relays.

Coil data - AC 50/60 Hz voltage version — Table 2

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
012AC	12	39,5	± 10%	9,6	13,2
024AC	**24**	**158**	**± 10%**	**19,2**	**26,4**
048AC	48	640	± 10%	38,4	52,8
120AC	120	3 770	± 10%	96,0	132,0
230AC	**230**	**16 100**	**± 10%**	**184,0**	**253,0**

The data in bold type relate to the standard versions of the relays.

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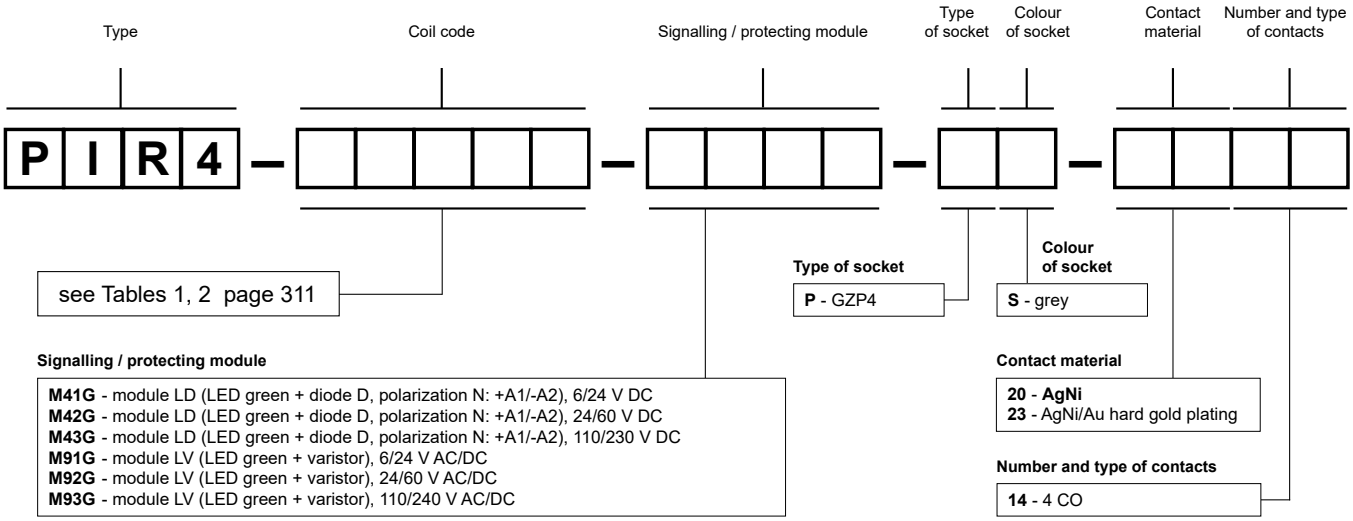
Ordering codes



Examples of ordering codes:

PIR4-024DC-M41G-PS-2014 interface relay **PIR4** consists of: relay **R4N** (four changeover contacts, contact material AgNi, coil voltage 24 V DC), socket **GZP4** (grey, Push-in terminals), signalling / protecting module **M41G** (version LD), retainer / retractor clip **GZP4-0400** (red, plastic)

PIR4-230AC-M93G-PS-2314 interface relay **PIR4** consists of: relay **R4N** (four changeover contacts, contact material AgNi/Au hard gold plating, coil voltage 230 V AC 50/60 Hz), socket **GZP4** (grey, Push-in terminals), signalling / protecting module **M93G** (version LV), retainer / retractor clip **GZP4-0400** (red, plastic)

- Width 6,2 mm
- Interface relay **PI6-1P** - with 1 CO contact output
- 35 mm rail mount acc. to EN 60715
- May be linked with 20-pole interconnection strip type **ZG20**
- Equipped in LED green
- Version for long control lines, with anti-interference filter (**PI6-1P-230VAC/DC-10** ❷)
- Recognitions, certifications, directives: : RoHS,

Output circuit - contact data

Number and type of contacts		1 CO	
Contact material		**$AgSnO_2$**	$AgSnO_2$/Au hard gold plating ❶
Max. switching voltage		400 V AC / 250 V DC	30 V AC / 36 V DC ❶
Min. switching voltage	AC / DC	10 V	5 V
Rated load	AC1	6 A / 250 V AC	0,05 A / 30 V AC ❶
	DC1	6 A / 24 V DC; 0,15 A / 250 V DC	0,05 A / 36 V DC ❶
Min. switching current		100 mA	10 mA
Max. inrush current		10 A 20 ms	0,1 A 20 ms ❶
Rated current		6 A	0,05 A ❶
Max. breaking capacity	AC1	1 500 VA	1,2 VA ❶
Min. breaking capacity		1 W	0,05 W
Contact resistance		≤ 100 mΩ 100 mA, 24 V	≤ 30 mΩ 10 mA, 5 V
Max. operating frequency			
• at rated load	AC1	360 cycles/hour	
• no load		72 000 cycles/hour	

Input circuit

Rated voltage	DC	12, **24**, 36 V	
	AC: 50/60 Hz AC/DC	24, 42, 115, **230** V	
Must release voltage		AC: ≥ 0,2 U_n	AC: ≥ 0,35 U_n ❷
		DC: ≥ 0,1 U_n	
Operating range of supply voltage		see Table 1	
Must operate voltage		AC: ≤ 0,8 U_n	AC: 0,6...0,85 U_n ❷
		DC: ≤ 0,8 U_n	
Input polarization current		AC: 8 mA < I_p < 10 mA 230 V AC ❷	
Rated power consumption	DC	0,3 ... 0,7 W	
	AC/DC	0,3 ... 1,6 VA / 0,3 ... 1,6 W	
Max. length of control line		≤ 300 m	AC control voltage ❷

Insulation according to EN 60664-1

Insulation rated voltage	400 V AC	
Rated surge voltage	4 000 V	1,2 / 50 µs
Overvoltage category	III	
Insulation pollution degree	3	
Dielectric strength		
• input - output	4 000 V AC	50/60 Hz, 1 min., type of insulation: reinforced
• input - output	6 000 V	1,2 / 50 µs
• mass - input, output	2 500 V AC	50/60 Hz, 1 min.
• contact clearance	1 000 V AC	50/60 Hz, 1 min., type of clearance: micro-disconnection
Input - output distance		
• clearance	≥ 6 mm	
• creepage	≥ 8 mm	

The data in bold type relate to the standard versions of the relays. ❶ For gold-plated contacts - when the maximum values given have been exceeded, the gold layer is destroyed. Then, the advantages of gold-plating disappear and the values are as for $AgSnO_2$ contacts (see beside), and electrical life of these contacts may be shorter than of normal contacts. ❷ Refers version for long control lines (max. 300 m) **PI6-1P-230VAC/DC-10** - relay with integrated anti-interference filter, resistant to occurrence of induced voltages in long distances of control wires.

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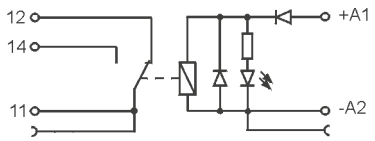
General data

Operating time (typical value)		AC: 7 ms	DC: 6 ms
Release time (typical value)		AC: 15 ms	DC: 10 ms
Electrical life			
• resistive AC1		> 0,6 x 10^5	6 A, 250 V AC
• cos φ = 0,4		> 2 x 10^5	2 A, 250 V AC
• resistive DC1		10^5	6 A, 30 V DC
Mechanical life (cycles)		> 2 x 10^7	
Dimensions (L x W x H)		93,8 x 6,2 x 80 mm	
Weight		40 g	
Ambient temperature (non-condensation and/or icing)	• storage	-40...+70 °C	
	• operating	-40...+55 °C	-40...+60 °C 12, 24 V DC
		-40...+40 °C 230 V AC ❷	-40...+50 °C 230 V DC ❷
Cover protection category		IP 20 EN 60529	
Environmental protection		RTI EN 61810-7	
Shock resistance		10 g	
Vibration resistance		5 g 10...500 Hz	

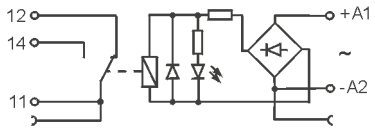
❷ Refers version for long control lines (max. 300 m), with integrated anti-interference filter.

Connection diagrams

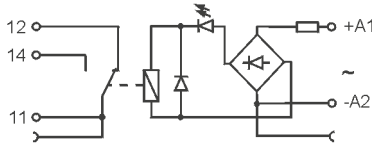
PI6-1P-12VDC, PI6-1P-12VDC-01
PI6-1P-24VDC, PI6-1P-24VDC-01
PI6-1P-36VDC, PI6-1P-36VDC-01



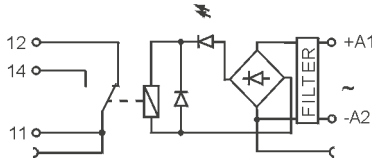
PI6-1P-24VAC/DC, PI6-1P-24VAC/DC-01
PI6-1P-42VAC/DC



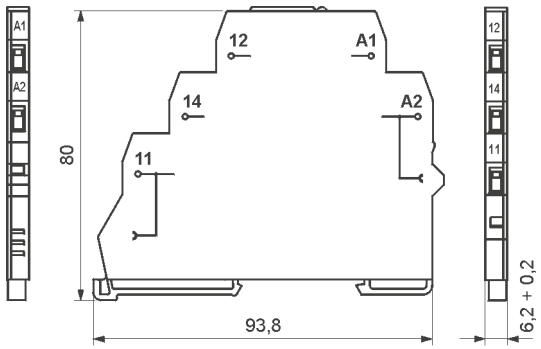
PI6-1P-115VAC/DC
PI6-1P-230VAC/DC, PI6-1P-230VAC/DC-01

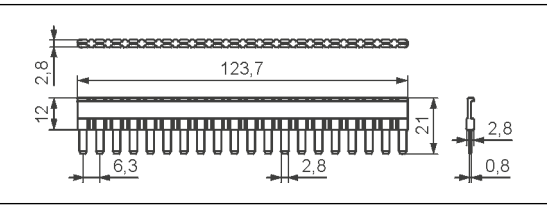


PI6-1P-230VAC/DC-10



Dimensions





20-pole interconnection strip type **ZG20**

Mounting

Relays **PI6-1P** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. **Connections:** max. cross section of the cables: 1 x 2,5 mm² / 2 x 1,5 mm² (1 x 14 / 2 x 16 AWG), stripping length: 8 mm, max. tightening moment for the terminal: 0,3 Nm.
PI6-1P may be linked with 20-pole interconnection strip type **ZG20**. Strip **ZG20** bridges common input or output signals, maximum permissible current is 36 A / 250 V AC. Colours of strips: **ZG20-1** red, **ZG20-2** black, **ZG20-3** blue.

Interconnection strip ZG20:
bridging of common
input or output signals.

ZG20

Input data

Table 1

Interface relay code	Rated input voltage U_n	Power of input circuit	Input - voltage range V	
			min. (at 20 °C)	max. (at 55 °C)
PI6-1P-12VDC	12 V DC	0,3 W	9,6	14,4
PI6-1P-24VDC	**24 V DC**	**0,4 W**	**19,2**	**28,0**
PI6-1P-36VDC	36 V DC	0,7 W	28,8	40,0
PI6-1P-24VAC/DC	24 V AC/DC	0,5 VA / 0,5 W	19,2	26,4
PI6-1P-42VAC/DC	42 V AC/DC	0,3 VA / 0,3 W	33,6	50,0
PI6-1P-115VAC/DC	115 V AC/DC	0,8 VA / 0,8 W	92,0	130,0
PI6-1P-230VAC/DC	**230 V AC/DC**	**0,8 VA / 0,8 W**	**184,0**	**253,0**
PI6-1P-230VAC/DC-10 ❷	230 V AC/DC	1,6 VA / 1,6 W	196,0	253,0
PI6-1P-12VDC-01 ❶	12 V DC	0,3 W	9,6	14,4
PI6-1P-24VDC-01 ❶	24 V DC	0,4 W	19,2	28,0
PI6-1P-36VDC-01 ❶	36 V DC	0,7 W	28,8	40,0
PI6-1P-24VAC/DC-01 ❶	24 V AC/DC	0,5 VA / 0,5 W	19,2	26,4
PI6-1P-230VAC/DC-01 ❶	230 V AC/DC	0,8 VA / 0,8 W	184,0	253,0

The data in bold type relate to the standard versions of the relays.
❶ Version with gold-plated contacts. ❷ Version for long control lines (max. 300 m), with anti-interference filter.

Ordering codes

Ordering codes **PI6-1P** are specified in Table 1, ”Interface relay code” column.

Interface relays
PI6-1P

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PI6-1T
interface relays

- Width 6,2 mm
- Interface relay **PI6-1T** - with triac output
- 35 mm rail mount acc. to EN 60715
- May be linked with 20-pole interconnection strip type **ZG20**
- Equipped in LED green
- Recognitions, certifications, directives: RoHS,

Output circuit - Triac

Number and type of outputs		1 NO	
Rated / max. switching voltage	AC	400 V / 440 V	
Min. switching voltage	AC	20 V	
Rated load	AC1	1,2 A / 400 V AC	
Min. switching current		10 mA	
Max. non-repeat surge current		30 A	20 ms
Rated current		1,2 A	
I^2t for fusing		5,1 A^2s	1...10 ms
dI/dt		50 A/µs	
dV/dt		40 V/µs	
Input circuit			
Rated voltage	DC	5...32 V	
	AC: 50/60 Hz AC/DC	24, 230 V	
Turn-off voltage		AC: ≥ 0,2 U_n	DC: ≥ 0,1 U_n
Rated power consumption	DC	0,3 W	5...32 V DC at 24 V
	AC/DC	0,3 VA / 0,3 W	24 V AC/DC
	AC/DC	1,6 VA / 1,6 W	230 V AC/DC
Insulation according to EN 60664-1			
Insulation rated voltage		600 V AC	
Insulation pollution degree		2	
Dielectric strength • input - output		4 000 V AC	50/60 Hz, 1 min., type of insulation: reinforced
General data			
Operating time		10 ms	max. (zero turn-on)
Release time		10 ms	max.
Dimensions (L x W x H)		93,8 x 6,2 x 80 mm	
Weight		40 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-40...+55 °C	
Cover protection category		IP 20	EN 60529
Environmental protection		RTI	EN 61810-7
Shock resistance		10 g	
Vibration resistance		5 g	10...500 Hz

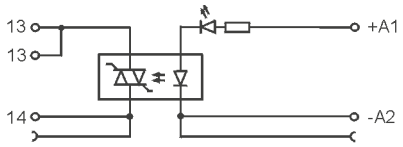
Interface relays SIR6W-... (SIR6WB-...)

set:
relay RM699BV (RSR30)
+ socket 6W (6WB)

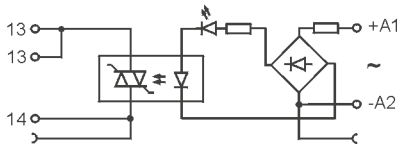
NEW

Connection diagrams

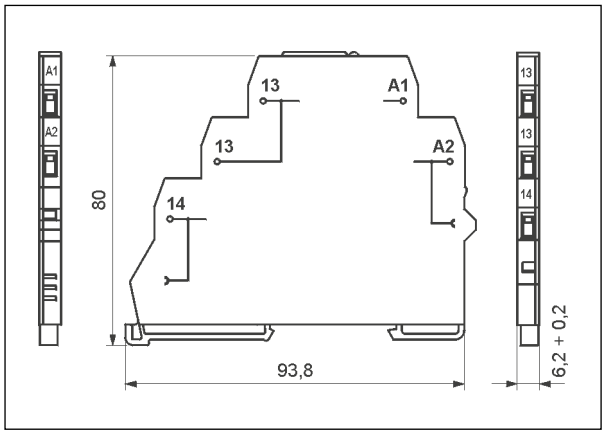
PI6-1T-5...32VDC

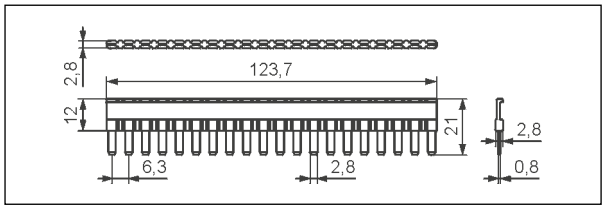


PI6-1T-24VAC/DC
PI6-1T-230VAC/DC



Dimensions





20-pole interconnection strip type **ZG20**

Mounting

Relays **PI6-1T** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. **Connections:** max. cross section of the cables: 1 x 2,5 mm² / 2 x 1,5 mm² (1 x 14 / 2 x 16 AWG), stripping length: 8 mm, max. tightening moment for the terminal: 0,3 Nm.
PI6-1T may be linked with 20-pole interconnection strip type **ZG20**. Strip **ZG20** bridges common input or output signals, maximum permissible current is 36 A / 250 V AC. Colours of strips: **ZG20-1** red, **ZG20-2** black, **ZG20-3** blue.

ZG20

Interconnection strip ZG20: bridging of common input or output signals.

Input data

Table 1

Interface relay code	Rated input voltage U_n	Power of input circuit
PI6-1T-5...32VDC	5...32 V DC	0,3 W at 24 V
PI6-1T-24VAC/DC	24 V AC/DC	0,3 VA / 0,3 W
PI6-1T-230VAC/DC	230 V AC/DC	1,6 VA / 1,6 W

Ordering codes

Ordering codes **PI6-1T** are specified in Table 1, ”Interface relay code” column.

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RM699BV + PI6W-1P-...

- Width 6,2 mm • Interface relay **PIR6W-1P-...** consists of: screw terminals socket, with electronic **PI6W-1P-...**, miniature operational relay - electromagnetic **RM699BV** ❶
- 35 mm rail mount acc. to EN 60715 • May be linked with 20-pole interconnection strip type **ZG20** • Equipped in LED green • Version for long control lines, with anti-interference filter (**PIR6W-1P-230V...-10** ❸)
- Accessories: description plates **PI6W-1246**
- Recognitions, certifications, directives: RoHS,

Output circuit (RM699BV) - contact data ❶

Number and type of contacts		1 CO	
Contact material		**$AgSnO_2$**	$AgSnO_2$/Au hard gold plating ❷
Max. switching voltage		400 V AC / 250 V DC	30 V AC / 36 V DC ❷
Min. switching voltage	AC / DC	10 V	5 V
Rated load	AC1	6 A / 250 V AC	0,05 A / 30 V AC ❷
	DC1	6 A / 24 V DC; 0,15 A / 250 V DC	0,05 A / 36 V DC ❷
Min. switching current		100 mA	10 mA
Max. inrush current		10 A 20 ms	0,1 A 20 ms ❷
Rated current		6 A	0,05 A ❷
Max. breaking capacity	AC1	1 500 VA	1,2 VA ❷
Min. breaking capacity		1 W	0,05 W
Contact resistance		≤ 100 mΩ 100 mA, 24 V	≤ 30 mΩ 10 mA, 5 V
Max. operating frequency			
• at rated load	AC1	360 cycles/hour	
• no load		72 000 cycles/hour	

Input circuit

Rated voltage	50/60 Hz AC	230 V	
	DC	12, **24**, 36 V	
	AC: 50/60 Hz AC/DC	24, 42, 115, **230** V	
Must release voltage		AC: ≥ 0,2 U_n	AC: ≥ 0,1 U_n 230 V AC
		AC: ≥ 0,35 U_n 230 V AC ❸	AC: ≥ 0,35 U_n 230 V AC/DC ❸
		DC: ≥ 0,1 U_n	
Operating range of supply voltage		see Table 1	
Must operate voltage		AC: ≤ 0,8 U_n	AC: 0,6...0,85 U_n ❸
		DC: ≤ 0,8 U_n	
Rated power consumption	AC	≤ 0,8 ... 0,9 VA	
	DC	0,3 W	
	AC/DC	0,3 ... 2,1 VA / 0,3 ... 1,0 W	
Max. length of control line		≤ 300 m	AC control voltage ❸

Insulation according to EN 60664-1

Insulation rated voltage	250 V AC	
Rated surge voltage	4 000 V	1,2 / 50 µs
Overvoltage category	III	
Insulation pollution degree	3	
Dielectric strength		
• input - output	4 000 V AC	50/60 Hz, 1 min., type of insulation: reinforced
• input - output	6 000 V	1,2 / 50 µs
• mass - input, output	2 500 V AC	50/60 Hz, 1 min.
• contact clearance	1 000 V AC	50/60 Hz, 1 min., type of clearance: micro-disconnection
Input - output distance		
• clearance	≥ 6 mm	
• creepage	≥ 8 mm	
Mass - output distance		
• clearance	≥ 3 mm	
• creepage	≥ 3,6 mm	

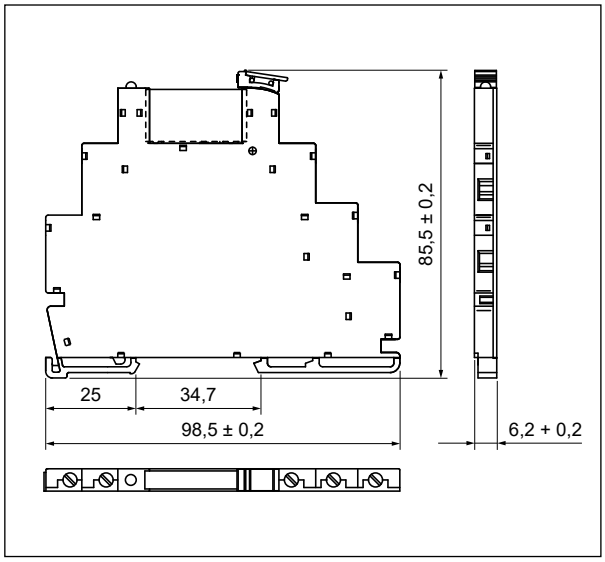
The data in bold type relate to the standard versions of the relays. ❶ Characteristics of the contact capacity of relays **PIR6W-1P-... with RM699BV** - see page 139. ❷ For gold-plated contacts - when the maximum values given have been exceeded, the gold layer is destroyed. Then, the advantages of gold-plating disappear and the values are as for $AgSnO_2$ contacts (see beside), and electrical life of these contacts may be shorter than of normal contacts. ❸ Refers version for long control lines (max. 300 m) **PIR6W-1P-230V...-10** - relay which includes the socket **PI6W-1P-230V...-10** with integrated anti-interference filter, resistant to occurrence of induced voltages in long distances of control wires, and operational miniature relay **RM699BV-3011-85-1060**.

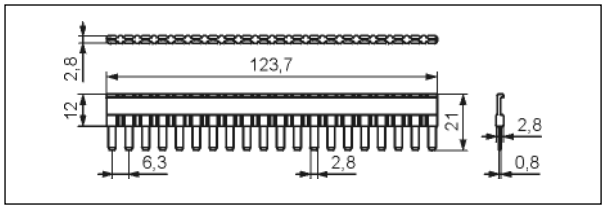
General data

Operating time (typical value)	AC: 11 ms	DC: 8 ms	AC, AC/DC: 20 ms 0,85 U_n ❸
Release time (typical value)	AC: 15 ms	DC: 10 ms	AC, AC/DC: 18 ms ❸
Electrical life			
• resistive AC1	> 0,6 x 10^5	6 A, 250 V AC, 360 cycles/hour	
• cos φ = 0,4	> 2 x 10^5	2 A, 250 V AC	
Mechanical life (cycles)	> 2 x 10^7		
Dimensions (L x W x H)	98,5 x 6,2 x 85,5 mm		
Weight	45 g		
Ambient temperature (non-condensation and/or icing) • storage	-40...+70 °C		
• operating	-40...+60 °C	12 V DC, 24 V DC	
	-40...+50 °C	230 V AC ❸, 230 V AC/DC ❹	
	-40...+55 °C	other voltages	
Cover protection category	IP 20	EN 60529	
Environmental protection	RTI	EN 61810-7	
Shock resistance	10 g		
Vibration resistance	5 g	10...500 Hz	

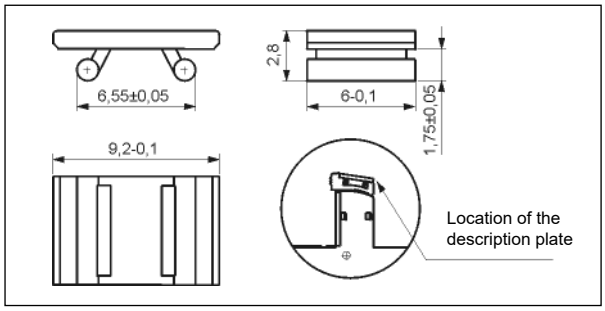
❸ Refers version for long control lines (max. 300 m), with integrated anti-interference filter.
❹ For versions 230VAC/DC and 230VAC/DC-10: the distance at least 5 mm between the relays mounted side by side.

Dimensions





20-pole interconnection strip type **ZG20**



Description plate **PI6W-1246**

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Mounting

Relays **PIR6W-1P-...** ❹ are designed for direct mounting on 35 mm rail mount acc. to EN 60715. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 / 2 x 1,5 mm^2 (1 x 14 / 2 x 16 AWG), stripping length: 9 mm, max. tightening moment for the terminal: 0,3 Nm.
Interface relay **PIR6W-1P-...** consists of: screw terminals socket, with electronic **PI6W-1P-...**, miniature operational relay - electromagnetic **RM699BV**.
PIR6W-1P-... may be linked with 20-pole interconnection strip type **ZG20**. Strip **ZG20** bridges common input or output signals, maximum permissible current is 36 A / 250 V AC. Colours of strips: **ZG20-1** red, **ZG20-2** black, **ZG20-3** blue. Description plates of **PI6W-1246** type are offered for **PIR6W-1P-...** relays; they are delivered with the relays, not mounted.

❹ For versions 230VAC/DC and 230VAC/DC-10: the distance at least 5 mm between the relays mounted side by side.

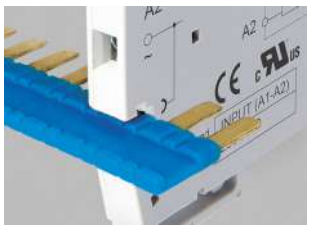
PI6W-1P-...

RM699BV

ZG20

PI6W-1246

Green LED:
signalling the operation status of the relay.



Interconnection strip ZG20:
bridging of common input or output signals.

Movable ejector: protection and easy replacement of the operational relay.

Interface relays PIR6W-1P-...

set: relay RM699BV
+ socket PI6W-1P-...

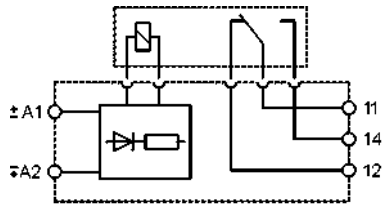
Input data

Table 1

Interface relay code	Input - voltage range V	
	min.	max.
PIR6W-1P-12VDC	9,6	14,4
PIR6W-1P-24VDC	**19,2**	**28,0**
PIR6W-1P-36VDC	28,8	40,0
PIR6W-1P-24VAC/DC	19,2	26,4
PIR6W-1P-42VAC/DC	33,6	50,0
PIR6W-1P-115VAC/DC	92,0	130,0
PIR6W-1P-230VAC/DC ❹	**184,0**	**253,0**
PIR6W-1P-230VAC	184,0	253,0
PIR6W-1P-230VAC/DC-10 ❸ ❹	❺ 196,0	253,0
PIR6W-1P-230VAC-10 ❸	196,0	253,0
PIR6W-1P-12VDC-01 ❷	9,6	14,4
PIR6W-1P-24VDC-01 ❷	**19,2**	**28,0**
PIR6W-1P-36VDC-01 ❷	28,8	40,0
PIR6W-1P-24VAC/DC-01 ❷	19,2	26,4
PIR6W-1P-42VAC/DC-01 ❷	33,6	50,0
PIR6W-1P-115VAC/DC-01 ❷	92,0	130,0
PIR6W-1P-230VAC/DC-01 ❷ ❹	**184,0**	**253,0**
PIR6W-1P-230VAC-01 ❷	184,0	253,0

Connection diagrams

PIR6W-1P-..., PIR6W-1P-...-01



PIR6W-1P-230V...-10

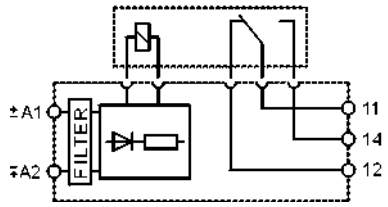


Table of codes

Table 2

Interface relay code	Rated input voltage Un ❻	Power of input circuit	Socket code	Operational relay code	Rated voltage of operational relay Us ❻
PIR6W-1P-12VDC	12 V DC	0,3 W	PI6W-1P-12VDC	RM699BV-3011-85-1012	12 V DC
PIR6W-1P-24VDC	**24 V DC**	**0,3 W**	**PI6W-1P-24VDC**	**RM699BV-3011-85-1024**	**24 V DC**
PIR6W-1P-36VDC	36 V DC	0,3 W	PI6W-1P-36VDC	RM699BV-3011-85-1024	24 V DC
PIR6W-1P-24VAC/DC	24 V AC/DC	0,3 VA / 0,3 W	PI6W-1P-24VAC/DC	RM699BV-3011-85-1024	24 V DC
PIR6W-1P-42VAC/DC	42 V AC/DC	0,4 VA / 0,4 W	PI6W-1P-42VAC/DC	RM699BV-3011-85-1024	24 V DC
PIR6W-1P-115VAC/DC	115 V AC/DC	0,9 VA / 0,9 W	PI6W-1P-115VAC/DC	RM699BV-3011-85-1024	24 V DC
PIR6W-1P-230VAC/DC ❹	**230 V AC/DC**	**0,8 VA / 0,8 W**	**PI6W-1P-230VAC/DC**	**RM699BV-3011-85-1060**	**60 V DC**
PIR6W-1P-230VAC	230 V AC	≤ 0,8 VA	PI6W-1P-230VAC	RM699BV-3011-85-1060	60 V DC
PIR6W-1P-230VAC/DC-10 ❸ ❹	230 V AC/DC	2,1 VA / 1,0 W	PI6W-1P-230VAC/DC-10	RM699BV-3011-85-1060	60 V DC
PIR6W-1P-230VAC-10 ❸	230 V AC	≤ 0,9 VA	PI6W-1P-230VAC-10	RM699BV-3011-85-1060	60 V DC
PIR6W-1P-12VDC-01 ❷	12 V DC	0,3 W	PI6W-1P-12VDC	RM699BV-3211-85-1012	12 V DC
PIR6W-1P-24VDC-01 ❷	**24 V DC**	**0,3 W**	**PI6W-1P-24VDC**	**RM699BV-3211-85-1024**	**24 V DC**
PIR6W-1P-36VDC-01 ❷	36 V DC	0,3 W	PI6W-1P-36VDC	RM699BV-3211-85-1024	24 V DC
PIR6W-1P-24VAC/DC-01 ❷	24 V AC/DC	0,3 VA / 0,3 W	PI6W-1P-24VAC/DC	RM699BV-3211-85-1024	24 V DC
PIR6W-1P-42VAC/DC-01 ❷	42 V AC/DC	0,4 VA / 0,4 W	PI6W-1P-42VAC/DC	RM699BV-3211-85-1024	24 V DC
PIR6W-1P-115VAC/DC-01 ❷	115 V AC/DC	0,9 VA / 0,9 W	PI6W-1P-115VAC/DC	RM699BV-3211-85-1024	24 V DC
PIR6W-1P-230VAC/DC-01 ❷ ❹	**230 V AC/DC**	**0,8 VA / 0,8 W**	**PI6W-1P-230VAC/DC**	**RM699BV-3211-85-1060**	**60 V DC**
PIR6W-1P-230VAC-01 ❷	230 V AC	≤ 0,8 VA	PI6W-1P-230VAC	RM699BV-3211-85-1060	60 V DC

The data in bold type relate to the standard versions of the relays. ❷ Version with gold-plated contacts. ❸ Version for long control lines (max. 300 m), with anti-interference filter. ❹ For versions 230VAC/DC and 230VAC/DC-10: the distance at least 5 mm between the relays mounted side by side. ❺ 196,0 V at supply voltage AC; 184,0 V at supply voltage DC. ❻ It shall be remarked that rated input voltage of the operational relay Us not always complies with the rated input voltage Un (which is important on ordering operational relays for sockets).

Ordering codes

Ordering codes **PIR6W-1P-...** are specified in Tables 1, 2, "Interface relay code" column.

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RM699BV + PI6W-1PS-...

RSR30 + PI6W-1PS-...

- Width 6,2 mm • Interface relay **PIR6W-1PS-...** consists of: screw terminals universal socket, with electronic **PI6W-1PS-...**, miniature operational relay - electromagnetic **RM699BV** or solid state **RSR30** ❶
- 35 mm rail mount acc. to EN 60715 • May be linked with 20-pole interconnection strip type **ZG20** • Equipped in LED green
- Accessories: description plates **PI6W-1246**
- Recognitions, certifications, directives: RoHS,

Output circuit (RM699BV) - contact data ❶

Number and type of contacts (code of output)		1 CO (R) ❸	1 CO (R01) ❸
Contact material		**$AgSnO_2$**	$AgSnO_2$/Au hard gold plating ❷
Max. switching voltage		400 V AC / 250 V DC	30 V AC / 36 V DC ❷
Min. switching voltage	AC / DC	10 V	5 V
Rated load	AC1	6 A / 250 V AC	0,05 A / 30 V AC ❷
	DC1	6 A / 24 V DC; 0,15 A / 250 V DC	0,05 A / 36 V DC ❷
Min. switching current		100 mA	10 mA
Max. inrush current		10 A 20 ms	0,1 A 20 ms ❷
Rated current		6 A	0,05 A ❷
Max. breaking capacity	AC1	1 500 VA	1,2 VA ❷
Min. breaking capacity		1 W	0,05 W
Contact resistance		≤ 100 mΩ 100 mA, 24 V	≤ 30 mΩ 10 mA, 5 V
Max. operating frequency			
• at rated load	AC1	360 cycles/hour	
• no load		72 000 cycles/hour	

Output circuit (RSR30) - output data ❶

Type of output (code of output)		Triac (T) ❸ max. 2 A	Transistor (C) ❸ max. 1 A	Transistor (O) ❸ max. 2 A
Number and type of outputs		1 NO	1 NO	1 NO
Rated voltage		240 V AC	48 V DC	24 V DC
Switching voltage range		12 ... 280 V AC	1,5 ... 60 V DC	1,5 ... 32 V DC
Rated continuous output current	AC1	1 A		
	DC1		1 A	2 A
Min. making capacity current		50 mA	1 mA	1 mA
Max. off-state leakage current (turn-off state)		1,5 mA	1 mA	1 mA
Max. on-state voltage drop on the connection (operating state)		1,2 V	0,4 V	0,24 V
Operating switching frequency			10 Hz	10 Hz

Input circuit

Rated voltage	50/60 Hz AC	230 V	
	DC	6, 12, **24**, 36, 48, 60 V	
	AC: 50/60 Hz AC/DC	**24**, 42, 115, **230** V	
Must release voltage		AC: ≥ 0,2 U_n	AC: ≥ 0,1 U_n 230 V AC
		DC: ≥ 0,1 U_n	
Operating range of supply voltage		0,8...1,2 U_n	0,85...1,2 U_n 6 V DC
Must operate voltage		AC: ≤ 0,8 U_n	
		DC: ≤ 0,8 U_n	DC: ≤ 0,85 U_n 6 V DC
Rated power consumption	AC	≤ 0,8 VA	
	DC	0,2 ... 0,5 W	
	AC/DC	0,5 ... 1,2 VA / 0,4 ... 1,2 W	

The data in bold type relate to the standard versions of the relays. ❶ Characteristics of the contact capacity of relays **PIR6W-1PS-... with RM699BV** - see page 139, **PIR6W-1PS-... with RSR30** - see www.relpol.com.pl ❷ For gold-plated contacts - when the maximum values given have been exceeded, the gold layer is destroyed. Then, the advantages of gold-plating disappear and the values are as for $AgSnO_2$ contacts (see beside), and electrical life of these contacts may be shorter than of normal contacts. ❸ Type of outputs: **R** - contacts $AgSnO_2$; **R01** - contacts $AgSnO_2$/Au hard gold plating; **T** - triac; **C** - transistor; **O** - transistor.

Insulation according to EN 60664-1

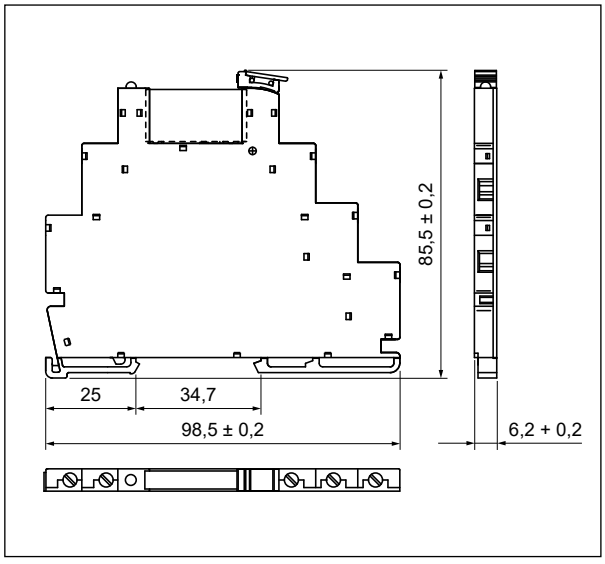
Insulation rated voltage	250 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Dielectric strength	
• input - output	4 000 V AC 50/60 Hz, 1 min., type of insulation: reinforced
• input - output	6 000 V 1,2 / 50 µs
• mass - input, output	2 500 V AC 50/60 Hz, 1 min.
• contact clearance	1 000 V AC 50/60 Hz, 1 min., output R and R01, type of clearance: micro-disconnection
Input - output distance	
• clearance / creepage	≥ 6 mm / ≥ 8 mm
Mass - output distance	
• clearance / creepage	≥ 3 mm / ≥ 3,6 mm

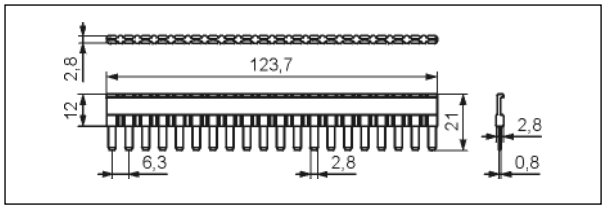
General data

Operating time (typical value)	PIR6W-1PS-...-R/-R01:	DC: 8 ms AC: 10 ms AC/DC: 20 ms
	PIR6W-1PS-...-T:	DC: 100 µs AC, AC/DC: 10 ms
	PIR6W-1PS-...-C/-O:	DC: 50 µs AC, AC/DC: 10 ms
Release time (typical value)	PIR6W-1PS-...-R/-R01:	DC: 10 ms AC: 20 ms AC/DC: 25 ms
	PIR6W-1PS-...-T:	DC: 1/2 cycle + 1 ms AC, AC/DC: 30 ms
	PIR6W-1PS-...-C/-O:	DC: 600 µs AC, AC/DC: 20 ms
Electrical life		
• resistive AC1	PIR6W-1PS-...-R:	> 0,5 x 10^5 6 A, 250 V AC
Mechanical life (cycles)	PIR6W-1PS-...-R/-R01:	> 10^7
Dimensions (L x W x H)		98,5 x 6,2 x 85,5 mm
Weight		45 g
Ambient temperature (non-condensation and/or icing) • storage	PIR6W-1PS-...-R/-R01/-T:	-40...+70 °C ...-C/-O: -25...+70 °C
• operating	PIR6W-1PS-...-R/-R01:	-40...+55 °C ...-T/-C/-O: -20...+55 °C
	PIR6W-1PS-230VAC/DC-R/-R01:	-40...+50 °C ❹ ...-C/-O: -20...+50 °C ❹
Cover protection category	IP 20	EN 60529
Environmental protection	RTI	EN 61810-7
Shock resistance	10 g	
Vibration resistance	5 g	10...500 Hz

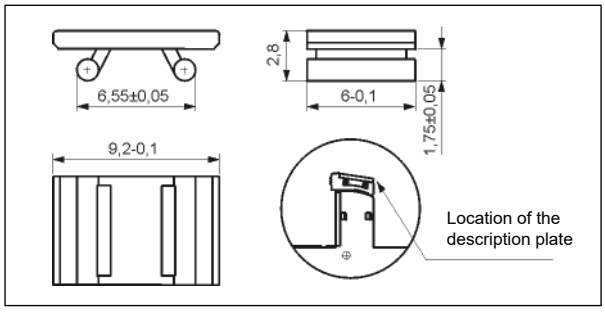
❹ For versions 230VAC/DC: the distance at least 5 mm between the relays mounted side by side.

Dimensions





20-pole interconnection strip type **ZG20**



Description plate **PI6W-1246**

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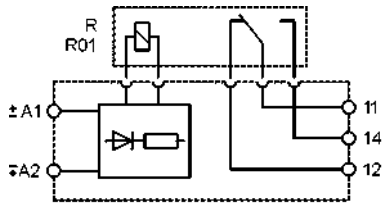
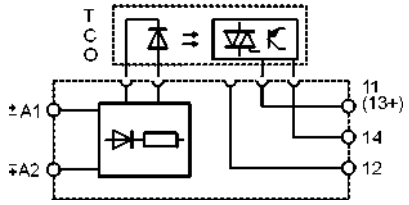
Connection diagrams

PIR6W-1PS-...-R, PIR6W-1PS-...-R01



PIR6W-1PS-...-T, PIR6W-1PS-...-C, PIR6W-1PS-...-O



Mounting

Relays **PIR6W-1PS-...** ❹ are designed for direct mounting on 35 mm rail mount acc. to EN 60715. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 / 2 x 1,5 mm^2 (1 x 14 / 2 x 16 AWG), stripping length: 9 mm, max. tightening moment for the terminal: 0,3 Nm.
Interface relay **PIR6W-1PS-...** consists of: screw terminals universal socket, with electronic **PI6W-1PS-...**, miniature operational relay - electromagnetic **RM699BV** or solid state **RSR30** ❸.
PIR6W-1PS-... may be linked with 20-pole interconnection strip type **ZG20**. Strip **ZG20** bridges common input or output signals, maximum permissible current is 36 A / 250 V AC. Colours of strips: **ZG20-1** red, **ZG20-2** black, **ZG20-3** blue. Description plates of **PI6W-1246** type are offered for **PIR6W-1PS-...** relays; they are delivered with the relays, not mounted.

❸ Type of outputs: **R** - contacts $AgSnO_2$; **R01** - contacts $AgSnO_2$/Au hard gold plating; **T** - triac; **C** - transistor; **O** - transistor. ❹ For versions 230VAC/DC: the distance at least 5 mm between the relays mounted side by side.

PI6W-1PS-...

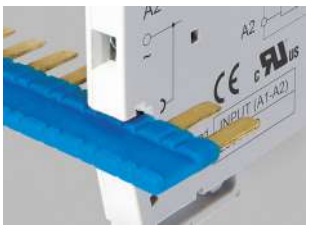
RM699BV

RSR30

ZG20

PI6W-1246

Green LED:
signalling the operation status of the relay.



Interconnection strip ZG20:
bridging of common input or output signals.

Movable ejector: protection and easy replacement of the operational relay.

Ordering codes

Ordering codes **PIR6W-1PS-...** are specified in Table 1, ”Interface relay code” column.

Table of codes Table 1

Interface relay code	Rated input voltage U_n ❺	Power of input circuit	Socket code	Operational relay code	Rated voltage of operational relay U_s ❺
PIR6W-1PS-6VDC-R	6 V DC	0,3 W	PI6W-1PS-6VDC	RM699BV-3011-85-1005	5 V DC
PIR6W-1PS-12VDC-R	12 V DC	0,2 W	PI6W-1PS-12/24VDC	RM699BV-3011-85-1012	12 V DC
PIR6W-1PS-24VDC-R	**24 V DC**	**0,3 W**	**PI6W-1PS-12/24VDC**	**RM699BV-3011-85-1024**	**24 V DC**
PIR6W-1PS-36VDC-R	36 V DC	0,3 W	PI6W-1PS-36VDC	RM699BV-3011-85-1024	24 V DC
PIR6W-1PS-48VDC-R	48 V DC	0,4 W	PI6W-1PS-48VDC	RM699BV-3011-85-1024	24 V DC
PIR6W-1PS-60VDC-R	60 V DC	0,5 W	PI6W-1PS-60VDC	RM699BV-3011-85-1024	24 V DC
PIR6W-1PS-24VAC/DC-R	**24 V AC/DC**	**0,5 VA / 0,4 W**	**PI6W-1PS-24VAC/DC**	**RM699BV-3011-85-1012**	**12 V DC**
PIR6W-1PS-42VAC/DC-R	42 V AC/DC	0,5 VA / 0,4 W	PI6W-1PS-42VAC/DC	RM699BV-3011-85-1024	24 V DC
PIR6W-1PS-115VAC/DC-R	115 V AC/DC	1,2 VA / 1,2 W	PI6W-1PS-115VAC/DC	RM699BV-3011-85-1024	24 V DC
PIR6W-1PS-230VAC/DC-R ❹	**230 V AC/DC**	**1,2 VA / 1,2 W**	**PI6W-1PS-230VAC/DC**	**RM699BV-3011-85-1060**	**60 V DC**
PIR6W-1PS-230VAC-R	230 V AC	≤ 0,8 VA	PI6W-1PS-230VAC	RM699BV-3011-85-1060	60 V DC
PIR6W-1PS-6VDC-R01 ❷	6 V DC	0,3 W	PI6W-1PS-6VDC	RM699BV-3211-85-1005	5 V DC
PIR6W-1PS-12VDC-R01 ❷	12 V DC	0,2 W	PI6W-1PS-12/24VDC	RM699BV-3211-85-1012	12 V DC
PIR6W-1PS-24VDC-R01 ❷	**24 V DC**	**0,3 W**	**PI6W-1PS-12/24VDC**	**RM699BV-3211-85-1024**	**24 V DC**
PIR6W-1PS-36VDC-R01 ❷	36 V DC	0,3 W	PI6W-1PS-36VDC	RM699BV-3211-85-1024	24 V DC
PIR6W-1PS-48VDC-R01 ❷	48 V DC	0,4 W	PI6W-1PS-48VDC	RM699BV-3211-85-1024	24 V DC
PIR6W-1PS-60VDC-R01 ❷	60 V DC	0,5 W	PI6W-1PS-60VDC	RM699BV-3211-85-1024	24 V DC
PIR6W-1PS-24VAC/DC-R01 ❷	**24 V AC/DC**	**0,5 VA / 0,4 W**	**PI6W-1PS-24VAC/DC**	**RM699BV-3211-85-1012**	**12 V DC**
PIR6W-1PS-42VAC/DC-R01 ❷	42 V AC/DC	0,5 VA / 0,4 W	PI6W-1PS-42VAC/DC	RM699BV-3211-85-1024	24 V DC
PIR6W-1PS-115VAC/DC-R01 ❷	115 V AC/DC	1,2 VA / 1,2 W	PI6W-1PS-115VAC/DC	RM699BV-3211-85-1024	24 V DC
PIR6W-1PS-230VAC/DC-R01 ❷ ❹	**230 V AC/DC**	**1,2 VA / 1,2 W**	**PI6W-1PS-230VAC/DC**	**RM699BV-3211-85-1060**	**60 V DC**
PIR6W-1PS-230VAC-R01 ❷	230 V AC	≤ 0,8 VA	PI6W-1PS-230VAC	RM699BV-3211-85-1060	60 V DC
PIR6W-1PS-6VDC-T	6 V DC	0,2 W	PI6W-1PS-6VDC	RSR30-D05-A1-24-020-1	5 V DC
PIR6W-1PS-12VDC-T	12 V DC	0,2 W	PI6W-1PS-12/24VDC	RSR30-D12-A1-24-020-1	12 V DC
PIR6W-1PS-24VDC-T	**24 V DC**	**0,3 W**	**PI6W-1PS-12/24VDC**	**RSR30-D24-A1-24-020-1**	**24 V DC**
PIR6W-1PS-36VDC-T	36 V DC	0,3 W	PI6W-1PS-36VDC	RSR30-D24-A1-24-020-1	24 V DC
PIR6W-1PS-48VDC-T	48 V DC	0,4 W	PI6W-1PS-48VDC	RSR30-D24-A1-24-020-1	24 V DC
PIR6W-1PS-60VDC-T	60 V DC	0,5 W	PI6W-1PS-60VDC	RSR30-D24-A1-24-020-1	24 V DC
PIR6W-1PS-24VAC/DC-T	**24 V AC/DC**	**0,5 VA / 0,4 W**	**PI6W-1PS-24VAC/DC**	**RSR30-D12-A1-24-020-1**	**12 V DC**
PIR6W-1PS-42VAC/DC-T	42 V AC/DC	0,5 VA / 0,4 W	PI6W-1PS-42VAC/DC	RSR30-D24-A1-24-020-1	24 V DC
PIR6W-1PS-115VAC/DC-T	115 V AC/DC	1,0 VA / 1,0 W	PI6W-1PS-115VAC/DC	RSR30-D24-A1-24-020-1	24 V DC
PIR6W-1PS-6VDC-C	6 V DC	0,2 W	PI6W-1PS-6VDC	RSR30-D05-D1-04-025-1	5 V DC
PIR6W-1PS-12VDC-C	12 V DC	0,2 W	PI6W-1PS-12/24VDC	RSR30-D12-D1-04-025-1	12 V DC
PIR6W-1PS-24VDC-C	**24 V DC**	**0,3 W**	**PI6W-1PS-12/24VDC**	**RSR30-D24-D1-04-025-1**	**24 V DC**
PIR6W-1PS-36VDC-C	36 V DC	0,3 W	PI6W-1PS-36VDC	RSR30-D24-D1-04-025-1	24 V DC
PIR6W-1PS-48VDC-C	48 V DC	0,4 W	PI6W-1PS-48VDC	RSR30-D24-D1-04-025-1	24 V DC
PIR6W-1PS-60VDC-C	60 V DC	0,5 W	PI6W-1PS-60VDC	RSR30-D24-D1-04-025-1	24 V DC
PIR6W-1PS-24VAC/DC-C	**24 V AC/DC**	**0,5 VA / 0,4 W**	**PI6W-1PS-24VAC/DC**	**RSR30-D12-D1-04-025-1**	**12 V DC**
PIR6W-1PS-42VAC/DC-C	42 V AC/DC	0,5 VA / 0,4 W	PI6W-1PS-42VAC/DC	RSR30-D24-D1-04-025-1	24 V DC
PIR6W-1PS-115VAC/DC-C	115 V AC/DC	1,0 VA / 1,0 W	PI6W-1PS-115VAC/DC	RSR30-D24-D1-04-025-1	24 V DC
PIR6W-1PS-230VAC/DC-C ❹	**230 V AC/DC**	**1,0 VA / 1,0 W**	**PI6W-1PS-230VAC/DC**	**RSR30-D48-D1-04-025-1**	**48 V DC**
PIR6W-1PS-230VAC-C	230 V AC	≤ 0,8 VA	PI6W-1PS-230VAC	RSR30-D48-D1-04-025-1	48 V DC
PIR6W-1PS-6VDC-O	6 V DC	0,2 W	PI6W-1PS-6VDC	RSR30-D05-D1-02-040-1	5 V DC
PIR6W-1PS-12VDC-O	12 V DC	0,2 W	PI6W-1PS-12/24VDC	RSR30-D12-D1-02-040-1	12 V DC
PIR6W-1PS-24VDC-O	**24 V DC**	**0,3 W**	**PI6W-1PS-12/24VDC**	**RSR30-D24-D1-02-040-1**	**24 V DC**
PIR6W-1PS-36VDC-O	36 V DC	0,3 W	PI6W-1PS-36VDC	RSR30-D24-D1-02-040-1	24 V DC
PIR6W-1PS-48VDC-O	48 V DC	0,4 W	PI6W-1PS-48VDC	RSR30-D24-D1-02-040-1	24 V DC
PIR6W-1PS-60VDC-O	60 V DC	0,5 W	PI6W-1PS-60VDC	RSR30-D24-D1-02-040-1	24 V DC
PIR6W-1PS-24VAC/DC-O	**24 V AC/DC**	**0,5 VA / 0,4 W**	**PI6W-1PS-24VAC/DC**	**RSR30-D12-D1-02-040-1**	**12 V DC**
PIR6W-1PS-42VAC/DC-O	42 V AC/DC	0,5 VA / 0,4 W	PI6W-1PS-42VAC/DC	RSR30-D24-D1-02-040-1	24 V DC
PIR6W-1PS-115VAC/DC-O	115 V AC/DC	1,0 VA / 1,0 W	PI6W-1PS-115VAC/DC	RSR30-D24-D1-02-040-1	24 V DC
PIR6W-1PS-230VAC/DC-O ❹	**230 V AC/DC**	**1,0 VA / 1,0 W**	**PI6W-1PS-230VAC/DC**	**RSR30-D48-D1-02-040-1**	**48 V DC**
PIR6W-1PS-230VAC-O	230 V AC	≤ 0,8 VA	PI6W-1PS-230VAC	RSR30-D48-D1-02-040-1	48 V DC

The data in bold type relate to the standard versions of the relays. ❷ Version with gold-plated contacts. ❹ For versions 230VAC/DC: the distance at least 5 mm between the relays mounted side by side. ❺ It shall be remarked that rated input voltage of the operational relay U_s not always complies with the rated input voltage U_n (which is important on ordering operational relays for sockets).

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PIR6WB-1PS-...
interface relays with spring terminals

RM699BV + PI6WB-1PS-... **RSR30 + PI6WB-1PS-...**

- Width 6,2 mm • Interface relay **PIR6WB-1PS-...** consists of: spring terminals ❶ universal socket, with electronic **PI6WB-1PS-...**, miniature operational relay - electromagnetic **RM699BV** or solid state **RSR30** ❷
- 35 mm rail mount acc. to EN 60715 • May be linked with 20-pole interconnection strip type **ZG20** • Equipped in LED green • Version for long control lines, with anti-interference filter (**PIR6WB-1P-230V...-10** ❹)
- Accessories: description plates **PI6W-1246**
- Recognitions, certifications, directives: RoHS,

Output circuit (RM699BV) - contact data ❷

Number and type of contacts (code of output)		1 CO (R) ❺	1 CO (R01) ❺
Contact material		**$AgSnO_2$**	$AgSnO_2$/Au hard gold plating ❸
Max. switching voltage		400 V AC / 250 V DC	30 V AC / 36 V DC ❸
Min. switching voltage	AC / DC	10 V	5 V
Rated load	AC1	6 A / 250 V AC	0,05 A / 30 V AC ❸
	DC1	6 A / 24 V DC; 0,15 A / 250 V DC	0,05 A / 36 V DC ❸
Min. switching current		100 mA	10 mA
Max. inrush current		10 A 20 ms	0,1 A 20 ms ❸
Rated current		6 A	0,05 A ❸
Max. breaking capacity	AC1	1 500 VA	1,2 VA ❸
Min. breaking capacity		1 W	0,05 W
Contact resistance		≤ 100 mΩ 100 mA, 24 V	≤ 30 mΩ 10 mA, 5 V
Max. operating frequency			
• at rated load	AC1	360 cycles/hour	
• no load		72 000 cycles/hour	

Output circuit (RSR30) - output data ❷

Type of output (code of output)		Triac (T) ❺ max. 2 A	Transistor (C) ❺ max. 1 A	Transistor (O) ❺ max. 2 A
Number and type of outputs		1 NO	1 NO	1 NO
Rated voltage		240 V AC	48 V DC	24 V DC
Switching voltage range		12 ... 280 V AC	1,5 ... 60 V DC	1,5 ... 32 V DC
Rated continuous output current	AC1	1 A		
	DC1		1 A	2 A
Min. making capacity current		50 mA	1 mA	1 mA
Max. off-state leakage current (turn-off state)		1,5 mA	1 mA	1 mA
Max. on-state voltage drop on the connection (operating state)		1,2 V	0,4 V	0,24 V
Operating switching frequency			10 Hz	10 Hz

Input circuit

Rated voltage	50/60 Hz AC	230 V	
	DC	6, 12, **24**, 36, 48, 60 V	
	AC: 50/60 Hz AC/DC	**24**, 42, 115, **230** V	
Must release voltage		AC: ≥ 0,2 U_n	AC: ≥ 0,1 U_n 230 V AC
		AC: ≥ 0,35 U_n 230 V AC ❹	AC: ≥ 0,35 U_n 230 V AC/DC ❹
		DC: ≥ 0,1 U_n	
Operating range of supply voltage		0,8...1,2 U_n	0,85...1,2 U_n 6 V DC
Must operate voltage		AC: ≤ 0,8 U_n	AC: 0,6...0,85 U_n ❹
		DC: ≤ 0,8 U_n	DC: ≤ 0,85 U_n 6 V DC
Rated power consumption	AC	≤ 0,8 ... 0,9 VA	
	DC	0,2 ... 0,5 W	
	AC/DC	0,5 ... 1,2 VA / 0,4 ... 1,2 W	
Max. length of control line		≤ 300 m AC control voltage ❹	

The data in bold type relate to the standard versions of the relays. ❶ Spring fixing terminals for electric wires (cage springs CAGE CLAMP® - is the registered trademark of WAGO Kontakttechnik GmbH & Co. KG, Germany). ❷ Characteristics of the contact capacity of relays **PIR6WB-1PS-... with RM699BV** - see page 139, **PIR6WB-1PS-... with RSR30** - see www.relpol.com.pl ❸ For gold-plated contacts - when the maximum values given have been exceeded, the gold layer is destroyed. Then, the advantages of gold-plating disappear and the values are as for $AgSnO_2$ contacts (see beside), and electrical life of these contacts may be shorter than of normal contacts. ❹ Refers version for long control lines (max. 300 m) **PIR6WB-1P-230V...-10** - relay which includes the socket **PI6WB-1P-230V...-10** with integrated anti-interference filter, resistant to occurrence of induced voltages in long distances of control wires, and operational miniature relay **RM699BV-3011-85-1060**. ❺ Type of outputs: **R** - contacts $AgSnO_2$; **R01** - contacts $AgSnO_2$/Au hard gold plating; **T** - triac; **C** - transistor; **O** - transistor.

Insulation according to EN 60664-1

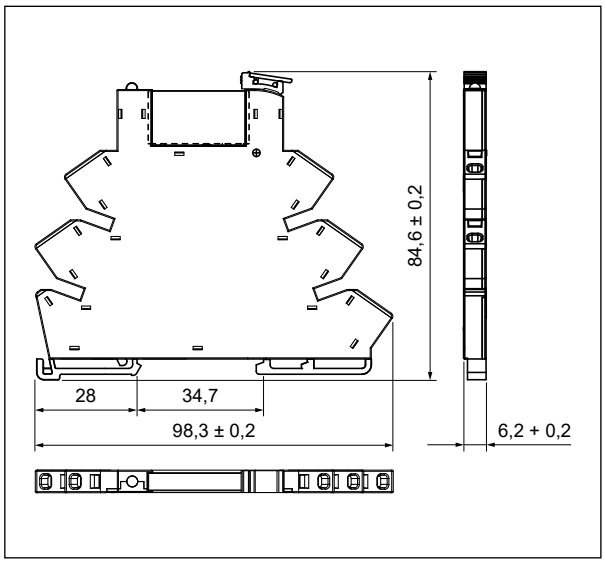
Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V	1,2 / 50 µs
Overvoltage category		III	
Insulation pollution degree		3	
Dielectric strength	• input - output	4 000 V AC	50/60 Hz, 1 min., type of insulation: reinforced
	• input - output	6 000 V	1,2 / 50 µs
	• mass - input, output	2 500 V AC	50/60 Hz, 1 min.
	• contact clearance	1 000 V AC	50/60 Hz, 1 min., output R and R01, type of clearance: micro-disconnection
Input - output distance		clearance / creepage: ≥ 6 mm / ≥ 8 mm	
Mass - output distance		clearance / creepage: ≥ 3 mm / ≥ 4 mm	

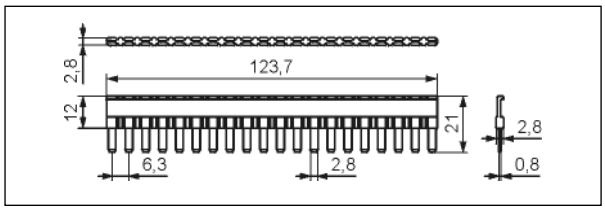
General data

Operating time (typical value)		PIR6WB-1PS-...-R/-R01: DC: 8 ms	AC, AC/DC: 20 ms
		PIR6WB-1PS-...-T: DC: 100 µs	AC, AC/DC: 10 ms
		PIR6WB-1PS-...-C/-O: DC: 50 µs	AC, AC/DC: 10 ms
Release time (typical value)		PIR6WB-1PS-...-R/-R01: DC: 10 ms	AC, AC/DC: 25 ms (18 ms ❹)
		PIR6WB-1PS-...-T: DC: 1/2 cycle + 1 ms	AC, AC/DC: 30 ms
		PIR6WB-1PS-...-C/-O: DC: 600 µs	AC, AC/DC: 20 ms
Electrical life	• resistive AC1	PIR6WB-1PS-...-R: > 0,5 x 10^5	6 A, 250 V AC
Mechanical life (cycles)		PIR6WB-1PS-...-R/-R01: > 10^7	
Dimensions (L x W x H)		98,3 x 6,2 x 84,6 mm	
Weight		55 g	
Ambient temperature (non-condensation and/or icing)	• storage	PIR6WB-1PS-...-R/-R01/-T: -40...+70 °C	...-C/-O: -25...+70 °C
		PIR6WB-1P-230V...-10 ❹: -25...+70 °C	
	• operating	PIR6WB-1PS-...-R/-R01: -40...+55 °C	...-T/-C/-O: -25...+55 °C
		PIR6WB-1PS-230VAC/DC-R/-R01/-C/-O: -25...+50 °C ❻	
		PIR6WB-1P-230V...-10 ❹: -25...+50 °C ❻	
Cover protection category		IP 20	EN 60529
Environmental protection		RTI	EN 61810-7
Shock resistance		10 g	
Vibration resistance		5 g	10...500 Hz

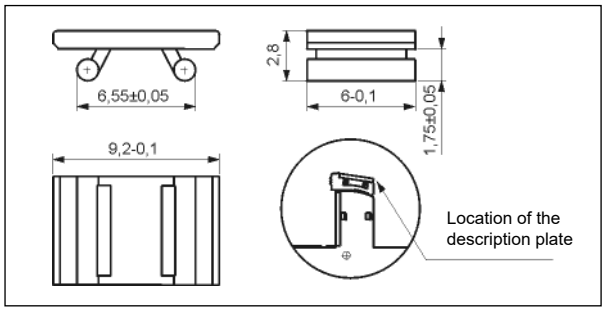
❹ Refers version for long control lines (max. 300 m), with integrated anti-interference filter.
❻ For versions 230VAC/DC and 230VAC/DC-10: the distance at least 5 mm between the relays mounted side by side.

Dimensions





20-pole interconnection strip type **ZG20**



Description plate **PI6W-1246**

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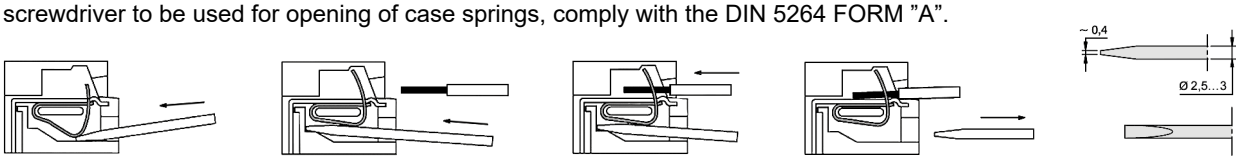
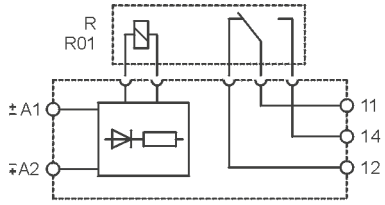
Wire connection

The drawings present the sequence of operations in course of inserting wire to the spring terminal, and the recommended screwdriver to be used for opening of case springs, comply with the DIN 5264 FORM "A".

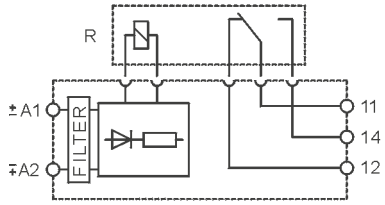


Connection diagrams

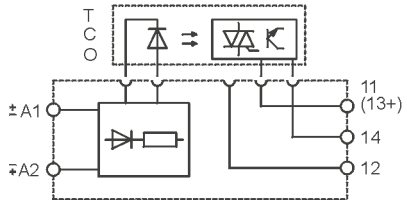
PIR6WB-1PS-...-R, PIR6WB-1PS-...-R01



PIR6WB-1P-230V...-10



PIR6WB-1PS-...-T, PIR6WB-1PS-...-C, PIR6WB-1PS-...-O



Mounting

Relays **PIR6WB-1PS-...** ❻ are designed for direct mounting on 35 mm rail mount acc. to EN 60715. **Connections:** max. cross section of the cables: 1 x 0,22...2,5 mm² (1 x 24...14 AWG), stripping length: 9 mm.
Interface relay **PIR6WB-1PS-...** consists of: spring terminals universal socket, with electronic **PI6WB-1PS-...**, miniature operational relay - electromagnetic **RM699BV** or solid state **RSR30** ❺.
PIR6WB-1PS-... may be linked with 20-pole interconnection strip type **ZG20**. Strip **ZG20** bridges common input or output signals, maximum permissible current is 36 A / 250 V AC. Colours of strips: **ZG20-1** red, **ZG20-2** black, **ZG20-3** blue. Description plates of **PI6W-1246** type are offered for **PIR6WB-1PS-...** relays; they are delivered with the relays, not mounted.

❺ Type of outputs: **R** - contacts $AgSnO_2$; **R01** - contacts $AgSnO_2$/Au hard gold plating; **T** - triac; **C** - transistor; **O** - transistor. ❻ For versions 230VAC/DC and 230VAC/DC-10: the distance at least 5 mm between the mounting relays.

PI6WB-1PS-...

RM699BV

RSR30

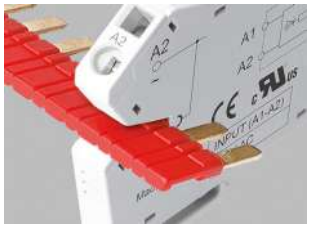
Ordering codes

Ordering codes **PIR6WB-1PS-...** are specified in Table 1, "Interface relay code" column.

ZG20

PI6W-1246

Green LED:
signalling the operation status of the relay.



Interconnection strip ZG20:
bridging of common input or output signals.

Movable ejector: protection and easy replacement of the operational relay.

Table of codes Table 1

Interface relay code	Rated input voltage Un ❼	Power of input circuit	Socket code	Operational relay code	Rated voltage of operational relay Us ❼
PIR6WB-1PS-6VDC-R	6 V DC	0,3 W	PI6WB-1PS-6VDC	RM699BV-3011-85-1005	5 V DC
PIR6WB-1PS-12VDC-R	12 V DC	0,2 W	PI6WB-1PS-12/24VDC	RM699BV-3011-85-1012	12 V DC
PIR6WB-1PS-24VDC-R	**24 V DC**	**0,3 W**	**PI6WB-1PS-12/24VDC**	**RM699BV-3011-85-1024**	**24 V DC**
PIR6WB-1PS-36VDC-R	36 V DC	0,3 W	PI6WB-1PS-36VDC	RM699BV-3011-85-1024	24 V DC
PIR6WB-1PS-48VDC-R	48 V DC	0,4 W	PI6WB-1PS-48VDC	RM699BV-3011-85-1024	24 V DC
PIR6WB-1PS-60VDC-R	60 V DC	0,5 W	PI6WB-1PS-60VDC	RM699BV-3011-85-1024	24 V DC
PIR6WB-1PS-24VAC/DC-R	**24 V AC/DC**	**0,5 VA / 0,4 W**	**PI6WB-1PS-24VAC/DC**	**RM699BV-3011-85-1012**	**12 V DC**
PIR6WB-1PS-42VAC/DC-R	42 V AC/DC	0,5 VA / 0,4 W	PI6WB-1PS-42VAC/DC	RM699BV-3011-85-1024	24 V DC
PIR6WB-1PS-115VAC/DC-R	115 V AC/DC	1,2 VA / 1,2 W	PI6WB-1PS-115VAC/DC	RM699BV-3011-85-1024	24 V DC
PIR6WB-1PS-230VAC/DC-R ❻	**230 V AC/DC**	**1,2 VA / 1,2 W**	**PI6WB-1PS-230VAC/DC**	**RM699BV-3011-85-1060**	**60 V DC**
PIR6WB-1PS-230VAC-R	230 V AC	≤ 0,8 VA	PI6WB-1PS-230VAC	RM699BV-3011-85-1060	60 V DC
PIR6WB-1P-230VAC/DC-10 ❹ ❻	230 V AC/DC	2,1 VA / 1,0 W	PI6WB-1P-230VAC/DC-10	RM699BV-3011-85-1060	60 V DC
PIR6WB-1P-230VAC-10 ❹	230 V AC	≤ 0,9 VA	PI6WB-1P-230VAC-10	RM699BV-3011-85-1060	60 V DC
PIR6WB-1PS-6VDC-R01 ❸	6 V DC	0,3 W	PI6WB-1PS-6VDC	RM699BV-3211-85-1005	5 V DC
PIR6WB-1PS-12VDC-R01 ❸	12 V DC	0,2 W	PI6WB-1PS-12/24VDC	RM699BV-3211-85-1012	12 V DC
PIR6WB-1PS-24VDC-R01 ❸	**24 V DC**	**0,3 W**	**PI6WB-1PS-12/24VDC**	**RM699BV-3211-85-1024**	**24 V DC**
PIR6WB-1PS-36VDC-R01 ❸	36 V DC	0,3 W	PI6WB-1PS-36VDC	RM699BV-3211-85-1024	24 V DC
PIR6WB-1PS-48VDC-R01 ❸	48 V DC	0,4 W	PI6WB-1PS-48VDC	RM699BV-3211-85-1024	24 V DC
PIR6WB-1PS-60VDC-R01 ❸	60 V DC	0,5 W	PI6WB-1PS-60VDC	RM699BV-3211-85-1024	24 V DC
PIR6WB-1PS-24VAC/DC-R01 ❸	**24 V AC/DC**	**0,5 VA / 0,4 W**	**PI6WB-1PS-24VAC/DC**	**RM699BV-3211-85-1012**	**12 V DC**
PIR6WB-1PS-42VAC/DC-R01 ❸	42 V AC/DC	0,5 VA / 0,4 W	PI6WB-1PS-42VAC/DC	RM699BV-3211-85-1024	24 V DC
PIR6WB-1PS-115VAC/DC-R01 ❸	115 V AC/DC	1,2 VA / 1,2 W	PI6WB-1PS-115VAC/DC	RM699BV-3211-85-1024	24 V DC
PIR6WB-1PS-230VAC/DC-R01 ❸ ❻	**230 V AC/DC**	**1,2 VA / 1,2 W**	**PI6WB-1PS-230VAC/DC**	**RM699BV-3211-85-1060**	**60 V DC**
PIR6WB-1PS-230VAC-R01 ❸	230 V AC	≤ 0,8 VA	PI6WB-1PS-230VAC	RM699BV-3211-85-1060	60 V DC
PIR6WB-1PS-6VDC-T	6 V DC	0,2 W	PI6WB-1PS-6VDC	RSR30-D05-A1-24-020-1	5 V DC
PIR6WB-1PS-12VDC-T	12 V DC	0,2 W	PI6WB-1PS-12/24VDC	RSR30-D12-A1-24-020-1	12 V DC
PIR6WB-1PS-24VDC-T	**24 V DC**	**0,3 W**	**PI6WB-1PS-12/24VDC**	**RSR30-D24-A1-24-020-1**	**24 V DC**
PIR6WB-1PS-36VDC-T	36 V DC	0,3 W	PI6WB-1PS-36VDC	RSR30-D24-A1-24-020-1	24 V DC
PIR6WB-1PS-48VDC-T	48 V DC	0,4 W	PI6WB-1PS-48VDC	RSR30-D24-A1-24-020-1	24 V DC
PIR6WB-1PS-60VDC-T	60 V DC	0,5 W	PI6WB-1PS-60VDC	RSR30-D24-A1-24-020-1	24 V DC
PIR6WB-1PS-24VAC/DC-T	**24 V AC/DC**	**0,5 VA / 0,4 W**	**PI6WB-1PS-24VAC/DC**	**RSR30-D12-A1-24-020-1**	**12 V DC**
PIR6WB-1PS-42VAC/DC-T	42 V AC/DC	0,5 VA / 0,4 W	PI6WB-1PS-42VAC/DC	RSR30-D24-A1-24-020-1	24 V DC
PIR6WB-1PS-115VAC/DC-T	115 V AC/DC	1,0 VA / 1,0 W	PI6WB-1PS-115VAC/DC	RSR30-D24-A1-24-020-1	24 V DC
PIR6WB-1PS-6VDC-C	6 V DC	0,2 W	PI6WB-1PS-6VDC	RSR30-D05-D1-04-025-1	5 V DC
PIR6WB-1PS-12VDC-C	12 V DC	0,2 W	PI6WB-1PS-12/24VDC	RSR30-D12-D1-04-025-1	12 V DC
PIR6WB-1PS-24VDC-C	**24 V DC**	**0,3 W**	**PI6WB-1PS-12/24VDC**	**RSR30-D24-D1-04-025-1**	**24 V DC**
PIR6WB-1PS-36VDC-C	36 V DC	0,3 W	PI6WB-1PS-36VDC	RSR30-D24-D1-04-025-1	24 V DC
PIR6WB-1PS-48VDC-C	48 V DC	0,4 W	PI6WB-1PS-48VDC	RSR30-D24-D1-04-025-1	24 V DC
PIR6WB-1PS-60VDC-C	60 V DC	0,5 W	PI6WB-1PS-60VDC	RSR30-D24-D1-04-025-1	24 V DC
PIR6WB-1PS-24VAC/DC-C	**24 V AC/DC**	**0,5 VA / 0,4 W**	**PI6WB-1PS-24VAC/DC**	**RSR30-D12-D1-04-025-1**	**12 V DC**
PIR6WB-1PS-42VAC/DC-C	42 V AC/DC	0,5 VA / 0,4 W	PI6WB-1PS-42VAC/DC	RSR30-D24-D1-04-025-1	24 V DC
PIR6WB-1PS-115VAC/DC-C	115 V AC/DC	1,0 VA / 1,0 W	PI6WB-1PS-115VAC/DC	RSR30-D24-D1-04-025-1	24 V DC
PIR6WB-1PS-230VAC/DC-C ❻	**230 V AC/DC**	**1,0 VA / 1,0 W**	**PI6WB-1PS-230VAC/DC**	**RSR30-D48-D1-04-025-1**	**48 V DC**
PIR6WB-1PS-230VAC-C	230 V AC	≤ 0,8 VA	PI6WB-1PS-230VAC	RSR30-D48-D1-04-025-1	48 V DC
PIR6WB-1PS-6VDC-O	6 V DC	0,2 W	PI6WB-1PS-6VDC	RSR30-D05-D1-02-040-1	5 V DC
PIR6WB-1PS-12VDC-O	12 V DC	0,2 W	PI6WB-1PS-12/24VDC	RSR30-D12-D1-02-040-1	12 V DC
PIR6WB-1PS-24VDC-O	**24 V DC**	**0,3 W**	**PI6WB-1PS-12/24VDC**	**RSR30-D24-D1-02-040-1**	**24 V DC**
PIR6WB-1PS-36VDC-O	36 V DC	0,3 W	PI6WB-1PS-36VDC	RSR30-D24-D1-02-040-1	24 V DC
PIR6WB-1PS-48VDC-O	48 V DC	0,4 W	PI6WB-1PS-48VDC	RSR30-D24-D1-02-040-1	24 V DC
PIR6WB-1PS-60VDC-O	60 V DC	0,5 W	PI6WB-1PS-60VDC	RSR30-D24-D1-02-040-1	24 V DC
PIR6WB-1PS-24VAC/DC-O	**24 V AC/DC**	**0,5 VA / 0,4 W**	**PI6WB-1PS-24VAC/DC**	**RSR30-D12-D1-02-040-1**	**12 V DC**
PIR6WB-1PS-42VAC/DC-O	42 V AC/DC	0,5 VA / 0,4 W	PI6WB-1PS-42VAC/DC	RSR30-D24-D1-02-040-1	24 V DC
PIR6WB-1PS-115VAC/DC-O	115 V AC/DC	1,0 VA / 1,0 W	PI6WB-1PS-115VAC/DC	RSR30-D24-D1-02-040-1	24 V DC
PIR6WB-1PS-230VAC/DC-O ❻	**230 V AC/DC**	**1,0 VA / 1,0 W**	**PI6WB-1PS-230VAC/DC**	**RSR30-D48-D1-02-040-1**	**48 V DC**
PIR6WB-1PS-230VAC-O	230 V AC	≤ 0,8 VA	PI6WB-1PS-230VAC	RSR30-D48-D1-02-040-1	48 V DC

The data in bold type relate to the standard versions of the relays. ❸ Version with gold-plated contacts. ❹ Version for long control lines (max. 300 m), with anti-interference filter. ❻ For versions 230VAC/DC and 230VAC/DC-10: the distance at least 5 mm between the relays mounted side by side. ❼ It shall be remarked that rated input voltage of the operational relay Us not always complies with the rated input voltage Un (which is important on ordering operational relays for sockets).

RM699BV + 6W-...

RSR30 + 6W-...

- Width 6,2 mm • Interface relay **SIR6W-...** consists of: screw terminals universal socket, with electronic **6W-...**, miniature operational relay - electromagnetic **RM699BV** or solid state **RSR30** ❶
- 35 mm rail mount acc. to EN 60715 • May be linked with 20-pole interconnection strip type **JB20** • Equipped in LED green
- Accessories: separators **6W-SEP**, cards of description plates **MP6-C**
- Recognitions, certifications, directives: RoHS,

NEW

Output circuit (RM699BV) - contact data ❶

Number and type of contacts (code of output)		1 CO (R) ❸	1 CO (R01) ❸
Contact material		**$AgSnO_2$**	$AgSnO_2$/Au hard gold plating ❷
Max. switching voltage		400 V AC / 250 V DC	30 V AC / 36 V DC ❷
Min. switching voltage	AC / DC	10 V	5 V
Rated load (capacity)	AC1	6 A / 250 V AC	0,05 A / 30 V AC ❷
	AC15	3 A / 120 V; 1,5 A / 240 V (B300)	–
	DC1	6 A / 30 V DC; 0,15 A / 250 V DC	0,05 A / 36 V DC ❷
	DC13	0,22 A / 120 V; 0,1 A / 250 V (R300)	–
Motor load	acc. to UL 508	1/4 HP 240 V AC ❹	–
	AC3 acc. to IEC 60947-4-1	0,186 kW 240 V AC ❹	–
Min. switching current		100 mA	10 mA
Max. inrush current		10 A 20 ms	0,1 A 20 ms ❷
Rated current		6 A	0,05 A ❷
Max. breaking capacity	AC1	1 500 VA	1,2 VA ❷
Min. breaking capacity		1 W	0,05 W
Contact resistance		≤ 100 mΩ 100 mA, 24 V	≤ 30 mΩ 10 mA, 5 V
Max. operating frequency	• at rated load AC1	360 cycles/hour	
	• no load	72 000 cycles/hour	

Output circuit (RSR30) - output data ❶

Type of output (code of output)		Triac (T) ❸ max. 2 A	Transistor (C) ❸ max. 1 A	Transistor (O) ❸ max. 2 A
Number and type of outputs		1 NO	1 NO	1 NO
Rated voltage		240 V AC	48 V DC	24 V DC
Switching voltage range		12 ... 280 V AC	1,5 ... 60 V DC	1,5 ... 32 V DC
Rated continuous output current	AC1	1 A		
	DC1		1 A	2 A
Min. making capacity current		50 mA	1 mA	1 mA
Max. off-state leakage current (turn-off state)		1,5 mA	1 mA	1 mA
Max. on-state voltage drop on the connection (operating state)		1,2 V	0,4 V	0,24 V
Operating switching frequency			10 Hz	10 Hz

Input circuit

Rated voltage	❺ DC	6, 12, **24** V
	AC: 50/60 Hz AC/DC	12, **24**, 48, 60, 110...125, **220...240** V
Operating range of supply voltage	DC	SIR6W-...-R/-R01: 0,8...1,2 U_n
	AC/DC	SIR6W-...-R/-R01: 0,8...1,1 U_n SIR6W-...-R/-R01: 0,85...1,1 U_n 6 V DC
	AC/DC	SIR6W-...-T/-C/-O: 0,8...1,25 U_n
Rated power consumption		see Table 1

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V	
Overvoltage category		III	
Insulation pollution degree		3	
Dielectric strength	• input - output	4 000 V AC	50/60 Hz, 1 min., type of insulation: reinforced
	• input - output	6 000 V	1,2 / 50 µs
	• mass - input, output	2 500 V AC	50/60 Hz, 1 min.
	• contact clearance	1 000 V AC	50/60 Hz, 1 min., output R and R01, type of clearance: micro-disconnection
Input - output distance		clearance / creepage: ≥ 6 mm / ≥ 8 mm	
Mass - output distance		clearance / creepage: ≥ 3 mm / ≥ 3,6 mm	

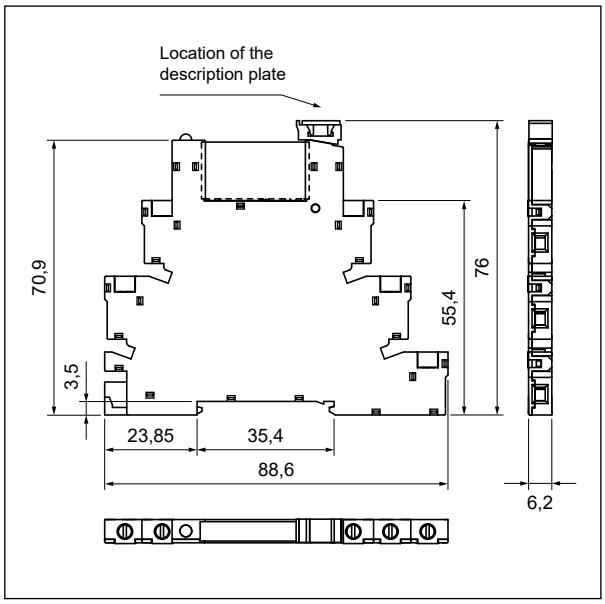
The data in bold type relate to the standard versions of the relays. ❶ Characteristics of the contact capacity of relays **SIR6W-... with RM699BV** - see page 139, **SIR6W-... with RSR30** - see www.relpol.com.pl ❷ For gold-plated contacts - when the maximum values given have been exceeded, the gold layer is destroyed. Then, the advantages of gold-plating disappear and the values are as for $AgSnO_2$ contacts (see beside), and electrical life of these contacts may be shorter than of normal contacts. ❸ Type of outputs: **R** - contacts $AgSnO_2$; **R01** - contacts $AgSnO_2$/Au hard gold plating; **T** - triac; **C** - transistor (1 A); **O** - transistor (2 A). ❹ Contact 1 NO, single-phase motor. ❺ Note: fixed polarization of input voltage (+A1, -A2).

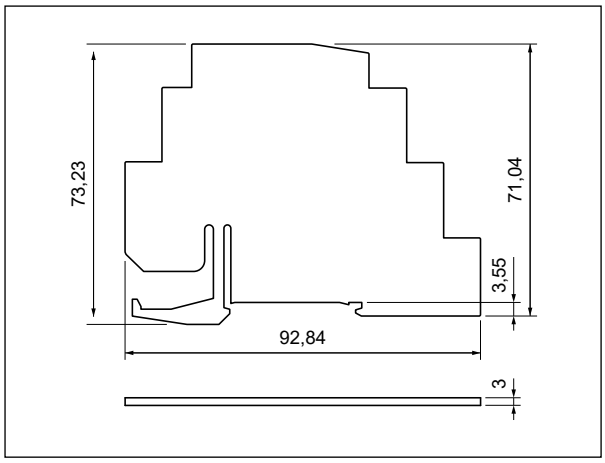
General data

Operating time (typical value)	SIR6W-...-R/-R01: version DC: 8 ms	version AC/DC: 20 ms
	SIR6W-...-T:	version AC/DC: 10 ms
	SIR6W-...-C/-O:	version AC/DC: 10 ms
Release time (typical value)	SIR6W-...-R/-R01: version DC: 10 ms	version AC/DC: 25 ms
	SIR6W-...-T:	version AC/DC: 30 ms
	SIR6W-...-C/-O:	version AC/DC: 20 ms
Electrical life • resistive AC1	SIR6W-...-R: > 0,5 x 10^5	6 A, 250 V AC
Mechanical life (cycles)	SIR6W-...-R/-R01: > 10^7	
Dimensions (L x W x H)	88,6 x 6,2 x 76 mm	
Weight	SIR6W-...-R/-R01: 30 g	...-T/-C/-O: 28 g
Ambient temperature • storage	SIR6W-...-R/-R01/-T: -40...+70 °C	...-C/-O: -25...+70 °C
(non-condensation and/or icing) • operating	SIR6W-...-R/-R01: -40...+70 °C	...-T/-C/-O: -20...+55 °C
	SIR6W-110-125VAC/DC-R/-R01: -40...+55 °C ❻	
	SIR6W-220-240VAC/DC-R/-R01: -40...+55 °C ❻	
Cover protection category	IP 20	EN 60529
Environmental protection	RTI	EN 61810-7
Shock resistance	10 g	
Vibration resistance	5 g	10...500 Hz

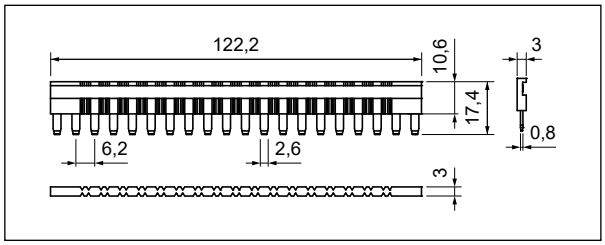
❻ For versions 110...125 V AC/DC and 220...240 V AC/DC: a distance of 5 mm must be maintained between relays operating at an ambient temperature of max. +55 °C, when they are supplied permanently or with a duty cycle > 50% (for groups of relays mounted without ventilation distances, the maximum operating temperature is max. +30 °C).

Dimensions

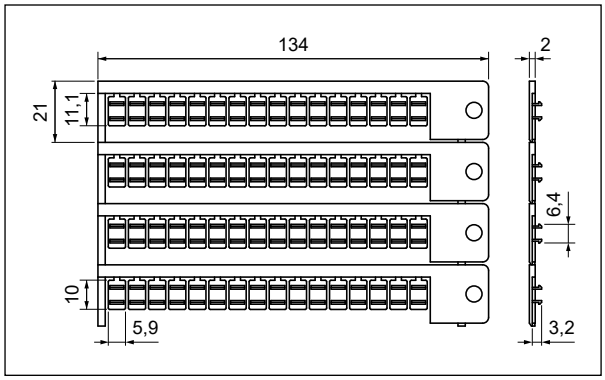




Separator **6W-SEP**



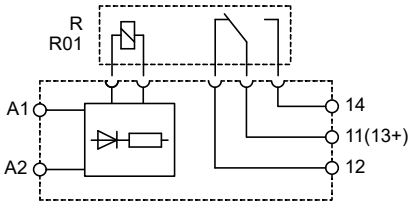
20-pole interconnection strip type **JB20**



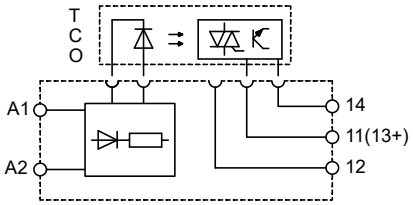
Card of description plates **MP6-C**

Connection diagrams

SIR6W-...-R, SIR6W-...-R01



SIR6W-...-T, SIR6W-...-C, SIR6W-...-O



Mounting

Relays **SIR6W-...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 / 2 x 1,5 mm^2 (1 x 14 / 2 x 16 AWG), stripping length: 7 mm, maks. max. tightening moment for the terminal: 0,5 Nm.
Interface relay **SIR6W-...** consists of: screw terminals universal socket, with electronic **6W-...**, miniature operational relay - electromagnetic **RM699BV** or solid state **RSR30** ❸.
SIR6W-... may be linked with 20-pole interconnection strip type **JB20**. Strip **JB20** bridges common input or output signals, maximum permissible current is 36 A / 250 V AC. Colours of strips: **JB20-1** red, **JB20-2** black, **JB20-3** blue. For **SIR6W-...** relays we offer **6W-SEP** separators that provide: optical division of groups of interface relays, separation of group of interface relays with different supply voltages (according to VDE 0106-101), insulation for cut **JB20** interconnection strips, additional insulation from other devices in metal housings or from metal end clamps on 35 mm rails. In the set with the **SIR6W-...** interface relay, a single description plate is supplied, snap into tall marker groove, compatible with the standard for DIN rail terminal blocks. Cards **MP6-C** for automatic printing, containing 64 description plates, should be ordered separately.

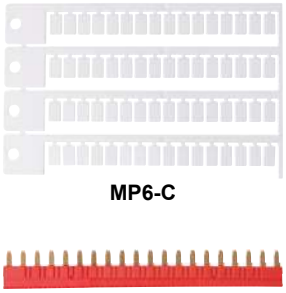
❸ Type of outputs: **R** - contacts $AgSnO_2$; **R01** - contacts $AgSnO_2$/Au hard gold plating; **T** - triac; **C** - transistor (1 A); **O** - transistor (2 A).

6W-...

6W-SEP

RM699BV

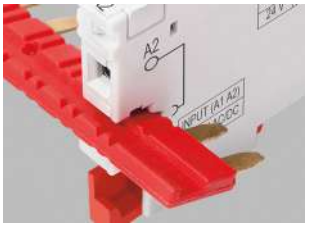
RSR30



MP6-C

JB20

Green LED:
signalling the operation status of the relay.



Interconnection strip JB20:
bridging of common input or output signals.

Movable ejector: protection and easy replacement of the operational relay.

Table of codes

Table 1

Interface relay code	Rated input voltage U_n ❽	Power of input circuit at voltage U_n	Socket code for the set	Operational relay code	Rated voltage of operational relay U_s ❽
SIR6W-6VDC-R ❺	6 V DC	0,2 W	6W-6-24VDC	RM699BV-3011-85-1005	5 V DC
SIR6W-12VDC-R ❺	12 V DC	0,2 W	6W-6-24VDC	RM699BV-3011-85-1012	12 V DC
SIR6W-24VDC-R ❺	**24 V DC**	**0,4 W**	**6W-6-24VDC**	**RM699BV-3011-85-1024**	**24 V DC**
SIR6W-12VAC/DC-R	12 V AC/DC	0,2 VA / 0,2 W	6W-12-24V-U	RM699BV-3011-85-1012	12 V DC
SIR6W-24VAC/DC-R	**24 V AC/DC**	**0,4 VA / 0,4 W**	**6W-12-24V-U**	**RM699BV-3011-85-1024**	**24 V DC**
SIR6W-48VAC/DC-R	48 V AC/DC	0,4 VA / 0,4 W	6W-48-60V-U	RM699BV-3011-85-1048	48 V DC
SIR6W-60VAC/DC-R	60 V AC/DC	0,5 VA / 0,5 W	6W-48-60V-U	RM699BV-3011-85-1060	60 V DC
SIR6W-110-125VAC/DC-R ❻	110…125 V AC/DC	0,7 VA / 0,7 W ❼	6W-110-125V-U	RM699BV-3011-85-1060	60 V DC
SIR6W-220-240VAC/DC-R ❻	**220…240 V AC/DC**	**0,9 VA / 0,86 W ❼**	**6W-220-240V-U**	**RM699BV-3011-85-1060**	**60 V DC**
SIR6W-6VDC-R01 ❺	6 V DC	0,2 W	6W-6-24VDC	RM699BV-3211-85-1005	5 V DC
SIR6W-12VDC-R01 ❺	12 V DC	0,2 W	6W-6-24VDC	RM699BV-3211-85-1012	12 V DC
SIR6W-24VDC-R01 ❺	**24 V DC**	**0,4 W**	**6W-6-24VDC**	**RM699BV-3211-85-1024**	**24 V DC**
SIR6W-12VAC/DC-R01	12 V AC/DC	0,2 VA / 0,2 W	6W-12-24V-U	RM699BV-3211-85-1012	12 V DC
SIR6W-24VAC/DC-R01	**24 V AC/DC**	**0,4 VA / 0,4 W**	**6W-12-24V-U**	**RM699BV-3211-85-1024**	**24 V DC**
SIR6W-48VAC/DC-R01	48 V AC/DC	0,4 VA / 0,4 W	6W-48-60V-U	RM699BV-3211-85-1048	48 V DC
SIR6W-60VAC/DC-R01	60 V AC/DC	0,5 VA / 0,5 W	6W-48-60V-U	RM699BV-3211-85-1060	60 V DC
SIR6W-110-125VAC/DC-R01 ❻	110…125 V AC/DC	0,7 VA / 0,7 W ❼	6W-110-125V-U	RM699BV-3211-85-1060	60 V DC
SIR6W-220-240VAC/DC-R01 ❻	**220…240 V AC/DC**	**0,9 VA / 0,86 W ❼**	**6W-220-240V-U**	**RM699BV-3211-85-1060**	**60 V DC**
SIR6W-12VAC/DC-T	12 V AC/DC	0,15 VA / 0,15 W	6W-12-24V-U	RSR30-D12-A1-24-020-1	12 V DC
SIR6W-24VAC/DC-T	**24 V AC/DC**	**0,3 VA / 0,3 W**	**6W-12-24V-U**	**RSR30-D24-A1-24-020-1**	**24 V DC**
SIR6W-12VAC/DC-C	12 V AC/DC	0,15 VA / 0,15 W	6W-12-24V-U	RSR30-D12-D1-04-025-1	12 V DC
SIR6W-24VAC/DC-C	**24 V AC/DC**	**0,3 VA / 0,3 W**	**6W-12-24V-U**	**RSR30-D24-D1-04-025-1**	**24 V DC**
SIR6W-48VAC/DC-C	48 V AC/DC	0,4 VA / 0,4 W	6W-48-60V-U	RSR30-D48-D1-04-025-1	48 V DC
SIR6W-12VAC/DC-O	12 V AC/DC	0,15 VA / 0,15 W	6W-12-24V-U	RSR30-D12-D1-02-040-1	12 V DC
SIR6W-24VAC/DC-O	**24 V AC/DC**	**0,3 VA / 0,3 W**	**6W-12-24V-U**	**RSR30-D24-D1-02-040-1**	**24 V DC**
SIR6W-48VAC/DC-O	48 V AC/DC	0,4 VA / 0,4 W	6W-48-60V-U	RSR30-D48-D1-02-040-1	48 V DC

The data in bold type relate to the standard versions of the relays. ❺ Note: fixed polarization of input voltage (+A1, -A2). ❻ For versions 110...125 V AC/DC and 220...240 V AC/DC: see recommendations regarding ambient temperature during operation. ❼ Power consumption at U_n=125 V and U_n=240 V. ❽ It shall be remarked that rated input voltage of the operational relay U_s not always complies with the rated input voltage U_n (which is important on ordering operational relays for sockets).

Ordering codes

Ordering codes **SIR6W-...** are specified in Table 1, ”Interface relay code” column.

Interface relays SIR6W-...

set: relay RM699BV (RSR30) + socket 6W-...

NEW

SIR6WB-...
interface relays with spring terminals

RM699BV + 6WB-...

RSR30 + 6WB-...

- Width 6,2 mm • Interface relay **SIR6WB-...** consists of: spring terminals universal socket, with electronic **6WB-...**, miniature operational relay - electromagnetic **RM699BV** or solid state **RSR30** ❶
- 35 mm rail mount acc. to EN 60715 • May be linked with 20-pole interconnection strip type **JB20** • Equipped in LED green
- Accessories: separators **6W-SEP**, cards of description plates **MP6-C**
- Recognitions, certifications, directives: RoHS,

NEW

Output circuit (RM699BV) - contact data ❶

Number and type of contacts (code of output)		1 CO (R) ❸	1 CO (R01) ❸
Contact material		**$AgSnO_2$**	$AgSnO_2$/Au hard gold plating ❷
Max. switching voltage		400 V AC / 250 V DC	30 V AC / 36 V DC ❷
Min. switching voltage	AC / DC	10 V	5 V
Rated load (capacity)	AC1	6 A / 250 V AC	0,05 A / 30 V AC ❷
	AC15	3 A / 120 V; 1,5 A / 240 V (B300)	–
	DC1	6 A / 30 V DC; 0,15 A / 250 V DC	0,05 A / 36 V DC ❷
	DC13	0,22 A / 120 V; 0,1 A / 250 V (R300)	–
Motor load	acc. to UL 508	1/4 HP 240 V AC ❹	–
	AC3 acc. to IEC 60947-4-1	0,186 kW 240 V AC ❹	–
Min. switching current		100 mA	10 mA
Max. inrush current		10 A 20 ms	0,1 A 20 ms ❷
Rated current		6 A	0,05 A ❷
Max. breaking capacity	AC1	1 500 VA	1,2 VA ❷
Min. breaking capacity		1 W	0,05 W
Contact resistance		≤ 100 mΩ 100 mA, 24 V	≤ 30 mΩ 10 mA, 5 V
Max. operating frequency	• at rated load AC1	360 cycles/hour	
	• no load	72 000 cycles/hour	

Output circuit (RSR30) - output data ❶

Type of output (code of output)		Triac (T) ❸ max. 2 A	Transistor (C) ❸ max. 1 A	Transistor (O) ❸ max. 2 A
Number and type of outputs		1 NO	1 NO	1 NO
Rated voltage		240 V AC	48 V DC	24 V DC
Switching voltage range		12 ... 280 V AC	1,5 ... 60 V DC	1,5 ... 32 V DC
Rated continuous output current	AC1	1 A		
	DC1		1 A	2 A
Min. making capacity current		50 mA	1 mA	1 mA
Max. off-state leakage current (turn-off state)		1,5 mA	1 mA	1 mA
Max. on-state voltage drop on the connection (operating state)		1,2 V	0,4 V	0,24 V
Operating switching frequency			10 Hz	10 Hz

Input circuit

Rated voltage	❺ DC	6, 12, **24** V
	AC: 50/60 Hz AC/DC	12, **24**, 48, 60, 110...125, **220...240** V
Operating range of supply voltage	DC	SIR6WB-...-R/-R01: 0,8...1,2 U_n
	AC/DC	SIR6WB-...-R/-R01: 0,8...1,1 U_n SIR6WB-...-R/-R01: 0,85...1,1 U_n 6 V DC
	AC/DC	SIR6WB-...-T/-C/-O: 0,8...1,25 U_n
Rated power consumption		see Table 1

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V	
Overvoltage category		III	
Insulation pollution degree		3	
Dielectric strength	• input - output	4 000 V AC	50/60 Hz, 1 min., type of insulation: reinforced
	• input - output	6 000 V	1,2 / 50 µs
	• mass - input, output	2 500 V AC	50/60 Hz, 1 min.
	• contact clearance	1 000 V AC	50/60 Hz, 1 min., output R and R01, type of clearance: micro-disconnection
Input - output distance		clearance / creepage: ≥ 6 mm / ≥ 8 mm	
Mass - output distance		clearance / creepage: ≥ 3 mm / ≥ 4 mm	

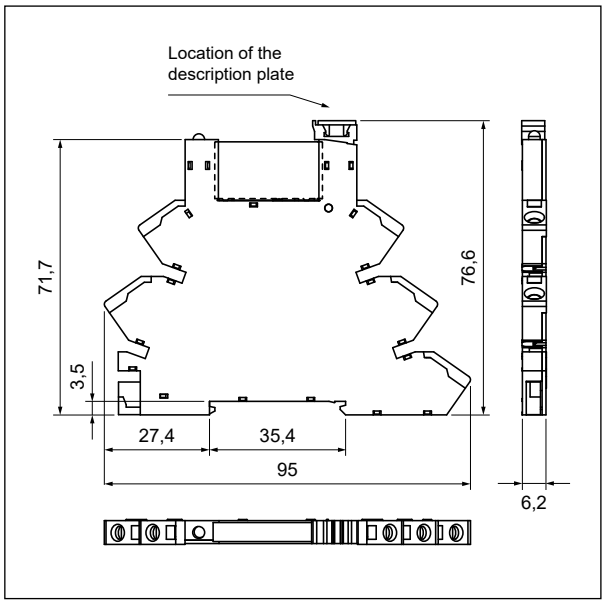
The data in bold type relate to the standard versions of the relays. ❶ Characteristics of the contact capacity of relays **SIR6WB-... with RM699BV** - see page 139, **SIR6WB-... with RSR30** - see www.relpol.com.pl ❷ For gold-plated contacts - when the maximum values given have been exceeded, the gold layer is destroyed. Then, the advantages of gold-plating disappear and the values are as for $AgSnO_2$ contacts (see beside), and electrical life of these contacts may be shorter than of normal contacts. ❸ Type of outputs: **R** - contacts $AgSnO_2$; **R01** - contacts $AgSnO_2$/Au hard gold plating; **T** - triac; **C** - transistor (1 A); **O** - transistor (2 A). ❹ Contact 1 NO, single-phase motor. ❺ Note: fixed polarization of input voltage (+A1, -A2).

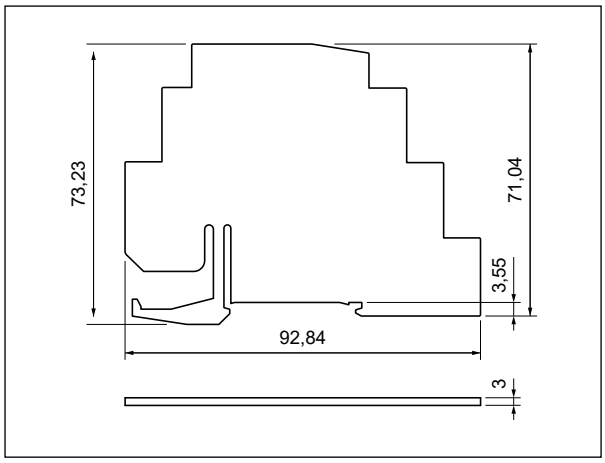
General data

Operating time (typical value)	SIR6WB-...-R/-R01: version DC: 8 ms	version AC/DC: 20 ms
	SIR6WB-...-T:	version AC/DC: 10 ms
	SIR6WB-...-C/-O:	version AC/DC: 10 ms
Release time (typical value)	SIR6WB-...-R/-R01: version DC: 10 ms	version AC/DC: 25 ms
	SIR6WB-...-T:	version AC/DC: 30 ms
	SIR6WB-...-C/-O:	version AC/DC: 20 ms
Electrical life • resistive AC1	SIR6WB-...-R: > 0,5 x 10^5 6 A, 250 V AC	
Mechanical life (cycles)	SIR6WB-...-R/-R01: > 10^7	
Dimensions (L x W x H)	95 x 6,2 x 76,6 mm	
Weight	SIR6WB-...-R/-R01: 30 g	...-T/-C/-O: 28 g
Ambient temperature • storage	SIR6WB-...-R/-R01/-T: -40...+70 °C	...-C/-O: -25...+70 °C
(non-condensation and/or icing) • operating	SIR6WB-...-R/-R01: -40...+70 °C	...-T/-C/-O: -20...+55 °C
	SIR6WB-110-125VAC/DC-R/-R01: -40...+55 °C ❻	
	SIR6WB-220-240VAC/DC-R/-R01: -40...+55 °C ❻	
Cover protection category	IP 20 EN 60529	
Environmental protection	RTI EN 61810-7	
Shock resistance	10 g	
Vibration resistance	5 g 10...500 Hz	

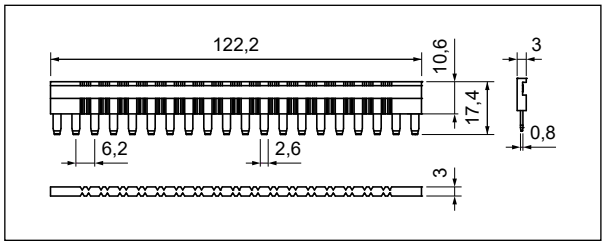
❻ For versions 110...125 V AC/DC and 220...240 V AC/DC: a distance of 5 mm must be maintained between relays operating at an ambient temperature of max. +55 °C, when they are supplied permanently or with a duty cycle > 50% (for groups of relays mounted without ventilation distances, the maximum operating temperature is max. +30 °C).

Dimensions

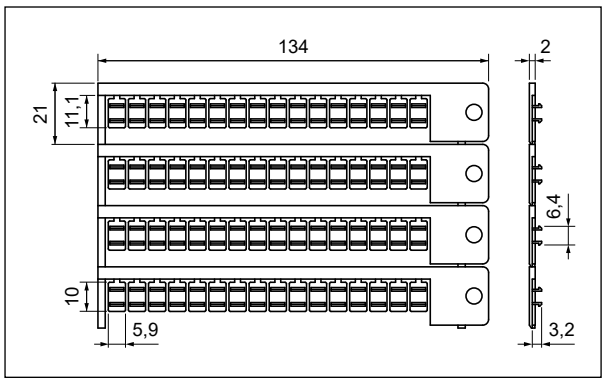




Separator **6W-SEP**



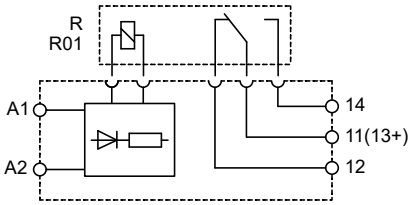
20-pole interconnection strip type **JB20**



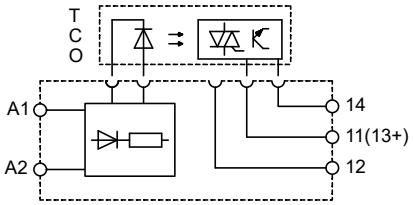
Card of description plates **MP6-C**

Connection diagrams

SIR6WB-...-R, SIR6WB-...-R01



SIR6WB-...-T, SIR6WB-...-C, SIR6WB-...-O



Mounting

Relays **SIR6WB-...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 (1 x 14 AWG), stripping length: 7 mm.
Interface relay **SIR6WB-...** consists of: spring terminals universal socket, with electronic **6WB-...**, miniature operational relay - electromagnetic **RM699BV** or solid state **RSR30** ❸.
SIR6WB-... may be linked with 20-pole interconnection strip type **JB20**. Strip **JB20** bridges common input or output signals, maximum permissible current is 36 A / 250 V AC. Colours of strips: **JB20-1** red, **JB20-2** black, **JB20-3** blue.
For **SIR6WB-...** relays we offer **6W-SEP** separators that provide: optical division of groups of interface relays, separation of group of interface relays with different supply voltages (according to VDE 0106-101), insulation for cut **JB20** interconnection strips, additional insulation from other devices in metal housings or from metal end clamps on 35 mm rails.
In the set with the **SIR6WB-...** interface relay, a single description plate is supplied, snap into tall marker groove, compatible with the standard for DIN rail terminal blocks. Cards **MP6-C** for automatic printing, containing 64 description plates, should be ordered separately.

❸ Type of outputs: **R** - contacts $AgSnO_2$; **R01** - contacts $AgSnO_2$/Au hard gold plating;
T - triac; **C** - transistor (1 A); **O** - transistor (2 A).

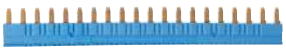
6WB-...

6W-SEP

RM699BV

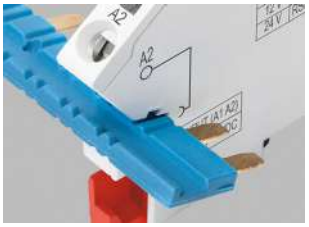
RSR30

MP6-C



JB20

Green LED:
signalling the operation status of the relay.



Interconnection strip JB20:
bridging of common input or output signals.

Movable ejector: protection and easy replacement of the operational relay.

Wire connection

The drawings present the sequence of operations in course of inserting wire to the spring terminal, and the recommended screwdriver to be used for opening of case springs, comply with the DIN 5264 FORM "A".

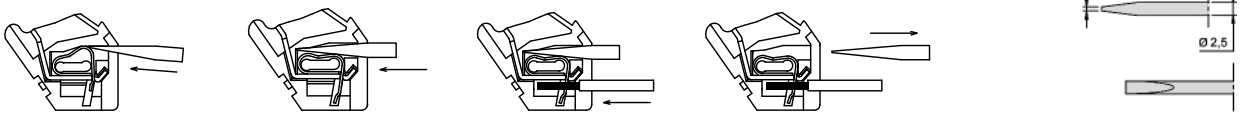


Table of codes

Table 1

Interface relay code	Rated input voltage U_n ❽	Power of input circuit at voltage U_n	Socket code for the set	Operational relay code	Rated voltage of operational relay U_s ❽
SIR6WB-6VDC-R ❺	6 V DC	0,2 W	6WB-6-24VDC	RM699BV-3011-85-1005	5 V DC
SIR6WB-12VDC-R ❺	12 V DC	0,2 W	6WB-6-24VDC	RM699BV-3011-85-1012	12 V DC
SIR6WB-24VDC-R ❺	**24 V DC**	**0,4 W**	**6WB-6-24VDC**	**RM699BV-3011-85-1024**	**24 V DC**
SIR6WB-12VAC/DC-R	12 V AC/DC	0,2 VA / 0,2 W	6WB-12-24V-U	RM699BV-3011-85-1012	12 V DC
SIR6WB-24VAC/DC-R	**24 V AC/DC**	**0,4 VA / 0,4 W**	**6WB-12-24V-U**	**RM699BV-3011-85-1024**	**24 V DC**
SIR6WB-48VAC/DC-R	48 V AC/DC	0,4 VA / 0,4 W	6WB-48-60V-U	RM699BV-3011-85-1048	48 V DC
SIR6WB-60VAC/DC-R	60 V AC/DC	0,5 VA / 0,5 W	6WB-48-60V-U	RM699BV-3011-85-1060	60 V DC
SIR6WB-110-125VAC/DC-R ❻	110…125 V AC/DC	0,7 VA / 0,7 W ❼	6WB-110-125V-U	RM699BV-3011-85-1060	60 V DC
SIR6WB-220-240VAC/DC-R ❻	**220…240 V AC/DC**	**0,9 VA / 0,86 W ❼**	**6WB-220-240V-U**	**RM699BV-3011-85-1060**	**60 V DC**
SIR6WB-6VDC-R01 ❺	6 V DC	0,2 W	6WB-6-24VDC	RM699BV-3211-85-1005	5 V DC
SIR6WB-12VDC-R01 ❺	12 V DC	0,2 W	6WB-6-24VDC	RM699BV-3211-85-1012	12 V DC
SIR6WB-24VDC-R01 ❺	**24 V DC**	**0,4 W**	**6WB-6-24VDC**	**RM699BV-3211-85-1024**	**24 V DC**
SIR6WB-12VAC/DC-R01	12 V AC/DC	0,2 VA / 0,2 W	6WB-12-24V-U	RM699BV-3211-85-1012	12 V DC
SIR6WB-24VAC/DC-R01	**24 V AC/DC**	**0,4 VA / 0,4 W**	**6WB-12-24V-U**	**RM699BV-3211-85-1024**	**24 V DC**
SIR6WB-48VAC/DC-R01	48 V AC/DC	0,4 VA / 0,4 W	6WB-48-60V-U	RM699BV-3211-85-1048	48 V DC
SIR6WB-60VAC/DC-R01	60 V AC/DC	0,5 VA / 0,5 W	6WB-48-60V-U	RM699BV-3211-85-1060	60 V DC
SIR6WB-110-125VAC/DC-R01 ❻	110…125 V AC/DC	0,7 VA / 0,7 W ❼	6WB-110-125V-U	RM699BV-3211-85-1060	60 V DC
SIR6WB-220-240VAC/DC-R01 ❻	**220…240 V AC/DC**	**0,9 VA / 0,86 W ❼**	**6WB-220-240V-U**	**RM699BV-3211-85-1060**	**60 V DC**
SIR6WB-12VAC/DC-T	12 V AC/DC	0,15 VA / 0,15 W	6WB-12-24V-U	RSR30-D12-A1-24-020-1	12 V DC
SIR6WB-24VAC/DC-T	**24 V AC/DC**	**0,3 VA / 0,3 W**	**6WB-12-24V-U**	**RSR30-D24-A1-24-020-1**	**24 V DC**
SIR6WB-12VAC/DC-C	12 V AC/DC	0,15 VA / 0,15 W	6WB-12-24V-U	RSR30-D12-D1-04-025-1	12 V DC
SIR6WB-24VAC/DC-C	**24 V AC/DC**	**0,3 VA / 0,3 W**	**6WB-12-24V-U**	**RSR30-D24-D1-04-025-1**	**24 V DC**
SIR6WB-48VAC/DC-C	48 V AC/DC	0,4 VA / 0,4 W	6WB-48-60V-U	RSR30-D48-D1-04-025-1	48 V DC
SIR6WB-12VAC/DC-O	12 V AC/DC	0,15 VA / 0,15 W	6WB-12-24V-U	RSR30-D12-D1-02-040-1	12 V DC
SIR6WB-24VAC/DC-O	**24 V AC/DC**	**0,3 VA / 0,3 W**	**6WB-12-24V-U**	**RSR30-D24-D1-02-040-1**	**24 V DC**
SIR6WB-48VAC/DC-O	48 V AC/DC	0,4 VA / 0,4 W	6WB-48-60V-U	RSR30-D48-D1-02-040-1	48 V DC

The data in bold type relate to the standard versions of the relays. ❺ Note: fixed polarization of input voltage (+A1, -A2). ❻ For versions 110...125 V AC/DC and 220...240 V AC/DC: see recommendations regarding ambient temperature during operation. ❼ Power consumption at U_n=125 V and U_n=240 V. ❽ It shall be remarked that rated input voltage of the operational relay U_s not always complies with the rated input voltage U_n (which is important on ordering operational relays for sockets).

Ordering codes

Ordering codes **SIR6WB-...** are specified in Table 1, "Interface relay code" column.

Export Sales Department: phone +48 68 47 90 832, 951, export@relpol.com.pl

Relays for railroad industry

Applications of relays for railroad industry:
electrical control systems,
signalling, lighting and air-conditioning systems.

Compliance with standards: EN 45545-2
(category EL10, requirement R26
- flammability class V-0 acc. to EN 60695-11-10);
EN 61373: 2011 category 1, class B
(mechanical shock and vibration resistance);
EN 50155; EN 60077-1; EN 61810-1.

They meet the requirements
of REACH and RoHS Directive.
The relays are recognized and certified by:

CE EAC CIK

industrial

interface

← Contents

12 A / 250 V AC

- For plug-in sockets: on 35 mm rail mount acc. to EN 60715 or on panel mounting • DC coils, insulation class F: 155 °C
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: RoHS, CE EAC CIK ❶

Contact data

Number and type of contacts		2 CO
Contact material		**AgNi**
Rated / max. switching voltage	AC	250 V / 440 V
Min. switching voltage		5 V
Rated load (capacity)	AC1	12 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	12 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❷
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		5 mA
Max. inrush current		24 A
Rated current		12 A
Max. breaking capacity	AC1	3 000 VA
Min. breaking capacity		0,3 W
Contact resistance		≤ 100 mΩ 100 mA, 24 V ≤ 50 mΩ 10 mA, 5 V
Max. operating frequency		
• at rated load	AC1	1 200 cycles/hour
• no load		12 000 cycles/hour

Coil data

Rated voltage	DC	**24**, 110 V ❸
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,7...1,25 U_n EN 50155 see Table 1
Must operate voltage		≤ 0,7 U_n
Rated power consumption	DC	0,9 W

Insulation according to EN 60664-1

Insulation rated voltage	250 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Flammability class	V-0 UL 94, PN-EN 60695-11-10
Dielectric strength	
• between coil and contacts	2 500 V AC type of insulation: basic
• contact clearance	1 500 V AC type of clearance: micro-disconnection
• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	
• clearance	≥ 2,5 mm
• creepage	≥ 4 mm

General data

Operating / release time (typical values)		13 ms / 3 ms
Electrical life		
• resistive AC1		> 10^5 12 A, 250 V AC (duty factor 50%)
• cosφ		see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		27,4 x 21 x 35,5 mm
Weight		35 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+70 °C
Cover protection category		IP 40 IP 20 (with socket GZT2-V0) EN 60529
Environmental protection		RTI EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g category 1, class B EN 61373
Vibration resistance		5 g 10...150 Hz category 1, class B EN 61373

The data in bold type relate to the standard versions of the relays. ❶ Certification IK for interface set PIR2T (R2T with socket GZT2-V0). ❷ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC. ❸ For other voltages, please contact Relpol S.A.

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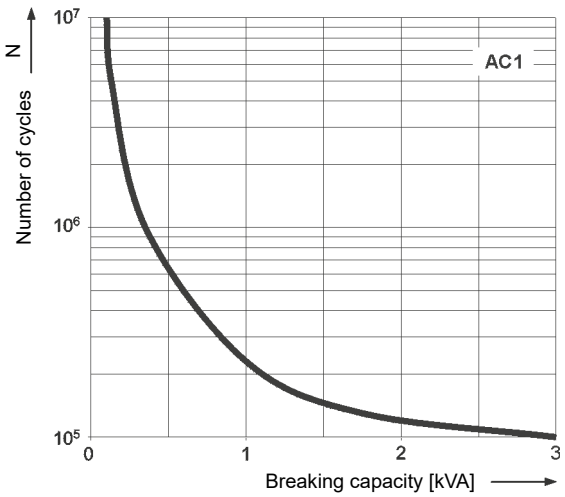
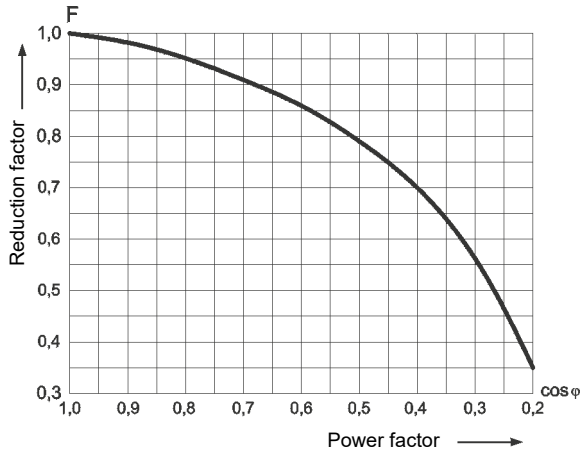
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



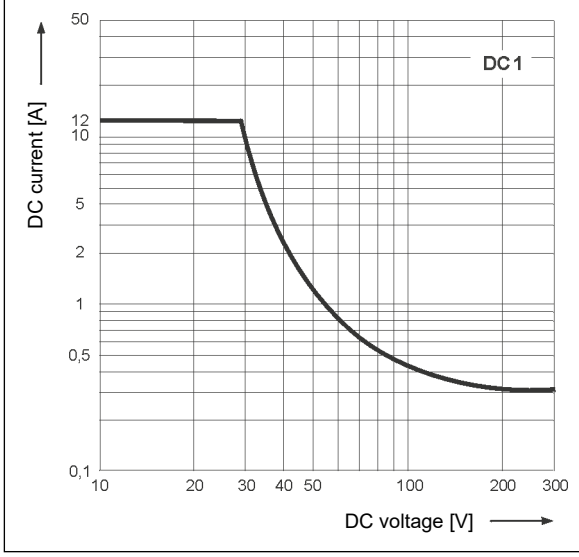
Electrical life reduction factor at AC inductive load Fig. 2



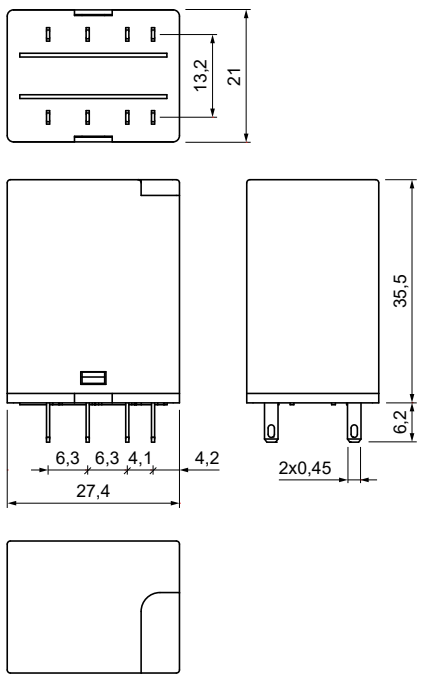
N - electrical life at AC1

$N_{cos\varphi} = N \times F$

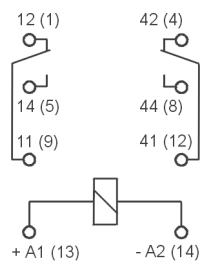
Max. DC resistive load breaking capacity Fig. 3



Dimensions



Connection diagram (pin side view)



2 CO

PIR2T

Relays for railroad industry - interface, contacts 2 CO

Mounting, sockets and accessories for relays

Relays **R2T** are designed for mounting in plug-in sockets.

Sockets for R2T	Accessories		Additional equipment
	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)			
GZT2-V0	G4 1052	GZT4-0035	M...-V0 ❹

❹ Signalling / protecting modules type M...-V0 - see page 4.

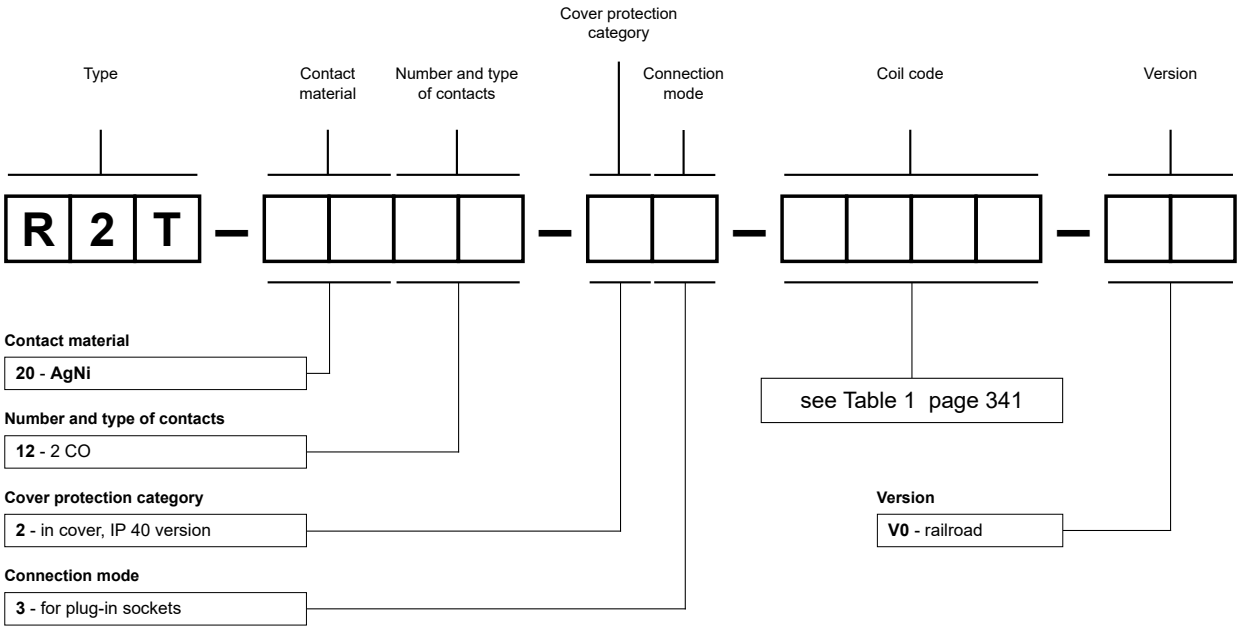
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❸	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC EN 50155 ❺	
				min.	max.
1024	**24**	**640**	**± 10%**	**16,8**	**30,0**
1110	110	13 600	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❸ For other voltages, please contact Relpol S.A. ❺ Changes of voltage within the range 0,6...1,4 Un below 0,1 s and changes of voltage within the range 1,25...1,4 Un below 1 s are admissible and they do not distort operation of the relays.

Ordering codes



Example of ordering codes:

R2T-2012-23-1024-V0 relay **R2T** (railroad version), for plug-in sockets, two changeover contacts, contact material AgNi, coil voltage 24 V DC, in cover IP 40

10 A / 250 V AC

- For plug-in sockets: on 35 mm rail mount acc. to EN 60715 or on panel mounting • DC coils, insulation class F: 155 °C
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: RoHS,

Contact data

Number and type of contacts		3 CO
Contact material		**AgNi**
Rated / max. switching voltage	AC	250 V / 440 V
Min. switching voltage		5 V
Rated load (capacity)	AC1	10 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	10 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❷
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		5 mA
Max. inrush current		20 A
Rated current		10 A
Max. breaking capacity	AC1	2 500 VA
Min. breaking capacity		0,3 W
Contact resistance		≤ 100 mΩ 100 mA, 24 V ≤ 50 mΩ 10 mA, 5 V
Max. operating frequency		
• at rated load	AC1	1 200 cycles/hour
• no load		18 000 cycles/hour

Coil data

Rated voltage	DC	**24**, 110 V ❸
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,7...1,25 U_n EN 50155 see Table 1
Must operate voltage		≤ 0,7 U_n
Rated power consumption	DC	0,9 W

Insulation according to EN 60664-1

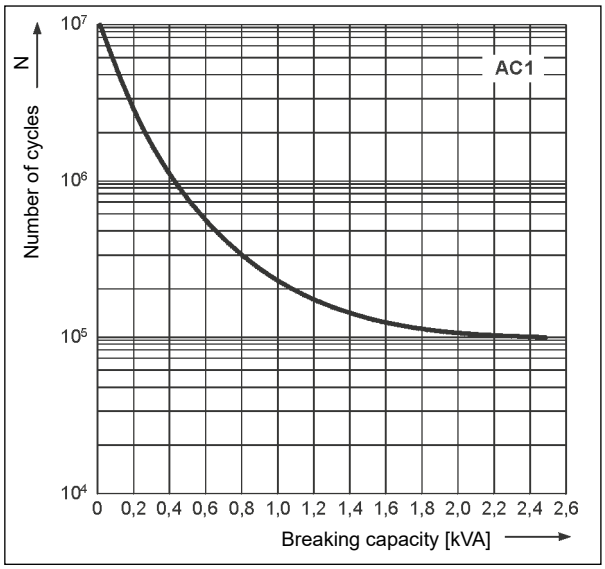
Insulation rated voltage	250 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	2
Flammability class	V-0 UL 94, PN-EN 60695-11-10
Dielectric strength	
• between coil and contacts	2 500 V AC type of insulation: basic
• contact clearance	1 500 V AC type of clearance: micro-disconnection
• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	
• clearance	≥ 2,5 mm
• creepage	≥ 4 mm

General data

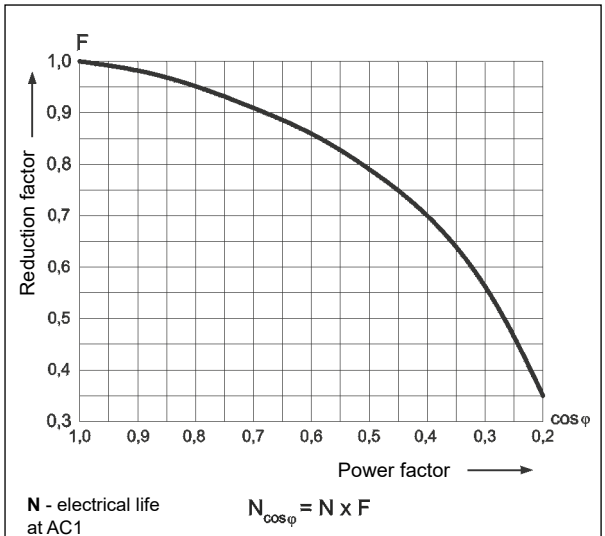
Operating / release time (typical values)		13 ms / 3 ms
Electrical life		
• resistive AC1		> 10^5 10 A, 250 V AC (duty factor 50%)
• cosφ		see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		27,4 x 21 x 35,5 mm
Weight		35 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+70 °C
Cover protection category		IP 40 IP 20 (with socket GZT3-V0) EN 60529
Environmental protection		RTI EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g category 1, class B EN 61373
Vibration resistance		5 g 10...150 Hz category 1, class B EN 61373

The data in bold type relate to the standard versions of the relays. ❶ Certification IK for interface set PIR3T (R3T with socket GZT3-V0). ❷ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC. ❸ For other voltages, please contact Relpol S.A.

Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



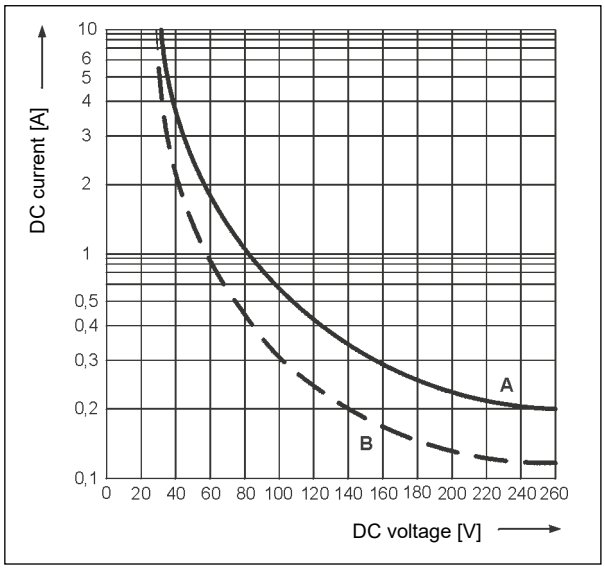
Electrical life reduction factor at AC inductive load Fig. 2



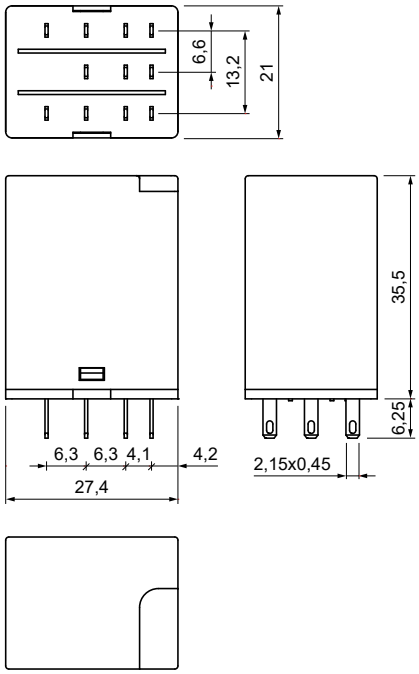
N - electrical life at AC1

$N_{\cos\varphi} = N \times F$

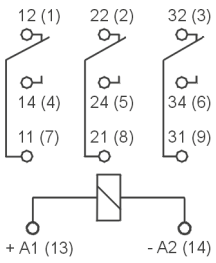
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Dimensions



Connection diagram (pin side view)



3 CO

PIR3T

Relays for railroad industry - interface, contacts 3 CO

RAILROAD

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Mounting, sockets and accessories for relays

Relays **R3T** are designed for mounting in plug-in sockets.

Sockets for R3T	Accessories		Additional equipment
	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)			
GZT3-V0	G4 1052	GZT4-0035	M...-V0 ❹

❹ Signalling / protecting modules type M...-V0 - see page 4.

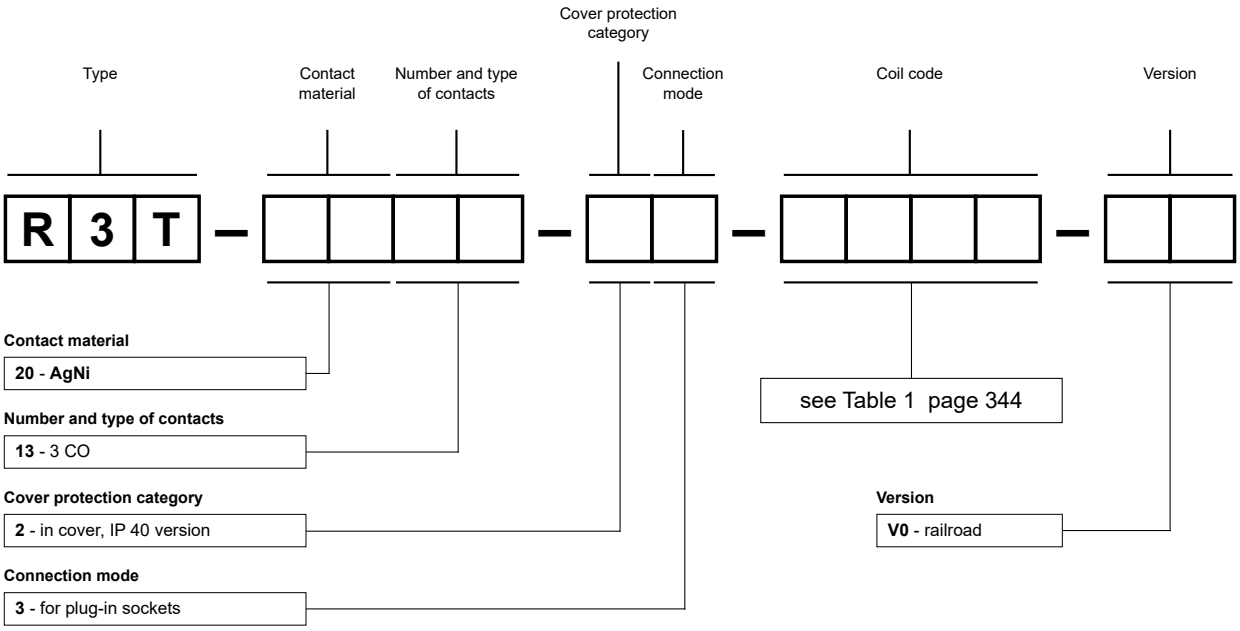
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❸	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC EN 50155 ❺	
				min.	max.
1024	**24**	**640**	**± 10%**	**16,8**	**30,0**
1110	110	13 600	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❸ For other voltages, please contact Relpol S.A. ❺ Changes of voltage within the range 0,6...1,4 Un below 0,1 s and changes of voltage within the range 1,25...1,4 Un below 1 s are admissible and they do not distort operation of the relays.

Ordering codes



Example of ordering codes:

R3T-2013-23-1024-V0 relay **R3T** (railroad version), for plug-in sockets, three changeover contacts, contact material AgNi, coil voltage 24 V DC, in cover IP 40

7 A / 230 V AC

- For plug-in sockets: on 35 mm rail mount acc. to EN 60715 or on panel mounting • DC coils, insulation class F: 155 °C
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: RoHS, CE EAC CIK ❶

Contact data

Number and type of contacts		4 CO	
Contact material		**AgNi**	
Rated / max. switching voltage	AC	250 V / 440 V	
Min. switching voltage		10 V	
Rated load (capacity)	AC1	7 A / 230 V AC (VDE)	6 A / 250 V AC
	AC15	1,5 A / 120 V	0,75 A / 240 V (C300)
	DC1	6 A / 24 V DC (see Fig. 3)	
	DC13	0,22 A / 120 V	0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/3 HP	240 V AC, 3,6 FLA, single-phase motor ❷
	AC3 acc. to IEC 60947-4-1	0,125 kW	240 V AC, single-phase motor
Min. switching current		5 mA	
Max. inrush current		12 A	
Rated current		7 A	
Max. breaking capacity	AC1	1 500 VA	
Min. breaking capacity		0,3 W	
Contact resistance		≤ 100 mΩ	100 mA, 24 V
Max. operating frequency			
• at rated load	AC1	1 200 cycles/hour	
• no load		18 000 cycles/hour	

Coil data

Rated voltage	DC	**24**, 110 V ❸	
Must release voltage		≥ 0,1 U_n	
Operating range of supply voltage		0,7...1,25 U_n EN 50155	see Table 1
Must operate voltage		≤ 0,7 U_n	
Rated power consumption	DC	0,9 W	

Insulation according to EN 60664-1

Insulation rated voltage	250 V AC	
Rated surge voltage	2 500 V	1,2 / 50 µs
Overvoltage category	II	
Insulation pollution degree	2	
Flammability class	V-0	UL 94, PN-EN 60695-11-10
Dielectric strength		
• between coil and contacts	2 500 V AC	type of insulation: basic
• contact clearance	1 500 V AC	type of clearance: micro-disconnection
• pole - pole	2 000 V AC	type of insulation: basic
Contact - coil distance		
• clearance	≥ 1,6 mm	
• creepage	≥ 3,2 mm	

General data

Operating / release time (typical values)		13 ms / 3 ms	
Electrical life			
• resistive AC1		> 5 x 10^4	7 A, 230 V AC (duty factor 50%)
		> 10^5	6 A, 250 V AC (duty factor 50%)
• cosφ		see Fig. 2	
Mechanical life (cycles)		> 2 x 10^7	
Dimensions (L x W x H)		27,4 x 21 x 35,5 mm	
Weight		35 g	
Ambient temperature	• storage	-40...+85 °C	
(non-condensation and/or icing)	• operating	-40...+70 °C	
Cover protection category		IP 40	IP 20 (with socket GZT4-V0) EN 60529
Environmental protection		RTI	EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g	category 1, class B EN 61373
Vibration resistance		5 g 10...150 Hz	category 1, class B EN 61373

The data in bold type relate to the standard versions of the relays. ❶ Certification IK for interface set PIR4T (R4T with socket GZT4-V0). ❷ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC. ❸ For other voltages, please contact Relpol S.A.

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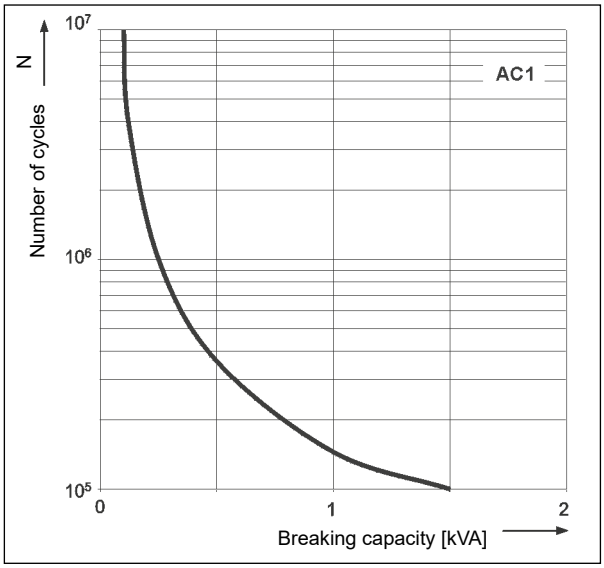
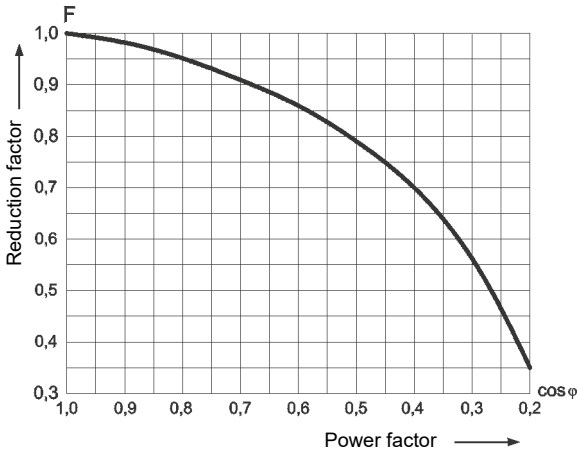
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



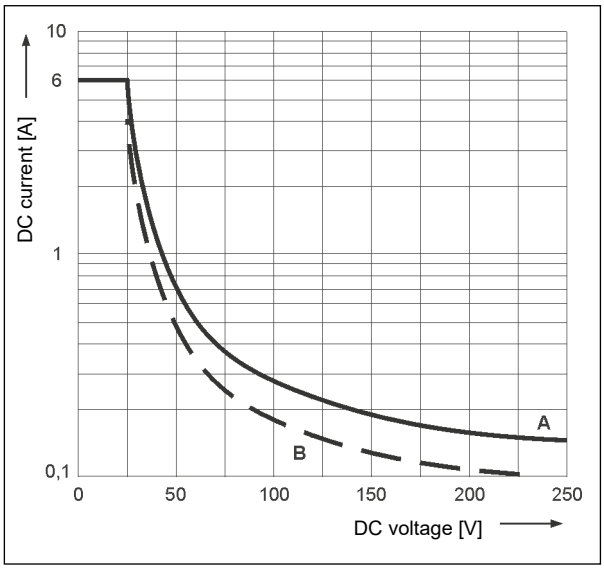
Electrical life reduction factor at AC inductive load Fig. 2



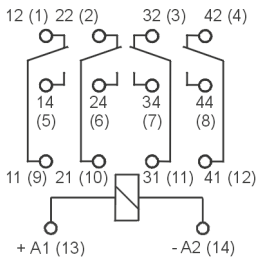
N - electrical life at AC1

$N_{cos\varphi} = N \times F$

Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3

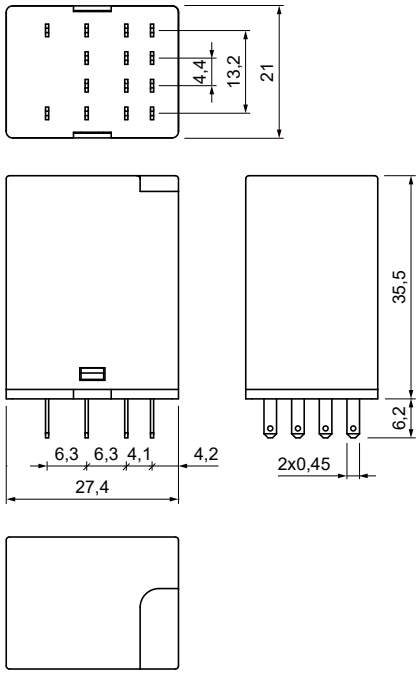


Connection diagram (pin side view)



4 CO

Dimensions



PIR4T

Relays for railroad industry - interface, contacts 4 CO

Mounting, sockets and accessories for relays

Relays **R4T** are designed for mounting in plug-in sockets.

Sockets for R4T	Accessories		Additional equipment
	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)			
GZT4-V0	G4 1052	GZT4-0035	M...-V0 ❹

❹ Signalling / protecting modules type M...-V0 - see page 4.

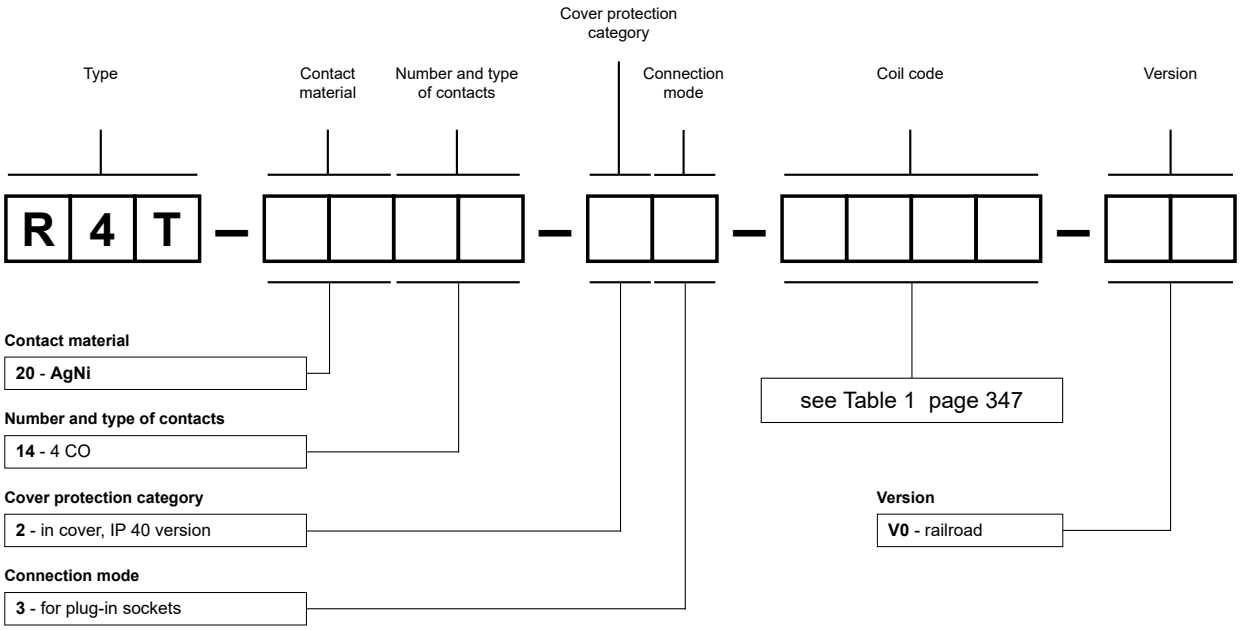
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❸	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC EN 50155 ❺	
				min.	max.
1024	**24**	**640**	**± 10%**	**16,8**	**30,0**
1110	110	13 600	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❸ For other voltages, please contact Relpol S.A. ❺ Changes of voltage within the range 0,6...1,4 U_n below 0,1 s and changes of voltage within the range 1,25...1,4 U_n below 1 s are admissible and they do not distort operation of the relays.

Ordering codes



Example of ordering codes:

R4T-2014-23-1110-V0 relay **R4T** (railroad version), for plug-in sockets, four changeover contacts, contact material AgNi, coil voltage 110 V DC, in cover IP 40

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R15T - 2 CO, 3 CO

relays for railroad industry - industrial

R15T - 2 CO

R15T - 3 CO

- For plug-in sockets: on 35 mm rail mount acc. to EN 60715 or on panel mounting • DC coils, insulation class F: 155 °C
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: RoHS,

CE EAC CIK ❶

Contact data

Number and type of contacts		2 CO, 3 CO
Contact material		**AgNi**
Rated / max. switching voltage	AC	250 V / 440 V
Min. switching voltage		5 V
Rated load (capacity)	AC1	10 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	10 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❷
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		5 mA
Max. inrush current		20 A
Rated current		10 A
Max. breaking capacity	AC1	2 500 VA
Min. breaking capacity		0,3 W
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	1 200 cycles/hour
• no load		12 000 cycles/hour

Coil data

Rated voltage	DC	**24**, 110 V ❸
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,7...1,25 U_n EN 50155 see Table 1
Must operate voltage		≤ 0,7 U_n
Rated power consumption	DC	1,7 W reinforced version

Insulation according to EN 60664-1

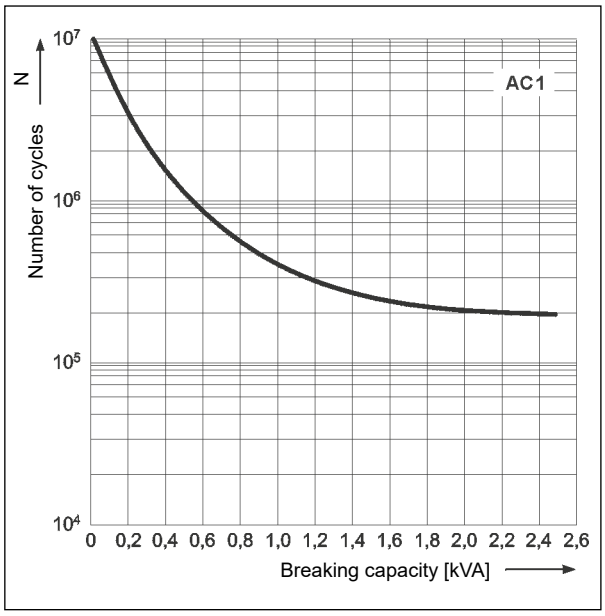
Insulation rated voltage	250 V AC
Rated surge voltage	2 500 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Flammability class	V-0 UL 94, PN-EN 60695-11-10
Dielectric strength	
• between coil and contacts	2 500 V AC type of insulation: basic
• contact clearance	1 500 V AC type of clearance: micro-disconnection
• pole - pole	2 000 V AC type of insulation: basic
Contact - coil distance	
• clearance	≥ 3 mm
• creepage	≥ 4,2 mm

General data

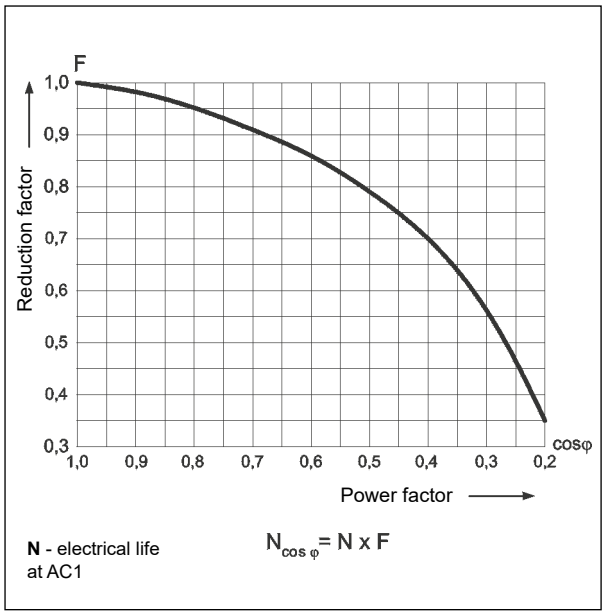
Operating / release time (typical values)		18 ms / 7 ms
Electrical life		
• resistive AC1		> 2 x 10^5 10 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		35 x 35 x 54,4 mm
Weight		83 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+70 °C
Cover protection category		IP 40 IP 20 (with socket PZ8-V0, PZ11-V0) EN 60529
Environmental protection		RTI EN 61810-7
Shock resistance		10 g category 1, class B EN 61373
Vibration resistance		5 g 10...150 Hz category 1, class B EN 61373

The data in bold type relate to the standard versions of the relays. ❶ Certification IK for interface set PIR15.T (R15T with socket PZ..-V0). ❷ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC. ❸ For other voltages, please contact Relpol S.A.

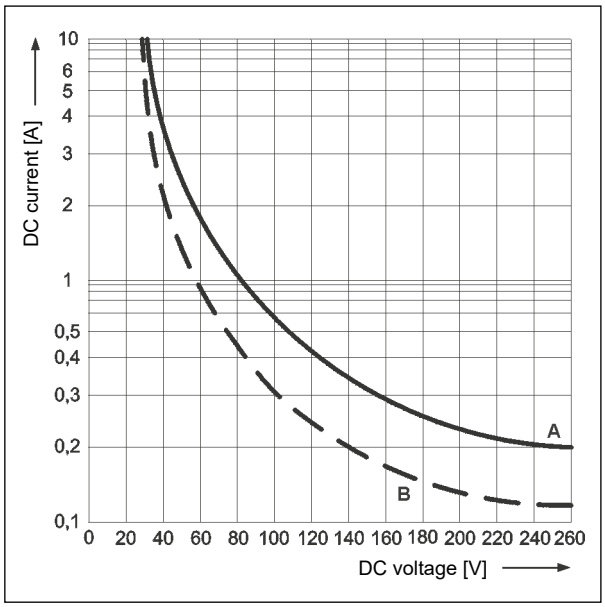
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



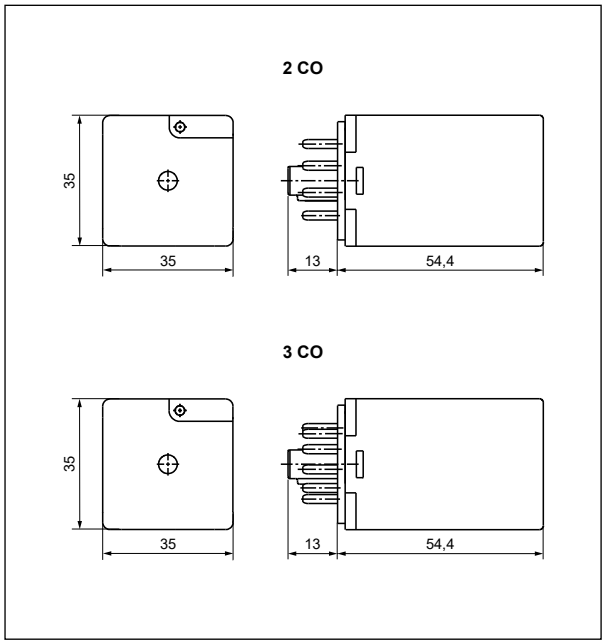
Electrical life reduction factor at AC inductive load Fig. 2



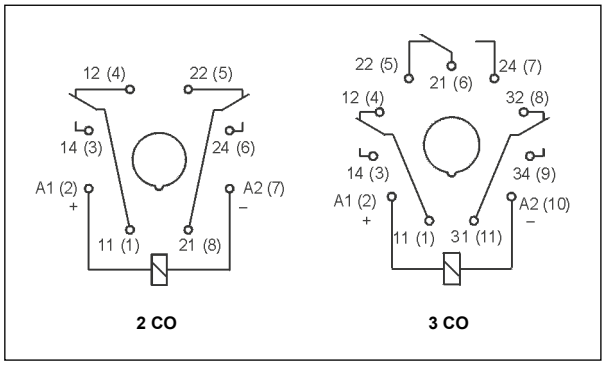
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Dimensions



Connection diagrams (pin side view)



PIR15.T

Relays for railroad industry - interface, contacts 2 CO, 3 CO

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Mounting, sockets and accessories for relays

Relays **R15T - 2 CO, 3 CO** are designed for mounting in plug-in sockets.

Sockets for R15T - 2 CO	Sockets for R15T - 3 CO	**Accessories**
		Spring wire clips
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)		
PZ8-V0	PZ11-V0	PZ11 0031

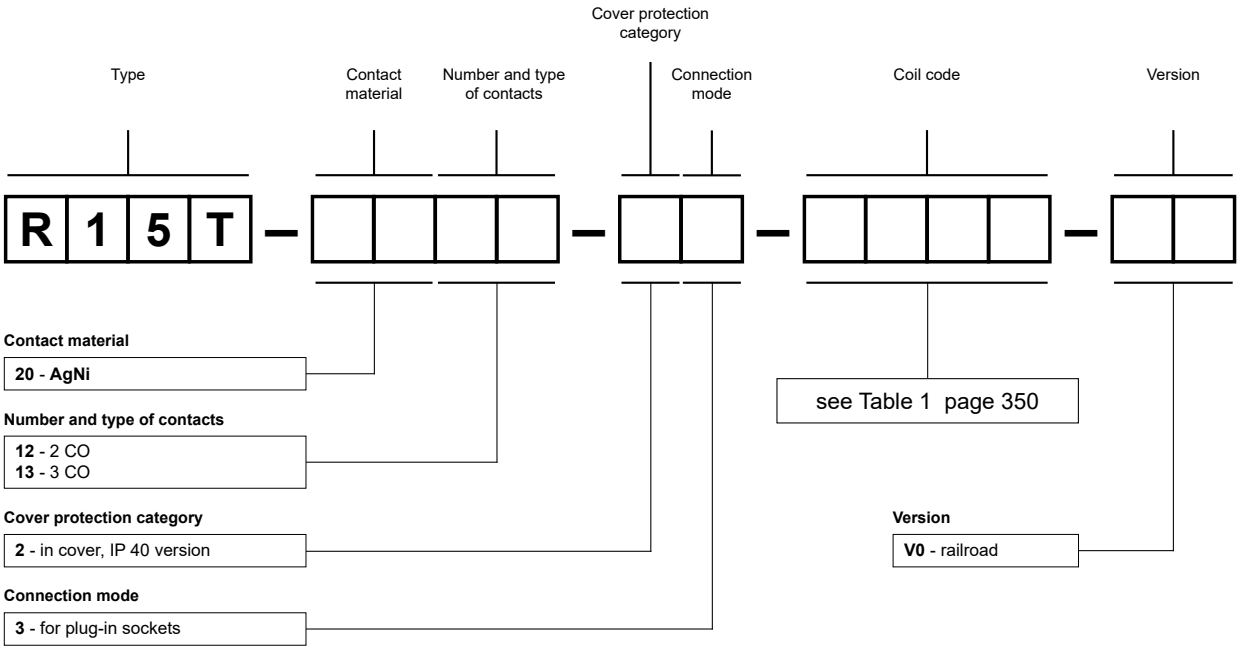
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❸	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC EN 50155 ❹	
				min.	max.
W024	**24**	**345**	**± 10%**	**16,8**	**30,0**
W110	110	7 300	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❸ For other voltages, please contact Relpol S.A. ❹ Changes of voltage within the range 0,6...1,4 U_n below 0,1 s and changes of voltage within the range 1,25...1,4 U_n below 1 s are admissible and they do not distort operation of the relays.

Ordering codes



Examples of ordering codes:

R15T-2012-23-W024-V0 relay **R15T** (railroad version), for plug-in sockets, two changeover contacts, contact material AgNi, reinforced coil voltage 24 V DC, in cover IP 40

R15T-2013-23-W110-V0 relay **R15T** (railroad version), for plug-in sockets, three changeover contacts, contact material AgNi, reinforced coil voltage 110 V DC, in cover IP 40

- For plug-in sockets: on 35 mm rail mount acc. to EN 60715 • DC coils, insulation class F: 155 °C • Version: faston 187 (4,8 x 0,5 mm)
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: RoHS, CE EAC IK ❶

Contact data

Number and type of contacts		3 CO, 3 NO
Contact material		**AgNi**
Rated / max. switching voltage	AC	230 V / 250 V
Min. switching voltage		5 V
Rated load	AC1	16 A / 250 V AC
	DC1	16 A / 24 V DC (see Fig. 3)
Min. switching current		5 mA
Max. inrush current		40 A
Rated current		16 A
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		0,3 W
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	1 200 cycles/hour
• no load		12 000 cycles/hour

Coil data

Rated voltage	DC	**24**, 110 V ❷
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,7...1,25 U_n EN 50155 see Table 1
Must operate voltage		≤ 0,7 U_n
Rated power consumption	DC	1,7 W reinforced version

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2
Flammability class		V-0 UL 94, PN-EN 60695-11-10
Dielectric strength		
• between coil and contacts		2 500 V AC 1 min., type of insulation: basic
• contact clearance		1 500 V AC 1 min., type of clearance: micro-disconnection with contact gap ≥ 0,4 mm
• pole - pole		2 500 V AC 1 min., type of insulation: basic
Contact - coil distance	• clearance	≥ 4 mm
	• creepage	≥ 5 mm
Pole - pole distance	• clearance	≥ 6,3 mm
	• creepage	≥ 8 mm

General data

Operating / release time	• typical values	20 ms / 15 ms
	• max. values	25 ms / 20 ms
Electrical life	• resistive AC1	$> 10^5$ 16 A, 250 V AC
		$> 10^5$ 10 A, 400 V AC
	• cosφ	see Fig. 2
Mechanical life (cycles)		$> 10^7$
Dimensions (L x W x H)		36,1 x 38,6 x 52,65 mm
Weight		80 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+55 °C
Cover protection category		IP 00 EN 60529
Environmental protection		RTI EN 61810-7
Shock resistance		10 g category 1, class B EN 61373
Vibration resistance		5 g 10...150 Hz category 1, class B EN 61373

The data in bold type relate to the standard versions of the relays. ❶ Certification IK for interface set PRUCT (RUCT with socket GUC11S-V0).
❷ For other voltages, please contact Relpol S.A.

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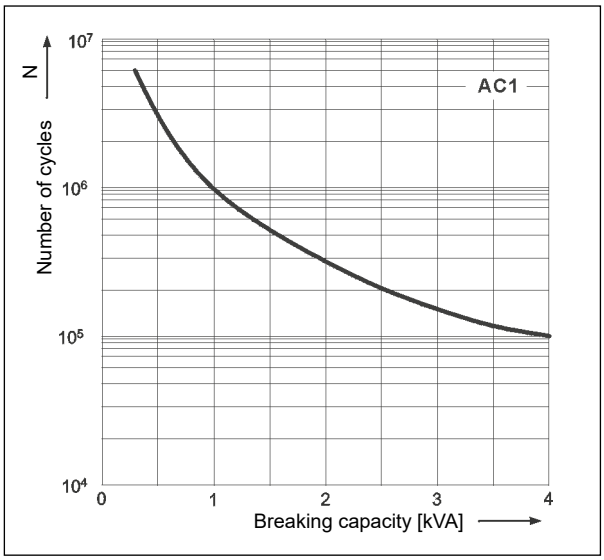
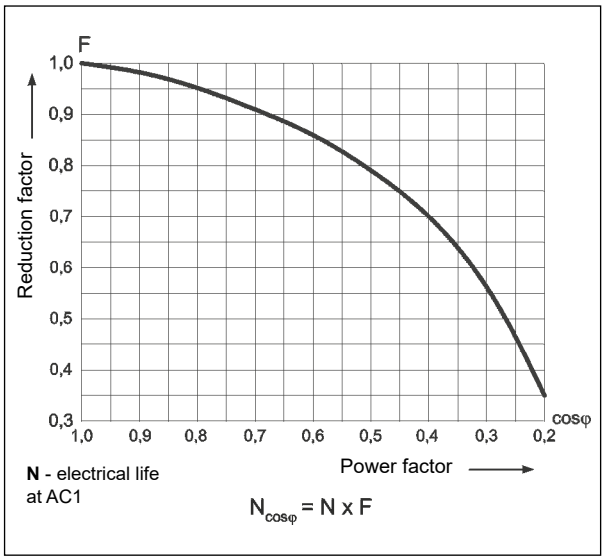
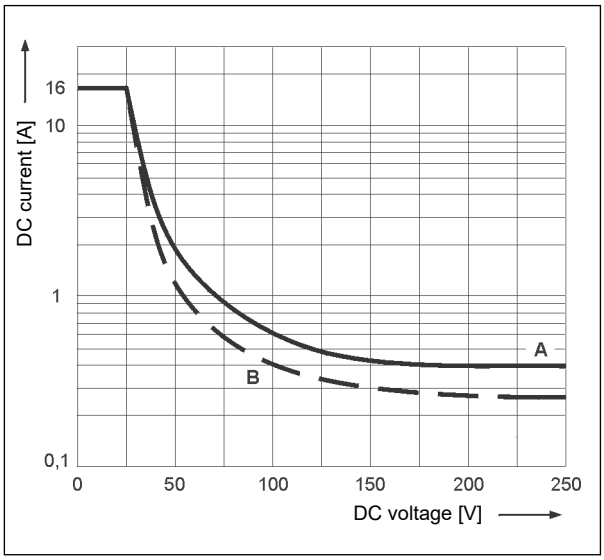
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



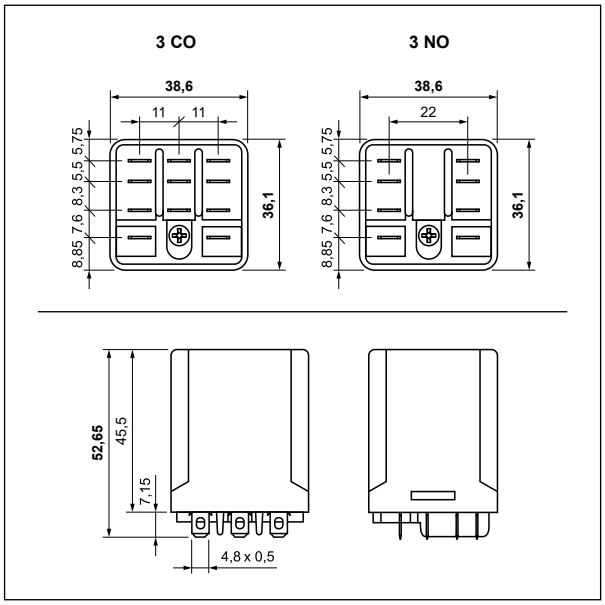
Electrical life reduction factor at AC inductive load Fig. 2



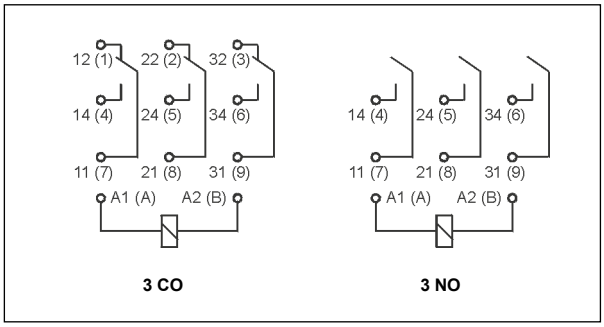
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Dimensions



Connection diagrams (pin side view)



PRUCT

Relays for
railroad industry
- interface,
contacts 3 CO, 3 NO

Mounting, sockets and accessories for relays

Relays **RUCT** are designed for mounting in plug-in sockets.

Sockets for RUCT	**Accessories**
	Spring wire clips
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715)	
GUC11S-V0	MBA

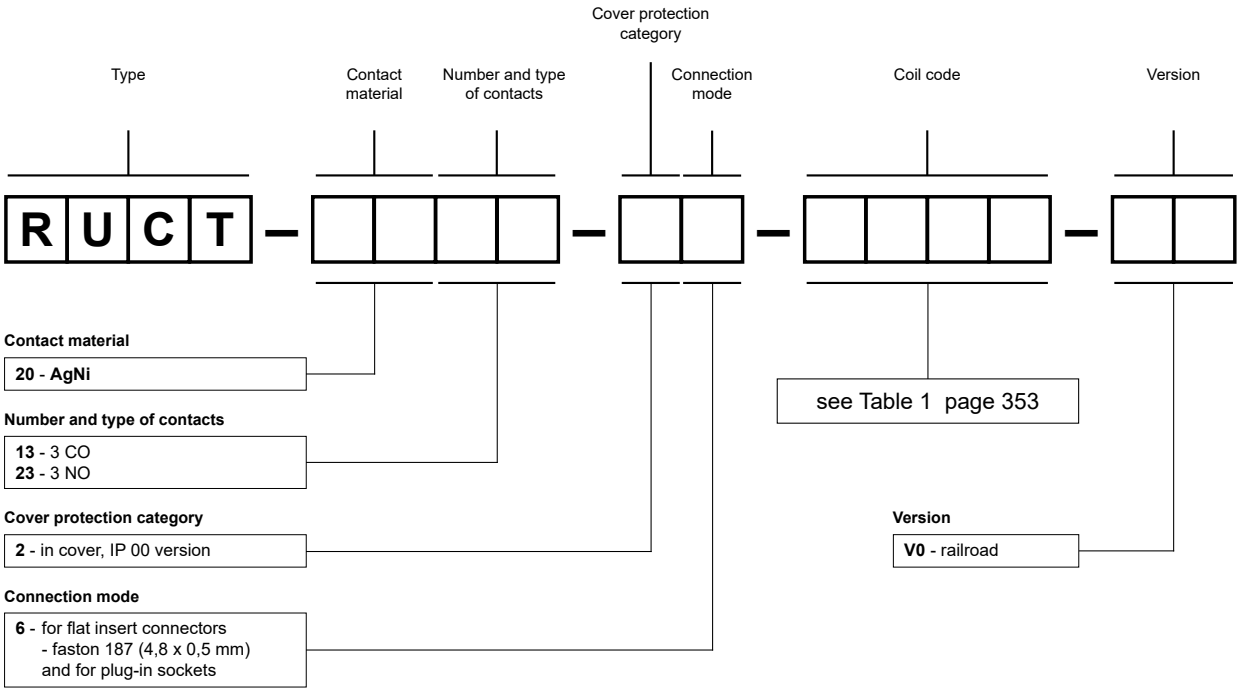
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❷	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC EN 50155 ❸	
				min.	max.
W024	**24**	**345**	**± 10%**	**16,8**	**30,0**
W110	110	7 300	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❷ For other voltages, please contact Relpol S.A. ❸ Changes of voltage within the range 0,6...1,4 U_n below 0,1 s and changes of voltage within the range 1,25...1,4 U_n below 1 s are admissible and they do not distort operation of the relays.

Ordering codes



Examples of ordering codes:

RUCT-2013-26-W024-V0 relay **RUCT** (railroad version), faston 187 (4,8 x 0,5 mm), for plug-in sockets, three changeover contacts, contact material AgNi, reinforced coil voltage 24 V DC, in cover IP 00

RUCT-2023-26-W110-V0 relay **RUCT** (railroad version), faston 187 (4,8 x 0,5 mm), for plug-in sockets, three normally open contacts, contact material AgNi, reinforced coil voltage 110 V DC, in cover IP 00

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- **Relays with permanent magnet ❶**
- For plug-in sockets: on 35 mm rail mount acc. to EN 60715
- DC coils, insulation class F: 155 °C • Version: faston 187 (4,8 x 0,5 mm)
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: RoHS, CE EAC CIK ❷

Contact data

Number and type of contacts		1 NO (double-break)	2 NO
Contact material		**AgNi**	
Rated / max. switching voltage		250 V DC; 250 V AC / 250 V DC; 250 V AC	
Min. switching voltage		5 V	
Rated load	DC1	16 A / 24 V DC; 13 A / 110 V DC 10 A / 220 V DC	16 A / 24 V DC; 9 A / 110 V DC 3,8 A / 220 V DC
	DC L/R=40 ms	16 A / 24 V DC; 4,6 A / 110 V DC 2,5 A / 220 V DC	16 A / 24 V DC; 1,2 A / 110 V DC 0,4 A / 220 V DC
	AC1	16 A / 250 V AC	16 A / 250 V AC
Min. switching current		5 mA	
Max. inrush current		40 A 20 ms	
Rated current		16 A	
Max. breaking capacity	AC1	4 000 VA	
Min. breaking capacity		0,3 W	
Contact resistance		≤ 100 mΩ	
Max. operating frequency • at rated load • no load	AC1	 1 200 cycles/hour 12 000 cycles/hour	

Coil data

Rated voltage	DC	**24**, 110 V ❸
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,7...1,25 U_n EN 50155 see Table 1
Must operate voltage		≤ 0,7 U_n
Rated power consumption	DC	1,7 W reinforced version

Insulation according to EN 60664-1

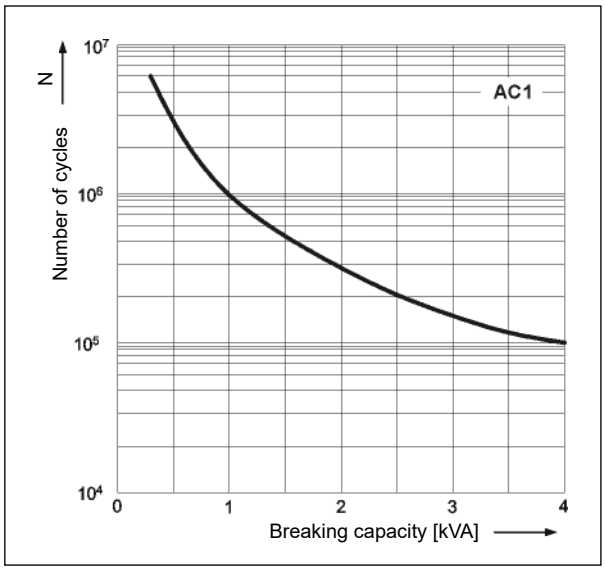
Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Flammability class		V-0 UL 94, PN-EN 60695-11-10
Dielectric strength • between coil and contacts • contact clearance • pole - pole		 2 500 V AC 1 min., type of insulation: basic 4 000 V AC 1 min., contact 1 NO, type of clearance: full-disconnection 2 000 V AC 1 min., contacts 2 NO, type of clearance: full-disconnection 2 500 V AC 1 min., contacts 2 NO, type of insulation: basic
Contact - coil distance	• clearance • creepage	≥ 6,3 mm ≥ 8 mm

General data

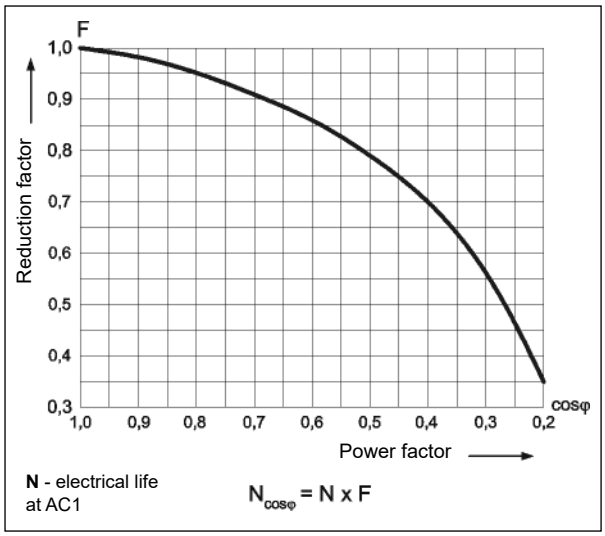
Operating / release time	• typical values • max. values	20 ms / 15 ms 25 ms / 35 ms	
Electrical life • resistive DC1 • DC L/R=40 ms		 > 2 x 10^5 10 A, 220 V DC > 2 x 10^5 2,5 A, 220 V DC	 > 2 x 10^5 3,8 A, 220 V DC > 2 x 10^5 0,4 A, 220 V DC
Mechanical life (cycles)		> 2 x 10^7	
Dimensions (L x W x H)		36,1 x 38,6 x 52,65 mm	
Weight		80 g	
Ambient temperature (non-condensation and/or icing)	• storage • operating	-40...+85 °C -40...+55 °C	
Cover protection category		IP 00 EN 60529	
Environmental protection		RTI EN 61810-7	
Shock resistance		10 g category 1, class B EN 61373	
Vibration resistance		5 g 10...150 Hz category 1, class B EN 61373	

The data in bold type relate to the standard versions of the relays. ❶ The permanent magnet is fixed on the contact plate. Its magnetic field is directed to the contacts and it blows the electric arc which occurs when the DC load is switched off. ❷ Certification IK for interface set PRUCT-M (RUCT-M with socket GUC11S-V0). ❸ For other voltages, please contact Relpol S.A.

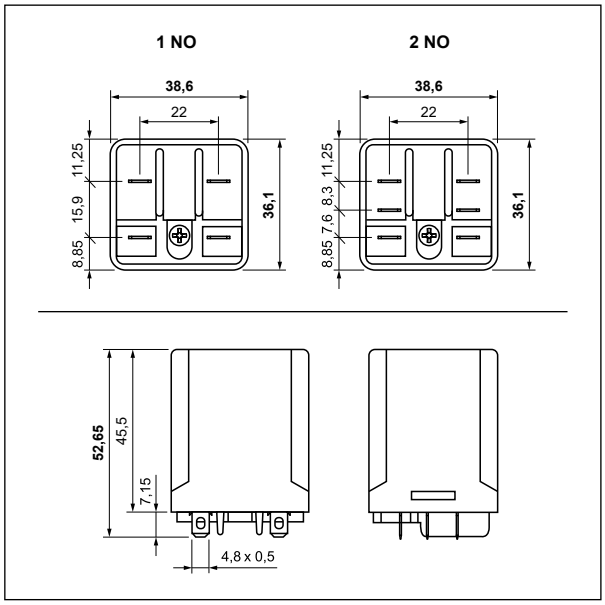
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



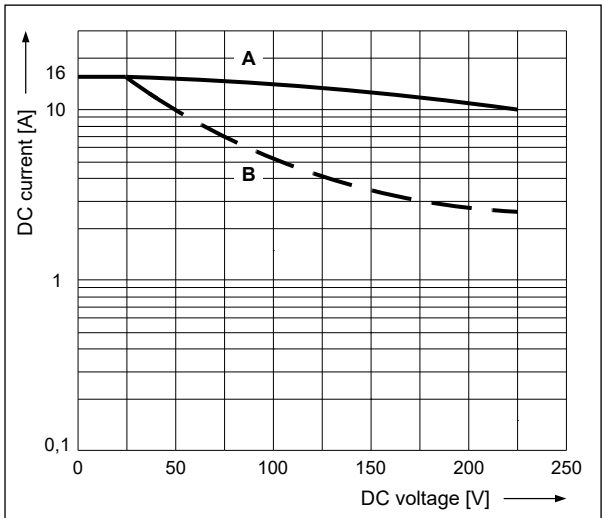
Electrical life reduction factor at AC inductive load Fig. 2



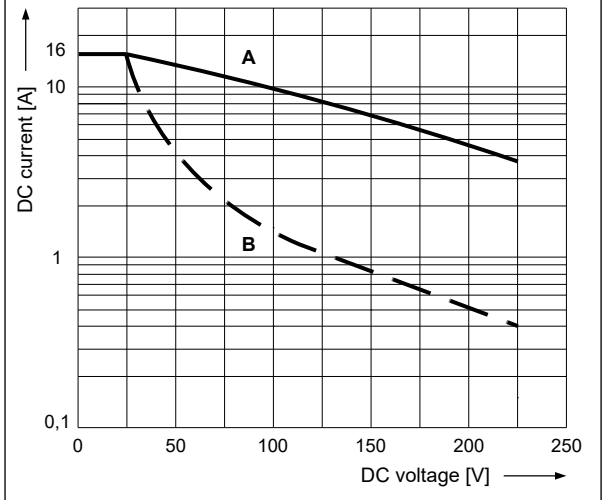
Dimensions



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3

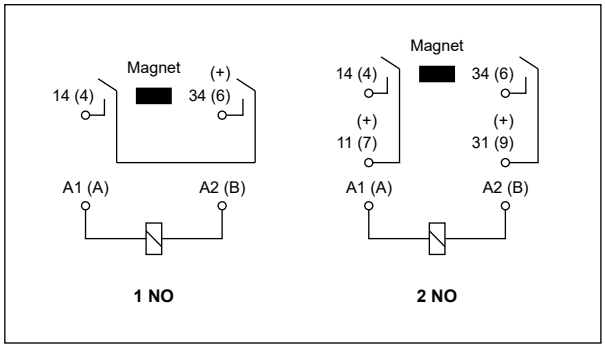


U_n = 24 V DC - version 1 NO (5 mm)



U_n = 24 V DC - version 2 NO (2,5 mm)

Connection diagrams (pin side view)



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Mounting, sockets and accessories for relays

Relays **RUCT-M** are designed for mounting in plug-in sockets.

Sockets for RUCT-M	**Accessories**
	Spring wire clips
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715)	
GUC11S-V0	MBA

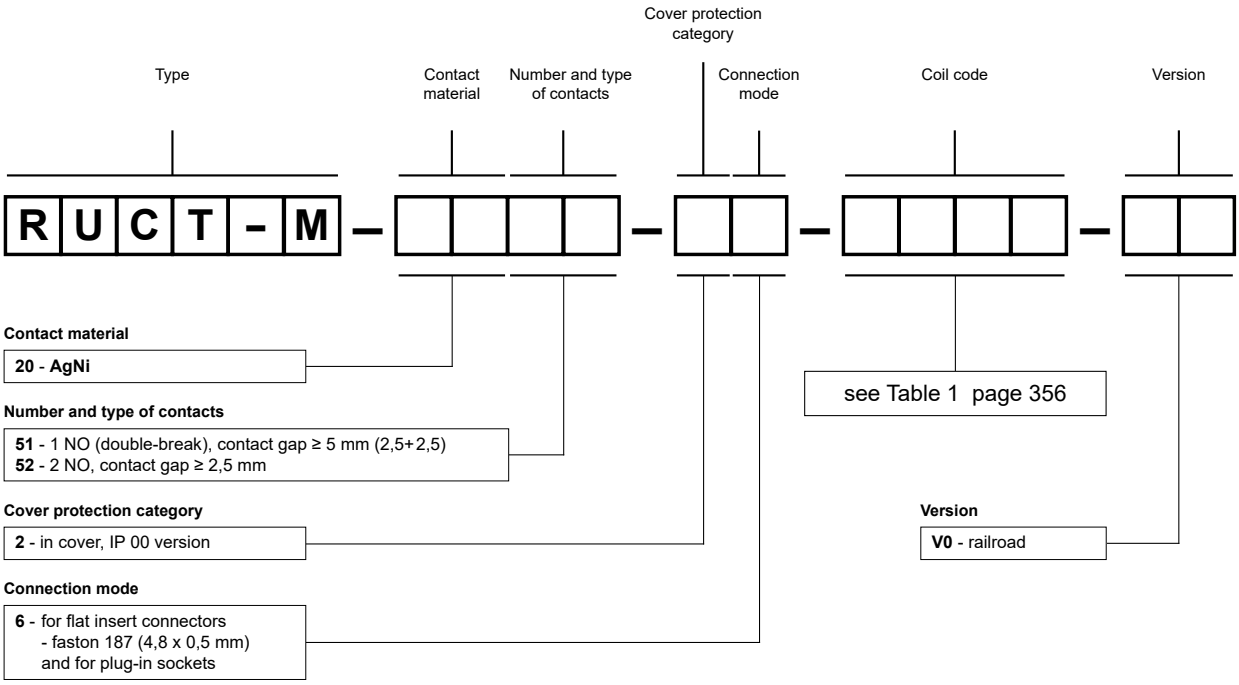
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❸	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC EN 50155 ❹	
				min.	max.
W024	**24**	**345**	**± 10%**	**16,8**	**30,0**
W110	110	7 300	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❸ For other voltages, please contact Relpol S.A. ❹ Changes of voltage within the range 0,6...1,4 U_n below 0,1 s and changes of voltage within the range 1,25...1,4 U_n below 1 s are admissible and they do not distort operation of the relays.

Ordering codes



Examples of ordering codes:

RUCT-M-2051-26-W024-V0 relay **RUCT-M** (railroad version), faston 187 (4,8 x 0,5 mm), for plug-in sockets, one normally open contact (double-break), with contact gap ≥ 5 mm (2,5+2,5), contact material AgNi, reinforced coil voltage 24 V DC, in cover IP 00

RUCT-M-2052-26-W110-V0 relay **RUCT-M** (railroad version), faston 187 (4,8 x 0,5 mm), for plug-in sockets, two normally open contacts, with contact gap ≥ 2,5 mm, contact material AgNi, reinforced coil voltage 110 V DC, in cover IP 00

RM84 + GZT80-V0

- 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: recognitions RM84, RoHS,

Contact data

Number and type of contacts		2 CO
Contact material		**$AgSnO_2$**
Rated / max. switching voltage	AC	250 V / 300 V
Min. switching voltage		10 V
Rated load (capacity)	AC1	8 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	8 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/3 HP 240 V AC, 3,6 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		10 mA
Max. inrush current		15 A
Rated current		8 A
Max. breaking capacity	AC1	2 000 VA
Min. breaking capacity		1 W
Contact resistance		≤ 100 mΩ 1 A, 24 V
Max. operating frequency		
• at rated load	AC1	600 cycles/hour
• no load		72 000 cycles/hour

Coil data

Rated voltage	DC	**24**, 110 V ❷
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,7...1,25 U_n EN 50155 see Table 1
Must operate voltage		≤ 0,7 U_n
Rated power consumption	DC	0,4 ... 0,48 W

Insulation according to EN 60664-1

Insulation rated voltage	250 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Flammability class	V-0 UL 94, EN 60695-11-10
Dielectric strength	
• between coil and contacts	5 000 V AC type of insulation: reinforced
• contact clearance	1 000 V AC type of clearance: micro-disconnection
• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	
• clearance	≥ 10 mm
• creepage	≥ 10 mm

General data

Operating / release time (typical values)		7 ms / 3 ms
Electrical life		
• resistive AC1		> 10^5 8 A, 250 V AC
• cosφ		see Fig. 2
• DC L/R=40 ms		> 10^5 0,12 A, 220 V DC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		80 x 15,6 x 61 mm
Weight		61 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+55 °C
Cover protection category		IP 20 EN 60529
Environmental protection		RM84: RTII GZT80-V0: RT0 EN 61810-7
Shock / vibration resistance		category 1, class B EN 61373 (set: relay in socket with clip and module)

The data in bold type relate to the standard versions of the relays. ❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC. ❷ For other voltages, please contact Relpol S.A.

RAILROAD

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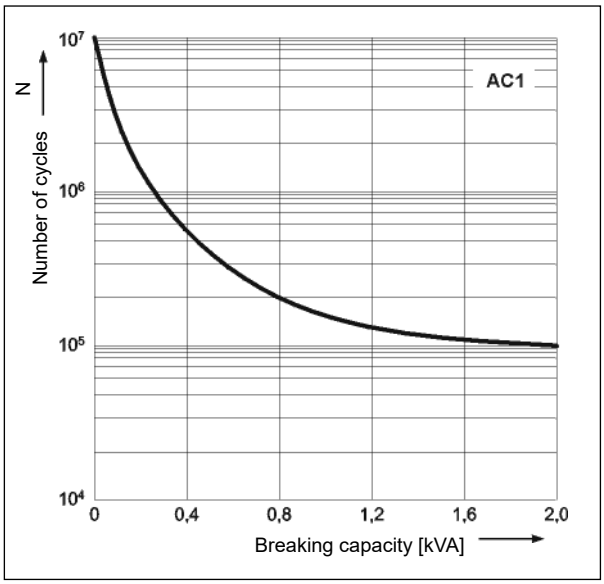
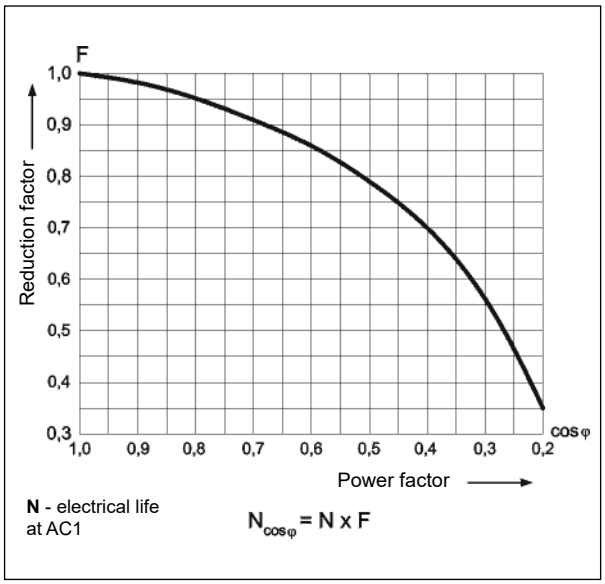
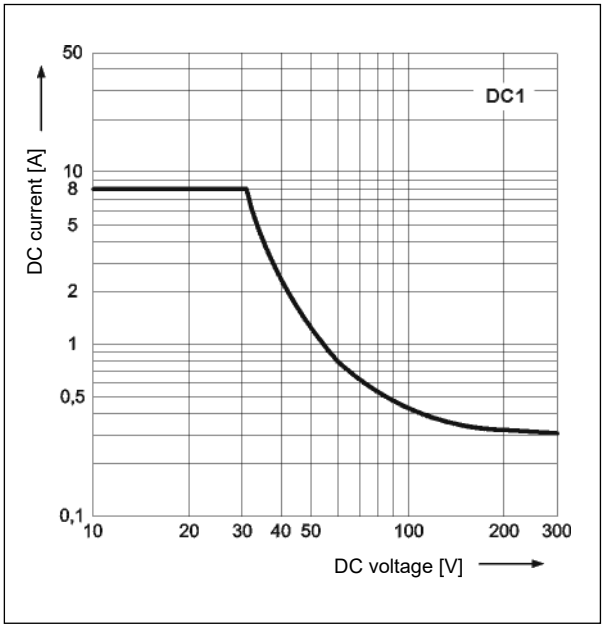
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



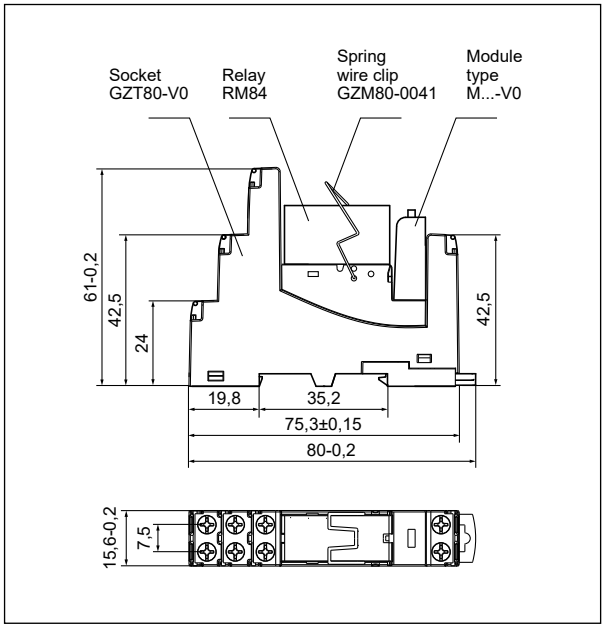
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC resistive load breaking capacity Fig. 3



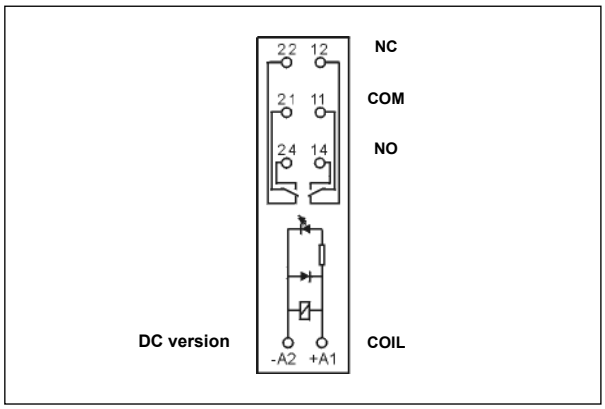
Dimensions



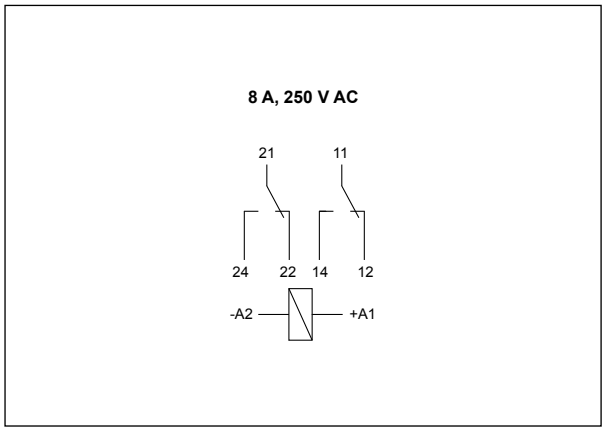
Mounting

Relays **PI84T with socket GZT80-V0** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm.

Connection diagram
(screw terminals side view)



Connection of GZT80-V0 socket



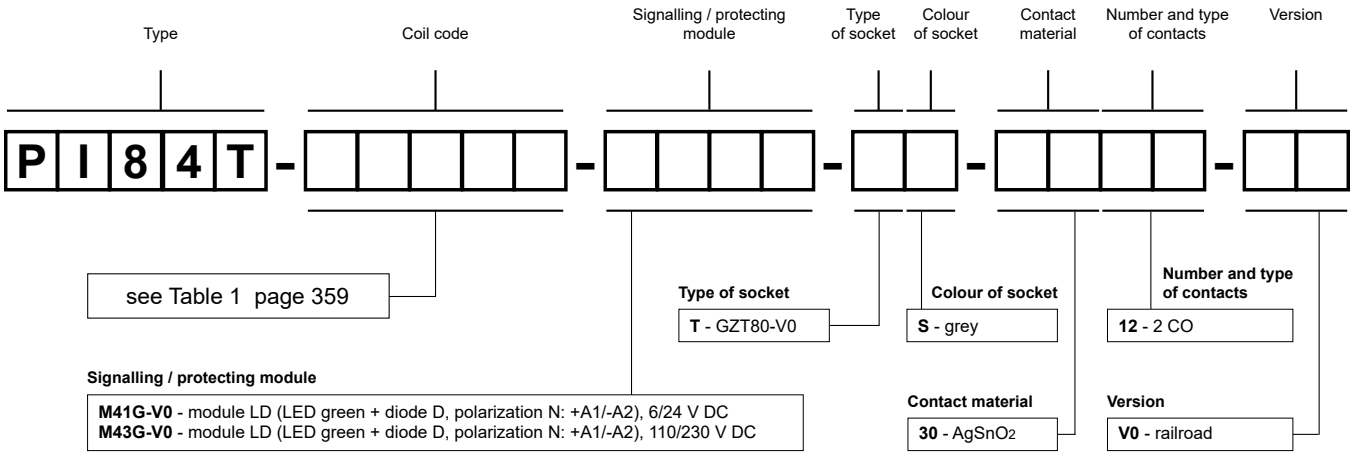
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❷	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC according to EN 50155 ❸	
				min.	max.
024DC	**24**	**1 440**	**± 10%**	**16,8**	**30,0**
110DC	110	25 200	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❷ For other voltages, please contact Relpol S.A. ❸ Changes of voltage within the range 0,6...1,4 Un below 0,1 s and changes of voltage within the range 1,25...1,4 Un below 1 s are admissible and they do not distort operation of the relays.

Ordering codes



Examples of ordering codes:

PI84T-024DC-M41G-TS-3012-V0 interface relay **PI84T** (railroad version) consists of: relay **RM84** (two changeover contacts, contact material $AgSnO_2$, coil voltage 24 V DC), socket **GZT80-V0** (grey, screw terminals), signalling / protecting module **M41G-V0** (version LD), spring wire clip **GZM80-0041**

PI84T-110DC-M43G-TS-3012-V0 interface relay **PI84T** (railroad version) consists of: relay **RM84** (two changeover contacts, contact material $AgSnO_2$, coil voltage 110 V DC), socket **GZT80-V0** (grey, screw terminals), signalling / protecting module **M43G-V0** (version LD), spring wire clip **GZM80-0041**

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RM85 + GZT80-V0

- 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: recognitions RM85, RoHS,

Contact data

Number and type of contacts		1 CO
Contact material		**$AgSnO_2$**
Rated / max. switching voltage	AC	250 V / 300 V
Min. switching voltage		10 V
Rated load (capacity)	AC1	16 A / 250 V AC ❶
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	16 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❷
	AC3 acc. to IEC 60947-4-1	0,5 kW 240 V AC, single-phase motor
Min. switching current		10 mA
Max. inrush current		30 A
Rated current		16 A
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		1 W
Contact resistance		≤ 100 mΩ 1 A, 24 V
Max. operating frequency		
• at rated load	AC1	600 cycles/hour
• no load		72 000 cycles/hour

Coil data

Rated voltage	DC	**24**, 110 V ❸
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,7...1,25 U_n EN 50155 see Table 1
Must operate voltage		≤ 0,7 U_n
Rated power consumption	DC	0,4 ... 0,48 W

Insulation according to EN 60664-1

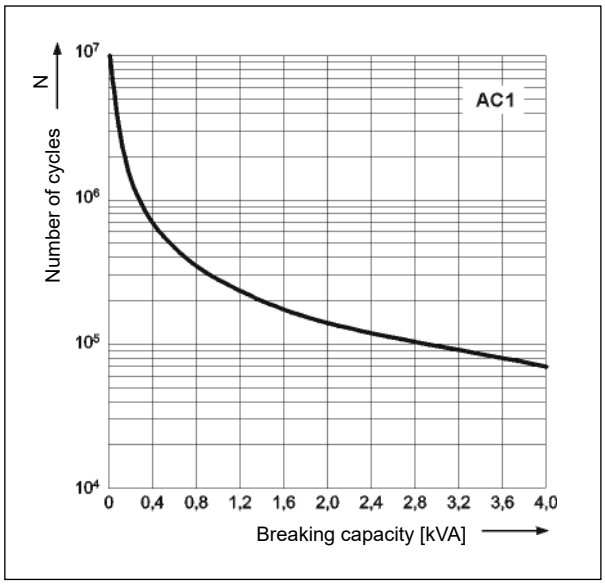
Insulation rated voltage	250 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Flammability class	V-0 UL 94, EN 60695-11-10
Dielectric strength	
• between coil and contacts	5 000 V AC type of insulation: reinforced
• contact clearance	1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	
• clearance	≥ 10 mm
• creepage	≥ 10 mm

General data

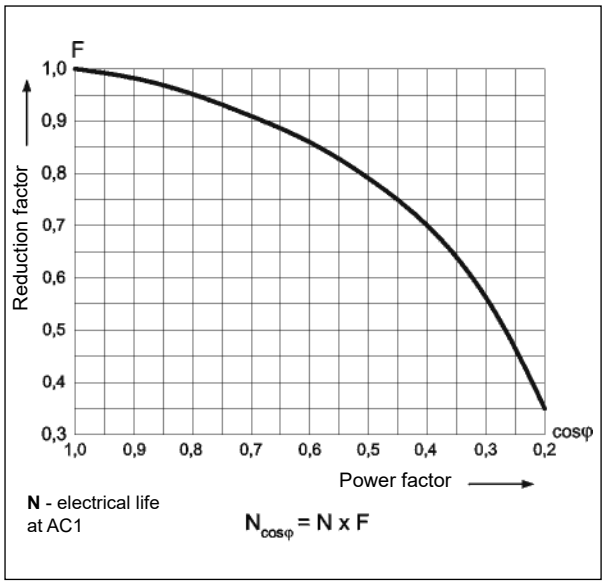
Operating / release time (typical values)		7 ms / 3 ms
Electrical life		
• resistive AC1		> 0,7 x 10^5 16 A, 250 V AC
• cosφ		see Fig. 2
• DC L/R=40 ms		> 10^5 0,12 A, 220 V DC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		80 x 15,6 x 61 mm
Weight		62 g
Ambient temperature (non-condensation and/or icing)	• storage	-40...+85 °C
	• operating	-40...+55 °C
Cover protection category		IP 20 EN 60529
Environmental protection		RM85: RTII GZT80-V0: RT0 EN 61810-7
Shock / vibration resistance		category 1, class B EN 61373 (set: relay in socket with clip and module)

The data in bold type relate to the standard versions of the relays. ❶ Loads above 12 A require bridging pairs of screw terminals: 11 with 21, 12 with 22, 14 with 24 - see page 362. ❷ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC. ❸ For other voltages, please contact Relpol S.A.

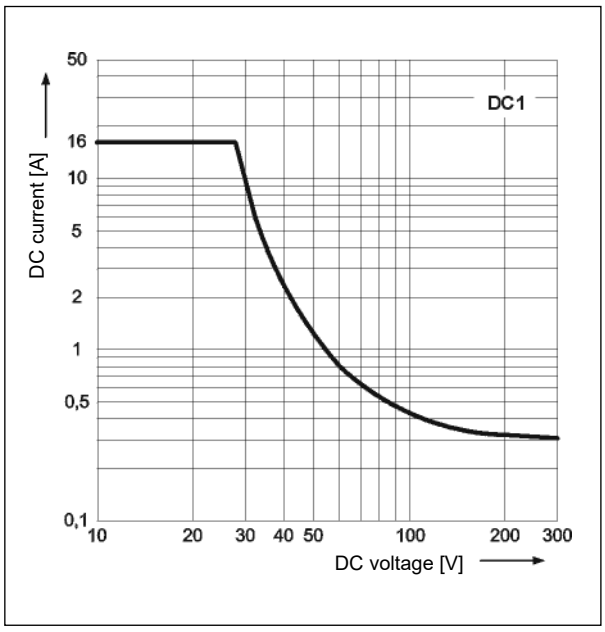
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



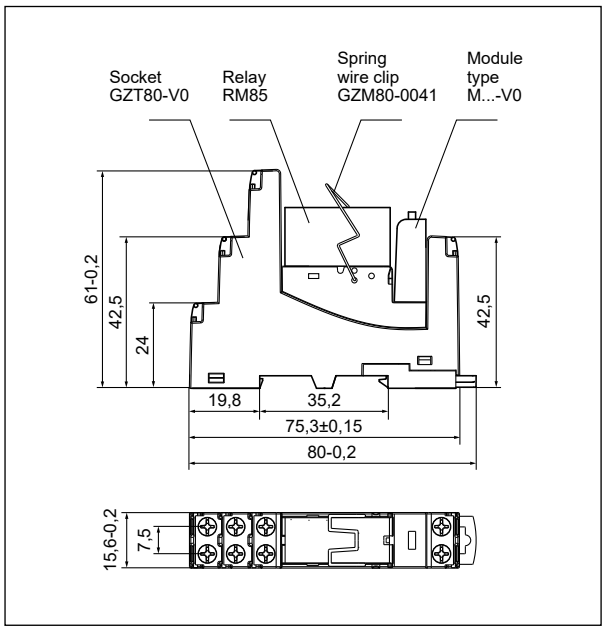
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC resistive load breaking capacity Fig. 3



Dimensions



Mounting

Relays **PI85T with socket GZT80-V0** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm.

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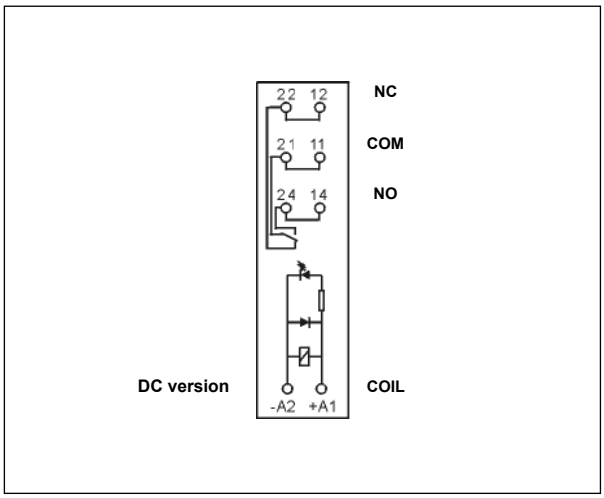
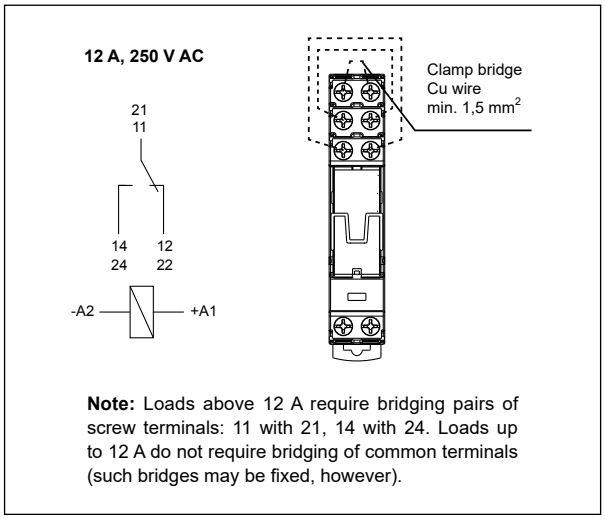
Connection diagram
(screw terminals side view)



Connection of GZT80-V0 socket



Note: Loads above 12 A require bridging pairs of screw terminals: 11 with 21, 14 with 24. Loads up to 12 A do not require bridging of common terminals (such bridges may be fixed, however).

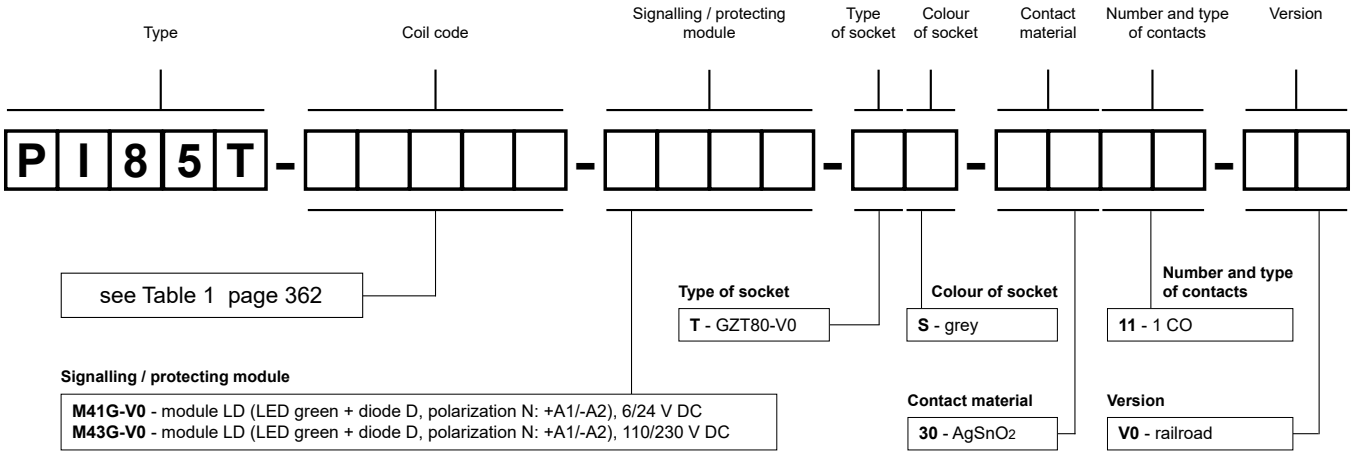
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❸	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC according to EN 50155 ❹	
				min.	max.
024DC	**24**	**1 440**	**± 10%**	**16,8**	**30,0**
110DC	110	25 200	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❸ For other voltages, please contact Relpol S.A. ❹ Changes of voltage within the range 0,6...1,4 Un below 0,1 s and changes of voltage within the range 1,25...1,4 Un below 1 s are admissible and they do not distort operation of the relays.

Ordering codes



Examples of ordering codes:

PI85T-024DC-M41G-TS-3011-V0 interface relay **PI85T** (railroad version) consists of: relay **RM85** (one changeover contact, contact material $AgSnO_2$, coil voltage 24 V DC), socket **GZT80-V0** (grey, screw terminals), signalling / protecting module **M41G-V0** (version LD), spring wire clip **GZM80-0041**

PI85T-110DC-M43G-TS-3011-V0 interface relay **PI85T** (railroad version) consists of: relay **RM85** (one changeover contact, contact material $AgSnO_2$, coil voltage 110 V DC), socket **GZT80-V0** (grey, screw terminals), signalling / protecting module **M43G-V0** (version LD), spring wire clip **GZM80-0041**

R2T + GZT2-V0

- 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: recognitions R2T, RoHS,

Contact data

Number and type of contacts		2 CO
Contact material		**AgNi**
Rated / max. switching voltage	AC	250 V / 300 V
Min. switching voltage		5 V
Rated load (capacity)	AC1	12 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	12 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Min. switching current		5 mA
Max. inrush current		24 A
Rated current		12 A
Max. breaking capacity	AC1	3 000 VA
Min. breaking capacity		0,3 W
Contact resistance		≤ 100 mΩ 100 mA, 24 V
Max. operating frequency		
• at rated load	AC1	1 200 cycles/hour
• no load		18 000 cycles/hour

Coil data

Rated voltage	DC	**24**, 110 V ❷
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,7...1,25 U_n EN 50155 see Table 1
Must operate voltage		≤ 0,7 U_n
Rated power consumption	DC	0,9 W

Insulation according to EN 60664-1

Insulation rated voltage	300 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Flammability class	V-0 UL 94, EN 60695-11-10
Dielectric strength	
• between coil and contacts	2 500 V AC type of insulation: basic
• contact clearance	1 500 V AC type of clearance: micro-disconnection
• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	
• clearance	≥ 2,5 mm
• creepage	≥ 4 mm

General data

Operating / release time (typical values)		13 ms / 3 ms
Electrical life		
• resistive AC1		> 10^5 12 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		76,3 x 27 x 65 mm
Weight		81 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+55 °C
Cover protection category		IP 20 EN 60529
Environmental protection		R2T: RTI GZT2-V0: RT0 EN 61810-7
Shock / vibration resistance		category 1, class B EN 61373 (set: relay in socket with clip and module)

The data in bold type relate to the standard versions of the relays. ❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC. ❷ For other voltages, please contact Relpol S.A.

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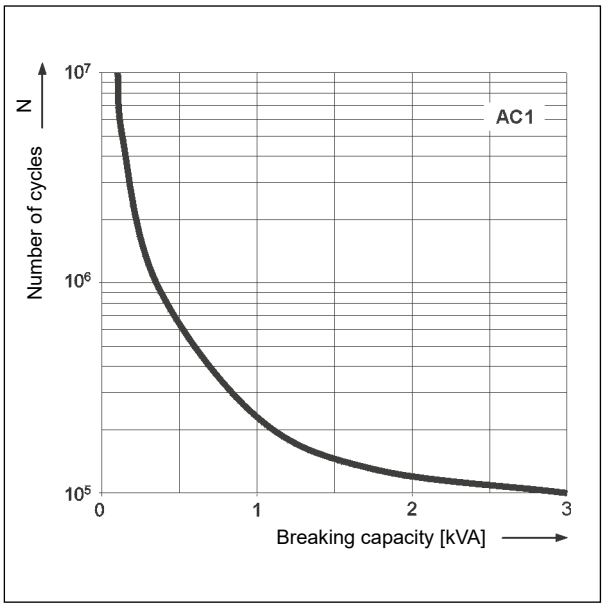
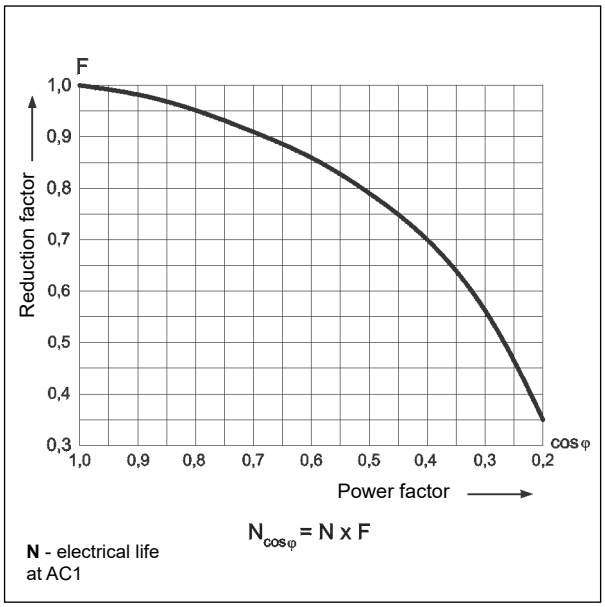
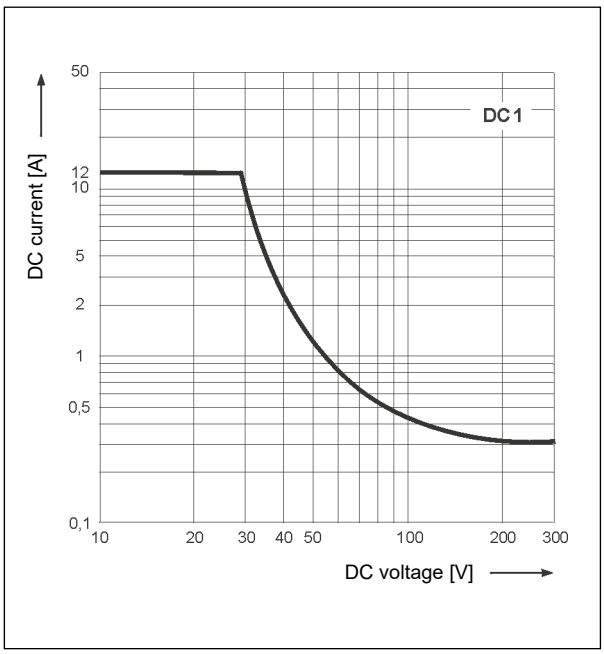
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



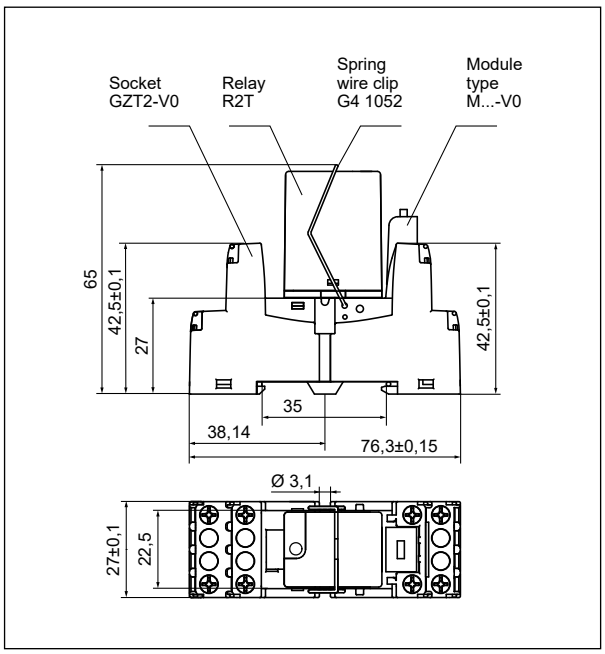
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC resistive load breaking capacity Fig. 3

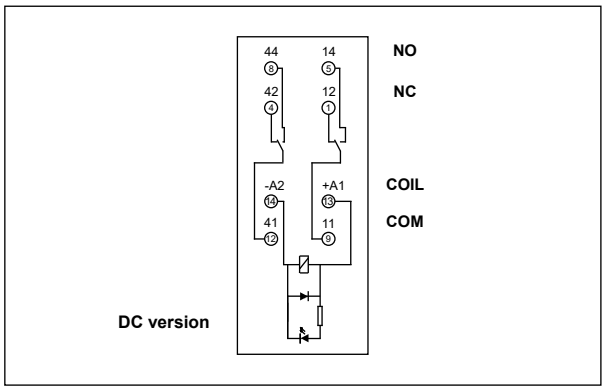


Dimensions



Relays for railroad industry - industrial

Connection diagram
(screw terminals side view)



Mounting

Relays **PIR2T with socket GZT2-V0** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm^2 (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm.

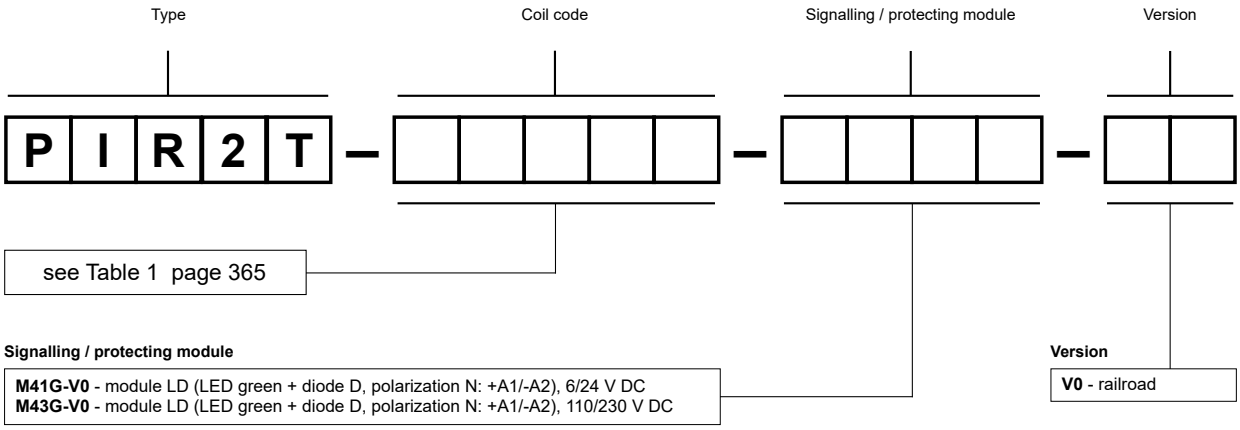
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❷	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC according to EN 50155 ❸	
				min.	max.
024DC	**24**	**640**	**± 10%**	**16,8**	**30,0**
110DC	110	13 600	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❷ For other voltages, please contact Relpol S.A. ❸ Changes of voltage within the range 0,6...1,4 Un below 0,1 s and changes of voltage within the range 1,25...1,4 Un below 1 s are admissible and they do not distort operation of the relays.

Ordering codes



Examples of ordering codes:

PIR2T-024DC-M41G-V0 interface relay **PIR2T** (railroad version) consists of: relay **R2T** (two changeover contacts, contact material AgNi, coil voltage 24 V DC), socket **GZT2-V0** (grey, screw terminals), signalling / protecting module **M41G-V0** (version LD), spring wire clip **G4 1052**

PIR2T-110DC-M43G-V0 interface relay **PIR2T** (railroad version) consists of: relay **R2T** (two changeover contacts, contact material AgNi, coil voltage 110 V DC), socket **GZT2-V0** (grey, screw terminals), signalling / protecting module **M43G-V0** (version LD), spring wire clip **G4 1052**

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R3T + GZT3-V0

- 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: recognitions R3T, RoHS,

Contact data

Number and type of contacts		3 CO
Contact material		**AgNi**
Rated / max. switching voltage	AC	250 V / 300 V
Min. switching voltage		5 V
Rated load (capacity)	AC1	10 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	10 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load acc. to UL 508		1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❶
AC3 acc. to IEC 60947-4-1		0,37 kW 240 V AC, single-phase motor
Min. switching current		5 mA
Max. inrush current		20 A
Rated current		10 A
Max. breaking capacity	AC1	2 500 VA
Min. breaking capacity		0,3 W
Contact resistance		≤ 100 mΩ 100 mA, 24 V
Max. operating frequency		
• at rated load	AC1	1 200 cycles/hour
• no load		18 000 cycles/hour

Coil data

Rated voltage	DC	**24**, 110 V ❷
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,7...1,25 U_n EN 50155 see Table 1
Must operate voltage		≤ 0,7 U_n
Rated power consumption	DC	0,9 W

Insulation according to EN 60664-1

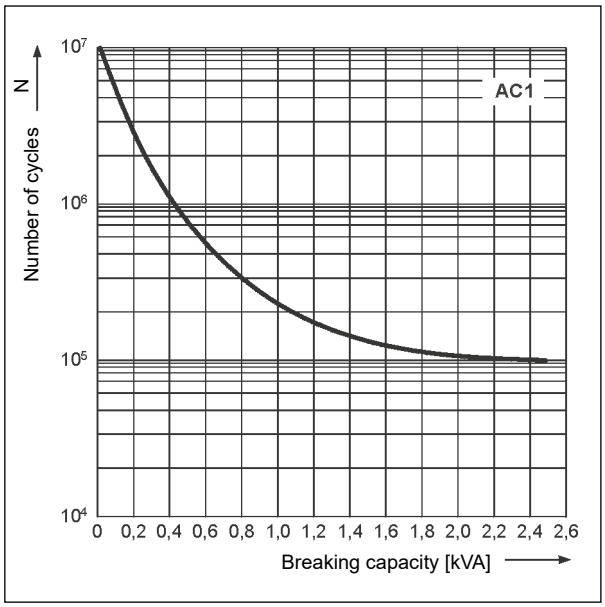
Insulation rated voltage	300 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	2
Flammability class	V-0 UL 94, EN 60695-11-10
Dielectric strength	
• between coil and contacts	2 500 V AC type of insulation: basic
• contact clearance	1 500 V AC type of clearance: micro-disconnection
• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	
• clearance	≥ 2,5 mm
• creepage	≥ 4 mm

General data

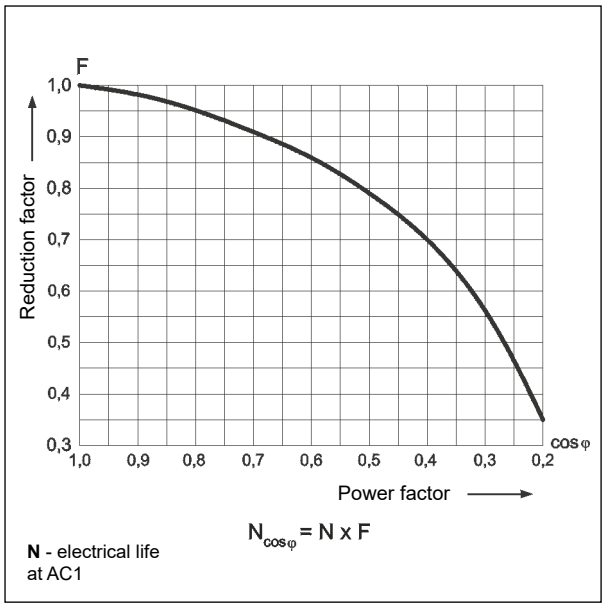
Operating / release time (typical values)		13 ms / 3 ms
Electrical life		
• resistive AC1		> 10^5 10 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		76,3 x 27 x 65 mm
Weight		87 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+55 °C
Cover protection category		IP 20 EN 60529
Environmental protection		R3T: RTI GZT3-V0: RT0 EN 61810-7
Shock / vibration resistance		category 1, class B EN 61373 (set: relay in socket with clip and module)

The data in bold type relate to the standard versions of the relays. ❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC. ❷ For other voltages, please contact Relpol S.A.

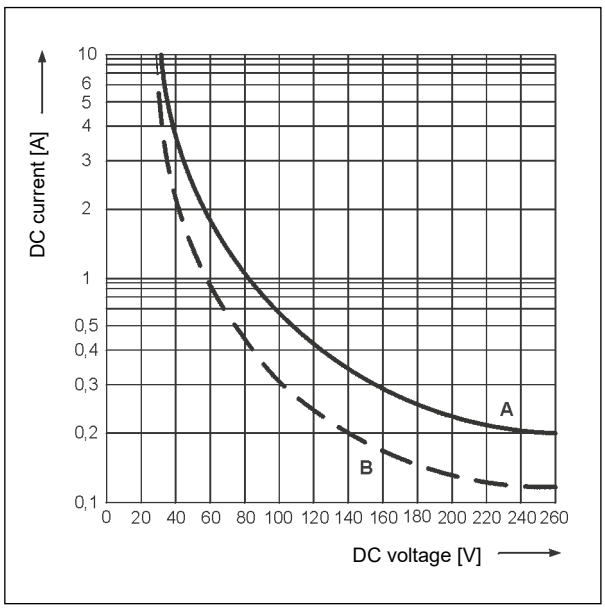
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



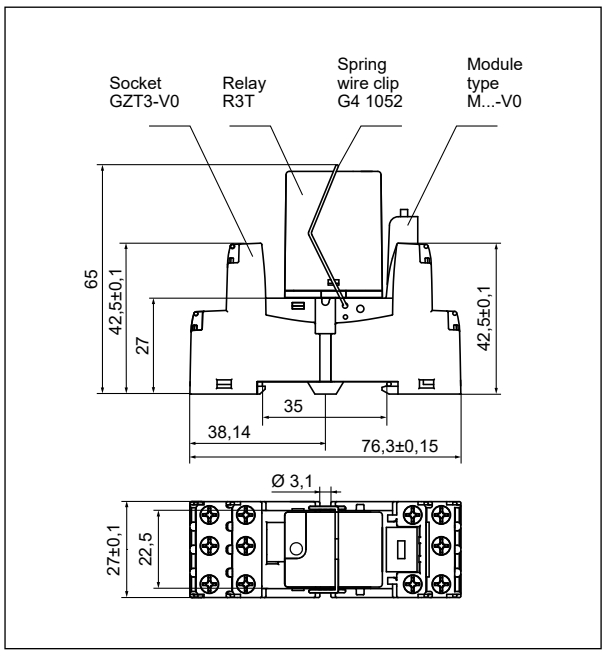
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Dimensions



Relays for railroad industry - industrial

R2T R3T R4T

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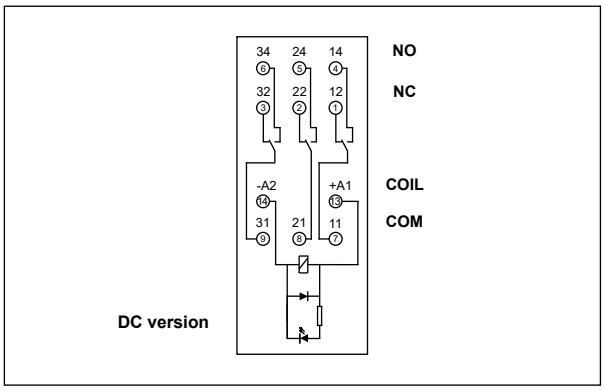
Connection diagram
(screw terminals side view)



Mounting

Relays **PIR3T with socket GZT3-V0** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm^2 (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm.

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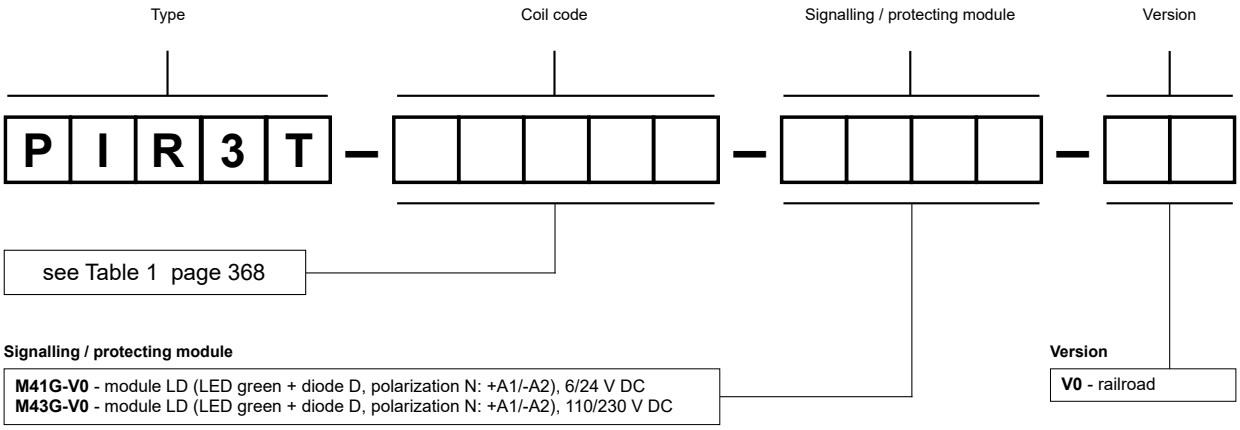
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❷	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC according to EN 50155 ❸	
				min.	max.
024DC	**24**	**640**	**± 10%**	**16,8**	**30,0**
110DC	110	13 600	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❷ For other voltages, please contact Relpol S.A. ❸ Changes of voltage within the range 0,6...1,4 Un below 0,1 s and changes of voltage within the range 1,25...1,4 Un below 1 s are admissible and they do not distort operation of the relays.

Ordering codes



Examples of ordering codes:

PIR3T-024DC-M41G-V0 interface relay **PIR3T** (railroad version) consists of: relay **R3T** (three changeover contacts, contact material AgNi, coil voltage 24 V DC), socket **GZT3-V0** (grey, screw terminals), signalling / protecting module **M41G-V0** (version LD), spring wire clip **G4 1052**

PIR3T-110DC-M43G-V0 interface relay **PIR3T** (railroad version) consists of: relay **R3T** (three changeover contacts, contact material AgNi, coil voltage 110 V DC), socket **GZT3-V0** (grey, screw terminals), signalling / protecting module **M43G-V0** (version LD), spring wire clip **G4 1052**

R4T + GZT4-V0

- 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: recognitions R4T, RoHS,

Contact data

Number and type of contacts		4 CO	
Contact material		**AgNi**	
Rated / max. switching voltage	AC	250 V / 300 V	
Min. switching voltage		5 V	
Rated load (capacity)	AC1	7 A / 230 V AC (VDE)	6 A / 250 V AC
	AC15	1,5 A / 120 V	0,75 A / 240 V (C300)
	DC1	6 A / 24 V DC (see Fig. 3)	
	DC13	0,22 A / 120 V	0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/3 HP	240 V AC, 3,6 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,125 kW	240 V AC, single-phase motor
Min. switching current		5 mA	
Max. inrush current		12 A	
Rated current		6 A	
Max. breaking capacity	AC1	1 500 VA	
Min. breaking capacity		0,3 W	
Contact resistance		≤ 100 mΩ	100 mA, 24 V
Max. operating frequency			
• at rated load	AC1	1 200 cycles/hour	
• no load		18 000 cycles/hour	

Coil data

Rated voltage	DC	**24**, 110 V ❷	
Must release voltage		≥ 0,1 U_n	
Operating range of supply voltage		0,7...1,25 U_n EN 50155	see Table 1
Must operate voltage		≤ 0,7 U_n	
Rated power consumption	DC	0,9 W	

Insulation according to EN 60664-1

Insulation rated voltage	300 V AC	
Rated surge voltage	2 500 V	1,2 / 50 µs
Overvoltage category	II	
Insulation pollution degree	2	
Flammability class	V-0	UL 94, EN 60695-11-10
Dielectric strength		
• between coil and contacts	2 500 V AC	type of insulation: basic
• contact clearance	1 500 V AC	type of clearance: micro-disconnection
• pole - pole	2 000 V AC	type of insulation: basic
Contact - coil distance		
• clearance	≥ 1,6 mm	
• creepage	≥ 3,2 mm	

General data

Operating / release time (typical values)		13 ms / 3 ms	
Electrical life			
• resistive AC1		> 5 x 10^4	7 A, 230 V AC
		> 10^5	6 A, 250 V AC
• cosφ		see Fig. 2	
Mechanical life (cycles)		> 2 x 10^7	
Dimensions (L x W x H)		76,3 x 27 x 65 mm	
Weight		94 g	
Ambient temperature	• storage	-40...+85 °C	
(non-condensation and/or icing)	• operating	-40...+55 °C	
Cover protection category		IP 20	EN 60529
Environmental protection		R4T: RTI	GZT4-V0: RT0 EN 61810-7
Shock / vibration resistance		category 1, class B EN 61373	
		(set: relay in socket with clip and module)	

The data in bold type relate to the standard versions of the relays. ❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC. ❷ For other voltages, please contact Relpol S.A.

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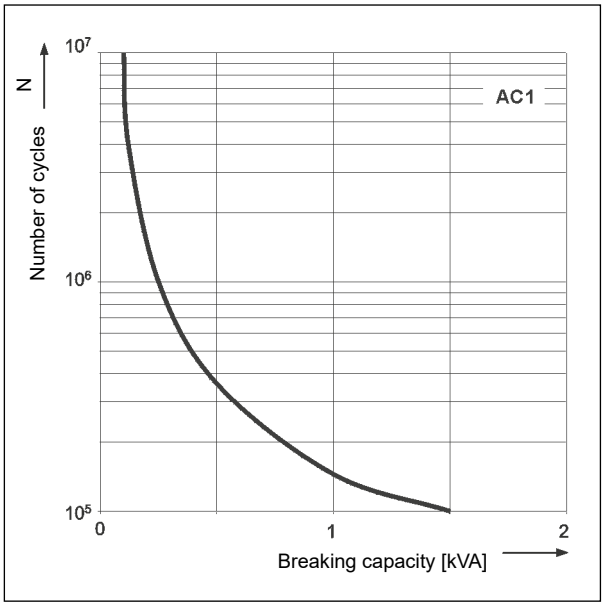
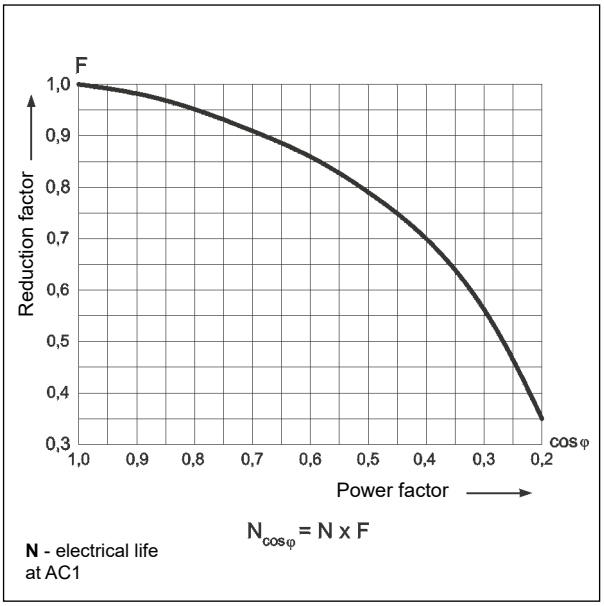
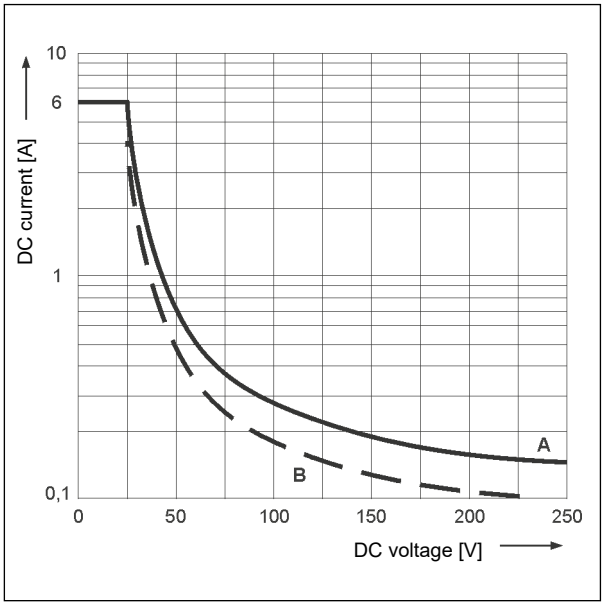
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



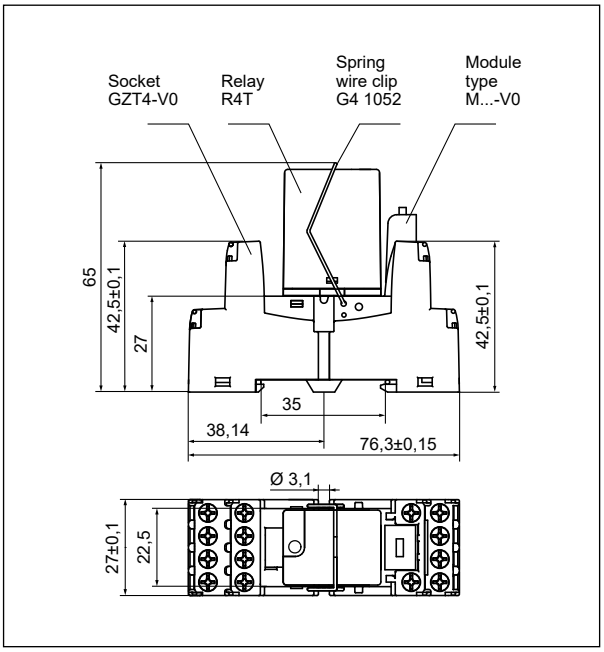
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3

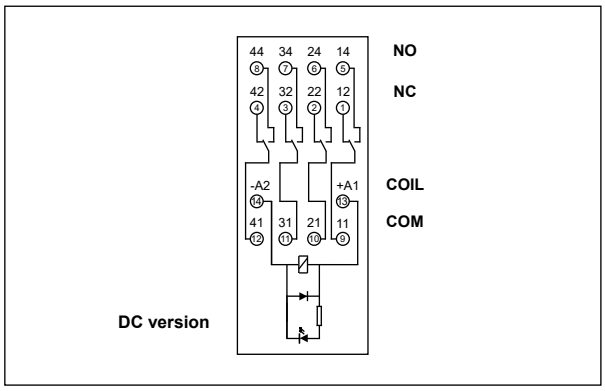


Dimensions



Relays for railroad industry - industrial

Connection diagram
(screw terminals side view)



Mounting

Relays **PIR4T with socket GZT4-V0** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm^2 (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm.

RAILROAD

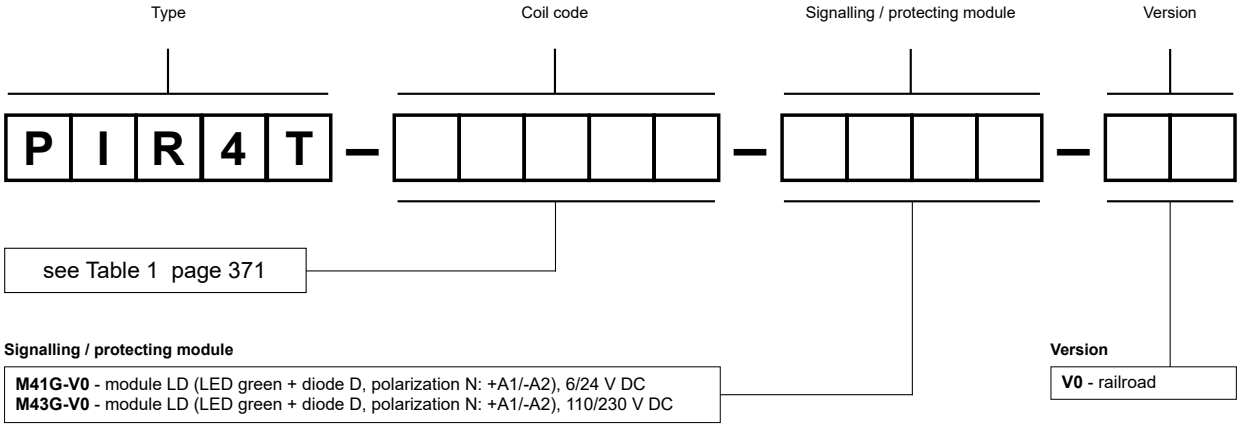
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❷	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC according to EN 50155 ❸	
				min.	max.
024DC	**24**	**640**	**± 10%**	**16,8**	**30,0**
110DC	110	13 600	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❷ For other voltages, please contact Relpol S.A. ❸ Changes of voltage within the range 0,6...1,4 Un below 0,1 s and changes of voltage within the range 1,25...1,4 Un below 1 s are admissible and they do not distort operation of the relays.

Ordering codes



Examples of ordering codes:

PIR4T-024DC-M41G-V0 interface relay **PIR4T** (railroad version) consists of: relay **R4T** (four changeover contacts, contact material AgNi, coil voltage 24 V DC), socket **GZT4-V0** (grey, screw terminals), signalling / protecting module **M41G-V0** (version LD), spring wire clip **G4 1052**

PIR4T-110DC-M43G-V0 interface relay **PIR4T** (railroad version) consists of: relay **R4T** (four changeover contacts, contact material AgNi, coil voltage 110 V DC), socket **GZT4-V0** (grey, screw terminals), signalling / protecting module **M43G-V0** (version LD), spring wire clip **G4 1052**

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PIR15.T with socket PZ..-V0
relays for railroad industry - interface

R15T - 2 CO
+ PZ8-V0

R15T - 3 CO
+ PZ11-V0

- 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: recognitions R15T, RoHS, CE EAC CIK

Contact data

Number and type of contacts		2 CO, 3 CO
Contact material		**AgNi**
Rated switching voltage	AC	250 V
Min. switching voltage		10 V
Rated load (capacity)	AC1	10 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	10 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load acc. to UL 508		1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❶
AC3 acc. to IEC 60947-4-1		0,37 kW 240 V AC, single-phase motor
Min. switching current		5 mA
Max. inrush current		20 A
Rated current		10 A
Max. breaking capacity	AC1	2 500 VA
Min. breaking capacity		0,3 W
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	1 200 cycles/hour
• no load		12 000 cycles/hour

Coil data

Rated voltage	DC	**24**, 110 V ❷
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,7...1,25 U_n EN 50155 see Table 1
Must operate voltage		≤ 0,7 U_n
Rated power consumption	DC	1,7 W reinforced version

Insulation according to EN 60664-1

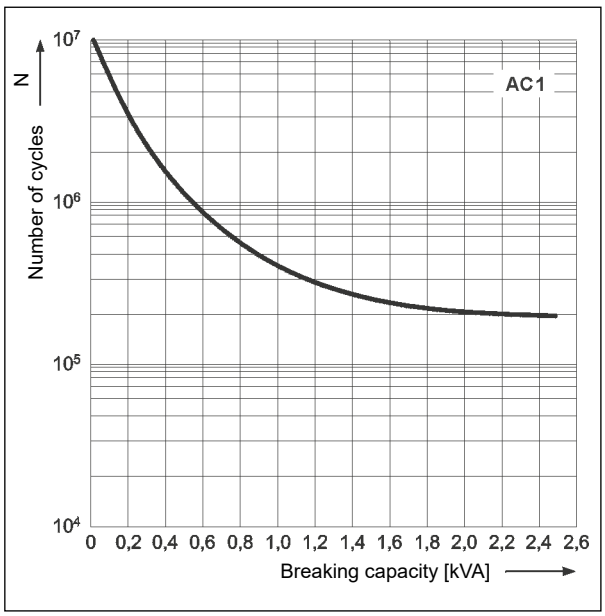
Insulation rated voltage	250 V AC
Rated surge voltage	2 500 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Flammability class	V-0 UL 94, EN 60695-11-10
Dielectric strength	
• between coil and contacts	2 500 V AC type of insulation: basic
• contact clearance	1 500 V AC type of clearance: micro-disconnection
• pole - pole	2 000 V AC type of insulation: basic
Contact - coil distance	
• clearance	≥ 3 mm
• creepage	≥ 4,2 mm

General data

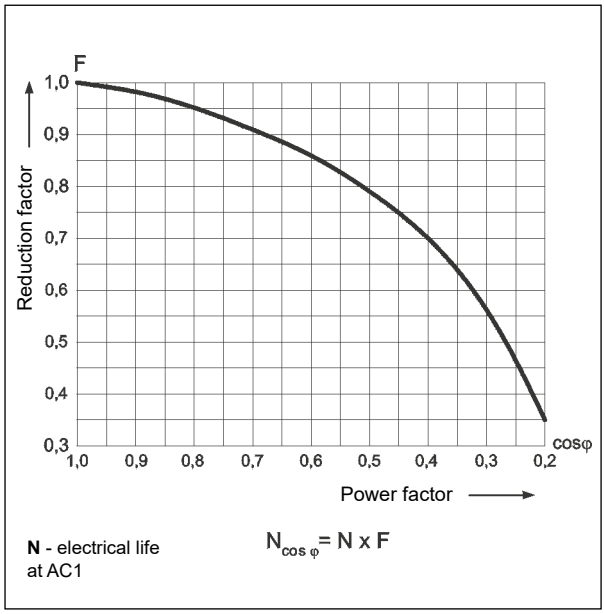
Operating / release time (typical values)		18 ms / 7 ms
Electrical life		
• resistive AC1		> 2 x 10^5 10 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		68,2 x 38 x 82 mm
Weight		PIR152T: 150 g PIR153T: 159 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+55 °C
Cover protection category		IP 20 EN 60529
Environmental protection		R15T: RTI PZ8-V0, PZ11-V0: RT0 EN 61810-7
Shock / vibration resistance		category 1, class B EN 61373 (set: relay in socket with clip)

The data in bold type relate to the standard versions of the relays. ❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC. ❷ For other voltages, please contact Relpol S.A.

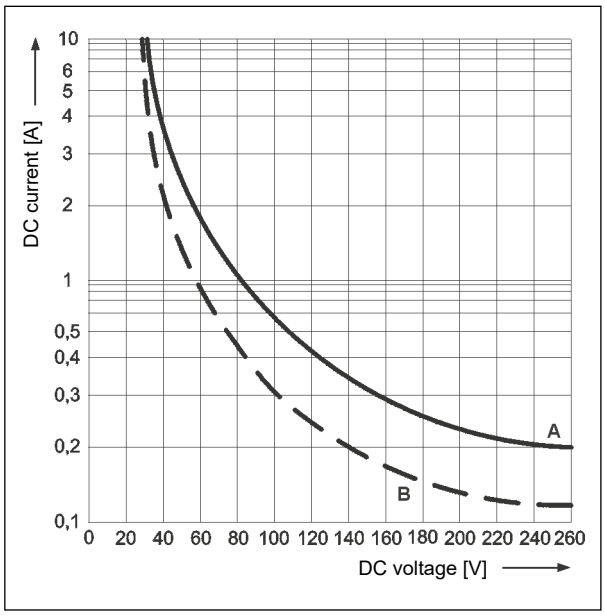
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



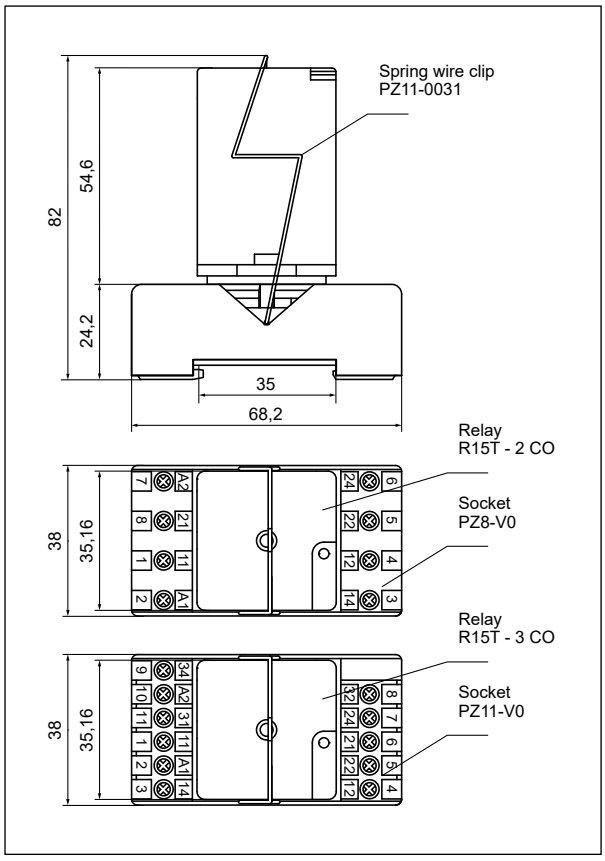
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Dimensions



Relays for railroad industry - industrial

R15T - 2 CO

R15T - 3 CO

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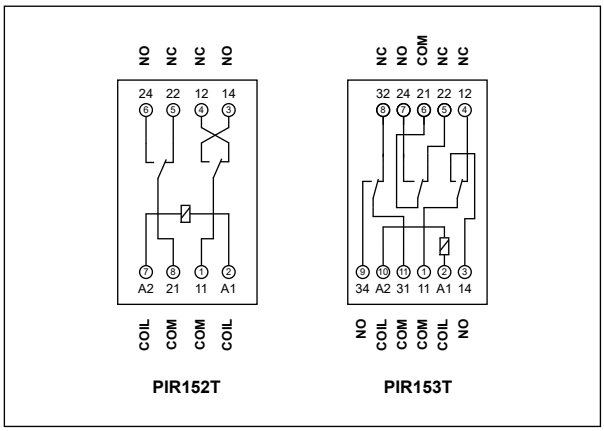
Connection diagrams
(screw terminals side view)



Mounting

Relays **PIR152T with socket PZ8-V0**, **PIR153T with socket PZ11-V0** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm^2 (2 x 14 AWG), stripping length: 7 mm, max. tightening moment for the terminal: 0,7 Nm.

RAILROAD

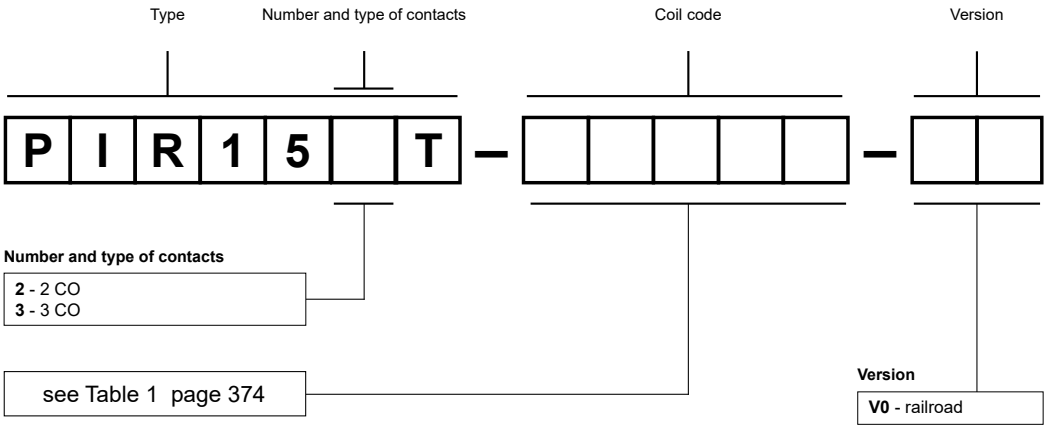
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❷	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC according to EN 50155 ❸	
				min.	max.
024DC	**24**	**345**	**± 10%**	**16,8**	**30,0**
110DC	110	7 300	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❷ For other voltages, please contact Relpol S.A. ❸ Changes of voltage within the range 0,6...1,4 Un below 0,1 s and changes of voltage within the range 1,25...1,4 Un below 1 s are admissible and they do not distort operation of the relays.

Ordering codes



Examples of ordering codes:

PIR152T-024DC-V0 interface relay **PIR152T** (railroad version) consists of: relay **R15T - 2 CO** (two change-over contacts, contact material AgNi, reinforced coil voltage 24 V DC), socket **PZ8-V0** (grey, screw terminals), spring wire clip **PZ11-0031**

PIR153T-110DC-V0 interface relay **PIR153T** (railroad version) consists of: relay **R15T - 3 CO** (three change-over contacts, contact material AgNi, reinforced coil voltage 110 V DC), socket **PZ11-V0** (grey, screw terminals), spring wire clip **PZ11-0031**

RUCT + GUC11S-V0

- 35 mm rail mount acc. to EN 60715
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: recognitions RUCT, RoHS,

Contact data

Number and type of contacts		3 CO, 3 NO
Contact material		**AgNi**
Rated / max. switching voltage	AC	230 V / 250 V
Min. switching voltage		5 V
Rated load	AC1	16 A / 250 V AC
	DC1	16 A / 24 V DC (see Fig. 3)
Min. switching current		5 mA
Max. inrush current		40 A
Rated current		16 A
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		0,3 W
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	1 200 cycles/hour
• no load		12 000 cycles/hour

Coil data

Rated voltage	DC	**24**, 110 V ❶
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,7...1,25 U_n EN 50155 see Table 1
Must operate voltage		≤ 0,7 U_n
Rated power consumption	DC	1,7 W reinforced version

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2
Flammability class		V-0 UL 94, EN 60695-11-10
Dielectric strength		
• between coil and contacts		2 500 V AC type of insulation: basic
• contact clearance		1 500 V AC type of clearance: micro-disconnection with contact gap ≥ 0,4 mm
• pole - pole		2 500 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 4 mm
	• creepage	≥ 5 mm
Pole - pole distance	• clearance	≥ 6,3 mm
	• creepage	≥ 8 mm

General data

Operating / release time	• typical values	20 ms / 15 ms
	• max. values	25 ms / 20 ms
Electrical life		
• resistive AC1		> 10^5 16 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 10^7
Dimensions (L x W x H)		84,5 x 41,5 x 77,3 mm
Weight		162 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-40...+55 °C
Cover protection category		IP 00 EN 60529
Environmental protection		RTI EN 61810-7
Shock / vibration resistance		category 1, class B EN 61373 (set: relay in socket with clip)

The data in bold type relate to the standard versions of the relays.
❶ For other voltages, please contact Relpol S.A.

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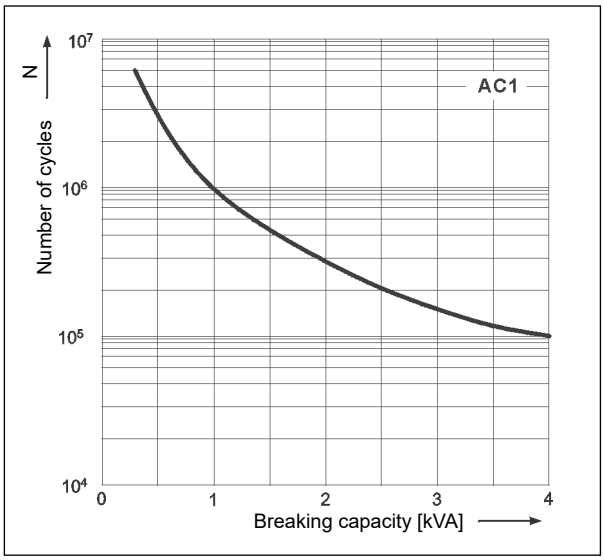
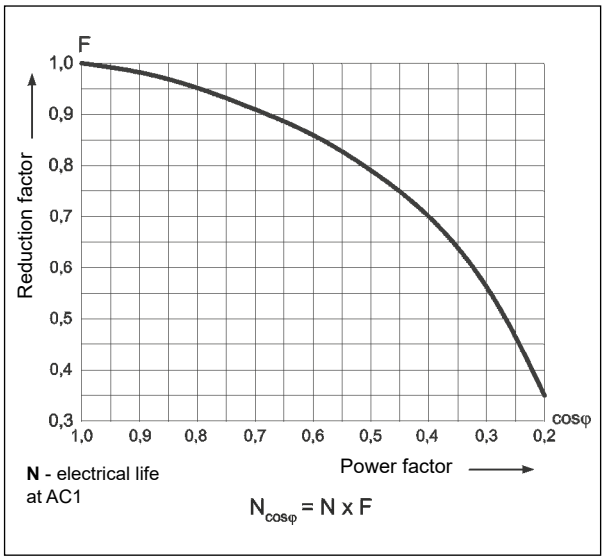
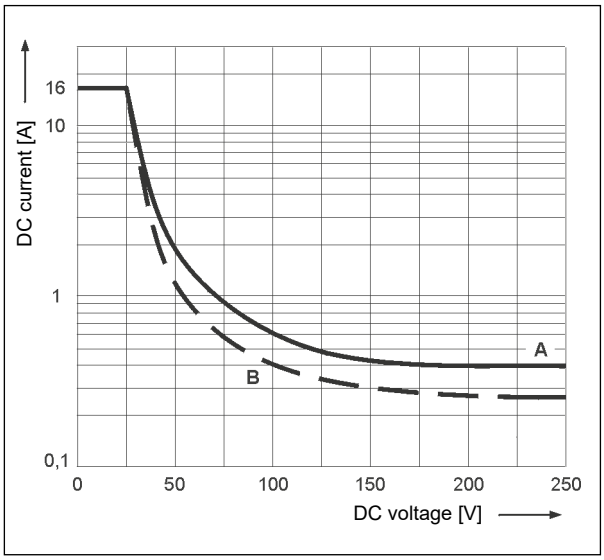
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



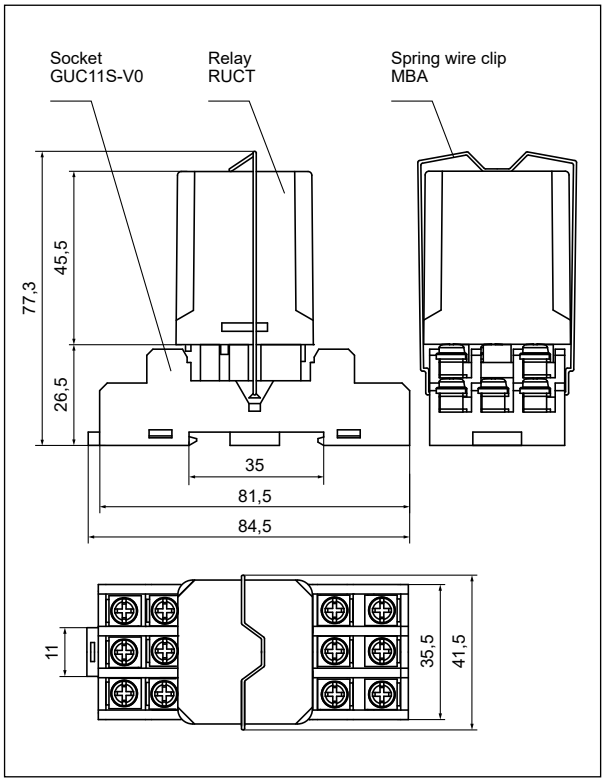
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Dimensions

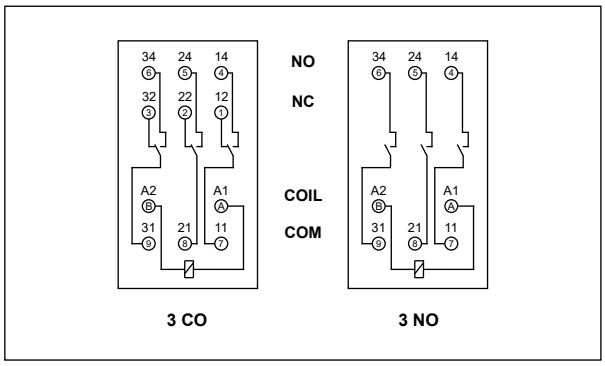


Relays for railroad industry - industrial

RUCT

RUCT-M

Connection diagrams
(screw terminals side view)



Mounting

Relays **PRUCT with socket GUC11S-V0** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 9 mm, max. tightening moment for the terminal: 0,7 Nm.

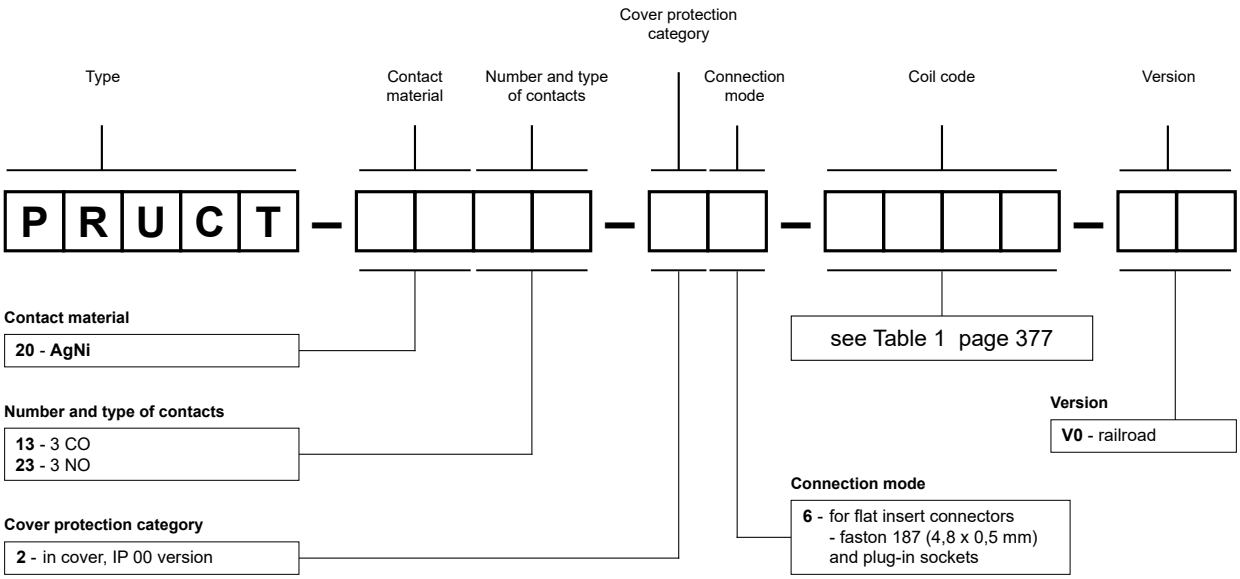
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❶	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC according to EN 50155 ❷	
				min.	max.
W024	**24**	**345**	**± 10%**	**16,8**	**30,0**
W110	110	7 300	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❶ For other voltages, please contact Relpol S.A. ❷ Changes of voltage within the range 0,6...1,4 Un below 0,1 s and changes of voltage within the range 1,25...1,4 Un below 1 s are admissible and they do not distort operation of the relays.

Ordering codes



Examples of ordering codes:

PRUCT-2013-26-W024-V0 interface relay **PRUCT** (railroad version) consists of: relay **RUCT** (three change-over contacts, contact material AgNi, reinforced coil voltage 24 V DC), socket **GUC11S-V0** (grey, screw terminals), spring wire clip **MBA**

PRUCT-2023-26-W110-V0 interface relay **PRUCT** (railroad version) consists of: relay **RUCT** (three normally open contacts, contact material AgNi, reinforced coil voltage 110 V DC), socket **GUC11S-V0** (grey, screw terminals), spring wire clip **MBA**

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PRUCT-M with socket GUC11S-V0
relays for railroad industry - interface

RUCT-M + GUC11S-V0

- **Relays with permanent magnet ❶**
- 35 mm rail mount acc. to EN 60715
- Compliance with standards: EN 45545-2 (category EL10, requirement R26 - flammability class V-0 acc. to EN 60695-11-10); EN 61373 category 1, class B (mechanical shock and vibration resistance); EN 50155; EN 60077-1; EN 61810-1
- Recognitions, certifications, directives: recognitions RUCT-M, RoHS,

CE EAC CIK

Contact data

Number and type of contacts		1 NO (double-break)	2 NO
Contact material		**AgNi**	
Rated / max. switching voltage		250 V DC; 250 V AC / 250 V DC; 250 V AC	
Min. switching voltage		5 V	
Rated load	DC1	16 A / 24 V DC; 13 A / 110 V DC 10 A / 220 V DC	16 A / 24 V DC; 9 A / 110 V DC 3,8 A / 220 V DC
	DC L/R=40 ms	16 A / 24 V DC; 4,6 A / 110 V DC 2,5 A / 220 V DC	16 A / 24 V DC; 1,2 A / 110 V DC 0,4 A / 220 V DC
	AC1	16 A / 250 V AC	16 A / 250 V AC
Min. switching current		5 mA	
Max. inrush current		40 A 20 ms	
Rated current		16 A	
Max. breaking capacity	AC1	4 000 VA	
Min. breaking capacity		0,3 W	
Contact resistance		≤ 100 mΩ	
Max. operating frequency			
• at rated load	AC1	1 200 cycles/hour	
• no load		12 000 cycles/hour	

Coil data

Rated voltage	DC	**24**, 110 V ❷
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,7...1,25 U_n EN 50155 see Table 1
Must operate voltage		≤ 0,7 U_n
Rated power consumption	DC	1,7 W reinforced version

Insulation according to EN 60664-1

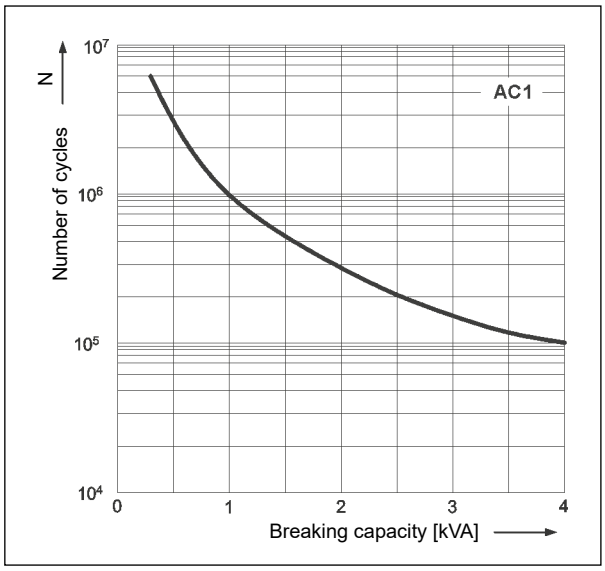
Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Flammability class		V-0 UL 94, EN 60695-11-10
Dielectric strength		
• between coil and contacts		2 500 V AC type of insulation: basic
• contact clearance		4 000 V AC contact 1 NO, type of clearance: full-disconnection
		2 000 V AC contacts 2 NO, type of clearance: full-disconnection
• pole - pole		2 500 V AC contacts 2 NO, type of insulation: basic
Contact - coil distance	• clearance	≥ 6,3 mm
	• creepage	≥ 8 mm

General data

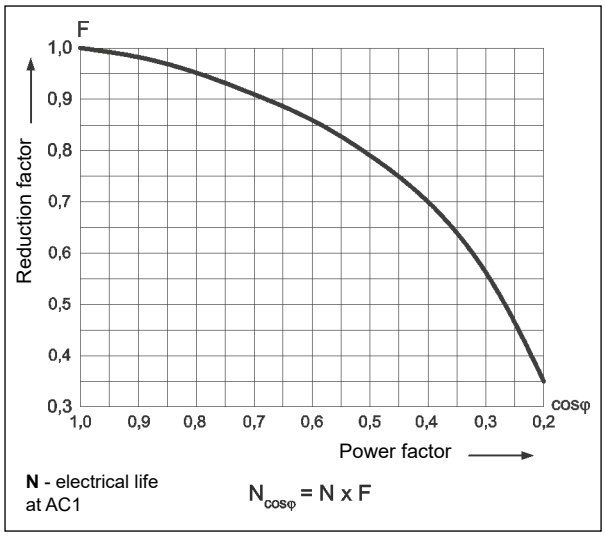
Operating / release time	• typical values	20 ms / 15 ms	
	• max. values	25 ms / 35 ms	
Electrical life			
• resistive DC1		> 2 x 10^5 10 A, 220 V DC	> 2 x 10^5 3,8 A, 220 V DC
• DC L/R=40 ms		> 2 x 10^5 2,5 A, 220 V DC	> 2 x 10^5 0,4 A, 220 V DC
Mechanical life (cycles)		> 2 x 10^7	
Dimensions (L x W x H)		84,5 x 41,5 x 77,3 mm	
Weight		154 g	
Ambient temperature	• storage	-40...+85 °C	
(non-condensation and/or icing)	• operating	-40...+55 °C	
Cover protection category		IP 00 EN 60529	
Environmental protection		RTI EN 61810-7	
Shock / vibration resistance		category 1, class B EN 61373	
		(set: relay in socket with clip)	

The data in bold type relate to the standard versions of the relays. ❶ The permanent magnet is fixed on the contact plate. Its magnetic field is directed to the contacts and it blows the electric arc which occurs when the DC load is switched off. ❷ For other voltages, please contact Relpol S.A.

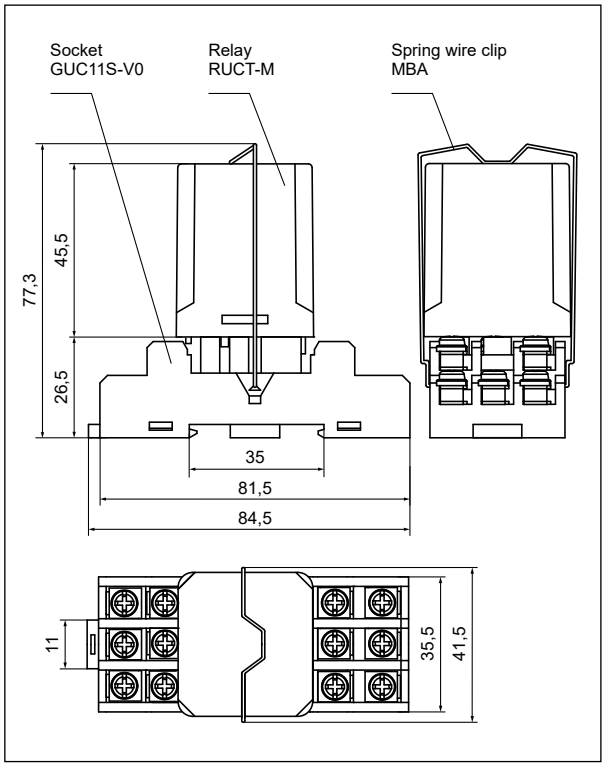
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



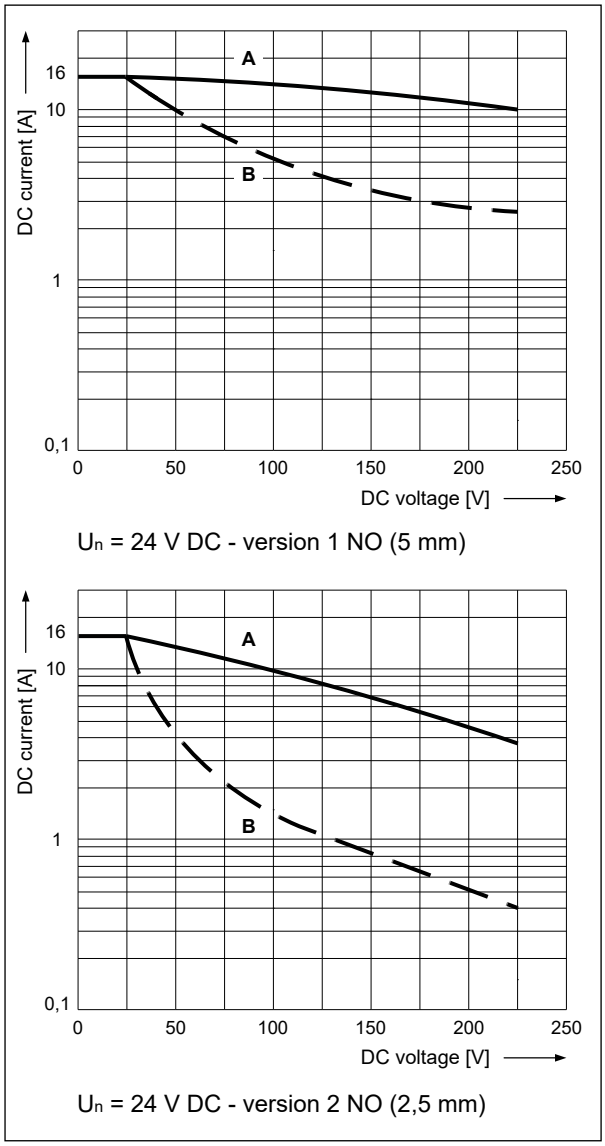
Electrical life reduction factor at AC inductive load Fig. 2



Dimensions



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Relays for railroad industry - industrial

RUCT

RUCT-M

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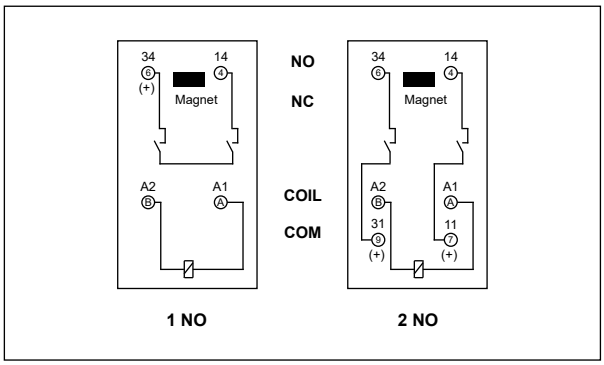
Connection diagrams
(screw terminals side view)



Mounting

Relays **PRUCT-M with socket GUC11S-V0** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 9 mm, max. tightening moment for the terminal: 0,7 Nm.

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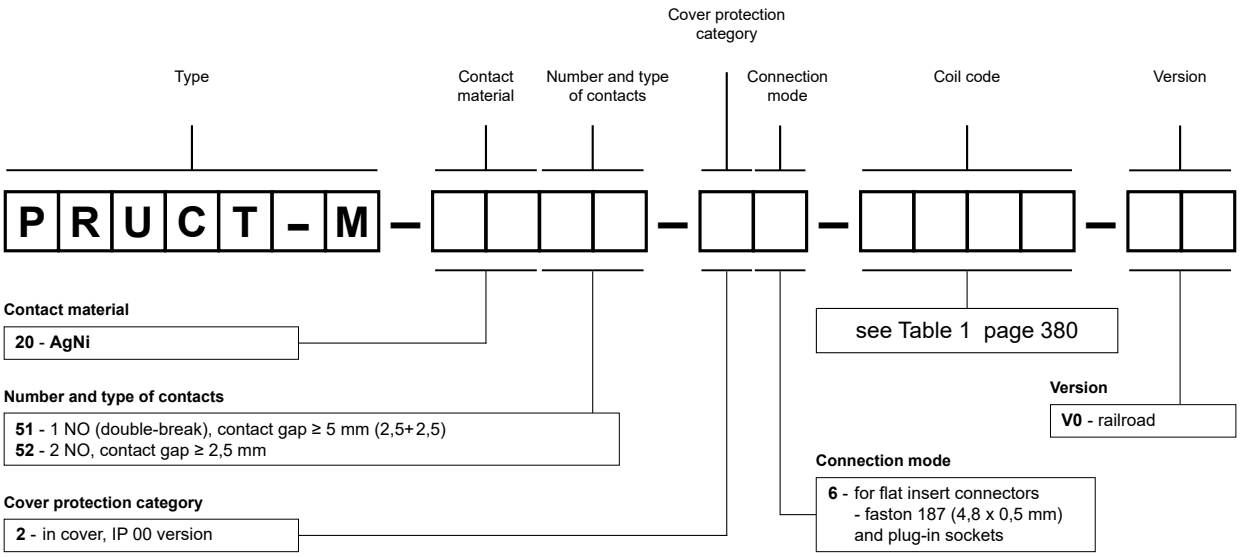
Coil data - DC voltage version

Table 1

Coil code	Rated voltage V DC ❷	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC according to EN 50155 ❸	
				min.	max.
W024	**24**	**345**	**± 10%**	**16,8**	**30,0**
W110	110	7 300	± 10%	77,0	137,5

The data in bold type relate to the standard versions of the relays. ❷ For other voltages, please contact Relpol S.A. ❸ Changes of voltage within the range 0,6...1,4 Un below 0,1 s and changes of voltage within the range 1,25...1,4 Un below 1 s are admissible and they do not distort operation of the relays.

Ordering codes

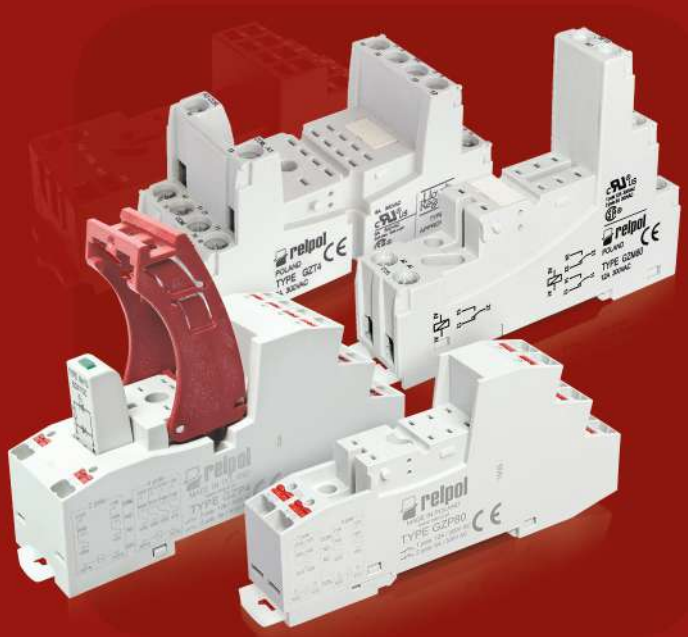


Examples of ordering codes:

PRUCT-M-2051-26-W024-V0 interface relay **PRUCT-M** (railroad version) consists of: relay **RUCT-M** (one normally open contact, contact material AgNi, reinforced coil voltage 24 V DC), socket **GUC11S-V0** (grey, screw terminals), spring wire clip **MBA**

PRUCT-M-2052-26-W110-V0 interface relay **PRUCT-M** (railroad version) consists of: relay **RUCT-M** (two normally open contacts, contact material AgNi, reinforced coil voltage 110 V DC), socket **GUC11S-V0** (grey, screw terminals), spring wire clip **MBA**

Sockets and accessories



relpol S.A.

Plug-in sockets are designed for miniature and industrial relays. They provide for mounting of the relays in printed circuits, on 35 mm rail mount acc. to EN 60715, and on panel mounting.

GZT..., GZM..., GZS..., GZF..., GZ..., GZU... series are the sockets with screw terminals. GZP... serie are the sockets with Push-in terminals.

The sockets have the following features: current circuits load: up to 12 A, available plug-in sockets with separation of input (coil) from output (contacts), i.e. coil terminals on one side of the socket, and contact terminals on another side, adapted for mounting signalling / protecting modules type M... - sockets of GZT..., GZM..., GZS..., GZP..., ES 32 series.

They meet the requirements of REACH and RoHS Directive. The plug-in sockets are recognized and certified by:

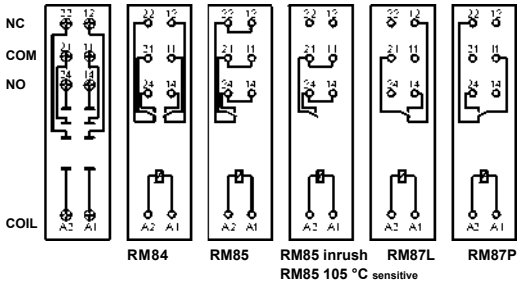
← Contents

GZT80

For RM84, RM85,
RM85 inrush,
RM85 105 °C sensitive,
RM87L, RM87L sensitive,
RM87P, RM87P sensitive

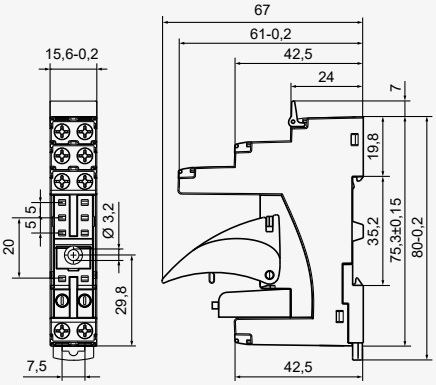
Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
80 x 15,6 x 61(67) mm ❷
Two poles, 5 mm pinout
12 A, 300 V AC

Connection diagrams ❸



Accessories ❶

Dimensions

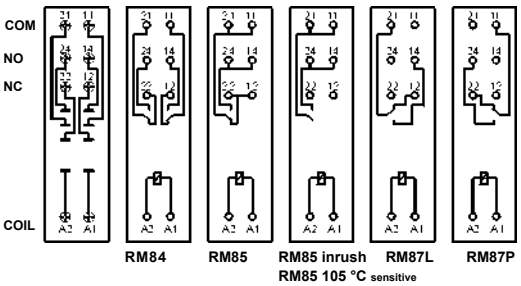


GZM80

For RM84, RM85,
RM85 inrush,
RM85 105 °C sensitive,
RM87L, RM87L sensitive,
RM87P, RM87P sensitive

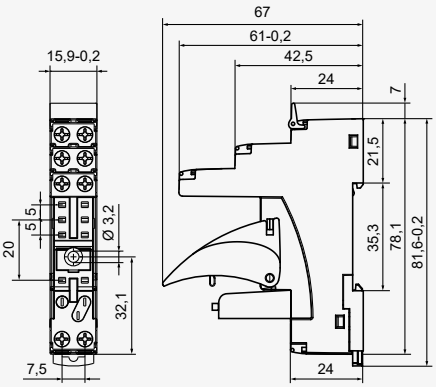
Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
81,6 x 15,9 x 61(67) mm ❷
Two poles, 5 mm pinout
12 A, 300 V AC

Connection diagrams ❸



Accessories ❶

Dimensions

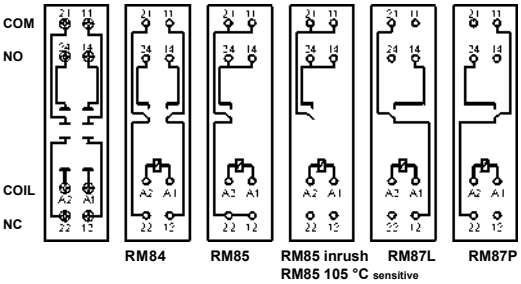


GZS80

For RM84, RM85,
RM85 inrush,
RM85 105 °C sensitive,
RM87L, RM87L sensitive,
RM87P, RM87P sensitive

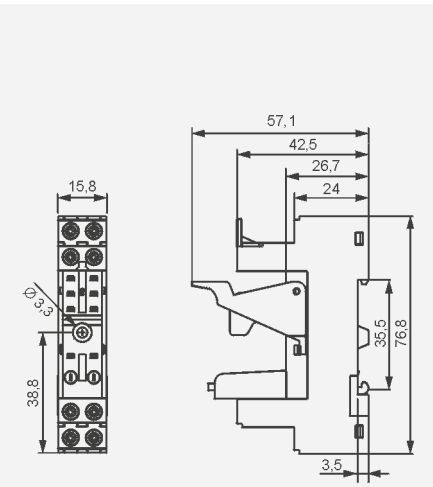
Screw terminals
Max. tightening moment
for the terminal: 0,5 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
76,8 x 15,8 x 42,5(57,1) mm ❷
Two poles, 5 mm pinout
10 A, 300 V AC

Connection diagrams ❸



Accessories ❶

Dimensions



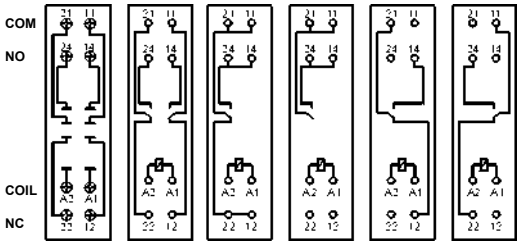
❶ Mounting and sub-assemblies of accessories in the socket - see page 398. Signalling / protecting modules type M... - see page 399. ❷ In the bracket the height of socket with retainer / retractor clip is shown. ❸ For RM85..., RMP85: loads above 12 A (GZT80, GZM80, GZP80) or 10 A (GZS80, GZF80) require bridging pairs of terminals: 11 with 21, 12 with 22, 14 with 24 - see pages 147, 155, 159, 184.

GZF80

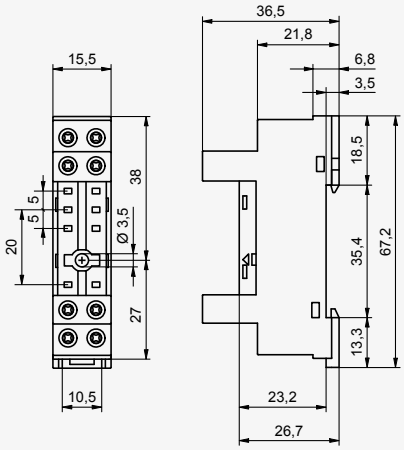
For RM84, RM85,
RM85 inrush,
RM85 105 °C sensitive,
RM87L, RM87L sensitive,
RM87P, RM87P sensitive,
RMP84, RMP85

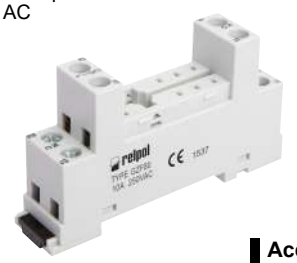
Screw terminals
Max. tightening moment
for the terminal: 0,5 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
67,2 x 15,5 x 36,5 mm
Two poles, 5 mm pinout
10 A, 250 V AC

Connection diagrams ❸



Dimensions





Accessories

GZM80-0041 GZ80-1001

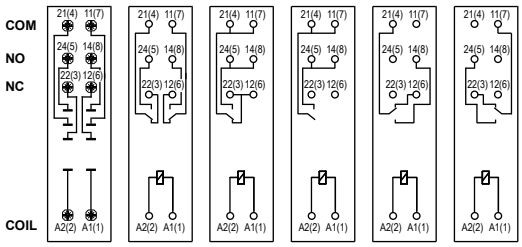
GZP80

For RM84, RM85,
RM85 inrush,
RM85 105 °C sensitive,
RM87L, RM87L sensitive,
RM87P, RM87P sensitive,
RMP84, RMP85

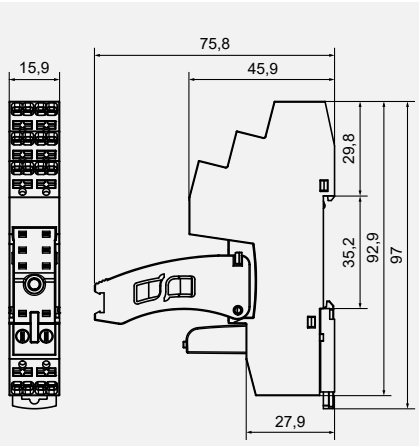
Push-in terminals
Max. cross section of the cables:
2 x 1,5 mm² (ferrules without insulation)
2 x 1 mm² (ferrules with insulation)
Stripping length: 8...10 mm

35 mm rail mount
acc. to EN 60715
or on panel mounting
97 x 15,9 x 45,9(75,8) mm ❷
5 mm pinout
One pole
12 A, 300 V AC
Two poles
8 A, 300 V AC

Connection diagrams ❸



Dimensions



ZGZP80-8

GZP80-0400

GZT80-0040

GZM80-0041

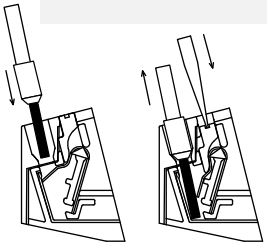
GZ80-1001

MP15

ZGZP80-2

ZGZP-2

Module type M...



The drawings present inserting wire into the Push-in terminal and removing wire using the button releasing a clamp (assembly without tools).

Accessories ❶

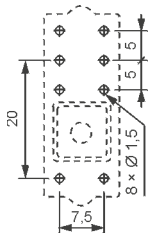
Wire connection

PW80

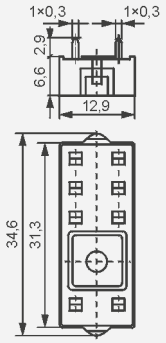
For RM84, RM85, RM85 inrush,
RM85 105 °C sensitive,
RM87L, RM87L sensitive,
RM87P, RM87P sensitive,
RM83

For PCB
34,6 x 12,9 x 6,6 mm
Two poles, 5 mm pinout
12 A, 250 V AC

Pinout



Dimensions



Accessories

MH16-2 MH25-2

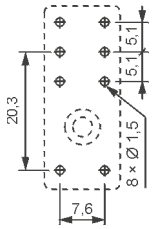
❶ Mounting and sub-assemblies of accessories in the socket - see page 398. Signalling / protecting modules type M... - see page 399. ❷ In the bracket the height of socket with retainer / retractor clip is shown. ❸ For RM85..., RMP85: loads above 12 A (GZT80, GZM80, GZP80) or 10 A (GZS80, GZF80) require bridging pairs of terminals: 11 with 21, 12 with 22, 14 with 24 - see pages 147, 155, 159, 184.

EC 50

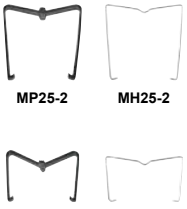
For RM84, RM85, RM85 inrush,
RM85 105 °C sensitive,
RM87L, RM87L sensitive,
RM87P, RM87P sensitive,
RM83, RMP84, RMP85

For PCB
31,3 x 12,7 x 9 mm
Two poles, 5 mm pinout
12 A, 250 V AC

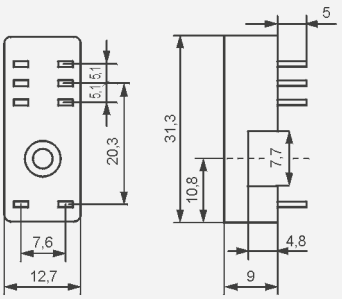
Pinout



Accessories



Dimensions

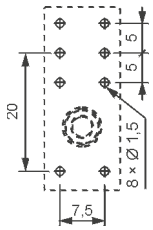


GD50

For RM84, RM85, RM85 inrush,
RM85 105 °C sensitive,
RM87L, RM87L sensitive,
RM87P, RM87P sensitive,
RM83, RMP84, RMP85

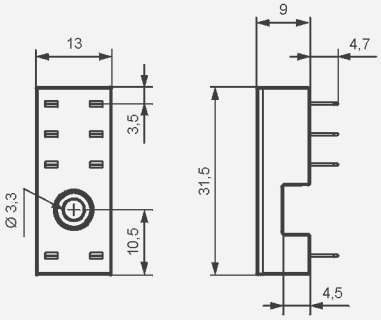
For PCB
31,5 x 13 x 9 mm
Two poles, 5 mm pinout
8 A, 300 V AC

Pinout



Accessories

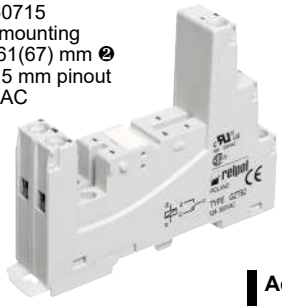
Dimensions



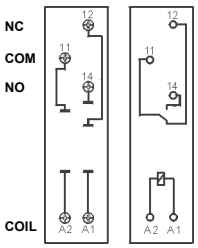
GZT92

For RM87N, RM87N sensitive

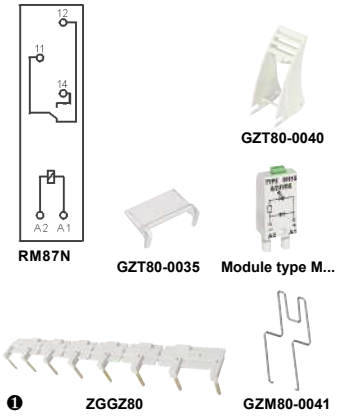
Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
80 x 15,6 x 61(67) mm ❷
One pole, 3,5 mm pinout
12 A, 300 V AC



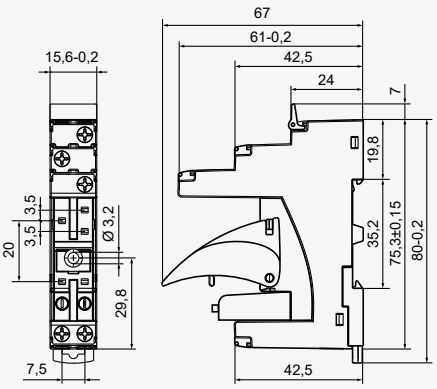
Connection diagrams



Accessories ❶



Dimensions

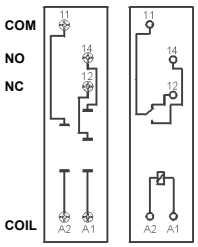


GZM92

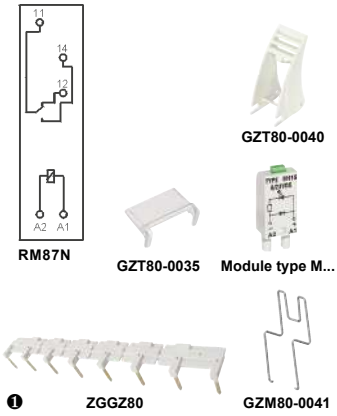
For RM87N, RM87N sensitive

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
81,6 x 15,9 x 61(67) mm ❷
One pole, 3,5 mm pinout
12 A, 300 V AC

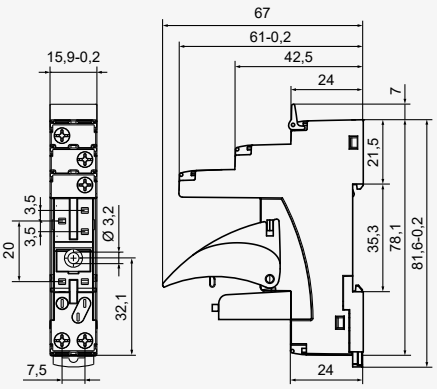
Connection diagrams



Accessories ❶



Dimensions



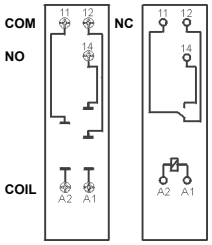
❶ Mounting and sub-assemblies of accessories in the socket - see page 398. Signalling / protecting modules type M... - see page 399.
❷ In the bracket the height of socket with retainer / retractor clip is shown.

GZS92

For RM87N, RM87N sensitive

Screw terminals
Max. tightening moment
for the terminal: 0,5 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
76,8 x 15,8 x 42,5(57,1) mm ❷
One pole, 3,5 mm pinout
12 A, 300 V AC

Connection diagrams



RM87N

GZS-0040

TR

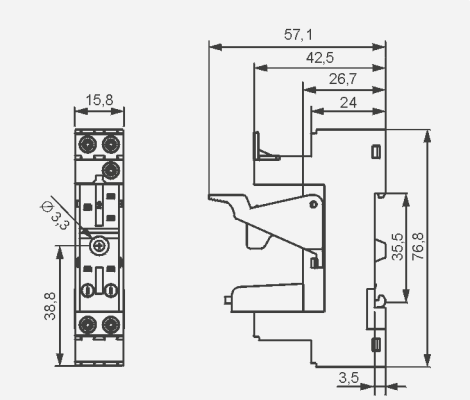
Module type M...

Accessories ❶

ZGGZ80

GZM80-0041

Dimensions

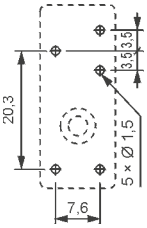


EC 35

For RM87N, RM87N sensitive

For PCB
31,3 x 12,7 x 9 mm
One pole, 3,5 mm pinout
12 A, 300 V AC

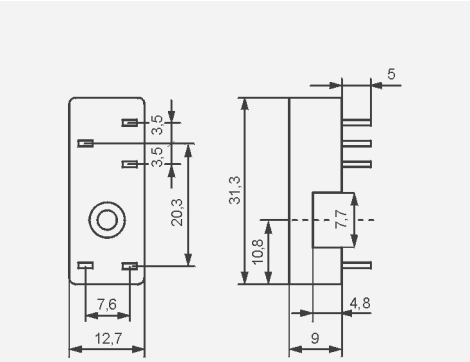
Pinout



Accessories

MP16-2 MH16-2

Dimensions

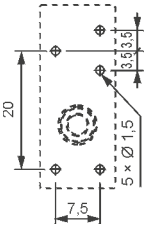


GD35

For RM87N, RM87N sensitive

For PCB
31,5 x 13 x 9 mm
One pole, 3,5 mm pinout
12 A, 300 V AC

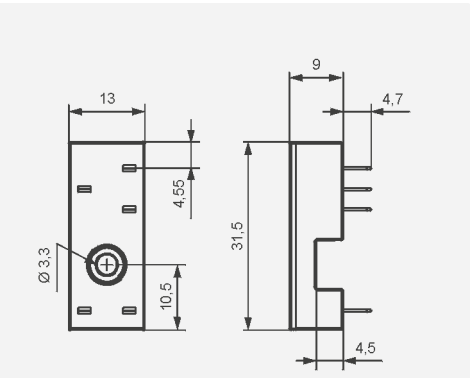
Pinout



Accessories

MP16-2 MH16-2 GD-0016

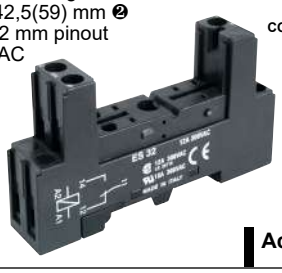
Dimensions



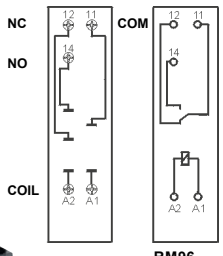
ES 32

For RM96 1 CO

Screw terminals
Max. tightening moment
for the terminal: 0,5 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
75 x 15,5 x 42,5(59) mm ❷
One pole, 3,2 mm pinout
12 A, 300 V AC



Connection diagrams



RM96

MS 16

TR

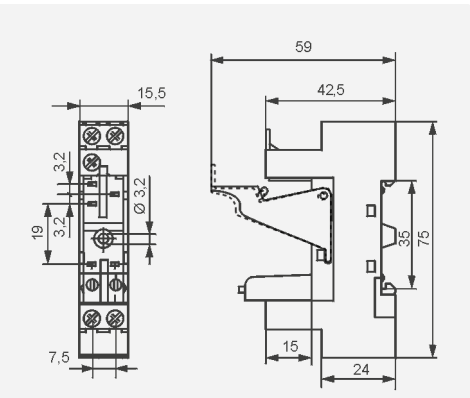
Module type M...

Accessories ❶

ZGGZ80

GZM80-0041

Dimensions



❶ Mounting and sub-assemblies of accessories in the socket - see page 398. Signalling / protecting modules type M... - see page 399.
❷ In the bracket the height of socket with retainer / retractor clip is shown.

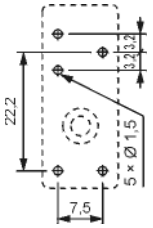
SOCKETS

← Contents

EC 32

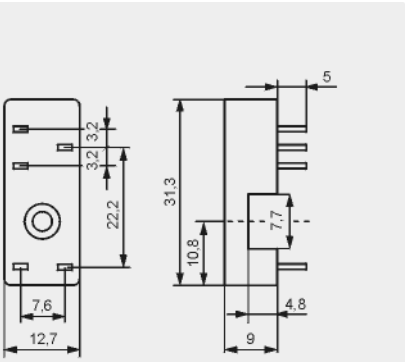
For PCB
31 x 12,7 x 9 mm
One pole, 3,2 mm pinout
12 A, 300 V AC

Pinout



Accessories

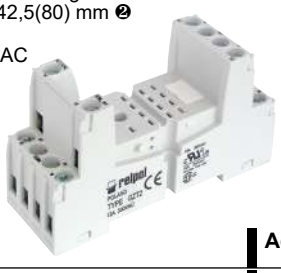
Dimensions



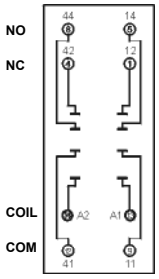
GZT2

For R2N

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
76,3 x 27 x 42,5(80) mm ❷
Two poles
12 A, 300 V AC

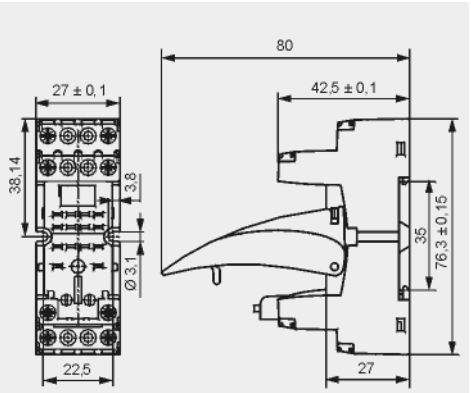


Connection diagram



Accessories ❶

Dimensions

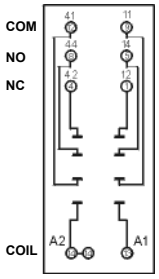


GZM2

For R2N

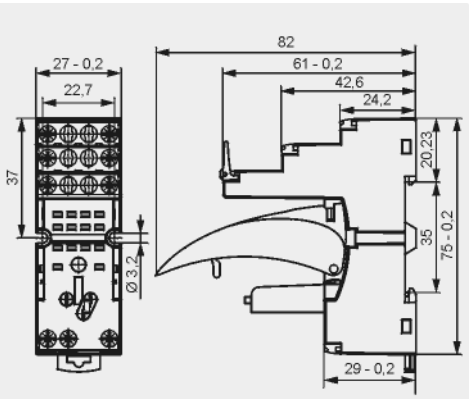
Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
75 x 27 x 61(82) mm ❷
Two poles
12 A, 300 V AC

Connection diagram



Accessories ❶

Dimensions

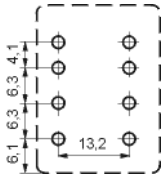


SU4/2D

For R2N

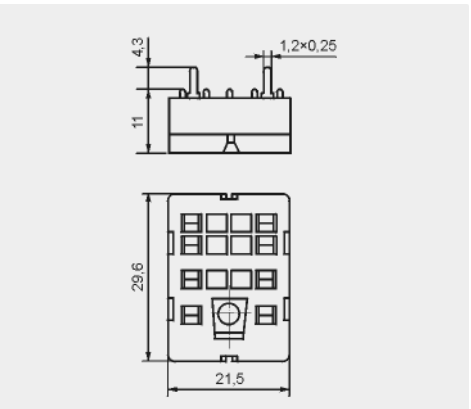
For PCB
29,6 x 21,5 x 11 mm
Two poles
12 A, 250 V AC

Pinout



Accessories

Dimensions



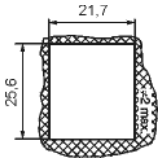
❶ Mounting and sub-assemblies of accessories in the socket - see page 398. Signalling / protecting modules type M... - see page 399.
❷ In the bracket the height of socket with retainer / retractor clip is shown.

SU4/2L

For R2N

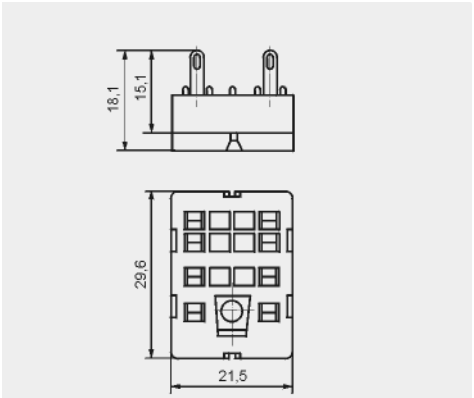
Solder terminals
29,6 x 21,5 x 18,1 mm
Two poles
12 A, 250 V AC

Dimensions of opening on panel mounting



Accessories G4 1053 G4 1040

Dimensions

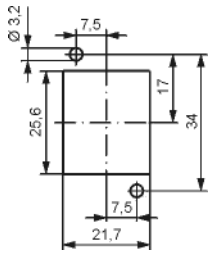


G4/2

For R2N

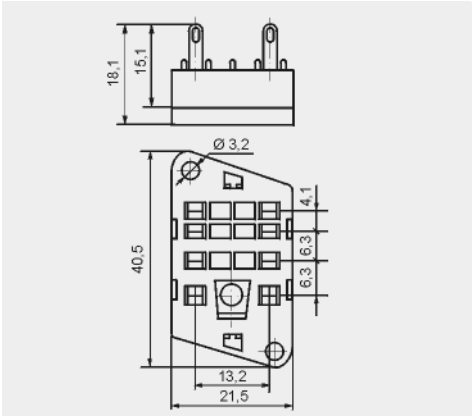
Solder terminals
40,5 x 21,5 x 18,1 mm
Two poles
12 A, 250 V AC

Pinout of openings on panel mounting



Accessories G4 1053

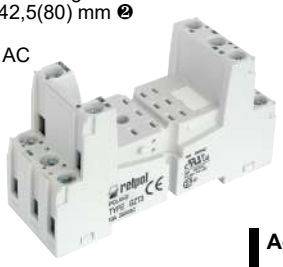
Dimensions



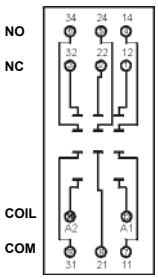
GZT3

For R3N

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
76,3 x 27 x 42,5(80) mm ❷
Three poles
10 A, 300 V AC

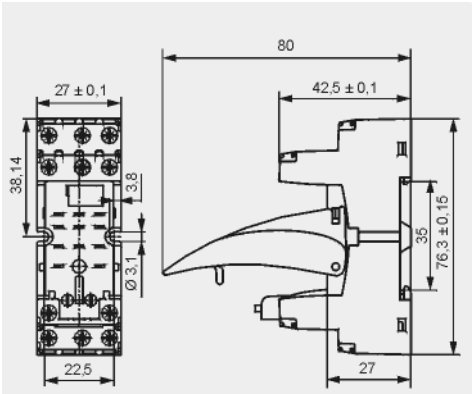


Connection diagram



Accessories ❶

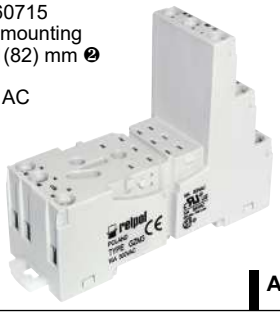
Dimensions



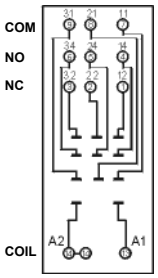
GZM3

For R3N

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
75 x 27 x 61(82) mm ❷
Three poles
10 A, 300 V AC

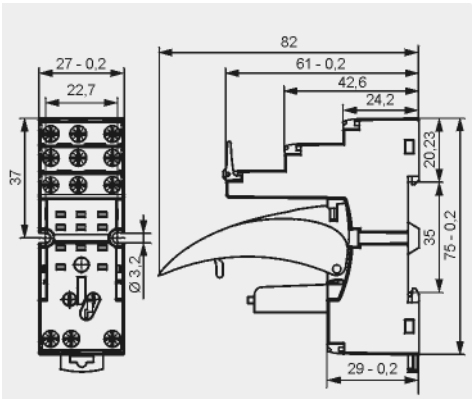


Connection diagram



Accessories ❶

Dimensions

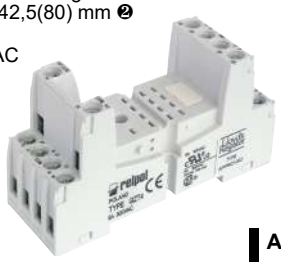


❶ Mounting and sub-assemblies of accessories in the socket - see page 398. Signalling / protecting modules type M... - see page 399.
❷ In the bracket the height of socket with retainer / retractor clip is shown.

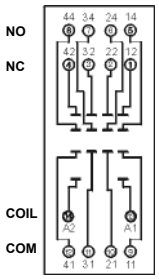
GZT4 ❹

For R4N, T-R4

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
76,3 x 27 x 42,5(80) mm ❷
Four poles
6 A, 300 V AC

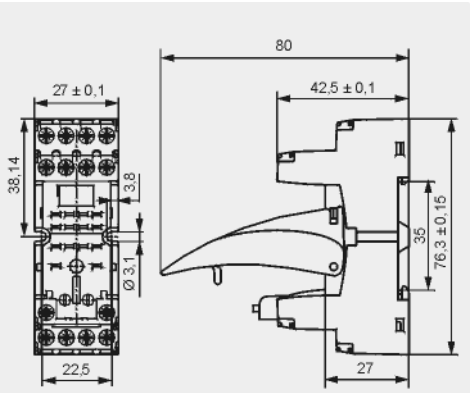


Connection diagram



Accessories ❶ ❺

Dimensions

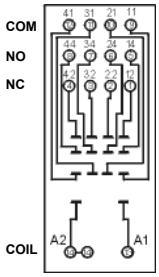


GZM4

For R4N, T-R4

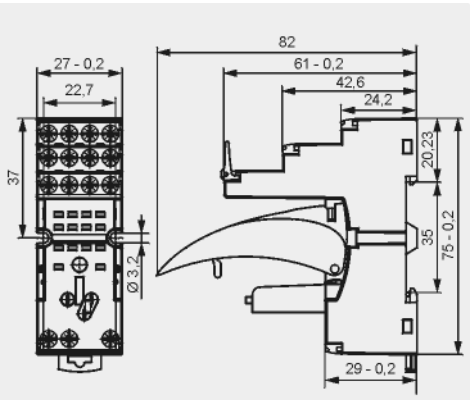
Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
75 x 27 x 61(82) mm ❷
Four poles
6 A, 300 V AC

Connection diagram



Accessories ❶ ❺

Dimensions

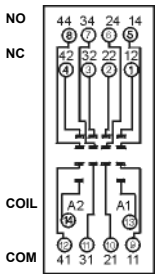


GZ4

For R4N

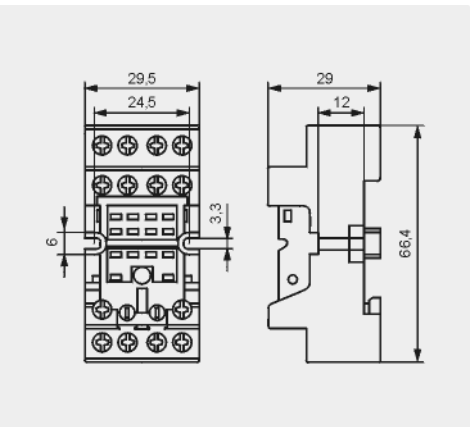
Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
66,4 x 29,5 x 29 mm
Four poles
10 A, 300 V AC

Connection diagram



Accessories

Dimensions

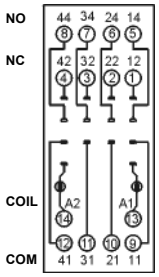


GS4

For R4N

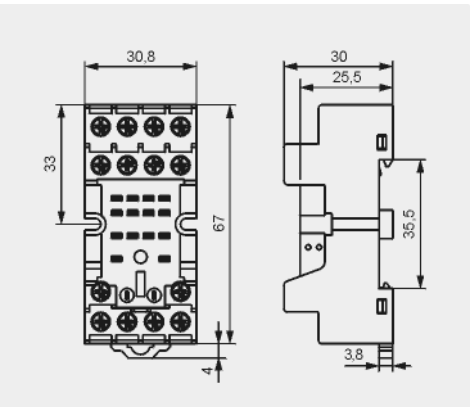
Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
67 x 30,8 x 30(~63,7) mm ❻
Four poles
10 A, 300 V AC

Connection diagram



Accessories

Dimensions



❶ Mounting and sub-assemblies of accessories in the socket - see page 398. Signalling / protecting modules type M... - see page 399. ❷ In the bracket the height of socket with retainer / retractor clip is shown. ❹ Have obtained LR Type Approval Certificate (Lloyd's Register). ❺ For R4N relays: G4 1052, GZT4-0040, GZT4-0035, TR, module type M...; for T-R4 relays: TR4-2000, GZT4-0035, TR. ❻ In the bracket the height of socket with spring wire clip is shown.

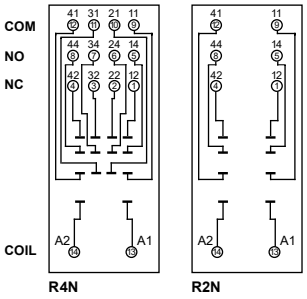
GZP4

For R4N, R2N

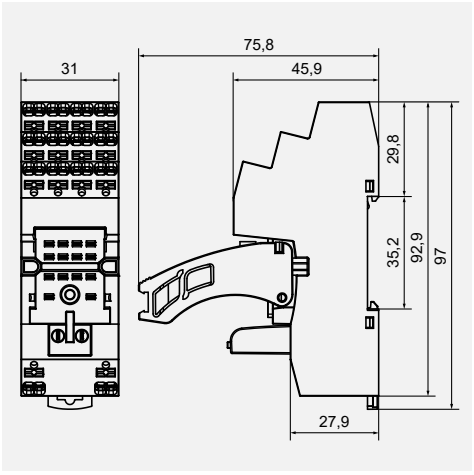
Push-in terminals
Max. cross section of the cables:
2 x 1,5 mm² (ferrules without insulation)
2 x 1 mm² (ferrules with insulation)
Stripping length: 8...10 mm

35 mm rail mount
acc. to EN 60715
or on panel mounting
97 x 31 x 45,9(75,8) mm ❷
Two poles
12 A, 300 V AC
Four poles
8 A, 300 V AC

Connection diagrams



Dimensions




GZP4-0400


GZT4-0040


G4 1052

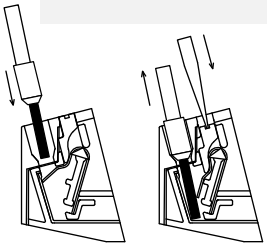

MP15


ZGZP4-8


ZGZP4-2

ZGZP-2


Module type M...



The drawings present inserting wire into the Push-in terminal and removing wire using the button releasing a clamp (assembly without tools).

Accessories ❶

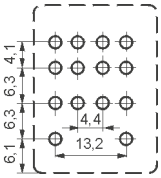
Wire connection

SU4D

For R4N

For PCB
29,6 x 21,5 x 11 mm
Four poles
6 A, 250 V AC

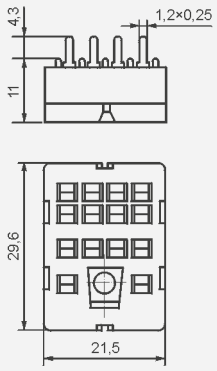
Pinout



Accessories


G4 1053

Dimensions

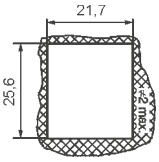


SU4L

For R4N

Solder terminals
29,6 x 21,5 x 18,1 mm
Four poles
6 A, 250 V AC

Dimensions of opening on panel mounting

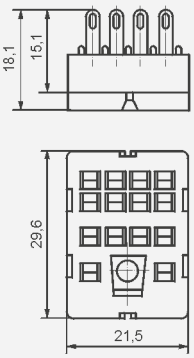


Accessories


G4 1053


G4 1040

Dimensions



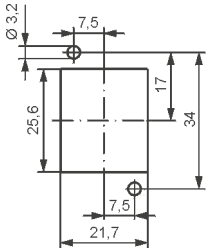
❶ Mounting and sub-assemblies of accessories in the socket - see page 398. Signalling / protecting modules type M... - see page 399.
❷ In the bracket the height of socket with retainer / retractor clip is shown.

G4

For R4N

Solder terminals
40,5 x 21,5 x 18,1 mm
Four poles
6 A, 250 V AC

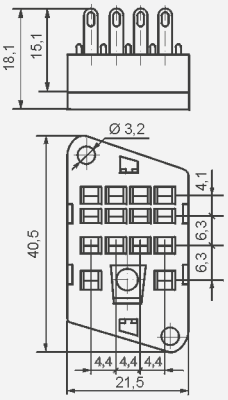
Pinout of openings on panel mounting



Accessories

G4 1053

Dimensions

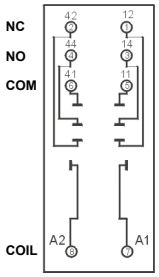


GZY2G

For RY2

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
78,7 x 28 x 32,4 mm
Two poles
12 A, 250 V AC

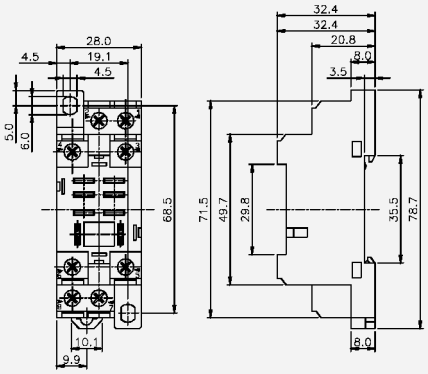
Connection diagram



Accessories

GZY2G-0041

Dimensions

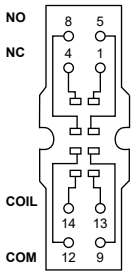


GZ2

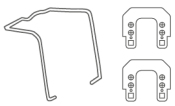
For R2M

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
65,2 x 20 x 25 mm
Two poles
7 A, 250 V AC

Connection diagram

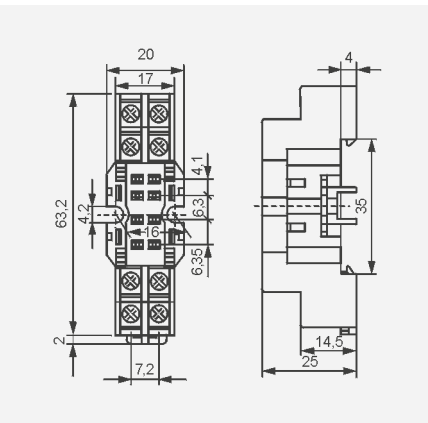


Accessories



GZ2 1060

Dimensions

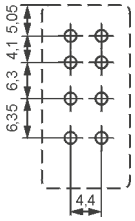


S2M

For R2M

For PCB
29,6 x 14 x 10,5 mm
Two poles
5 A, 250 V AC

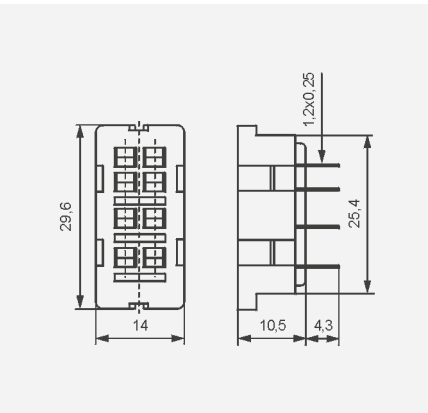
Pinout



Accessories

G4 1050

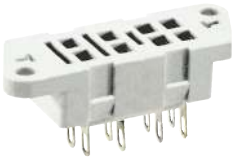
Dimensions



G2M

For R2M

Solder terminals
40,5 x 14 x 10,5 mm
Two poles
5 A, 250 V AC

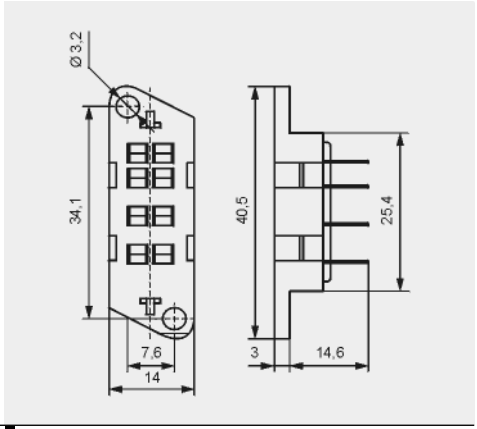


Accessories


G4 1050


G2M 1020

Dimensions

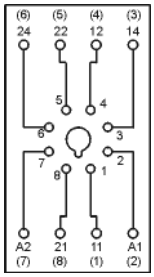


PZ8 ❹

For R15 - 2 CO

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
68,2 x 38 x 24,2 mm
Two poles
10 A, 250 V AC

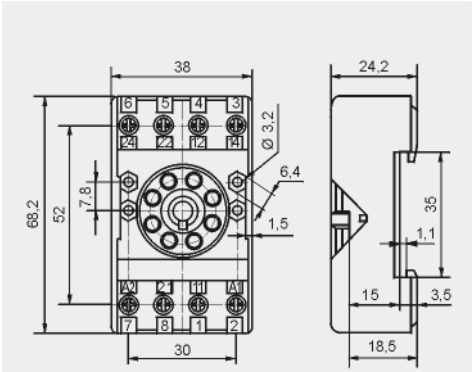
Connection diagram



Accessories


PZ11 0031

Dimensions

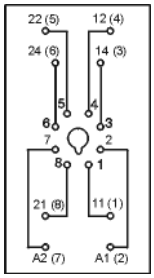


GZU8

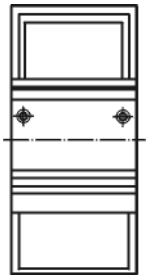
For R15 - 2 CO

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
82 x 35,5 x 25,7 mm
Two poles
10 A, 250 V AC

Connection diagram



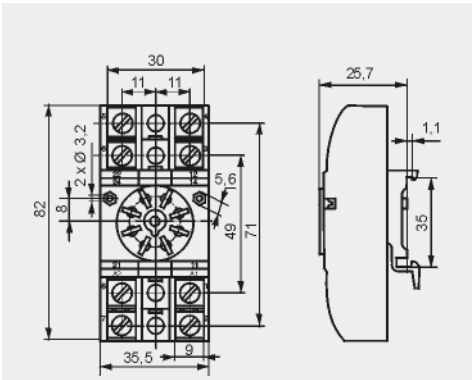
Adaptor



Accessories


GZU 1052

Dimensions

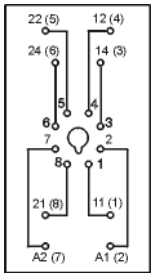


GZ8

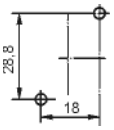
For R15 - 2 CO

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
On panel mounting
82,8 x 35,5 x 22,5 mm
Two poles
10 A, 250 V AC

Connection diagram



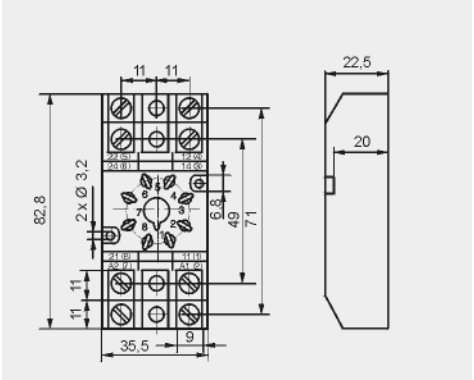
Mounting dimensions



Accessories


GZ 1050

Dimensions



❹ Have obtained LR Type Approval Certificate (Lloyd's Register).

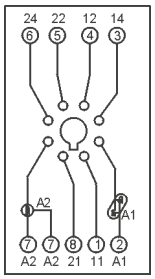
SOCKETS

GZP8

For R15 - 2 CO

Screw terminals
Max. tightening moment
for the terminal: 0,5 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
73 x 38,2 x 27,2 mm
Two poles
12 A, 300 V AC

Connection diagram



Module type 21, 41

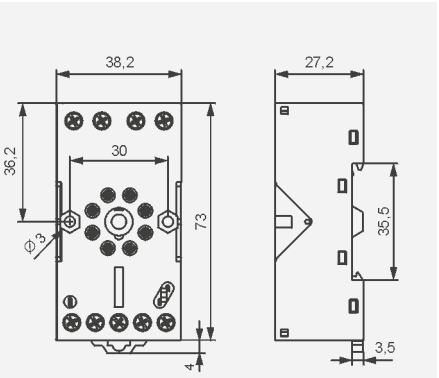
Time module COM3

Accessories

GZP-0054

GZP-0035

Dimensions

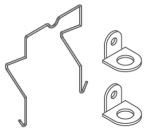


GOP8

For R15 - 2 CO

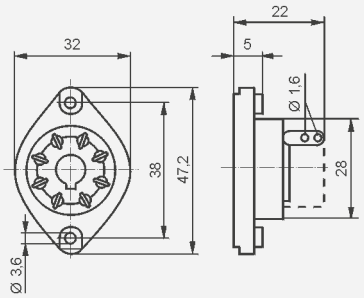
Solder terminals
47,2 x 32 x 22 mm
Two poles
10 A, 250 V AC

Accessories



R159 1051

Dimensions

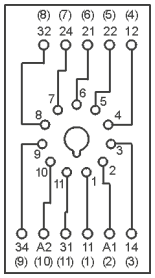


PZ11 ❹

For R15 - 3 CO

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
68,2 x 38 x 24,2 mm
Three poles
10 A, 250 V AC

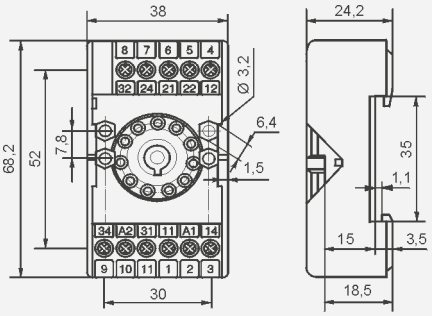
Connection diagram



Accessories

PZ11 0031

Dimensions

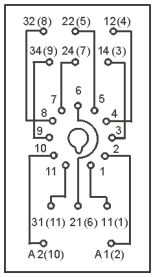


GZU11

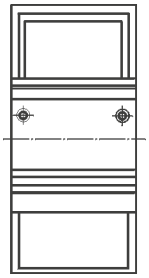
For R15 - 3 CO

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
82 x 35,5 x 25,7 mm
Three poles
10 A, 250 V AC

Connection diagram



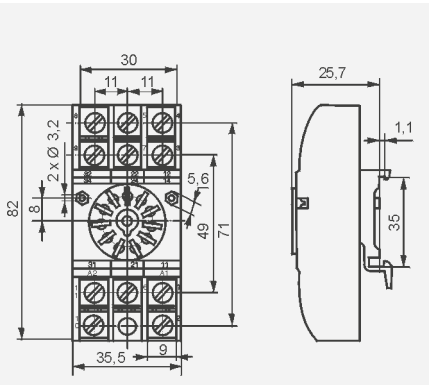
Adaptor



Accessories

GZU 1052

Dimensions



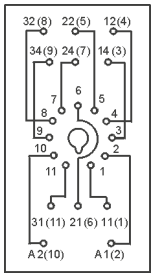
❹ Have obtained LR Type Approval Certificate (Lloyd's Register).

GZ11

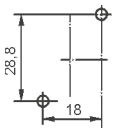
For R15 - 3 CO

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
On panel mounting
82,8 x 35,5 x 22,5 mm
Three poles
10 A, 250 V AC

Connection diagram



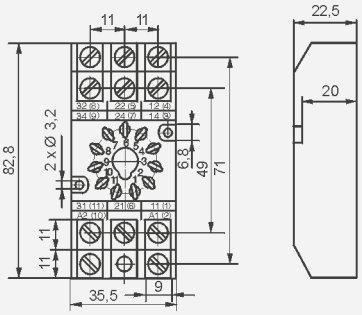
Mounting dimensions



Accessories

GZ 1050

Dimensions

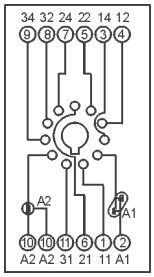


GZP11

For R15 - 3 CO

Screw terminals
Max. tightening moment
for the terminal: 0,5 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
73 x 38,2 x 27,2 mm
Three poles
12 A, 300 V AC

Connection diagram



Module type 21, 41

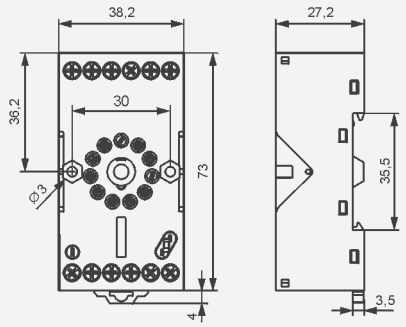
Time module COM3

Accessories

GZP-0054

GZP-0035

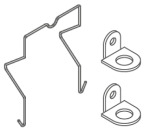
Dimensions



GOP11

For R15 - 3 CO

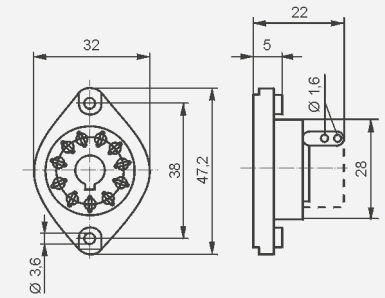
Solder terminals
47,2 x 32 x 22 mm
Three poles
10 A, 250 V AC



Accessories

R159 1051

Dimensions

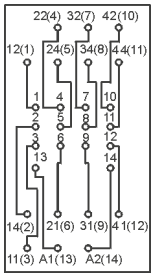


GZ14U

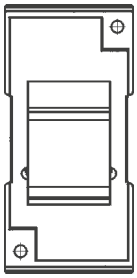
For R15 - 4 CO

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
96,8 x 46,4 x 33,3 mm
Four poles
10 A, 250 V AC

Connection diagram



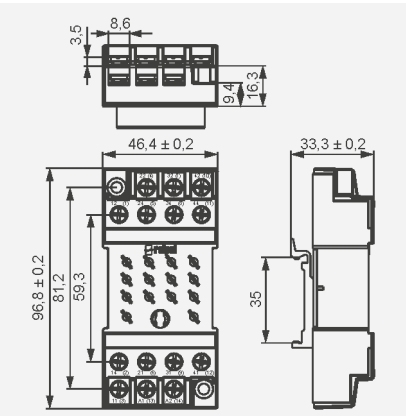
Adaptor



Accessories

GZ14 0737

Dimensions



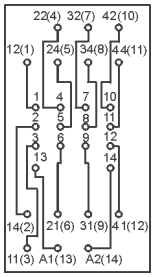
SOCKETS

GZ14

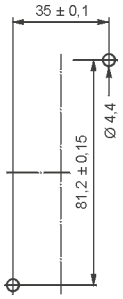
For R15 - 4 CO

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
On panel mounting
96,8 x 46,4 x 24,5 mm
Four poles
10 A, 250 V AC

Connection diagram



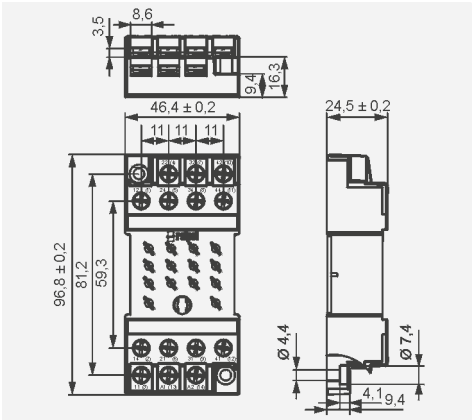
Mounting dimensions



Accessories

GZ14 0737

Dimensions



GOP14

For R15 - 4 CO

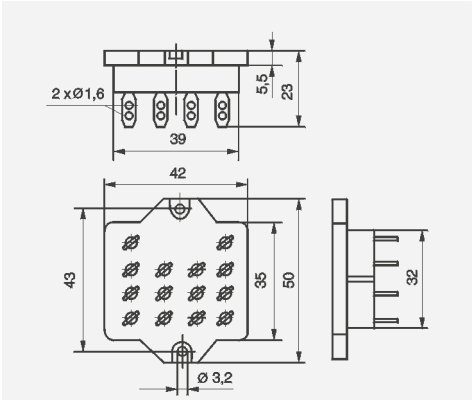
Solder terminals
50 x 42 x 23 mm
Four poles
10 A, 250 V AC

Accessories

R15 0736

R15 5922

Dimensions



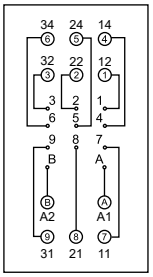
GUC11S-V0 ❼

For RUC faston 4,8x0,5, RUC-M

Screw terminals
Cross section of the cables: max. 1 x 4 mm² / 2 x 2,5 mm² (1 x 12 / 2 x 14 AWG), min. 1 x 0,25 mm² (1 x 23 AWG)
Max. tightening moment
for the terminal: 0,7 Nm

35 mm rail mount
acc. to EN 60715
81,5 x 35,5 x 26,5 mm
Three poles
16 A, 250 V AC

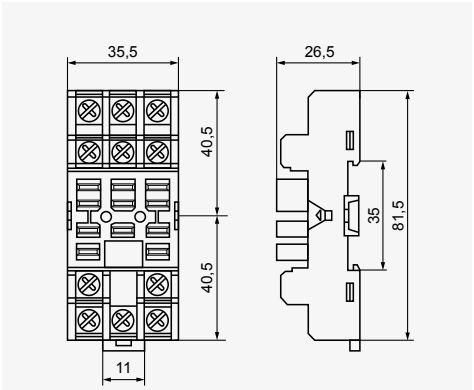
Connection diagram



Accessories

MBA

Dimensions



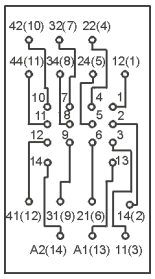
❼ For RUC faston 4,8 x 0,5 and RUC-M, with GUC11S-V0 socket, max. switching voltages and coil voltages of relays are limited to 250 V AC / DC.

GZ14Z

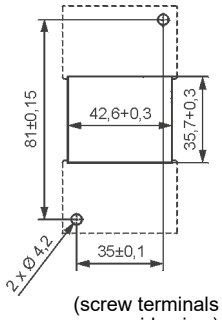
For R15 - 4 CO

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
On panel mounting, behind
92,2 x 46 x 24,5 mm
Four poles
10 A, 250 V AC

Connection diagram



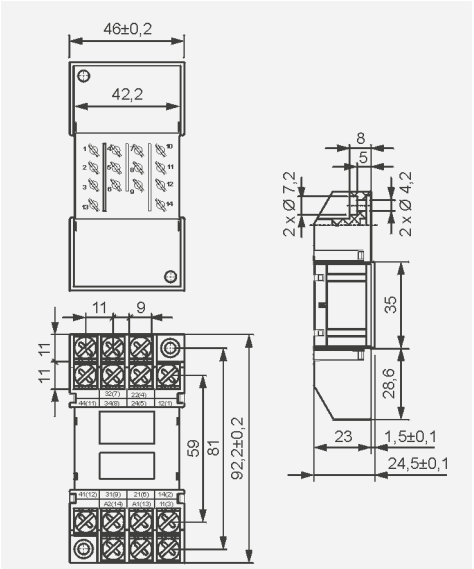
Mounting dimensions



(screw terminals side view)

GZ14 0737

Dimensions



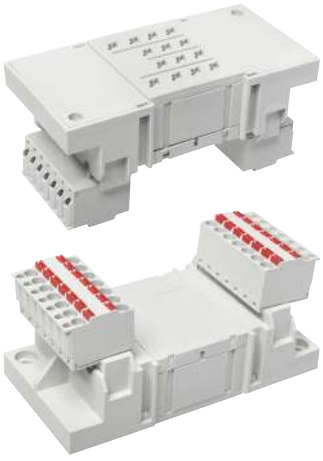
Accessories

GZ14P

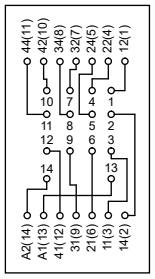
For R15 - 4 CO

Push-in terminals
Max. cross section of the cables:
2 x 2,5 mm² (ferrules without insulation)
2 x 1,5 mm² (ferrules with insulation)
Stripping length: 10 mm

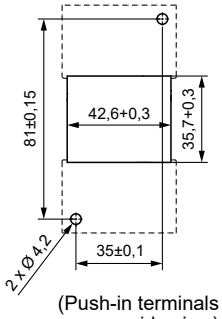
On panel mounting, behind
92,2 x 46,2 x 44,7 mm
Four poles
10 A, 250 V AC



Connection diagram



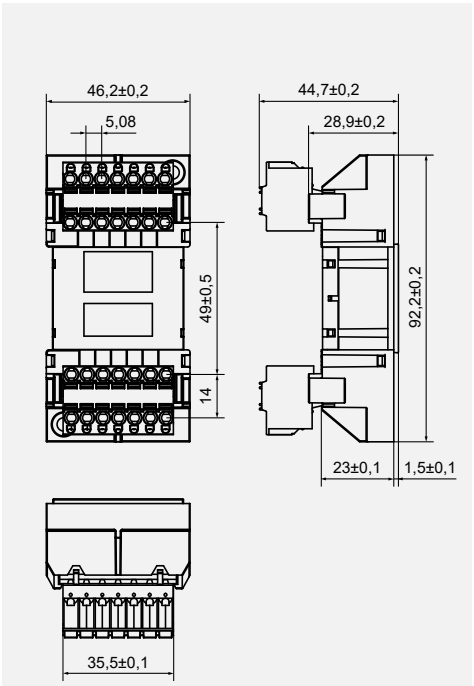
Mounting dimensions



(Push-in terminals side view)

GZ14 0737

Dimensions



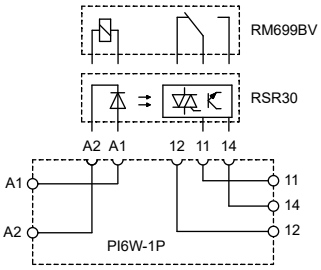
Accessories

PI6W-1P ❽

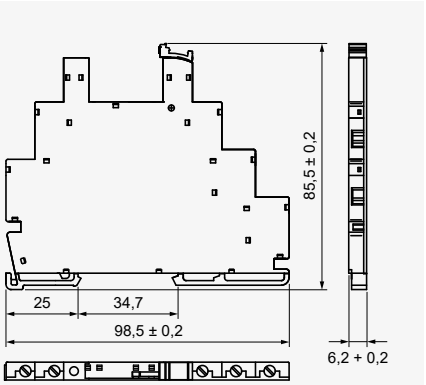
For RM699BV, RSR30 ❿

Screw terminals
Max. tightening moment for the terminal: 0,3 Nm
35 mm rail mount
acc. to EN 60715
98,5 x 6,2 x 85,5 mm
One pole
6 A, 250 V AC

Connection diagram



Dimensions



Accessories


ZG20

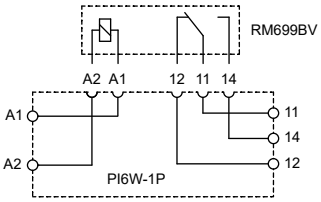

PI6W-1246

PI6W-1P ❾

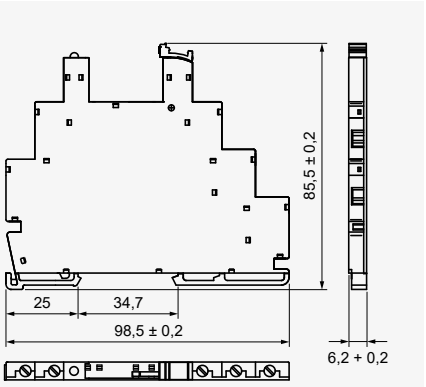
For RM699BV

Screw terminals
Max. tightening moment for the terminal: 0,3 Nm
35 mm rail mount
acc. to EN 60715
98,5 x 6,2 x 85,5 mm
One pole
6 A, 250 V AC

Connection diagram



Dimensions



Accessories ⓫


ZG20

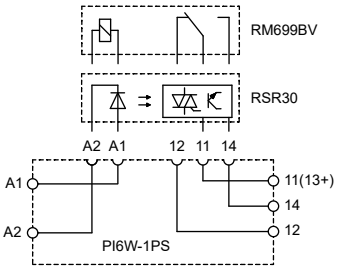

PI6W-1246

PI6W-1PS ❾

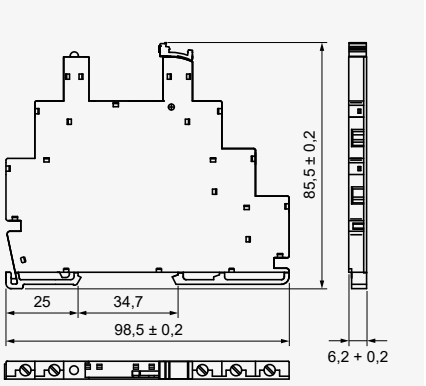
For RM699BV, RSR30 ❿

Screw terminals
Max. tightening moment for the terminal: 0,3 Nm
35 mm rail mount
acc. to EN 60715
98,5 x 6,2 x 85,5 mm
One pole
6 A, 250 V AC

Connection diagram



Dimensions



Accessories ⓫


ZG20

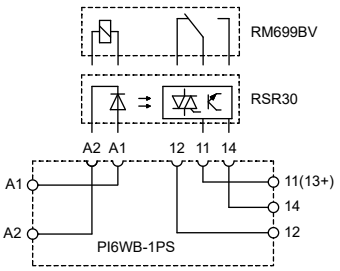

PI6W-1246

PI6WB-1PS ❾

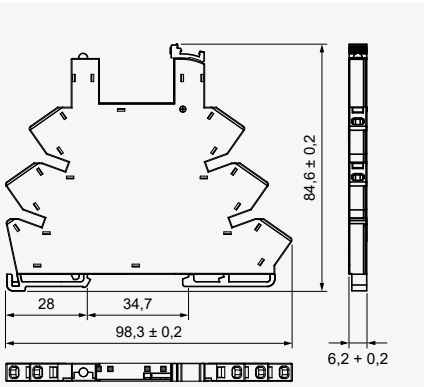
For RM699BV, RSR30 ❿

Spring terminals
35 mm rail mount
acc. to EN 60715
98,3 x 6,2 x 84,6 mm
One pole
6 A, 250 V AC

Connection diagram



Dimensions



Accessories ⓫


ZG20


PI6W-1246

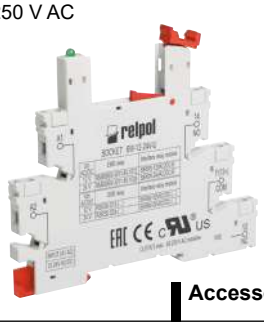
❽ Sockets without electronic. ❾ Sockets with electronic PI6W., 6W.: version codes and selection of relays for sockets can be found in the data sheets of interface relays PIR6W., SIR6W. - see pages 321, 325, 329, 333, 337. ❿ Solid state relays **RSR30** - see www.relpol.com.pl ⓫ Colours of strips: ZG20-1, JB20-1 red; ZG20-2, JB20-2 black; ZG20-3, JB20-3 blue.

6W ❾

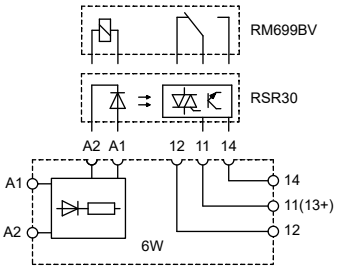
For RM699BV, RSR30 ❿

Screw terminals; Max. cross section of the cables:
1 x 2,5 mm² / 2 x 1,5 mm²
Stripping length: 7 mm
Max. tightening moment for the terminal: 0,5 Nm

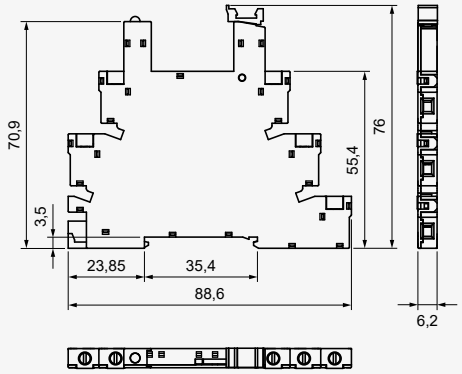
35 mm rail mount acc. to EN 60715
88,6 x 6,2 x 76 mm
One pole
6 A, 250 V AC



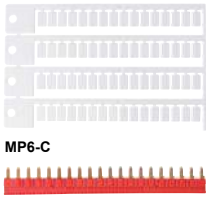
Connection diagram



Dimensions



Accessories ⓫


MP6-C

JB20


6W-SEP

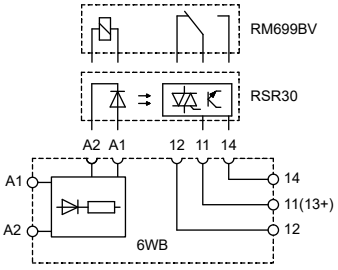
6WB ❾

For RM699BV, RSR30 ❿

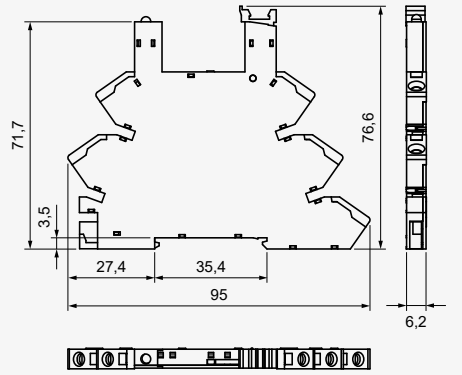
Spring terminals
Max. cross section of the cables: 1 x 2,5 mm²
Stripping length: 7 mm

35 mm rail mount acc. to EN 60715
95 x 6,2 x 76,6 mm
One pole
6 A, 250 V AC

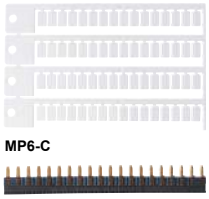
Connection diagram



Dimensions



Accessories ⓫


MP6-C

JB20

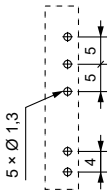

6W-SEP

GD699

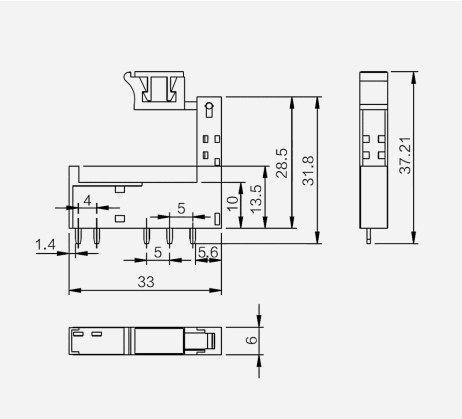
For RM699BV, RSR30 ❿

For PCB
33 x 6 x 37,21 mm
One pole, 5 mm pinout
6 A, 250 V AC

Rozstaw otworów w obwodzie drukowanym



Dimensions

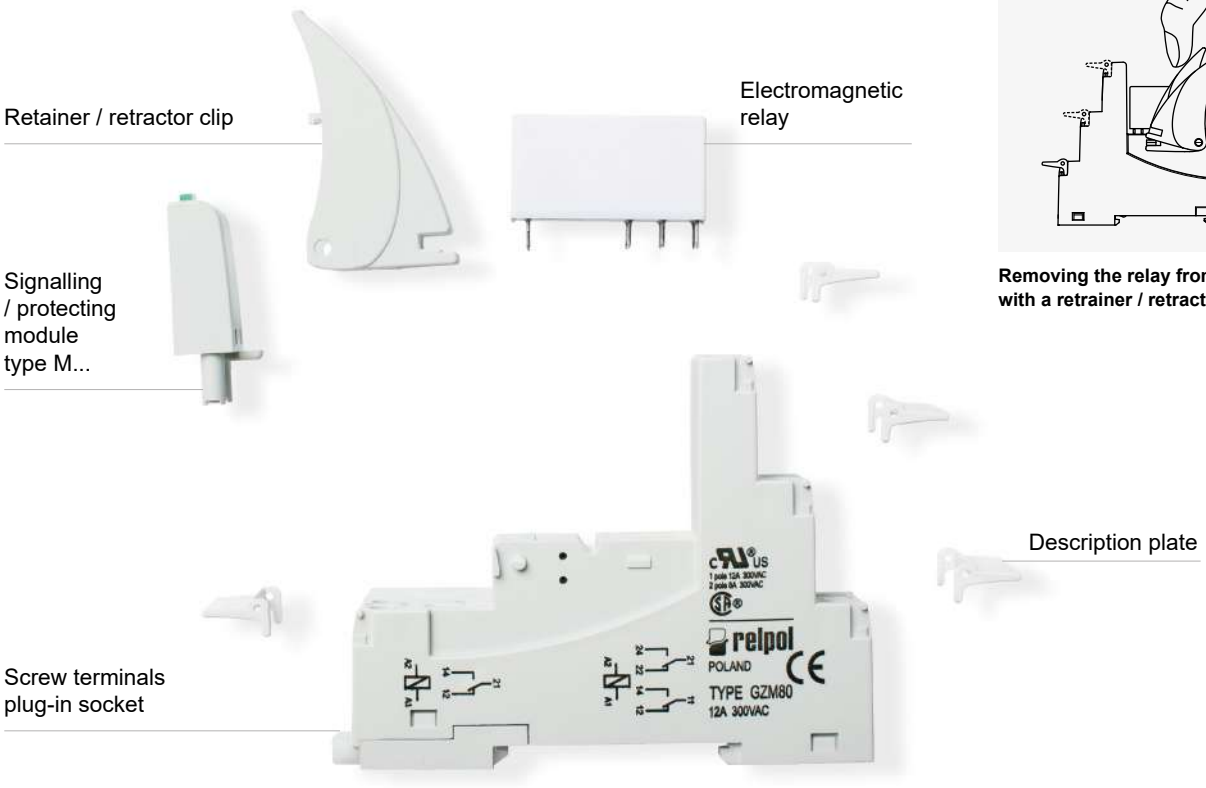


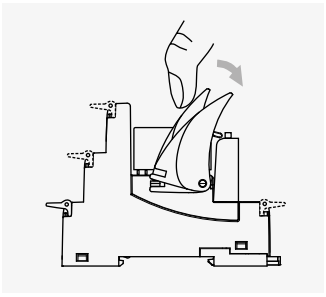
Accessories

MP6-C

❾ Sockets with electronic PI6W., 6W.: version codes and selection of relays for sockets can be found in the data sheets of interface relays PIR6W., SIR6W. - see pages 321, 325, 329, 333, 337. ❿ Solid state relays **RSR30** - see www.relpol.com.pl ⓫ Colours of strips: ZG20-1, JB20-1 red; ZG20-2, JB20-2 black; ZG20-3, JB20-3 blue.

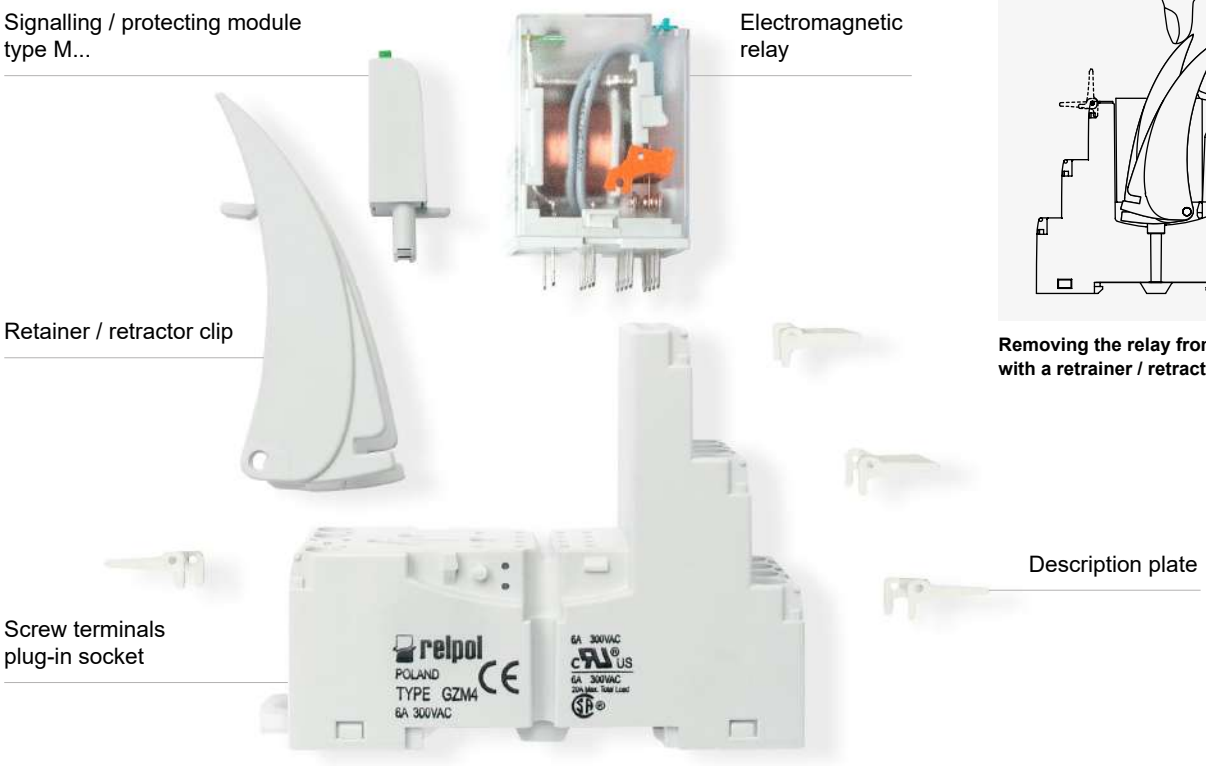
Miniature relays

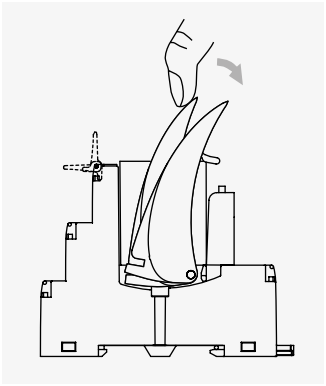




Removing the relay from the socket with a retrainer / retractor clip

Miniature industrial relays

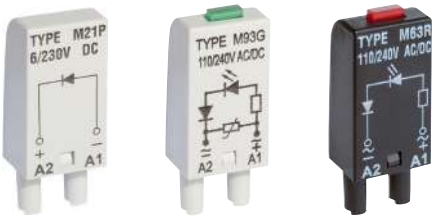


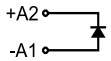
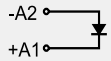
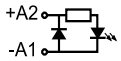
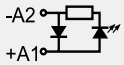
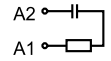
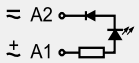
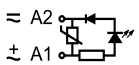
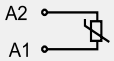
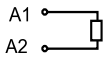


Removing the relay from the socket with a retrainer / retractor clip

For sockets type:
GZT80, GZM80, GZS80, GZP80, GZT92, GZM92, GZS92, ES 32, GZT2, GZM2, GZT3, GZM3, GZT4, GZM4, GZP4

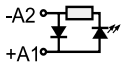
Modules type M... are parallelly connected with relay coil.
Polarization P: -A1/+A2. Polarization N: +A1/-A2.



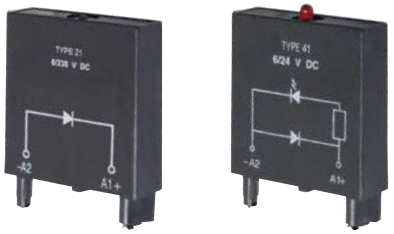
Modules type M…	Layout	Voltage	Type of module ❶ ❷
Module D (polarization P) It limits overvoltage on DC coils.		6/230 V DC	M21P
Module D (polarization N) It limits overvoltage on DC coils.		6/230 V DC	M21N
Module LD (polarization P) It limits overvoltage on DC coils. Coil energizing indication.		6/24 V DC 24/60 V DC 110/230 V DC	M31R, M31G M32R, M32G M33R, M33G
Module LD (polarization N) It limits overvoltage on DC coils. Coil energizing indication.		6/24 V DC 24/60 V DC 110/230 V DC	M41R, M41G M42R, M42G M43R, M43G
Module RC It protects against EMC disturbance. It limits overvoltage.		6/24 V AC/DC 24/60 V AC/DC 110/240 V AC/DC	M51 M52 M53
Module L Coil energizing indication.		6/24 V AC/DC 24/60 V AC/DC 110/240 V AC/DC	M61R, M61G M62R, M62G M63R, M63G
Module LV It limits overvoltage on AC and DC coils. Coil energizing indication.		6/24 V AC/DC 24/60 V AC/DC 110/240 V AC/DC	M91R, M91G M92R, M92G M93R, M93G
Module V It limits overvoltage on AC coils. No indication.		6/24 V AC 110/130 V AC 220/240 V AC	M71 M72 M73
Module R It limits harmful voltage on AC coils induced in long lines which causes unwanted making of the relay.		110/240 V AC	M103

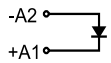
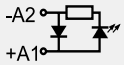
❶ **M...R** - LED red, **M...G** - LED green ❷ When ordering modules indicate their color: gray or black.

For sockets type: GZT2-V0, GZT3-V0, GZT4-V0
Modules type M...-V0 are parallelly connected with relay coil. Polarization N: +A1/-A2.

Modules type M…	Layout	Voltage	Type of module
Module LD (polarization N) It limits overvoltage on DC coils. Coil energizing indication.		6/24 V DC 110/230 V DC	M41G-V0 M43G-V0

For sockets type: GZP8, GZP11
Modules type 21, 41 are parallelly connected with relay coil.
Polarization N: +A1/-A2.



Modules	Layout	Voltage	Type of module
Module D (polarization N) It limits overvoltage on DC coils.		6/230 V DC	Module 21
Module LD (polarization N) It limits overvoltage on DC coils. Coil energizing indication (LED red).		6/24 V DC	Module 41

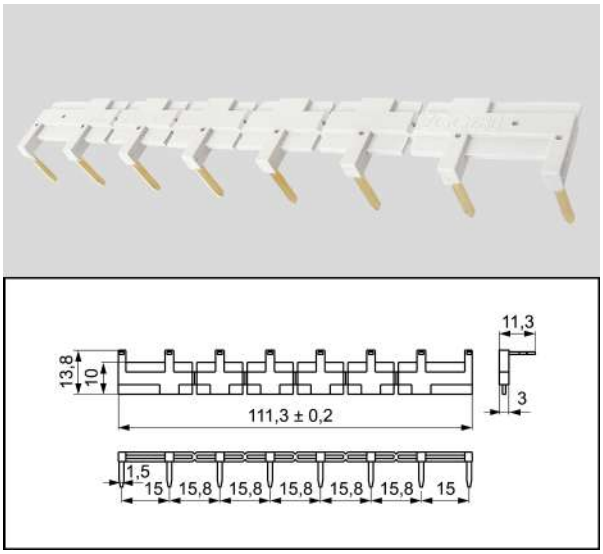
ZGGZ80 for:

Plug-in sockets	Relays for plug-in sockets	Interface relays ❸
GZT80	RM84, RM85, RM85 inrush, RM85 105 °C sensitive, RM87L ❹, RM87P ❹, RM87N ❹	PI84-...-TS-... (RM84 + GZT80)
GZM80		PI84-...-MS-... (RM84 + GZM80)
GZS80		PI85-...-TS-... (RM85 + GZT80)
GZT92		(RM85 inrush + GZT80)
GZM92		PI85-...-MS-... (RM85 + GZM80)
GZS92		
ES 32	RM96 1 CO	

❸ Interface relay **PI84** (**PI85**) is offered as a **set**: electromagnetic relay **RM84** (**RM85**) + plug-in socket **GZT80** or **GZM80** + signalling / protecting module type **M...** + retainer / retractor clip **GZT80-0040** + description plate **GZT80-0035**. ❹ Also versions RM87. sensitive

Interconnection strip ZGGZ80

- designed for the co-operation with plug-in sockets of miniature relays and with interface relays PI84 and PI85, which are equipped with screw terminals; sockets and relays are mounted on 35 mm rail mount acc. to EN 60715,
- bridges common input signals (coil terminals A1 or A2) or output signals - see photo at the top,
- maximum permissible current is 10 A / 250 V AC,
- possibility of connection of 8 sockets or relays,
- colours of strips: **ZGGZ80-1** grey, **ZGGZ80-2** black.



PIR2-...-00L.
(R2N + GZM2)

ZGGZ4

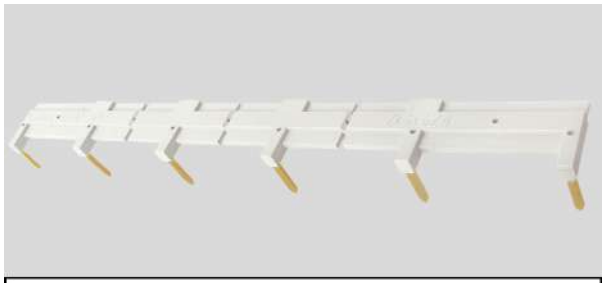
ZGGZ4 for:

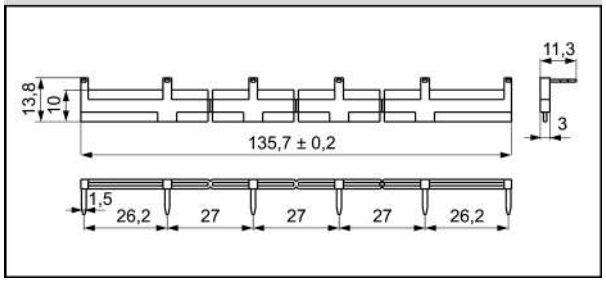
Plug-in sockets	Relays for plug-in sockets	Interface relays ⑤
GZM2	R2N	PIR2-...-00L. (R2N + GZM2)
GZT2		
GZM3	R3N	PIR3-...-00L. (R3N + GZM3)
GZT3		
GZM4	R4N	PIR4-...-00L. (R4N + GZM4)
GZT4		

⑤ Interface relay **PIR2** (**PIR3**, **PIR4**) is offered as a **set**: electromagnetic relay **R2N** (**R3N**, **R4N**) + plug-in socket **GZM2** (**GZM3**, **GZM4**) + signalling / protecting module type **M...** + retainer / retractor clip **GZT4-0040** + description plate **GZT4-0035**.

Interconnection strip ZGGZ4

- designed for the co-operation with plug-in sockets of miniature industrial relays and with interface relays PIR2, PIR3 and PIR4, which are equipped with screw terminals; sockets and relays are mounted on 35 mm rail mount acc. to EN 60715,
- bridges common input signals (coil terminals A1 or A2) or output signals - see photo at the top,
- maximum permissible current is 10 A / 250 V AC,
- possibility of connection of 6 sockets or relays,
- colours of strips: **ZGGZ4-1** grey, **ZGGZ4-2** black.





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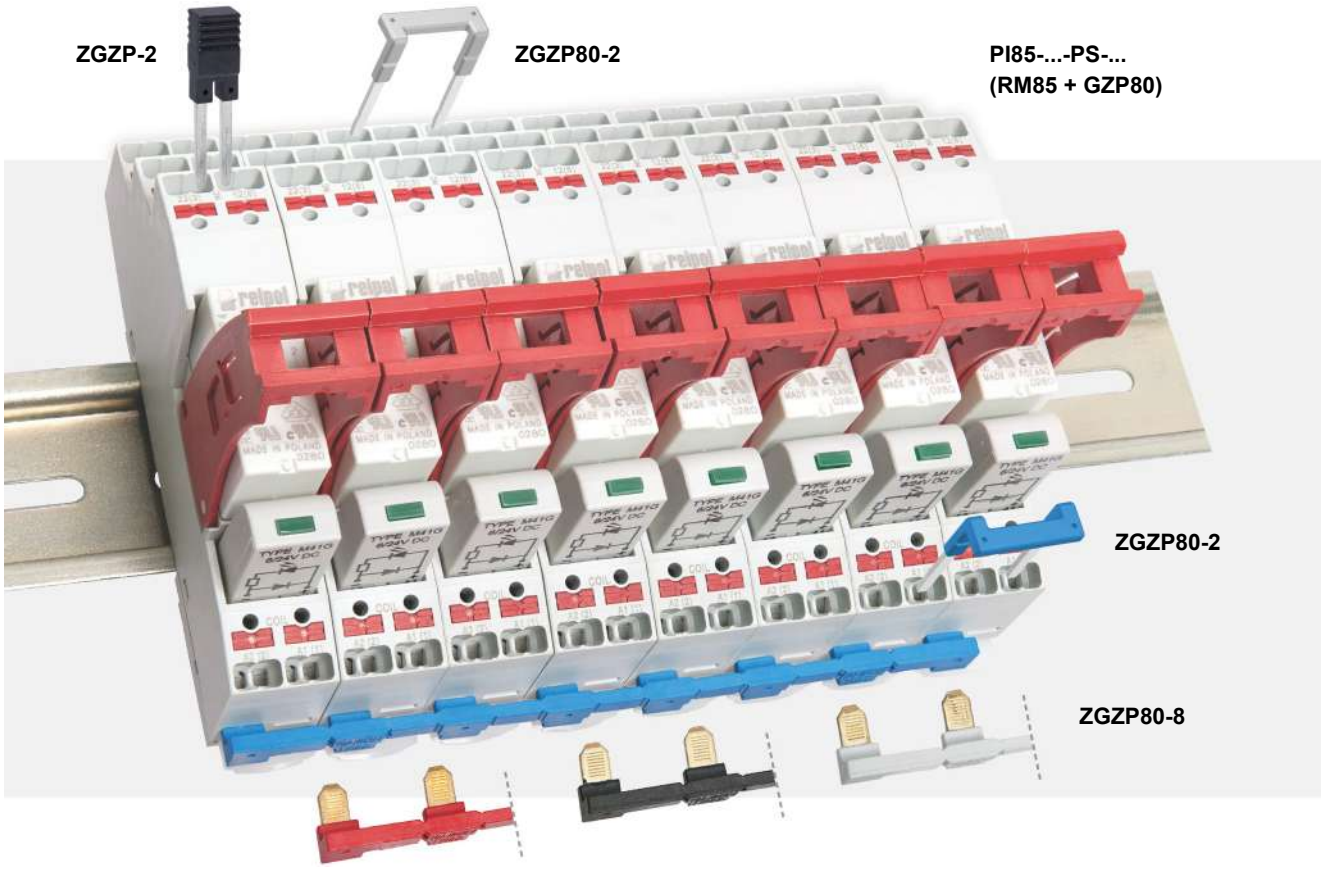


ZGZP... for:

Plug-in sockets	Relays for plug-in sockets	Interface relays ❻
GZP80	RM84, RM85, RM85 inrush, RM85 105 °C sensitive, RM87L ❹, RM87P ❹, RMP84, RMP85	PI84-...-PS-... (RM84 + GZP80)
		PI85-...-PS-... (RM85 + GZP80)
		PI84P-...-PS-... (RMP84 + GZP80)
		PI85P-...-PS-... (RMP85 + GZP80)

❻ Interface relay **PI84** (**PI85**, **PI84P**, **PI85P**) is offered as a **set**: electromagnetic relay **RM84** (**RM85**, **RMP84**, **RMP85**) + plug-in socket **GZP80** + signalling / protecting module type **M...** + retainer / retractor clip **GZP80-0400**.
❹ Also versions RM87. sensitive

Interconnection strips ZGZP...

- designed for the co-operation with plug-in sockets of miniature relays and with interface relays PI84, PI85, PI84P, PI85P, which are equipped with Push-in terminals; sockets and relays are mounted on 35 mm rail mount acc. to EN 60715,
- strip **ZGZP80-8** bridges common input signals (coil terminals A1 or A2), maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets or relays,

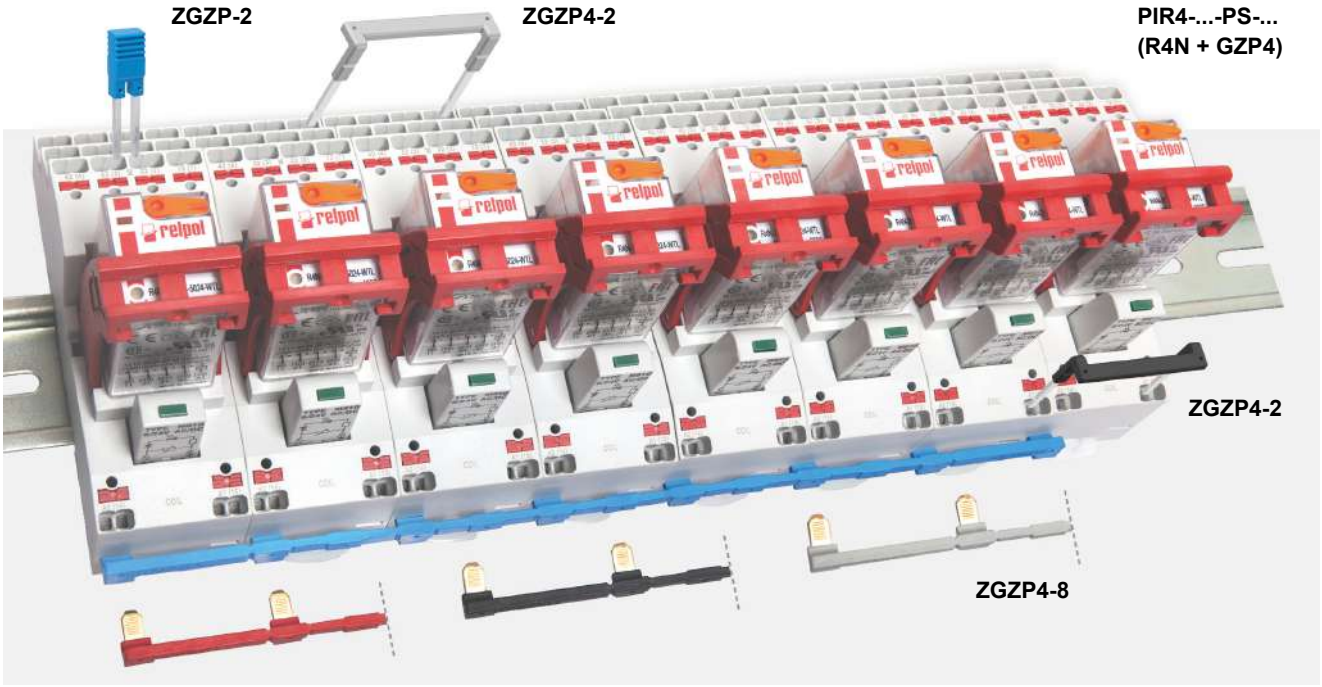
ZGZP80-8 GY grey | **ZGZP80-8 BK** black | **ZGZP80-8 RD** red | **ZGZP80-8 BE** blue

- strip **ZGZP80-2** bridges common input signals (coil terminals A1 or A2) or output signals, possibility of connection of 2+n sockets or relays,

ZGZP80-2 GY grey | **ZGZP80-2 BK** black | **ZGZP80-2 RD** red | **ZGZP80-2 BE** blue

- jumper **ZGZP-2** bridges the neighboring poles of single socket **GZP80**.

ZGZP-2 GY grey | **ZGZP-2 BK** black | **ZGZP-2 RD** red | **ZGZP-2 BE** blue



ZGZP... for:

Plug-in sockets	Relays for plug-in sockets	Interface relays ❼	
GZP4	R2N	PIR2-...-PS-...	(R2N + GZP4)
	R4N	PIR4-...-PS-...	(R4N + GZP4)

❼ Interface relay **PIR2** (**PIR4**) is offered as a **set**: electromagnetic relay **R2N** (**R4N**) + plug-in socket **GZP4** + signalling / protecting module type **M...** + retainer / retractor clip **GZP4-0400**.

Interconnection strips ZGZP...

- designed for the co-operation with plug-in sockets of miniature industrial relays and with interface relays PIR2 and PIR4, which are equipped with screw terminals; sockets and relays are mounted on 35 mm rail mount acc. to EN 60715,

- strip **ZGZP4-8** bridges common input signals (coil terminals A1 or A2), maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets or relays,

ZGZP4-8 GY grey | **ZGZP4-8 BK** black | **ZGZP4-8 RD** red | **ZGZP4-8 BE** blue

- strip **ZGZP4-2** bridges common input signals (coil terminals A1 or A2) or output signals, possibility of connection of 2+n sockets or relays,

ZGZP4-2 GY grey | **ZGZP4-2 BK** black | **ZGZP4-2 RD** red | **ZGZP4-2 BE** blue

- jumper **ZGZP-2** bridges the neighboring poles of single socket **GZP4**.

ZGZP-2 GY grey | **ZGZP-2 BK** black | **ZGZP-2 RD** red | **ZGZP-2 BE** blue

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Industrial relays for plug-in sockets: R2N, R3N, R4N, R15 - 2 CO ⑨, R15 - 3 CO ⑨ **with WT equipment as standard** (**W** - mechanical indicator + **T** - lockable front test button). **Detailed information** on additional equipment of individual relays can be found in the data sheets on the side of "Ordering codes".

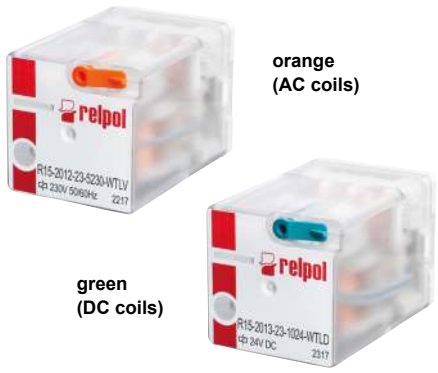
Note:
While the relay operates, the test button of the **T** type becomes heated. In order to push the test button manually, you should first turn the supply voltage off, and wait some time until the button becomes colder (or push the button immediately using a protective glove or an insulated tool). The button shall be pushed smoothly and quickly. The normally open contacts are closed with the button for the time during which the button is pushed. Releasing the button opens the normally open contacts. Normally open contacts may be closed with the blocking function of the button (it shall be turned by 90°). When the button is turned back, the normally open contacts are opened.

Type ⑧	Description	For industrial relays
W	mechanical indicator	R2N, R3N, R4N, (R15 - 2 CO, 3 CO ⑨)
T	lockable front test button, orange (AC coils), green (DC coils)	R2N, R3N, R4N, (R15 - 2 CO, 3 CO ⑨)
L	light indicator (LED diode), located inside the relay	R2N, R3N, R4N, RY2, (R15 - 2 CO, 3 CO, 4 CO ⑨) RUC, RUC-M
D	surge suppression element (diode) - only for DC coils	R2N, R3N, R4N, RY2, (R15 - 2 CO, 3 CO, 4 CO ⑨)
V	surge suppression element (varistor) - only for AC coils	(R15 - 2 CO, 3 CO ⑨)
K	test button without block function, orange (AC coils), green (DC coils)	(R15 - 4 CO ⑨), RUC

⑧ Available combinations:
WT, WTL, WTD, WTLD - in relays R2N, R3N, R4N for plug-in sockets
L, D, LD - in relays RY2 for plug-in sockets
WT, WTL, WTD, WTLD, WTV, WTLV - in relays R15 - 2 CO, 3 CO for plug-in sockets
K, L, D, KL, KD, LD, KLD - in relays R15 - 4 CO for plug-in sockets
K, L, KL - in relays RUC
L - in relays RUC-M
⑨ Voltage versions, in covers

Test buttons type T R2N, R3N, R4N

Test buttons type T R15 - 2 CO, 3 CO



Test buttons (no latching) are recommended for R2N...WT, R3N...WT, R4N...WT, R15...WT 2 CO, R15...WT 3 CO relays - **for applications that do not allow permanent contact latching**. By manual operation (pressing the button) relay contacts can get switched for as long time as long the button is pressed. Contacts return to initial position as soon as pressure is released from the button. Those operations can be done while the coil is deenergized ⑩.

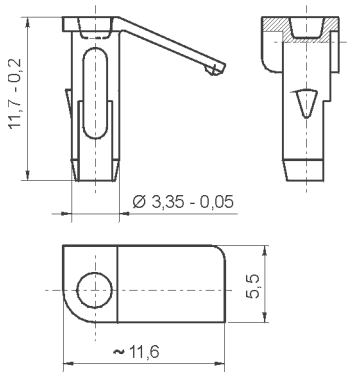
Button **R4P-0001** or **R15-M404** can be easily inserted by the Customer after removal of button type **T** (see Fig. 2). Button type **T** can be removed with screwdriver as shown on Fig. 1.

⑩ While the relay operates, the test button becomes heated. In order to push the test button manually, you should first turn the supply voltage off, and wait some time until the button becomes colder (or push the button immediately using a protective glove or an insulated tool). The button shall be pushed smoothly and quickly.

Fig. 1

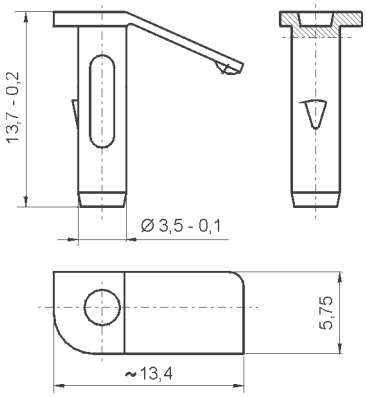
Fig. 2

Dimensions - test button **R4P-0001**
for **R2N...WT, R3N...WT, R4N...WT**



Types of buttons:
R4P-0001-A - orange colour (AC coils)
R4P-0001-D - green colour (DC coils)

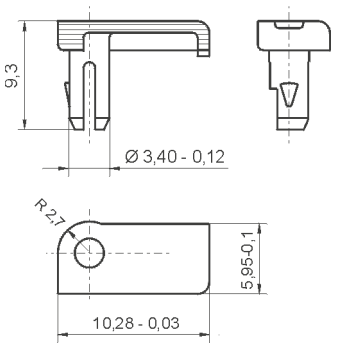
Dimensions - test button **R15-M404**
for **R15...WT 2 CO, R15...WT 3 CO**



Types of buttons:
R15-M404-A - orange colour (AC coils)
R15-M404-D - green colour (DC coils)

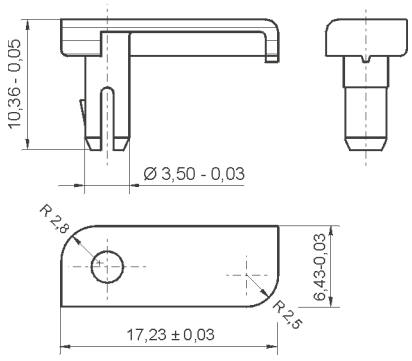
Plugs R4W-0003 or **R15-M203** can substitute button type **T if manual operation (latching and testing) is not allowed**. Changing button type **T** for plug can be done by Customer themselves in the same way as changing button type **T** for button (no latching).

Dimensions - plug **R4W-0003**
for **R2N...WT, R3N...WT, R4N...WT**



Types of plugs:
R4W-0003-A - orange colour (AC coils)
R4W-0003-D - green colour (DC coils)

Dimensions - plug **R15-M203**
for **R15...WT 2 CO, R15...WT 3 CO**



Types of plugs:
R15-M203-A - orange colour (AC coils)
R15-M203-D - green colour (DC coils)

The relays not specified in the table are designed for other manners of mounting.

Type of relay	Plug-in sockets				
	Screw terminals		Push-in terminals	Spring terminals	For PCB
	on 35 mm rail mount	on panel mounting			
Miniature relays					
RM699BV, RSR30	(PI6W, 6W ❶)	–	–	(PI6WB, 6WB ❶)	GD699 ❶
RM84, RM85, RM85 inrush RM85 105 °C sensitive RM87L, RM87L sensitive RM87P, RM87P sensitive	(GZT80, GZM80 ❷), (GZS80, GZF80 ❸)	(GZT80, GZM80 ❷), (GZS80, GZF80 ❸)	GZP80 ❹	–	(PW80, EC 50, GD50 ❺)
RM87N, RM87N sensitive	(GZT92, GZM92 ❷), GZS92 ❸	(GZT92, GZM92 ❷), GZS92 ❸	–	–	(EC 35, GD35 ❺)
RM96 1 CO	ES 32	ES 32	–	–	–
RM83	–	–	–	–	(PW80, EC 50, GD50 ❺)
RMP84, RMP85	GZF80 ❸	GZF80 ❸	GZP80 ❹	–	(EC 50, GD50 ❺)
Miniature industrial relays					
R2N	(GZT2, GZM2 ❻)	(GZT2, GZM2 ❻)	GZP4 ❽	–	SU4/2D ❿
R3N	GZT3, GZM3	GZT3, GZM3	–	–	–
R4N	(GZT4, GZM4 ❻), (GZ4, GS4 ❼)	(GZT4, GZM4 ❻), (GZ4, GS4 ❼)	GZP4 ❽	–	SU4D ❿
RY2	GZY2G	GZY2G	–	–	–
R2M	GZ2 ❶	GZ2 ❶	–	–	S2M ❷
Industrial relays of small dimensions					
R15 - 2 CO	PZ8 ❸, GZU8 ❹, GZP8 ❺	PZ8 ❸, GZ8 ❹, GZP8 ❺	–	–	–
R15 - 3 CO	PZ11 ❸, GZU11 ❹, GZP11 ❺	PZ11 ❸, GZ11 ❹, GZP11 ❺	–	–	–
R15 - 4 CO	GZ14U ❻	(GZ14, GZ14Z ❻)	GZ14P ❻	–	–
RUC faston 4,8x0,5 RUC-M	GUC11S-V0	–	–	–	–
Time relays					
T-R4	GZT4, GZM4	GZT4, GZM4	–	–	–

❶ For sockets PI6W, PI6WB apply description plates PI6W-1246 and interconnection strips ZG20. For sockets 6W, 6WB apply cards of description plates MP6-C, interconnection strips JB20 and separators 6W-SEP. For sockets GD699 apply cards of description plates MP6-C ❷ For sockets GZT80, GZT92, GZM80, GZM92 apply retainer / retractor clips GZT80-0040 or spring wire clips GZM80-0041, description plates GZT80-0035 and interconnection strips ZGGZ80 ❸ For sockets GZS80, GZS92 apply retainer / retractor clips GZS-0040 or spring wire clips GZM80-0041, description plates TR and interconnection strips ZGGZ80. For sockets GZF80 apply spring wire clips GZM80-0041, GZ80-1001. For sockets GZF80 not applicable modules type M... and interconnection strips ❹ For sockets GZP80 apply retainer / retractor clips GZP80-0400, GZT80-0040 or spring wire clips GZM80-0041, GZ80-1001, description plates MP15 and interconnection strips ZGZP... ❺ For sockets EC 35, EC 50, GD35, GD50 apply: plastic clips MP16-2, MP25-2; spring wire clips MH16-2, MH25-2. For sockets GD35, GD50 apply also spring wire clips GD-0016. For sockets PW80 apply spring wire clips MH16-2, MH25-2 ❻ For sockets GZT2, GZT4, GZM2, GZM4 apply retainer / retractor clips GZT4-0040 or spring wire clips G4 1052, description plates GZT4-0035 and interconnection strips ZGGZ4 ❼ For sockets GZ4 apply spring wire clips G4 1052. For sockets GS4 apply spring wire clips GS4-0036 and description plates GS4-0035. For sockets GZ4, GS4 not applicable modules type M... and interconnection strips ❽ For sockets GZP4 apply retainer / retractor clips GZP4-0400, GZT4-0040 or spring wire clips G4 1052, description plates MP15 and interconnection strips ZGZP... ❾ For sockets SU4/2D, SU4D, SU4/2L, SU4L, G4/2, G4 apply spring wire clips G4 1053. For sockets SU4/2L, SU4L apply also spring clamps G4 1040

Mounting options - see **page 12-15**.

Sockets	Accessories			
Solder terminals	Retainer / retractor clips	Spring wire clips	Description plates	Additional equipment
–	–	–	PI6W-1246 ❶, MP6-C ❶	ZG20 ❶, (JB20, 6W-SEP ❶)
–	GZT80-0040 ❷ ❹, GZS-0040 ❸, GZP80-0400 ❹	GZM80-0041 ❷ ❸ ❹ ❺, (MP16-2, MH16-2, GD-0016 ❺)	GZT80-0035 ❷, TR ❸ ❺, MP15 ❹	M... ❸, ZGGZ80 ❷ ❸, (ZGZP80-8, ZGZP80-2, ZGZP-2 ❹)
–	GZT80-0040 ❷, GZS-0040 ❸	GZM80-0041 ❷ ❸, (MP16-2, MH16-2, GD-0016 ❺)	GZT80-0035 ❷, TR ❸	M..., ZGGZ80 ❷ ❸
–	MS 16	GZM80-0041	TR	M..., ZGGZ80
–	–	(MP25-2, MH25-2 ❺)	–	–
–	GZP80-0400 ❹	GZ80-1001 ❸ ❹ ❺, MH25-2 ❻ ❺	MP15 ❹, TR ❺	M... ❸, (ZGZP80-8, ZGZP80-2, ZGZP-2 ❹)
(SU4/2L, G4/2 ❾)	GZT4-0040 ❻ ❽, GZP4-0400 ❽	G4 1052 ❻ ❼ ❽ ❾, G4 1053 ❾	GZT4-0035 ❻, MP15 ❽, TR ❾	R4P-0001, R4W-0003, M..., ZGGZ4 ❻, (ZGZP4-8, ZGZP4-2, ZGZP-2 ❽)
–	GZT4-0040	G4 1052	GZT4-0035	R4P-0001, R4W-0003, M..., ZGGZ4
(SU4L, G4 ❾)	GZT4-0040 ❻ ❽, GZP4-0400 ❽	G4 1052 ❻ ❼ ❽ ❾, GS4-0036 ❼, G4 1053 ❾	GZT4-0035 ❻, GS4-0035 ❼, MP15 ❽, TR ❾	R4P-0001, R4W-0003, M... ❼, ZGGZ4 ❻, (ZGZP4-8, ZGZP4-2, ZGZP-2 ❽)
–	–	–	–	–
G2M ❷	–	GZ2 1060 ❶, G4 1050 ❷	–	–
GOP8 ❼	–	PZ11 0031 ❸, (GZ 1050, GZU 1052 ❹), GZP-0054 ❺, R159 1051 ❼	GZP-0035 ❺	R15-M404, R15-M203, (21, 41, COM3 ❺)
GOP11 ❼	–	PZ11 0031 ❸, (GZ 1050, GZU 1052 ❹), GZP-0054 ❺, R159 1051 ❼	GZP-0035 ❺	R15-M404, R15-M203, (21, 41, COM3 ❺)
GOP14 ❼	–	GZ14 0737 ❻, R15 0736 ❼	–	–
–	–	MBA	–	–
–	–	TR4-2000	GZT4-0035, TR	ZGGZ4

❶ For sockets GZ2 apply spring wire clips GZ2 1060 and spring clamps GZ2 1111 ❷ For sockets S2M, G2M apply spring wire clips G4 1050. For sockets G2M apply also spring clamps G2M 1020 ❸ For sockets PZ8, PZ11 apply spring wire clips PZ11 0031 ❹ For sockets GZ8, GZ11 apply spring wire clips GZ 1050. For sockets GZU8, GZU11 apply spring wire clips GZU 1052 ❺ For sockets GZP8, GZP11 apply spring wire clips GZP-0054, description plates GZP-0035, modules type 21, 41 and time modules COM3 ❻ For sockets GZ14U, GZ14, GZ14Z, GZ14P apply spring wire clips GZ14 0737 ❼ For sockets GOP8, GOP11 apply sets R159 1051 (spring wire clip and two spring clamps). For sockets GOP14 apply spring wire clips R15 0736 and spring clamps R15 5922

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Type	Terminals	Signs credits	Rated load	Insulation (EN 60664-1)	
				Dielectric strength 50/60 Hz, 1 min.	
				between coil and contacts	pole - pole
For RM699BV, RSR30					
PI6W	screw terminals	CE, cЯUus, VDE, EAC	6 A / 250 V AC	4 000 V AC	–
PI6WB	spring terminals	CE, cЯUus, VDE, EAC	6 A / 250 V AC	4 000 V AC	–
6W	screw terminals	CE, cЯUus, EAC	6 A / 250 V AC	5 000 V AC	–
6WB	spring terminals	CE, cЯUus, EAC	6 A / 250 V AC	5 000 V AC	–
GD699	for PCB	CE, EAC	6 A / 250 V AC	6 000 V AC	–
For RM84, RM85..., RM87L..., RM87P...					
GZT80	screw terminals	CE, cЯUus, EAC, CSA	12 A / 300 V AC	5 000 V AC	3 000 V AC
GZM80	screw terminals	CE, cЯUus, EAC, CSA	12 A / 300 V AC	5 000 V AC	3 000 V AC
GZS80	screw terminals	CE, cЯUus, EAC	10 A / 300 V AC	4 000 V AC	2 500 V AC
For RM84, RM85..., RM87L..., RM87P..., RM83, RMP84, RMP85					
GZF80	screw terminals	CE, EAC	10 A / 250 V AC	2 000 V AC	3 000 V AC
GZP80	Push-in terminals	CE, cЯUus, EAC	12 A / 300 V AC ❶	5 000 V AC	3 000 V AC
EC 50	for PCB	EAC	12 A / 250 V AC	2 500 V AC	2 500 V AC
PW80	for PCB	EAC	12 A / 250 V AC	2 000 V AC	2 000 V AC
GD50	for PCB	ЯU, EAC	8 A / 300 V AC	2 000 V AC	2 000 V AC
For RM87N...					
GZT92	screw terminals	CE, cЯUus, EAC, CSA	12 A / 300 V AC	5 000 V AC	–
GZM92	screw terminals	CE, cЯUus, EAC, CSA	12 A / 300 V AC	5 000 V AC	–
GZS92	screw terminals	CE, cЯUus, EAC	12 A / 300 V AC	4 000 V AC	–
EC 35	for PCB	EAC	12 A / 300 V AC	2 500 V AC	–
GD35	for PCB	ЯU, EAC	12 A / 300 V AC	2 000 V AC	–
For RM96 1 CO					
ES 32	screw terminals	CE, EAC	12 A / 300 V AC	2 500 V AC	–
For miniature relays					
EC 32	for PCB	EAC	12 A / 300 V AC	2 500 V AC	–
For R2N					
GZT2	screw terminals	CE, cЯUus, EAC, CSA	12 A / 300 V AC	3 000 V AC	3 000 V AC
GZM2	screw terminals	CE, cЯUus, EAC, CSA	12 A / 300 V AC	4 000 V AC	3 000 V AC
GZP4	Push-in terminals	CE, cЯUus, EAC	12 A / 300 V AC ❷	4 000 V AC	3 000 V AC
SU4/2D	for PCB	cЯUus, EAC, CSA	12 A / 250 V AC	2 500 V AC	2 500 V AC
SU4/2L	solder terminals	CE, cЯUus, EAC, CSA	12 A / 250 V AC	2 500 V AC	2 500 V AC
G4/2	solder terminals	CE, cЯUus, EAC, CSA	12 A / 250 V AC	2 500 V AC	2 500 V AC
For R3N					
GZT3	screw terminals	CE, cЯUus, EAC, CSA	10 A / 300 V AC	3 000 V AC	3 000 V AC
GZM3	screw terminals	CE, cЯUus, EAC, CSA	10 A / 300 V AC	4 000 V AC	3 000 V AC

❶ One pole 12 A / 300 V AC, two poles 8 A / 300 V AC ❷ Two poles 12 A / 300 V AC, four poles 8 A / 300 V AC
❸ For versions110...125 V AC/DC and 220...240 V AC/DC: max. +55 °C ❹ Ferrules without insulation 2 x 1,5 mm^2, ferrules with insulation 2 x 1 mm^2

General data			Connections (mounting)			
Number of poles	Weight	Ambient temperature - operating (non-condensation and/or icing)	Protection category (EN 60529)	Max. cross section of the cables (stranded)	Stripping length	Max. tightening moment for the terminal
1	40 g	-40...+55 °C	IP 20	1 x 2,5 / 2 x 1,5 mm²	9 mm	0,3 Nm
1	40 g	-40...+55 °C	IP 20	1 x 0,22...2,5 mm²	9 mm	–
1	25 g	-40...+70 °C ❸	IP 20	1 x 2,5 / 2 x 1,5 mm²	7 mm	0,5 Nm
1	25 g	-40...+70 °C ❸	IP 20	1 x 2,5 mm²	7 mm	–
1	3 g	-40...+70 °C	IP 20	–	–	–
2	45 g	-40...+70 °C	IP 20	2 x 2,5 mm²	6,5 mm	0,7 Nm
2	44 g	-40...+70 °C	IP 20	2 x 2,5 mm²	6,5 mm	0,7 Nm
2	37 g	-40...+85 °C	IP 20	2 x 2,5 mm²	6,5 mm	–
2	30 g	-40...+70 °C	IP 20	1 x 4 / 2 x 2,5 mm²	7 mm	0,5 Nm
1, 2 ❶	46 g	-20...+70 °C	IP 20	2 x 1,5 mm² ❹	8...10 mm	–
2	4 g	-40...+85 °C	–	–	–	–
2	4 g	-40...+85 °C	–	–	–	–
2	4 g	-40...+85 °C	–	–	–	–
1	38 g	-40...+70 °C	IP 20	2 x 2,5 mm²	6,5 mm	0,7 Nm
1	40 g	-40...+70 °C	IP 20	2 x 2,5 mm²	6,5 mm	0,7 Nm
1	33 g	-40...+85 °C	IP 20	2 x 2,5 mm²	6,5 mm	0,5 Nm
1	4 g	-40...+85 °C	–	–	–	–
1	4 g	-40...+85 °C	–	–	–	–
1	37 g	-40...+85 °C	IP 20	2 x 2,5 mm²	6,5 mm	0,5 Nm
1	4 g	-40...+85 °C	–	–	–	–
2	52 g	-40...+70 °C	IP 20	2 x 2,5 mm²	6,5 mm	0,7 Nm
2	68 g	-40...+70 °C	IP 20	2 x 2,5 mm²	6,5 mm	0,7 Nm
2, 4 ❷	76 g	-20...+70 °C	IP 20	2 x 1,5 mm² ❹	8...10 mm	–
2	6 g	-40...+70 °C	–	–	–	–
2	6 g	-40...+70 °C	–	2 x 0,75 mm²	–	–
2	6 g	-40...+70 °C	–	2 x 0,75 mm²	–	–
3	60 g	-40...+70 °C	IP 20	2 x 2,5 mm²	6,5 mm	0,7 Nm
3	68 g	-40...+70 °C	IP 20	2 x 2,5 mm²	6,5 mm	0,7 Nm

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Type	Terminals	Signs credits	Rated load	Insulation (EN 60664-1)	
				Dielectric strength 50/60 Hz, 1 min.	
				between coil and contacts	pole - pole
For R4N, T-R4					
GZT4	screw terminals	CE, cЯUus, EAC, CSA, LR	6 A / 300 V AC	3 000 V AC	3 000 V AC
GZM4	screw terminals	CE, cЯUus, EAC, CSA	6 A / 300 V AC	4 000 V AC	3 000 V AC
For R4N					
GZ4	screw terminals	CE, EAC	10 A / 300 V AC	2 500 V AC	2 000 V AC
GS4	screw terminals	CE, cЯUus, EAC	10 A / 300 V AC	2 500 V AC	2 000 V AC
GZP4	Push-in terminals	CE, cЯUus, EAC	12 A / 300 V AC ❷	4 000 V AC	3 000 V AC
SU4D	for PCB	cЯUus, EAC, CSA	6 A / 250 V AC	2 500 V AC	2 000 V AC
SU4L	solder terminals	CE, cЯUus, EAC, CSA	6 A / 250 V AC	2 500 V AC	2 000 V AC
G4	solder terminals	CE, cЯUus, EAC, CSA	6 A / 250 V AC	2 500 V AC	2 000 V AC
For RY2					
GZY2G	screw terminals	CE, EAC	12 A / 250 V AC	2 000 V AC	2 000 V AC
For R2M					
GZ2	screw terminals	CE, EAC	7 A / 250 V AC	2 000 V AC	2 000 V AC
S2M	for PCB	cЯUus, EAC	5 A / 250 V AC	2 000 V AC	2 000 V AC
G2M	solder terminals	CE, cЯUus, EAC	5 A / 250 V AC	2 000 V AC	2 000 V AC
For R15 - 2 CO					
PZ8	screw terminals	CE, ЯU, EAC, CSA, LR	10 A / 250 V AC	2 500 V AC	2 500 V AC
GZU8	screw terminals	CE, ЯU, EAC, CSA	10 A / 250 V AC	2 500 V AC	2 500 V AC
GZ8	screw terminals	CE, EAC, CSA	10 A / 250 V AC	2 500V AC	2 500 V AC
GZP8	screw terminals	CE, cЯUus, EAC	12 A / 300 V AC	4 000 V AC	2 500 V AC
GOP8	solder terminals	CE, EAC	10 A / 250 V AC	2 000 V AC	2 000 V AC
For R15 - 3 CO					
PZ11	screw terminals	CE, ЯU, EAC, CSA, LR	10 A / 250 V AC	2 000 V AC	2 000 V AC
GZU11	screw terminals	CE, ЯU, EAC, CSA	10 A / 250 V AC	2 000 V AC	2 000 V AC
GZ11	screw terminals	CE, EAC, CSA	10 A / 250 V AC	2 000 V AC	2 000 V AC
GZP11	screw terminals	CE, cЯUus, EAC	12 A / 300 V AC	2 500 V AC	2 000 V AC
GOP11	solder terminals	CE, EAC	10 A / 250 V AC	2 000 V AC	2 000 V AC
For R15 - 4 CO					
GZ14U	screw terminals	CE, EAC, CSA	10 A / 250 V AC	2 000 V AC	2 000 V AC
GZ14	screw terminals	CE, EAC, CSA	10 A / 250 V AC	2 000 V AC	2 000 V AC
GOP14	solder terminals	CE, EAC	10 A / 250 V AC	2 000 V AC	2 000 V AC
GZ14Z	screw terminals	CE, EAC	10 A / 250 V AC	2 000 V AC	2 000 V AC
GZ14P	Push-in terminals	CE	10 A / 250 V AC	2 500 V AC	2 000 V AC
For RUC faston 4,8 x 0,5, RUC-M					
GUC11S-V0	screw terminals	CE, EAC	16 A / 250 V AC	2 500 V AC	2 500 V AC

❷ Two poles 12 A / 300 V AC, four poles 8 A / 300 V AC ❹ Ferrules without insulation 2 x 1,5 mm^2, ferrules with insulation 2 x 1 mm^2
❺ Ferrules without insulation 2 x 2,5 mm^2, ferrules with insulation 2 x 1,5 mm^2

General data			Connections (mounting)			
Number of poles	Weight	Ambient temperature - operating (non-condensation and/or icing)	Protection category (EN 60529)	Max. cross section of the cables (stranded)	Stripping length	Max. tightening moment for the terminal
4	64 g	-40...+70 °C	IP 20	2 x 2,5 mm^2	6,5 mm	0,7 Nm
4	74 g	-40...+70 °C	IP 20	2 x 2,5 mm^2	6,5 mm	0,7 Nm
4	40 g	-40...+70 °C	IP 20	2 x 1,5 mm^2	7 mm	0,7 Nm
4	40 g	-40...+70 °C	IP 20	2 x 1,5 mm^2	7 mm	0,7 Nm
2, 4 ❷	76 g	-20...+70 °C	IP 20	2 x 1,5 mm^2 ❹	8...10 mm	–
4	7 g	-40...+70 °C	–	–	–	–
4	7 g	-40...+70 °C	–	–	–	–
4	8 g	-40...+70 °C	–	2 x 0,75 mm^2	–	–
2	54 g	-25...+55 °C	IP 20	2 x 2,5 mm^2	7 mm	0,7 Nm
2	35 g	-40...+70 °C	IP 00	2 x 2,5 mm^2	7 mm	0,7 Nm
2	8 g	-40...+70 °C	–	–	–	–
2	8 g	-40...+70 °C	–	–	–	–
2	55 g	-40...+70 °C	IP 20	2 x 2,5 mm^2	7 mm	0,7 Nm
2	70 g	-40...+70 °C	IP 00	2 x 2,5 mm^2	9,5 mm	0,7 Nm
2	80 g	-40...+70 °C	IP 00	2 x 2,5 mm^2	9,5 mm	0,7 Nm
2	50 g	-40...+70 °C	IP 20	2 x 2,5 mm^2	6,5 mm	0,5 Nm
2	25 g	-40...+70 °C	–	–	–	–
3	55 g	-40...+70 °C	IP 20	2 x 2,5 mm^2	7 mm	0,7 Nm
3	70 g	-40...+70 °C	IP 00	2 x 2,5 mm^2	9,5 mm	0,7 Nm
3	80 g	-40...+70 °C	IP 00	2 x 2,5 mm^2	9,5 mm	0,7 Nm
3	55 g	-40...+70 °C	IP 20	2 x 2,5 mm^2	6,5 mm	0,5 Nm
3	27 g	-40...+70 °C	–	–	–	–
4	120 g	-40...+70 °C	IP 20	2 x 2,5 mm^2	9,5 mm	0,7 Nm
4	120 g	-40...+70 °C	IP 20	2 x 2,5 mm^2	9,5 mm	0,7 Nm
4	35 g	-40...+70 °C	–	–	–	–
4	120 g	-40...+55 °C	IP 00	2 x 2,5 mm^2	9,5 mm	0,7 Nm
4	90 g	-20...+55 °C	IP 20	2 x 2,5 mm^2 ❺	10 mm	–
3	72 g	-40...+70 °C	IP 00	1 x 4 mm^2 / 2 x 2,5 mm^2	9 mm	0,7 Nm

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Programmable relays

relpol® S.A.

Programmable relays NEED are offered in versions: 8 inputs / 4 relay or transistor outputs, 16 inputs / 8 relay or transistor outputs; with LCD display, without display.

Supply voltages: 12 V DC, 24 V DC, 220 V DC, 230 V AC; programming: LAD, STL; LED signaling the status of the relay and inputs/outputs; designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting.

NEED-MODBUS: communication modules NEED Master / ModBus RTU Slave; designed for cooperation with NEED relays; for direct mounting on 35 mm rail mount acc. to EN 60715.

They meet the requirements of REACH and RoHS Directive. The relays are recognized and certified by:

CE EAC

← Contents

NEED-...-22-...-D

NEED-...-11-...

- Programmable relays with LCD display or without display, exceptional simplicity of programming in language LAD and STL - page 421
- 8 inputs: AC or DC voltages • 4 outputs: relay or transistor
- LED signaling the status of the relay and inputs/outputs • Cooperation with communication modules NEED-MODBUS • Mounting on 35 mm rail mount or on panel mounting • Control of applications - page 422
- Compliance with standards EN 61131-2, EN 50178
- Recognitions, certifications, directives: RoHS, CE EAC

Supply voltage

Rated supply voltage	50/60 Hz AC	230 V
	DC	12, 24, 220 V
Operating range of supply voltage		230 V AC: 95...260 V AC; 12 V DC: 10,2...14,4 V DC; 24 V DC: 19,6...28,8 V DC; 220 V DC: 154...242 V DC
Rated power consumption	AC	< 8,0 VA
	DC	< 3,0 W
Range of supply frequency	AC	47...63 Hz

Inputs

Number of digital inputs		6 (I1 - I6)
Number and type of analog-digital inputs		2 (I7 - I8) AC or DC voltage
Rated voltage	• for logic state "1"	230 V AC: 85...260 V AC 50 Hz; 12 V DC: 8...26 V DC; 24 V DC: 15...40 V DC; 220 V DC: 80...260 V DC
	• for logic state "0"	230 V AC: 0...40 V AC 50 Hz; 12 V DC: -1,5...4 V DC; 24 V DC: -3...5 V DC; 220 V DC: 0...40 V DC
Input current for logic state "1" ❶		230 V AC: 0,6 mA (I1 - I4), 8,0 mA (I5 - I6), 0,9 mA (I7 - I8); 12 V DC: 3,3 mA (I1 - I6), 1,1 mA (I7 - I8); 24 V DC: 3,3 mA (I1 - I6), 2,0 mA (I7 - I8); 220 V DC: 0,6 mA (I1 - I6), 1,1 mA (I7 - I8)
Range of analog input signals		230 V AC: 0...255 V AC 50 Hz; 12 V DC, 24 V DC: 0...12,75 / 0...25,5 V DC; 220 V DC: 0...255 V DC

Outputs

Number and type of outputs		relay: 4 NO (Q1 - Q4) ❷; transistor: 4 NO (Q1 - Q4) ❸
Max. voltage		250 V AC ❷, 30 V DC ❸
Min. voltage		10 V ❷
Rated load	AC1	10 A / 250 V AC ❷
	DC1	0,5 A / 24 V DC ❸
Min. current		10 mA ❷ 1 mA ❸
Resistance		≤ 100 mΩ ❷

Insulation according to EN 60664-1

Insulation rated voltage		300 V AC
Rated surge voltage		
• inputs - outputs		2 500 V 1,2 / 50 µs
Overvoltage category		II
Insulation pollution degree		2
Dielectric strength		
• inputs - outputs		2 000 V AC type of insulation: reinforced
• contact clearance		1 000 V AC type of clearance: micro-disconnection ❷

General data

Operating / release time (typical values)		7 ms / 3 ms ❷
Electrical life		
• resistive AC1		> 0,7 x 10^5 10 A, 250 V AC ❷
• DC L/R=40 ms		> 10^5 0,15 A, 220 V DC ❷
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		90 x 72 x 55 mm
Weight		max. 250 g
Ambient temperature (non-condensation and/or icing)	• storage	-40...+70 °C
	• operating	-20...+55 °C
Cover protection category		IP 20 EN 60529

❶ At rated voltage U_n. ❷ Versions with unprotected relay outputs. ❸ Version 24 V DC with protected transistor outputs: max. off-state leakage current < 0,1 mA; max. on-state voltage drop on the connection < 2,5 V.

PROGRAMM.

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Physical resources

Mode switch	STOP/RUN
LCD display ❹	preview of variables, illuminated, of high contrast (4 lines 12 characters each)
Keyboard ❹	set of program parameters
Programmable function buttons ❹	4 (B1 - B4)
LED indicators	three-colour LED - relay status (green: RUN, yellow: STOP, red: ERROR) yellow LEDs - output status green LEDs - input status
Internal potentiometer ❺	for analog value setting
Real time RTC clock	with automatic time change summer / winter for various time zones (EU, GB, US, RU)
Connection with stopper	for relay programming and external memory card connection

Program resources

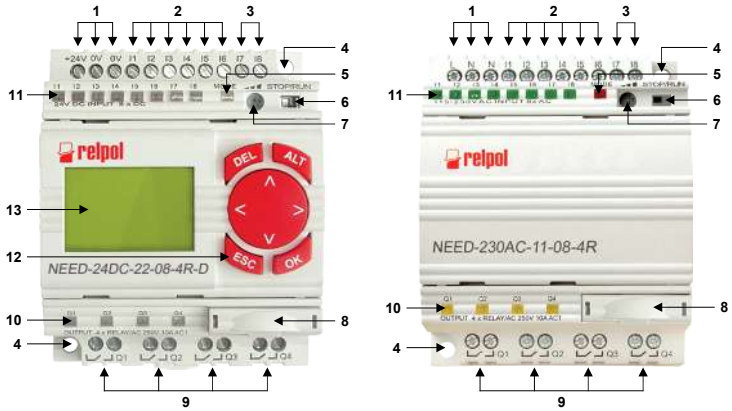
Timers ❻	NEED-...-22-...-D: 32 (T1 - T32) NEED-...-11-...: 8 (T1 - T8) time range 10 ms...99 h 59 min., resolution 10 ms, accuracy ±1% of the set value +0...1 ms
Bidirectional counters ❻	8 (C1 - C8), values 0-65535
Fast bidirectional counter / meter ❹	measurement of frequency up to 20 kHz (digital input I4)
Clocks	NEED-...-22-...-D: 8 (H1 - H8) NEED-...-11-...: 4 (H1 - H4)
Comparators of analog values	NEED-...-22-...-D: 16 (A1 - A16) NEED-...-11-...: 8 (A1 - A8)
Markers	NEED-...-22-...-D: 64 (M1 - M64) NEED-...-11-...: 16 (M1 - M16)
Text markers ❹	8 (MT1 - MT8)

System structure

NEED-...	programmable relay (see "Table of codes")
NEED-PC-15B (RS-232) NEED-PC-15C (USB)	cables for programming and diagnostics, for connection to PC computer
NEED-M-4KB (NEED-...-22-...-D) NEED-M-1KB (NEED-...-11-...)	external memory cards (4 kB or 1 kB) ❼
PC NEED	software for editing, compiling, programming of the relay and the external memory card (language: graphic LAD and text STL), user's manual: www.need.com.pl
NEED-MODBUS	communication module NEED Master / ModBus RTU Slave

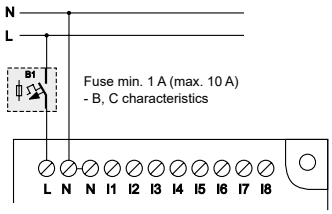
❹ Only for NEED-...-22-...-D ❺ For versions 12 V DC, 24 V DC: possibility of connecting external potentiometer. ❻ Possibility of configuration from analog inputs. ❼ The external memory card is not required and is an optional extension of the relay program memory.

Front panel description



1 Supply terminals
2 Digital input terminals
3 Analog-digital input terminals
4 Openings of 5,5 mm diameter for panel mounting with two M4 screws
5 LED indicator (three-colour) of the relay status
6 STOP/RUN mode switch
7 Potentiometer for analog value setting
8 Relay programming and external memory card connection, secured by stopper
9 Output terminals
10 LED indicators (yellow) of output status
11 LED indicators (green) of input status
12 Keyboard
13 LCD display

Connection diagram - supply connection



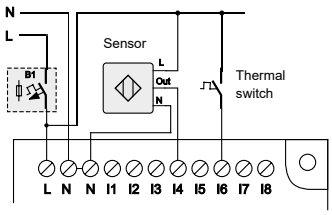
NEED-230AC-..-08-4R-.
230 V AC 50/60 Hz (95...260 V AC), L = 230 V AC, N = 0 V

NEED-12DC-..-08-4R-.
12 V DC (10,2...14,4 V DC), L = +12 V DC, N = 0 V

NEED-24DC-..-08-4.-.
24 V DC (19,6...28,8 V DC), L = +24 V DC, N = 0 V

NEED-220DC-..-08-4R-.
220 V DC (154...242 V DC), L = +220 V DC, N = 0 V

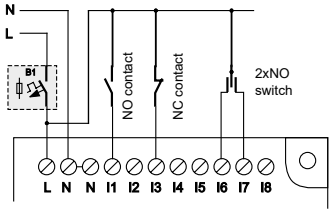
Connection diagrams - digital inputs



NEED-12DC-..-08-4R-. L = +12 V DC, N = 0 V
Logic state "1": 8...26 V DC **I1 - I6**: 3,3 mA, **I7 - I8**: 1,1 mA
Logic state "0": -1,5...4 V DC

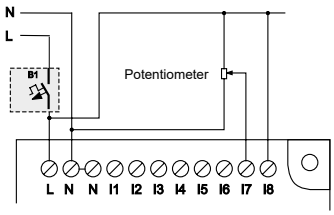
NEED-24DC-..-08-4.-. L = +24 V DC, N = 0 V
Logic state "1": 15...40 V DC **I1 - I6**: 3,3 mA, **I7 - I8**: 2,0 mA
Logic state "0": -3...5 V DC

NEED-220DC-..-08-4R-. L = +220 V DC, N = 0 V
Logic state "1": 80...260 V DC **I1 - I6**: 0,6 mA, **I7 - I8**: 1,1 mA
Logic state "0": 0...40 V DC



NEED-230AC-..-08-4R-. L = 230 V AC, N = 0 V
Logic state "1": 85...260 V AC 50 Hz **I1 - I4**: 0,6 mA
I5 - I6: 8,0 mA
I7 - I8: 0,9 mA
Logic state "0": 0...40 V AC 50 Hz

Connection diagram - analog-digital inputs



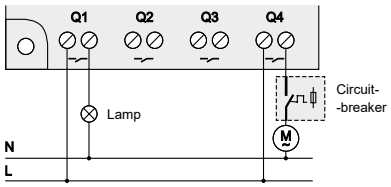
NEED-230AC-..-08-4R-.
0...255 V AC 50 Hz ① **I7 - I8**: 0,9 mA

NEED-12DC-..-08-4R-.
0...12,75 / 0...25,5 V DC ① **I7 - I8**: 1,1 mA

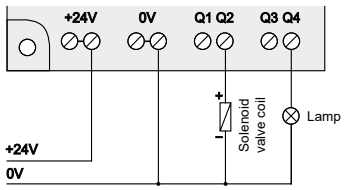
NEED-24DC-..-08-4.-.
0...12,75 / 0...25,5 V DC ① **I7 - I8**: 2,0 mA

NEED-220DC-..-08-4R-.
0...255 V DC ① **I7 - I8**: 1,1 mA

Connection diagrams - digital outputs

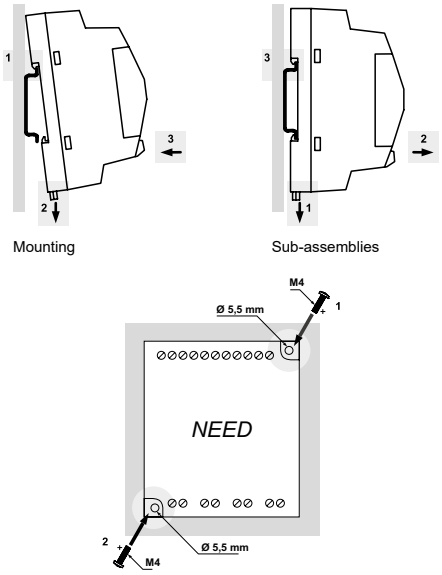


NEED-...-..-08-4R-.
relay outputs Q1 - Q4: 10 A, 250 V AC

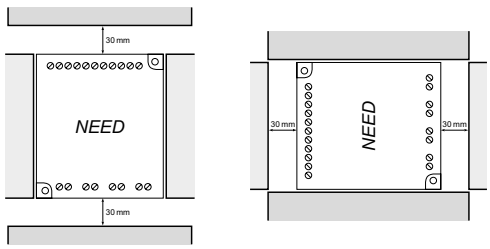


NEED-24DC-..-08-4T-.
transistor outputs Q1 - Q4: 0,5 A, 24 V DC

Mechanical mounting

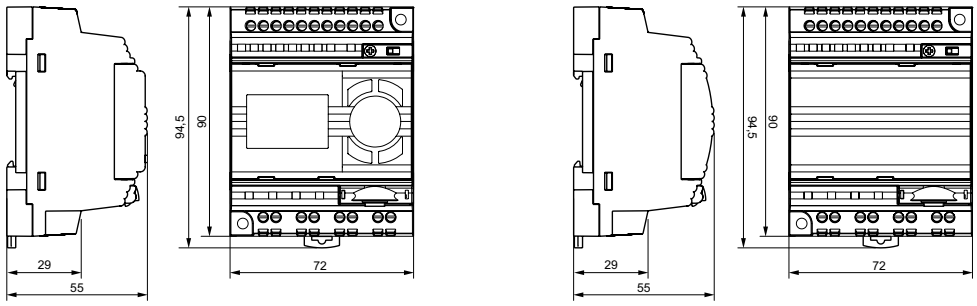


Any operation position - mounting distances for walls with terminals



PROGRAMM.

Dimensions



Mounting, connection to PC computer

Relays **NEED-...-08-4...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M4 screws). Operational position - any. **Connections:** max. cross section of the cables:1 x 2,5 mm² / 2 x 1,0 mm² (1 x 14 / 2 x 17 AWG), cables to PC computer: **NEED-PC-15B** (RS-232), **NEED-PC-15C** (USB).

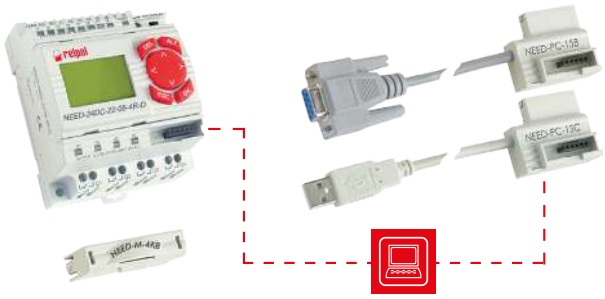


Table of codes

Table 1

Programmable relay code	Supply voltage	Version	Number of inputs	Number and type of outputs	Equipment
NEED-230AC-22-08-4R-D	230 V AC	22	8	4 relay	LCD display, keyboard
NEED-230AC-11-08-4R	230 V AC	11	8	4 relay	–
NEED-12DC-22-08-4R-D	12 V DC	22	8	4 relay	LCD display, keyboard
NEED-12DC-11-08-4R	12 V DC	11	8	4 relay	–
NEED-24DC-22-08-4R-D	**24 V DC**	**22**	**8**	**4 relay**	**LCD display, keyboard**
NEED-24DC-11-08-4R	**24 V DC**	**11**	**8**	**4 relay**	**–**
NEED-24DC-22-08-4T-D	24 V DC	22	8	4 transistor	LCD display, keyboard
NEED-24DC-11-08-4T	24 V DC	11	8	4 transistor	–
NEED-220DC-22-08-4R-D	220 V DC	22	8	4 relay	LCD display, keyboard
NEED-220DC-11-08-4R	220 V DC	11	8	4 relay	–

The data in bold type relate to the standard versions of the relays.

NEED-...-22-...-D

NEED-...-11-...

- Programmable relays with LCD display or without display, exceptional simplicity of programming in language LAD and STL - page 421
- 16 inputs: AC or DC voltages • 8 outputs: relay or transistor
- LED signaling the status of the relay and inputs/outputs • Cooperation with communication modules NEED-MODBUS • Mounting on 35 mm rail mount or on panel mounting • Control of applications - page 422
- Compliance with standards EN 61131-2, EN 50178
- Recognitions, certifications, directives: RoHS, CE EAC

Supply voltage

Rated supply voltage	50/60 Hz AC	230 V		
	DC	12, 24, 220 V		
Operating range of supply voltage		230 V AC: 95...260 V AC	12 V DC: 10,2...14,4 V DC	
		24 V DC: 19,6...28,8 V DC	220 V DC: 154...242 V DC	
Rated power consumption	AC	< 10,0 VA		
	DC	12 V DC, 24 V DC: < 5,0 W	220 V DC: < 6,0 W	
Range of supply frequency	AC	47...63 Hz		

Inputs

Number of digital inputs		13 (I1 - I13)		
Number and type of analog-digital inputs		3 (I14 - I16)	AC or DC voltage ❷	
Rated voltage	• for logic state "1"	230 V AC: 85...260 V AC 50 Hz	12 V DC: 8...26 V DC	
		24 V DC: 15...40 V DC	220 V DC: 80...260 V DC	
	• for logic state "0"	230 V AC: 0...32 V AC 50 Hz	12 V DC: -1,5...4 V DC	
		24 V DC: -3...5 V DC	220 V DC: 0...40 V DC	
Input current for logic state "1" ❶		230 V AC: 0,6 mA (I1 - I11)	8,0 mA (I12 - I13)	1,5 mA (I14 - I16)
		12 V DC: 3,3 mA (I1 - I13)		1,1 mA (I14 - I16)
		24 V DC: 3,3 mA (I1 - I13)		2,0 mA (I14 - I16)
		220 V DC: 0,6 mA (I1 - I13)		1,1 mA (I14 - I16)
Range of analog input signals		230 V AC: 0...255 V AC 50 Hz		
		12 V DC, 24 V DC: 0...12,75 / 0...25,5 V DC		0...25,5 / 0...51 mA ❸
		220 V DC: 0...255 V DC		

Outputs

Number and type of outputs		relay: 8 NO (Q1 - Q8) ❹	
		transistor: 8 NO (Q1 - Q8) ❺	
Max. voltage		250 V AC ❹, 30 V DC ❺	
Min. voltage		10 V ❹	
Rated load	AC1	10 A / 250 V AC ❹	
	DC1	0,5 A / 24 V DC ❺	
Min. current		10 mA ❹	1 mA ❺
Resistance		≤ 100 mΩ ❹	

Insulation according to EN 60664-1

Insulation rated voltage	300 V AC	
Rated surge voltage		
• inputs - outputs	2 500 V	1,2 / 50 µs
Overvoltage category	II	
Insulation pollution degree	2	
Dielectric strength		
• inputs - outputs	2 000 V AC	type of insulation: reinforced
• contact clearance	1 000 V AC	type of clearance: micro-disconnection ❹

General data

Operating / release time (typical values)	7 ms / 3 ms ❹	
Electrical life		
• resistive AC1	> 0,7 x 10^5	10 A, 250 V AC ❹
• DC L/R=40 ms	> 10^5	0,15 A, 220 V DC ❹
Mechanical life (cycles)	> 3 x 10^7	
Dimensions (L x W x H)	90 x 132 x 55 mm	
Weight	max. 413 g	
Ambient temperature (non-condensation and/or icing)	• storage	-40...+70 °C
	• operating	-20...+55 °C
Cover protection category	IP 20	EN 60529

❶ At rated voltage U_n. ❷ For versions 12 V DC, 24 V DC: it is possible to program configuration the type of inputs as voltage or current ones. ❸ Range for current mode in versions DC. ❹ Versions with unprotected relay outputs. ❺ Version 24 V DC with protected transistor outputs: max. off-state leakage current < 0,1 mA; max. on-state voltage drop on the connection < 2,5 V.

PROGRAMM.

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Physical resources

Mode switch	STOP/RUN
LCD display ❻	preview of variables, illuminated, of high contrast (4 lines 12 characters each)
Keyboard ❻	set of program parameters
Programmable function buttons ❻	4 (B1 - B4)
LED indicators	three-colour LED - relay status (green: RUN, yellow: STOP, red: ERROR) yellow LEDs - output status green LEDs - input status
Internal potentiometer ❼	for analog value setting
Real time RTC clock	with automatic time change summer / winter for various time zones (EU, GB, US, RU)
Connection with stopper	for relay programming and external memory card connection
Three-phase network equipment control system	monitoring of voltage, asymmetry and phase sequence ❽

Program resources

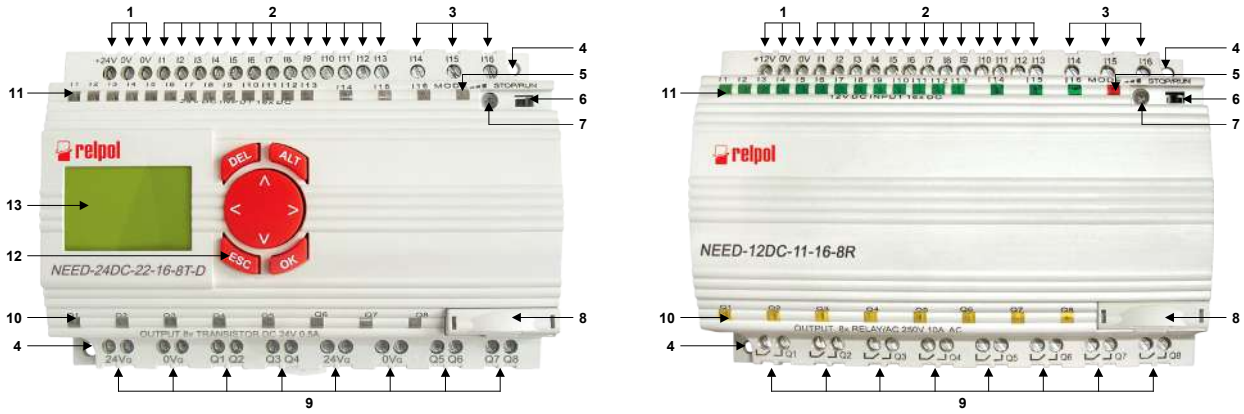
Timers ❾	NEED-...-22-...-D: 32 (T1 - T32) time range 10 ms...99 h 59 min., resolution 10 ms, accuracy ±1% of the set value +0...1 ms	NEED-...-11-...: 16 (T1 - T16)
Bidirectional counters ❾	8 (C1 - C8), values 0-65535	
Fast bidirectional counter / meter ❻	measurement of frequency up to 20 kHz (digital input I11)	
Clocks	NEED-...-22-...-D: 8 (H1 - H8)	NEED-...-11-...: 4 (H1 - H4)
Comparators of analog values	NEED-...-22-...-D: 16 (A1 - A16)	NEED-...-11-...: 12 (A1 - A12)
Markers	NEED-...-22-...-D: 64 (M1 - M64)	NEED-...-11-...: 16 (M1 - M16)
Text markers ❻	8 (MT1 - MT8)	
Marker of phase sequence	❽	

System structure

NEED-...	programmable relay (see "Table of codes")
NEED-PC-15B (RS-232) NEED-PC-15C (USB)	cables for programming and diagnostics, for connection to PC computer
NEED-M-4KB (NEED-...-22-...-D) NEED-M-1KB (NEED-...-11-...)	external memory cards (4 kB or 1 kB) ❿
PC NEED	software for editing, compiling, programming of the relay and the external memory card (language: graphic LAD and text STL), user's manual: www.need.com.pl
NEED-MODBUS	communication module NEED Master / ModBus RTU Slave

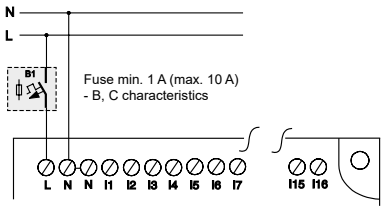
❻ Only for NEED-...-22-...-D ❼ For versions 12 V DC, 24 V DC: possibility of connecting external potentiometer. ❽ Only for version 230 V AC.
❾ Possibility of configuration from analog inputs. ❿ The external memory card is not required and is an optional extension of the relay program memory.

Front panel description



1 Supply terminals
2 Digital input terminals
3 Analog-digital input terminals
4 Openings of 5,5 mm diameter for panel mounting with two M4 screws
5 LED indicator (three-colour) of the relay status
6 STOP/RUN mode switch
7 Potentiometer for analog value setting
8 Relay programming and external memory card connection, secured by stopper
9 Output terminals
10 LED indicators (yellow) of output status
11 LED indicators (green) of input status
12 Keyboard
13 LCD display

Connection diagram - supply connection



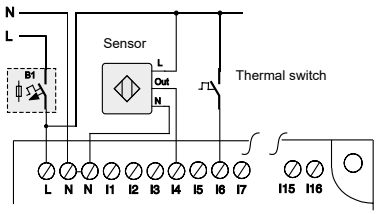
NEED-230AC-..-16-8R-.
230 V AC 50/60 Hz (95...260 V AC), L = 230 V AC, N = 0 V

NEED-12DC-..-16-8R-.
12 V DC (10,2...14,4 V DC), L = +12 V DC, N = 0 V

NEED-24DC-..-16-8.-.
24 V DC (19,6...28,8 V DC), L = +24 V DC, N = 0 V

NEED-220DC-..-16-8R-.
220 V DC (154...242 V DC), L = +220 V DC, N = 0 V

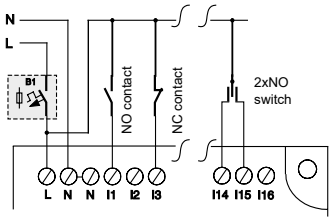
Connection diagrams - digital inputs



NEED-12DC-..-16-8R-. L = +12 V DC, N = 0 V
Logic state "1": 8...26 V DC **I1 - I13**: 3,3 mA, **I14 - I16**: 1,1 mA
Logic state "0": -1,5...4 V DC

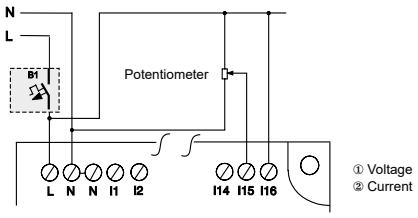
NEED-24DC-..-16-8.-. L = +24 V DC, N = 0 V
Logic state "1": 15...40 V DC **I1 - I13**: 3,3 mA, **I14 - I16**: 2,0 mA
Logic state "0": -3...5 V DC

NEED-220DC-..-16-8R-. L = +220 V DC, N = 0 V
Logic state "1": 80...260 V DC **I1 - I13**: 0,6 mA, **I14 - I16**: 1,1 mA
Logic state "0": 0...40 V DC



NEED-230AC-..-16-8R-. L = 230 V AC, N = 0 V
Logic state "1": 85...260 V AC 50 Hz **I1 - I11**: 0,6 mA
I12 - I13: 8,0 mA
I14 - I16: 1,5 mA
Logic state "0": 0...32 V AC 50 Hz

Connection diagram - analog-digital inputs



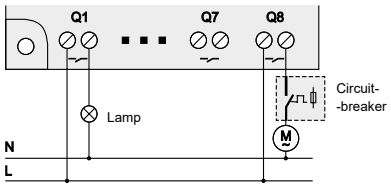
NEED-230AC-..-16-8R-.
0...255 V AC 50 Hz ① **I14 - I16**: 1,5 mA

NEED-12DC-..-16-8R-.
0...12,75 / 0...25,5 V DC ① **I14 - I16**: 1,1 mA
0...25,5 / 0...51 mA ② **I14 - I16**: 1,1 mA

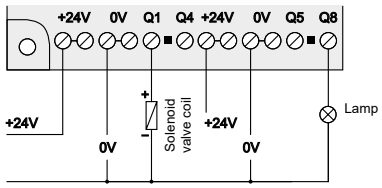
NEED-24DC-..-16-8.-.
0...12,75 / 0...25,5 V DC ① **I14 - I16**: 2,0 mA
0...25,5 / 0...51 mA ② **I14 - I16**: 2,0 mA

NEED-220DC-..-16-8R-.
0...255 V DC ① **I14 - I16**: 1,1 mA

Connection diagrams - digital outputs

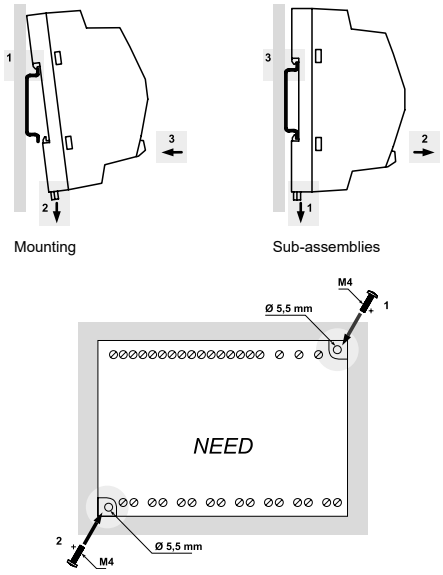


NEED-...-..-16-8R-.
relay outputs Q1 - Q8: 10 A, 250 V AC

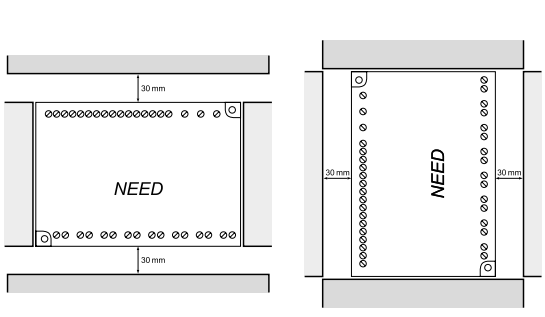


NEED-24DC-..-16-8T-.
transistor outputs Q1 - Q8: 0,5 A, 24 V DC

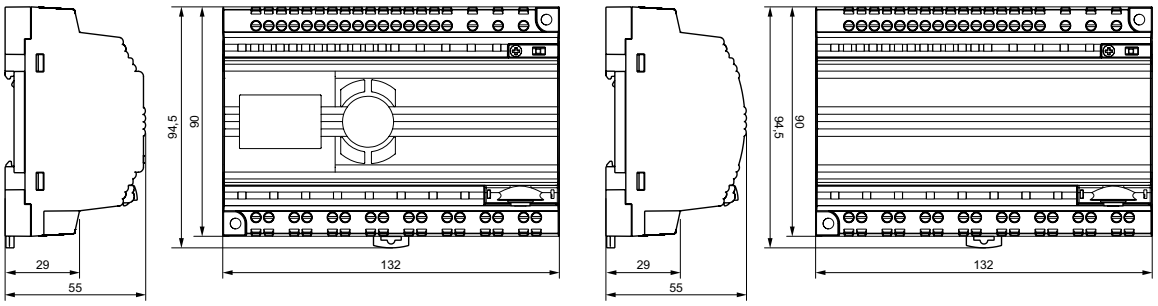
Mechanical mounting



Any operation position - mounting distances for walls with terminals



Dimensions



Mounting, connection to PC computer

Relays **NEED-...-16-8...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M4 screws). Operational position - any. **Connections:** max. cross section of the cables:1 x 2,5 mm² / 2 x 1,0 mm² (1 x 14 / 2 x 17 AWG), cables to PC computer: **NEED-PC-15B** (RS-232), **NEED-PC-15C** (USB).

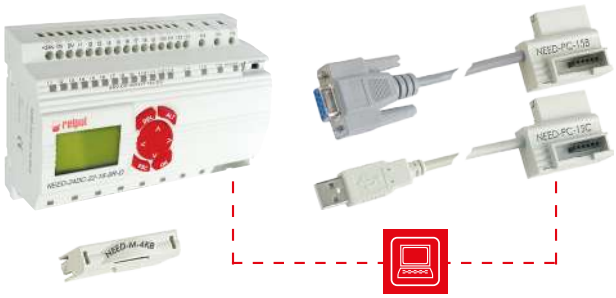


Table of codes

Table 1

Programmable relay code	Supply voltage	Version	Number of inputs	Number and type of outputs	Equipment
NEED-230AC-22-16-8R-D	230 V AC	22	16	8 relay	LCD display, keyboard
NEED-230AC-11-16-8R	230 V AC	11	16	8 relay	–
NEED-12DC-22-16-8R-D	12 V DC	22	16	8 relay	LCD display, keyboard
NEED-12DC-11-16-8R	12 V DC	11	16	8 relay	–
NEED-24DC-22-16-8R-D	**24 V DC**	**22**	**16**	**8 relay**	**LCD display, keyboard**
NEED-24DC-11-16-8R	**24 V DC**	**11**	**16**	**8 relay**	**–**
NEED-24DC-22-16-8T-D	24 V DC	22	16	8 transistor	LCD display, keyboard
NEED-24DC-11-16-8T	24 V DC	11	16	8 transistor	–
NEED-220DC-22-16-8R-D	220 V DC	22	16	8 relay	LCD display, keyboard
NEED-220DC-11-16-8R	220 V DC	11	16	8 relay	–

The data in bold type relate to the standard versions of the relays.

Exceptional simplicity of programming

Software PC NEED

A computer program which allows editing, compiling and downloading of a program to the memory of a programmable relay.

The resources of the relay may be monitored in course of operation, owing to which the user may be currently informed about the status of the inputs, outputs, timers, counters, clocks, comparators, etc.

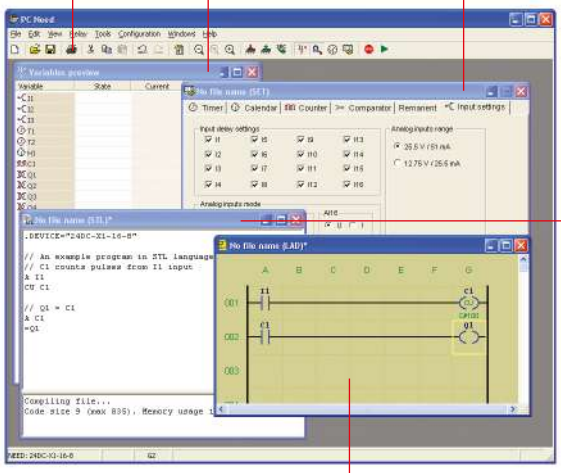
The simplicity and variety of the program edition (text or graphics) make the PC NEED a very convenient tool, owing to which even complex applications are made very quickly, and their start-up time is short.

Hardware requirements: any computer of PC class with RS-232 or USB interface and VGA graphic card, operating system – Windows 2000®, Windows XP®, Windows Vista®, Windows 7®, Windows 8®.

Program printout:
- LAD or STL,
- configuration parameters.

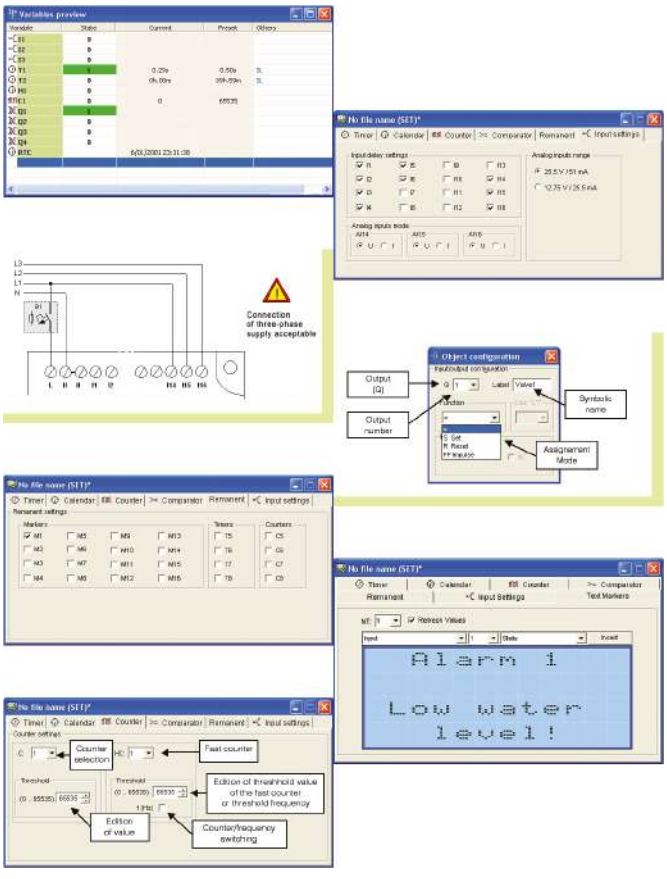
Preview of variables:
- possibility to monitor the relay's resources.

Resources settings:
- possibility to set the parameters of timers, counters, clocks, comparators, etc.,
- simple operation and understandable menu,
- editable alert texts and definitions of keyboard buttons.



STL language:
- possibility of conversion from LAD to text language,
- possibility of programming in text editor and further copying of the application,
- the language syntax highlighted,
- setting customized colors and fonts.

LAD language:
- simplicity of programming which allows quick application designing,
- symbolic labels of individual elements,
- easy creation of applications based upon an electrical chart,
- possibility of inserting comments, color and font configurations,
- ladder preview to facilitate the start of the software.



Functions of NEED relay

The NEED programmable relay is a product based on the Polish know-how which is perfectly implemented in applications of industrial automatics. The relay is an interesting alternative for similar solutions offered by other manufacturers due to its numerous outstanding advantages.

1) Preview of variables as a tool for monitoring all the resources in the relay.

2) A wide range of analog-digital inputs and possibility of configuration of DC inputs as voltage or current ones.

3) The mode of monitoring three-phase voltage for the 230AC-...-16-8R-. version.

4) Possibility to read the program structure existing in the relay, including the symbolic names assigned to individual elements.

5) Remanence mode - possibility of identifying some resources of the relay, which might be maintained when the supply voltage is off.

6) Fast bidirectional counter / meter of frequency - measurement up to 20 kHz.

7) Edition of texts of alerts shown on the display, which include the variables of the relay.

8) Four keys of the keyboard to be used in LAD or STL languages.

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Control of applications

Management of a parking lot with limited number of places

The parking lot may operate in timing mode (from ... to ...) or in permanent mode. The sensors at the entrance and exit help to define the number of cars in the parking lot and to compare the number with the preset number of places. When the maximum number of vehicles are parked, the information ”NO PLACES AVAILABLE” is lit at the entrance. Additionally, the entrance gate remains closed as long as a vehicle leaves the parking lot.

Controller of two pumps – direct start-up

Alternate operation of pumps - automatic or manual. Sequence control of the pumps - two levels of switching on, one level of switching off. Automatic start-up of the second pump in case of a failure of the first one. Protection against dry operation. Outlets to the external alarm signaling (failure of the pump).

Control of a machine for wire mesh production

Control of the squashing unit which bends the end parts of the wires of the mesh so to avoid injuries. The design of the unit is based on two pneumatic servo-motors connected to the compressed air supply source. The control system protects also against failures in course of production.

Segregation of details in production process

Segregation of details on stroke feed according to their height. Two height sensors of the appropriate range.

Control of lighting and drives of ventilators

Voltage central switching on and off - manual or automatic switching according to timing schedule. Possibility of flexible shaping of the function of lighting for each room.

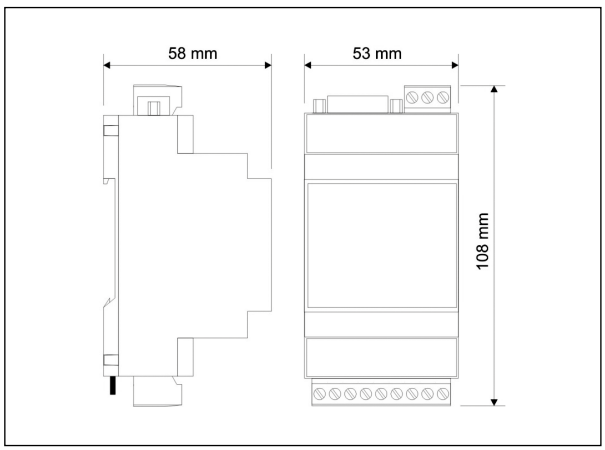
Control of moving stairways

Control of the direction of movement (up and down). Detection of passengers on the stairway on the basis of the signals from movement detectors.

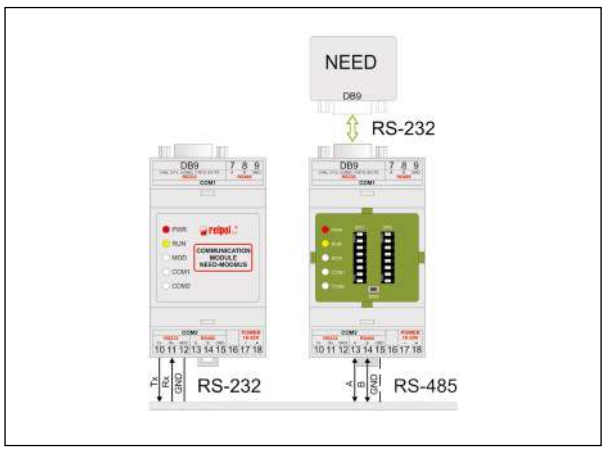
- **Appropriation**: data reading from NEED relays and availability of the data values with the ModBus RTU protocol; transmission of control commands to NEED; modification of the real time RTC clock setting; operation from COM1 side as NEED Master and from COM2 side as a device of ModBus RTU Slave type
- **Options**: operation mode change: STOP/RUN; RTC clock: current data reading (in the RUN mode) and setting change record (in the STOP mode); current data reading (in the RUN mode): status, program name and version, digital and analog inputs, digital outputs, phase sequence, timers, counters, fast counter current value, clocks, comparators, markers; setting reading and record (in the STOP mode): timers, counters, fast counter, comparators.

Input circuit		
Rated supply voltage	7...26 V AC 50/60 Hz	7...35 V DC
Max. power consumption	no load: 2 VA	
Max. power consumption		
Parameter memory	EEPROM	
Introduction of the basic parameter transmission	with the use of DIP SWITCH	
Transmission parameters for ModBus RTU Slave	9600 bits/s, 1 bit start, 8 bits of data, 1 bit stop, without parity control	
RS-232	standard EIA/TIA-574	
• max. length of line	15 m	
RS-485	standard EIA/TIA-485	
• max. length of line	1200 m	
• max. number of devices on the line	32	
• port protection	100 mA / 600 W surge and short circuit protection	
• port line terminator	yes	
Connections • RS-232 (COM1)	SUB-D 9M connection	
• RS-485/RS-232 (COM2)	N/O connectors	
EMC electromagnet compatibility	according to EN-61000-6-1/2/3/4	
General data		
Cover	ABS	
Insulation rated voltage	COM1: supply	COM2: 1 kV DC
Dimensions with connectors / Weight	108 x 53 x 58 mm / 116 g	
Ambient temperature • storage	-30…70 °C	
(non-condensation and/or icing) • operating	-30…60 °C	
Protection category	cover: IP 43	terminals: IP 20
Relative humidity	20...95%	

Dimensions



Connection manner



Mounting

Modules **NEED-MODBUS** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. **Connections:** max. cross section of the cables: 1 x 0,22...2,5 mm² (1 x 24...14 AWG).

Installation relays

relpol S.A.

Electromagnetic relays of the RPI series in modular covers, designed for direct mounting on 35 mm rail mount acc. to EN 60715.

They meet the requirements of REACH and RoHS Directive. The relays are recognized and certified by:

CE EAC

← Contents


RPI-1P-A230


RPI-2P-D24

NEW

- **Installation relays - electromagnetic**
- Cadmium - free contacts 1 CO, 2 CO • AC and DC input voltages
- Cover - modular, width 17,5 mm • Direct mounting on 35 mm rail mount acc. to EN 60715 • Applications: automatic systems in buildings - in cooperation with control timers, switches, push buttons; electric systems; industrial automation and power engineering automation; switchgears of modular equipment
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit - contact data

Number and type of contacts		1 CO	2 CO
Contact material		**$AgSnO_2$**	
Max. switching voltage		300 V AC / 300 V DC	
Min. switching voltage		10 V	
Rated load	AC1	16 A / 250 V AC	8 A / 250 V AC
	DC1	16 A / 24 V DC	8 A / 24 V DC
Min. switching current		10 mA	
Max. inrush current		30 A	15 A
Rated current		16 A	8 A
Max. breaking capacity	AC1	4 000 VA	2 000 VA
Min. breaking capacity		1 W	
Contact resistance		≤ 100 mΩ	
Max. operating frequency			
• at rated load	AC1	600 cycles/hour	
• no load		72 000 cycles/hour	

Input circuit - coil data

Rated voltage	50/60 Hz AC	24, 115, 230 V	terminals A1, A2
	DC	12, 24, 48 V	terminals (+)A1, (-)A2
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,05 U_n
Operating range of supply voltage		0,85...1,1 U_n	see Tables 1, 2
Rated power consumption		≤ 1 W	12, 24, 48 V DC
		≤ 1 W	24, 115 V AC, 50/60 Hz
		≤ 1,5 W / 5,5 VA	230 V AC, 50/60 Hz
Range of supply frequency	AC	48...63 Hz	

Insulation according to EN 60664-1

Insulation rated voltage	250 V AC	
Rated surge voltage	4 000 V	1,2 / 50 µs
Overvoltage category	III	
Insulation pollution degree	2	
Flammability class	V-0	for modular cover, UL 94
Dielectric strength		
• input - output	4 000 V AC	type of insulation: basic
• contact clearance	1 000 V AC	type of clearance: micro-disconnection
• pole - pole	2 000 V AC	contacts 2 CO, type of insulation: basic

General data

Operating / release time (typical values)		15 ms / 20 ms	
Electrical life	• resistive AC1	10^4	contact 1 NO, 16 A, 8 A, 250 V AC
Mechanical life (cycles)		10^7	
Dimensions (L x W x H)		90 ❶ x 17,5 x 64,6 mm	
Weight		60 g	62 g
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+50 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock resistance		15 g	
Vibration resistance	(NO/NC)	9 g / 5 g	10...150 Hz

The data in bold type relate to the standard versions of the relays. ❶ Length with 35 mm rail catches: 98,8 mm.

INSTALLATION

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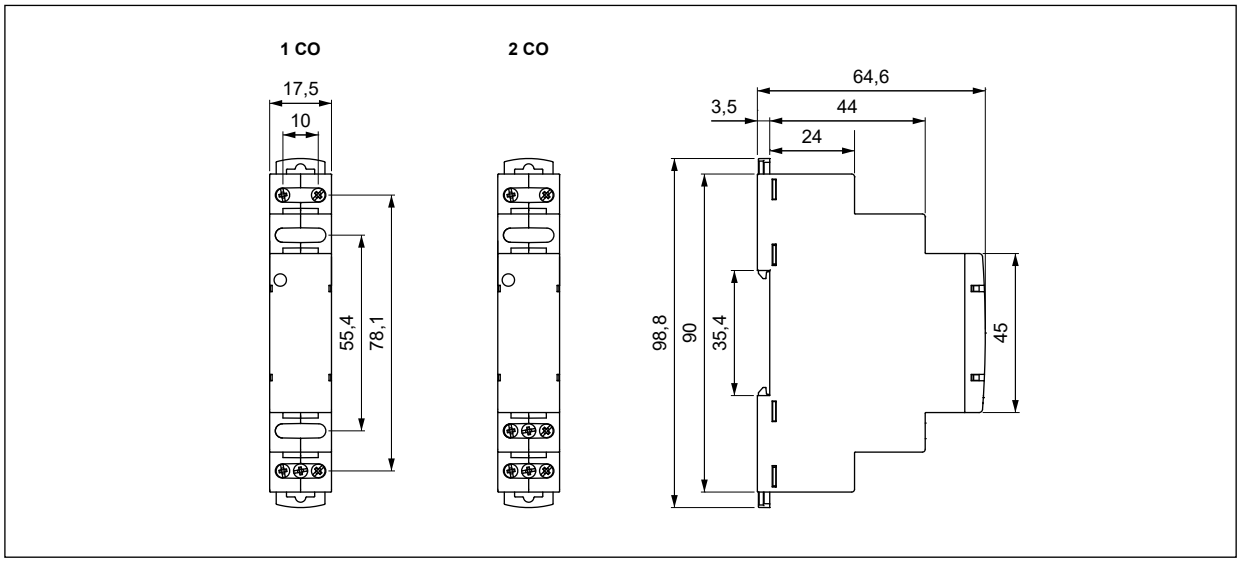
Dimensions

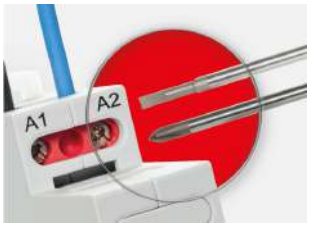


Mounting

Relays **RPI-.P-...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

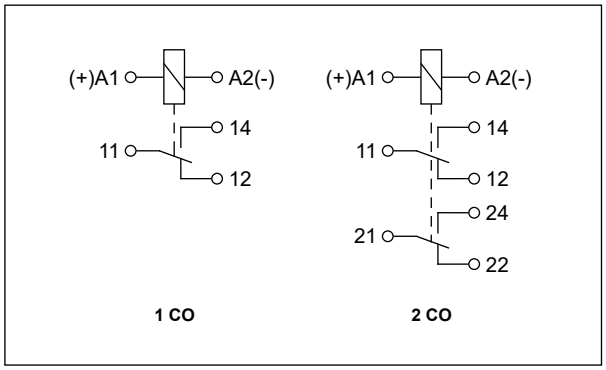
Green LED:
signalling the operation status of the relay (is illuminated permanently - correct supply).

Two catches:
easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps:
universal screw (cross-recessed or slotted head).

Connection diagrams



Note: the indicated polarization of the supply refers only to the relays RPI-...-D...

Coil data - DC voltage version Table 1

Coil code	Rated voltage V DC	Coil operating range V DC	
		min. (at 20 °C)	max. (at 50 °C)
D12	12	10,2	13,2
D24	24	20,4	26,4
D48	48	40,8	52,8

Coil data - AC 50/60 Hz voltage version Table 2

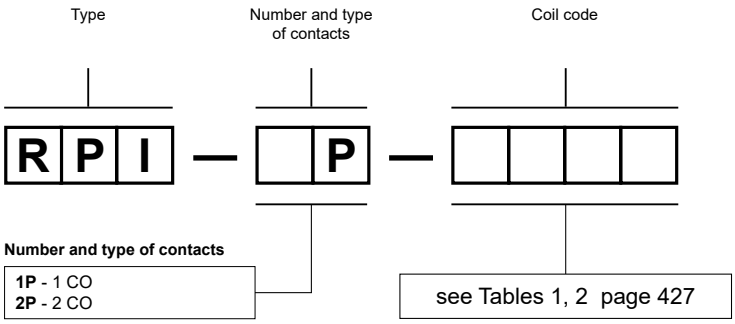
Coil code	Rated voltage V AC	Coil operating range V AC	
		min. (at 20 °C)	max. (at 50 °C)
A24	24	20,4	26,4
A115	115	97,8	126,5
A230	230	195,5	253,0

Table of codes Table 3

Relays **RPI-.P-...** replace withdrawn from the offer relays **MT-PI-...**

Installation relay code				Rated coil voltage
with 1 CO contact		**with 2 CO contacts**		
MT-PI-17S-11-1012	RPI-1P-D12	MT-PI-17S-12-1012	RPI-2P-D12	12 V DC
MT-PI-17S-11-1024	RPI-1P-D24	MT-PI-17S-12-1024	RPI-2P-D24	24 V DC
MT-PI-17S-11-1048	RPI-1P-D48	MT-PI-17S-12-1048	RPI-2P-D48	48 V DC
MT-PI-17S-11-5024	RPI-1P-A24	MT-PI-17S-12-5024	RPI-2P-A24	24 V AC 50/60 Hz
MT-PI-17S-11-5115	RPI-1P-A115	MT-PI-17S-12-5115	RPI-2P-A115	115 V AC 50/60 Hz
MT-PI-17S-11-5230	RPI-1P-A230	MT-PI-17S-12-5230	RPI-2P-A230	230 V AC 50/60 Hz

Ordering codes



❷ Ordering codes **RPI-.P-...** are specified in Table 3, "Installation relay code" column.

Examples of ordering codes ❷:

RPI-1P-A230 relay **RPI-.P-...**, cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, coil voltage 230 V AC 50/60 Hz

RPI-2P-D24 relay **RPI-.P-...**, cover - modular, width 17,5 mm, two changeover contacts, contact material $AgSnO_2$, coil voltage 24 V DC

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RPI-1Z-U12

RPI-2Z-U24A

NEW

- **Installation relays - electromagnetic**
- Cadmium - free contacts 1 NO, 2 NO • AC/DC and AC input voltages
- Cover - modular, width 17,5 mm • Direct mounting on 35 mm rail mount acc. to EN 60715 • Applications: automatic systems in buildings - in cooperation with control timers, switches, push buttons; electric systems; industrial automation and power engineering automation; switchgears of modular equipment
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit - contact data

Number and type of contacts		1 NO	2 NO
Contact material		**$AgSnO_2$**	
Max. switching voltage		300 V AC / 300 V DC	
Min. switching voltage		10 V	
Rated load	AC1	16 A / 250 V AC	8 A / 250 V AC
	DC1	16 A / 24 V DC	8 A / 24 V DC
Min. switching current		10 mA	
Max. inrush current		30 A	15 A
Rated current		16 A	8 A
Max. breaking capacity	AC1	4 000 VA	2 000 VA
Min. breaking capacity		1 W	
Contact resistance		≤ 100 mΩ	
Max. operating frequency			
• at rated load	AC1	600 cycles/hour	
• no load		72 000 cycles/hour	

Input circuit - coil data

Rated voltage	50 Hz AC	230 V	terminals A1, A3
	AC: 50 Hz AC/DC	12, 24, 48, 115 V	terminals (+)A1, (-)A2
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,05 U_n
Operating range of supply voltage		0,85...1,1 U_n	see Table 1
Rated power consumption		≤ 1 W	12, 24, 48, 115 V AC/DC, AC: 50 Hz
		≤ 1,5 W / 5,5 VA	230 V AC, 50 Hz
Range of supply frequency	AC	48...63 Hz	

Insulation according to EN 60664-1

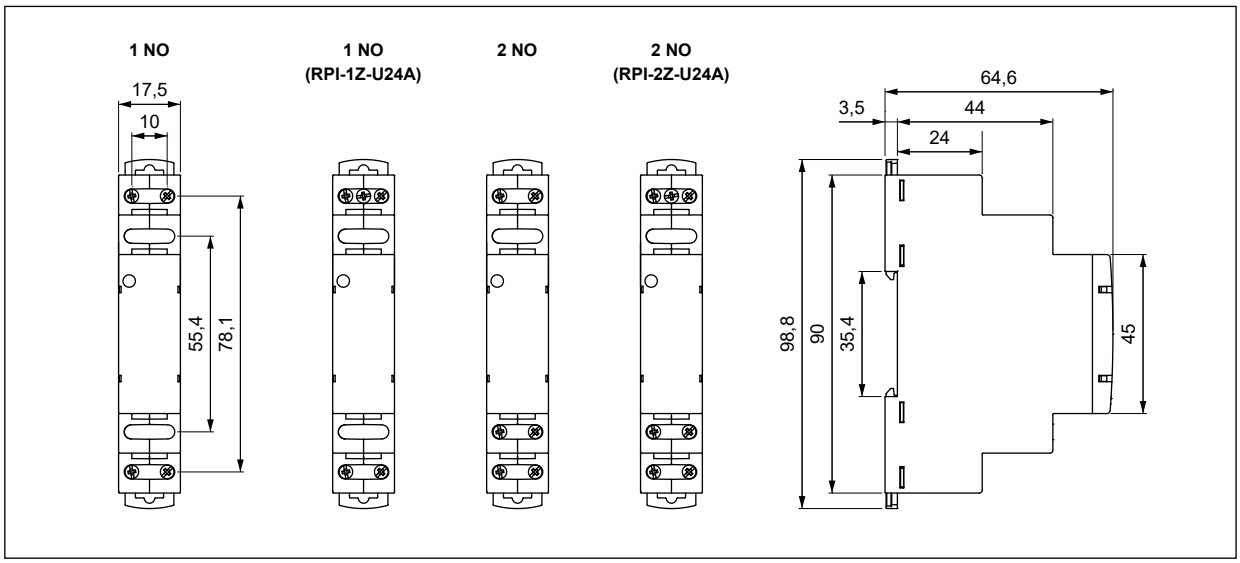
Insulation rated voltage	250 V AC	
Rated surge voltage	4 000 V	1,2 / 50 µs
Overvoltage category	III	
Insulation pollution degree	2	
Flammability class	V-0	for modular cover, UL 94
Dielectric strength		
• input - output	4 000 V AC	type of insulation: basic
• contact clearance	1 000 V AC	type of clearance: micro-disconnection
• pole - pole	2 500 V AC	contacts 2 NO, type of insulation: basic

General data

Operating / release time (typical values)		15 ms / 20 ms	
Electrical life	• resistive AC1	$0,5 \times 10^5$	16 A, 8 A, 250 V AC
Mechanical life (cycles)		10^7	
Dimensions (L x W x H)		90 ❶ x 17,5 x 64,6 mm	
Weight		63 g	65 g
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+50 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock resistance		15 g	
Vibration resistance	(NO)	9 g	10...150 Hz

The data in bold type relate to the standard versions of the relays. ❶ Length with 35 mm rail catches: 98,8 mm.

Dimensions

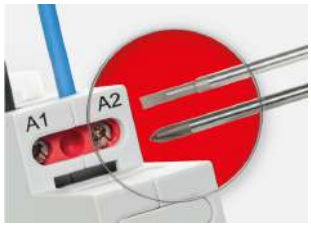


Mounting

Relays **RPI-.Z-...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

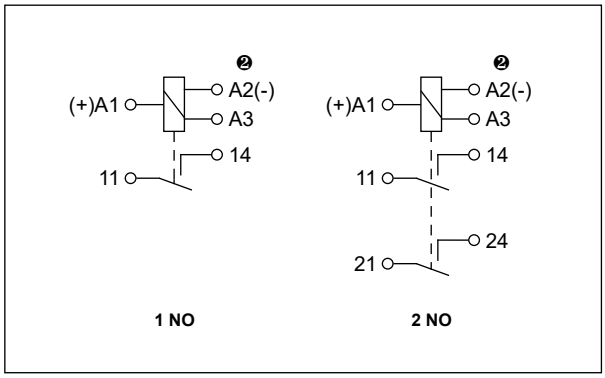
Green LED:
signalling the operation status of the relay (is illuminated permanently - correct supply).

Two catches:
easy mounting on 35 mm rail, firm hold (top and bottom).

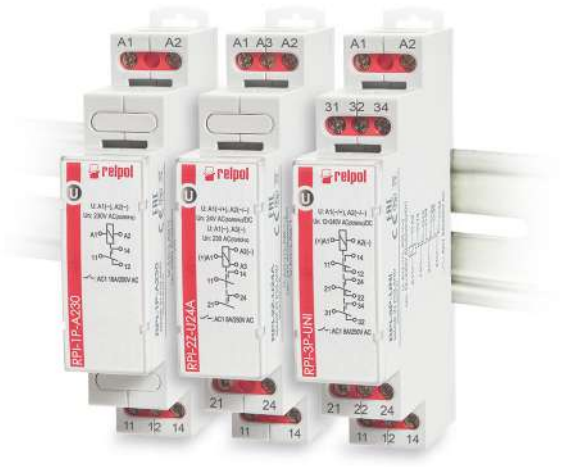


Mounting wires in clamps:
universal screw (cross-recessed or slotted head).

Connection diagrams



❷ Terminal A3 occurs only in versions RPI-.Z-U24A. Selection of relays supply voltage: 24 V AC/DC - wires connection to the terminals A1-A2; 230 V AC - to the terminals A1-A3.



INSTALLATION

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Coil data - AC/DC 50 Hz voltage version — Table 1

Coil code	Rated voltage V AC/DC	Coil operating range V AC/DC	
		min. (at 20 °C)	max. (at 50 °C)
U12	12	10,2	13,2
U24	24	20,4	26,4
U24A	24 V AC/DC ❷	20,4	26,4
	230 V AC ❷	195,5	253,0
U48	48	40,8	52,8
U115	115	97,8	126,5

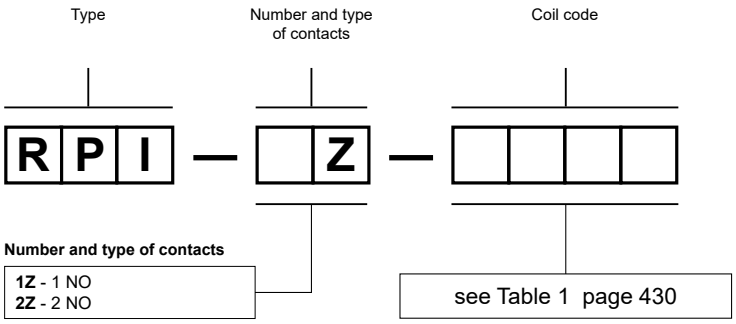
Table of codes — Table 2

Relays **RPI-.Z-...** replace withdrawn from the offer relays **MT-PI-...**

Installation relay code				Rated coil voltage
with 1 NO contact		**with 2 NO contacts**		
MT-PI-17S-21-8012	RPI-1Z-U12	MT-PI-17S-22-8012	RPI-2Z-U12	12 V AC/DC AC: 50 Hz
–	RPI-1Z-U24	–	RPI-2Z-U24	24 V AC/DC AC: 50 Hz
MT-PI-17S-21-8048	RPI-1Z-U48	MT-PI-17S-22-8048	RPI-2Z-U48	48 V AC/DC AC: 50 Hz
MT-PI-17S-21-8115	RPI-1Z-U115	MT-PI-17S-22-8115	RPI-2Z-U115	115 V AC/DC AC: 50 Hz
MT-PI-17S-21-9024	RPI-1Z-U24A	MT-PI-17S-22-9024	RPI-2Z-U24A	24 V AC/DC AC: 50 Hz 230 V AC 50 Hz ❷

❷ Selection of relays supply voltage: 24 V AC/DC - wires connection to the terminals A1-A2; 230 V AC - to the terminals A1-A3.

Ordering codes



❸ Ordering codes **RPI-.Z-...** are specified in Table 2, "Installation relay code" column.

Examples of ordering codes ❸:

RPI-1Z-U12 relay **RPI-.Z-...**, cover - modular, width 17,5 mm, one normally open contact, contact material $AgSnO_2$, coil voltage 12 V AC/DC AC: 50 Hz

RPI-2Z-U24A relay **RPI-.Z-...**, cover - modular, width 17,5 mm, two normally open contacts, contact material $AgSnO_2$, coil voltage 24 V AC/DC AC: 50 Hz or 230 V AC 50 Hz ❷

RPI-1ZI-D12

NEW

- **Installation relays - electromagnetic**
- **Resistance to inrush current 120 A (20 ms)**
- Cadmium - free contacts 1 NO
- DC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Recognitions, certifications, directives: RoHS, CE EAC

- **Switching lighting circuits**, in cooperation with control timers, switches, push buttons
- Wide range of application in switchgears of modular equipment, in particular for **switching circuits of high inrush current**

Output circuit - contact data

Number and type of contacts		1 NO
Contact material		**$AgSnO_2$**
Max. switching voltage		300 V AC / 300 V DC
Min. switching voltage		10 V
Rated load	AC1	16 A / 250 V AC
	DC1	16 A / 24 V DC
Min. switching current		10 mA
Max. inrush current		**120 A 20 ms**
Rated current		16 A
Max. breaking capacity	• AC1	4 000 VA (16 A / 250 V AC)
	• AC15	720 VA (3 A / 240 V AC)
	• AC3	650 W
	• DC1	0,35 A / 230 V DC; 16 A / 24 V DC
• at fluorescent lamp load		**800 W**
• at halogen lamp load		**2 500 W**
• at LED lamp load		**500 W**
Min. breaking capacity		1 W
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	600 cycles/hour
	• no load	72 000 cycles/hour

Input circuit

Rated voltage	DC	12 V terminals (+)A1, (-)A2
Must release voltage		DC: ≥ 0,05 U_n
Operating range of supply voltage		0,85...1,1 U_n
Rated power consumption		≤ 1 W

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2
Flammability class		V-0 for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC type of insulation: basic
	• contact clearance	1 000 V AC type of clearance: micro-disconnection

General data

Operating / release time (typical values)		15 ms / 20 ms
Electrical life	• resistive AC1	$0,5 \times 10^5$ 16 A, 250 V AC
Mechanical life (cycles)		10^7
Dimensions (L x W x H)		90 ❶ x 17,5 x 64,6 mm
Weight		68 g
Ambient temperature (non-condensation and/or icing)	• storage	-40...+70 °C
	• operating	-20...+50 °C
Cover protection category		IP 20 EN 60529
Relative humidity		up to 85%
Shock resistance		15 g
Vibration resistance	(NO)	9 g 10...150 Hz

The data in bold type relate to the standard versions of the relays. ❶ Length with 35 mm rail catches: 98,8 mm.

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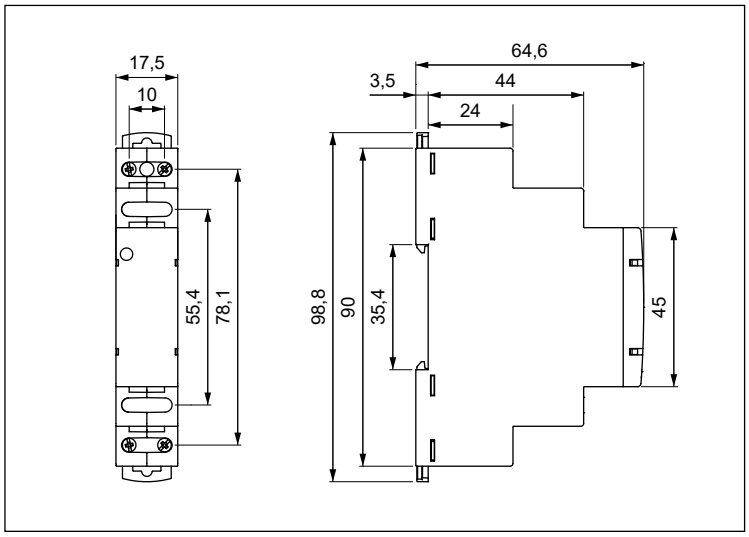
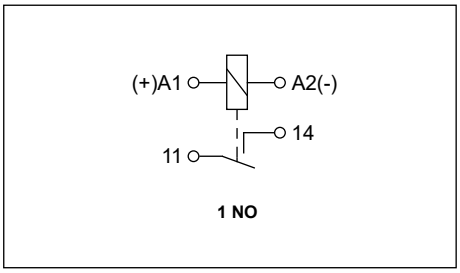
Dimensions



Connection diagram

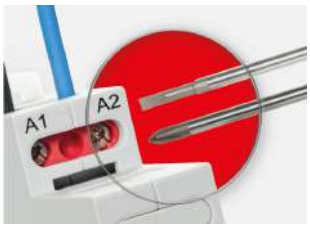


Mounting

Relays **RPI-1ZI-D12** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Green LED:
signalling the operation status of the relay (is illuminated permanently - correct supply).

Two catches:
easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps:
universal screw (cross-recessed or slotted head).

Ordering codes

Type	Number and type of contacts	Version	Rated input voltage
R P I	— 1 Z	I	— D 1 2

Number and type of contacts

1Z - 1 NO

Version

I - version inrush (resistance to inrush current 120 A)

Rated input voltage

D12 - 12 V DC

Example of ordering codes:

RPI-1ZI-D12
relay **RPI-1ZI-D12**, cover - modular, width 17,5 mm, one normally open contact, version inrush, contact material $AgSnO_2$, rated input voltage 12 V DC

RPI-1ZI-U24A

NEW

- **Installation relays - electromagnetic**
- **Resistance to inrush current 120 A (20 ms)**
- Cadmium - free contacts 1 NO
- AC/DC and AC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Recognitions, certifications, directives: RoHS, CE EAC

- **Switching lighting circuits**, in cooperation with control timers, switches, push buttons
- Wide range of application in switchgears of modular equipment, in particular for **switching circuits of high inrush current**

Output circuit - contact data

Number and type of contacts		1 NO	
Contact material		**$AgSnO_2$**	
Max. switching voltage		300 V AC / 300 V DC	
Min. switching voltage		10 V	
Rated load	AC1	16 A / 250 V AC	
	DC1	16 A / 24 V DC	
Min. switching current		10 mA	
Max. inrush current		**120 A 20 ms**	
Rated current		16 A	
Max. breaking capacity	• AC1	4 000 VA	(16 A / 250 V AC)
	• AC15	720 VA	(3 A / 240 V AC)
	• AC3	650 W	
	• DC1	0,35 A / 230 V DC; 16 A / 24 V DC	
• at fluorescent lamp load		**800 W**	
• at halogen lamp load		**2 500 W**	
• at LED lamp load		**500 W**	
Min. breaking capacity		1 W	
Contact resistance		≤ 100 mΩ	
Max. operating frequency	• at rated load AC1	600 cycles/hour	
	• no load	72 000 cycles/hour	

Input circuit

Rated voltage	50 Hz AC	230 V	terminals A1, A3
	AC: 50 Hz AC/DC	24 V	terminals (+)A1, (-)A2
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,05 U_n
Operating range of supply voltage		0,85...1,1 U_n	
Rated power consumption		≤ 1 W	24 V AC/DC, AC: 50 Hz
		≤ 1,5 W / 5,5 VA	230 V AC, 50 Hz
Range of supply frequency	AC	48...63 Hz	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V	1,2 / 50 µs
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection

General data

Operating / release time (typical values)		15 ms / 20 ms	
Electrical life	• resistive AC1	$0,5 \times 10^5$	16 A, 250 V AC
Mechanical life (cycles)		10^7	
Dimensions (L x W x H)		90 ❶ x 17,5 x 64,6 mm	
Weight		68 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+50 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock resistance		15 g	
Vibration resistance	(NO)	9 g	10...150 Hz

The data in bold type relate to the standard versions of the relays. ❶ Length with 35 mm rail catches: 98,8 mm.

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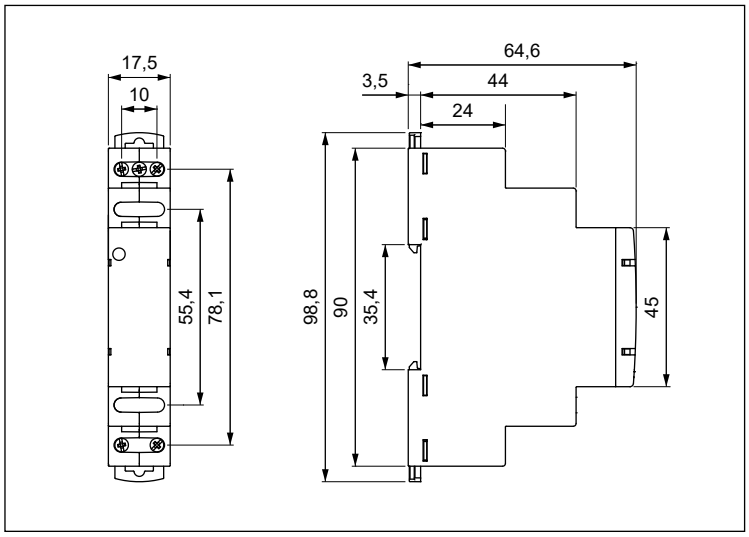
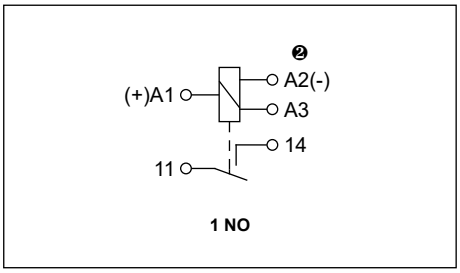
Dimensions



Connection diagram



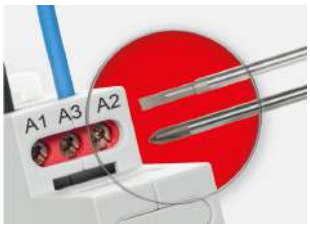
❷ Selection of relays supply voltage:
24 V AC/DC - wires connection to the terminals A1-A2;
230 V AC - to the terminals A1-A3.

Mounting

Relays **RPI-1ZI-U24A** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

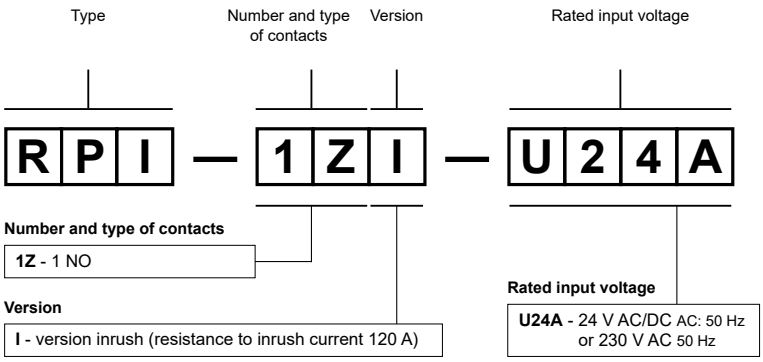
Green LED:
signalling the operation status of the relay (is illuminated permanently - correct supply).

Two catches:
easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps:
universal screw (cross-recessed or slotted head).

Ordering codes



Example of ordering codes:

RPI-1ZI-U24A
relay **RPI-1ZI-U24A**, cover - modular, width 17,5 mm, one normally open contact, version inrush, contact material $AgSnO_2$, rated input voltage 24 V AC/DC AC: 50 Hz or 230 V AC 50 Hz ❷

RPI-1P-UNI

RPI-3P-UNI

NEW

- **Installation relays - electromagnetic**
- Cadmium - free contacts 1 CO, 2 CO, 3 CO • AC/DC input voltages
- Cover - modular, width 17,5 mm • Direct mounting on 35 mm rail mount acc. to EN 60715 • Applications: automatic systems in buildings - in cooperation with control timers, switches, push buttons; electric systems; industrial automation and power engineering automation; switchgears of modular equipment
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit - contact data

Number and type of contacts			1 CO	2 CO, 3 CO
Contact material			**$AgSnO_2$**	
Max. switching voltage			300 V AC / 300 V DC	
Min. switching voltage			10 V	
Rated load		AC1	16 A / 250 V AC	8 A / 250 V AC
		DC1	16 A / 24 V DC	8 A / 24 V DC
Min. switching current			10 mA	
Max. inrush current			30 A	15 A
Rated current			16 A	8 A
Max. breaking capacity		AC1	4 000 VA	2 000 VA
Min. breaking capacity			1 W	
Contact resistance			≤ 100 mΩ	
Max. operating frequency	• at rated load AC1		600 cycles/hour	
	• no load		72 000 cycles/hour	

Input circuit

Rated voltage	AC: 50/60 Hz AC/DC	12...240 V	terminals (+)A1, (-)A2
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,05 U_n
Operating range of supply voltage		0,85...1,1 U_n	
Rated power consumption		≤ 1,5 W	
Range of supply frequency	AC	48...63 Hz	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V	1,2 / 50 µs
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection
	• pole - pole	2 000 V AC	contacts 2 CO, 3 CO, type of insulation: basic

General data

Electrical life	• resistive AC1	> 0,5 x 10^5	16 A, 8 A, 250 V AC
Mechanical life (cycles)		> 10^7	
Dimensions (L x W x H)		90 ❶ x 17,5 x 64,6 mm	
Weight		60 g	65 g
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+50 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock resistance		15 g (11 ms)	
Vibration resistance	(NO/NC)	9 g / 5 g	10...150 Hz

The data in bold type relate to the standard versions of the relays. ❶ Length with 35 mm rail catches: 98,8 mm.

Table of codes Table 1

Installation relay code			Rated input voltage
with 1 CO contact	**with 2 CO contacts**	**with 3 CO contacts**	
RPI-1P-UNI	RPI-2P-UNI	RPI-3P-UNI	12...240 V AC/DC AC: 50/60 Hz

PRECAUTIONS:

1. Ensure that the parameters of the product described in its specification provide a safety margin for the appropriate operation of the device or system and never use the product in circumstances which exceed the parameters of the product. **2.** Never touch any live parts of the device. **3.** Ensure that the product has been connected correctly. An incorrect connection may cause malfunction, excessive heating or risk of fire. **4.** In case of any risk of any serious material loss or death or injuries of humans or animals, the devices or systems shall be designed so to equip them with double safety system to guarantee their reliable operation.

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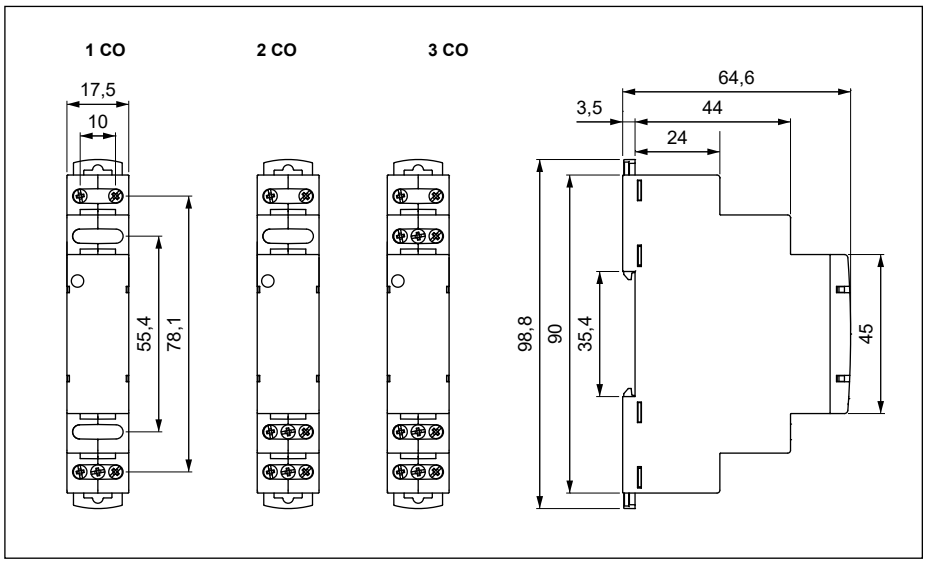
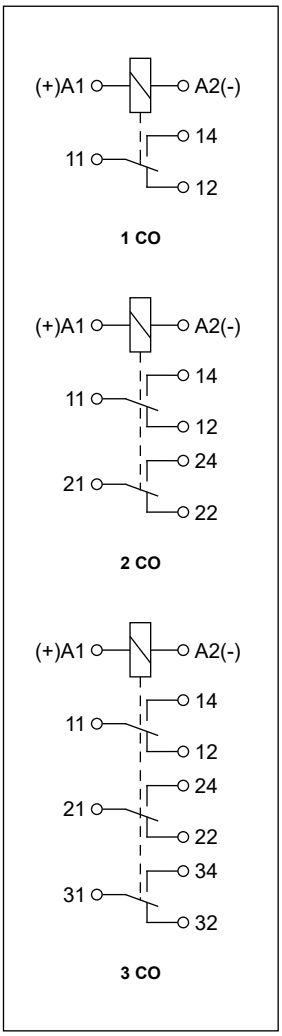
Dimensions



Connection diagrams

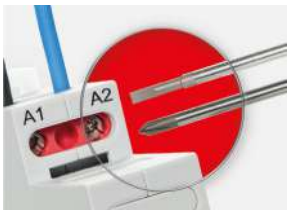


Mounting

Relays **RPI-.P-UNI** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

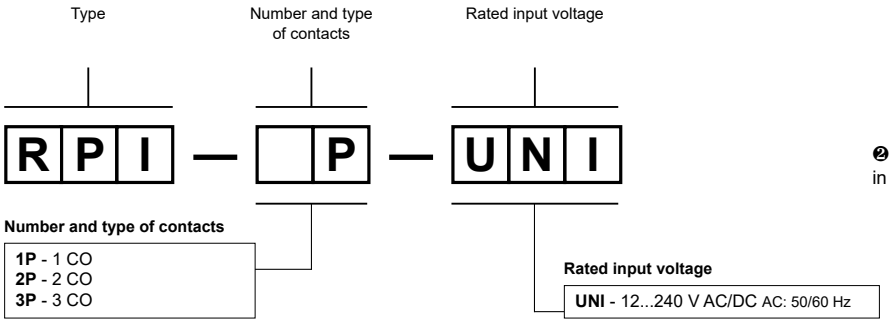
Green LED:
signalling the operation status of the relay (is illuminated permanently - correct supply).

Two catches:
easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps:
universal screw (cross-recessed or slotted head).

Ordering codes



❷ Ordering codes **RPI-.P-UNI** are specified in Table 1, "Installation relay code" column.

Example of ordering codes ❷:

RPI-3P-UNI relay **RPI-.P-UNI**, cover - modular, width 17,5 mm, three changeover contacts, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz


RPI-1Z-UNI


RPI-2Z-UNI

NEW

- **Installation relays - electromagnetic**
- Cadmium - free contacts 1 NO, 2 NO, 3 NO • AC/DC input voltages
- Cover - modular, width 17,5 mm • Direct mounting on 35 mm rail mount acc. to EN 60715 • Applications: automatic systems in buildings - in cooperation with control timers, switches, push buttons; electric systems; industrial automation and power engineering automation; switchgears of modular equipment
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit - contact data

Number and type of contacts			1 NO	2 NO, 3 NO
Contact material			**$AgSnO_2$**	
Max. switching voltage			300 V AC / 300 V DC	
Min. switching voltage			10 V	
Rated load		AC1	16 A / 250 V AC	8 A / 250 V AC
		DC1	16 A / 24 V DC	8 A / 24 V DC
Min. switching current			10 mA	
Max. inrush current			30 A	15 A
Rated current			16 A	8 A
Max. breaking capacity		AC1	4 000 VA	2 000 VA
Min. breaking capacity			1 W	
Contact resistance			≤ 100 mΩ	
Max. operating frequency	• at rated load	AC1	600 cycles/hour	
	• no load		72 000 cycles/hour	

Input circuit

Rated voltage	AC: 50/60 Hz	AC/DC	12...240 V	terminals (+)A1, (-)A2
Must release voltage			AC: ≥ 0,15 U_n	DC: ≥ 0,05 U_n
Operating range of supply voltage			0,85...1,1 U_n	
Rated power consumption			≤ 1,5 W	
Range of supply frequency		AC	48...63 Hz	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V	1,2 / 50 µs
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection
	• pole - pole	2 500 V AC	contacts 2 NO, 3 NO, type of insulation: basic

General data

Electrical life	• resistive AC1	> 0,5 x 10^5	16 A, 8 A, 250 V AC
Mechanical life (cycles)		> 10^7	
Dimensions (L x W x H)		90 ❶ x 17,5 x 64,6 mm	
Weight		60 g	65 g
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+50 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock resistance		15 g (11 ms)	
Vibration resistance	(NO/NC)	9 g	10...150 Hz

The data in bold type relate to the standard versions of the relays. ❶ Length with 35 mm rail catches: 98,8 mm.

Table of codes Table 1

Installation relay code			Rated input voltage
with 1 NO contact	**with 2 NO contacts**	**with 3 NO contacts**	
RPI-1Z-UNI	RPI-2Z-UNI	RPI-3Z-UNI	12...240 V AC/DC AC: 50/60 Hz

INSTALLATION

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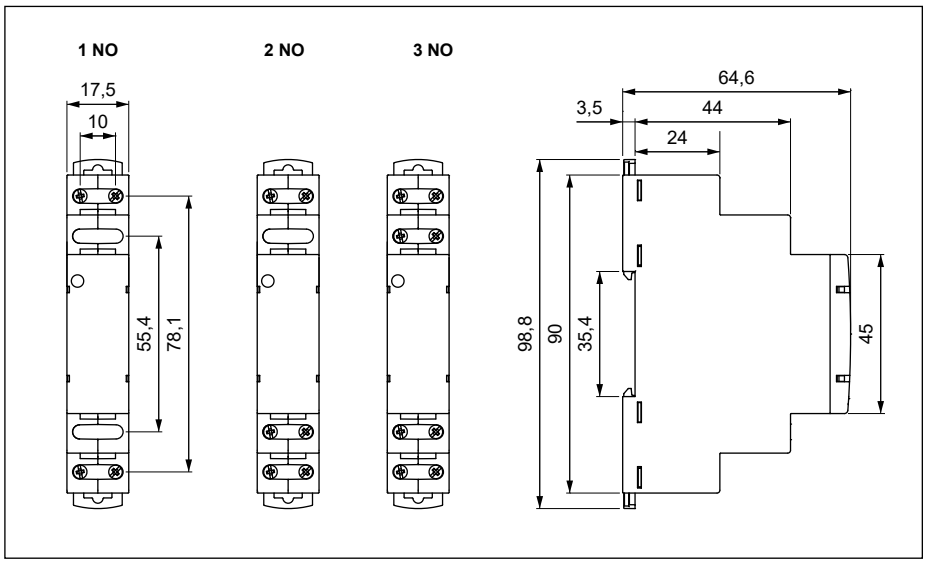
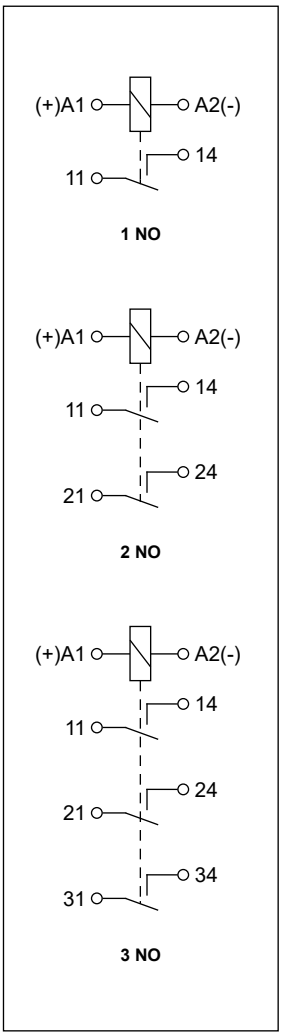
Dimensions



Connection diagrams

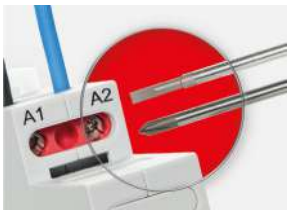


Mounting

Relays **RPI-.Z-UNI** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

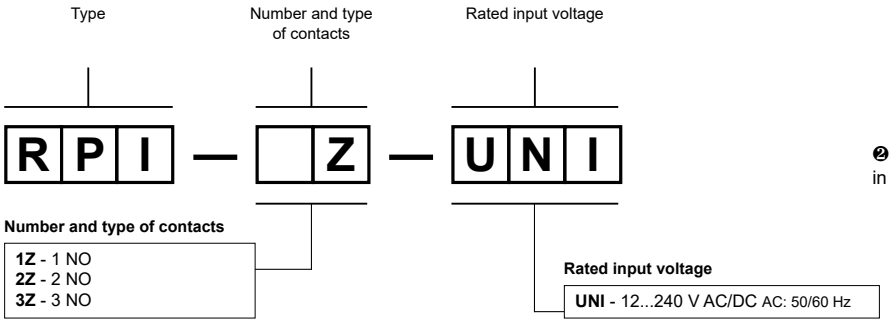
Green LED:
signalling the operation status of the relay (is illuminated permanently - correct supply).

Two catches:
easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps:
universal screw (cross-recessed or slotted head).

Ordering codes



❷ Ordering codes **RPI-.Z-UNI** are specified in Table 1, "Installation relay code" column.

Example of ordering codes ❷:

RPI-2Z-UNI relay **RPI-.Z-UNI**, cover - modular, width 17,5 mm, two normally open contacts, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

INSTALLATION

Bistable - impulse relays

relpol S.A.

Bistable - impulse relays of the RPB series in modular covers, designed for direct mounting on 35 mm rail mount acc. to EN 60715.

They meet the requirements of REACH, RoHS and EMC Directive. The relays are recognized and certified by:

CE EAC

← Contents

RPB-1P-...
bistable - impulse relays


RPB-1P-A230


RPB-1P-U24

NEW

- **Bistable - impulse relays type "ON-OFF", single-function without memory**
- Cadmium - free contacts 1 CO • AC and AC/DC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in cooperation with control switches and buttons ❶; electric systems; switchgears of modular equipment
- Compliance with standard EN 61810
- Recognitions, certifications, directives: RoHS, EMC ❷

Output circuit - contact data

Number and type of contacts		1 CO	
Contact material		$AgSnO_2$	
Max. switching voltage		300 V AC / 300 V DC	
Rated load	AC1	16 A / 250 V AC	
	DC1	16 A / 24 V DC	
Max. inrush current		30 A	
Rated current		16 A	
Max. breaking capacity	AC1	4 000 VA	
Min. breaking capacity		1 W 10 V, 10 mA	
Contact resistance		≤ 100 mΩ	
Max. operating frequency	• at rated load AC1	600 cycles/hour	
	• no load	3 600 cycles/hour	

Input circuit - coil data

Rated voltage	50/60 Hz AC	230 V	terminals A1, A2
	AC: 50/60 Hz AC/DC	24 V	terminals (-/+)A1, (+/-)A2
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,05 U_n
Operating range of supply voltage		0,85...1,15 U_n	see Tables 1, 2
Rated power consumption		≤ 0,5 W	230 V AC, 50/60 Hz
		≤ 0,8 W	24 V AC/DC, 50/60 Hz
Control contact S ❶	• load	ΣI < 5 mA	
	• min. voltage ❸	0,85 U_n	
	• min. time of pulse duration ❸	≥ 55 ms	
	• max. length of control line	10 m	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection

General data

Operating / release time (typical values)		60 ms / 60 ms	
Electrical life	• resistive AC1	$0,5 \times 10^5$	contact 1 NO, 16 A, 250 V AC ❹
Mechanical life (cycles)		10^7	
Operation cycle		1:1	
Dimensions (L x W x H)		90 ❺ x 17,5 x 64,6 mm	
Weight		65 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+55 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock / vibration resistance		15 g / 0,35 mm DA 10...55 Hz	

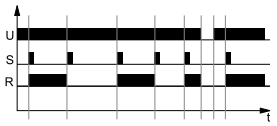
Function data

Functions	SET/RESET (RESET)
LED indicator	green LED U ON - indication of supply voltage U yellow LED R ON/OFF - output relay status

❶ Control contact S provides control of switching ON/OFF of receivers (lighting or other devices) from a few different points, with the use of connected in parallel momentary (doorbell) switches or lit-up buttons (ΣI < 5 mA). ❷ EMC tests (electromagnetic compatibility): EN 55011, EN 61000-4-2/3/4/5/6/11. ❸ Where the control signal is recognizable. ❹ Continuous voltage applied between A1, A2, activated with the control contact S. ❺ Length with 35 mm rail catches: 98,8 mm.

Functions

SET/RESET (RESET) - Switching ON and OFF, controlled by pulses on the contact S.



After the supply voltage has been applied, the output relay R remains switched off.
When a pulse occurs on the control input S, the output relay R is activated (SET). This status lasts until another control pulse occurs - then, the output relay R is switched off (RESET).
Further pulses which will occur on the control input S will change the R contact status into an opposite one.
Switching the supply off will cause switching the output relay R off. Switching on the supply again and applying a control pulse to the S input will switch the R relay on. Further control pulses which will occur on the control input S will change the R contact status into an opposite one.

Additional functions

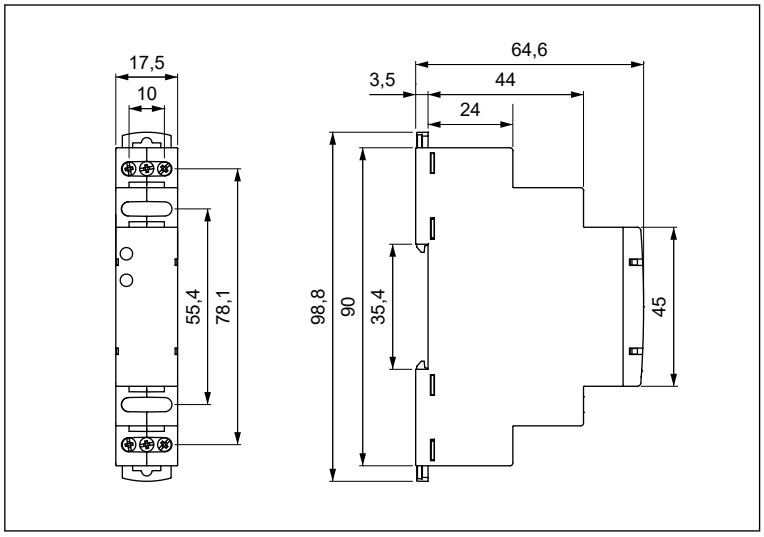
LEDs: green U, yellow R - are lit permanently.

Triggering: the relay is triggered by connecting the contact S to the A1 terminal, from connected in parallel control switches / buttons. For DC supply, the positive pole may be connected to the A1 or A2 terminal.

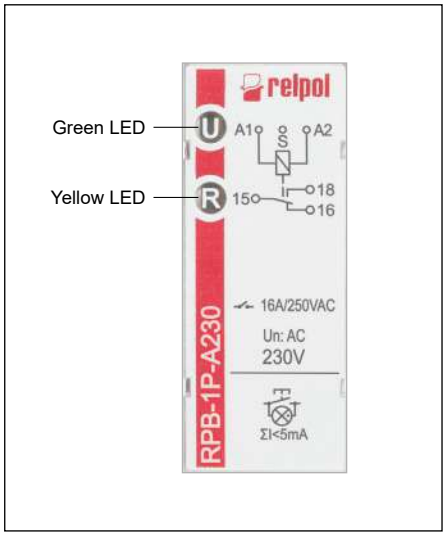
Supply:
- **RPB-1P-A230**: the relay may be supplied with AC voltage 50/60 Hz of 195,5...264,5 V,
- **RPB-1P-U24**: the relay may be supplied with DC voltage or AC voltage 50/60 Hz of 20,4...27,6 V.

U - supply voltage; **R** - output state of the relay; **t** - time axis

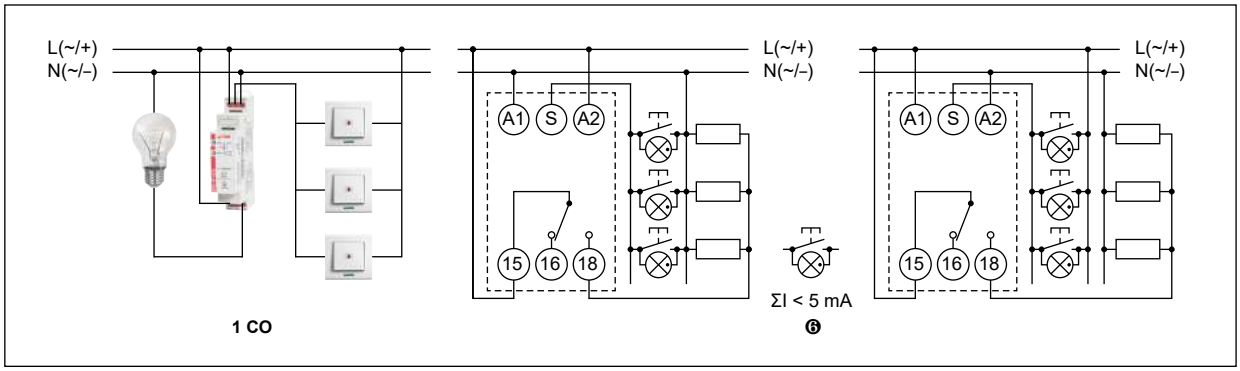
Dimensions



Front panel description



Connection diagrams



Note: the indicated polarization of the supply refers only to the relays RPB-1P-U24.
6 If too many lit-up buttons are connected, the lighting circuits can be switched on spontaneously or the lights can be switched on permanently.

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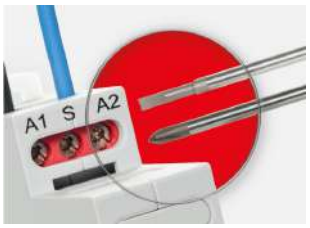
Mounting

Relays **RPB-1P-...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

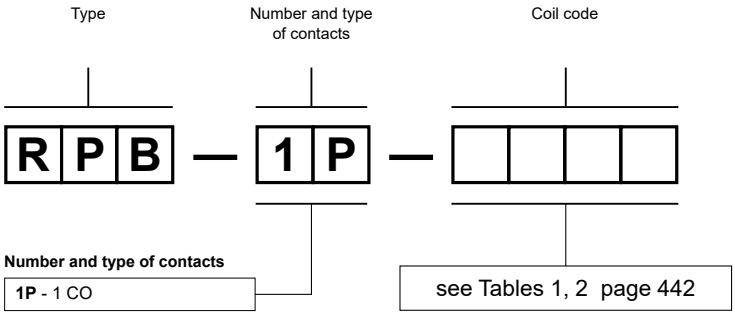
Coil data - AC 50/60 Hz voltage version — Table 1

Coil code	Rated voltage V AC	Coil operating range V AC	
		min. (at 20 °C)	max. (at 55 °C)
A230	230	195,5	264,5

Coil data - AC/DC 50/60 Hz voltage version — Table 2

Coil code	Rated voltage V AC/DC	Coil operating range V AC/DC	
		min. (at 20 °C)	max. (at 55 °C)
U24	24	20,4	27,6

Ordering codes



Examples of ordering codes:

RPB-1P-A230 bistable - impulse relay **RPB-1P-...**, single-function (relay perform function SET/RESET (RESET)), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, coil voltage 230 V AC 50/60 Hz

RPB-1P-U24 bistable - impulse relay **RPB-1P-...**, single-function (relay perform function SET/RESET (RESET)), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, coil voltage 24 V AC/DC AC: 50/60 Hz


RPB-1PM-A230


RPB-1PM-U24

NEW

- **Bistable - impulse relays type "ON-OFF", single-function with memory**
- Cadmium - free contacts 1 CO • AC and AC/DC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in cooperation with control switches and buttons ❶; electric systems; switchgears of modular equipment
- Compliance with standard EN 61810
- Recognitions, certifications, directives: RoHS, EMC ❷ CE EAC

Output circuit - contact data

Number and type of contacts		1 CO	
Contact material		$AgSnO_2$	
Max. switching voltage		300 V AC / 300 V DC	
Rated load	AC1	16 A / 250 V AC	
	DC1	16 A / 24 V DC	
Max. inrush current		30 A	
Rated current		16 A	
Max. breaking capacity	AC1	4 000 VA	
Min. breaking capacity		1 W 10 V, 10 mA	
Contact resistance		≤ 100 mΩ	
Max. operating frequency	• at rated load AC1	600 cycles/hour	
	• no load	3 600 cycles/hour	

Input circuit - coil data

Rated voltage	50/60 Hz AC	230 V	terminals A1, A2
	AC: 50/60 Hz AC/DC	24 V	terminals (-/+)A1, (+/-)A2
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,05 U_n
Operating range of supply voltage		0,85...1,15 U_n	see Tables 1, 2
Rated power consumption		≤ 0,5 W	230 V AC, 50/60 Hz
		≤ 0,8 W	24 V AC/DC, 50/60 Hz
Control contact S ❶	• load	ΣI < 5 mA	
	• min. voltage ❸	0,85 U_n	
	• min. time of pulse duration ❸	≥ 55 ms	
	• max. length of control line	10 m	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection

General data

Operating / release time (typical values)		60 ms / 60 ms	
Electrical life	• resistive AC1	$0,5 \times 10^5$	contact 1 NO, 16 A, 250 V AC ❹
Mechanical life (cycles)		10^7	
Operation cycle		1:1	
Dimensions (L x W x H)		90 ❺ x 17,5 x 64,6 mm	
Weight		65 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+55 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock / vibration resistance		15 g / 0,35 mm DA 10...55 Hz	

Function data

Functions	SET/RESET with memory (NORMAL)
LED indicator	green LED U ON - indication of supply voltage U yellow LED R ON/OFF - output relay status

❶ Control contact S provides control of switching ON/OFF of receivers (lighting or other devices) from a few different points, with the use of connected in parallel momentary (doorbell) switches or lit-up buttons (ΣI < 5 mA). ❷ EMC tests (electromagnetic compatibility): EN 55011, EN 61000-4-2/3/4/5/6/11. ❸ Where the control signal is recognizable. ❹ Continuous voltage applied between A1, A2, activated with the control contact S. ❺ Length with 35 mm rail catches: 98,8 mm.

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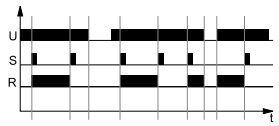
Functions

SET/RESET with memory (NORMAL) - Switching ON and OFF with memory, controlled by pulses on the contact S.



When a pulse occurs on the control input S, the output relay R is activated (SET). This status lasts until another control pulse occurs - then, the output relay R is switched off (RESET).
Further pulses which will occur on the control input S will change the R contact status into an opposite one.
In case the U supply is interrupted and then switched on again, the R contact of the output relay will return to the status prior to switching the U supply off, and the relay will start operation according to the foregoing function.

Additional functions

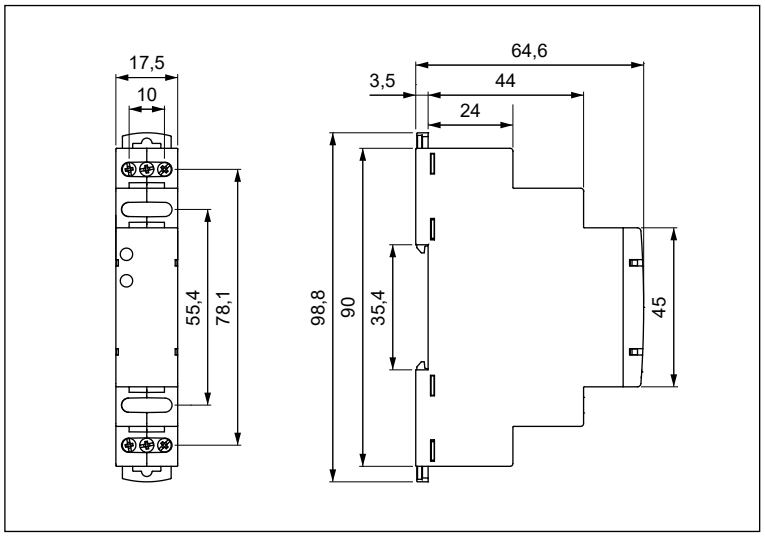
LEDs: green U, yellow R - are lit permanently.

Triggering: the relay is triggered by connecting the contact S to the A1 terminal, from connected in parallel control switches / buttons. For DC supply, the positive pole may be connected to the A1 or A2 terminal.

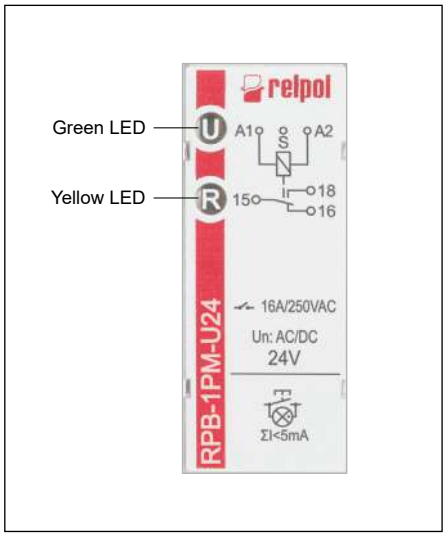
Supply:
- **RPB-1PM-A230**: the relay may be supplied with AC voltage 50/60 Hz of 195,5...264,5 V,
- **RPB-1PM-U24**: the relay may be supplied with DC voltage or AC voltage 50/60 Hz of 20,4...27,6 V.

U - supply voltage; **R** - output state of the relay; **t** - time axis

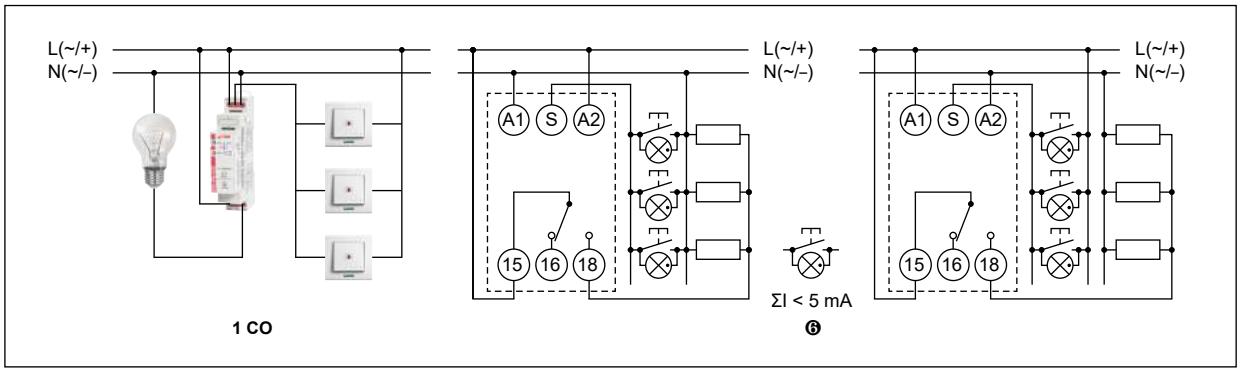
Dimensions



Front panel description



Connection diagrams



Note: the indicated polarization of the supply refers only to the relays RPB-1PM-U24.
❻ If too many lit-up buttons are connected, the lighting circuits can be switched on spontaneously or the lights can be switched on permanently.

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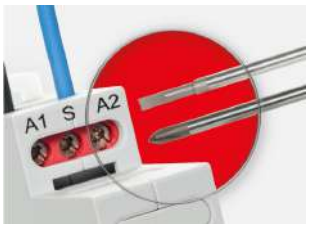
Mounting

Relays **RPB-1PM-...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Coil data - AC 50/60 Hz voltage version

Table 1

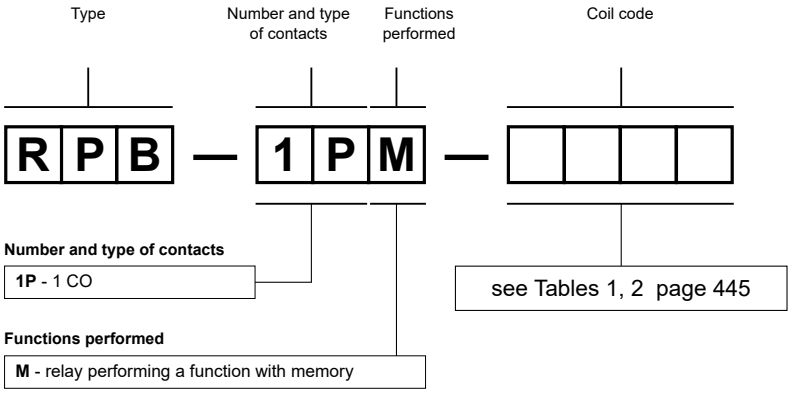
Coil code	Rated voltage V AC	Coil operating range V AC	
		min. (at 20 °C)	max. (at 55 °C)
A230	230	195,5	264,5

Coil data - AC/DC 50/60 Hz voltage version

Table 2

Coil code	Rated voltage V AC/DC	Coil operating range V AC/DC	
		min. (at 20 °C)	max. (at 55 °C)
U24	24	20,4	27,6

Ordering codes



Examples of ordering codes:

RPB-1PM-A230 bistable - impulse relay **RPB-1PM-...**, single-function (relay perform function SET/RESET with memory (NORMAL)), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, coil voltage 230 V AC 50/60 Hz

RPB-1PM-U24 bistable - impulse relay **RPB-1PM-...**, single-function (relay perform function SET/RESET with memory (NORMAL)), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, coil voltage 24 V AC/DC AC: 50/60 Hz

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RPB-2Z-...
bistable - impulse relays


RPB-2Z-A230


RPB-2Z-U24

NEW

- **Bistable - impulse relays type "ON-OFF", single-function without memory**
- Cadmium - free contacts 2 NO • AC and AC/DC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in cooperation with control switches and buttons ❶; electric systems; switchgears of modular equipment
- Compliance with standard EN 61810
- Recognitions, certifications, directives: RoHS, EMC ❷

Output circuit - contact data

Number and type of contacts		2 NO	
Contact material		$AgSnO_2$	
Max. switching voltage		300 V AC / 300 V DC	
Rated load	AC1	8 A / 250 V AC	
	DC1	8 A / 24 V DC	
Max. inrush current		15 A	
Rated current		8 A	
Max. breaking capacity	AC1	2 000 VA	
Min. breaking capacity		1 W	10 V, 10 mA
Contact resistance		≤ 100 mΩ	
Max. operating frequency	• at rated load AC1	600 cycles/hour	
	• no load	3 600 cycles/hour	

Input circuit - coil data

Rated voltage	50/60 Hz AC	230 V	terminals A1, A2
	AC: 50/60 Hz AC/DC	24 V	terminals (-/+)A1, (+/-)A2
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,05 U_n
Operating range of supply voltage		0,85...1,15 U_n	see Tables 1, 2
Rated power consumption		≤ 0,6 W	230 V AC, 50/60 Hz
		≤ 0,9 W	24 V AC/DC, 50/60 Hz
Control contact S ❶	• load	ΣI < 5 mA	
	• min. voltage ❸	0,85 U_n	
	• min. time of pulse duration ❸	≥ 55 ms	
	• max. length of control line	10 m	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V	1,2 / 50 µs
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection
	• pole - pole	2 500 V AC	type of insulation: basic

General data

Operating / release time (typical values)		60 ms / 60 ms	
Electrical life	• resistive AC1	$0,5 \times 10^5$	8 A, 250 V AC ❹
Mechanical life (cycles)		10^7	
Operation cycle		1:1	
Dimensions (L x W x H)		90 ❺ x 17,5 x 64,6 mm	
Weight		69 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+55 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock / vibration resistance		15 g / 0,35 mm DA	10...55 Hz

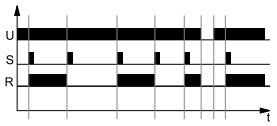
Function data

Functions	SET/RESET (RESET)
LED indicator	green LED U ON - indication of supply voltage U yellow LED R ON/OFF - output relay status

❶ Control contact S provides control of switching ON/OFF of receivers (lighting or other devices) from a few different points, with the use of connected in parallel momentary (doorbell) switches or lit-up buttons (ΣI < 5 mA). ❷ EMC tests (electromagnetic compatibility): EN 55011, EN 61000-4-2/3/4/5/6/11. ❸ Where the control signal is recognizable. ❹ Continuous voltage applied between A1, A2, activated with the control contact S. ❺ Length with 35 mm rail catches: 98,8 mm.

Functions

SET/RESET (RESET) - Switching ON and OFF, controlled by pulses on the contact S.



After the supply voltage has been applied, the output relay R remains switched off.
When a pulse occurs on the control input S, the output relay R is activated (SET). This status lasts until another control pulse occurs - then, the output relay R is switched off (RESET).
Further pulses which will occur on the control input S will change the R contact status into an opposite one.
Switching the supply off will cause switching the output relay R off. Switching on the supply again and applying a control pulse to the S input will switch the R relay on. Further control pulses which will occur on the control input S will change the R contact status into an opposite one.

Additional functions

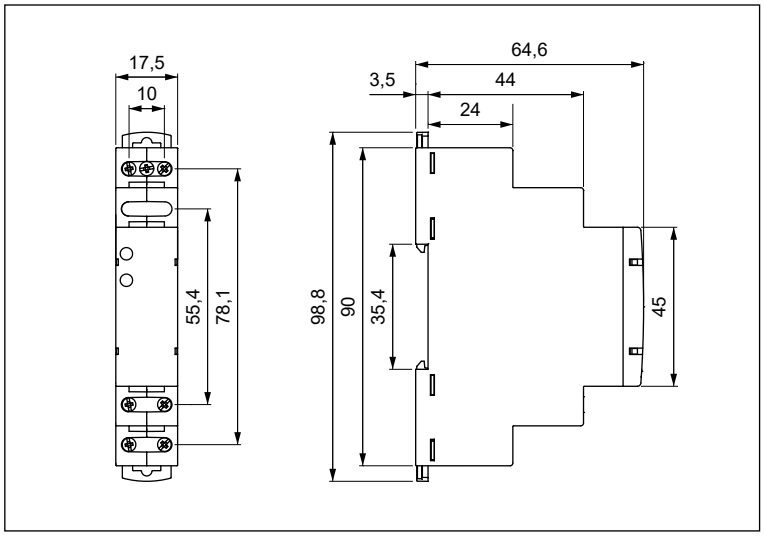
LEDs: green U, yellow R - are lit permanently.

Triggering: the relay is triggered by connecting the contact S to the A1 terminal, from connected in parallel control switches / buttons. For DC supply, the positive pole may be connected to the A1 or A2 terminal.

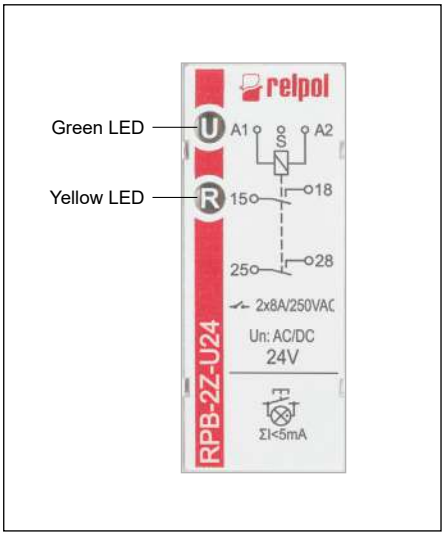
Supply:
- **RPB-2Z-A230**: the relay may be supplied with AC voltage 50/60 Hz of 195,5...264,5 V,
- **RPB-2Z-U24**: the relay may be supplied with DC voltage or AC voltage 50/60 Hz of 20,4...27,6 V.

U - supply voltage; **R** - output state of the relay; **t** - time axis

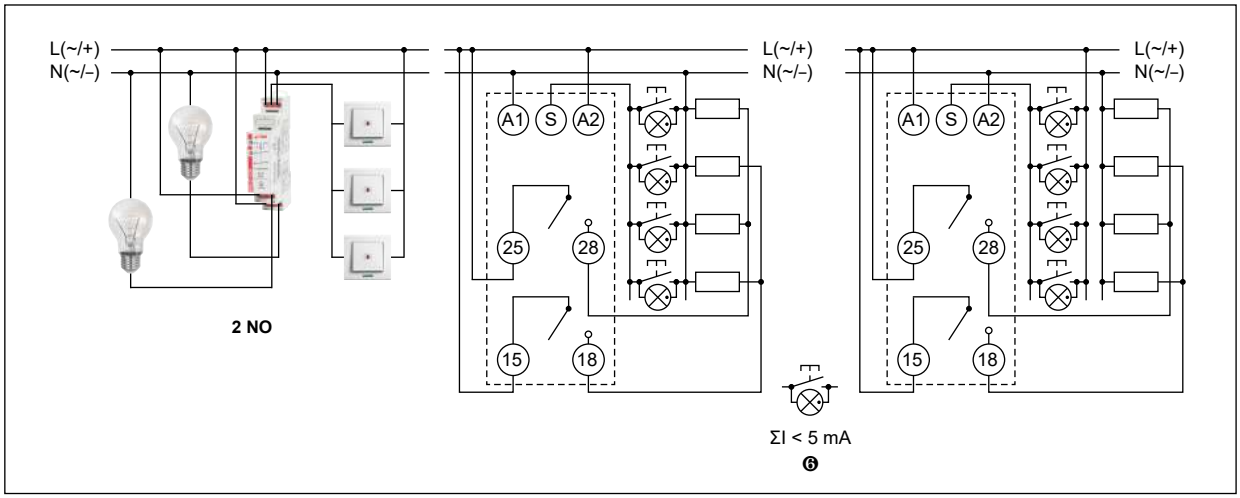
Dimensions



Front panel description



Connection diagrams



Note: the indicated polarization of the supply refers only to the relays RPB-2Z-U24.
❻ If too many lit-up buttons are connected, the lighting circuits can be switched on spontaneously or the lights can be switched on permanently.

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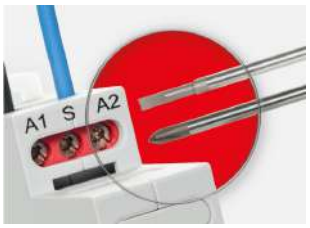
Mounting

Relays **RPB-2Z-...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

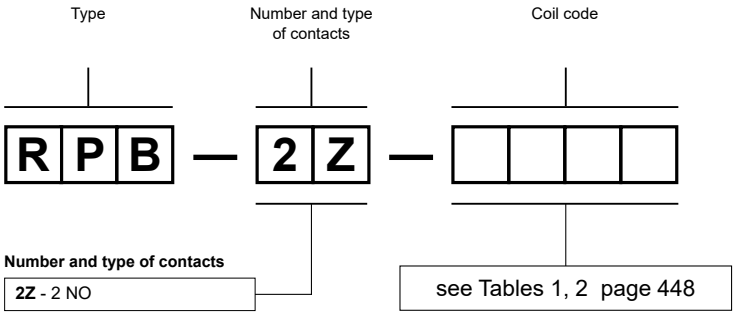
Coil data - AC 50/60 Hz voltage version — Table 1

Coil code	Rated voltage V AC	Coil operating range V AC	
		min. (at 20 °C)	max. (at 55 °C)
A230	230	195,5	264,5

Coil data - AC/DC 50/60 Hz voltage version — Table 2

Coil code	Rated voltage V AC/DC	Coil operating range V AC/DC	
		min. (at 20 °C)	max. (at 55 °C)
U24	24	20,4	27,6

Ordering codes



Examples of ordering codes:

RPB-2Z-A230 bistable - impulse relay **RPB-2Z-...**, single-function (relay perform function SET/RESET (RESET)), cover - modular, width 17,5 mm, two normally open contacts, contact material $AgSnO_2$, coil voltage 230 V AC 50/60 Hz

RPB-2Z-U24 bistable - impulse relay **RPB-2Z-...**, single-function (relay perform function SET/RESET (RESET)), cover - modular, width 17,5 mm, two normally open contacts, contact material $AgSnO_2$, coil voltage 24 V AC/DC AC: 50/60 Hz


RPB-1ZI-A230


RPB-1ZI-U24

NEW

- **Bistable - impulse relays type "ON-OFF", single-function without memory**
- **Resistance to inrush current 120 A (20 ms) ❶**
- Cadmium - free contacts 1 NO • AC and AC/DC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in cooperation with control switches and buttons ❷; electric systems; switchgears of modular equipment
- Compliance with standard EN 61810
- Recognitions, certifications, directives: RoHS, EMC ❸

Output circuit - contact data

Number and type of contacts		1 NO	
Contact material		$AgSnO_2$	
Max. switching voltage		300 V AC / 300 V DC	
Rated load	AC1	16 A / 250 V AC	
	DC1	16 A / 24 V DC	
Max. inrush current		120 A 20 ms ❶	
Rated current		16 A	
Max. breaking capacity	• AC1	4 000 VA	
• at halogen lamp load		2 500 W	
• at LED lamp load		500 W	
Min. breaking capacity		1 W 10 V, 10 mA	
Contact resistance		≤ 100 mΩ	
Max. operating frequency	• at rated load AC1	600 cycles/hour	
	• no load	3 600 cycles/hour	

Input circuit - coil data

Rated voltage	50/60 Hz AC	230 V	terminals A1, A2
	AC: 50/60 Hz AC/DC	24 V	terminals (-/+)A1, (+/-)A2
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,05 U_n
Operating range of supply voltage		0,85...1,15 U_n	see Tables 1, 2
Rated power consumption		≤ 0,6 W	230 V AC, 50/60 Hz
		≤ 0,9 W	24 V AC/DC, 50/60 Hz
Control contact S ❶	• load	ΣI < 5 mA	
	• min. voltage ❸	0,85 U_n	
	• min. time of pulse duration ❸	≥ 55 ms	
	• max. length of control line	10 m	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection

General data

Operating / release time (typical values)		60 ms / 60 ms	
Electrical life	• resistive AC1	$0,5 \times 10^5$	16 A, 250 V AC ❺
Mechanical life (cycles)		10^7	
Operation cycle		1:1	
Dimensions (L x W x H) / Weight		90 ❻ x 17,5 x 64,6 mm / 69 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+55 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock / vibration resistance		15 g / 0,35 mm DA 10...55 Hz	

Function data

Functions	SET/RESET (RESET)
LED indicator	green LED U ON - indication of supply voltage U yellow LED R ON/OFF - output relay status

❶ Contacts "inrush": high resistance to short-time surge currents occurring on switching on LED-lamps, ESL fluorescent tubes, electronic transformers, discharge lamps, etc. ❷ Control contact S provides control of switching ON/OFF of receivers (lighting or other devices) from a few different points, with the use of connected in parallel momentary (doorbell) switches or lit-up buttons (ΣI < 5 mA). ❸ EMC tests (electromagnetic compatibility):EN 55011, EN 61000-4-2/3/4/5/6/11. ❹ Where the control signal is recognizable. ❺ Continuous voltage applied between A1, A2, activated with the control contact S. ❻ Length with 35 mm rail catches: 98,8 mm.

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Functions

SET/RESET (RESET) - Switching ON and OFF, controlled by pulses on the contact S.

After the supply voltage has been applied, the output relay R remains switched off.
When a pulse occurs on the control input S, the output relay R is activated (SET). This status lasts until another control pulse occurs - then, the output relay R is switched off (RESET).
Further pulses which will occur on the control input S will change the R contact status into an opposite one.
Switching the supply off will cause switching the output relay R off. Switching on the supply again and applying a control pulse to the S input will switch the R relay on. Further control pulses which will occur on the control input S will change the R contact status into an opposite one.

Additional functions

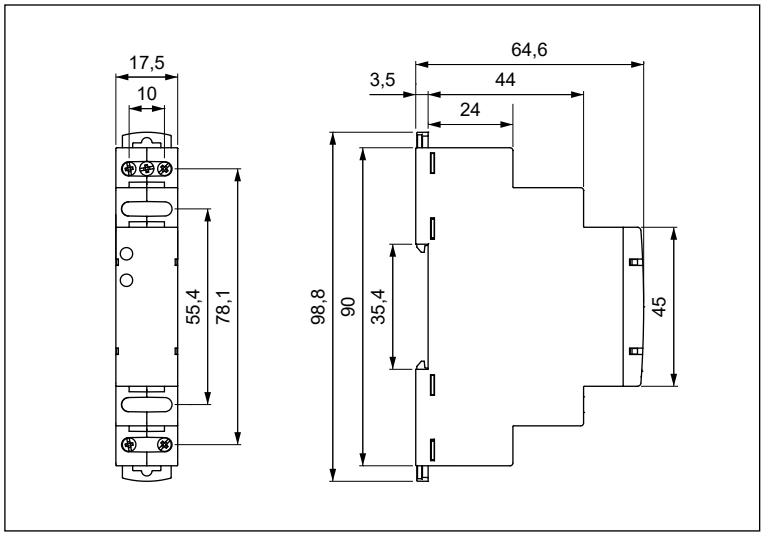
LEDs: green U, yellow R - are lit permanently.

Triggering: the relay is triggered by connecting the contact S to the A1 terminal, from connected in parallel control switches / buttons. For DC supply, the positive pole may be connected to the A1 or A2 terminal.

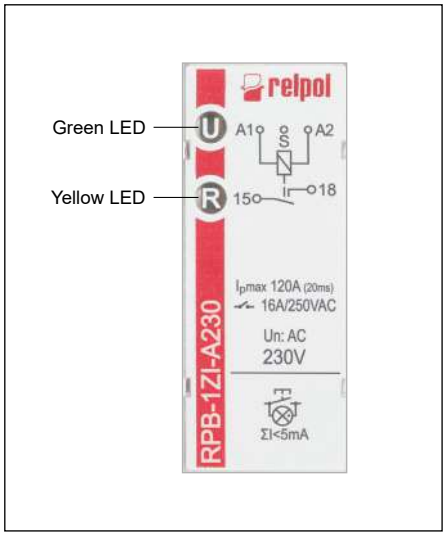
Supply:
- **RPB-1ZI-A230**: the relay may be supplied with AC voltage 50/60 Hz of 195,5...264,5 V,
- **RPB-1ZI-U24**: the relay may be supplied with DC voltage or AC voltage 50/60 Hz of 20,4...27,6 V.

U - supply voltage; **R** - output state of the relay; **t** - time axis

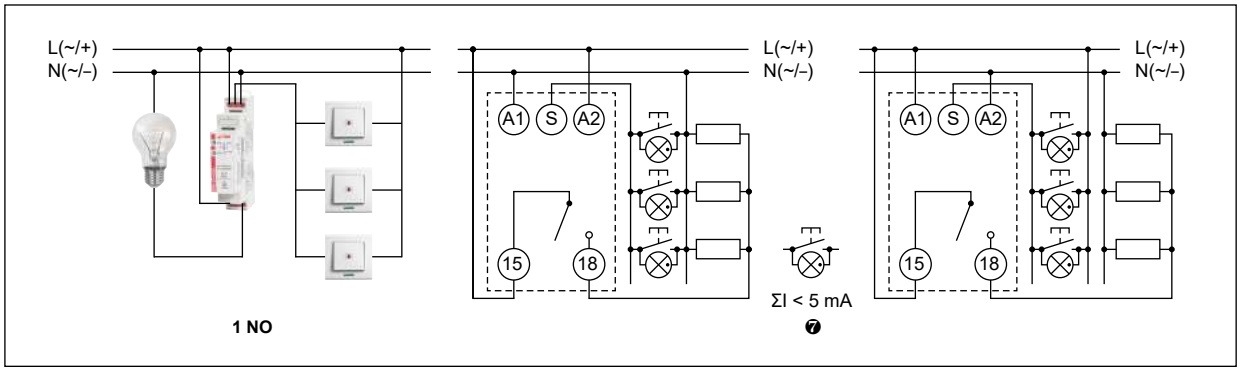
Dimensions



Front panel description



Connection diagrams

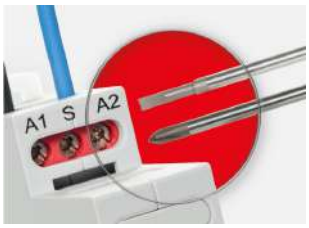


Note: the indicated polarization of the supply refers only to the relays RPB-1ZI-U24.
❼ If too many lit-up buttons are connected, the lighting circuits can be switched on spontaneously or the lights can be switched on permanently.

Mounting

Relays **RPB-1ZI-...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

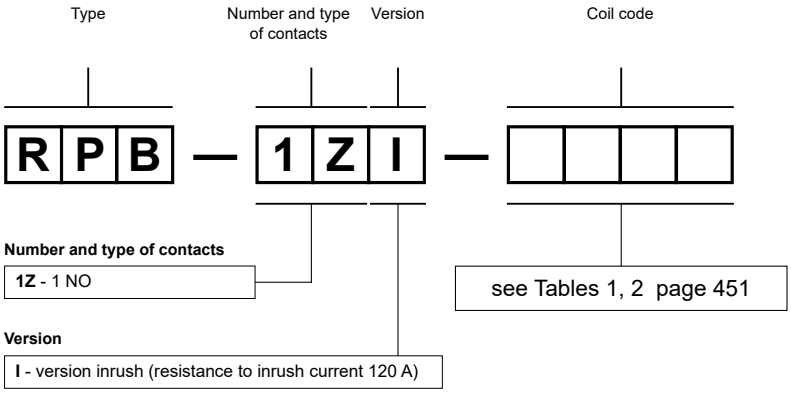
Coil data - AC 50/60 Hz voltage version — Table 1

Coil code	Rated voltage V AC	Coil operating range V AC	
		min. (at 20 °C)	max. (at 55 °C)
A230	230	195,5	264,5

Coil data - AC/DC 50/60 Hz voltage version — Table 2

Coil code	Rated voltage V AC/DC	Coil operating range V AC/DC	
		min. (at 20 °C)	max. (at 55 °C)
U24	24	20,4	27,6

Ordering codes



Examples of ordering codes:

RPB-1ZI-A230 bistable - impulse relay **RPB-1ZI-...**, single-function (relay perform function SET/RESET (RESET)), cover - modular, width 17,5 mm, one normally open contact, version inrush, contact material $AgSnO_2$, coil voltage 230 V AC 50/60 Hz

RPB-1ZI-U24 bistable - impulse relay **RPB-1ZI-...**, single-function (relay perform function SET/RESET (RESET)), cover - modular, width 17,5 mm, one normally open contact, version inrush, contact material $AgSnO_2$, coil voltage 24 V AC/DC AC: 50/60 Hz

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RPB-1PM-UNI
bistable - impulse relays

RPB-1PM-UNI

NEW

- **Bistable - impulse relays type ”ON-OFF”, multifunction with memory**
- Cadmium - free contacts 1 CO • AC/DC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in cooperation with control switches ❶; electric systems; switchgears of modular equipment
- Compliance with standard EN 61810
- Recognitions, certifications, directives: RoHS, EMC ❷

Output circuit - contact data

Number and type of contacts		1 CO
Contact material		$AgSnO_2$
Max. switching voltage		300 V AC / 300 V DC
Rated load	AC1	16 A / 250 V AC
	DC1	16 A / 24 V DC
Max. inrush current		30 A
Rated current		16 A
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		1 W 10 V, 10 mA
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	600 cycles/hour
	• no load	3 600 cycles/hour

Input circuit

Rated voltage	AC: 50/60 Hz AC/DC	12...240 V	terminals (+)A1, (-)A2
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,05 U_n
Operating range of supply voltage		0,85...1,15 U_n	
Rated power consumption		≤ 1,7 W	
Control contact S ❶	• load	no	
	• min. voltage ❸	0,85 U_n	
	• min. time of pulse duration ❸	≥ 55 ms	
	• max. length of control line	10 m	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection

General data

Operating / release time (typical values)		60 ms / 60 ms	
Electrical life	• resistive AC1	$0,5 \times 10^5$	contact 1 NO, 16 A, 250 V AC ❹
Mechanical life (cycles)		10^7	
Operation cycle		1:1	
Dimensions (L x W x H)		90 ❺ x 17,5 x 64,6 mm	
Weight		65 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+55 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock / vibration resistance		15 g / 0,35 mm DA 10...55 Hz	

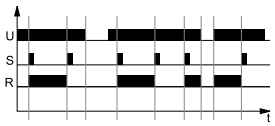
Function data

Functions	SET/RESET with memory (NORMAL) SET/RESET (RESET)
LED indicator	green LED U ON - indication of supply voltage U yellow LED R ON/OFF - output relay status

❶ Control contact S provides control of switching ON/OFF of receivers (lighting or other devices) from a few different points, with the use of connected in parallel momentary (doorbell) switches; the relays cannot operate with lit-up buttons. ❷ EMC tests (electromagnetic compatibility): EN 55011, EN 61000-4-2/3/4/5/6/11. ❸ Where the control signal is recognizable. ❹ Continuous voltage applied between A1, A2, activated with the control contact S. ❺ Length with 35 mm rail catches: 98,8 mm.

Functions

SET/RESET with memory (NORMAL) - Switching ON and OFF with memory, controlled by pulses on the contact S.



When a pulse occurs on the control input S, the output relay R is activated (SET). This status lasts until another control pulse occurs - then, the output relay R is switched off (RESET).
Further pulses which will occur on the control input S will change the R contact status into an opposite one.
In case the U supply is interrupted and then switched on again, the R contact of the output relay will return to the status prior to switching the U supply off, and the relay will start operation according to the foregoing function.

U - supply voltage; **R** - output state of the relay; **t** - time axis

SET/RESET (RESET) - Switching ON and OFF, controlled by pulses on the contact S.

After the supply voltage has been applied, the output relay R remains switched off.
When a pulse occurs on the control input S, the output relay R is activated (SET). This status lasts until another control pulse occurs - then, the output relay R is switched off (RESET).
Further pulses which will occur on the control input S will change the R contact status into an opposite one.
Switching the supply off will cause switching the output relay R off. Switching on the supply again and applying a control pulse to the S input will switch the R relay on. Further control pulses which will occur on the control input S will change the R contact status into an opposite one.

Additional functions

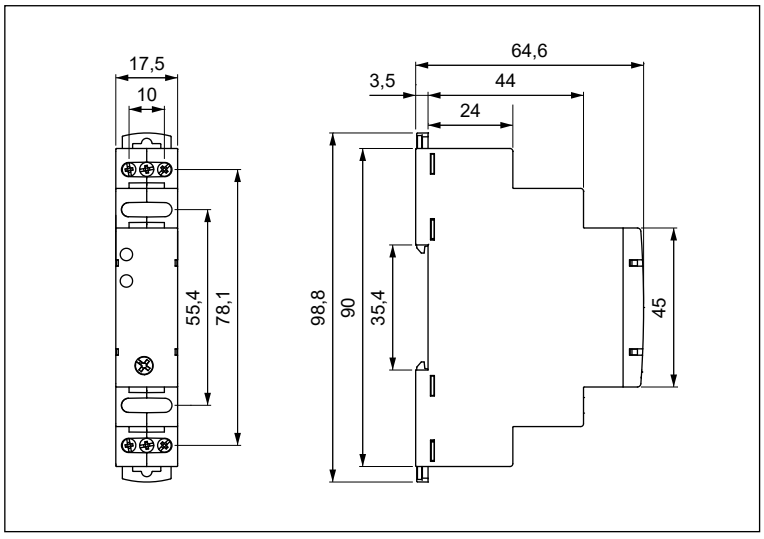
LEDs: green U, yellow R - are lit permanently.

Adjustment of the set values: the function may be changed after the supply voltage has been switched off and on again. If the memory function was set, and a no-memory function is set next, the memory is cancelled in such case.

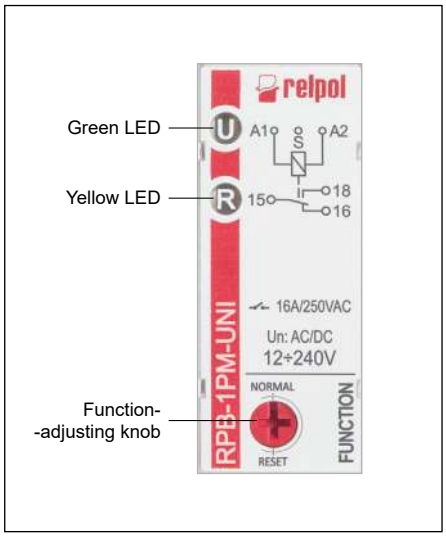
Triggering: the relay is triggered by connecting the contact S to the A1 terminal, from connected in parallel control switches. For DC supply, the positive pole must be connected to A1 terminal.

Supply: the relay may be supplied with DC voltage or AC voltage 50/60 Hz of 10,2...276 V.

Dimensions



Front panel description



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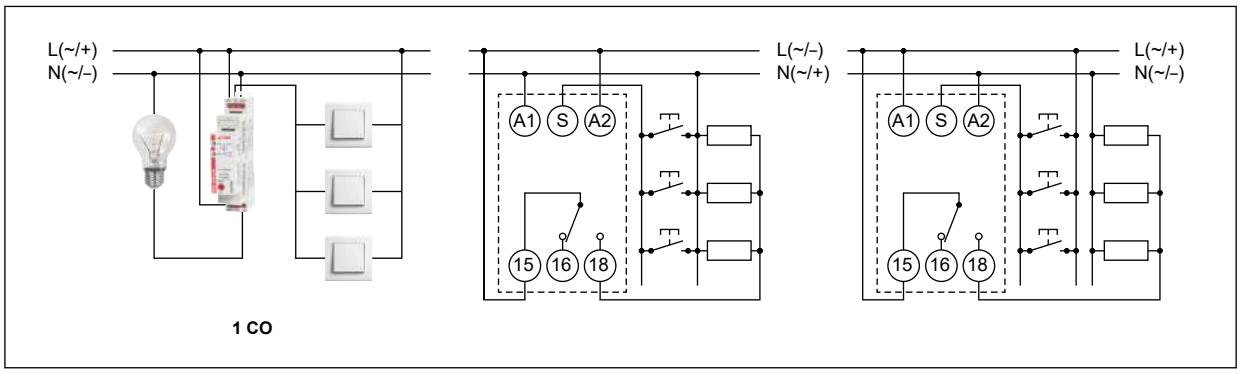
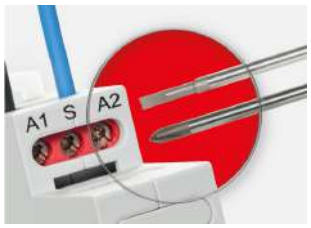
Connection diagrams



Mounting

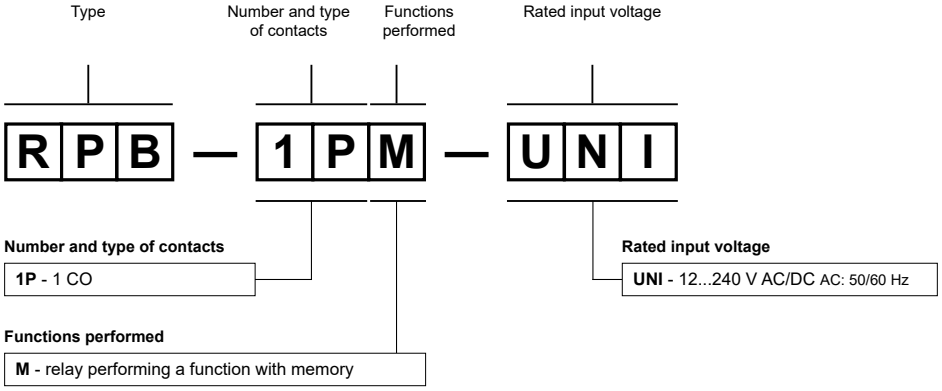
Relays **RPB-1PM-UNI** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes



Example of ordering codes:

RPB-1PM-UNI bistable - impulse relay **RPB-1PM-UNI**, multifunction (relay perform 2 functions), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

RPB-1ZMI-UNI

NEW

- **Bistable - impulse relays type ”ON-OFF”, multifunction with memory**
- **Resistance to inrush current 80 A (20 ms) ❶**
- Cadmium - free contacts 1 NO • AC/DC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in cooperation with control switches ❷; electric systems; switchgears of modular equipment
- Compliance with standard EN 61810
- Recognitions, certifications, directives: RoHS, EMC ❸ CE EAC

Output circuit - contact data

Number and type of contacts		1 NO
Contact material		$AgSnO_2$
Max. switching voltage		300 V AC / 300 V DC
Rated load	AC1	16 A / 250 V AC
	DC1	16 A / 24 V DC
Max. inrush current		80 A 20 ms ❶
Rated current		16 A
Max. breaking capacity	• AC1	4 000 VA
• at halogen lamp load		2 500 W
• at LED lamp load		500 W
Min. breaking capacity		1 W 10 V, 10 mA
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	600 cycles/hour
	• no load	3 600 cycles/hour

Input circuit

Rated voltage	AC: 50/60 Hz AC/DC	12...240 V terminals (+)A1, (-)A2
Must release voltage		AC: ≥ 0,15 U_n DC: ≥ 0,05 U_n
Operating range of supply voltage		0,85...1,15 U_n
Rated power consumption		≤ 1,8 W
Control contact S ❶	• load	no
	• min. voltage ❸	0,85 U_n
	• min. time of pulse duration ❸	≥ 55 ms
	• max. length of control line	10 m

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2
Flammability class		V-0 for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC type of insulation: basic
	• contact clearance	1 000 V AC type of clearance: micro-disconnection

General data

Operating / release time (typical values)		60 ms / 60 ms
Electrical life	• resistive AC1	$0,5 \times 10^5$ 16 A, 250 V AC ❺
Mechanical life (cycles)		10^7
Operation cycle		1:1
Dimensions (L x W x H) / Weight		90 ❻ x 17,5 x 64,6 mm / 69 g
Ambient temperature	• storage	-40...+70 °C
(non-condensation and/or icing)	• operating	-20...+55 °C
Cover protection category		IP 20 EN 60529
Relative humidity		up to 85%
Shock / vibration resistance		15 g / 0,35 mm DA 10...55 Hz

Function data

Functions	SET/RESET with memory (NORMAL) SET/RESET (RESET)
LED indicator	green LED U ON - indication of supply voltage U yellow LED R ON/OFF - output relay status

❶ Contacts "inrush": high resistance to short-time surge currents occurring on switching on LED-lamps, ESL fluorescent tubes, electronic transformers, discharge lamps, etc. ❷ Control contact S provides control of switching ON/OFF of receivers (lighting or other devices) from a few different points, with the use of connected in parallel momentary (doorbell) switches; the relays cannot operate with lit-up buttons. ❸ EMC tests (electromagnetic compatibility): EN 55011, EN 61000-4-2/3/4/5/6/11. ❹ Where the control signal is recognizable. ❺ Continuous voltage applied between A1, A2, activated with the control contact S. ❻ Length with 35 mm rail catches: 98,8 mm.

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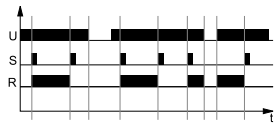
RPB-1ZMI-UNI
bistable - impulse relays

Functions

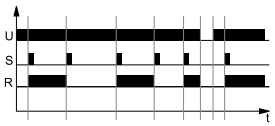
SET/RESET with memory (NORMAL) - Switching ON and OFF with memory, controlled by pulses on the contact S.



When a pulse occurs on the control input S, the output relay R is activated (SET). This status lasts until another control pulse occurs - then, the output relay R is switched off (RESET).
Further pulses which will occur on the control input S will change the R contact status into an opposite one.
In case the U supply is interrupted and then switched on again, the R contact of the output relay will return to the status prior to switching the U supply off, and the relay will start operation according to the foregoing function.

U - supply voltage; **R** - output state of the relay; **t** - time axis

SET/RESET (RESET) - Switching ON and OFF, controlled by pulses on the contact S.



After the supply voltage has been applied, the output relay R remains switched off.
When a pulse occurs on the control input S, the output relay R is activated (SET). This status lasts until another control pulse occurs - then, the output relay R is switched off (RESET).
Further pulses which will occur on the control input S will change the R contact status into an opposite one.
Switching the supply off will cause switching the output relay R off. Switching on the supply again and applying a control pulse to the S input will switch the R relay on. Further control pulses which will occur on the control input S will change the R contact status into an opposite one.

Additional functions

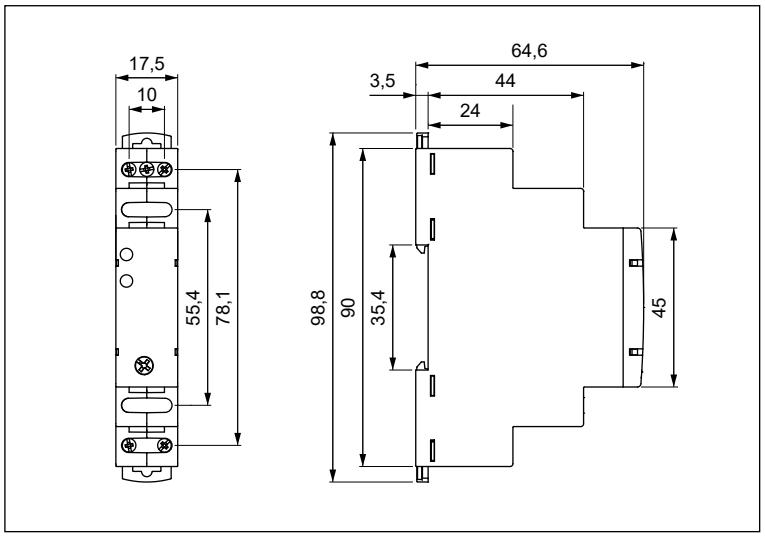
LEDs: green U, yellow R - are lit permanently.

Adjustment of the set values: the function may be changed after the supply voltage has been switched off and on again. If the memory function was set, and a no-memory function is set next, the memory is cancelled in such case.

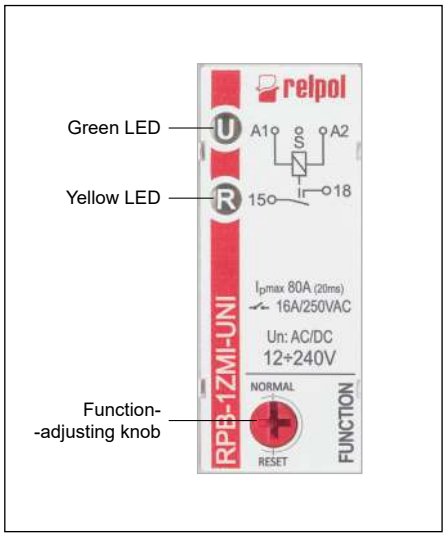
Triggering: the relay is triggered by connecting the contact S to the A1 terminal, from connected in parallel control switches. For DC supply, the positive pole must be connected to A1 terminal.

Supply: the relay may be supplied with DC voltage or AC voltage 50/60 Hz of 10,2...276 V.

Dimensions

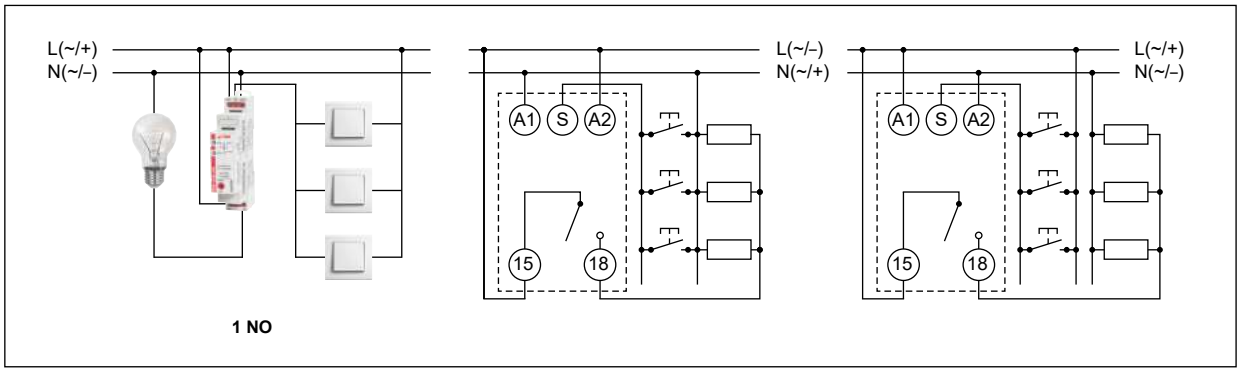


Front panel description



BISTABLE

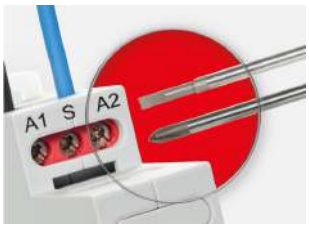
Connection diagrams



Mounting

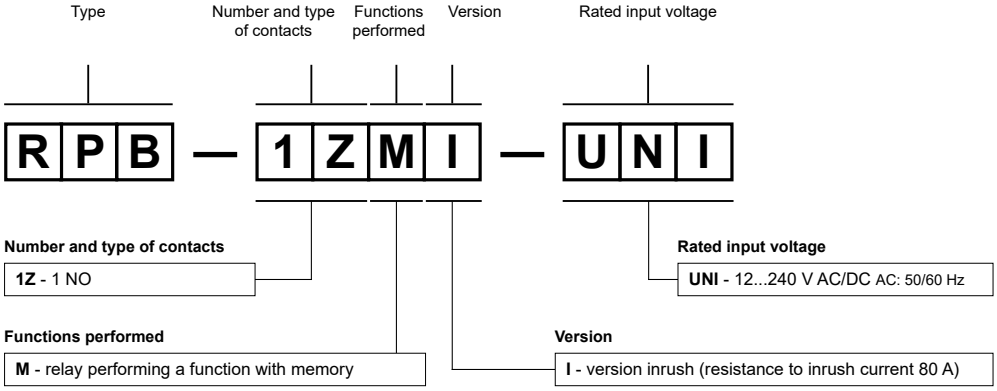
Relays **RPB-1ZMI-UNI** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes



Example of ordering codes:

RPB-1ZMI-UNI bistable - impulse relay **RPB-1ZMI-UNI**, multifunction (relay perform 2 functions), cover - modular, width 17,5 mm, one normally open contact, version inrush, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

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RPB-2PSM-UNI
bistable - impulse relays

RPB-2PSM-UNI

NEW

- **Bistable - impulse relays type ”ON-OFF”, multifunction - sequential with memory**
- Cadmium - free contacts 2 x 1 CO • AC/DC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in cooperation with control switches ❶; electric systems; switchgears of modular equipment
- Compliance with standard EN 61810
- Recognitions, certifications, directives: RoHS, EMC ❷

Output circuit - contact data

Number and type of contacts		2 x 1 CO	
Contact material		$AgSnO_2$	
Max. switching voltage		300 V AC / 300 V DC	
Rated load	AC1	16 A / 250 V AC	
	DC1	16 A / 24 V DC	
Max. inrush current		30 A	
Rated current		16 A	
Max. breaking capacity	AC1	2 x 4 000 VA	
Min. breaking capacity		1 W 10 V, 10 mA	
Contact resistance		≤ 100 mΩ	
Max. operating frequency	• at rated load AC1	600 cycles/hour	
	• no load	3 600 cycles/hour	

Input circuit

Rated voltage	AC: 50/60 Hz AC/DC	12...240 V	terminals (+)A1, (-)A2
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,05 U_n
Operating range of supply voltage		0,85...1,15 U_n	
Rated power consumption		≤ 1,7 W	
Control contact S ❶	• load	no	
	• min. voltage ❸	0,85 U_n	
	• min. time of pulse duration ❸	≥ 55 ms	
	• max. length of control line	10 m	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection
	• pole - pole	2 000 V AC	type of insulation: basic

General data

Operating / release time (typical values)		60 ms / 60 ms	
Electrical life	• resistive AC1	$0,5 \times 10^5$	contact 1 NO, 16 A, 250 V AC ❹
Mechanical life (cycles)		10^7	
Operation cycle		1:1	
Dimensions (L x W x H)		90 ❺ x 17,5 x 64,6 mm	
Weight		83 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+55 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock / vibration resistance		15 g / 0,35 mm DA 10...55 Hz	

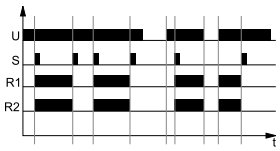
Function data

Functions	BOTH, RESET BOTH, RESET SEQ, SEQ
LED indicator	green LED U ON - indication of supply voltage U yellow LEDs R1, R2 ON/OFF - output relays status

❶ Control contact S provides control of switching ON/OFF of receivers (lighting or other devices) from a few different points, with the use of connected in parallel momentary (doorbell) switches; the relays cannot operate with lit-up buttons. ❷ EMC tests (electromagnetic compatibility): EN 55011, EN 61000-4-2/3/4/5/6/11. ❸ Where the control signal is recognizable. ❹ Continuous voltage applied between A1, A2, activated with the control contact S. ❺ Length with 35 mm rail catches: 98,8 mm.

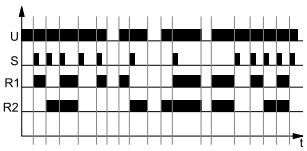
Functions

BOTH - Simultaneous switching ON and OFF with memory, controlled by pulses on the contact S.



On occurrence of a pulse on the control input S, output relays R1 and R2 are switched on. This status lasts until another control pulse occurs - then, the output relays R1 and R2 are switched off.
Further control pulses which will occur on the control input S will change status of the contacts of R1 and R2 into an opposite one.
In case the U supply is interrupted and then switched on again, the R1 and R2 contacts of the output relays will return to the status prior to switching the U supply off, and the relay will start operation according to the foregoing function.

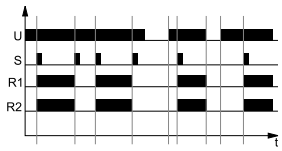
SEQ - Sequential switching ON and OFF with memory, controlled by pulses on the contact S.



When a pulse occurs on the control input S, the output relay R1 is switched on. The status lasts until another control pulse occurs - then, the output relay R1 is switched off, and the R2 relay is switched on.
Another control pulse will activate the R1 contact - both R1 and R2 relays are on. Another control pulse S will switch both R1 and R2 relays off.
Consecutive pulses occurring on the control input S will cause a change of the status of the R1 and R2 contacts according to the foregoing sequence, i.e.:
- R1 off, R2 off (supply activated, R1, R2 were previously off),
- R1 on, R2 off (first control pulse),
- R1 off, R2 on (second control pulse),
- R1 on, R2 on (third control pulse),
- R1 off, R2 off (fourth control pulse), etc.

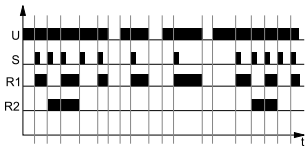
In case the U supply is interrupted, the R1, R2 relays are switched off. Switching the supply voltage on again will recover the status of switching on / off of the R1, R2 relays prior to switching the U supply off.
Further pulses to occur on the control input S will cause a change of the status of the R1, R2 contacts according to the foregoing sequence, from the status prior to switching the supply off.

RESET BOTH - Simultaneous switching ON and OFF, controlled by pulses on the contact S.



On occurrence of a pulse on the control input S, output relays R1 and R2 are switched on. This status lasts until another control pulse occurs - then, the output relays R1 and R2 are switched off.
Further control pulses which will occur on the control input S will change status of the contacts of R1 and R2 into an opposite one.
In case the U supply is interrupted and then switched on again, the R1 and R2 contacts of the output relays will start operation from switching off (R1 off, R2 off). Then, when the pulse occurs again on the control input S, the relay will start operation according to the foregoing function.

RESET SEQ - Sequential switching ON and OFF, controlled by pulses on the contact S.



When a pulse occurs on the control input S, the output relay R1 is switched on. The status lasts until another control pulse occurs - then, the output relay R1 is switched off, and the R2 relay is switched on.
Another control pulse will activate the R1 contact - both R1 and R2 relays are on. Another control pulse S will switch both R1 and R2 relays off.
Consecutive pulses occurring on the control input S will cause a change of the status of the R1 and R2 contacts according to the foregoing sequence, i.e.:
- R1 off, R2 off (supply activated, R1, R2 were previously off),
- R1 on, R2 off (first control pulse),
- R1 off, R2 on (second control pulse),
- R1 on, R2 on (third control pulse),
- R1 off, R2 off (fourth control pulse), etc.

In case the U supply is interrupted, the R1, R2 relays are switched off. Following switching the supply voltage on again, the R1, R2 remain off.
Further pulses to occur on the control input S will cause a change in the status of the R1, R2 contacts according to the foregoing sequence.

U - supply voltage; **R1**, **R2** - output states of the relays; **t** - time axis

Additional functions

LEDs: green U, yellows R1, R2 - are lit permanently.

Adjustment of the set values: the function may be changed after the supply voltage has been switched off and on again. If the memory function was set, and a no-memory function is set next, the memory is cancelled in such case.

Triggering: the relay is triggered by connecting the contact S to the A1 terminal, from connected in parallel control switches. For DC supply, the positive pole must be connected to A1 terminal.

Supply: the relay may be supplied with DC voltage or AC voltage 50/60 Hz of 10,2...276 V.

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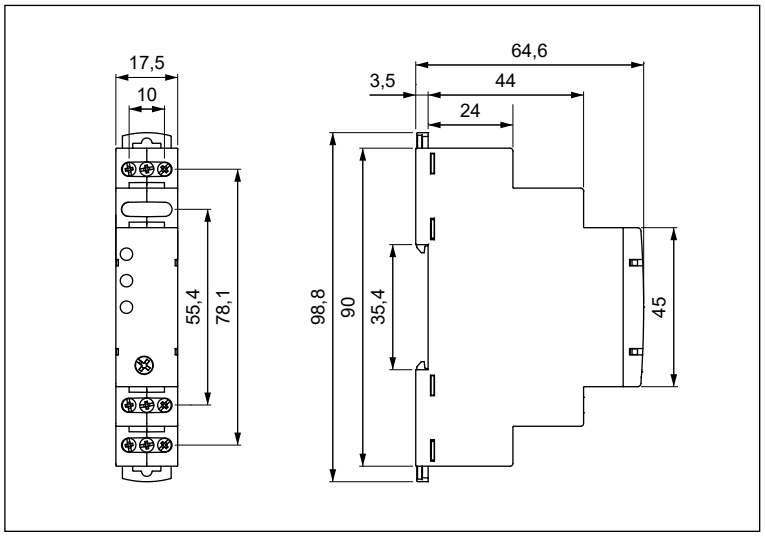
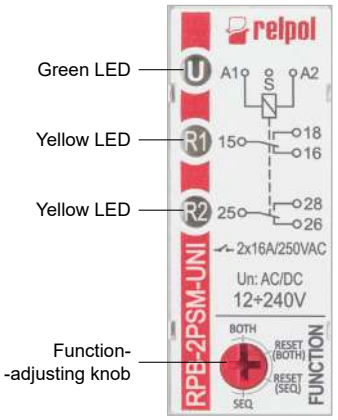
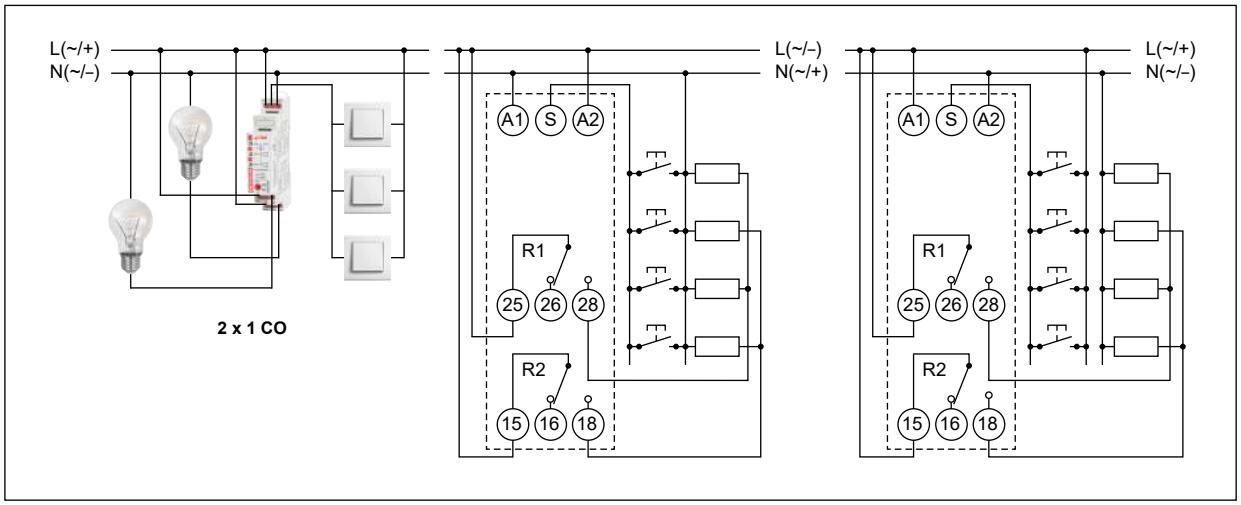
Dimensions



Front panel description



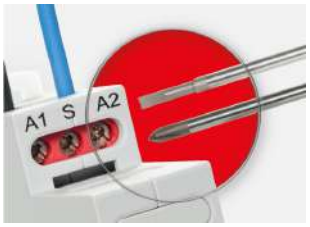
Connection diagrams



Mounting

Relays **RPB-2PSM-UNI** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

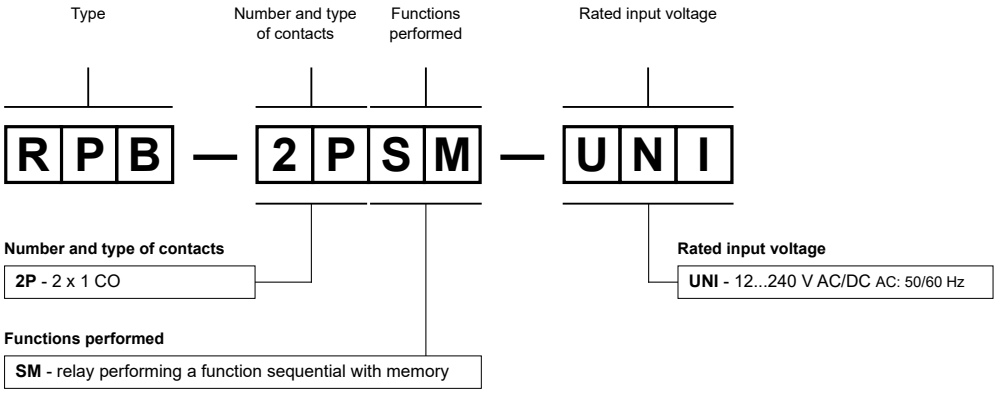
Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

BISTABLE

Ordering codes



Example of ordering codes:

RPB-2PSM-UNI bistable - impulse relay **RPB-2PSM-UNI**, multifunction (relay perform 4 functions), cover - modular, width 17,5 mm, two changeover contacts, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

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RPB-2ZSMI-UNI
bistable - impulse relays

RPB-2ZSMI-UNI

NEW

- **Bistable - impulse relays type "ON-OFF", multifunction - sequential with memory**
- **Resistance to inrush current 80 A (20 ms) ❶**
- Cadmium - free contacts 2 x 1 NO • AC/DC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in cooperation with control switches ❷; electric systems; switchgears of modular equipment
- Compliance with standard EN 61810
- Recognitions, certifications, directives: RoHS, EMC ❸

Output circuit - contact data

Number and type of contacts		2 x 1 NO	
Contact material		$AgSnO_2$	
Max. switching voltage		300 V AC / 300 V DC	
Rated load	AC1	16 A / 250 V AC	
	DC1	16 A / 24 V DC	
Max. inrush current		80 A 20 ms ❶	
Rated current		16 A	
Max. breaking capacity	• AC1	4 000 VA	
• at halogen lamp load		2 500 W	
• at LED lamp load		500 W	
Min. breaking capacity		1 W 10 V, 10 mA	
Contact resistance		≤ 100 mΩ	
Max. operating frequency	• at rated load AC1	600 cycles/hour	
	• no load	3 600 cycles/hour	

Input circuit

Rated voltage	AC: 50/60 Hz AC/DC	12...240 V	terminals (+)A1, (-)A2
Must release voltage		AC: ≥ 0,15 U_n	DC: ≥ 0,05 U_n
Operating range of supply voltage		0,85...1,15 U_n	
Rated power consumption		≤ 1,8 W	
Control contact S ❶	• load	no	
	• min. voltage ❹	0,85 U_n	
	• min. time of pulse duration ❹	≥ 55 ms	
	• max. length of control line	10 m	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection
	• pole - pole	2 500 V AC	type of insulation: basic

General data

Operating / release time (typical values)		60 ms / 60 ms	
Electrical life	• resistive AC1	$0,5 \times 10^5$	16 A, 250 V AC ❺
Mechanical life (cycles)		10^7	
Operation cycle		1:1	
Dimensions (L x W x H) / Weight		90 ❻ x 17,5 x 64,6 mm / 80 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+55 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock / vibration resistance		15 g / 0,35 mm DA 10...55 Hz	

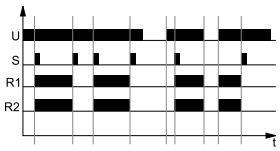
Function data

Functions	BOTH, RESET BOTH, RESET SEQ, SEQ
LED indicator	green LED U ON - indication of supply voltage U yellow LEDs R1, R2 ON/OFF - output relays status

❶ Contacts "inrush": high resistance to short-time surge currents occurring on switching on LED-lamps, ESL fluorescent tubes, electronic transformers, discharge lamps, etc. ❷ Control contact S provides control of switching ON/OFF of receivers (lighting or other devices) from a few different points, with the use of connected in parallel momentary (doorbell) switches; the relays cannot operate with lit-up buttons. ❸ EMC tests (electromagnetic compatibility): EN 55011, EN 61000-4-2/3/4/5/6/11. ❹ Where the control signal is recognizable. ❺ Continuous voltage applied between A1, A2, activated with the control contact S. ❻ Length with 35 mm rail catches: 98,8 mm.

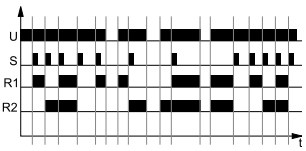
Functions

BOTH - Simultaneous switching ON and OFF with memory, controlled by pulses on the contact S.



On occurrence of a pulse on the control input S, output relays R1 and R2 are switched on. This status lasts until another control pulse occurs - then, the output relays R1 and R2 are switched off.
Further control pulses which will occur on the control input S will change status of the contacts of R1 and R2 into an opposite one.
In case the U supply is interrupted and then switched on again, the R1 and R2 contacts of the output relays will return to the status prior to switching the U supply off, and the relay will start operation according to the foregoing function.

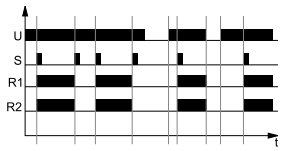
SEQ - Sequential switching ON and OFF with memory, controlled by pulses on the contact S.



When a pulse occurs on the control input S, the output relay R1 is switched on. The status lasts until another control pulse occurs - then, the output relay R1 is switched off, and the R2 relay is switched on.
Another control pulse will activate the R1 contact - both R1 and R2 relays are on. Another control pulse S will switch both R1 and R2 relays off.
Consecutive pulses occurring on the control input S will cause a change of the status of the R1 and R2 contacts according to the foregoing sequence, i.e.:
- R1 off, R2 off (supply activated, R1, R2 were previously off),
- R1 on, R2 off (first control pulse),
- R1 off, R2 on (second control pulse),
- R1 on, R2 on (third control pulse),
- R1 off, R2 off (fourth control pulse), etc.

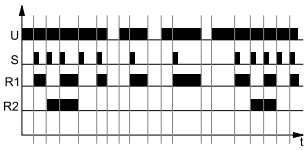
In case the U supply is interrupted, the R1, R2 relays are switched off. Switching the supply voltage on again will recover the status of switching on / off of the R1, R2 relays prior to switching the U supply off.
Further pulses to occur on the control input S will cause a change of the status of the R1, R2 contacts according to the foregoing sequence, from the status prior to switching the supply off.

RESET BOTH - Simultaneous switching ON and OFF, controlled by pulses on the contact S.



On occurrence of a pulse on the control input S, output relays R1 and R2 are switched on. This status lasts until another control pulse occurs - then, the output relays R1 and R2 are switched off.
Further control pulses which will occur on the control input S will change status of the contacts of R1 and R2 into an opposite one.
In case the U supply is interrupted and then switched on again, the R1 and R2 contacts of the output relays will start operation from switching off (R1 off, R2 off). Then, when the pulse occurs again on the control input S, the relay will start operation according to the foregoing function.

RESET SEQ - Sequential switching ON and OFF, controlled by pulses on the contact S.



When a pulse occurs on the control input S, the output relay R1 is switched on. The status lasts until another control pulse occurs - then, the output relay R1 is switched off, and the R2 relay is switched on.
Another control pulse will activate the R1 contact - both R1 and R2 relays are on. Another control pulse S will switch both R1 and R2 relays off.
Consecutive pulses occurring on the control input S will cause a change of the status of the R1 and R2 contacts according to the foregoing sequence, i.e.:
- R1 off, R2 off (supply activated, R1, R2 were previously off),
- R1 on, R2 off (first control pulse),
- R1 off, R2 on (second control pulse),
- R1 on, R2 on (third control pulse),
- R1 off, R2 off (fourth control pulse), etc.

In case the U supply is interrupted, the R1, R2 relays are switched off. Following switching the supply voltage on again, the R1, R2 remain off.
Further pulses to occur on the control input S will cause a change in the status of the R1, R2 contacts according to the foregoing sequence.

U - supply voltage; **R1**, **R2** - output states of the relays; **t** - time axis

Additional functions

LEDs: green U, yellows R1, R2 - are lit permanently.

Adjustment of the set values: the function may be changed after the supply voltage has been switched off and on again. If the memory function was set, and a no-memory function is set next, the memory is cancelled in such case.

Triggering: the relay is triggered by connecting the contact S to the A1 terminal, from connected in parallel control switches. For DC supply, the positive pole must be connected to A1 terminal.

Supply: the relay may be supplied with DC voltage or AC voltage 50/60 Hz of 10,2...276 V.

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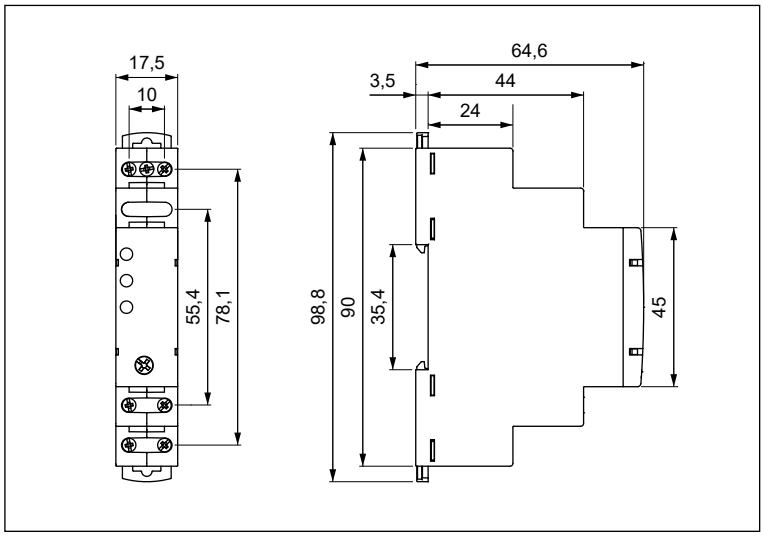
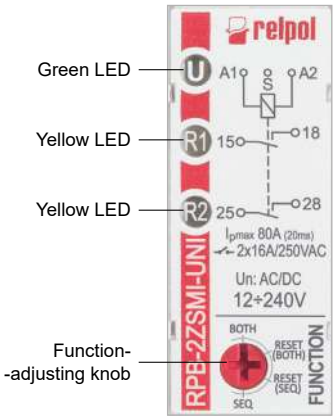
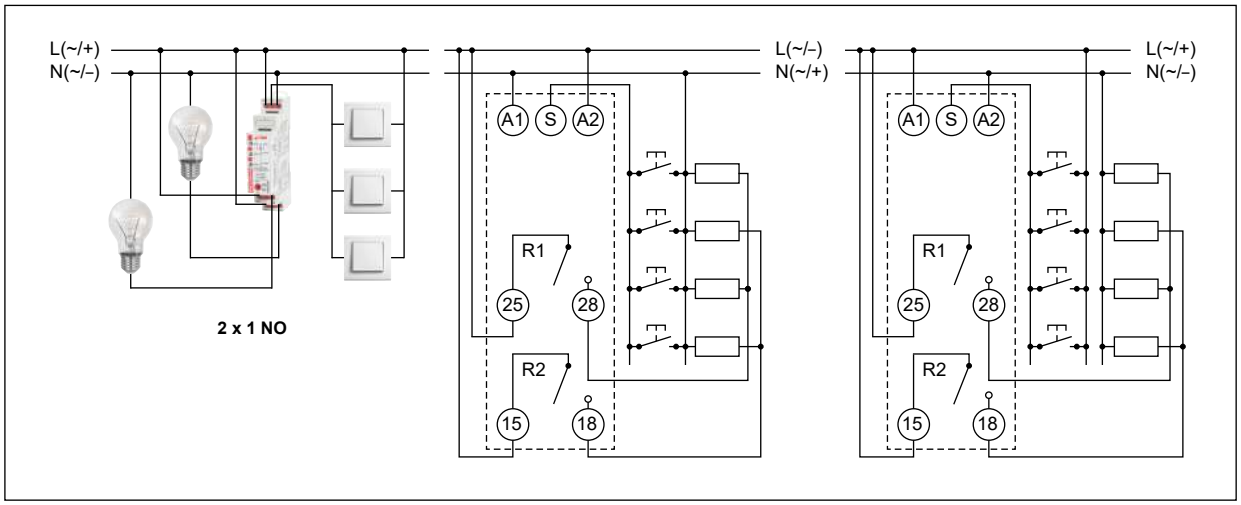
Dimensions



Front panel description



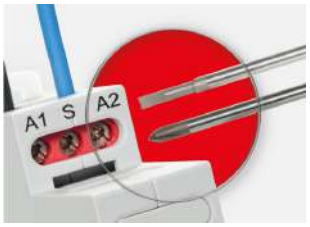
Connection diagrams



Mounting

Relays **RPB-2ZSMI-UNI** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

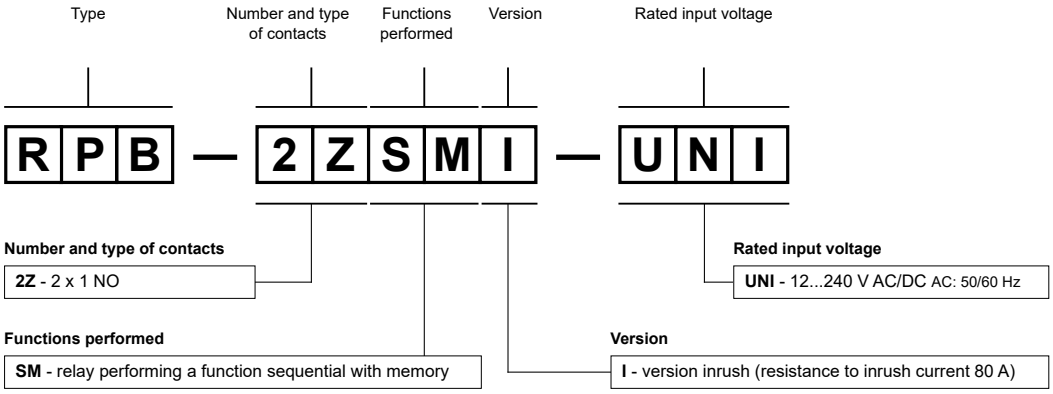
Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

BISTABLE

Ordering codes



Example of ordering codes:

RPB-2ZSMI-UNI bistable - impulse relay **RPB-2ZSMI-UNI**, multifunction (relay perform 4 functions), cover - modular, width 17,5 mm, two normally open contacts, version inrush, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

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Time relays

relpol® S.A.

Time relays are available in modular covers (MT-W...M with LED display, RPC series) and in industrial covers (TR4N series, T-R4, PIR15...T).

Design features (depending on the type of relay): multifunctions, single-functions; with settings of T interval, with independent settings of T1 and T2 intervals, with independent settings of T1, T2 and T3 intervals (MT-W...M); contacts / outputs: 1 CO, 2 CO, 3 CO, 4 CO; supply: universal AC/DC; specified voltage.

Applications in low voltage systems: in industrial automation; in BMS automation; in air-conditioning, ventilation, heating systems; in protection, signalling, alarm systems; in lighting systems; various other applications.

They meet the requirements of REACH and RoHS Directive. The relays are recognized and certified by:

CE EAC CIK

modular covers

industrial covers

← Contents

- **Universal, multifunction time relays with independently controled times T1, T2 and T3 (25 time functions + functions ON and OFF; quick times set with the accuracy of 0,1 s)**
- Two digit LED display • Programming with two buttons only • Cadmium - free contacts
- AC/DC input voltages • Cover - modular, width 17,5 mm • Direct mounting on 35 mm rail mount acc. to EN 60715 • Applications: in low-voltage systems
- Compliance with standards: EN 45545-2 (category EL5, requirement R23 - flammability class V-0 as per EN 60695-11-10); EN 61373:2011 category 1, class B (mechanical shock and vibration resistance); EN 50121-3-2 (railroad applications - electromagnetic compatibility); EN 50155:2007; EN 60077-1; EN 61810-1; EN 61812-1
- Recognitions, certifications, directives: RoHS,

Output circuit - contact data

Number and type of contacts		1 CO
Contact material		$AgSnO_2$
Max. switching voltage		300 V
Rated load	AC1	10 A / 250 V AC
	DC1	10 A / 24 V DC
Max. inrush current		16 A
Rated current		10 A
Max. breaking capacity	AC1	2 500 VA
Min. breaking capacity		1 W 10 V, 10 mA
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	600 cycles/hour
• no load		72 000 cycles/hour

Input circuit

Rated voltage	AC: 50/60 Hz AC/DC	12...240 V terminals (+)A1 – (-)A2
Operating range of supply voltage		0,9...1,1 U_n
Rated power consumption	AC	≤ 2,0 VA AC: 50 Hz
	DC	≤ 1,5 W
Range of supply frequency	AC	48...63 Hz
Residual ripple to DC		5%
Control contact S ❶		
• min. voltage ❷		0,9 U_n
• min. time of pulse duration ❷		AC: > 50 ms DC: > 20 ms
• max. length of control line		10 m

Insulation according to EN 60664-1

Insulation rated voltage	250 V AC
Rated surge voltage	2 500 V 1,2 / 50 µs
Overvoltage category	II
Insulation pollution degree	1
Flammability class	V-0 UL 94 , EN 60695-11-10
Dielectric strength	
• input - output	2 500 V AC type of insulation: basic
• contact clearance	1 000 V AC type of clearance: micro-disconnection

General data

Electrical life		
• resistive AC1		> 0,5 x 10^5 10 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		90 ❸ x 17,5 x 65,5 mm
Weight		70 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• operating	-20...+50 °C
Cover protection category		IP 20 EN 60529
Environmental protection		RTI EN 61810-7
Relative humidity		up to 85%
Shock resistance		15 g
Vibration resistance		0,35 mm DA 10...55 Hz

❶ The control terminal S is activated by connection to A1 terminal via the external control contact S. ❷ Where the control signal is recognizable.
❸ Length with 35 mm rail catches: 98,8 mm.

TIME

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Time module data

Functions	Es, E, E(S), E(R), R, Wu, Wu(S), Wu(R), Ws, Wa, B, Wi, ER, EWs, EWa, EWu, WsWa, EWf, Wt, Pi, Pi(S), Pp, Pp(S), Est, Esp, ON, OFF
Selection of function and settings of T1, T2, T3 intervals	with two buttons: "F/T" and "OK", to be with viewed on the LED display
Timing adjustments	0,1 s ... 99 h 59 min. 59,9 s
Setting accuracy / Repeatability	0,1 s / 0,12 s
Values affecting the timing adjustment	temperature: ≤ 0,01% / °C supply voltage: ≤ 0,1% / V
Recovery time	controlled by contact S / supply voltage: ≤ 50 ms / ≤ 650 ms

LED indicator

LEDs

green "U" - indication of supply voltage U
yellow "h" - indication of setting hours T1, T2, T3 times ❹
yellow "m" - indication of setting minutes T1, T2, T3 times ❹
yellow "s" - indication of setting seconds T1, T2, T3 times ❹
green "T2" - indication of setting T2 time ❹
green "T3" - indication of setting T3 time ❹ ❺
green "T3" flashing - measurement of T3 time / request for programming T3 time ❺
yellow "R" - status ON of operational relay R

LED display

strip spinning to the right - measurement of T1 time

strip spinning to the left - measurement of T2 time

message "End" - stop of the function being carried out

pulsating point during programming - indication of setting decimal parts of a second

Instruction of programming

1. Hold the lower button "F/T" for a longer time (> 2 s). A symbol of service function F0 will appear on LED display.
2. By pressing the button "F/T" choose the required number of function (F0 ... F21 - see table below).
3. Save the number of the selected function by shortly pressing the upper button "OK". The display will show two digits "Zero" and the yellow LED "h" will appear (T1 time hours setting). The first "Zero" is for tens of hours, the other "Zero" specifies the units of hours. Each number set has to be confirmed with the "OK" button. Note: similar situation applies for setting minutes and seconds.
4. By clicking the lower button "F/T" select the required number of T1 time hours.
5. After selecting the number of T1 time hours click the "OK" button in order to confirm the selection.
6. Again two digits "Zero" will appear and the yellow LED "m" will appear - setting minutes. Next, act accordingly to points 4 and 5. Similarly set seconds when the yellow LED "s" appears. Then set decimal parts of second when a point is pulsing on the display.
7. After confirming with the "OK" button the decimal parts of second the green LED "T2" will start flashing (if T2 time appears in a given function).
8. If we select T2 time, then we do everything accordingly to the way of T1 time setting.
9. Next the green LED "T3" will start flashing (if T3 time appears in a given function) - request for setting T3 time ❺. T3 time setting may be confirmed with "OK" or rejected with "F/T". T3 time is set similarly to T1 or T2.
10. Turn off feeding. After another provision of feeding the function will start. Some functions are started by the external control contact S ❶.
11. During carrying out of the function (lasting longer than 60 s) it is possible to check the used time [%] by shortly pressing the "OK" button. A longer pressing will show the "presentation" of settings (checking the set function and times).
12. In order to "exit" the set service function F0 or F1 press the lower button "F/T" for a longer time until the symbol of a given function disappears from the display.

Note: a new function can be programmed during the operation of the relay (during the operation of any function). The newly programmed function will be active only after turning on and providing feeding voltage.

Number	Name	Times ❺	Control ❶
F0	OFF	–	U
F1	ON	–	U
F2	Es	T1	U, S
F3	E E(S)	T1 T1	U U, S
F4	E(R)	T1	U, S
F5	R	T1	U, S
F6	Wu Wu(S)	T1 T1	U U, S
F7	Wu(R)	T1	U, S
F8	Ws	T1	U, S
F9	Wa	T1	U, S
F10	B Wi	T1 = 0 ❻ T1	U, S U, S
F11	ER	T1, T2	U, S
F12	EWs	T1, T2	U, S
F13	EWa	T1, T2	U, S
F14	EWu	T1, T2	U
F15	WsWa	T1, T2	U, S
F16	EWf	T1, T2	U, S
F17	Wt	T1, T2	U, S
F18	Pi Pi(S)	T1, T2, T3 T1, T2, T3	U U, S
F19	Pp Pp(S)	T1, T2, T3 T1, T2, T3	U U, S
F20	Est	T1	U, S
F21	Esp	T1	U, S

❶ The control terminal S is activated by connection to A1 terminal via the external control contact S. ❹ View on LED display. ❺ Option: possibility of turninig on or omitting T3 time. ❻ Time T1 has to be set with "Zero" value.

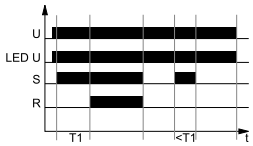
TIME

Time functions

F0 – OFF - Constant service off.
F0 function can be turned on at any time, during feeding the time relay with U_n voltage. Turning on F0 function during carrying out any time function will cause the function to stop as well as constant operating relay R off (LED diode "R" is off). Function F0 is activated by pressing "F/T" button for a longer time (more than 2 seconds) and selecting F0 function. Confirm this function with red button "OK" (after confirmation display will show digit 0). Exiting the service function needs a longer pressing of "F/T" button - until the display stops showing F0 function symbol. Next, after a short time, display will show "End". Going back to the function previously carried out is done by turning off feeding voltage U_n and turning it on again. If the "T/F" button is being pressed for too long and it will cause, after turning off F0 function symbol, showing the symbols of other functions, then going back to the function previously carried out (set before F0 function) is done by turning off feeding voltage U_n and turning it on again.

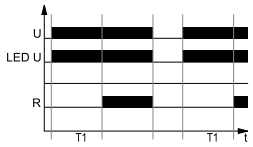
F1 – ON - Constant service on.
F1 function can be turned on at any time, during feeding the time relay with U_n voltage. Turning on F1 function during carrying out any time function will cause the function to stop as well as constant operating relay R on (LED diode "R" is on). Function F1 is activated by pressing "F/T" button for a longer time (more than 2 seconds) and selecting F1 function. Confirm this function with red button "OK" (after confirmation display will show digit 1). Exiting the service function needs a longer pressing of "F/T" button - until the display stops showing F1 function symbol. Next, after a short time, display will show "End". Going back to the function previously carried out is done by turning off feeding voltage U_n and turning it on again. If the "T/F" button is being pressed for too long and it will cause, after turning off F1 function symbol, showing the symbols of other functions, then going back to the function previously carried out (set before F1 function) is done by turning off feeding voltage U_n and turning it on again.

F2 – Es - ON delay with the control contact S.



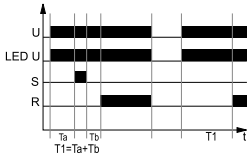
Feeding voltage U has to be put onto time relay in a constant way (LED diode "U" gives constant light). Turning off controlling contact S starts measuring the set time T1 (display shows a vertical strip spinning to the right). When T1 time is finished operating relay R turns on (display shows "End", LED diode "R" is on). Such state lasts until the moment of opening control contact S. Opening the control contact S causes immediate turning off the operating relay R (display still shows "End", and LED diode "R" is off). When the control contact S is open before T1 time is finished, the operating relay will not turn on and the measurement of T time will be cancelled.

F3 – E - ON delay.



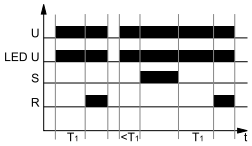
Turning on the feeding voltage U starts measuring set T1 time (display shows vertical strip spinning to the right). After measuring T1 time the operating relay R turns on and stays in this state until feeding U is turned off (display shows "End", and LED diode "R" is on).

F3 – E(S) - ON delay, with time measurement stopped with contact S.



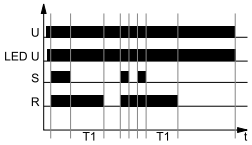
Turning on the feeding voltage U starts measuring set T1 time (display shows vertical strip spinning to the right). If during measuring T1 time control contact S is closed, measuring of T1 time is stopped for the time of closing contact S (display shows two horizontal strips). Opening of control contact S resumes measuring of T1 time (display shows a vertical strip spinning to the right). After finishing measuring T1 time the operating relay R turns on and stays in this state until feeding U is turned off (display shows "End", and LED diode "R" is on).

F4 – E(R) - ON delay with the Reset function.



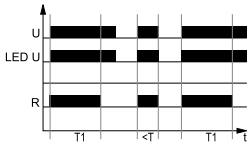
Turning on the feeding voltage U starts measuring set T1 time (display shows vertical strip spinning to the right). After measuring T1 time operating relay R turns on. If control contact S is closed during measuring T1 time measuring of T1 time is stopped for the time of closing contact S (display shows two horizontal strips). After opening contact S T1 time is measured from the start. After measuring T1 time operating relay R turns on (display shows "End", and LED diode "R" is on). and this state lasts until the moment of turning off feeding voltage U or when the control contact is closed again.

F5 – R - OFF delay with the control contact S.



Time relay input is powered by voltage U in a constant way. Closing the control contact S causes immediate turning on of the operating relay R (display shows two horizontal strips, LED diode "R" is on). Opening the control contact S starts measuring of the set T1 time (display shows vertical strip spinning to the right). After measuring T1 time the operating relay turns off (display shows "End", and LED diode "R" is off). If control contact S is closed before T1 time is finished, the previously measured time will be restarted and the operating relay will stay on. The delay of turning off the operating relay R will start at the moment of another opening of control contact S.

F6 – Wu - ON for the set interval.



Turning on the feeding voltage U causes immediate turning on the operating relay R at the set time T1 (display shows vertical strip spinning to the right, LED diode "R" is on). After measuring T1 time the operating relay R turns off (display shows "End", and LED diode "R" is off).

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T1, T2, T3** - measured times;
Ts - pause in function performance - time measurement stop period (applies to F18 and F19); **t** - time axis

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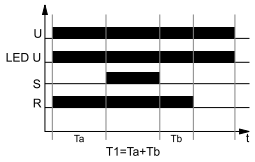
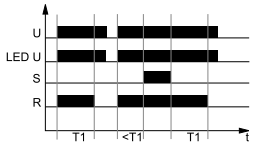
Time functions

F6 – Wu(S) - ON for the set interval, with time measurement stopped with contact S closing.



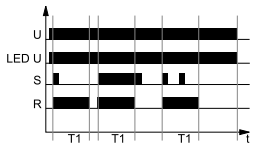
Turning on the feeding voltage U causes immediate turning on the operating relay R at the set time T1 (display shows vertical strip spinning to the right, LED diode "R" is on). If the control contact S is closed, measuring T1 time will be stopped (display shows two horizontal strips) until the moment when control contact is opened. Opening contact S starts further measuring of T1 time. After finishing measuring T1 time the operating relay turns off (display shows "End", and LED diode "R" is off).

F7 – Wu(R) - ON for the set interval with the Reset function.



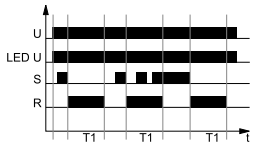
Turning on feeding voltage U causes immediate turning on the operating relay R at the set time T1 (display shows vertical strip spinning to the right, LED diode "R" is on). When control contact S is closed, measuring time T1 is stopped for the time of closing contact S (with operating relay being on, and display showing two horizontal strips). After opening contact S T1 time is measured from the start. After measuring T1 time the operating relay R turns off (display shows "End", and LED diode "R" is off).

F8 – Ws - Single shot for the set interval triggered by closing of the control contact S.



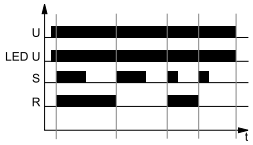
Time relay input is powered by voltage U in a constant way. Closing the control contact S causes immediate turning on operating relay R for the T1 time (display shows vertical strip spinning to the right, LED diode "R" is on). After measuring T1 time the operating relay R turns off display shows "End", and LED diode "R" is off). Opening and closing the control contact S during measuring T1 time does not affect the function being carried out. Turning on the operating relay R again is possible (after measuring T1 time) by another closing of control contact S.

F9 – Wa - ON for the set interval triggered with the control contact S.



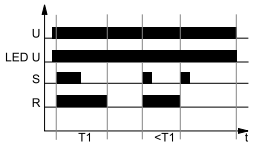
Time relay input is powered by voltage U in a constant way. Opening the control contact S causes immediate turning on operating relay R for the T1 time (display shows vertical strip spinning to the right, LED diode "R" is on). After measuring T1 time the operating relay R turns off display shows "End", and LED diode "R" is off). Opening and closing the control contact S during measuring T1 time does not affect the function being carried out. Turning on the operating relay R again is possible (after measuring T1 time) by another closing of control contact S.

F10 – B - Cyclical operation with the control contact S (the feature of a bistable relay) - setting T1 time to the value of "Zero" is required.



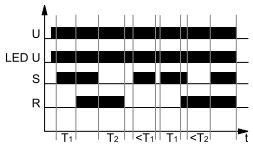
Time relay input is powered by voltage U in a constant way. Each closing of control contact S causes the change of the state of the operating relay R into the opposite one (the feature of a bistable relay).

F10 – Wi - ON for the set interval controlled by closing of the control contact S, with the function of switching off the output relay R prior to the lapse of the interval T1 (the feature of a bistable relay).



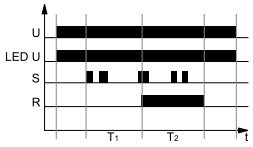
Time relay input is powered by voltage U in a constant way. Closing the control contact S causes immediate turning on the operating relay for T1 time (display shows a vertical strip spinning to the right, and LED diode "R" is on). After measuring T1 time the operating relay R turns off (display shows "End", and LED diode "R" is off). If during the measuring T1 time the control contact is closed, the measured time T1 will be restarted, and the operating relay R turns off. Another closing of the control contact S causes another turning on the operating relay R for the T1 time. Relay with this function adopts the feature of bistable relay.

F11 – ER - ON delay and OFF delay with control contact S. Independent settings of T1 and T2 intervals.



Time relay input is powered by voltage U in a constant way Closing the control contact S starts measuring the T1 time (display shows a vertical strip spinning to the right) and after measuring the T1 time the operating relay R turns on (display shows two horizontal strips, and LED diode "R" is on). Opening the control contact S starts measuring T1 time - the delayed turning off the operating relay R (display shows a vertical strip spinning to the left) and after the time is finished the operating relay R turns off display shows "End", and LED diode "R" is off). If during the measuring T2 time the control contact S is closed, the measured time will be restarted, and the operating relay R stays on. If the control contact S is closed for a shorter time than T1 time, the system will not turn on the operating relay R.

F12 – EWs - ON delay and ON for the set time with closing of the control contact S. Independent settings of T1 and T2 intervals.

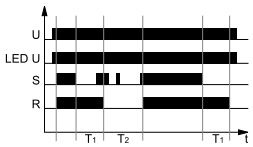


Time relay input is powered by voltage U in a constant way. Closing the control contact (impulsive or constant) starts measuring T1 time (Time relay input is powered by voltage U in a constant way.), and after its completion the operating relay R turns on for T2 time (display shows a vertical strip spinning to the left, LED diode "R" is on). After the T2 time the operating relay R turns off (display shows "End", and LED diode is off). The system is waiting for another closing of the control contact S. During measuring times T1 and T2 the state of the contact S does not matter.

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T1, T2, T3** - measured times;
Ts - pause in function performance - time measurement stop period (applies to F18 and F19); **t** - time axis

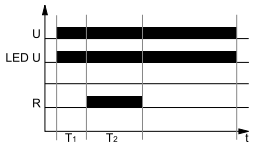
Time functions

F13 – EWa - OFF delay and breaking time delay with opening of the control contact S. Independent settings of T1 and T2 intervals.



Time relay input is powered by voltage U in a constant way. Closing the control contact S causes immediate turning on the operating relay R (display shows two horizontal strips, and LED diode "R" is on). Opening the control contact S starts measuring the time T1 (display shows a vertical strip spinning to the right), and after measuring is finished the operating relay R turns off and measuring of T2 time starts (display shows a vertical strip spinning to the left, and LED diode "R" is off) After measuring T2 time display shows "End", and the operating relay R - depending on the state of the control contact S - stays off when the control contact S is open or turns on when the control contact S is closed, and LED diode "R" goes on.

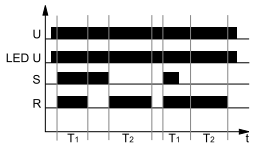
F14 – EWu - ON delay for the set interval. Independent settings of T1 and T2 intervals.



Turning on feeding U starts work from measuring the time T1 (display shows a vertical strip spinning to the right), and after its completion the operating relay R starts at T2 time (display shows a vertical strip spinning to the left, and LED diode "R" is on). After measuring T2 time the operating relay turns off (display shows "End", and LED diode "R" is off).

F15 – WsWa - ON for the set intervals T1 and T2 with the control contact S. Independent settings of T1 and T2 intervals.

Diagram 1

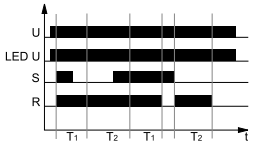


Time relay input is powered by voltage U in a constant way. Closing the control contact S turns on the operating relay R for T1 time (display shows a vertical strip spinning to the right, and the LED diode "R" is on). After measuring T1 time the operating relay R turns off (display shows two horizontal strips, and LED diode "R" is off). Opening the control contact S causes another turning on the operating relay R for T2 time (display shows a vertical strip spinning to the left, and the LED diode "R" is on). After measuring T2 time the operating relay turns off (display shows "End", and LED diode "R" is off).

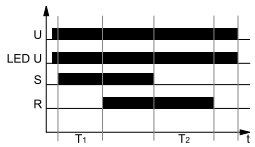
a/ If during measuring T1 time the control contact S is opened, then (after measuring T1 time) the operating relay will stay on until the moment of the end of measuring T2 time. After measuring T2 time the operating relay R will turn off (display shows "End", and LED diode "R" turns off) - see Diagram 1.

b/ If during measuring T1 time the control contact S is opened, and next, during measuring T2 time, it is closed, then (after measuring T1 and T2 times) the operating relay R will turn on for the additional T1 time. After measuring additional T1 time the operating relay R will turn off (display shows two horizontal strips, and LED diode will turn off). Such state will last until the opening of the control contact S. After opening the control contact S the operating relay R will turn on again and the measuring of T2 time will start (display shows a vertical strip spinning to the left, and LED diode "R" is on). After measuring T2 time the operating relay R will turn off (display shows "End", and LED diode "R" will turn off) - see Diagram 2.

Diagram 2

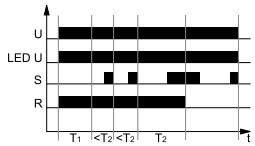


F16 – EWf - ON delay and OFF delay with the control contact S. Independent settings of T1 and T2 intervals.



Time relay input is powered by voltage U in a constant way. Closing the control contact S starts measuring the time T1 (display shows a vertical strip spinning to the gight). After T1 time is finished, the relay R turns on (display shows two horizontal strips, and LED diode "R" is on). Opening the control contact S starts measuring the time T2 - delayed turning off the operating relay R (display shows a vertical strip spinning to the left). After measuring T2 time the operating relay R turns off (display shows "End", and LED diode "R" is off).

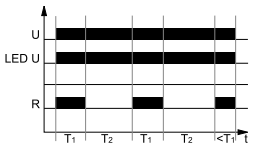
F17 – Wt - Monitoring of the sequence of pulses. Switching on T2 interval is extended with consecutive pulses (closing and opening of the contact S). Independent settings of T1 and T2 intervals.



Turning on the feeding voltage U causes immediate turning on of the operating relay R fot the set T1 time (display shows a vertical strip spinning to the right, and LED diode "R" is on). After measuring T1 time measuring T2 time starts with the operating relay R still being on (display shows a vertical strip spinning to the left, and LED diode "R" is on) In order to keep the operating relay R on, during measuring T2 time closing, and next opening of the control contact S must occur (single impulse), which will cause resetting the time measured so far and start measuring T2 time again. If before T2 time is finished the single impulse of the control contact S does not occur, the operating relay will turn off (display shows "End", and LED diode "R" will turn off). Another turning on of the operating relay will be possible after turning off feeding U and turning it on again.

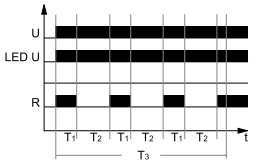
F18 – Pi - Cyclical operation pulse first. Independent settings of T1 and T2 intervals. Possibility of turninig on or omitting T3 time.

Diagram 1



Turning on feeding voltage U starts cyclic work from turning on the operating relay R for the T1 time (display shows a vertical strip spinning to the right, and LED diode "R" is on), after which occurs turning off of the operating relay R for T2 time (display shows a vertical strip spinning to the left, and LED diode "R" is off). Cyclic work lasts until the moment of turning off feeding voltage - see Diagram 1.

Diagram 2



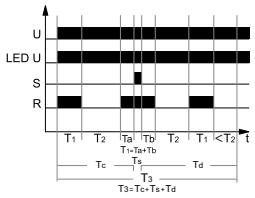
Note: it is possible **to turn on T3 time** (i.e. the time of cyclic work) during programming the relay (when the LED T3 diode is flashing) by confirming it with the OK button, or omitting the T3 time by pressing "F/T" button. When T3 time has been turned on and set, during cyclic work green LED diode T3 is flashing. After T3 time is finished display shows "End", LED diode T3 is off, and operating relay R remains in the state which it was in at the moment of the end of T3 time. If T3 time finishes during measuring T1 time, the operating relay R will remain on (LED "R" is on), and if it finishes during measuring T2 time, the operating relay R will remain off (LED diode "R" is off). Another turning on the function of cyclic work will be possible after turning off feeding U and turning it on again - see Diagram 2.

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T1, T2, T3** - measured times; **Ts** - pause in function performance - time measurement stop period (applies to F18 and F19); **t** - time axis

TIME

Time functions

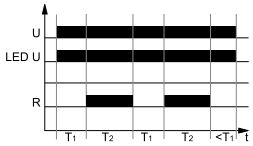
F18 – Pi(S) - Cyclical operation pulse first. Independent settings of T1 and T2 intervals. Possibility of turninig on or omitting T3 time. Possibility of stopping and resuming cyclic work by control contact S.



Turning on the feeding voltage U starts cyclic work from turning on the operating relay R for the T1 time (display shows a vertical strip spinning to the right, and LED diode "R" is on), after which the operating relay turns off for T2 time (display shows a vertical strip spinning to the left, and LED diode "R" is off). Cyclic work lasts until the moment of turning off feeding voltage U.
Note: it is possible **to turn on T3 time** (i.e. the time of cyclic work) during programming the relay (when the LED T3 diode is flashing) by confirming it with the OK button, or omitting the T3 time by pressing "F/T" button. When T3 time has been turned on and set, during cyclic work green LED diode T3 is flashing. After T3 time is finished display shows "End", LED diode T3 is off, and operating relay R remains in the state which it was in at the moment of the end of T3 time. If T3 time finishes during measuring T1 time, the operating relay R will remain on (LED "R" is on), and if it finishes during measuring T2 time, the operating relay R will remain off (LED diode "R" is off). Another turning on the function of cyclic work will be possible after turning off feeding U and turning it on again.
Operation of contact S: closing control contact S immediately stops measuring times. Opening control contact S resumes measuring times. The break in carrying out the function Pi(S) (by the period of closing contact S) is included in T3.

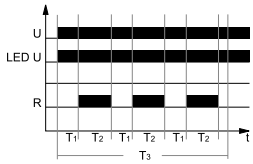
F19 – Pp - Cyclical operation pause first. Independent settings of T1 and T2 intervals. Possibility of turninig on or omitting T3 time.

Diagram 1



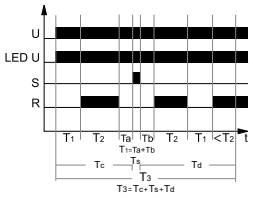
Turning on feeding voltage U starts cyclic work from measuring the time of break T1 - the time of turning off the operating relay R (display shows a vertical strip spinning to the right), after which occurs turning off of the operating relay R for the T2 time (Display shows a vertical strip spinning to the left, and LED diode "R" is on). Cyclic work lasts until the moment of turning off feeding voltage U - see Diagram 1.

Diagram 2



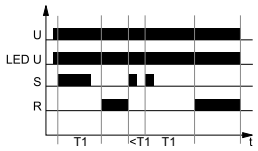
Note: it is possible **to turn on T3 time** (i.e. the time of cyclic work) during programming the relay (when the LED T3 diode is flashing) by confirming it with the OK button, or omitting the T3 time by pressing "F/T" button. When T3 time has been turned on and set, during cyclic work green LED diode T3 is flashing. After T3 time is finished display shows "End", LED diode T3 is off, and operating relay R remains in the state which it was in at the moment of the end of T3 time. If T3 time finishes during measuring T1 time, the operating relay R will remain on (LED "R" is on), and if it finishes during measuring T2 time, the operating relay R will remain off (LED diode "R" is off). Another turning on the function of cyclic work will be possible after turning off feeding U and turning it on again - see Diagram 2.

F19 – Pp(S) - Cyclical operation pause first. Independent settings of T1 and T2 intervals. Possibility of turninig on or omitting T3 time. Possibility of stopping and resuming cyclic work by control contact S.



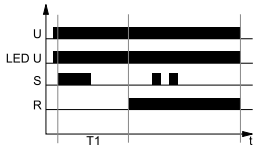
Turning on feeding voltage U starts cyclic work from measuring break time T1 - time of turning off the operating relay R (display shows a vertical strip spinning to the right), after which occurs turning on the operating relay R for the T2 time (display shows a vertical strip spinning to the left, and LED diode "R" is on). Cyclic work lasts until the moment of turning off feeding voltage U.
Note: it is possible **to turn on T3 time** (i.e. the time of cyclic work) during programming the relay (when the LED T3 diode is flashing) by confirming it with the OK button, or omitting the T3 time by pressing "F/T" button. When T3 time has been turned on and set, during cyclic work green LED diode T3 is flashing. After T3 time is finished display shows "End", LED diode T3 is off, and operating relay R remains in the state which it was in at the moment of the end of T3 time. If T3 time finishes during measuring T1 time, the operating relay R will remain on (LED "R" is on), and if it finishes during measuring T2 time, the operating relay R will remain off (LED diode "R" is off). Another turning on the function of cyclic work will be possible after turning off feeding U and turning it on again.
Operation of contact S: closing control contact S immediately stops measuring times. Opening control contact S resumes measuring times. The break in carrying out the function Pi(S) (by the period of closing contact S) is included in T3.

F20 – Est - ON delay with closing of the control contact S, with the interval T1 extended.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S for a shorter time than T1 time starts the T1 time, and after the T1 time has lapsed, the output relay R switches on and remains in this position until the control contact S is closed again or until the supply voltage U is interrupted. Closing of the control contact S resets the thus far measured time and starts the new T1 time.

F21 – Esp - ON delay - one cycle, with closing of the control contact S.

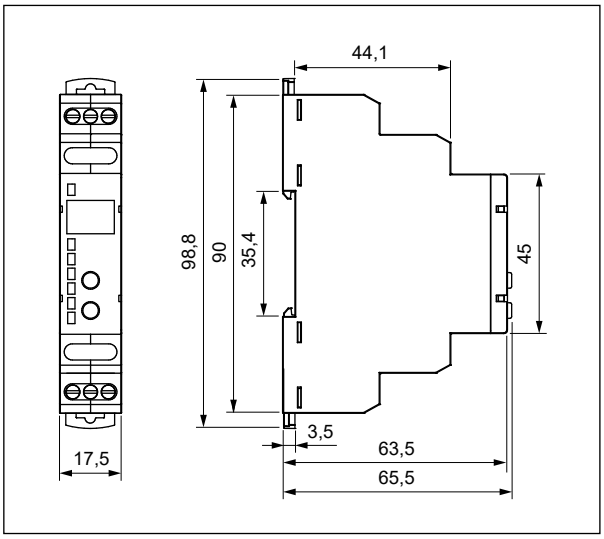


The input of the time relay is supplied with voltage U continuously. Closing of the control contact S starts the T1 time, and after the T1 time has lapsed, the output relay R switches on and remains in this position until the supply voltage U is interrupted. When the output relay R is on, opening or closing of the control contact S does not affect its status.

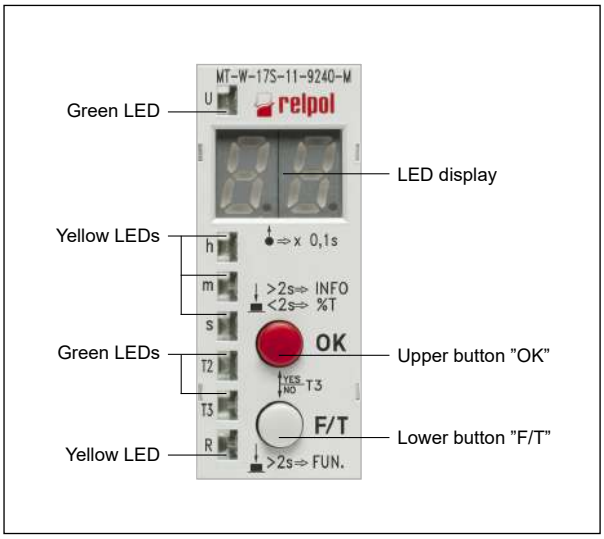
U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T1, T2, T3** - measured times;
Ts - pause in function performance - time measurement stop period (applies to F18 and F19); **t** - time axis

TIME

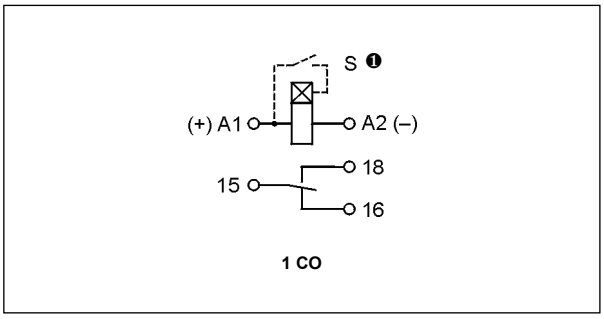
Dimensions



Front panel description



Connection diagram



❶ The control terminal S is activated by connection to A1 terminal via the external control contact S.

Mounting

Relays **MT-W...M** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² / 2 x 1,5 mm² (1 x 14 / 2 x 16 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,6 Nm.

Two catches:
easy mounting on 35 mm rail,
firm hold (top and bottom).

Ordering codes

Type	Cover	Number and type of contacts	Rated input voltage	Time functions performed
MT-W	17S	11	9240	M

W - LED display

Cover
17S - modular, width 17,5 mm

Number and type of contacts
11 - 1 CO

Rated input voltage
9240 - 12...240 V AC/DC AC: 50/60 Hz

Time functions performed
M - multifunction

Example of ordering codes:

MT-W-17S-11-9240-M universal time relay **MT-W...M** with LED display, multifunction (relay perform 6 functions), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz


RPC-1MA-UNI


RPC-2MA-A230

- **Multifunction time relays (10 time functions; 8 time ranges)**
- Cadmium - free contacts 1 CO and 2 CO
- AC and AC/DC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in low-voltage systems
- Compliance with standard EN 61812-1
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit - contact data

Number and type of contacts		1 CO	2 CO
Contact material		$AgSnO_2$	
Max. switching voltage		300 V AC	
Rated load	AC1	16 A / 250 V AC	8 A / 250 V AC
	DC1	16 A / 24 V DC	8 A / 24 V DC
	DC1	0,3 A / 250 V DC	0,3 A / 250 V DC
Rated current		16 A / 250 V AC	8 A / 250 V AC
Max. breaking capacity	AC1	4 000 VA	2 000 VA
Min. breaking capacity		1 W 10 mA	
Contact resistance		≤ 100 mΩ	
Max. operating frequency		600 cycles/hour at rated load AC1	

Input circuit

Rated voltage	50/60 Hz AC	230 V terminals A1, A2	
	AC: 50/60 Hz AC/DC	12...240 V terminals (+)A1, (-)A2	
Must release voltage		≥ 0,1 U_n	
Operating range of supply voltage		0,9...1,1 U_n	
Rated power consumption	AC	≤ 3,5 VA 230 V AC, 50 Hz	≤ 1,5 VA 12...240 V AC/DC, AC: 50 Hz
	DC	≤ 1,5 W 12...240 V AC/DC	
Range of supply frequency	AC	48...63 Hz	
Control contact S ❶			
• min. voltage ❷		0,7 U_n	
• min. time of pulse duration ❷		AC: ≥ 50 ms	DC: ≥ 30 ms
• max. length of control line		10 m	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection
	• pole - pole	2 000 V AC	contacts 2 CO, type of insulation: basic

General data

Electrical life	• resistive AC1	> 0,5 x 10^5	16 A, 8 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7	
Dimensions (L x W x H)		90 ❸ x 17,5 x 64,6 mm	
Weight		contact 1 CO: 65...66 g	contacts 2 CO: 72...73 g
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+50 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock resistance		15 g	
Vibration resistance		0,35 mm DA 10...55 Hz	

❶ The control terminal S is activated by connection to A1 terminal via the external control contact S.
❷ Where the control signal is recognizable. ❸ Length with 35 mm rail catches: 98,8 mm.

Table of codes Table 1

Time relay code		Rated input voltage
with 1 CO contact	**with 2 CO contacts**	
RPC-1MA-A230	RPC-2MA-A230	230 V AC 50/60 Hz
RPC-1MA-UNI	RPC-2MA-UNI	12...240 V AC/DC AC: 50/60 Hz

TIME

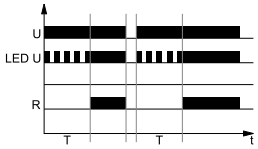
Time module data

Functions		E, Wu, Bp, Bi, R, Ws, Wa, Esa, B, T
Time ranges		OFF - permanent switching off; ON - permanent switching on 1 s ❹; 10 s; 1 min.; 10 min.; 1 h; 10 h; 1 d; 10 d
Timing adjustment		smooth - (0,1...1) x time range (does not refer to range ON / OFF)
Setting accuracy		± 5% ❺ ❹
Repeatability		± 0,5% ❹
Values affecting the timing adjustment		temperature: ± 0,05% / °C supply voltage: ± 0,01% / V
Recovery time	AC	≤ 150 ms 230 V AC, 50 Hz ≤ 400 ms 12...240 V AC/DC, AC: 50 Hz
	DC	≤ 150 ms 12...240 V AC/DC
LED indicator		green LED U ON - indication of supply voltage U green LED U flashing - measurement of T time yellow LED R ON/OFF - output relay status

❹ For first range setpoint (1 s) setting accuracy and repeatability are smaller than the given ones in technical parameters (significant influence of the operational relay operating time, processor start-time, and the moment of supply switching as referred to the AC supply course). ❺ Calculated from the final range values, for the setting direction from minimum to maximum.

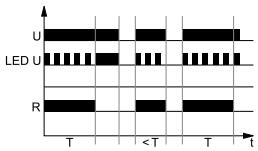
Time functions

E - ON delay.



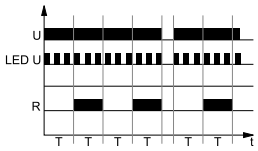
On applying the supply voltage U the set interval T begins - off-delay of the output relay R. After the interval T has lapsed, the output relay R switches on and remains on until supply voltage U is interrupted.

Wu - ON for the set interval.



Applying the supply voltage U immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R switches off.

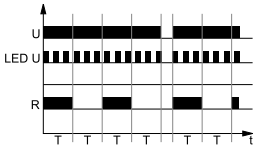
Bp - Symmetrical cyclical operation pause first.



Applying the supply voltage U starts the cyclical operation from the interval T - switching the output relay R off followed by switching on the output relay R for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

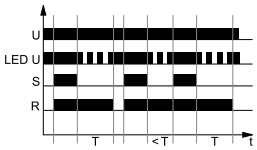
U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T** - measured time; **t** - time axis

Bi - Symmetrical cyclical operation pulse first.



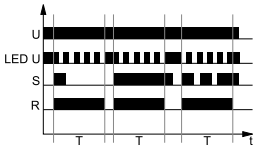
Applying the supply voltage U starts the cyclical operation from switching on the output relay R for the set interval T. After the interval T has lapsed, the output relay R switches off for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

R - OFF delay with the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches on the output relay R. Opening of the control contact S starts the set time of the delayed switching off of the output relay R. After the interval T has lapsed, the output relay R switches off. If the control contact S is closed during the interval T, the already measured time is reset, and the output relay R is switched on again. The OFF delay of the output relay R will start when the control contact S is opened again.

Ws - Single shot for the set interval triggered by closing of the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R is switched off. In the course of the interval T, any opening of the control contact S does not affect the function to be performed. The output relay R may be switched on again for the set interval, after the interval T has lapsed, by closing the control contact S again.

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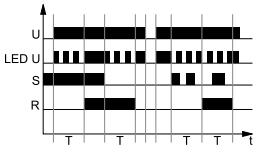
Time functions

Wa - ON for the set interval triggered with the control contact S.

The input of the time relay is supplied with voltage U continuously. Closing of the control contact S does not start the interval T, and it does not change the position of the output relay R. Opening of the control contact S immediately switches on the output relay R for the set time. After the interval T has lapsed, the output relay R switches off. Opening and closing of the control contact S in the course of the interval T does not affect the function to be performed. The output relay R may be switched on again for the set interval with another closing and opening of the control contact S.

Esa - ON and OFF delay with the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S starts the interval T - on-delay of the output relay R. After the interval T has lapsed, the output relay R switches on. Opening of the control contact S begins further measurement of the interval T - off-delay of the output relay R, and after the interval has lapsed, the output relay switches off. In case the time for which the control contact S is closed in the course of measurement of the on-delay of the output relay R is shorter than the set interval T, the output relay R will switch on after the set interval T, and the output relay R will remain in on position for the interval T. When the output relay R is in on position, closing of the control contact S does not affect the function to be performed.

Additional functions

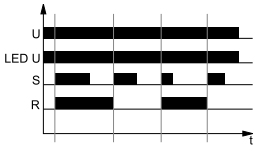
Supply diode: it is lit permanently when the time is not being measured. In course of the T time measurement, it flashes at 500 ms period where it is lit for 50% of the time, and off for 50% of the time.

Adjustment of the set values:
- the values of time and range are read in the course of the relay's operation. The set values may be modified at any moment,
- no change of the function is possible in the course of the relay's operation. Any change of the settings of the relay shall be read only after the supply voltage has been switched off and on again.

Triggering: depending on the function to be performed, the relay is triggered with the supply voltage or by connection of the S contact to the A1 line. For DC supply, the positive pole must be connected to the A1 line. The level of the S contact activation is adjusted automatically depending on the supply voltage.

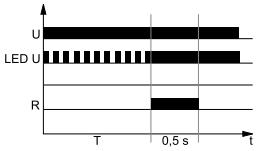
Supply:
- **RPC-...-A230**: the relay may be supplied with AC voltage 48...63 Hz of 207...253 V,
- **RPC-...-UNI**: the relay may be supplied with DC voltage or AC voltage 48...63 Hz of 10,8...264 V.

B - Cyclical operation controlled with closing of the control contact S.



The input of the time relay is supplied with U voltage continuously. Closing of the control contact S immediately switches on the output relay R. Each next closing of the control contact S results in a change of the status of the output relay R to an opposite one (the feature of a bistable relay).

T - Generation of the 0,5 s pulse after the interval T.

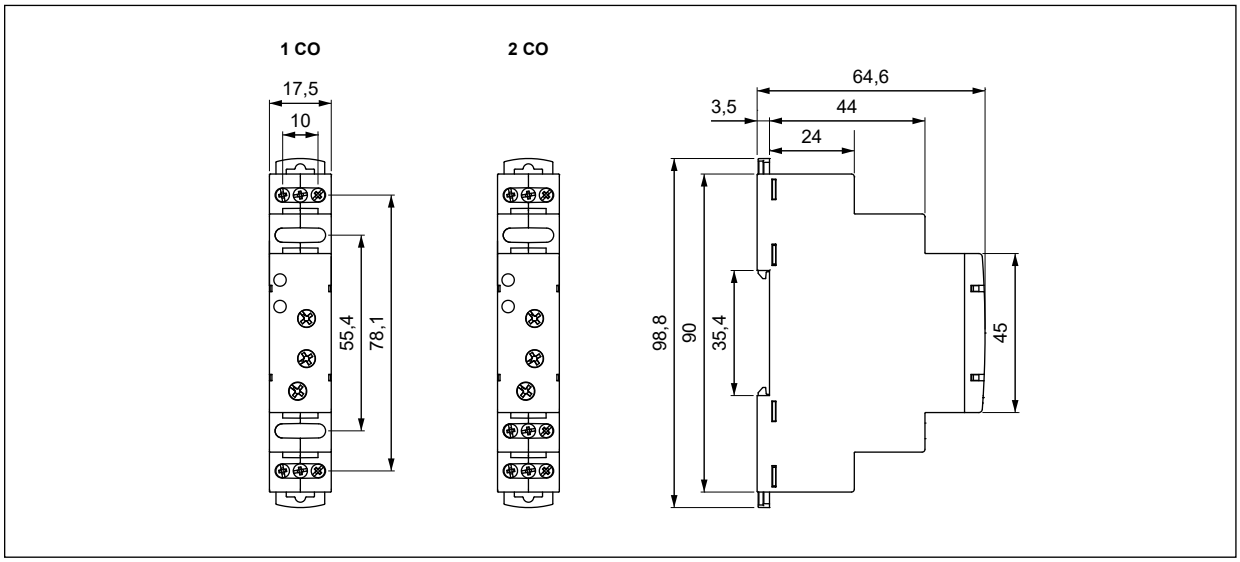


Applying the supply voltage U starts the interval T. After the interval T has lapsed, the output relay switches on for 0,5 s (the time of the NO contact of the output relay).

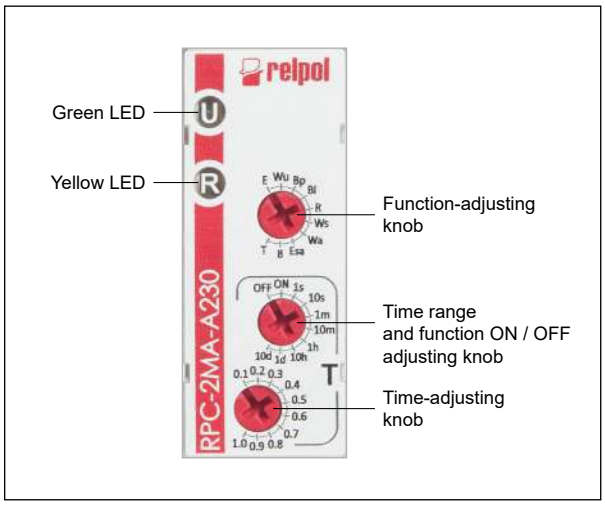
ON / **OFF** - Permanent switching on / off.
The functions ON and OFF are selected with T time range adjusting knob. In the ON function, the normally open contacts are closed all the time whereas in the OFF function they are open. The position of the function--adjusting knob is of no significance in these functions as is the preset measurement time. The ON or OFF functions are used for the time relay operation control in electric systems.

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T** - measured time; **t** - time axis

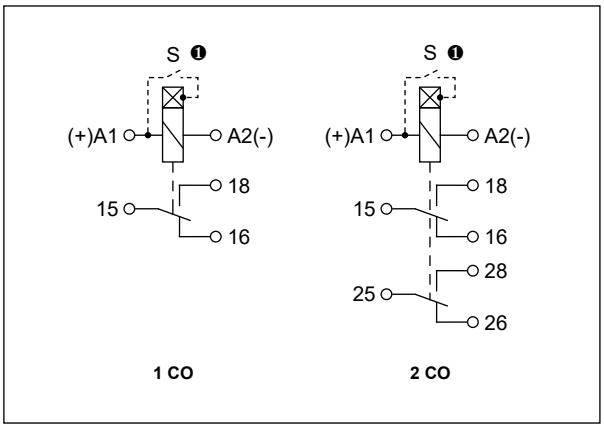
Dimensions



Front panel description



Connection diagrams

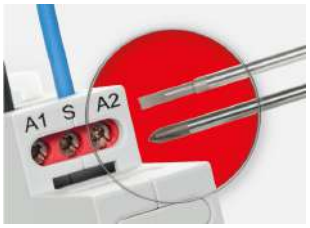


Note: the indicated polarization of the supply refers only to the relays RPC-...-UNI. ❶ The control terminal S is activated by connection to A1 terminal via the external control contact S.

Mounting

Relays **RPC-.MA-...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

TIME

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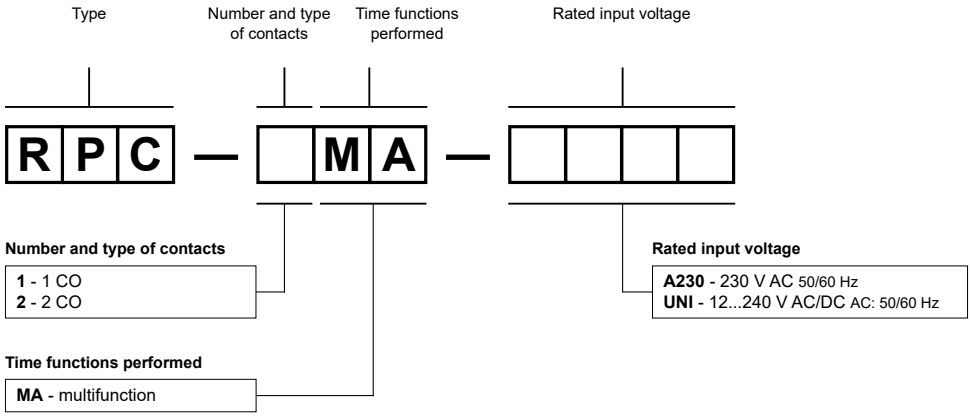
Ordering codes



Examples of ordering codes ❻:

RPC-1MA-A230 time relay **RPC-.MA-...**, multifunction (relay perform 10 functions), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage 230 V AC 50/60 Hz

RPC-2MA-UNI time relay **RPC-.MA-...**, multifunction (relay perform 10 functions), cover - modular, width 17,5 mm, two changeover contacts, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

❻ Ordering codes **RPC-.MA-...** are specified in Table 1, "Time relay code" column.

Table of codes

Table 1

Time relay code		Rated input voltage
with 1 CO contact	**with 2 CO contacts**	
RPC-1MA-A230	RPC-2MA-A230	230 V AC 50/60 Hz
RPC-1MA-UNI	RPC-2MA-UNI	12...240 V AC/DC AC: 50/60 Hz


RPC-1MB-UNI


RPC-2MB-A230

- **Multifunction time relays (10 time functions; 8 time ranges)**
- Cadmium - free contacts 1 CO and 2 CO
- AC and AC/DC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in low-voltage systems
- Compliance with standard EN 61812-1
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit - contact data

Number and type of contacts		1 CO		2 CO
Contact material		$AgSnO_2$		
Max. switching voltage		300 V AC		
Rated load	AC1	16 A / 250 V AC		8 A / 250 V AC
	DC1	16 A / 24 V DC		8 A / 24 V DC
	DC1	0,3 A / 250 V DC		0,3 A / 250 V DC
Rated current		16 A / 250 V AC		8 A / 250 V AC
Max. breaking capacity	AC1	4 000 VA		2 000 VA
Min. breaking capacity		1 W 10 mA		
Contact resistance		≤ 100 mΩ		
Max. operating frequency		600 cycles/hour at rated load AC1		
Input circuit				
Rated voltage	50/60 Hz AC	230 V terminals A1, A2		
	AC: 50/60 Hz AC/DC	12...240 V terminals (+)A1, (-)A2		
Must release voltage		≥ 0,1 U_n		
Operating range of supply voltage		0,9...1,1 U_n		
Rated power consumption	AC	≤ 3,5 VA 230 V AC, 50 Hz		≤ 1,5 VA 12...240 V AC/DC, AC: 50 Hz
	DC	≤ 1,5 W 12...240 V AC/DC		
Range of supply frequency	AC	48...63 Hz		
Control contact S ❶				
• min. voltage ❷		0,7 U_n		
• min. time of pulse duration ❷		AC: ≥ 50 ms		DC: ≥ 30 ms
• max. length of control line		10 m		
Insulation according to EN 60664-1				
Insulation rated voltage		250 V AC		
Rated surge voltage		4 000 V 1,2 / 50 µs		
Overvoltage category		III		
Insulation pollution degree		2		
Flammability class		V-0 for modular cover, UL 94		
Dielectric strength	• input - output	4 000 V AC type of insulation: basic		
	• contact clearance	1 000 V AC type of clearance: micro-disconnection		
	• pole - pole	2 000 V AC contacts 2 CO, type of insulation: basic		
General data				
Electrical life	• resistive AC1	> 0,5 x 10^5 16 A, 8 A, 250 V AC		
Mechanical life (cycles)		> 3 x 10^7		
Dimensions (L x W x H)		90 ❸ x 17,5 x 64,6 mm		
Weight		contact 1 CO: 65...66 g		contacts 2 CO: 72...73 g
Ambient temperature	• storage	-40...+70 °C		
(non-condensation and/or icing)	• operating	-20...+50 °C		
Cover protection category		IP 20 EN 60529		
Relative humidity		up to 85%		
Shock resistance		15 g		
Vibration resistance		0,35 mm DA 10...55 Hz		

❶ The control terminal S is activated by connection to A1 terminal via the external control contact S.
❷ Where the control signal is recognizable. ❸ Length with 35 mm rail catches: 98,8 mm.

Table of codes Table 1

Time relay code		Rated input voltage
with 1 CO contact	**with 2 CO contacts**	
RPC-1MB-A230	RPC-2MB-A230	230 V AC 50/60 Hz
RPC-1MB-UNI	RPC-2MB-UNI	12...240 V AC/DC AC: 50/60 Hz

TIME

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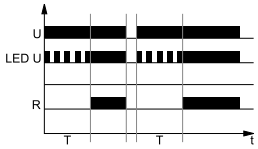
Time module data

Functions		E, Wu, Bp, Bi, Ra, Wst, Wi, Esf, Esp, Est
Time ranges		OFF - permanent switching off; ON - permanent switching on 1 s ❹; 10 s; 1 min.; 10 min.; 1 h; 10 h; 1 d; 10 d
Timing adjustment		smooth - (0,1...1) x time range (does not refer to range ON / OFF)
Setting accuracy		± 5% ❺ ❹
Repeatability		± 0,5% ❹
Values affecting the timing adjustment		temperature: ± 0,05% / °C supply voltage: ± 0,01% / V
Recovery time	AC	≤ 150 ms 230 V AC, 50 Hz ≤ 400 ms 12...240 V AC/DC, AC: 50 Hz
	DC	≤ 150 ms 12...240 V AC/DC
LED indicator		green LED U ON - indication of supply voltage U green LED U flashing - measurement of T time yellow LED R ON/OFF - output relay status

❹ For first range setpoint (1 s) setting accuracy and repeatability are smaller than the given ones in technical parameters (significant influence of the operational relay operating time, processor start-time, and the moment of supply switching as referred to the AC supply course). ❺ Calculated from the final range values, for the setting direction from minimum to maximum.

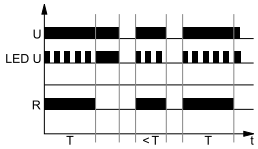
Time functions

E - ON delay.



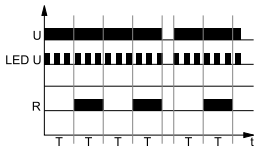
On applying the supply voltage U the set interval T begins - off-delay of the output relay R. After the interval T has lapsed, the output relay R switches on and remains on until supply voltage U is interrupted.

Wu - ON for the set interval.



Applying the supply voltage U immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R switches off.

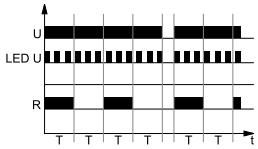
Bp - Symmetrical cyclical operation pause first.



Applying the supply voltage U starts the cyclical operation from the interval T - switching the output relay R off followed by switching on the output relay R for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

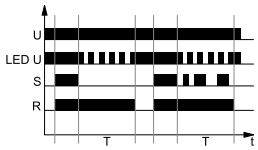
U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T** - measured time; **t** - time axis

Bi - Symmetrical cyclical operation pulse first.



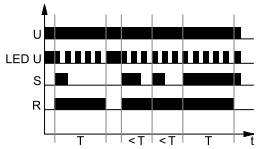
Applying the supply voltage U starts the cyclical operation from switching on the output relay R for the set interval T. After the interval T has lapsed, the output relay R switches off for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

Ra - OFF delay with the control contact S, without the interval T extension.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches on the output relay R. Opening of the control contact S starts the set time of the delayed switching off of the output relay R. After the interval T has lapsed, the output relay R switches off. Opening or closing of the control contact S within the interval T does not affect the function to be performed.

Wst - ON for the set interval by closing the control contact S, with extension of the interval T - extension of the time of switching on the output relay R.

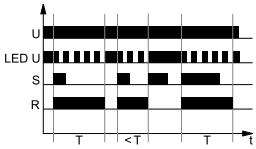


The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R is switched off. The next closing of the control contact S immediately switches on the output relay R for the interval T. In case the control contact S is closed within the interval T, the measured time is cancelled, and the interval T starts again.

TIME

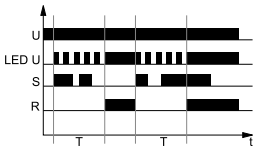
Time functions

Wi - ON for the set interval controlled by closing of the control contact S, with the function of switching off the output relay R prior to the lapse of the interval T.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R is switched off. Any next closing of the control contact S switches on the output relay R again. In case the control contact S is closed again during the interval T, the output relay is immediately switched off, and the measured interval is cancelled. In the course of the interval T, any opening of the control contact S does not affect the function to be performed.

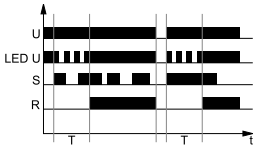
Esf - ON delay with the control contact S, without the interval T extension.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S starts the interval T - on-delay of the output relay R. After the interval T has lapsed, the output relay R switches on and remains in this position until the control contact S is closed again, which instantly switches the output relay off for the time T, and after the interval T has lapsed, the output relay R switches on again. In the course of measurement of the interval T, opening or closing of the control contact S does not affect the status of the output relay R. The output relay R may be switched on again after the current cycle has been completed.

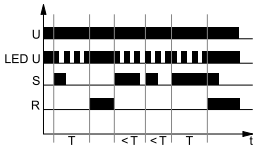
U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T** - measured time; **t** - time axis

Esp - ON delay - one cycle, with closing of the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S starts the interval T, and after the interval T has lapsed, the output relay R switches on and remains in this position until the supply voltage U is interrupted. When the output relay R is on, opening or closing of the control contact S does not affect its status.

Est - ON delay with closing of the control contact S, with the interval T extended.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S starts the interval T, and after the interval T has lapsed, the output relay R switches on and remains in this position until the control contact S is closed again or until the supply voltage U is interrupted. Closing of the control contact S resets the thus far measured time and starts the new interval T.

ON / **OFF** - Permanent switching on / off.
The functions ON and OFF are selected with T time range adjusting knob. In the ON function, the normally open contacts are closed all the time whereas in the OFF function they are open. The position of the function--adjusting knob is of no significance in these functions as is the preset measurement time. The ON or OFF functions are used for the time relay operation control in electric systems.

Additional functions

Supply diode: it is lit permanently when the time is not being measured. In course of the T time measurement, it flashes at 500 ms period where it is lit for 50% of the time, and off for 50% of the time.

Adjustment of the set values:
- the values of time and range are read in the course of the relay's operation. The set values may be modified at any moment,
- no change of the function is possible in the course of the relay's operation. Any change of the settings of the relay shall be read only after the supply voltage has been switched off and on again.

Triggering: depending on the function to be performed, the relay is triggered with the supply voltage or by connection of the S contact to the A1 line. For DC supply, the positive pole must be connected to the A1 line. The level of the S contact activation is adjusted automatically depending on the supply voltage.

Supply:
- **RPC-...-A230**: the relay may be supplied with AC voltage 48...63 Hz of 207...253 V,
- **RPC-...-UNI**: the relay may be supplied with DC voltage or AC voltage 48...63 Hz of 10,8...264 V.

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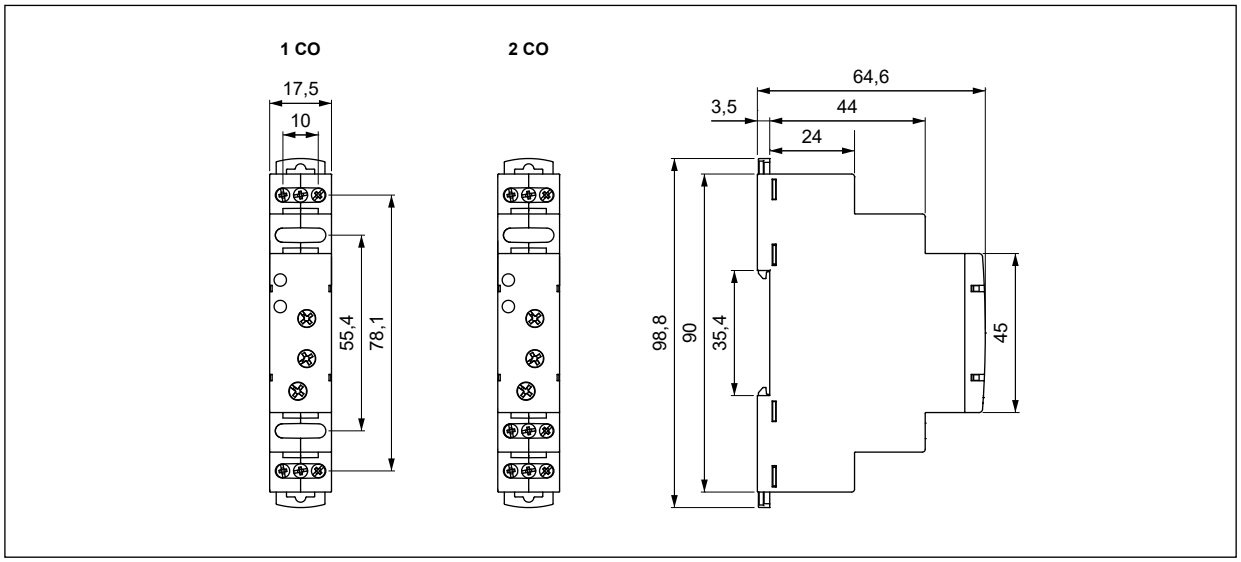
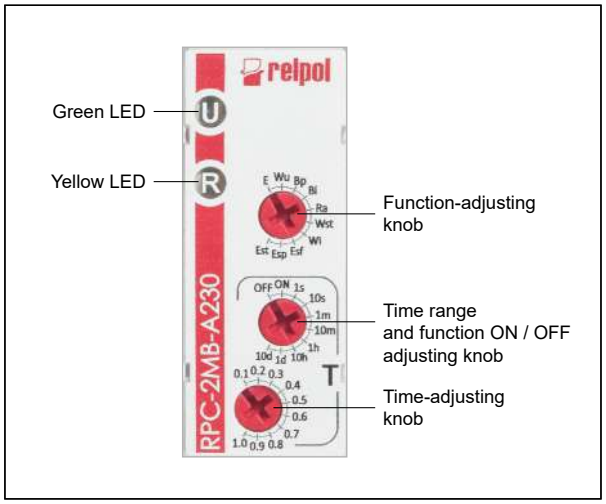
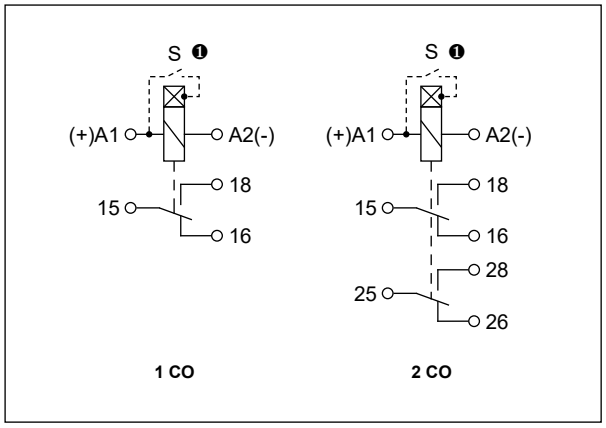
Dimensions



Front panel description



Connection diagrams

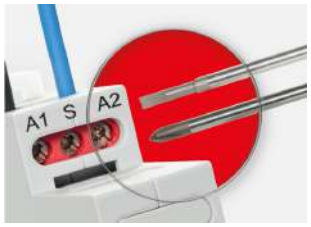


Note: the indicated polarization of the supply refers only to the relays RPC-...-UNI. ❶ The control terminal S is activated by connection to A1 terminal via the external control contact S.

Mounting

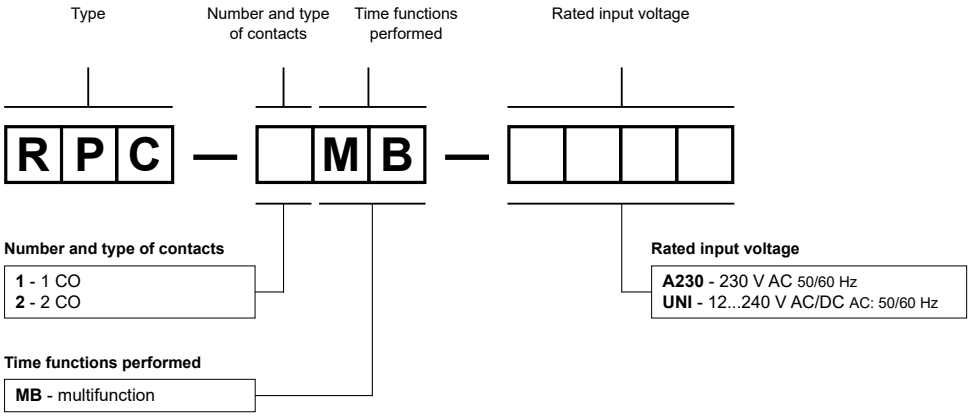
Relays **RPC-.MB-...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes



Examples of ordering codes ❻:

RPC-1MB-A230 time relay **RPC-.MB-...**, multifunction (relay perform 10 functions), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage 230 V AC 50/60 Hz

RPC-2MB-UNI time relay **RPC-.MB-...**, multifunction (relay perform 10 functions), cover - modular, width 17,5 mm, two changeover contacts, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

❻ Ordering codes **RPC-.MB-...** are specified in Table 1, "Time relay code" column.

Table of codes

Table 1

Time relay code		Rated input voltage
with 1 CO contact	**with 2 CO contacts**	
RPC-1MB-A230	RPC-2MB-A230	230 V AC 50/60 Hz
RPC-1MB-UNI	RPC-2MB-UNI	12...240 V AC/DC AC: 50/60 Hz

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RPC-2A-UNI

NEW

- **Operation after the power supply is switched off** - with the operational relay on, contact holding time up to 10 minutes

- **Multifunction time relays (6 time functions; 10 time ranges)**
- Cadmium - free contacts 2 CO • AC/DC input voltages
- Cover - modular, width 17,5 mm • Direct mounting on 35 mm rail mount acc. to EN 60715 • Applications: in low-voltage systems
- Compliance with standard EN 61812-1
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit - contact data

Number and type of contacts			2 CO
Contact material			$AgSnO_2$
Max. switching voltage			300 V AC
Rated load		AC1	8 A / 250 V AC
		DC1	8 A / 24 V DC; 0,3 A / 250 V DC
Rated current			8 A / 250 V AC
Max. breaking capacity		AC1	2 000 VA
Min. breaking capacity			1 W 10 mA
Contact resistance			≤ 100 mΩ
Max. operating frequency			600 cycles/hour at rated load AC1

Input circuit

Rated voltage	AC: 50/60 Hz	AC/DC	12...240 V terminals (+)A1, (-)A2
Must release voltage			≥ 0,1 U_n
Operating range of supply voltage			0,9...1,1 U_n
Rated power consumption		AC	≤ 1,5 VA AC: 50 Hz
		DC	≤ 1,5 W
Range of supply frequency		AC	48...63 Hz

Insulation according to EN 60664-1

Insulation rated voltage			250 V AC
Rated surge voltage			4 000 V 1,2 / 50 µs
Overvoltage category			III
Insulation pollution degree			2
Flammability class			V-0 for modular cover, UL 94
Dielectric strength	• input - output		4 000 V AC type of insulation: basic
	• contact clearance		1 000 V AC type of clearance: micro-disconnection
	• pole - pole		2 000 V AC type of insulation: basic

General data

Electrical life	• resistive AC1		> 0,5 x 10^5 8 A, 250 V AC
Mechanical life (cycles)			> 3 x 10^7
Dimensions (L x W x H)			90 ❶ x 17,5 x 64,6 mm
Weight			72 g
Ambient temperature	• storage		-40...+70 °C
(non-condensation and/or icing)	• operating		-20...+50 °C
Cover protection category			IP 20 EN 60529
Relative humidity			up to 85%
Shock resistance			15 g
Vibration resistance			0,35 mm DA 10...55 Hz

Time module data

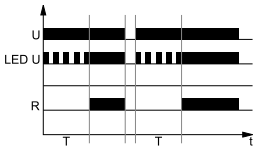
Functions		E, A, nWa, nWu, nWuWa, nWs
Time ranges		1 s ❷; 10 s; 20 s; 30 s; 1 min.; 1,5 min.; 2 min.; 3 min.; 5 min.; 10 min.
Timing adjustment		smooth - (0,1...1) x time range
Setting accuracy		± 5% ❸ ❷
Repeatability		± 0,5% ❷
Values affecting the timing adjustment		temperature: ± 0,05% / °C supply voltage: ± 0,01% / V
Recovery time		AC: ≤ 400 ms DC: ≤ 150 ms
LED indicator		green LED U ON - indication of supply voltage U green LED U flashing - measurement of T time yellow LED R ON/OFF - output relay status

❶ Length with 35 mm rail catches: 98,8 mm. ❷ For first range setpoint (1 s) setting accuracy and repeatability are smaller than the given ones in technical parameters (significant influence of the operational relay operating time, processor start-time, and the moment of supply switching as referred to the AC supply course). ❸ Calculated from the final range values, for the setting direction from minimum to maximum.

Time functions

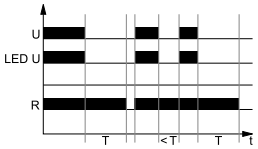
Note: before the first use, perform the **RESET** of the relay:
- set the E function,
- set 1 s on the time range knob,
- connect terminals A1, A2 with supply power,
- after approx. 5 s turn off the supply power.

E - ON delay.



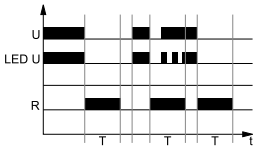
On applying the supply voltage U the set interval T begins - off-delay of the output relay R. After the interval T has lapsed, the output relay R switches on and remains on until supply voltage U is interrupted.

A - OFF delay without supply voltage.



When the supply voltage U is supplied, the output relay R switches into on-position (green LED U illuminated). If the supply voltage is interrupted (green LED U not illuminated), the set interval T begins. After the set interval T has lapsed, the output relay R switches into off-position. If the supply voltage is reconnected before the interval T has lapsed, the interval already measured is erased and is restarted with the next cycle.

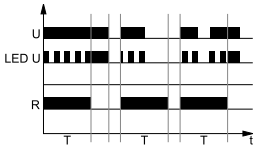
nWa - Maintained single shot trailing edge.



When the supply voltage U is supplied, the output relay R remains in off-position (green LED U illuminated). As soon as the supply voltage is interrupted, the output relay switches into on-position and the set interval T begins (green LED not illuminated). After the set interval T has lapsed, the output relay switches into off-position. When the supply voltage is re-connected before the interval T has lapsed, the unit continues to perform the actual single shot.

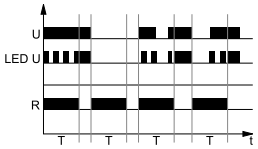
U - supply voltage; **R** - output state of the relay;
T - measured time; **t** - time axis

nWu - Maintained single shot leading edge.



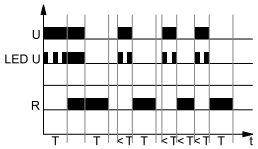
When the supply voltage U is applied (green LED U illuminated), the output relay R switches into on-position and the set interval T begins (green LED U flashes). After the interval T has lapsed, the output relay switches into off-position. This status remains until the supply voltage is interrupted. If the supply voltage is reconnected before the interval T has lapsed, the unit continues to perform the actual single shot.

nWuWa - Maintained single shot leading and trailing edge.



When the supply voltage U is applied, the output relay R switches into on-position and the set interval T begins (green LED U illuminated). After the interval T has lapsed, the output relay switches into off-position. As soon as the supply voltage is interrupted the output relay switches into on-position again, and the set interval T begins (green LED not illuminated). After the set interval T has lapsed, the output relay switches into off-position. If the supply voltage is interrupted (nWu) or reconnected (nWa) before the interval T has lapsed, the unit continues to perform the actual single shot.

nWs - Latching ON delay.



Applying the supply voltage U triggers the operation with delay in switching on the R contact by the set T interval. The R contact is switched on after the delay interval has lapsed. Interrupting the supply voltage while the R contact starts measurement of the T interval after which the R contact is to be switched off. After the T interval of switching the R contact off has lapsed, the R contact is switched off. Interruption of the supply voltage U while ON-delay by the set T interval is being measured for the R contact stops measurement of the T interval and switches the R contact immediately for the set T interval; after the interval has lapsed, the R contact is switched off. Applying the supply voltage U when the T interval is being measured for the R contact to be switched off stops measurement of the interval, switches the R contact off, and starts measurement of ON-delay for the R contact.

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Additional functions

Green supply diode:
- when supply of the relay is on: it is lit permanently when the time is not being measured. In course of the T time measurement, it flashes at 500 ms period where it is lit for 50% of the time, and off for 50% of the time,
- when supply of the relay is off: it is not illuminated.

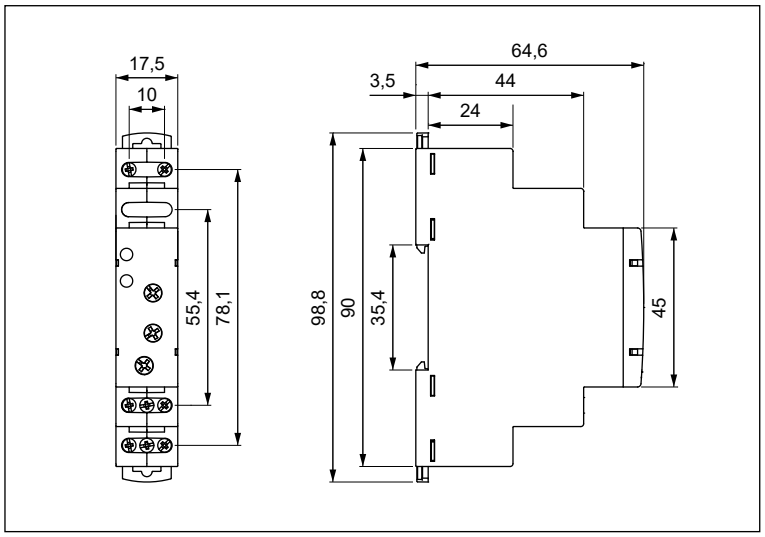
Yellow diode R:
- when the supply voltage is on: the diode is permanently illuminated for the R relay switched on,
- when the supply voltage is off, and the output relay R is on: the time range 1 s - it is illuminated permanently; time ranges 10 s, 20 s, 30 s: a blink of 30 ms every 1 s; time ranges longer than 1 min: a blink of 30 ms every 10 s.

Adjustment of the set values:
- no change of the time value and range is possible when the relay operates. Any chnage of the time setting shall be read only after the supply voltage has been interrupted and reconnected,
- no change of the function is possible in the course of the relay's operation. Any change of the settings of the relay shall be read only after the supply voltage has been switched off and on again.

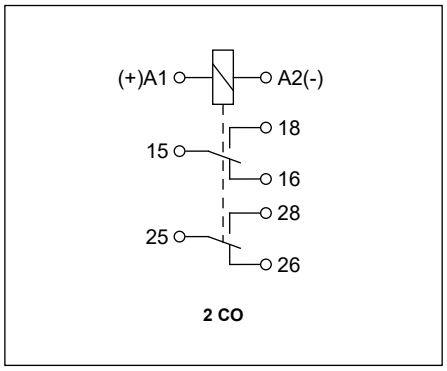
Triggering: the relay is triggered with the supply voltage.

Supply: the relay may be supplied with DC voltage or AC voltage 48...63 Hz of 10,8...264 V.

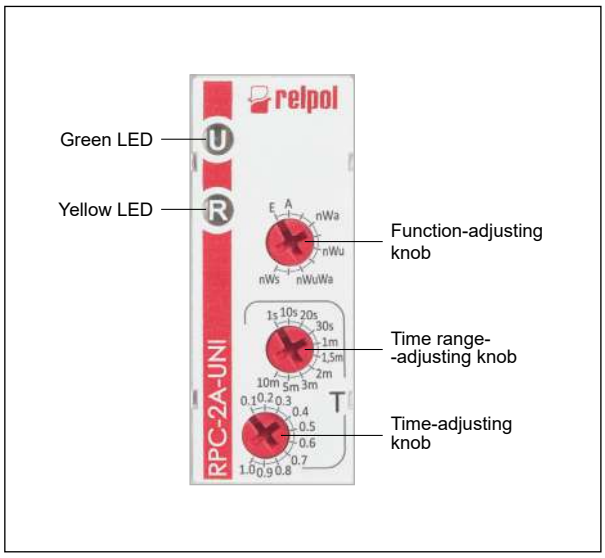
Dimensions



Connection diagram



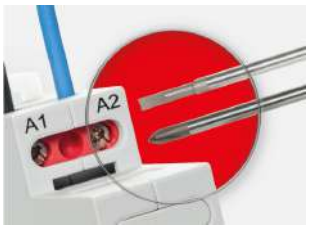
Front panel description



Mounting

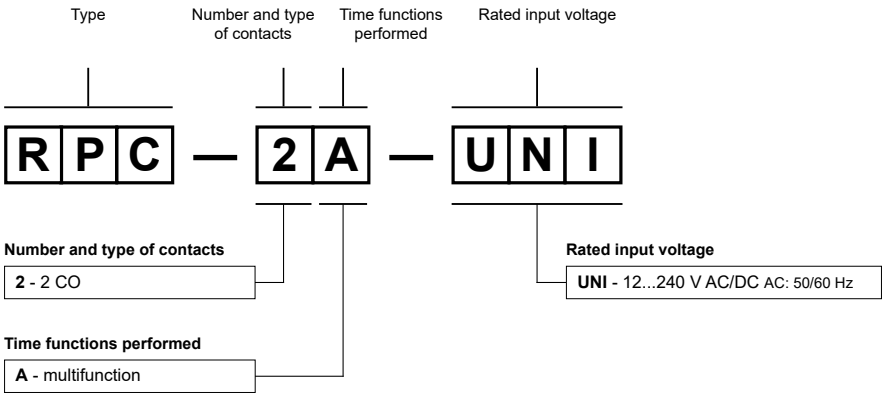
Relays **RPC-2A-UNI** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes



Example of ordering codes:

RPC-2A-UNI time relay **RPC-2A-UNI**, multifunction (relay perform 6 functions), cover - modular, width 17,5 mm, two changeover contacts, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

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RPC-1MC-UNI

• **Immediate activation of the selected function**
- without having to temporarily turn off the power supply

- **Multifunction time relays (14 time functions; 8 time ranges)**
- Cadmium - free contacts 1 CO • AC/DC input voltages
- Cover - modular, width 17,5 mm • Direct mounting on 35 mm rail mount acc. to EN 60715 • Applications: in low-voltage systems
- Compliance with standard EN 61812-1
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit - contact data

Number and type of contacts		1 CO	
Contact material		$AgSnO_2$	
Max. switching voltage		300 V AC	
Rated load	AC1	16 A / 250 V AC	
	DC1	16 A / 24 V DC	0,3 A / 250 V DC
Rated current		16 A / 250 V AC	
Max. breaking capacity	AC1	4 000 VA	
Min. breaking capacity		1 W 10 mA	
Contact resistance		≤ 100 mΩ	
Max. operating frequency		600 cycles/hour at rated load AC1	

Input circuit

Rated voltage	AC: 50/60 Hz AC/DC	12...240 V terminals (+)A1, (-)A2	
Must release voltage		≥ 0,1 U_n	
Operating range of supply voltage		0,9...1,1 U_n	
Rated power consumption	AC	≤ 1,5 VA AC: 50 Hz	
	DC	≤ 1,5 W	
Range of supply frequency	AC	48...63 Hz	
Control contact S ❶	• min. voltage ❷	0,7 U_n	
	• min. time of pulse duration ❷	AC: ≥ 50 ms	DC: ≥ 30 ms
	• max. length of control line	10 m	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection

General data

Electrical life	• resistive AC1	> 0,5 x 10^5	16 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7	
Dimensions (L x W x H) / Weight		90 ❸ x 17,5 x 64,6 mm / 65 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+50 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock / vibration resistance		15 g / 0,35 mm DA 10...55 Hz	

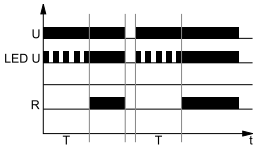
Time module data

Functions	E, E(S), Wu, Wu(S), Bp, Bp(S), Bi, Bi(S), R, Ws, Wa, Esa(R), E(R), Wu(R)	
Time ranges	OFF - permanent switching off; ON - permanent switching on 1 s ❹; 10 s; 1 min.; 10 min.; 1 h; 10 h; 1 d; 10 d	
Timing adjustment	smooth - (0,1...1) x time range	(does not refer to range ON / OFF)
Setting accuracy	± 5% ❺ ❹	
Repeatability	± 0,5% ❹	
Values affecting the timing adjustment	temperature: ± 0,05% / °C	supply voltage: ± 0,01% / V
Recovery time	AC: ≤ 400 ms	DC: ≤ 150 ms
LED indicator	green LED U ON - indication of supply voltage U green LED U flashing - measurement of T time yellow LED R ON/OFF - output relay status	

❶ The control terminal S is activated by connection to A1 terminal via the external control contact S. ❷ Where the control signal is recognizable. ❸ Length with 35 mm rail catches: 98,8 mm. ❹ For first range setpoint (1 s) setting accuracy and repeatability are smaller than the given ones in technical parameters (significant influence of the operational relay operating time, processor start-time, and the moment of supply switching as referred to the AC supply course). ❺ Calculated from the final range values, for the setting direction from minimum to maximum.

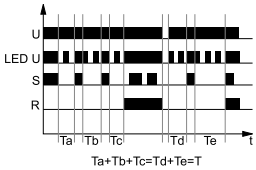
Time functions

E - ON delay.



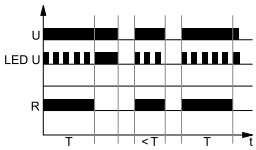
On applying the supply voltage U the set interval T begins - off-delay of the output relay R. After the interval T has lapsed, the output relay R switches on and remains on until supply voltage U is interrupted.

E(S) - ON delay, with time measurement stopped with contact S.



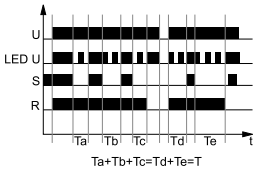
On applying the supply voltage U the set interval T begins. If during measuring time T control contact S is closed, measuring of time T is stopped for the time of closing contact S. Opening of control contact S resumes measuring of time T. After finishing measuring time T, the output relay R switches on and remains on until supply voltage U is interrupted.

Wu - ON for the set interval.



Applying the supply voltage U immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R switches off.

Wu(S) - ON for the set interval, with time measurement stopped with closing of contact S.



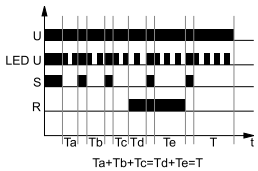
Applying the supply voltage U immediately switches the output relay R on for the set interval T. If the control contact S is closed, the interval T measurement will be stopped until the moment when control contact is opened. Opening contact S starts further measuring of time T. After finishing measuring time T, the output relay R switches off.

Bp - Symmetrical cyclical operation pause first.

Applying the supply voltage U starts the cyclical operation from the interval T - switching the output relay R off followed by switching on the output relay R for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

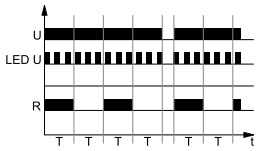
U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T** - measured time; **t** - time axis

Bp(S) - Symmetrical cyclical operation pause first, with interval T measurement stopped for the time the S contact is switched on.



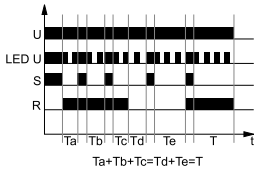
Applying the supply voltage U starts the cyclical operation from the interval T - switching the output relay R off. If in the course of measurement of interval T the control contact S is closed, the measurement of the time of switching off the R relay will be interrupted for the time the S contact remains closed. Opening of the control contact S triggers further measurement of the interval T. After the interval T has lapsed, the output relay R switches on for the set interval T. If during the measurement of the interval T the control contact S is closed, measurement of the time of switching on the R relay will be interrupted for the time the S contact remains closed. Opening of the control contact S triggers further measurement of the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

Bi - Symmetrical cyclical operation pulse first.



Applying the supply voltage U starts the cyclical operation from switching on the output relay R for the set interval T. After the interval T has lapsed, the output relay R switches off for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

Bi(S) - Symmetrical cyclical operation pulse first, with interval T measurement stopped for the time the S contact is switched on.



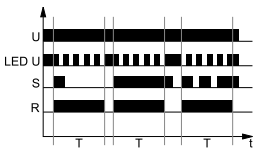
Applying the supply voltage U starts cyclical operation from measurement of the interval T - switching on the output relay R. If in the course of measurement of interval T the control contact S is closed, the measurement of the time of switching off the R relay will be interrupted for the time the S contact remains closed. Opening of the control contact S triggers further measurement of the interval T. After the interval T has lapsed, the output relay R switches on for the set interval T. If during the measurement of the interval T the control contact S is closed, measurement of the time of switching off the R relay will be interrupted for the time the S contact remains closed. Opening of the control contact S triggers further measurement of the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

R - OFF delay with the control contact S.

The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches on the output relay R. Opening of the control contact S starts the set time of the delayed switching off of the output relay R. After the interval T has lapsed, the output relay R switches off. If the control contact S is closed during the interval T, the already measured time is reset, and the output relay R is switched on again. The OFF delay of the output relay R will start when the control contact S is opened again.

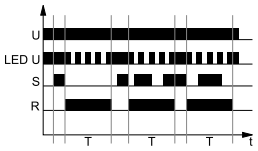
Time functions

Ws - Single shot for the set interval triggered by closing of the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R is switched off. In the course of the interval T, any opening of the control contact S does not affect the function to be performed. The output relay R may be switched on again for the set interval, after the interval T has lapsed, by closing the control contact S again.

Wa - ON for the set interval triggered with the control contact S.

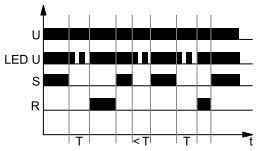


The input of the time relay is supplied with voltage U continuously. Closing of the control contact S does not start the interval T, and it does not change the position of the output relay R. Opening of the control contact S immediately switches on the output relay R for the set time. After the interval T has lapsed, the output relay R switches off. Opening and closing of the control contact S in the course of the interval T does not affect the function to be performed. The output relay R may be switched on again for the set interval with another closing and opening of the control contact S.

Esa(R) - ON and OFF delay controlled with on and off of the S contact with the Reset function.

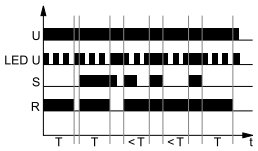
The input of the time relay is supplied with voltage U continuously. Closing of the control contact S begins the measurement of the set interval T - ON delay of the output relay R. If the control contact S is opened during the measurement of the interval T - ON delay of the output relay R, the measured time will be reset. The interval T measurement will start after the control contact S has been closed. After the set interval T has lapsed, the output relay R switches on. Opening of the control contact S will again trigger measurement of the set interval T - OFF delay of the output relay R, and after the interval has been measured, the output relay R switches off. If the control contact S is closed during the interval T measurement, the measured time will be reset. Opening of the control contact S will again trigger measurement of the interval T.

E(R) - ON delay with the Reset function.



On applying the supply voltage U the set interval T begins. After the interval T has lapsed, output relay R turns on. If control contact S is closed during the measurement T, measuring of interval T is stopped for the time the S contact remains closed. After opening contact S, time T is measured from the start. After the interval T has lapsed, the output relay R switches on until the moment of turning off supply voltage U or when the control contact S is closed again.

Wu(R) - ON for the set interval with the Reset function.



Applying the supply voltage U immediately switches the output relay R on for the set interval T. When control contact S is closed, measurement of the interval T is stopped for the time of closing contact S (with output relay R on). After opening contact S, time T is measured from the beginning. After the interval T has lapsed, the output relay R switches off.

ON / **OFF** - Permanent switching on / off.
The functions ON and OFF are selected with T time range adjusting knob. In the ON function, the normally open contacts are closed all the time whereas in the OFF function they are open. The position of the function--adjusting knob is of no significance in these functions as is the preset measurement time. The ON or OFF functions are used for the time relay operation control in electric systems.

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T** - measured time; **t** - time axis

Additional functions

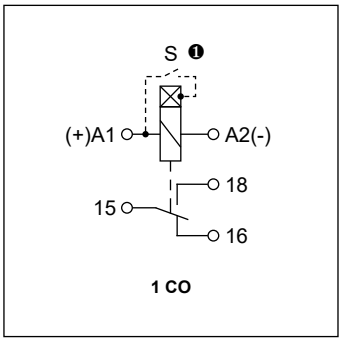
Supply diode: it is lit permanently when the time is not being measured. In course of the T time measurement, it flashes at 500 ms period where it is lit for 50% of the time, and off for 50% of the time.

Adjustment of the set values:
- the values of time and range are read in the course of the relay's operation. The set values may be modified at any moment,
- it is possible to change the function during operation of the relay, which results in triggering operation with a new setting. It is not necessary to switch the supply off and on again for the relay to start operating with a new setting.

Triggering: depending on the function to be performed, the relay is triggered with the supply voltage or by connection of the S contact to the A1 line. For DC supply, the positive pole must be connected to the A1 line. The level of the S contact activation is adjusted automatically depending on the supply voltage.

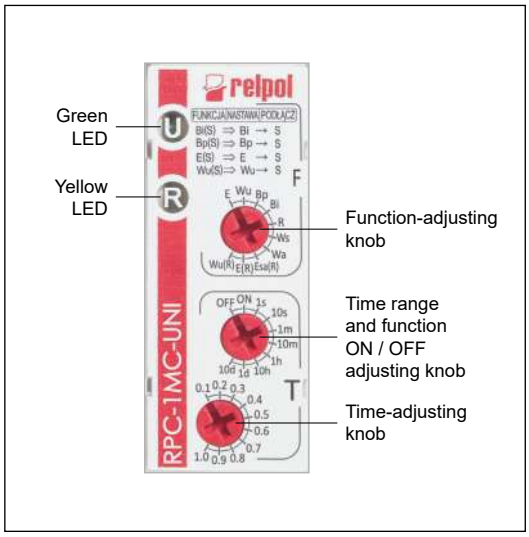
Supply: the relay may be supplied with DC voltage or AC voltage 48...63 Hz of 10,8...264 V.

Connection diagram

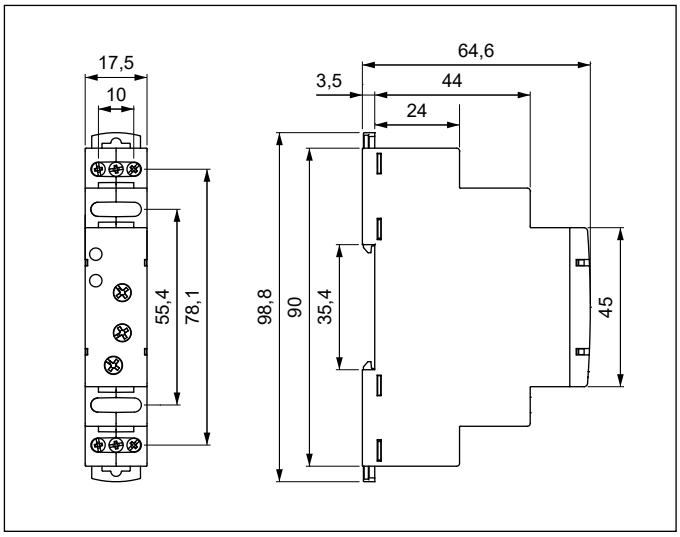


❶ The control terminal S is activated by connection to A1 terminal via the external control contact S.

Front panel description



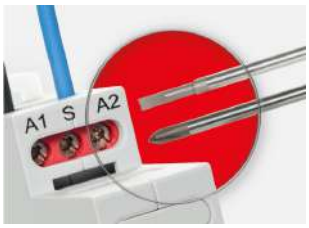
Dimensions



Mounting

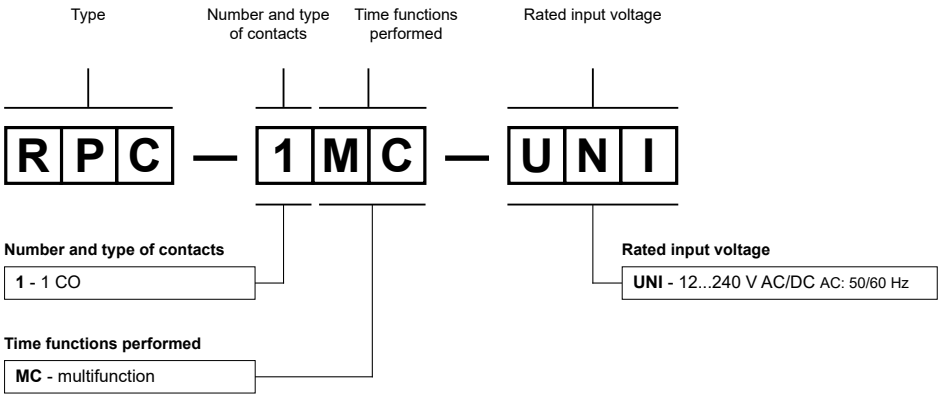
Relays **RPC-1MC-UNI** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes



Example of ordering codes:

RPC-1MC-UNI time relay **RPC-1MC-UNI**, multifunction (relay perform 14 functions), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

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RPC-1MD-UNI

RPC-3MD-UNI

NEW

- **Immediate activation of the selected function**
  - without having to temporarily turn off the power supply

- **Multifunction time relays (10 time functions; 8 time ranges)**
- Cadmium - free contacts 1 CO and 3 CO • AC/DC input voltages
- Cover - modular, width 17,5 mm • Direct mounting on 35 mm rail mount acc. to EN 60715 • Applications: in low-voltage systems
- Compliance with standard EN 61812-1
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit - contact data

Number and type of contacts			1 CO	3 CO
Contact material			$AgSnO_2$	
Max. switching voltage			300 V AC	
Rated load		AC1	16 A / 250 V AC	8 A / 250 V AC
		DC1	16 A / 24 V DC	8 A / 24 V DC
		DC1	0,3 A / 250 V DC	0,2 A / 250 V DC
Rated current			16 A / 250 V AC	8 A / 250 V AC
Max. breaking capacity		AC1	4 000 VA	2 000 VA
Min. breaking capacity			1 W 10 mA	
Contact resistance			≤ 100 mΩ	
Max. operating frequency			600 cycles/hour at rated load AC1	

Input circuit

Rated voltage	AC: 50/60 Hz AC/DC		12...240 V terminals (+)A1, (-)A2	
Must release voltage			≥ 0,1 U_n	
Operating range of supply voltage			0,9...1,1 U_n	
Rated power consumption		AC	≤ 1,5 VA AC: 50 Hz	
		DC	≤ 1,5 W	
Range of supply frequency		AC	48...63 Hz	
Control contact S ❶	• min. voltage ❷		0,7 U_n	
	• min. time of pulse duration ❷		AC: ≥ 50 ms	DC: ≥ 30 ms
	• max. length of control line		10 m	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection
	• pole - pole	2 000 V AC	contacts 3 CO, type of insulation: basic

General data

Electrical life	• resistive AC1		> 0,5 x 10^5	16 A, 8 A, 250 V AC
Mechanical life (cycles)			> 3 x 10^7	
Dimensions (L x W x H)			90 ❸ x 17,5 x 64,6 mm	
Weight			contact 1 CO: 65 g	contacts 3 CO: 88 g
Ambient temperature	• storage		-40...+70 °C	
(non-condensation and/or icing)	• operating		-20...+50 °C	
Cover protection category			IP 20	EN 60529
Relative humidity			up to 85%	
Shock / vibration resistance			15 g / 0,35 mm DA 10...55 Hz	

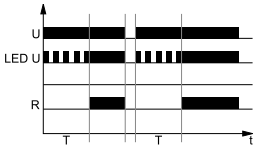
Time module data

Functions		E, Wu, Bp, Bi, R, Ws, Wa, Esa, B, T
Time ranges		OFF - permanent switching off; ON - permanent switching on 1 s ❹; 10 s; 1 min.; 10 min.; 1 h; 10 h; 1 d; 10 d
Timing adjustment		smooth - (0,1...1) x time range (does not refer to range ON / OFF)
Setting accuracy / Repeatability		± 5% ❺ ❹ / ± 0,5% ❹
Values affecting the timing adjustment		temperature: ± 0,05% / °C supply voltage: ± 0,01% / V
Recovery time		AC: ≤ 400 ms DC: ≤ 150 ms
LED indicator		green LED U ON - indication of supply voltage U green LED U flashing - measurement of T time yellow LED R ON/OFF - output relay status

❶ The control terminal S is activated by connection to A1 terminal via the external control contact S. ❷ Where the control signal is recognizable. ❸ Length with 35 mm rail catches: 98,8 mm. ❹ For first range setpoint (1 s) setting accuracy and repeatability are smaller than the given ones in technical parameters (significant influence of the operational relay operating time, processor start-time, and the moment of supply switching as referred to the AC supply course). ❺ Calculated from the final range values, for the setting direction from minimum to maximum.

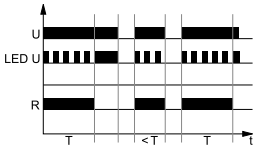
Time functions

E - ON delay.



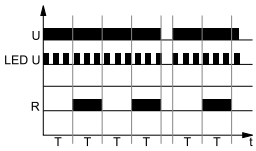
On applying the supply voltage U the set interval T begins - off-delay of the output relay R. After the interval T has lapsed, the output relay R switches on and remains on until supply voltage U is interrupted.

Wu - ON for the set interval.



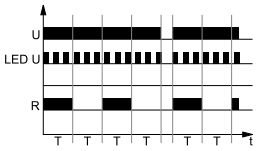
Applying the supply voltage U immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R switches off.

Bp - Symmetrical cyclical operation pause first.



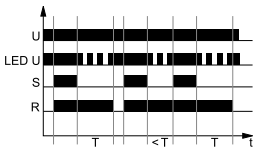
Applying the supply voltage U starts the cyclical operation from the interval T - switching the output relay R off followed by switching on the output relay R for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

Bi - Symmetrical cyclical operation pulse first.



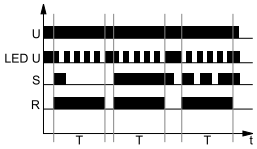
Applying the supply voltage U starts the cyclical operation from switching on the output relay R for the set interval T. After the interval T has lapsed, the output relay R switches off for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

R - OFF delay with the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches on the output relay R. Opening of the control contact S starts the set time of the delayed switching off of the output relay R. After the interval T has lapsed, the output relay R switches off. If the control contact S is closed during the interval T, the already measured time is reset, and the output relay R is switched on again. The OFF delay of the output relay R will start when the control contact S is opened again.

Ws - Single shot for the set interval triggered by closing of the control contact S.

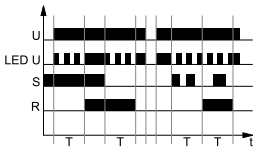


The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R is switched off. In the course of the interval T, any opening of the control contact S does not affect the function to be performed. The output relay R may be switched on again for the set interval, after the interval T has lapsed, by closing the control contact S again.

Wa - ON for the set interval triggered with the control contact S.

The input of the time relay is supplied with voltage U continuously. Closing of the control contact S does not start the interval T, and it does not change the position of the output relay R. Opening of the control contact S immediately switches on the output relay R for the set time. After the interval T has lapsed, the output relay R switches off. Opening and closing of the control contact S in the course of the interval T does not affect the function to be performed. The output relay R may be switched on again for the set interval with another closing and opening of the control contact S.

Esa - ON and OFF delay with the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S starts the interval T - on-delay of the output relay R. After the interval T has lapsed, the output relay R switches on. Opening of the control contact S begins further measurement of the interval T - off-delay of the output relay R, and after the interval has lapsed, the output relay switches off. In case the time for which the control contact S is closed in the course of measurement of the on-delay of the output relay R is shorter than the set interval T, the output relay R will switch on after the set interval T, and the output relay R will remain in on position for the interval T. When the output relay R is in on position, closing of the control contact S does not affect the function to be performed.

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T** - measured time; **t** - time axis

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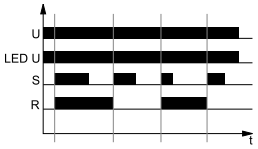
Time functions

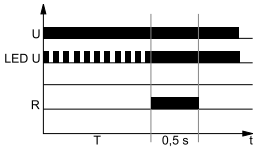
B - Cyclical operation controlled with closing of the control contact S.



The input of the time relay is supplied with U voltage continuously. Closing of the control contact S immediately switches on the output relay R. Each next closing of the control contact S results in a change of the status of the output relay R to an opposite one (the feature of a bistable relay).

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T** - measured time; **t** - time axis

T - Generation of the 0,5 s pulse after the interval T.



Applying the supply voltage U starts the interval T. After the interval T has lapsed, the output relay switches on for 0,5 s (the time of the NO contact of the output relay).

ON / **OFF** - Permanent switching on / off.
The functions ON and OFF are selected with T time range adjusting knob. In the ON function, the normally open contacts are closed all the time whereas in the OFF function they are open. The position of the function--adjusting knob is of no significance in these functions as is the preset measurement time. The ON or OFF functions are used for the time relay operation control in electric systems.

Additional functions

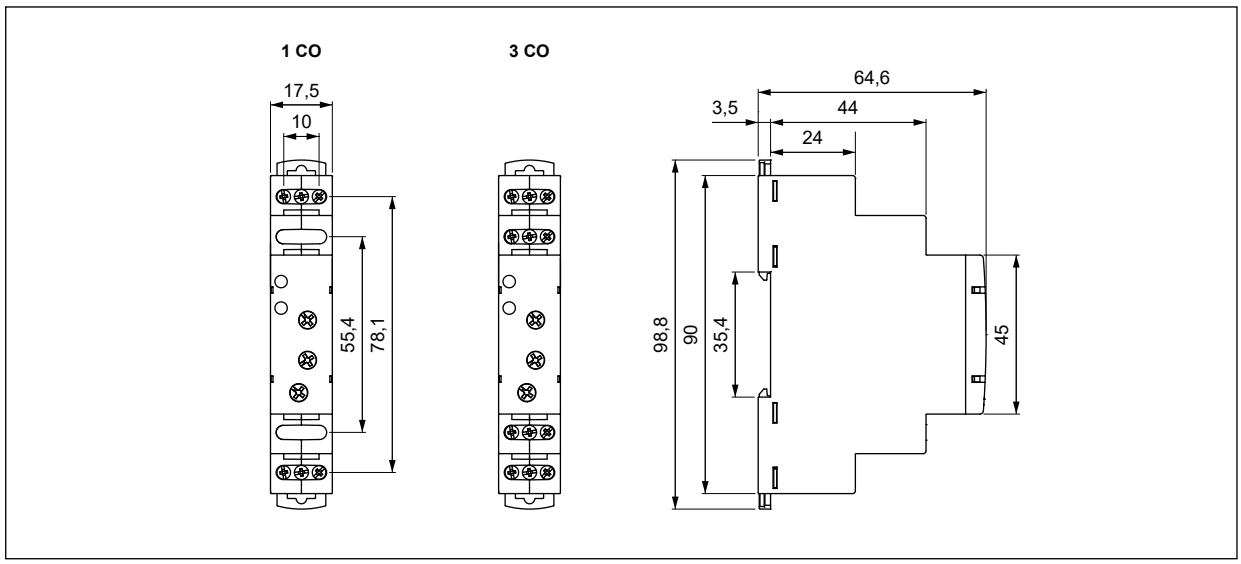
Supply diode: it is lit permanently when the time is not being measured. In course of the T time measurement, it flashes at 500 ms period where it is lit for 50% of the time, and off for 50% of the time.

Adjustment of the set values:
- the values of time and range are read in the course of the relay's operation. The set values may be modified at any moment,
- it is possible to change the function during operation of the relay, which results in triggering operation with a new setting. It is not necessary to switch the supply off and on again for the relay to start operating with a new setting.

Triggering: depending on the function to be performed, the relay is triggered with the supply voltage or by connection of the S contact to the A1 line. For DC supply, the positive pole must be connected to the A1 line. The level of the S contact activation is adjusted automatically depending on the supply voltage.

Supply: the relay may be supplied with DC voltage or AC voltage 48...63 Hz of 10,8...264 V.

Dimensions



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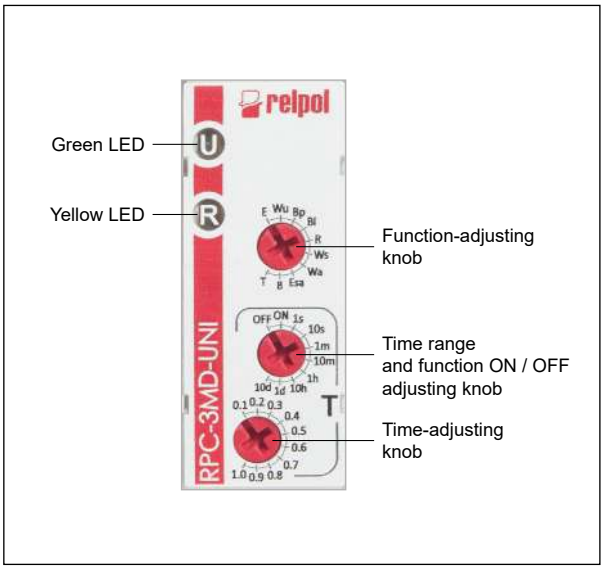
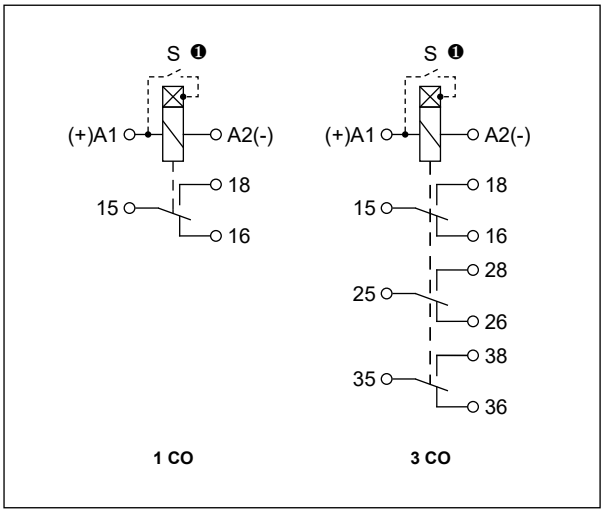
Front panel description



Connection diagrams

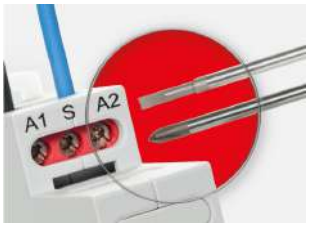


❶ The control terminal S is activated by connection to A1 terminal via the external control contact S.

Mounting

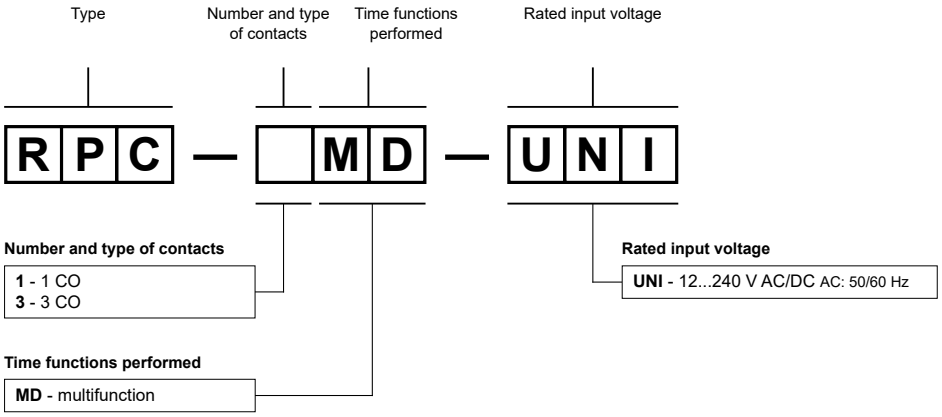
Relays **RPC-.MD-UNI** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes



Examples of ordering codes:

RPC-1MD-UNI time relay **RPC-.MD-UNI**, multifunction (relay perform 10 functions), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

RPC-3MD-UNI time relay **RPC-.MD-UNI**, multifunction (relay perform 10 functions), cover - modular, width 17,5 mm, three changeover contacts, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

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RPC-1ER-UNI


RPC-1WT-A230

- **Single-function time relays with independently controled times T1 and T2 (8 time ranges)**
- Cadmium - free contacts 1 CO • AC and AC/DC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in low-voltage systems
- Compliance with standard EN 61812-1
- Recognitions, certifications, directives: RoHS, CE EAC

- **Codes of versions** - time functions performed:

RPC-1ER-...	RPC-1EA-...	RPC-1ES-...	RPC-1EU-...	RPC-1IP-...	RPC-1SA-...	RPC-1WT-...
function ER	function EWa	function EWs	function EWu + NWu	function Ii + Ip	function WsWa	function Wt

Output circuit - contact data

Number and type of contacts		1 CO	
Contact material		$AgSnO_2$	
Max. switching voltage		300 V AC	
Rated load	AC1	16 A / 250 V AC	
	DC1	16 A / 24 V DC	0,3 A / 250 V DC
Rated current		16 A / 250 V AC	
Max. breaking capacity	AC1	4 000 VA	
Min. breaking capacity		1 W 10 mA	
Contact resistance		≤ 100 mΩ	
Max. operating frequency		600 cycles/hour at rated load AC1	

Input circuit

Rated voltage	50/60 Hz AC	230 V terminals A1, A2	
	AC: 50/60 Hz AC/DC	12...240 V terminals (+)A1, (-)A2	
Must release voltage		≥ 0,1 U_n	
Operating range of supply voltage		0,9...1,1 U_n	
Rated power consumption	AC	≤ 3,5 VA 230 V AC, 50 Hz	≤ 1,5 VA 12...240 V AC/DC, AC: 50 Hz
	DC	≤ 1,5 W 12...240 V AC/DC	
Range of supply frequency	AC	48...63 Hz	
Control contact S ❶			
• min. voltage ❷		0,7 U_n	
• min. time of pulse duration ❷		AC: ≥ 50 ms	DC: ≥ 30 ms
• max. length of control line		10 m	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection

❶ The control terminal S is activated by connection to A1 terminal via the external control contact S.
❷ Where the control signal is recognizable.

Table of codes Table 1

Time relay code	Rated input voltage
with 1 CO contact	
RPC-1ER-A230	230 V AC 50/60 Hz
RPC-1EA-A230	
RPC-1ES-A230	
RPC-1EU-A230	
RPC-1IP-A230	
RPC-1SA-A230	
RPC-1WT-A230	

Time relay code	Rated input voltage
with 1 CO contact	
RPC-1ER-UNI	12...240 V AC/DC AC: 50/60 Hz
RPC-1EA-UNI	
RPC-1ES-UNI	
RPC-1EU-UNI	
RPC-1IP-UNI	
RPC-1SA-UNI	
RPC-1WT-UNI	

General data

Electrical life	• resistive AC1	> 0,5 x 10^5	16 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7	
Dimensions (L x W x H)		90 ❸ x 17,5 x 64,6 mm	
Weight		65...66 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+50 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock resistance		15 g	
Vibration resistance		0,35 mm DA	10...55 Hz

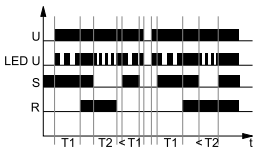
Time module data

Functions		ER, EWa, EWs, EWu + NWu, Ii + Ip, WsWa, Wt			
Time ranges		OFF - permanent switching off; ON - permanent switching on 1 s ❹; 10 s; 1 min.; 10 min.; 1 h; 10 h; 1 d; 10 d			
Timing adjustment		smooth - (0,1...1) x time range	(does not refer to range ON / OFF)		
Setting accuracy		± 5% ❺ ❹			
Repeatability		± 0,5% ❹			
Values affecting the timing adjustment		temperature: ± 0,05% / °C		supply voltage: ± 0,01% / V	
Recovery time	AC	≤ 150 ms	230 V AC, 50 Hz	≤ 400 ms	12...240 V AC/DC, AC: 50 Hz
	DC	≤ 150 ms	12...240 V AC/DC		
LED indicator		green LED U ON - indication of supply voltage U green LED U slow flashing - measurement of T1 time green LED U fast flashing - measurement of T2 time yellow LED R ON/OFF - output relay status			

❸ Length with 35 mm rail catches: 98,8 mm. ❹ For first range setpoint (1 s) setting accuracy and repeatability are smaller than the given ones in technical parameters (significant influence of the operational relay operating time, processor start-time, and the moment of supply switching as referred to the AC supply course). ❺ Calculated from the final range values, for the setting direction from minimum to maximum.

Time functions

ER - ON delay and OFF delay with control contact S. Independent settings of T1 and T2 intervals.
Codes of versions: **RPC-1ER-...**

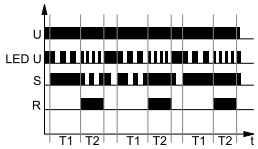


The input of the time relay is supplied with voltage U continuously. Closing of the control contact S starts the interval T1, and after it has lapsed, the output relay R switches on. Opening of the control contact S starts the interval T2, and after it has lapsed, the output relay R switches off. In case the control contact S is closed in the course of the interval T2, the measured time is reset and the output relay R remains switched on. In case the control contact S is closed for time shorter than T1, the unit will not switch the output relay R on.

EWa - OFF delay and breaking time delay with opening of the control contact S. Independent settings of T1 and T2 intervals.
Codes of versions: **RPC-1EA-...**

The input of the time relay is supplied with voltage U continuously. Closing of the control contact S switches on the output relay R. Opening of the control contact S starts the interval T1, and after the interval has lapsed, the output relay R switches off for the interval T2. Following the interval T2, the output relay R will be switched on again when the control contact S is closed on the lapse of the interval. In the course of the intervals T1 and T2 the position of the control contact S is of no importance.

EWs - ON delay and ON for the set time with closing of the control contact S. Independent settings of T1 and T2 intervals.
Codes of versions: **RPC-1ES-...**



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S starts the interval T1, and after the interval has lapsed, the output relay R switches on for the interval T2. Following the interval T2, the output relay switches off, and the circuits awaits for the control contact S to be closed again. In the course of the intervals T1 and T2 the position of the control contact S is of no importance.

U - supply voltage; **R** - output state of the relay;
S - control contact state; **T1**, **T2** - measured times; **t** - time axis

TIME

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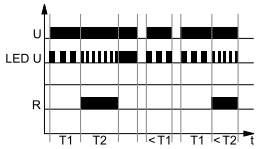
Time functions

EWu + NWu - ON delay for the set interval (EWu) or switching ON for the set interval-switching OFF for the set interval-continuous ON (NWu), with the control contact S. Independent settings of T1 and T2 intervals.
Codes of versions: **RPC-1EU-...**

function EWu



When the control contact S is open, application of the supply voltage U starts operation in the EWu function - the interval T1, and after the interval T1 has lapsed, the output relay switches on for the interval T2.

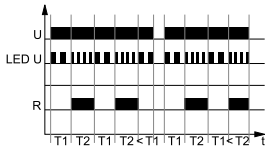
function NWu

When the control contact S is closed, application of the supply voltage U starts operation in the NWu function - from switching on the output relay R for the interval T1, and after the interval T1 has lapsed, the output relay switches off for the interval T2, and following the interval T2, the output relay R switches on for continuous time.

In the course of the relay operation, closing of the control contact S at any time will cause reset and the operation in the NWu function will start whereas opening of the control contact S at any time will cause reset and the operation in the EWu function will start.

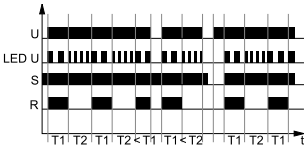
Ii + Ip - Cyclical operation in two independent intervals T1 and T2. Operation in the function Ii or Ip depending on the position of the control contact S.
Codes of versions: **RPC-1IP-...**

function Ip



Application of the supply voltage U when the control contact S is open start the cyclical operation in the Ip function - from the interval T1 (time of switching off the output relay R), following which the output relay R is switched on for the interval T2. The cyclical operation continues until the supply voltage U is interrupted.

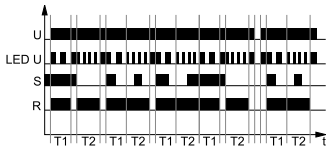
function Ii



When the control contact S is closed, application of the supply voltage U starts operation in the Ii function - from switching on the output relay R for the interval T1, and after the interval T1 has lapsed, the output relay switches off for the interval T2. The cyclical operation continues until the supply voltage U is interrupted.

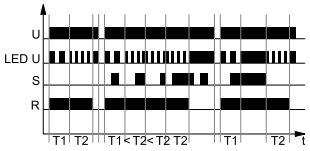
In the course of the relay operation, closing of the control contact S at any time will cause reset and the operation in the Ii function will start whereas opening of the control contact S at any time will cause reset and the operation in the Ip function will start.

WsWa - ON for the set intervals T1 and T2 with the control contact S. Independent settings of T1 and T2 intervals.
Codes of versions: **RPC-1SA-...**



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S switches the output relay R for the interval T1, and after the interval has lapsed, the relay R is switched off. Opening of the control contact S switches on the output relay R for the interval T2. If the control contact S is open when the interval T1 lapses, the output relay R will remain on for the interval T2. If the control contact S is closed when the interval T2 lapses, the output relay R will remain on for the interval T1.

Wt - Monitoring of the sequence of pulses. Switching on extended with consecutive pulses / closings of the contact S. Independent settings of T1 and T2 intervals.
Codes of versions: **RPC-1WT-...**



On applying the supply voltage U the output relay R is switched on for the set interval T1. After the interval T1 has lapsed, the interval T2 starts with the output relay R still switched on. For the output relay to switch on, the control contact S must be closed and then opened (single pulse) during the interval T2, which cancels the time already measured an starts the interval T2 again. In case of absence of a single pulse prior to lapse of the interval T2, the output relay R will switch off, and it may be switched on after the supply voltage has been interrupted and applied again.

ON / **OFF** - Permanent switching on / off.
The functions ON and OFF are selected with T1, T2 time range adjusting knobs. In the ON function, the normally open contacts are closed all the time whereas in the OFF function they are open. The ON state is implemented only when both T1, T2 time range adjusting knobs are set to ON. The OFF state is implemented only when at least one of the T1, T2 time range adjusting knobs is set to OFF or when one of these knobs is set to time range 1 s, 10 s, etc., and the other is set to ON. The ON or OFF functions are used for the time relay operation control in electric systems.

U - supply voltage; **R** - output state of the relay;
S - control contact state; **T1**, **T2** - measured times; **t** - time axis

TIME

Additional functions

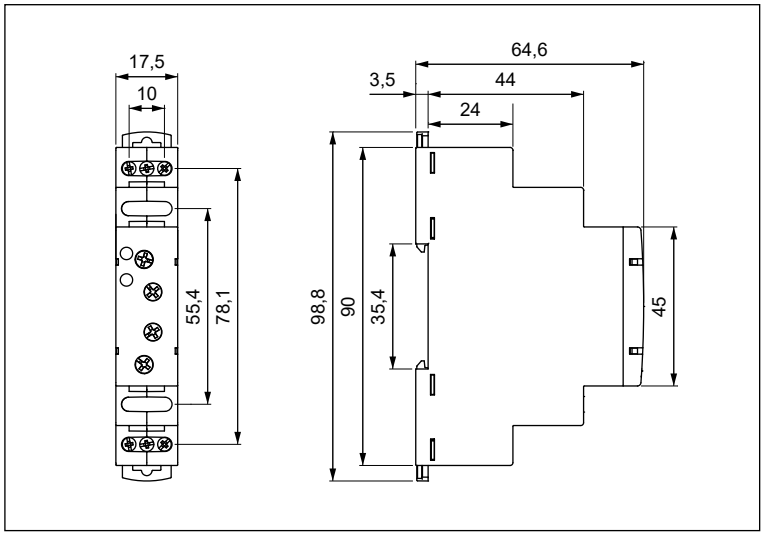
Supply diode: it is lit permanently when the time is not being measured. In course of the T1 time measurement, it flashes at 500 ms period, in course of the T2 time measurement at 250 ms period, where it is lit for 50% of the time, and off for 50% of the time.

Adjustment of the set values: the values of time and range are read in the course of the relay's operation. The set values may be modified at any moment.

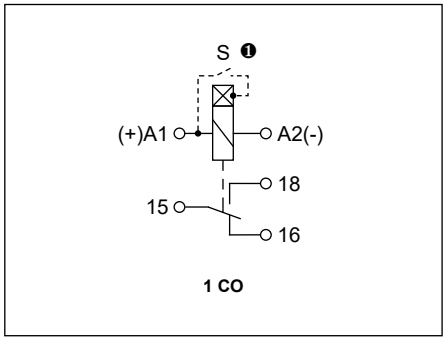
Triggering: the relay is triggered by connection of the S contact to the A1 line. For DC supply, the positive pole must be connected to the A1 line. The level of the S contact activation is adjusted automatically depending on the supply voltage.

Supply:
- **RPC-...-A230**: the relay may be supplied with AC voltage 48...63 Hz of 207...253 V,
- **RPC-...-UNI**: the relay may be supplied with DC voltage or AC voltage 48...63 Hz of 10,8...264 V.

Dimensions

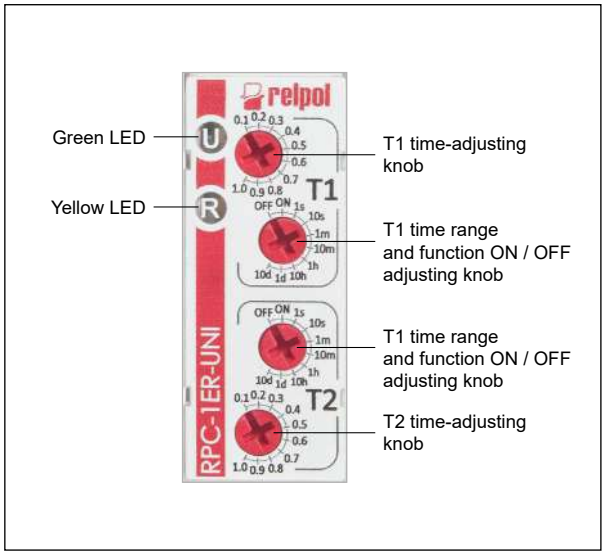


Connection diagram



Note: the indicated polarization of the supply refers only to the relays RPC-...-UNI. ❶ The control terminal S is activated by connection to A1 terminal via the external control contact S.

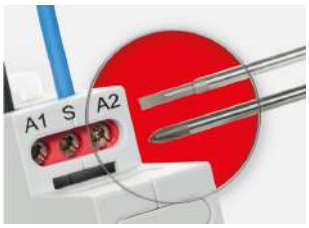
Front panel description



Mounting

Relays **RPC-1..-...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

TIME

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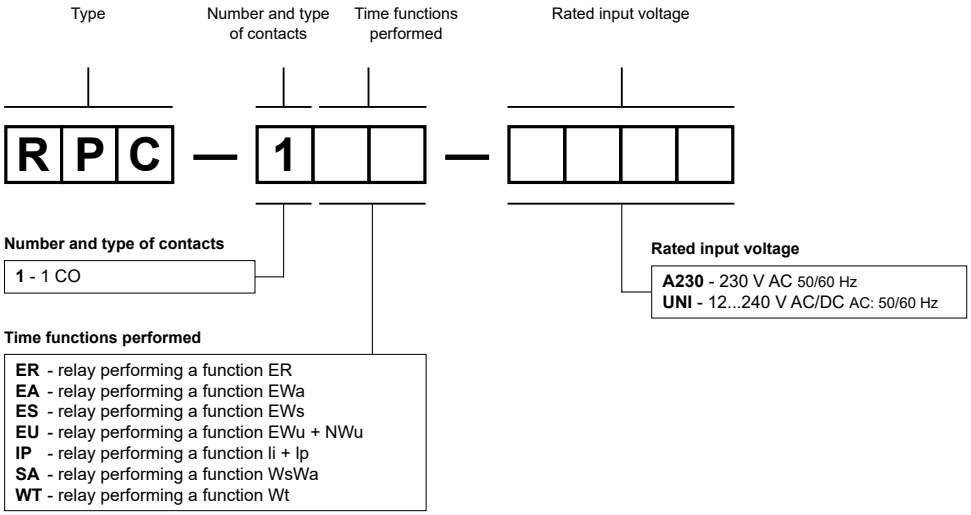
Ordering codes



Examples of ordering codes ❻:

RPC-1ER-A230 time relay **RPC-1ER-...**, single-function (relay perform function ER), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage 230 V AC 50/60 Hz

RPC-1WT-UNI time relay **RPC-1WT-...**, single-function (relay perform function Wt), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

❻ Ordering codes **RPC-1ER/EA/ES/EU/IP/SA/WT-...** are specified in Table 1, "Time relay code" column.

Table of codes

Table 1

Time relay code	Rated input voltage
with 1 CO contact	
RPC-1ER-A230	230 V AC 50/60 Hz
RPC-1EA-A230	
RPC-1ES-A230	
RPC-1EU-A230	
RPC-1IP-A230	
RPC-1SA-A230	
RPC-1WT-A230	

Time relay code	Rated input voltage
with 1 CO contact	
RPC-1ER-UNI	12...240 V AC/DC AC: 50/60 Hz
RPC-1EA-UNI	
RPC-1ES-UNI	
RPC-1EU-UNI	
RPC-1IP-UNI	
RPC-1SA-UNI	
RPC-1WT-UNI	

RPC-1E-UNI

RPC-2BP-A230

• **Single-function time relays (8 time ranges)** • Cadmium - free contacts 1 CO and 2 CO • AC and AC/DC input voltages • Cover - modular, width 17,5 mm • Direct mounting on 35 mm rail mount acc. to EN 60715 • Applications: in low-voltage systems • Compliance with standard EN 61812-1 • Recognitions, certifications, directives: RoHS,

• **Codes of versions** - time functions performed:

RPC-.E-...	RPC-.WU-...	RPC-.BP-...
function E	function Wu	function Bp

Output circuit - contact data

Number and type of contacts		1 CO	2 CO
Contact material		$AgSnO_2$	
Max. switching voltage		300 V AC	
Rated load	AC1	16 A / 250 V AC	8 A / 250 V AC
	DC1	16 A / 24 V DC	8 A / 24 V DC
	DC1	0,3 A / 250 V DC	0,3 A / 250 V DC
Rated current		16 A / 250 V AC	8 A / 250 V AC
Max. breaking capacity	AC1	4 000 VA	2 000 VA
Min. breaking capacity		1 W 10 mA	
Contact resistance		≤ 100 mΩ	
Max. operating frequency		600 cycles/hour at rated load AC1	

Input circuit

Rated voltage	50/60 Hz AC	230 V terminals A1, A2	
	AC: 50/60 Hz AC/DC	12...240 V terminals (+)A1, (-)A2	
Must release voltage		≥ 0,1 U_n	
Operating range of supply voltage		0,9...1,1 U_n	
Rated power consumption	AC	≤ 3,5 VA 230 V AC, 50 Hz	≤ 1,5 VA 12...240 V AC/DC, AC: 50 Hz
	DC	≤ 1,5 W 12...240 V AC/DC	
Range of supply frequency	AC	48...63 Hz	

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		2	
Flammability class		V-0	for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection
	• pole - pole	2 000 V AC	contacts 2 CO, type of insulation: basic

General data

Electrical life	• resistive AC1	> 0,5 x 10^5	16 A, 8 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7	
Dimensions (L x W x H)		90 ❶ x 17,5 x 64,6 mm	
Weight		contact 1 CO: 64...71 g	contacts 2 CO: 70...71 g
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+50 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock / vibration resistance		15 g / 0,35 mm DA 10...55 Hz	

❶ Length with 35 mm rail catches: 98,8 mm.

Table of codes Table 1

Time relay code		Rated input voltage
with 1 CO contact	**with 2 CO contacts**	
RPC-1E-A230	RPC-2E-A230	230 V AC 50/60 Hz
RPC-1WU-A230	RPC-2WU-A230	
RPC-1BP-A230	RPC-2BP-A230	
RPC-1E-UNI	RPC-2E-UNI	12...240 V AC/DC AC: 50/60 Hz
RPC-1WU-UNI	RPC-2WU-UNI	
RPC-1BP-UNI	RPC-2BP-UNI	

TIME

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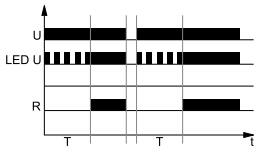
Time module data

Functions		E, Wu, Bp
Time ranges		OFF - permanent switching off; ON - permanent switching on 1 s ❷; 10 s; 1 min.; 10 min.; 1 h; 10 h; 1 d; 10 d
Timing adjustment		smooth - (0,1...1) x time range (does not refer to range ON / OFF)
Setting accuracy		± 5% ❸ ❷
Repeatability		± 0,5% ❷
Values affecting the timing adjustment		temperature: ± 0,05% / °C supply voltage: ± 0,01% / V
Recovery time	AC	≤ 150 ms 230 V AC, 50 Hz ≤ 400 ms 12...240 V AC/DC, AC: 50 Hz
	DC	≤ 150 ms 12...240 V AC/DC
LED indicator		green LED U ON - indication of supply voltage U green LED U flashing - measurement of T time yellow LED R ON/OFF - output relay status

❷ For first range setpoint (1 s) setting accuracy and repeatability are smaller than the given ones in technical parameters (significant influence of the operational relay operating time, processor start-time, and the moment of supply switching as referred to the AC supply course). ❸ Calculated from the final range values, for the setting direction from minimum to maximum.

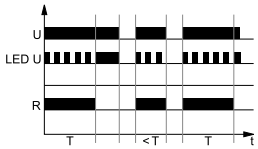
Time functions

E - ON delay.
Codes of versions: **RPC-.E-...**



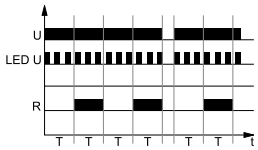
On applying the supply voltage U the set interval T begins - off-delay of the output relay R. After the interval T has lapsed, the output relay R switches on and remains on until supply voltage U is interrupted.

Wu - ON for the set interval.
Codes of versions: **RPC-.WU-...**



Applying the supply voltage U immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R switches off.

Bp - Symmetrical cyclical operation pause first.
Codes of versions: **RPC-.BP-...**



Applying the supply voltage U starts the cyclical operation from the interval T - switching the output relay R off followed by switching on the output relay R for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

ON / **OFF** - Permanent switching on / off.
The functions ON and OFF are selected with T time range adjusting knob. In the ON function, the normally open contacts are closed all the time whereas in the OFF function they are open. The preset measurement time is of no significance in these functions. The ON or OFF functions are used for the time relay operation control in electric systems.

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T** - measured time; **t** - time axis

Additional functions

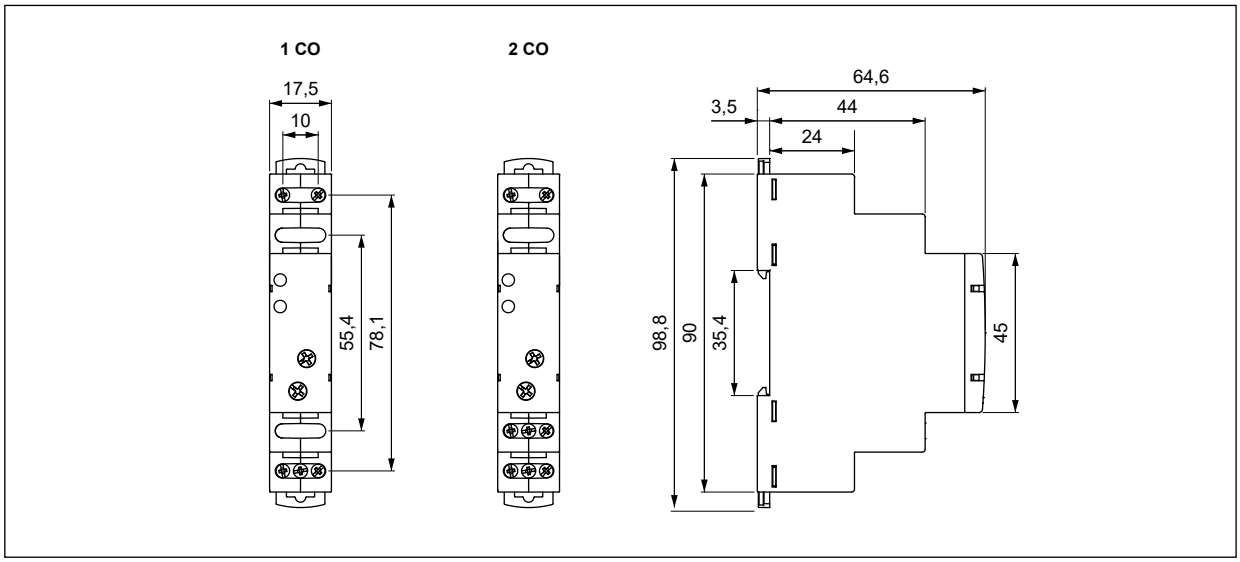
Supply diode: it is lit permanently when the time is not being measured. In course of the T time measurement, it flashes at 500 ms period where it is lit for 50% of the time, and off for 50% of the time.

Adjustment of the set values: the values of time and range are read in the course of the relay's operation. The set values may be modified at any moment.

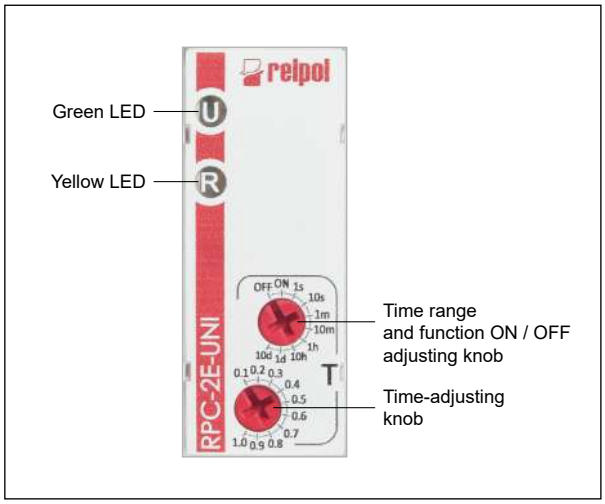
Triggering: the relay is triggered with the supply voltage.

Supply:
- **RPC-...-A230**: the relay may be supplied with AC voltage 48...63 Hz of 207...253 V,
- **RPC-...-UNI**: the relay may be supplied with DC voltage or AC voltage 48...63 Hz of 10,8...264 V.

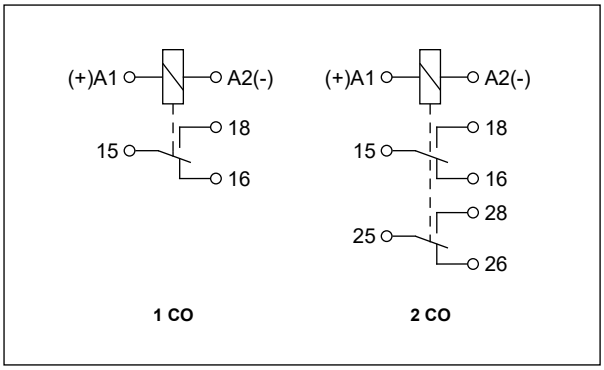
Dimensions



Front panel description



Connection diagrams

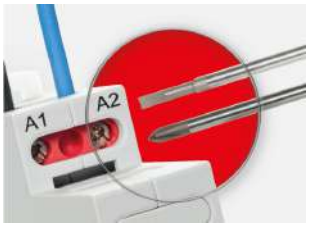


Note: the indicated polarization of the supply refers only to the relays RPC-...-UNI.

Mounting

Relays **RPC-...-...** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

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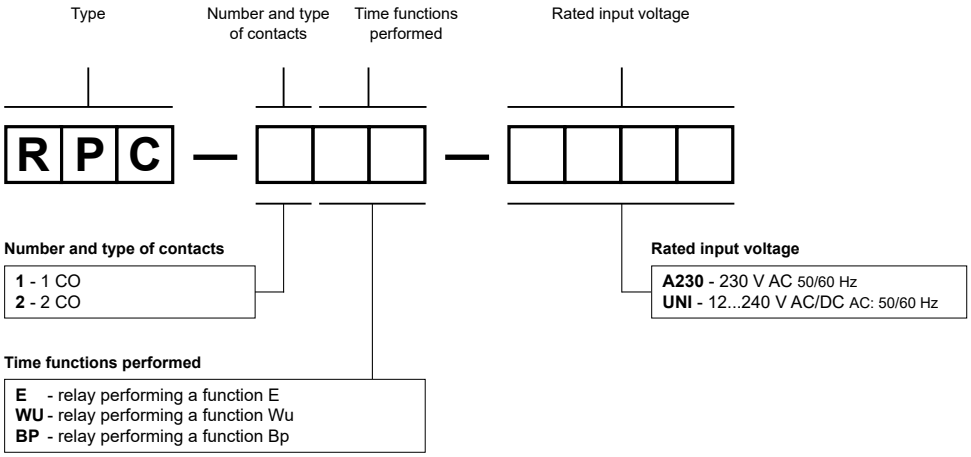
Ordering codes



Examples of ordering codes ❹:

RPC-1E-A230 time relay **RPC-.E-...**, single-function (relay perform function E), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage 230 V AC 50/60 Hz

RPC-2BP-UNI time relay **RPC-.BP-...**, single-function (relay perform function Bp), cover - modular, width 17,5 mm, two changeover contacts, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

❹ Ordering codes **RPC-.E/WU/BP-...** are specified in Table 1, "Time relay code" column.

Table of codes

Table 1

Time relay code		Rated input voltage
with 1 CO contact	**with 2 CO contacts**	
RPC-1E-A230	RPC-2E-A230	230 V AC 50/60 Hz
RPC-1WU-A230	RPC-2WU-A230	
RPC-1BP-A230	RPC-2BP-A230	
RPC-1E-UNI	RPC-2E-UNI	12...240 V AC/DC AC: 50/60 Hz
RPC-1WU-UNI	RPC-2WU-UNI	
RPC-1BP-UNI	RPC-2BP-UNI	

RPC-2SD-UNI

- **Single-function time relays with independently controled times T1 and T2 (time function SD** - Star-Delta start-up**; 10 time ranges)**
- Cadmium - free contacts 2 x 1 CO • AC/DC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in low-voltage systems
- Compliance with standard EN 61812-1
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit - contact data

Number and type of contacts		2 x 1 CO
Contact material		$AgSnO_2$
Max. switching voltage		300 V AC
Rated load	AC1	8 A / 250 V AC
	DC1	8 A / 24 V DC 0,3 A / 250 V DC
Rated current		8 A / 250 V AC
Max. breaking capacity	AC1	2 000 VA
Min. breaking capacity		1 W 10 mA
Contact resistance		≤ 100 mΩ
Max. operating frequency		600 cycles/hour at rated load AC1

Input circuit

Rated voltage	AC: 50/60 Hz AC/DC	12...240 V terminals (+)A1, (-)A2
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,9...1,1 U_n
Rated power consumption	AC	≤ 1,5 VA AC: 50 Hz
	DC	≤ 1,5 W
Range of supply frequency	AC	48...63 Hz

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2
Flammability class		V-0 for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC type of insulation: basic
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
	• pole - pole	2 000 V AC type of insulation: basic

General data

Electrical life	• resistive AC1	> 0,5 x 10^5 8 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		90 ❶ x 17,5 x 64,6 mm
Weight		83 g
Ambient temperature	• storage	-40...+70 °C
(non-condensation and/or icing)	• operating	-20...+50 °C
Cover protection category		IP 20 EN 60529
Relative humidity		up to 85%
Shock resistance		15 g
Vibration resistance		0,35 mm DA 10...55 Hz

Time module data

Functions	SD
Time ranges (start-up for the star) T1	1 s ❷; 10 s; 30 s; 1 min.; 1,5 min.; 3 min.; 5 min.; 10 min.; 30 min.; 1 h
Timing adjustment T1	smooth - (0,1...1) x time range
Transit time (adjustable) ❸ T2	smoothly within the range 0,05...0,9 s (linear adjustment of time)
Setting accuracy	± 5% ❹ ❷
Repeatability	± 0,5% ❷
Values affecting the timing adjustment	temperature: ± 0,05% / °C supply voltage: ± 0,01% / V
Recovery time	AC: ≤ 400 ms DC: ≤ 150 ms
LED indicator	green LED U ON - indication of supply voltage U green LED U slow flashing - measurement of T1 time green LED U fast flashing - measurement of T2 time yellow LEDs ON/OFF - contactors switching signal

❶ Length with 35 mm rail catches: 98,8 mm. ❷ For first range setpoint (1 s) setting accuracy and repeatability are smaller than the given ones in technical parameters (significant influence of the operational relay operating time, processor start-time, and the moment of supply switching as referred to the AC supply course). ❸ Pause time between switching off the star contactor and switching on the delta contactor. ❹ Calculated from the final range values, for the setting direction from minimum to maximum.

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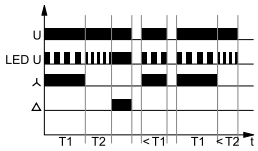
Time functions

SD - Star-Delta start-up.



When the supply voltage U is applied, the operating star-contact (15-18) becomes closed, which is signaled with illumination of the yellow LED. Measurement of the set time T1 starts, and the greed LED slow flashes. After the T1 time has lapsed, the star contact is disconnected and the relay begins measuring the T2 time, which is signaled with the green LED fast flashing. After the T2 time has lapsed, the delta contact (25-28) is switched on together with the yellow LED, and the green LED remains illuminated.

Additional functions

Supply diode: it is lit permanently when the time is not being measured. In course of the T1 time measurement, it flashes at 500 ms period, in course of the T2 time measurement at 250 ms period, where it is lit for 50% of the time, and off for 50% of the time.

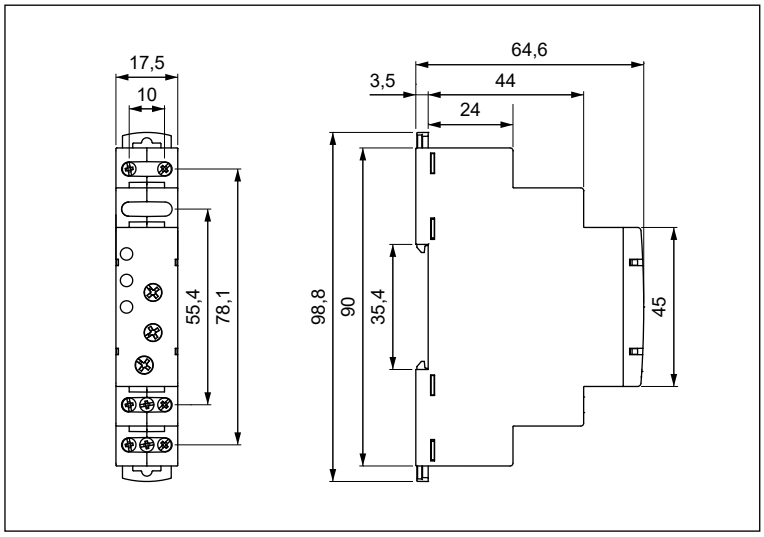
Adjustment of the set values: the values of time and range are read in the course of the relay's operation. The set values may be modified at any moment.

Triggering: the relay is triggered with the supply voltage.

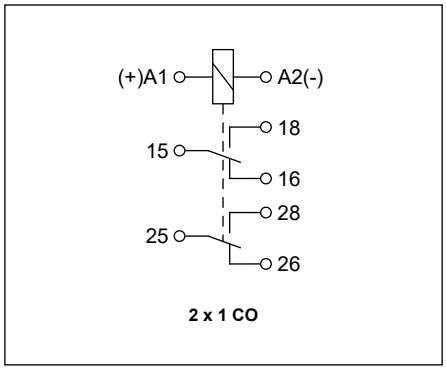
Supply: the relay may be supplied with DC voltage or AC voltage 48...63 Hz of 10,8...264 V.

U - supply voltage; **T1**, **T2** - measured times; **t** - time axis

Dimensions



Connection diagram



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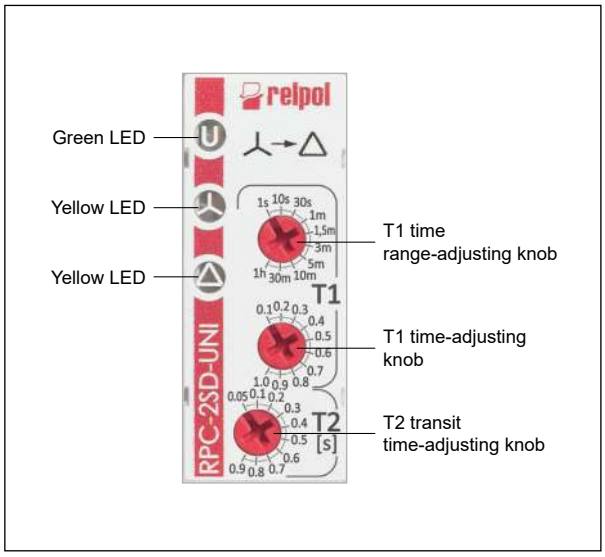
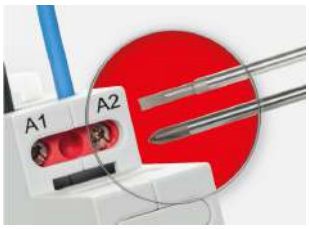
Front panel description



Mounting

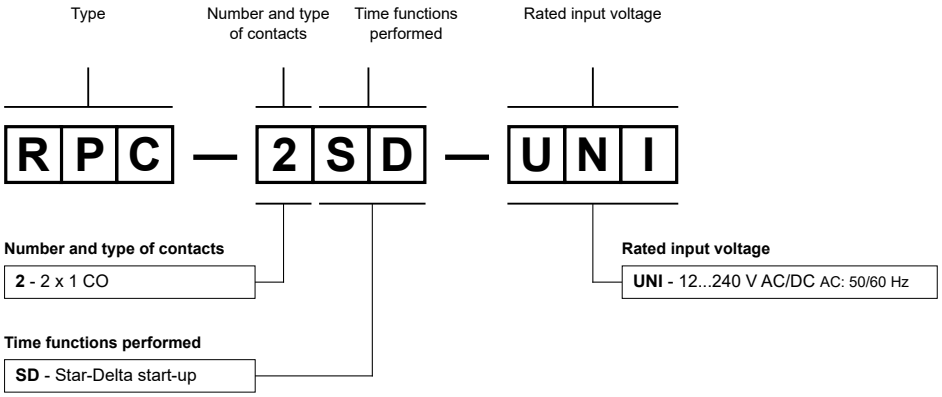
Relays **RPC-2SD-UNI** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes



Example of ordering codes:

RPC-2SD-UNI time relay **RPC-2SD-UNI**, single-function (relay perform function SD), cover - modular, width 17,5 mm, two changeover contacts, contact material $AgSnO_2$, rated input voltage 12...240 V AC/DC AC: 50/60 Hz

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RPC-1AS-A230

NEW

• **Staircase switches** - switching lighting circuits equipped with gas-discharge lamps or bulbs

- **Multifunction time relays (5 time functions; 10 time ranges)**
- **Resistance to inrush current 120 A (20 ms)**
- Cadmium - free contacts 1 NO • AC input voltages • Cover - modular, width 17,5 mm • Direct mounting on 35 mm rail mount acc. to EN 60715 • Applications: in low-voltage systems • Compliance with standard EN 61812-1 • Recognitions, certifications, directives: RoHS,

CE EAC

Output circuit - contact data

Number and type of contacts		1 NO
Contact material		$AgSnO_2$
Max. switching voltage		300 V AC
Rated load	AC1	16 A / 250 V AC
	AC5a	3 A / 230 V AC 690 VA, gas-discharge lamps ❶
	AC5b	230 V AC 1 000 W, bulbs ❶
Rated current		16 A / 250 V AC
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		1 W 10 mA
Contact resistance		≤ 100 mΩ
Max. operating frequency		600 cycles/hour at rated load AC1

Input circuit

Rated voltage	50/60 Hz AC	230 V terminals A1, A2
Must release voltage		≥ 0,1 U_n
Operating range of supply voltage		0,9...1,1 U_n
Rated power consumption	AC	≤ 3,5 VA 50 Hz
Range of supply frequency	AC	48...63 Hz
Control contact S ❷	• min. voltage ❸	0,7 U_n
	• min. time of pulse duration ❸	AC: ≥ 50 ms
	• max. length of control line	10 m
	• max. load	10 mA

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2
Flammability class		V-0 for modular cover, UL 94
Dielectric strength	• input - output	4 000 V AC type of insulation: basic
	• contact clearance	1 000 V AC type of clearance: micro-disconnection

General data

Electrical life	• resistive AC1	> 0,5 x 10^5 16 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H) / Weight		90 ❹ x 17,5 x 64,6 mm / 66 g
Ambient temperature	• storage	-30...+70 °C
(non-condensation and/or icing)	• operating	-20...+50 °C
Cover protection category		IP 20 EN 60529
Relative humidity		up to 85%
Shock / vibration resistance		15 g / 0,35 mm DA 10...55 Hz

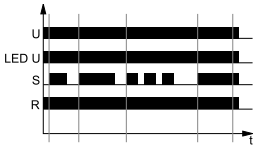
Time module data

Functions	ON, OFF, AUTO, R, Wi, Extra Time
Time ranges	1 s ❺; 10 s; 20 s; 30 s; 1 min.; 1,5 min.; 2 min.; 3 min.; 5 min.; 10 min.
Timing adjustment	(1...10) x time range
Setting accuracy / Repeatability	± 5% ❻ ❺ / ± 0,5% ❺
Values affecting the timing adjustment	temperature: ± 0,05% / °C supply voltage: ± 0,01% / V
Recovery time	AC: ≤ 150 ms
LED indicator	green LED U ON - indication of supply voltage U green LED U flashing - measurement of T time yellow LED R ON/OFF - output relay status

❶ Acc. to EN 60669-2-1; AC5a - without an additional capacitor or test with a 14 µF capacitor. ❷ The control terminal S is activated by connection to A1 terminal via the external control contact S. ❸ Where the control signal is recognizable. ❹ Length with 35 mm rail catches: 98,8 mm. ❺ For first range setpoint (1 s) setting accuracy and repeatability are smaller than the given ones in technical parameters (significant influence of the operational relay operating time, processor start-time, and the moment of supply switching as referred to the AC supply course). ❻ Calculated from the final range values, for the setting direction from minimum to maximum.

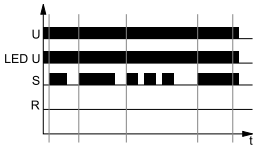
Time functions

ON - Stable ON.



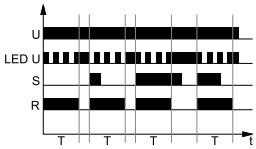
Applying the supply voltage U results in stable switching on the R contact. Switching the control contact S does not affect the status of the R contact.

OFF - Stable OFF.



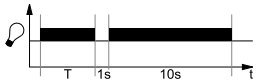
Applying the supply voltage U does not result in any change of the status of the relay - the R contact remains switched off permanently. Switching the control contact S on and off does not affect the status of the R contact.

AUTO - ON for a set interval triggered by applying the supply voltage U or closing of the control contact S.



Each application of the supply voltage U or closing of the control contact S while supply voltage U is applied results in immediate switching the R contact on for an adjustable interval T. After the T interval has lapsed, the R contact remains off. Opening and closing of the control contact S within the T interval does not affect the function to be fulfilled.

AUTO + Extra Time



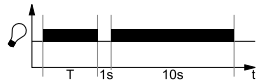
If the AUTO function is activated in the "Extra Time" Mode, after the T interval has lapsed, the R contact is switched off for 1 s, and switched on again for 10 s. After the time of 10 s has been measured, the R contact is switched off.

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T** - measured time; **t** - time axis

R - OFF delay with the control contact S.

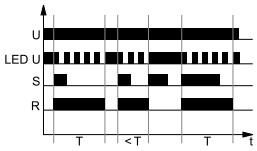
The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches on the output relay R. Opening of the control contact S starts the set time of the delayed switching off of the output relay R. After the interval T has lapsed, the output relay R switches off. If the control contact S is closed during the interval T, the already measured time is reset, and the output relay R is switched on again. The OFF delay of the output relay R will start when the control contact S is opened again.

R + Extra Time



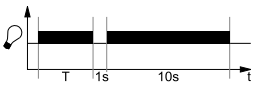
If the R function is activated in the "Extra Time" Mode, after the T interval has lapsed, the R contact is switched off for 1 s, and switched on again for 10 s. After the time of 10 s has been measured, the R contact is switched off.

Wi - ON for the set interval controlled by closing of the control contact S, with the function of switching off the output relay R prior to the lapse of the interval T.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R is switched off. Any next closing of the control contact S switches on the output relay R again. In case the control contact S is closed again during the interval T, the output relay is immediately switched off, and the measured interval is cancelled. In the course of the interval T, any opening of the control contact S does not affect the function to be performed.

Wi + Extra Time



If the Wi function is activated in the "Extra Time" Mode, after the T interval has lapsed, the R contact is switched off for 1 s, and switched on again for 10 s. After the time of 10 s has been measured, the R contact is switched off.

Additional functions

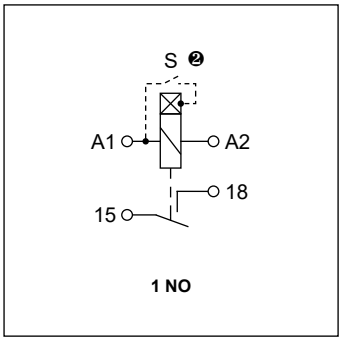
Supply diode: it is lit permanently when the time is not being measured. In course of the T time measurement, it flashes at 500 ms period where it is lit for 50% of the time, and off for 50% of the time.

Adjustment of the set values:
- the values of time and range are read in the course of the relay's operation. The set values may be modified at any moment,
- it is possible to change the function during operation of the relay, which results in triggering operation with a new setting. It is not necessary to switch the supply off and on again for the relay to start operating with a new setting.

Triggering: depending on the function to be performed, the relay is triggered with the supply voltage or by connection of the S contact to the A1 line.

Supply: the relay may be supplied with AC voltage 48...63 Hz with a nominal value 230 V.

Connection diagram



❷ The control terminal S is activated by connection to A1 terminal via the external control contact S.

TIME

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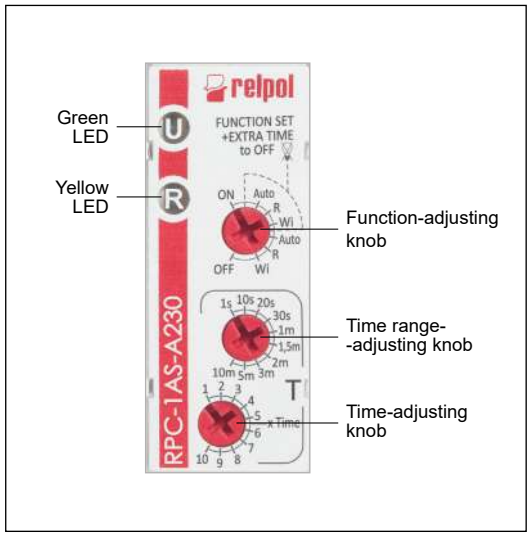
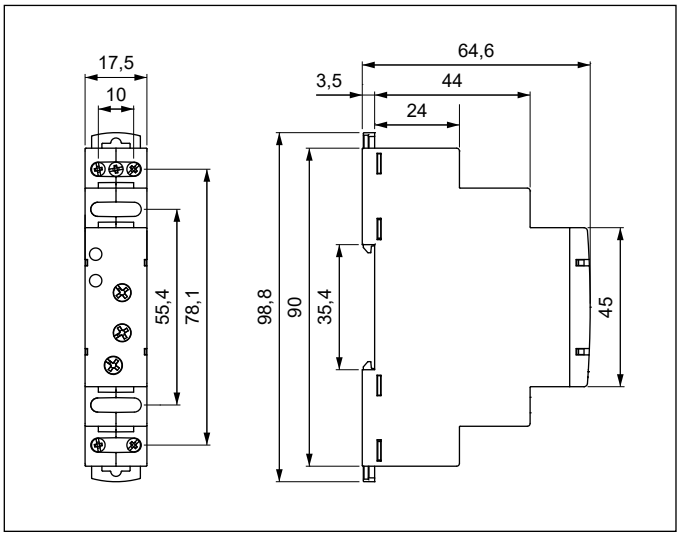
Front panel description



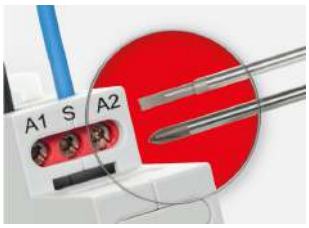
Dimensions



Mounting

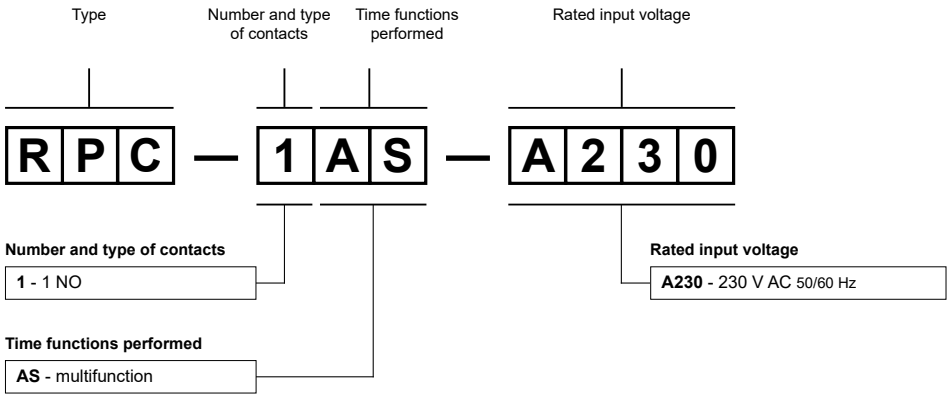
Relays **RPC-1AS-A230** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes



Example of ordering codes:

RPC-1AS-A230 time relay **RPC-1AS-A230**, multifunction (relay perform 5 functions), cover - modular, width 17,5 mm, one normally open contact, contact material $AgSnO_2$, rated input voltage 230 V AC 50/60 Hz

- 10-function electronic time relays in compact cover • Cadmium - free contacts • AC and AC/DC input voltages • Direct mounting on 35 mm rail mount acc. to EN 60715 • The main advantages of application: simple selection of the performed function, possibility to control one or two circuits (1 or 2 changeover contacts), esthetic design in the control cabinet
- The switching capacity of contacts as in RM85 (1 CO) or RM84 (2 CO) electromagnetic relay • Compliance with standard EN 61812-1
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuits - contact data

Number and type of contacts		1 CO		2 CO	
Contact material		**AgNi**		**AgNi**	
Max. switching voltage		400 V AC / 300 V DC		400 V AC / 300 V DC	
Rated load	AC1	16 A / 250 V AC		8 A / 250 V AC	
	DC1	16 A / 24 V DC; 0,3 A / 250 V DC		8 A / 24 V DC; 0,3 A / 250 V DC	
Rated current		16 A		8 A	
Max. breaking capacity	AC1	4 000 VA		2 000 VA	
Min. breaking capacity		0,3 W 5 V, 5 mA			
Contact resistance		≤ 100 mΩ			
Max. operating frequency					
• at rated load	AC1	600 cycles/hour			
• no load		72 000 cycles/hour			
Input circuit					
Rated voltage	50/60 Hz AC	115, 230 V			
	AC: 50/60 Hz AC/DC	12, 24 V			
Operating range of supply voltage		0,9...1,2 U_n	12 V AC/DC		
		0,85...1,2 U_n	24 V AC/DC, 115 V AC, 230 V AC		
Rated power consumption	AC	1,3 VA	115 V AC	1,7 VA	230 V AC
	AC/DC	0,5 VA / 0,5 W	12 V AC/DC	0,7 VA / 0,7 W	24 V AC/DC
Range of supply frequency	AC	48...63 Hz			
	AC/DC	48...100 Hz			
Control contact S ❶					
• min. voltage ❷		0,6 U_n			
• min. time of pulse duration ❷		AC: ≥ 25 ms	DC: ≥ 15 ms		
Insulation according to EN 60664-1					
Insulation rated voltage		250 V AC			
Insulation category		B250			
Overvoltage category		III			
Insulation pollution degree		2			
Flammability class		V-1	UL 94		
Dielectric strength	• input - outputs	2 000 V AC	type of insulation: basic		
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection		
Input - outputs distance					
• clearance		≥ 10 mm			
• creepage		≥ 10 mm			
General data					
Electrical life					
• resistive AC1		> 0,7 x 10^5	16 A, 250 V AC	> 10^5	8 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7			
Dimensions (L x W x H)		90 x 17,6 x 55 mm			
Weight		67 g			
Ambient temperature	• storage	-40...+70 °C			
(non-condensation and/or icing)	• operating	-20...+55 °C			
Cover protection category		IP 20	EN 60529		
Environmental protection		RTI	EN 61810-7		
Shock resistance		15 g			
Vibration resistance		0,35 mm DA	10...55 Hz		

The data in bold type relate to the standard versions of the relays.
❶ The control terminal S is activated by connection to A1 terminal via the external control contact S.
❷ Where the control signal is recognizable.

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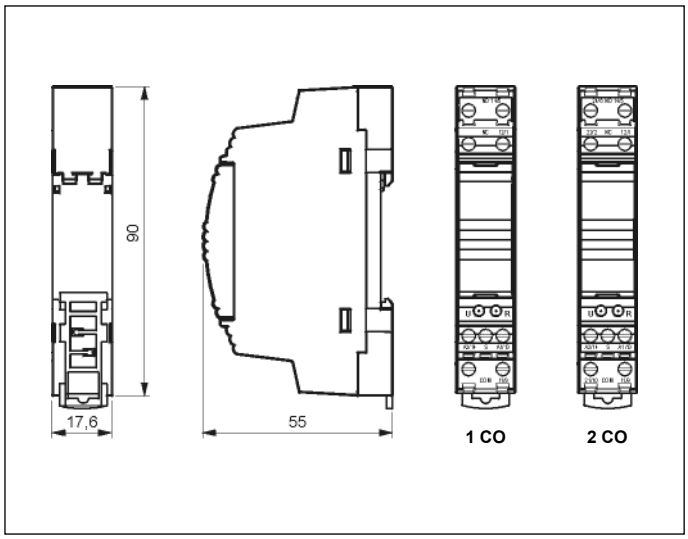
Time module data

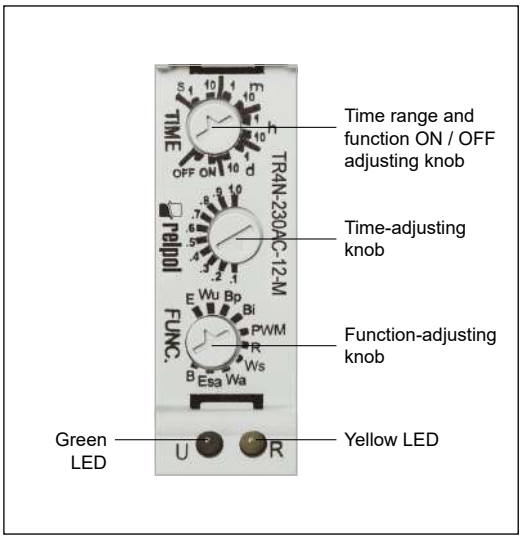
Functions	E, Wu, Bp, Bi, PWM, R, Ws, Wa, Esa, B permanent switching ON and OFF
Time ranges	1 s ❸; 10 s; 1 min.; 10 min.; 1 h; 10 h; 1 d; 10 d
Timing adjustment	smooth - (0,1...1) x time range
Setting accuracy	± 5% (calculated from the final range values) ❸
Repeatability	± 0,5% ❸
Temperature influence	± 0,01% / °C
Recovery time	80 ms
LED indicator	green LED - indication of supply voltage U yellow LED - indication of time period T and the status of outputs after the time T has been measured ❹

❸ For first range setpoint (1 s) setting accuracy and repeatability are smaller than the given ones in technical parameters (significant influence of the operational relay operating time). Recommend to set measuring time by experimental method. ❹ The yellow LED - T time measurement (pulsating); excited operational relay; time not measured (steady light); de-excited operational relay, time not measured (no light).

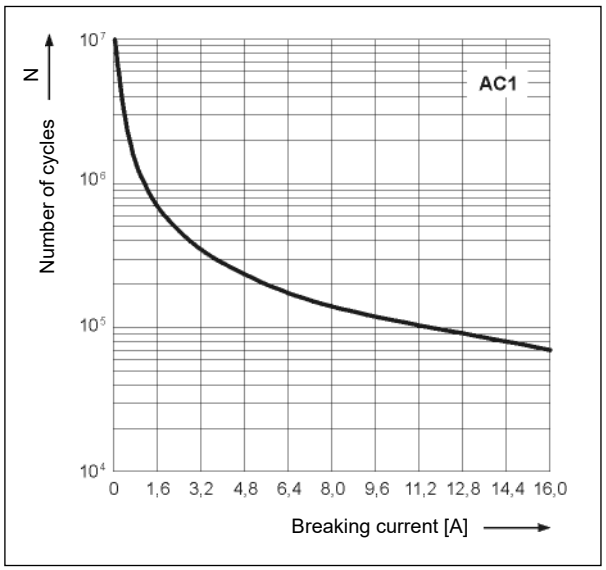
Dimensions



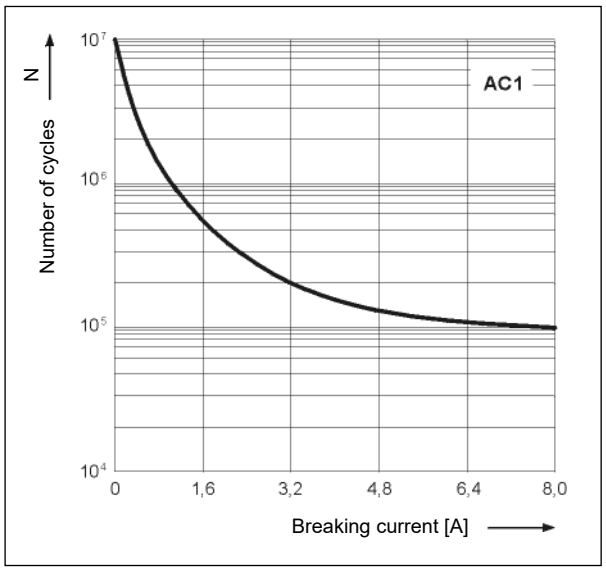
Front panel description



Electrical life at AC resistive current. Switching frequency: 600 cycles/hour - TR4N 1 CO — Fig. 1

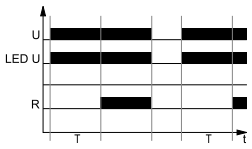


Electrical life at AC resistive current. Switching frequency: 600 cycles/hour - TR4N 2 CO — Fig. 2



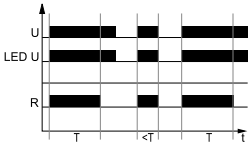
Time functions

E - ON delay.



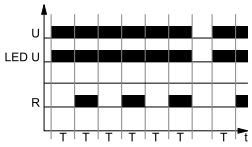
On applying the supply voltage U the set interval T begins - off-delay of the output relay R. After the interval T has lapsed, the output relay R switches on and remains on until supply voltage U is interrupted.

Wu - ON for the set interval.



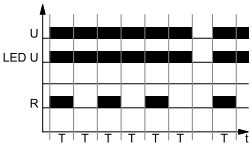
Applying the supply voltage U immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R switches off.

Bp - Symmetrical cyclical operation pause first.



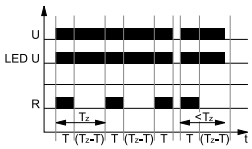
Applying the supply voltage U starts the cyclical operation from the interval T - switching the output relay R off followed by switching on the output relay R for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

Bi - Symmetrical cyclical operation pulse first.



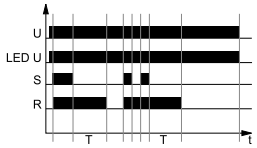
Applying the supply voltage U starts the cyclical operation from switching on the output relay R for the set interval T. After the interval T has lapsed, the output relay R switches off for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

PWM - Pulse width modulation.



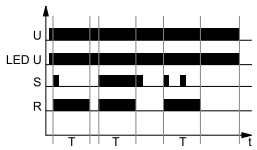
Set the relay to a single Tz cycle which is one of the time ranges available for a time relay. The cycle shall be set with the time selection knob. Then, set the interval T, i.e. the ON time of the output relay R with the time fine setting knob. The interval T may be set from 0.1 to 1.0 of the time range (Tz cycle). Applying the supply voltage U immediately switches on the output relay R for the set interval, and after the interval has lapsed, the output relay R switches off for the time left until the set time Tz. After the Tz time, consecutive cycles start and are continued until the supply voltage U is interrupted. In the course of the PWM function, the ON time of the output relay R may be changed, and such change does not affect the interval of the Tz cycle. The changed ON time of the output relay R shall be realized starting from the new Tz cycle following the change.

R - OFF delay with the control contact S.



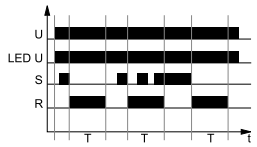
The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches on the output relay R. Opening of the control contact S starts the set time of the delayed switching off of the output relay R. After the interval T has lapsed, the output relay R switches off. If the control contact S is closed during the interval T, the already measured time is reset, and the output relay R is switched on again. The OFF delay of the output relay R will start when the control contact S is opened again.

Ws - Single shot for the set interval triggered by closing of the control contact S.



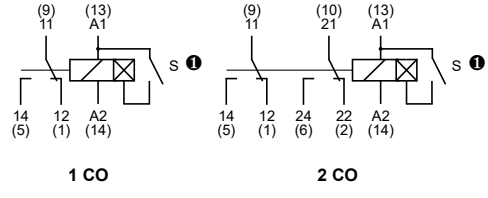
The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R is switched off. In the course of the interval T, any opening of the control contact S does not affect the function to be performed. The output relay R may be switched on again for the set interval, after the interval T has lapsed, by closing the control contact S again.

Wa - ON for the set interval triggered with the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S does not start the interval T, and it does not change the position of the output relay R. Opening of the control contact S immediately switches on the output relay R for the set time. After the interval T has lapsed, the output relay R switches off. Opening and closing of the control contact S in the course of the interval T does not affect the function to be performed. The output relay R may be switched on again for the set interval with another closing and opening of the control contact S.

Connections diagrams



❶ The control terminal S is activated by connection to A1 terminal via the external control contact S.

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **Tz** - value of the set interval; **T** - measured time; **t** - time axis

TIME

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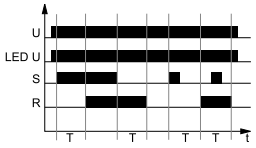
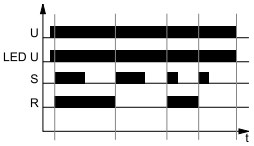
Time functions

Esa - ON and OFF delay with the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S starts the interval T - on-delay of the output relay R. After the interval T has lapsed, the output relay R switches on. Opening of the control contact S begins further measurement of the interval T - off-delay of the output relay R, and after the interval has lapsed, the output relay switches off. In case the time for which the control contact S is closed in the course of measurement of the on-delay of the output relay R is shorter than the set interval T, the output relay R will switch on after the set interval T, and the output relay R will remain in on position for the interval T. When the output relay R is in on position, closing of the control contact S does not affect the function to be performed.

B - Cyclical operation controlled with closing of the control contact S.



The input of the time relay is supplied with U voltage continuously. Closing of the control contact S immediately switches on the output relay R. Each next closing of the control contact S results in a change of the status of the output relay R to an opposite one (the feature of a bistable relay).

Permanent switching ON and OFF.
The functions ON and OFF are selected with range adjusting knob (TIME). In the ON function, the normally open contacts are closed all the time whereas in the OFF function they are open. The position of the function--adjusting knob (FUNC.) is of no significance in these functions as is the preset measurement time. The ON or OFF functions are used for the time relay operation control in electric systems.

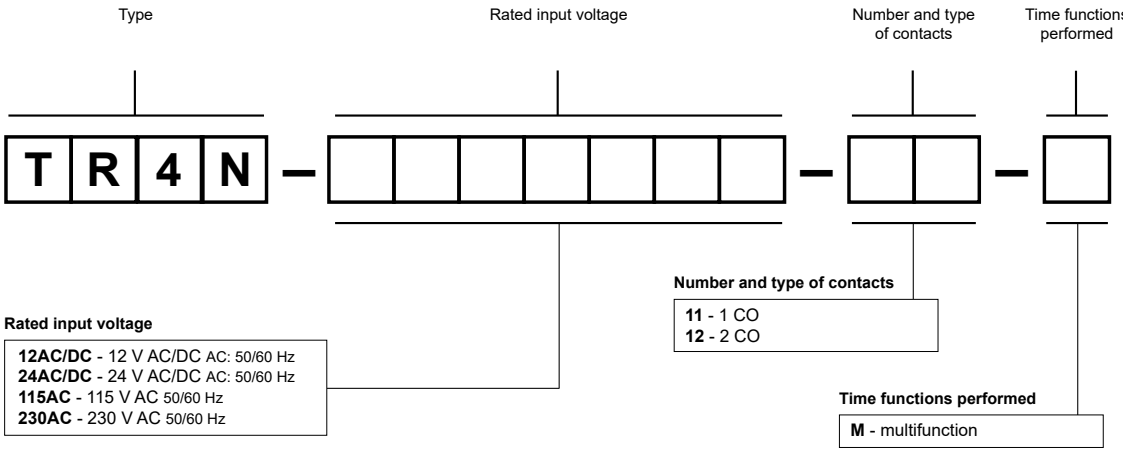
U - supply voltage; **R** - output state of the relay; **S** - control contact state; **Tz** - value of the set interval; **T** - measured time; **t** - time axis

Mounting

Relays **TR4N 1 CO, 2 CO** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 / 2 x 1,5 mm^2 (1 x 14 / 2 x 16 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,6 Nm.

One catch:
easy mounting
on 35 mm rail,
firm hold (bottom).

Ordering codes



Examples of ordering codes:

TR4N-230AC-11-M time relay **TR4N 1 CO**, multifunction (relay perform 10 functions), one changeover contact, contact material AgNi, rated input voltage 230 V AC 50/60 Hz

TR4N-24AC/DC-12-M time relay **TR4N 2 CO**, multifunction (relay perform 10 functions), two changeover contacts, contact material AgNi, rated input voltage 24 V AC/DC AC: 50/60 Hz

- 10-function electronic time relays in compact cover • Cadmium - free contacts • AC and AC/DC input voltages • Direct mounting on 35 mm rail mount acc. to EN 60715 • The main advantages of application: simple selection of the performed function, possibility to control a few circuits (4 changeover contacts), esthetic design in the control cabinet
- The switching capacity of contacts as in R4 electromagnetic relay
- Compliance with standard EN 61812-1
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuits - contact data

Number and type of contacts		4 CO	
Contact material		**AgNi**	
Max. switching voltage		250 V AC	
Rated load	AC1	6 A / 250 V AC	
	DC1	6 A / 24 V DC	0,15 A / 250 V DC
Rated current		6 A	
Max. breaking capacity	AC1	1 500 VA	
Min. breaking capacity		0,3 W	5 V, 5 mA
Contact resistance		≤ 100 mΩ	
Max. operating frequency			
• at rated load	AC1	1 200 cycles/hour	
• no load		18 000 cycles/hour	

Input circuit

Rated voltage	50/60 Hz AC	115, 230 V	
	AC: 50/60 Hz AC/DC	12, 24 V	
Operating range of supply voltage		0,9...1,1 U_n	12 V AC/DC
		0,85...1,1 U_n	24 V AC/DC, 115 V AC, 230 V AC
Rated power consumption	AC	2,2 VA	115 V AC, 230 V AC
	AC/DC	1,0 VA / 1,0 W	12 V AC/DC, 24 V AC/DC
Range of supply frequency	AC	48...63 Hz	
	AC/DC	48...100 Hz	
Control contact S ❶			
• min. voltage ❷		0,6 U_n	
• min. time of pulse duration ❷		AC: ≥ 25 ms	DC: ≥ 15 ms

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC	
Insulation category		B250	
Overvoltage category		II	
Insulation pollution degree		2	
Flammability class		V-1	UL 94
Dielectric strength	• input - outputs	2 500 V AC	type of insulation: basic
	• contact clearance	1 500 V AC	type of clearance: micro-disconnection
Input - outputs distance			
• clearance		≥ 1,6 mm	
• creepage		≥ 3,2 mm	

General data

Electrical life			
• resistive AC1		> 10^5	6 A, 250 V AC
Mechanical life (cycles)		> 2 x 10^7	
Dimensions (L x W x H)		90 x 36 x 55 mm	
Weight		115 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+55 °C	
Cover protection category		IP 20	EN 60529
Environmental protection		RTI	EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g	
Vibration resistance		0,35 mm DA	10...55 Hz

The data in bold type relate to the standard versions of the relays.
❶ The control terminal S is activated by connection to A1 terminal via the external control contact S.
❷ Where the control signal is recognizable.

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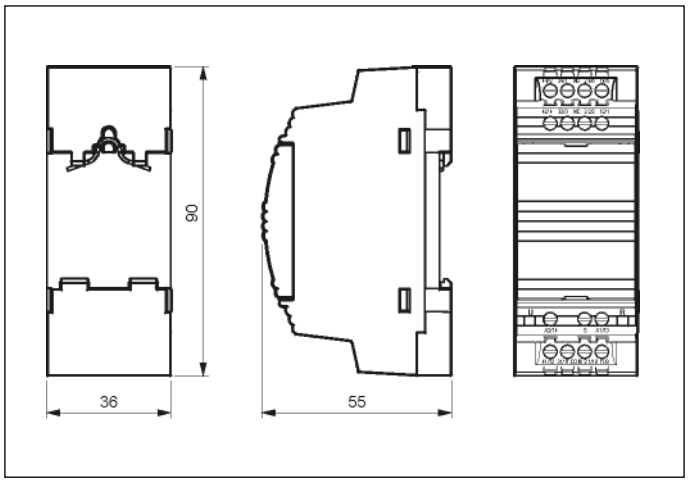
Time module data

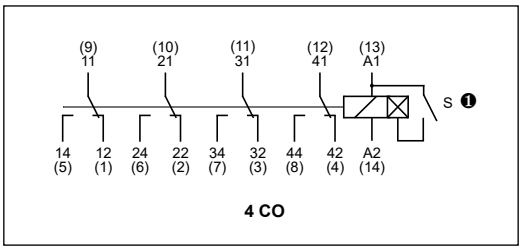
Functions	E, Wu, Bp, Bi, PWM, R, Ws, Wa, Esa, B permanent switching ON and OFF
Time ranges	1 s ❸; 10 s; 1 min.; 10 min.; 1 h; 10 h; 1 d; 10 d
Timing adjustment	smooth - (0,1...1) x time range
Setting accuracy	± 5% (calculated from the final range values) ❸
Repeatability	± 0,5% ❸
Temperature influence	± 0,01% / °C
Recovery time	90 ms
LED indicator	green LED - indication of supply voltage U yellow LED - indication of time period T and the status of outputs after the time T has been measured ❹

❸ For first range setpoint (1 s) setting accuracy and repeatability are smaller than the given ones in technical parameters (significant influence of the operational relay operating time). Recommend to set measuring time by experimental method. ❹ The yellow LED - T time measurement (pulsating); excited operational relay; time not measured (steady light); de-excited operational relay, time not measured (no light).

Dimensions



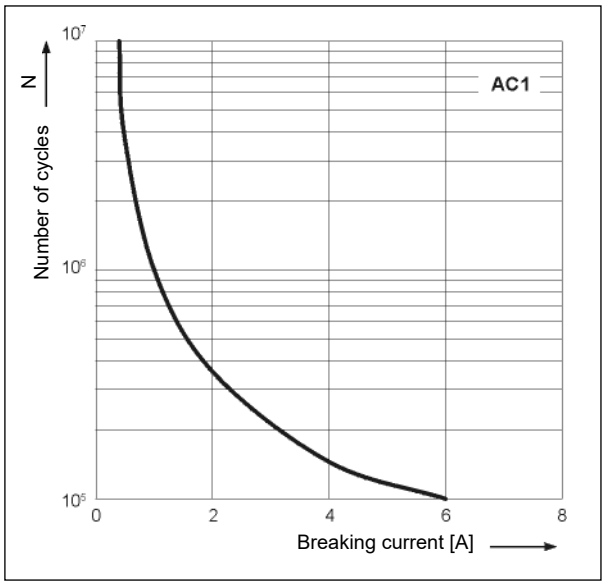
Connections diagram



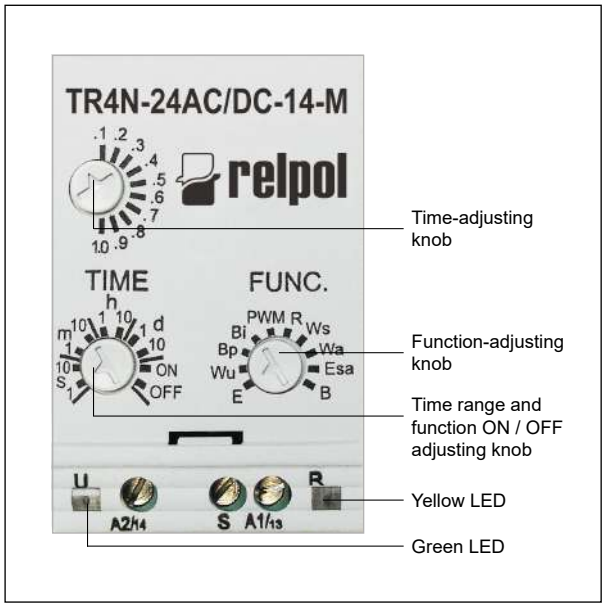
❶ The control terminal S is activated by connection to A1 terminal via the external control contact S.

Electrical life at AC resistive current. Switching frequency: 1 200 cycles/hour

Fig. 1



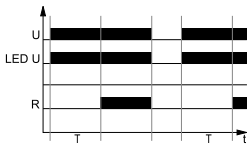
Front panel description



TIME

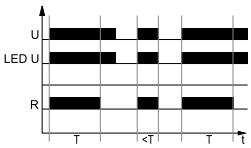
Time functions

E - ON delay.



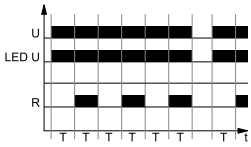
On applying the supply voltage U the set interval T begins - off-delay of the output relay R. After the interval T has lapsed, the output relay R switches on and remains on until supply voltage U is interrupted.

Wu - ON for the set interval.



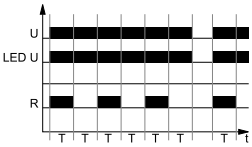
Applying the supply voltage U immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R switches off.

Bp - Symmetrical cyclical operation pause first.



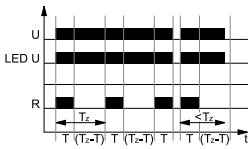
Applying the supply voltage U starts the cyclical operation from the interval T - switching the output relay R off followed by switching on the output relay R for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

Bi - Symmetrical cyclical operation pulse first.



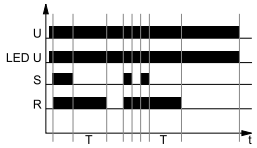
Applying the supply voltage U starts the cyclical operation from switching on the output relay R for the set interval T. After the interval T has lapsed, the output relay R switches off for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

PWM - Pulse width modulation.



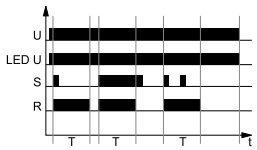
Set the relay to a single Tz cycle which is one of the time ranges available for a time relay. The cycle shall be set with the time selection knob. Then, set the interval T, i.e. the ON time of the output relay R with the time fine setting knob. The interval T may be set from 0.1 to 1.0 of the time range (Tz cycle). Applying the supply voltage U immediately switches on the output relay R for the set interval, and after the interval has lapsed, the output relay R switches off for the time left until the set time Tz. After the Tz time, consecutive cycles start and are continued until the supply voltage U is interrupted. In the course of the PWM function, the ON time of the output relay R may be changed, and such change does not affect the interval of the Tz cycle. The changed ON time of the output relay R shall be realized starting from the new Tz cycle following the change.

R - OFF delay with the control contact S.



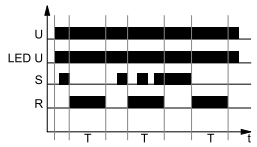
The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches on the output relay R. Opening of the control contact S starts the set time of the delayed switching off of the output relay R. After the interval T has lapsed, the output relay R switches off. If the control contact S is closed during the interval T, the already measured time is reset, and the output relay R is switched on again. The OFF delay of the output relay R will start when the control contact S is opened again.

Ws - Single shot for the set interval triggered by closing of the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R is switched off. In the course of the interval T, any opening of the control contact S does not affect the function to be performed. The output relay R may be switched on again for the set interval, after the interval T has lapsed, by closing the control contact S again.

Wa - ON for the set interval triggered with the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S does not start the interval T, and it does not change the position of the output relay R. Opening of the control contact S immediately switches on the output relay R for the set time. After the interval T has lapsed, the output relay R switches off. Opening and closing of the control contact S in the course of the interval T does not affect the function to be performed. The output relay R may be switched on again for the set interval with another closing and opening of the control contact S.

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **Tz** - value of the set interval; **T** - measured time; **t** - time axis

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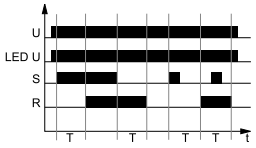
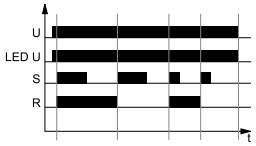
Time functions

Esa - ON and OFF delay with the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S starts the interval T - on-delay of the output relay R. After the interval T has lapsed, the output relay R switches on. Opening of the control contact S begins further measurement of the interval T - off-delay of the output relay R, and after the interval has lapsed, the output relay switches off. In case the time for which the control contact S is closed in the course of measurement of the on-delay of the output relay R is shorter than the set interval T, the output relay R will switch on after the set interval T, and the output relay R will remain in on position for the interval T. When the output relay R is in on position, closing of the control contact S does not affect the function to be performed.

B - Cyclical operation controlled with closing of the control contact S.



The input of the time relay is supplied with U voltage continuously. Closing of the control contact S immediately switches on the output relay R. Each next closing of the control contact S results in a change of the status of the output relay R to an opposite one (the feature of a bistable relay).

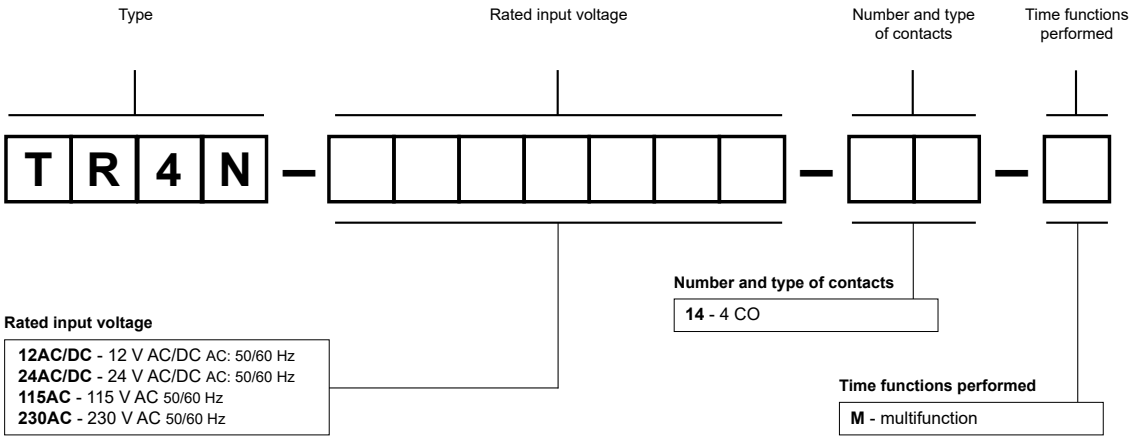
Permanent switching ON and OFF.
The functions ON and OFF are selected with range adjusting knob (TIME). In the ON function, the normally open contacts are closed all the time whereas in the OFF function they are open. The position of the function--adjusting knob (FUNC.) is of no significance in these functions as is the preset measurement time. The ON or OFF functions are used for the time relay operation control in electric systems.

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **Tz** - value of the set interval; **T** - measured time; **t** - time axis

Mounting

Relays **TR4N 4 CO** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 / 2 x 1,5 mm^2 (1 x 14 / 2 x 16 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,6 Nm.

Ordering codes



Examples of ordering codes:

TR4N-230AC-14-M time relay **TR4N 4 CO**, multifunction (relay perform 10 functions), four changeover contacts, contact material AgNi, rated input voltage 230 V AC 50/60 Hz

TR4N-24AC/DC-14-M time relay **TR4N 4 CO**, multifunction (relay perform 10 functions), four changeover contacts, contact material AgNi, rated input voltage 24 V AC/DC AC: 50/60 Hz

T-R4

T-R4 + GZM4

- **Single-function, single-voltage time relays (7 time ranges)**
- Cadmium - free contacts 4 CO • AC and DC input voltages
- For plug-in sockets, 35 mm rail mount acc. to EN 60715 or on panel mounting
- Applications: as time systems in electric circuits of machines, technological lines, in automation systems, etc.
- Recognitions, certifications, directives: RoHS, recognitions R4N,

CE EAC

• **Codes of versions** - time functions performed:

T-R4E-...	T-R4Wu-...	T-R4Bp-...	T-R4Bi-...
function E	function Wu	function Bp	function Bi

Output circuits - contact data

Number and type of contacts		4 CO
Contact material		**AgNi**
Max. switching voltage		250 V AC / 250 V DC
Rated load	AC1	6 A / 230 V AC
Max. inrush current		12 A
Rated current		6 A
Max. breaking capacity	AC1	1 500 VA
Min. breaking capacity		0,3 W 5 V, 5 mA
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	1 200 cycles/hour
• no load		18 000 cycles/hour

Input circuit

Rated voltage	50/60 Hz AC	24, 115, 230 V
	DC	12, 24 V
Must release voltage		AC: ≥ 0,2 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage		0,8...1,1 U_n see Tables 1, 2
Rated power consumption	AC	2,2 VA
	DC	1,2 W
Range of supply frequency		48...63 Hz

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Overvoltage category		III
Dielectric strength	• input - outputs	2 500 V AC type of insulation: basic
	• contact clearance	1 500 V AC type of clearance: micro-disconnection
	• pole - pole	2 000 V AC type of insulation: basic
Input - outputs distance	• clearance	≥ 1,6 mm
	• creepage	≥ 3,2 mm

General data

Operating / release time (typical values)		10 ms / 8 ms
Electrical life		
• resistive AC1		> 10^5 6 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		T-R4 + GZM4: 75 x 27 x 91,5 mm T-R4 + GZT4: 76,3 x 27 x 90 mm T-R4: 27,5 x 21,2 x 62,5 mm
Weight		T-R4 + GZM4: 123 g T-R4 + GZT4: 113 g T-R4: 49 g
Ambient temperature	• storage	-20...+85 °C
(non-condensation and/or icing)	• operating	-20...+55 °C
Cover protection category		IP 20 (with socket) EN 60529
Environmental protection		T-R4: RTI GZM4: RT0 EN 61810-7
Shock resistance	(NO/NC)	10 g / 5 g
Vibration resistance		5 g 10...150 Hz

The data in bold type relate to the standard versions of the relays.
❶ Length with 35 mm rail catch: 100 mm.

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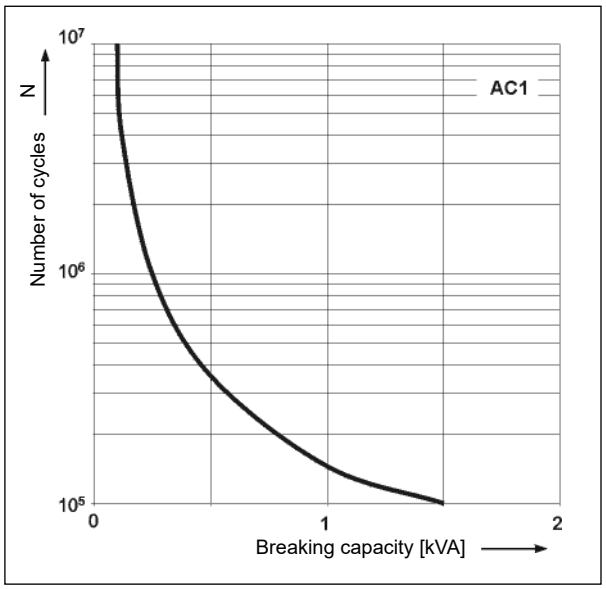
Time module data

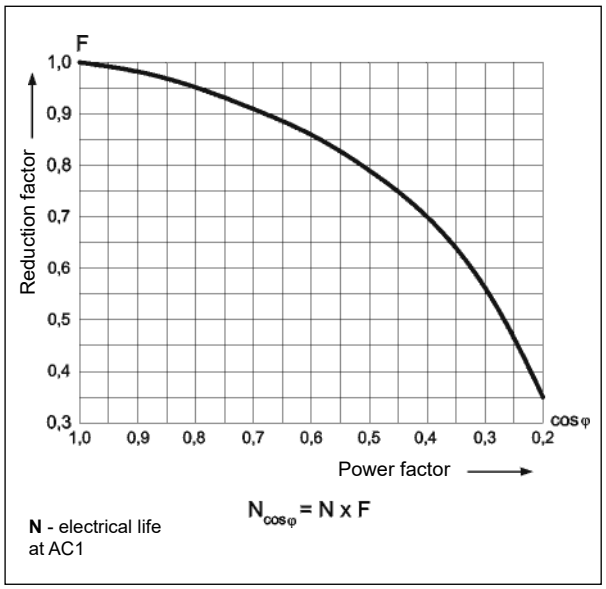
Functions	E, Wu, Bp, Bi
Time ranges	1 s ❶; 10 s; 1 min.; 10 min.; 1 h; 10 h; 100 h
Timing adjustment	range - with the range-adjusting knob / switch; within the range - with the time-adjusting knob / potentiometer
Setting accuracy	± 5% (calculated from the final range values) ❶
Repeatability	± 1% ❶
Temperature influence	± 0,01% / °C
Recovery time	100 ms
LED indicator	green LED - indication of supply voltage U yellow LED - indication of time period T and the status of outputs after the time T has been measured ❷

❶ For first range setpoint (1 s) setting accuracy and repeatability are smaller than the given ones in technical parameters (significant influence of the operational relay operating time). Recommend to set measuring time by experimental method. ❷ The yellow LED - T time measurement (pulsating); excited operational relay; time not measured (steady light); de-excited operational relay, time not measured (no light).

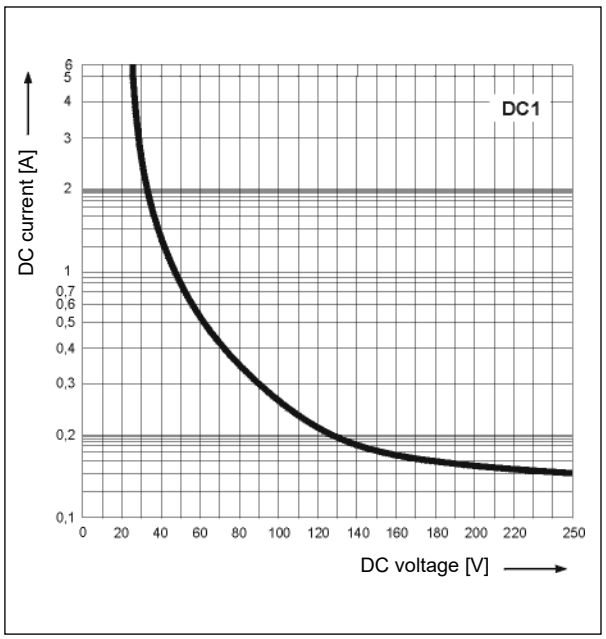
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



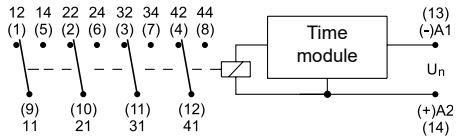
Electrical life reduction factor at AC inductive load Fig. 2



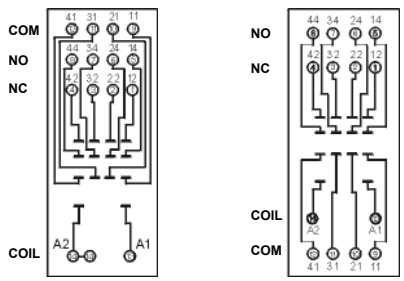
Max. DC resistive load breaking capacity Fig. 3



Connection diagrams



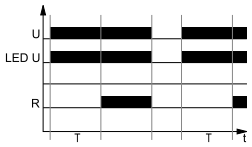
4 CO



GZM4 GZT4

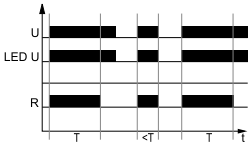
Time functions

E - ON delay.
Codes of versions: **T-R4E-...**



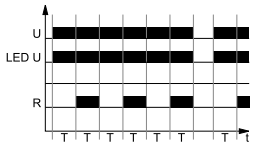
On applying the supply voltage U the set interval T begins - off-delay of the output relay R. After the interval T has lapsed, the output relay R switches on and remains on until supply voltage U is interrupted.

Wu - ON for the set interval.
Codes of versions: **T-R4Wu-...**



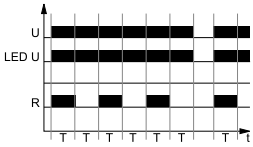
Applying the supply voltage U immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R switches off.

Bp - Symmetrical cyclical operation pause first.
Codes of versions: **T-R4Bp-...**



Applying the supply voltage U starts the cyclical operation from the interval T - switching the output relay R off followed by switching on the output relay R for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

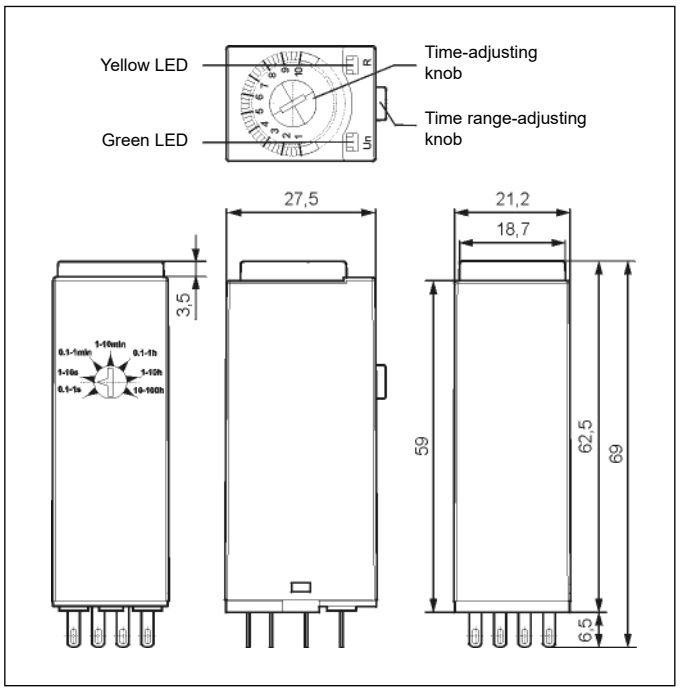
Bi - Symmetrical cyclical operation pulse first.
Codes of versions: **T-R4Bi-...**



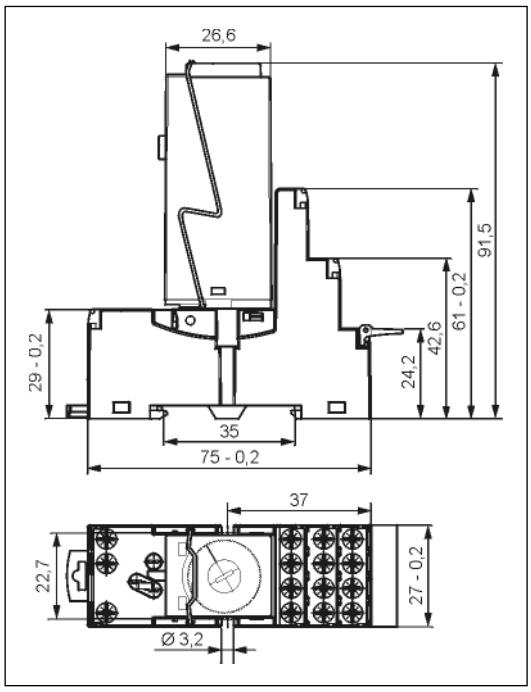
Applying the supply voltage U starts the cyclical operation from switching on the output relay R for the set interval T. After the interval T has lapsed, the output relay R switches off for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

U - supply voltage; **R** - output state of the relay; **T** - measured time; **t** - time axis

Dimensions - T-R4



Dimensions - T-R4 with socket GZM4



TIME

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Mounting, sockets and accessories for relays

Relays **T-R4E**, **T-R4Wu**, **T-R4Bp**, **T-R4Bi** are designed for mounting in plug-in sockets.

Sockets for T-R4	Accessories		Additional equipment
	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)			
GZT4 ❹	TR4-2000	GZT4-0035	ZGGZ4 ❺
GZM4 ❹	TR4-2000	GZT4-0035	ZGGZ4 ❺

❹ Sockets GZT4, GZM4 - connections: max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 Nm. ❺ Interconnection strips ZGGZ4 - see page 401.

Separate T-R4 control circuits from load circuits (T-R4 contacts)	GZM4: yes GZT4: no
Increased dielectric strength spacing between coil and contacs clamps	GZM4: min. 5 kV GZT4: min. 4 kV
Double A2(14) terminal is introduced for easy wiring in electrical devices	GZM4: yes GZT4: no

Input data - DC voltage version

Table 1

Input voltage code	Rated input voltage U_n V DC	Input resistance at 20 °C Ω	Acceptable resistance	Input - voltage range V DC	
				min. (at 20 °C)	max. (at 55 °C)
1012	**12**	**160**	**± 10%**	**9,6**	**13,2**
1024	**24**	**640**	**± 10%**	**19,2**	**26,4**

The data in bold type relate to the standard versions of the relays.

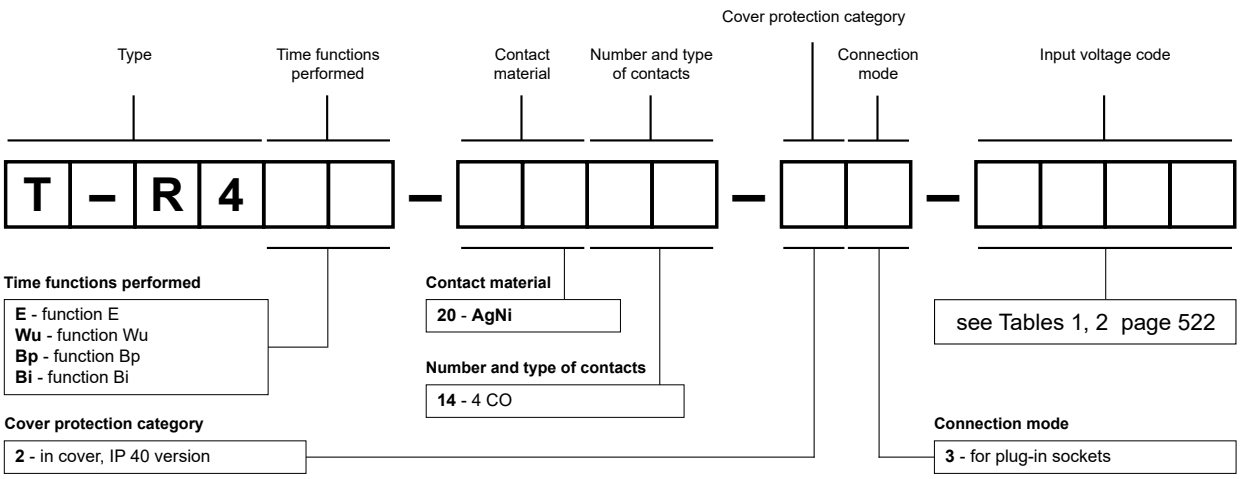
Input data - AC 50/60 Hz voltage version

Table 2

Input voltage code	Rated input voltage U_n V AC	Input resistance at 20 °C Ω	Acceptable resistance	Input - voltage range V AC	
				min. (at 20 °C)	max. (at 55 °C)
5024	**24**	**158**	**± 10%**	**19,2**	**26,4**
5115	115	3 610	± 10%	92,0	127,0
5230	**230**	**16 100**	**± 10%**	**184,0**	**253,0**

The data in bold type relate to the standard versions of the relays.

Ordering codes



Example of ordering code:

T-R4E-2014-23-1012 time relay **T-R4**, single-function (relay perform function **E** - ON delay), for plug-in sockets, four changeover contacts, contact material AgNi, rated input voltage 12 V DC, in cover IP 40

R15 - 3 CO (AC) + GZP11 + COM3

R15 - 2 CO (DC) + GZP8 + COM3

- Time relay **PIR15 - 3 CO (standard)** consists of: electromagnetic relay **R15 - 3 CO**, black plug-in socket **GZP11**, time module **COM3**, spring wire clip **GZP-0054**, white description plate **GZP-0035**
- Time relay **PIR15 - 2 CO** consists of: electromagnetic relay **R15 - 2 CO**, black plug-in socket **GZP8**, time module **COM3**, spring wire clip **GZP-0054**, white description plate **GZP-0035**
- 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws
- Recognitions, certifications, directives: recognitions R15, RoHS,

CE EAC

Output circuits - contact data

Number and type of contacts		2 CO, **3 CO**
Contact material		**AgNi**
Max. switching voltage		250 V AC / 300 V DC
Rated load (capacity)	AC1	10 A / 250 V AC
	AC15	3 A / 120 V 1,5 A / 240 V (B300)
	DC1	10 A / 24 V DC (see Fig. 3)
	DC13	0,22 A / 120 V 0,1 A / 250 V (R300)
Motor load	acc. to UL 508	1/2 HP 240 V AC, 4,9 FLA, single-phase motor ❶
	AC3 acc. to IEC 60947-4-1	0,37 kW 240 V AC, single-phase motor
Max. inrush current		20 A
Rated current		10 A
Max. breaking capacity	AC1	2 500 VA
Min. breaking capacity		0,3 W 5 V, 5 mA
Contact resistance		≤ 100 mΩ
Max. operating frequency	• at rated load AC1	1 200 cycles/hour
	• no load	12 000 cycles/hour

Input circuit

Rated voltage of output relay R15	50/60 Hz AC	**24**, 48, 60, 110, 120, **230**, 240 V
	DC	**24**, 48, 60, 110, 120, **220** V
Supply voltage of time module COM3		24...240 V AC/DC (universal module)
Operating range of supply voltage		0,85...1,1 U_n see Tables 1, 2
Rated power consumption	AC	3,0 VA
	DC	2,0 W
Range of supply frequency		48...63 Hz
Control contact S ❷	• connections	not potential free, terminals A1-B1
	• line length	max. 10 m (twisted pair)
	• min. time of pulse duration ❸	100 ms

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Overvoltage category		III
Dielectric strength	• between coil and contacts	2 500 V AC type of insulation: basic
	• contact clearance	1 500 V AC type of clearance: micro-disconnection
	• pole - pole	2 000 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 3 mm
	• creepage	≥ 4,2 mm

General data

Operating / release time (typical values)		AC: 12 ms / 10 ms DC: 18 ms / 7 ms
Electrical life	• resistive AC1	> 2 x 10^5 10 A, 250 V AC
	• cosφ	see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		73 x 38,2 x 85,4 mm
Weight		3 CO: 175 g 2 CO: 168 g
Ambient temperature (non-condensation and/or icing)	• storage	-25...+70 °C
	• operating	-25...+55 °C
Cover protection category		IP 20 EN 60529
Environmental protection		R15: RTI GZP11, GZP8: RT0 EN 61810-7
Shock resistance		10 g
Vibration resistance		5 g 10...500 Hz

The data in bold type relate to the standard versions of the relays. ❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC. ❷ The control terminal B1 is activated by connection to A1 terminal via the external control contact S. ❸ Where the control signal is recognizable.

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Time module data

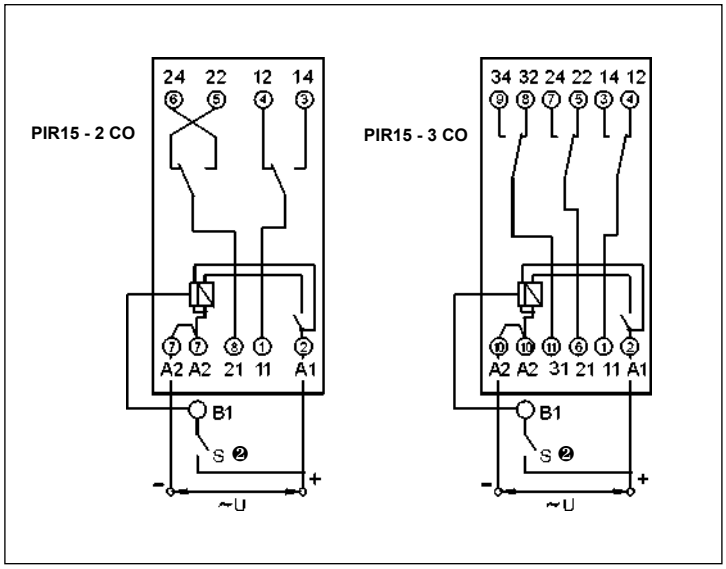
Functions	E, Wu, Bp, Bi, R, Ws, Wa, Es
Function adjustment ❹	selection with microswitches
Time ranges	1 s; 10 s; 1 min.; 10 min.; 1 h; 10 h; 1 d; 10 d
Timing adjustment ❹	time range - with microswitches smooth - (0,05...1) x time range - with potentiometer
Base accuracy	± 1% (calculated from the final range values)
Setting accuracy	± 5% (calculated from the final range values)
Repeatability	± 0,5% or ± 5 ms
Temperature influence	± 0,01% / °C
Recovery time	150 ms
LED indicator	green LED U ON - indication of supply voltage U green LED U flashing - measurement of T time

❹ Settings of switches - see below.

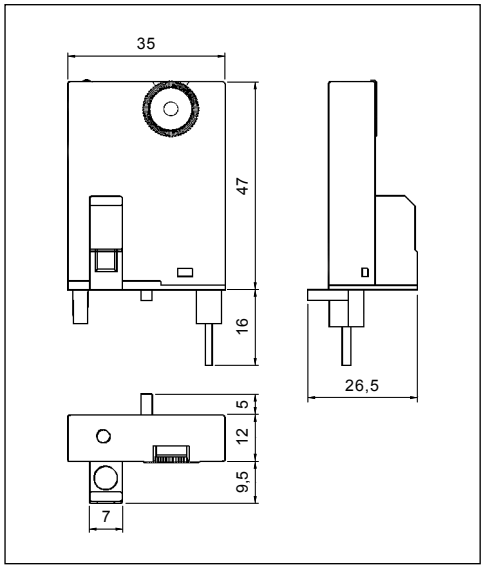
Settings of switches

Function adjustment microswitches 1, 2, 3	E	Wu	Bi	Bp	R	Ws	Wa	Es
								
Timing adjustment (max.) microswitches 4, 5, 6	1 s	10 s	1 min.	10 min.	1 h	10 h	1 d	10 d
								

Connection diagrams (screw terminals side view)



Dimensions - time module COM3



❷ The control terminal B1 is activated by connection to A1 terminal via the external control contact S.

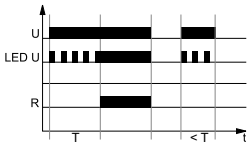
COM3

Universal
time modules

Time functions

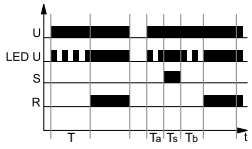
E - ON delay.

Diagram 1



When the supply voltage U is applied, the set interval T begins (green LED flashing). After the interval T has expired (green LED illuminated) the output relay R switches into on-position. This status remains until the supply voltage is interrupted - see Diagram 1.

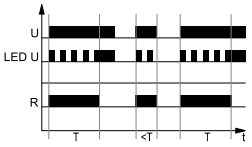
Diagram 2



Additional option (ON delay adding): if the control contact S is closed the running interval T is stopped (green LED illuminated) and the interval already expired is saved. When the control contact S is opened once again the interval T is continued (green LED flashing). After the interval T has expired, the control contact S can be operated as you like - see Diagram 2.

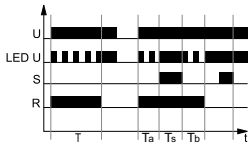
Wu - Single shot leading edge voltage controlled.

Diagram 1



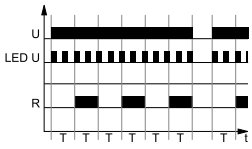
When the supply voltage U is applied, the output relay R switches into on-position and the set interval T begins (green LED flashing). After the interval T has expired (green LED illuminated) the output relay switches into off-position. This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the interval T has expired, the output relay switches into off-position. The interval already expired is erased and is restarted when the supply voltage is next applied - see Diagram 1.

Diagram 2



Additional option (Single shot leading edge adding): if the control contact S is closed the running interval T is stopped (green LED illuminated) and the interval already expired is saved. When the control contact S is opened once again the interval T is continued (green LED flashing). After the interval T has expired, the control contact S can be operated as you like - see Diagram 2.

Bp - Symmetrical cyclical operation pause first.

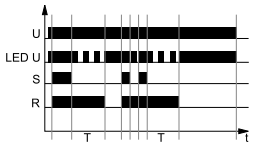


Applying the supply voltage U starts the cyclical operation from the interval T - switching the output relay R off followed by switching on the output relay R for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

Bi - Symmetrical cyclical operation pulse first.

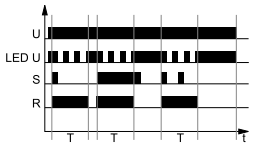
Applying the supply voltage U starts the cyclical operation from switching on the output relay R for the set interval T. After the interval T has lapsed, the output relay R switches off for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

R - OFF delay with the control contact S.



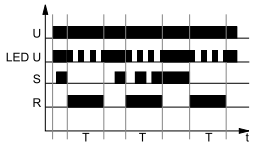
The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches on the output relay R. Opening of the control contact S starts the set time of the delayed switching off of the output relay R. After the interval T has lapsed, the output relay R switches off. If the control contact S is closed during the interval T, the already measured time is reset, and the output relay R is switched on again. The OFF delay of the output relay R will start when the control contact S is opened again.

Ws - Single shot for the set interval triggered by closing of the control contact S.



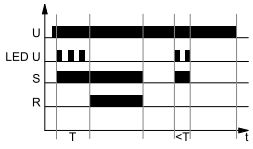
The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R is switched off. In the course of the interval T, any opening of the control contact S does not affect the function to be performed. The output relay R may be switched on again for the set interval, after the interval T has lapsed, by closing the control contact S again.

Wa - ON for the set interval triggered with the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S does not start the interval T, and it does not change the position of the output relay R. Opening of the control contact S immediately switches on the output relay R for the set time. After the interval T has lapsed, the output relay R switches off. Opening and closing of the control contact S in the course of the interval T does not affect the function to be performed. The output relay R may be switched on again for the set interval with another closing and opening of the control contact S.

Es - ON delay with the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S starts the interval T - on-delay of the output relay R. After the interval T has lapsed, the output relay R switches on and remains in this position until the control contact S is opened. In case the control contact S is closed for time shorter than the set interval T, the output relay R will not activate.

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T** - measured time; **Ta**, **Tb** - component intervals of T time; **Ts** - period of T time interrupt; **t** - time axis

TIME

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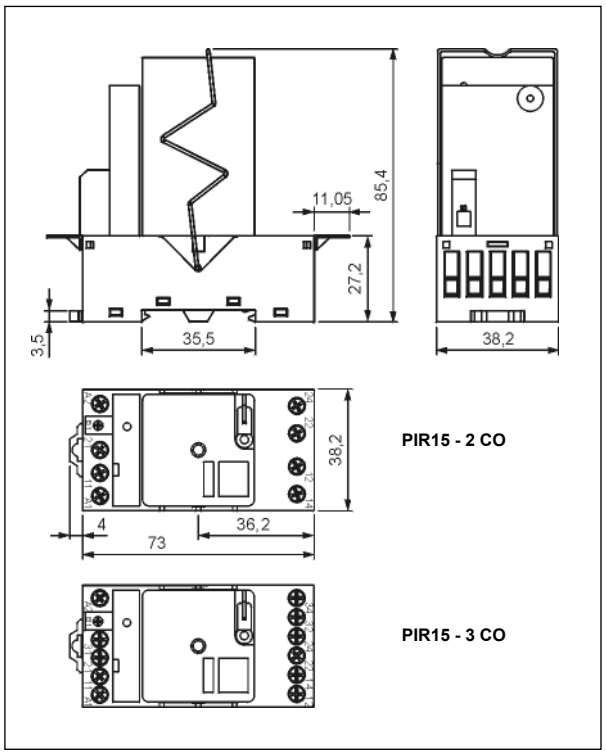
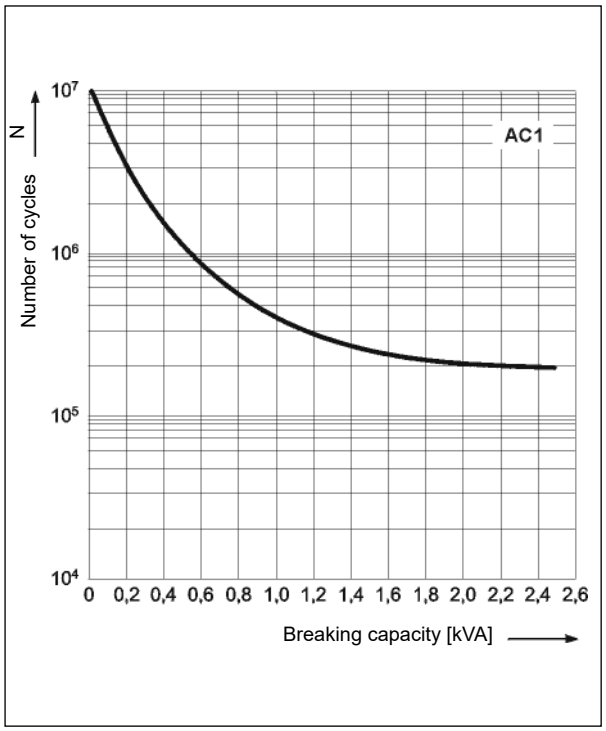
Dimensions



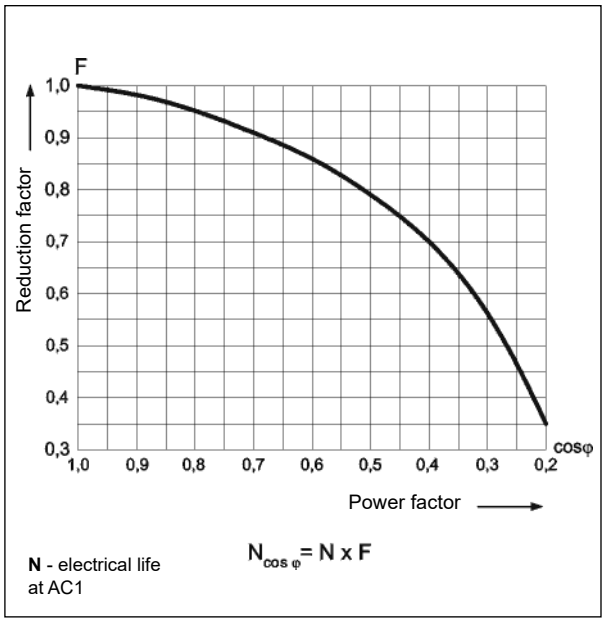
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour

Fig. 1



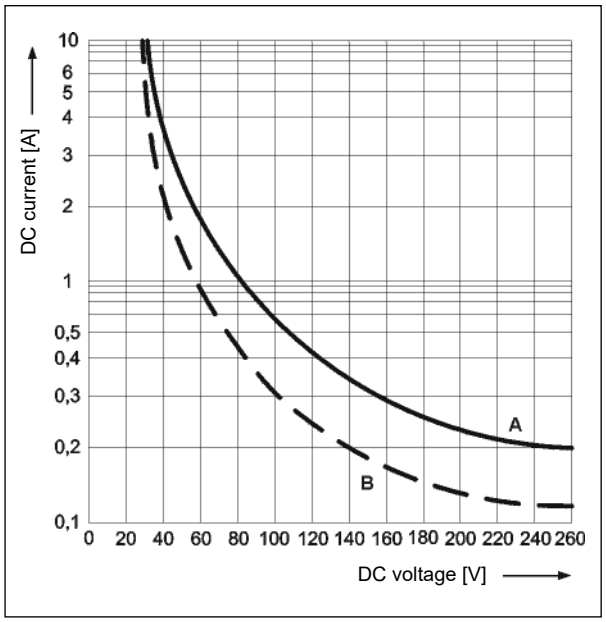
Electrical life reduction factor at AC inductive load

Fig. 2



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms

Fig. 3



Mounting

Relays **PIR15...T** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Input data - DC voltage version Table 1

Input voltage code	Rated input voltage U_n V DC	Input resistance at 20 °C Ω	Acceptable resistance	Input - voltage range V DC	
				min. (at 20 °C)	max. (at 55 °C)
024DC	**24**	**430**	**± 10%**	**19,2**	**26,4**
048DC	48	1 750	± 10%	38,4	52,8
060DC	60	2 700	± 10%	48,0	66,0
110DC	110	9 200	± 10%	88,0	121,0
120DC	120	11 000	± 10%	96,0	132,0
220DC	**220**	**37 000**	**± 10%**	**176,0**	**242,0**

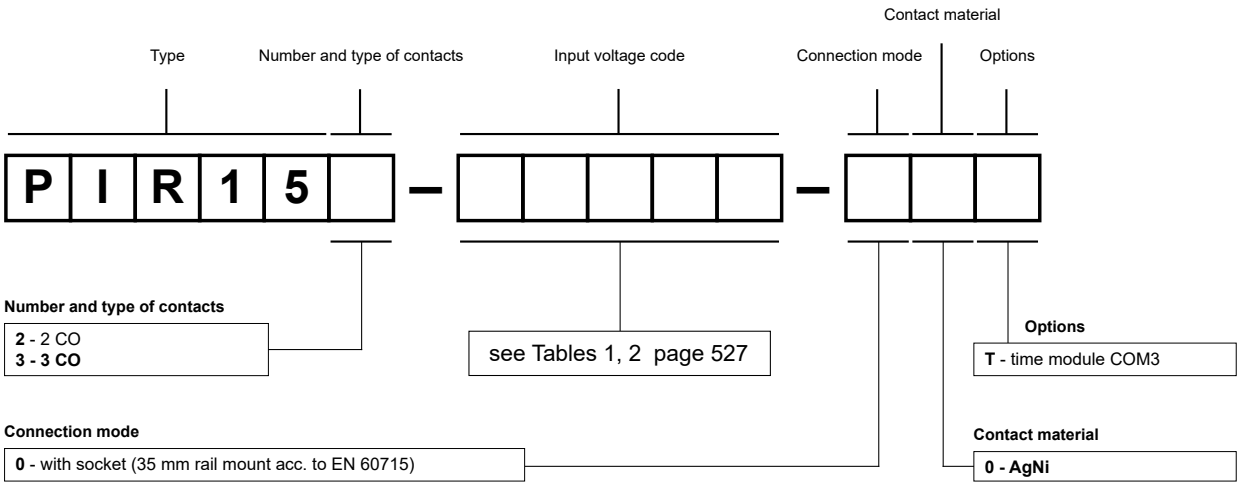
The data in bold type relate to the standard versions of the relays.

Input data - AC 50/60 Hz voltage version Table 2

Input voltage code	Rated input voltage U_n V AC	Input resistance at 20 °C Ω	Acceptable resistance	Input - voltage range V AC	
				min. (at 20 °C)	max. (at 55 °C)
024AC	**24**	**75**	**± 15%**	**19,2**	**26,4**
048AC	48	305	± 15%	38,4	52,8
060AC	60	475	± 15%	48,0	66,0
110AC	110	1 700	± 15%	88,0	121,0
120AC	120	1 910	± 15%	96,0	132,0
230AC	**230**	**7 080**	**± 15%**	**184,0**	**253,0**
240AC	240	7 760	± 15%	192,0	264,0

The data in bold type relate to the standard versions of the relays.

Ordering codes



Examples of ordering codes:

PIR153-230AC-00T time relay **PIR15 - 3 CO** consists of: relay **R15 - 3 CO** (three changeover contacts, contact material AgNi, input voltage 230 V AC 50/60 Hz), socket **GZP11** (black, screw terminals), time module **COM3**, spring wire clip **GZP-0054**, description plate **GZP-0035** (white)

PIR152-024DC-00T time relay **PIR15 - 2 CO** consists of: relay **R15 - 2 CO** (two changeover contacts, contact material AgNi, input voltage 24 V DC), socket **GZP8** (black, screw terminals), time module **COM3**, spring wire clip **GZP-0054**, description plate **GZP-0035** (white)

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COM3
universal time modules

- **Multifunction time modules (8 time functions; 8 time ranges)**
- AC/DC input voltages
- Mounting: combinable to relay R15 - 3 CO (2 CO) with plug-in socket GZP11 (GZP8)
- Recognitions, certifications, directives: RoHS, CE

Output circuits - contact data

Number and type of contacts		according to relays R15 - 3 CO (2 CO)	
Input circuit			
Rated voltage	AC: 50/60 Hz AC/DC	24...240 V	terminals (+)A1 – (-)A2
Must release voltage		> 10 V AC or 10 V DC	
Operating range of supply voltage		0,85...1,1 U_n	
Rated power consumption	AC	80 mVA (54 mW)	24 V AC
		940 mVA (520 mW)	230 V AC
	DC	60 mW	24 V DC
		765 mW	240 V AC
Range of supply frequency	AC	45...65 Hz	
Duty cycle		100%	
Residual ripple to DC		10%	
Control contact S ❶	• connections	not potential free, terminals A1-B1	
	• line length	max. 10 m (twisted pair)	
	• min. time of pulse duration ❷	100 ms	
Insulation according to EN 60664-1			
Insulation pollution degree		2	if built-in: 3
General data			
Dimensions (L x W x H)		26,5 x 35 x 47 mm	
Ambient temperature (non-condensation and/or icing)	• storage	-25...+70 °C	
	• operating	-25...+55 °C	
Cover protection category		IP 40	EN 60529
Relative humidity		15...85%	
Time module data			
Functions		E, Wu, Bp, Bi, R, Ws, Wa, Es	
Function adjustment ❸		selection with microswitches	
Time ranges		1 s; 10 s; 1 min.; 10 min.; 1 h; 10 h; 1 d; 10 d	
Timing adjustment ❸		time range - with microswitches smooth - (0,05...1) x time range - with potentiometer	
Base accuracy		± 1% (calculated from the final range values)	
Setting accuracy		± 5% (calculated from the final range values)	
Repeatability		± 0,5% or ± 5 ms	
Temperature influence		± 0,01% / °C	
Recovery time		150 ms	
LED indicator		green LED U ON - indication of supply voltage U green LED U flashing - measurement of T time	

❶ The control terminal B1 is activated by connection to A1 terminal via the external control contact S.
❷ Where the control signal is recognizable.
❸ Settings of switches - see page 530.

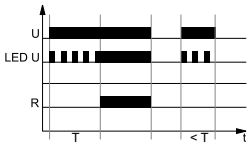
Time relay PIR15...T

set: relay R15 - 3 CO (2 CO)
+ socket GZP11 (GZP8)
+ time module COM3

Time functions

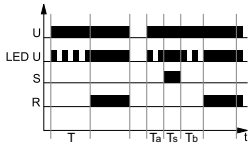
E - ON delay.

Diagram 1



When the supply voltage U is applied, the set interval T begins (green LED flashing). After the interval T has expired (green LED illuminated) the output relay R switches into on-position. This status remains until the supply voltage is interrupted - see Diagram 1.

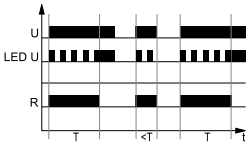
Diagram 2



Additional option (ON delay adding): if the control contact S is closed the running interval T is stopped (green LED illuminated) and the interval already expired is saved. When the control contact S is opened once again the interval T is continued (green LED flashing). After the interval T has expired, the control contact S can be operated as you like - see Diagram 2.

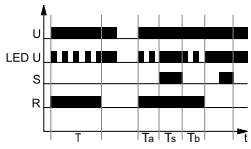
Wu - Single shot leading edge voltage controlled.

Diagram 1



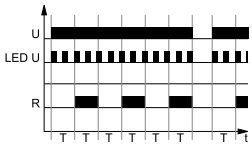
When the supply voltage U is applied, the output relay R switches into on-position and the set interval T begins (green LED flashing). After the interval T has expired (green LED illuminated) the output relay switches into off-position. This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the interval T has expired, the output relay switches into off-position. The interval already expired is erased and is restarted when the supply voltage is next applied - see Diagram 1.

Diagram 2



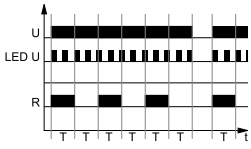
Additional option (Single shot leading edge adding): if the control contact S is closed the running interval T is stopped (green LED illuminated) and the interval already expired is saved. When the control contact S is opened once again the interval T is continued (green LED flashing). After the interval T has expired, the control contact S can be operated as you like - see Diagram 2.

Bp - Symmetrical cyclical operation pause first.



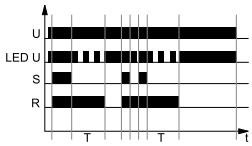
Applying the supply voltage U starts the cyclical operation from the interval T - switching the output relay R off followed by switching on the output relay R for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

Bi - Symmetrical cyclical operation pulse first.



Applying the supply voltage U starts the cyclical operation from switching on the output relay R for the set interval T. After the interval T has lapsed, the output relay R switches off for the interval T. The cyclical operation lasts until the supply voltage U is interrupted.

R - OFF delay with the control contact S.

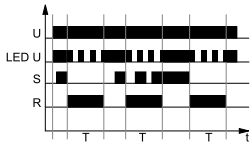


The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches on the output relay R. Opening of the control contact S starts the set time of the delayed switching off of the output relay R. After the interval T has lapsed, the output relay R switches off. If the control contact S is closed during the interval T, the already measured time is reset, and the output relay R is switched on again. The OFF delay of the output relay R will start when the control contact S is opened again.

Ws - Single shot for the set interval triggered by closing of the control contact S.

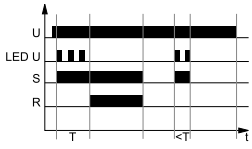
The input of the time relay is supplied with voltage U continuously. Closing of the control contact S immediately switches the output relay R on for the set interval T. After the interval T has lapsed, the output relay R is switched off. In the course of the interval T, any opening of the control contact S does not affect the function to be performed. The output relay R may be switched on again for the set interval, after the interval T has lapsed, by closing the control contact S again.

Wa - ON for the set interval triggered with the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S does not start the interval T, and it does not change the position of the output relay R. Opening of the control contact S immediately switches on the output relay R for the set time. After the interval T has lapsed, the output relay R switches off. Opening and closing of the control contact S in the course of the interval T does not affect the function to be performed. The output relay R may be switched on again for the set interval with another closing and opening of the control contact S.

Es - ON delay with the control contact S.



The input of the time relay is supplied with voltage U continuously. Closing of the control contact S starts the interval T - on-delay of the output relay R. After the interval T has lapsed, the output relay R switches on and remains in this position until the control contact S is opened. In case the control contact S is closed for time shorter than the set interval T, the output relay R will not activate.

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T** - measured time; **Ta**, **Tb** - component intervals of T time; **Ts** - period of T time interrupt; **t** - time axis

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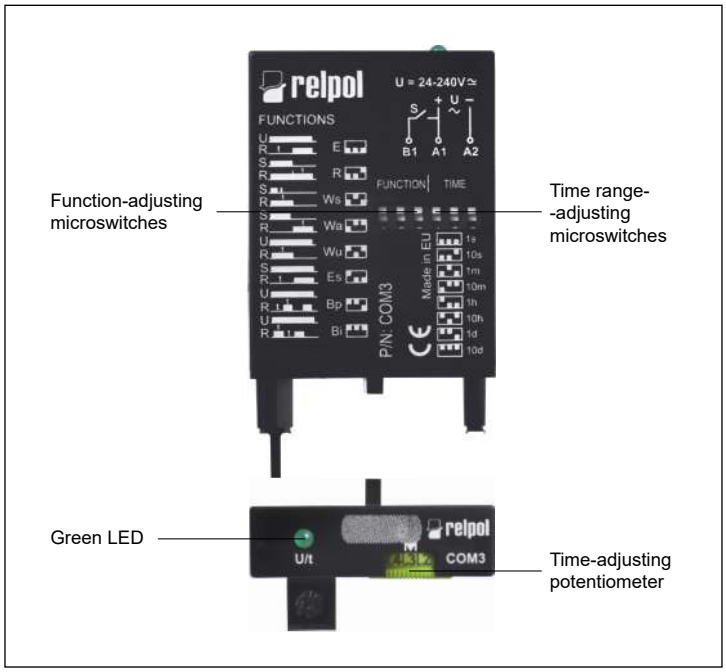
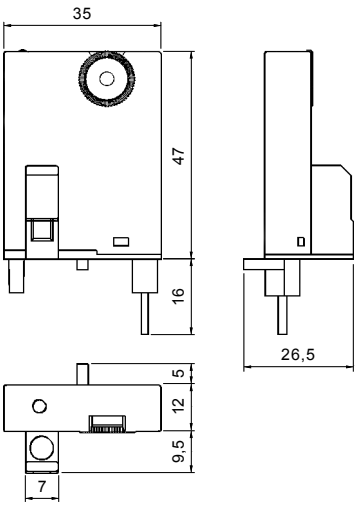
Settings of switches

Function adjustment microswitches 1, 2, 3	E	Wu	Bi	Bp	R	Ws	Wa	Es
								
Timing adjustment (max.) microswitches 4, 5, 6	1 s	10 s	1 min.	10 min.	1 h	10 h	1 d	10 d
								

Panels description



Dimensions - time module COM3



Mounting

Modules **COM3** are designed for mounting on plug-in sockets GZP11 or GZP8 (combinable to relays R15 - 3 CO or R15 - 2 CO). Operational position - any.

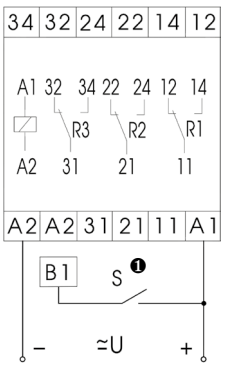
Ordering codes

Type

C	O	M	3

❶ The control terminal B1 is activated by connection to A1 terminal via the external control contact S.

Connection diagram (COM3 + GZP11 + R15 - 3 CO)



TIME

Monitoring relays

relpol S.A.

Multifunctions monitoring relays for power-engineering and industrial automation systems.

Monitoring relays RPN, MR-E series in modular covers and MR-G series in industrial covers are designed for direct mounting on 35 mm rail mount acc. to EN 60715.

They meet the requirements of REACH and RoHS Directive.
The relays are recognized and certified by:

CE EAC

modular covers

industrial covers

← Contents

RPN-1VF-A400

NEW

- **Multifunctions monitoring relays**
  (AC voltage monitoring in 3-phase network - 3(N)~ 400/230 V)
- Monitoring of phase failure, asymmetry
- Histeresis mode • Tripping delay
- Cadmium - free contacts 1 CO • AC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Compliance with standard EN 50178
- Recognitions, certifications, directives: RoHS,

Output circuit - contact data

Number and type of contacts		1 CO
Contact material		$AgSnO_2$
Max. switching voltage		300 V AC
Rated load	AC1	12 A / 250 V AC
	DC1	12 A / 24 V DC
	DC1	0,3 A / 250 V DC
Rated current		12 A / 250 V AC
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		1 W 10 mA
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	600 cycles/hour

Input circuit

Supply voltage	AC	= monitoring voltage
Rated voltage	50/60 Hz AC	3(N)~ 400/230 V terminals (N)-L1-L2-L3
Must release voltage		AC: ≥ 0,2 U_n
Operating range of supply voltage		when supplied from at least two phases: 0,7...1,15 U_n when supplied from single phase: 0,85...1,15 U_n
Rated power consumption		1,2 W
Range of supply frequency	AC	48...63 Hz
Measuring circuit ❶		
• measured value		electrical voltage, RMS value, 50 Hz 3(N)~, sinus, 48...63 Hz
• measuring inputs		= supply voltage AC: 3(N)~ 400/230 V
• measuring terminals		(N)-L1-L2-L3
• measuring range		0,7...1,15 U_n
• overload capacity		≥ 1,2 U_n
• hysteresis H		5 V
• switching thresholds for single phase		ERROR: ≤ 175 V AC OK: > 175 V AC OK (when returning after an error): ≥ 180 V AC
• switching thresholds for asymmetry		fixed value: ERROR: ≥ 55 V AC OK: < 55 V AC OK (when returning after an error): ≤ 50 V AC

Insulation according to EN 60664-1

Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2
Flammability class		V-0 for modular cover, UL 94
Dielectric strength		
• input - output		4 000 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection

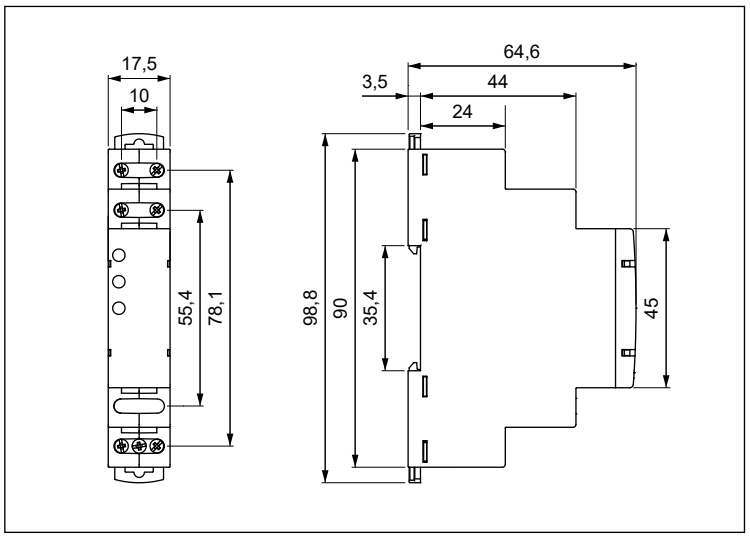
❶ The measuring circuit is not galvanically insulated from the relay supply circuit.

General data

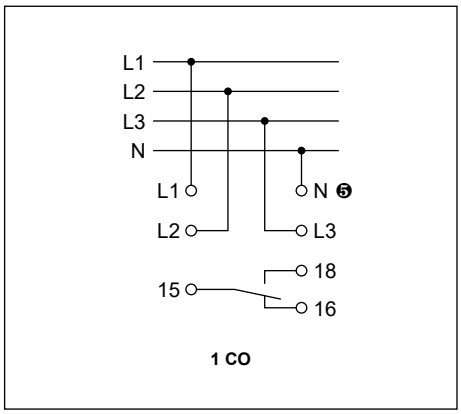
Electrical life	• resistive AC1	> 0,5 x 10^5 12 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		90 ❷ x 17,5 x 64,6 mm
Weight		72 g
Ambient temperature	• storage	-40...+70 °C
(non-condensation and/or icing)	• operating	-35...+60 °C
Cover protection category		IP 20 EN 60529
Relative humidity		up to 85%
Shock resistance		15 g
Vibration resistance		0,35 mm DA 10...55 Hz
Meassuring circuit data ❶		
Functions		LOST D - phase failure monitoring ASYM D - asymmetry monitoring histeresis mode
Ranges of asymmetry		fixed value: 55 V
Tripping delay		fixed value: 4 s
Base accuracy		voltage measurement: ± 5% ❸
Recovery time		200 ms
LED indicator ❹		two-colour LEDs (green/red) L1, L2, L3: indication of supply voltage U, error, tripping delay

❶ The measuring circuit is not galvanically insulated from the relay supply circuit. ❷ Length with 35 mm rail catches: 98,8 mm. ❸ From a measured value in the range of 100...230 V. ❹ LED indication - see "Additional functions", page 534.

Dimensions



Connection diagram



❺ Requires terminal (N) connection to the neutral wire.

MONITORING

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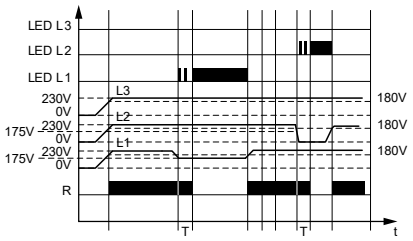
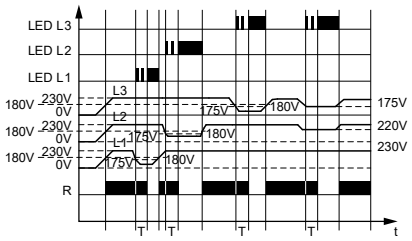
Functions

LOST D - Phase failure monitoring (with delayed disconnection of contact R).



If the voltage at all phases will exceed 175 V and no error condition occurred earlier, then the operational relay R is switched on. If voltage at one of the three phases, L1, L2, L3 falls to a value of 175 V, then after applying a delay time 4 s, the R contact is switched off. The operational relay R will be switched back on when the voltage value at the given phase rises to 180 V.

ASYM D - Asymmetry monitoring (with delayed disconnection of contact R).



The operational relay R switches to the off position when the asymmetry exceeds the value 55 V. The asymmetry caused by the return voltage of the receiver (e.g. a motor that still operates in only two phases) does not disconnect.

L1, **L2**, **L3** - phase supply voltages; **R** - output state of the relay; **T** - delay time; t - time axis

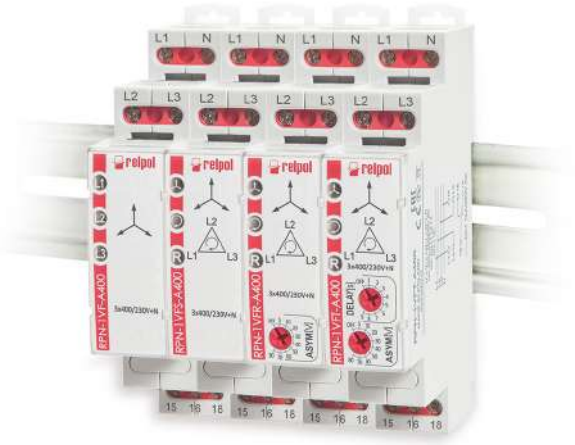
Additional functions

LEDs: two-colour (green/red) L1, L2, L3 - are lit permanently or flashes at 500 ms period where it is lit for 50% of the time, and off for 50% of the time.

Supply: the relay may be supplied with AC voltage 48...63 Hz of 161...264,5 V.

LED indication	L1	L2	L3
green lights up all the time	power supply and asymmetry are correct		
red lights up all the time	ERROR power supply or asymmetry		
red flashes	ERROR power supply or asymmetry ❻		

❻ Measurement of the tripping delay time (disconnection of contact R) after has occurred a phase failure or asymmetry error.



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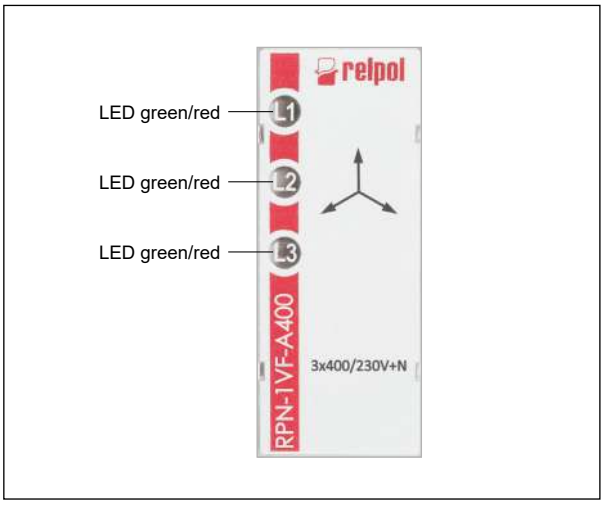
← Contents

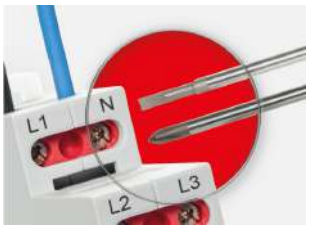
Front panel description



Mounting

Relays **RPN-1VF-A400** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes

Type	Number and type of contacts	Functions performed	Rated input voltage
RPN	1	VF	A400

Number and type of contacts

1 - 1 CO

Functions performed

VF - relay performing functions LOST D, ASYM D

Rated input voltage

A400 - 3(N)~ 400/230 50/60 Hz

Example of ordering codes:

RPN-1VF-A400 monitoring relay **RPN-1VF-A400**, multifunction (relay perform 2 functions), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage = monitoring 3(N)~ 400/230 V AC 50/60 Hz

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RPN-1VFS-A400

NEW

- **Multifunctions monitoring relays**
  (AC voltage monitoring in 3-phase network - 3(N)~ 400/230 V)
- Monitoring of phase failure, asymmetry, phase sequence
- Histeresis mode • Tripping delay
- Cadmium - free contacts 1 CO • AC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Compliance with standard EN 50178
- Recognitions, certifications, directives: RoHS,

Output circuit - contact data

Number and type of contacts		1 CO
Contact material		$AgSnO_2$
Max. switching voltage		300 V AC
Rated load	AC1	12 A / 250 V AC
	DC1	12 A / 24 V DC
	DC1	0,3 A / 250 V DC
Rated current		12 A / 250 V AC
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		1 W 10 mA
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	600 cycles/hour

Input circuit

Supply voltage	AC	= monitoring voltage
Rated voltage	50/60 Hz AC	3(N)~ 400/230 V terminals (N)-L1-L2-L3
Must release voltage		AC: ≥ 0,2 U_n
Operating range of supply voltage		when supplied from at least two phases: 0,7...1,15 U_n when supplied from single phase: 0,85...1,15 U_n
Rated power consumption		1,2 W
Range of supply frequency	AC	48...63 Hz
Measuring circuit ❶		
• measured value		electrical voltage, RMS value, 50 Hz 3(N)~, sinus, 48...63 Hz
• measuring inputs		= supply voltage AC: 3(N)~ 400/230 V
• measuring terminals		(N)-L1-L2-L3
• measuring range		0,7...1,15 U_n
• overload capacity		≥ 1,2 U_n
• hysteresis H		5 V
• switching thresholds for single phase		ERROR: ≤ 175 V AC OK: > 175 V AC OK (when returning after an error): ≥ 180 V AC
• switching thresholds for asymmetry		fixed value: ERROR: ≥ 55 V AC OK: < 55 V AC OK (when returning after an error): ≤ 50 V AC
• switching thresholds for phase sequence		OK: correct sequence of phase connection to the terminals ERROR: phase connection to terminals other than OK status

Insulation according to EN 60664-1

Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2
Flammability class		V-0 for modular cover, UL 94
Dielectric strength		
• input - output		4 000 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection

❶ The measuring circuit is not galvanically insulated from the relay supply circuit.

General data

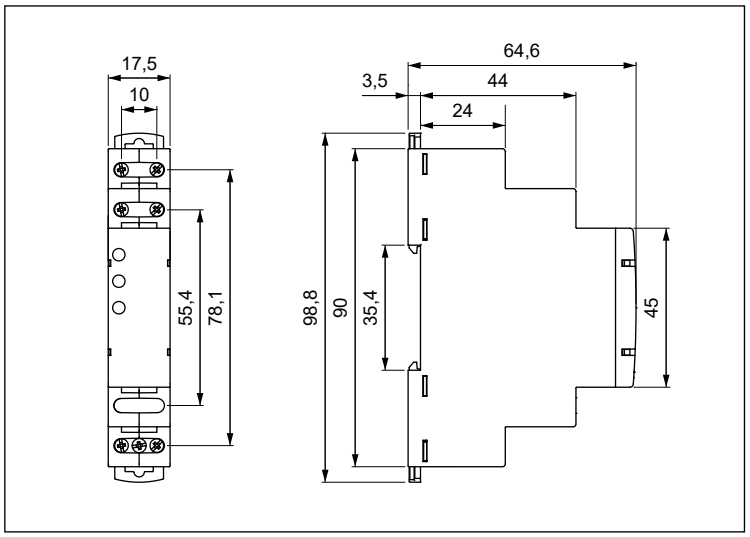
Electrical life	• resistive AC1	> 0,5 x 10^5 12 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		90 ❷ x 17,5 x 64,6 mm
Weight		72 g
Ambient temperature	• storage	-40...+70 °C
(non-condensation and/or icing)	• operating	-35...+60 °C
Cover protection category		IP 20 EN 60529
Relative humidity		up to 85%
Shock resistance		15 g
Vibration resistance		0,35 mm DA 10...55 Hz

Meassuring circuit data ❶

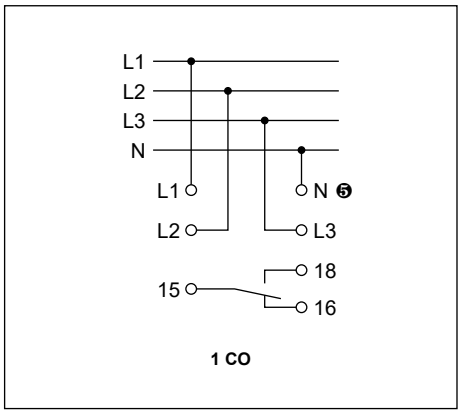
Functions	LOST D - phase failure monitoring ASYM D - asymmetry monitoring SEQ D - phase sequence monitoring histeresis mode
Ranges of asymmetry	fixed value: 55 V
Tripping delay	fixed value: 4 s
Base accuracy	voltage measurement: ± 5% ❸
Recovery time	200 ms
LED indicator ❹	two-colour LEDs (green/red) LOST+ASYM, SEQ: indication of supply voltage U, error, tripping delay yellow LED R - output relay status

❶ The measuring circuit is not galvanically insulated from the relay supply circuit. ❷ Length with 35 mm rail catches: 98,8 mm. ❸ From a measured value in the range of 100...230 V. ❹ LED indication - see "Additional functions", page 538.

Dimensions



Connection diagram



❺ Requires terminal (N) connection to the neutral wire.

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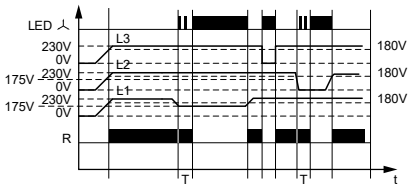
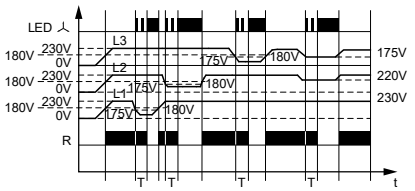
Functions

LOST D - Phase failure monitoring (with delayed disconnection of contact R).



If the voltage at all phases will exceed 175 V and no error condition occurred earlier, then the operational relay R is switched on. If voltage at one of the three phases, L1, L2, L3 falls to a value of 175 V, then after applying a delay time 4 s, the R contact is switched off. The operational relay R will be switched back on when the voltage value at the given phase rises to 180 V. A rapid phase loss is treated as a phase sequence error and no delay is then applied.

ASYM D - Asymmetry monitoring (with delayed disconnection of contact R).



The operational relay R switches to the off position when the asymmetry exceeds the value 55 V. The asymmetry caused by the return voltage of the receiver (e.g. a motor that still operates in only two phases) does not disconnect.

SEQ D - Phase sequence monitoring (without delay for disconnection of contact R).

If all the phases are connected to the terminals in the correct sequence (L1->L1, L2->L2, L3->L3) or in a consecutive sequence, then the operational relay R switches on. When the phase sequence changes, the operational relay R is immediately switched off.

Allowed connections combinations phases with terminal:

Terminal	Phase
L1 ->	L1
L2 ->	L2
L3 ->	L3
L1 ->	L2
L2 ->	L3
L3 ->	L1
L1 ->	L3
L2 ->	L1
L3 ->	L2

L1: misalignment phase 0°
L2: misalignment phase 2π/3=120°
L3: misalignment phase 4π/3=240°

L1, **L2**, **L3** - phase supply voltages; **R** - output state of the relay; **T** - delay time; t - time axis

Additional functions

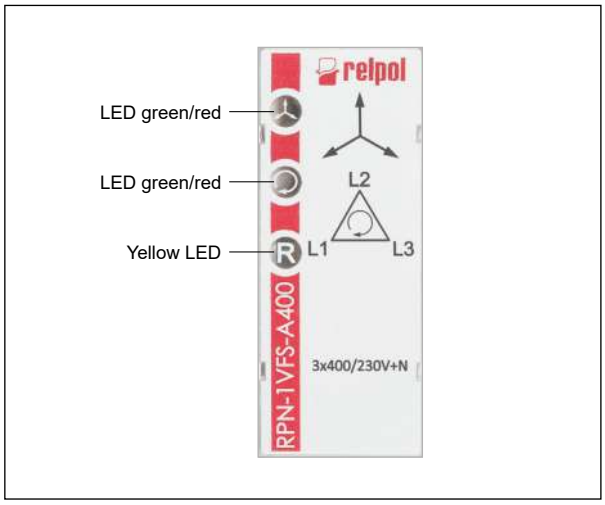
LEDs: two-colour (green/red) LOST+ASYM, SEQ - are lit permanently or flashes at 500 ms period where it is lit for 50% of the time, and off for 50% of the time. Yellow R is lit permanently.

Supply: the relay may be supplied with AC voltage 48...63 Hz of 161...264,5 V.

LED indication	LOST+ASYM	SEQ	R
green lights up all the time	power supply and asymmetry are correct	correct phase sequence	–
red lights up all the time	ERROR power supply or asymmetry	ERROR phase sequence	–
red flashes	ERROR power supply or asymmetry ❻	–	–
yellow does not light up	–	–	contact R disconnected
yellow lights up all the time	–	–	contact R connected

❻ Measurement of the tripping delay time (disconnection of contact R) after has occurred a phase failure or asymmetry error.

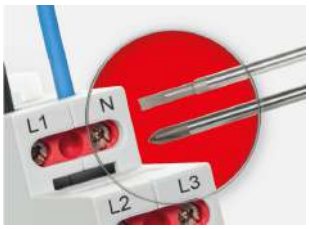
Front panel description



Mounting

Relays **RPN-1VFS-A400** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes

Type	Number and type of contacts	Functions performed	Rated input voltage
RPN	1	VFS	A400

Number and type of contacts

1 - 1 CO

Functions performed

VFS - relay performing functions LOST D, ASYM D, SEQ D

Rated input voltage

A400 - 3(N)~ 400/230 50/60 Hz

Example of ordering codes:

RPN-1VFS-A400 monitoring relay **RPN-1VFS-A400**, multifunction (relay perform 3 functions), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage = monitoring 3(N)~ 400/230 V AC 50/60 Hz

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RPN-1VFR-A400

NEW

- **Multifunctions monitoring relays**
  (AC voltage monitoring in 3-phase network - 3(N)~ 400/230 V)
- Monitoring of phase failure, asymmetry, phase sequence
- Histeresis mode • Tripping delay
- Cadmium - free contacts 1 CO • AC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Compliance with standard EN 50178
- Recognitions, certifications, directives: RoHS,

Output circuit - contact data

Number and type of contacts		1 CO
Contact material		$AgSnO_2$
Max. switching voltage		300 V AC
Rated load	AC1	12 A / 250 V AC
	DC1	12 A / 24 V DC
	DC1	0,3 A / 250 V DC
Rated current		12 A / 250 V AC
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		1 W 10 mA
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	600 cycles/hour

Input circuit

Supply voltage	AC	= monitoring voltage
Rated voltage	50/60 Hz AC	3(N)~ 400/230 V terminals (N)-L1-L2-L3
Must release voltage		AC: ≥ 0,2 U_n
Operating range of supply voltage		when supplied from at least two phases: 0,7...1,15 U_n when supplied from single phase: 0,85...1,15 U_n
Rated power consumption		1,2 W
Range of supply frequency	AC	48...63 Hz
Measuring circuit ❶		
• measured value		electrical voltage, RMS value, 50 Hz 3(N)~, sinus, 48...63 Hz
• measuring inputs		= supply voltage AC: 3(N)~ 400/230 V
• measuring terminals		(N)-L1-L2-L3
• measuring range		0,7...1,15 U_n
• overload capacity		≥ 1,2 U_n
• hysteresis H		5 V
• switching thresholds for single phase		ERROR: ≤ 175 V AC OK: > 175 V AC OK (when returning after an error): ≥ 180 V AC
• switching thresholds for asymmetry		smooth adjustment: ERROR: > 5...80 V AC OK: ≤ 5...80 V AC OK (when returning after an error): ≤ 0...75 V AC
• switching thresholds for phase sequence		OK: correct sequence of phase connection to the terminals ERROR: phase connection to terminals other than OK status

Insulation according to EN 60664-1

Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2
Flammability class		V-0 for modular cover, UL 94
Dielectric strength		
• input - output		4 000 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection

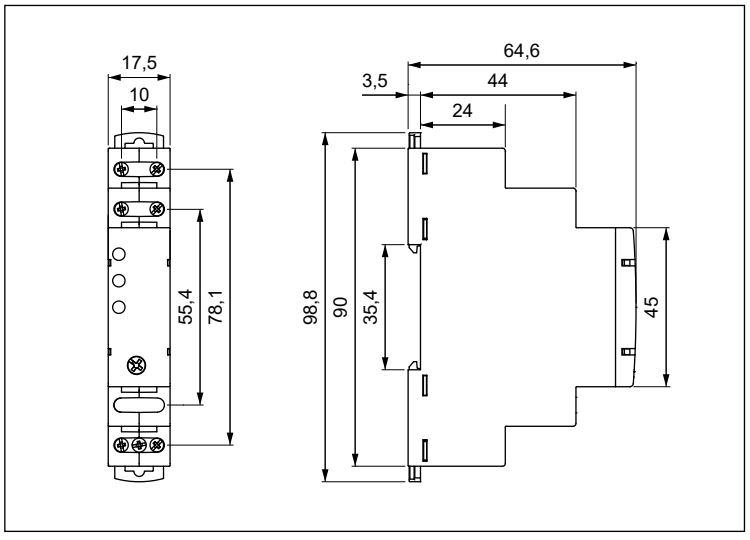
❶ The measuring circuit is not galvanically insulated from the relay supply circuit.

General data

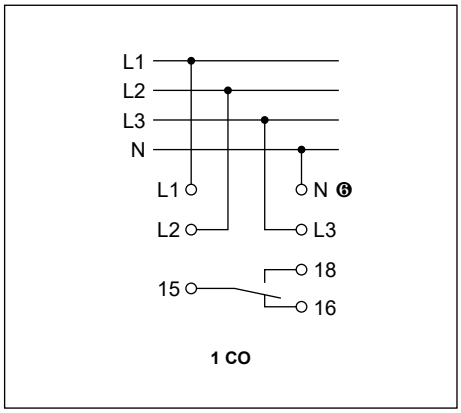
Electrical life	• resistive AC1	> 0,5 x 10^5 12 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		90 ❷ x 17,5 x 64,6 mm
Weight		72 g
Ambient temperature	• storage	-40...+70 °C
(non-condensation and/or icing)	• operating	-35...+60 °C
Cover protection category		IP 20 EN 60529
Relative humidity		up to 85%
Shock resistance		15 g
Vibration resistance		0,35 mm DA 10...55 Hz
Meassuring circuit data ❶		
Functions		LOST D - phase failure monitoring ASYM D - asymmetry monitoring SEQ D - phase sequence monitoring histeresis mode
Ranges of asymmetry		smooth adjustment: OFF - permanent switching off; 5...80 V AC
Tripping delay		fixed value: 4 s
Base accuracy		voltage measurement: ± 5% ❸
Accuracy of asymmetry settings		threshold limits: ± 10% ❹
Recovery time		200 ms
LED indicator ❺		two-colour LEDs (green/red) LOST+ASYM, SEQ: indication of supply voltage U, error, tripping delay yellow LED R - output relay status

❶ The measuring circuit is not galvanically insulated from the relay supply circuit. ❷ Length with 35 mm rail catches: 98,8 mm. ❸ From a measured value in the range of 100...230 V. ❹ Calculated from the final range values, for the setting direction from minimum to maximum. ❺ LED indication - see "Additional functions", page 542.

Dimensions



Connection diagram



❻ Requires terminal (N) connection to the neutral wire.

MONITORING

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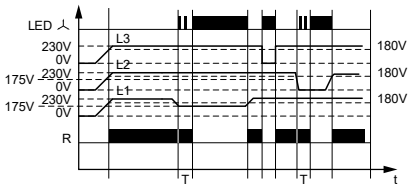
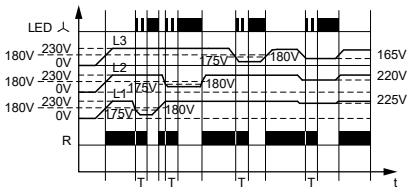
Functions

LOST D - Phase failure monitoring (with delayed disconnection of contact R).



If the voltage at all phases will exceed 175 V and no error condition occurred earlier, then the operational relay R is switched on. If voltage at one of the three phases, L1, L2, L3 falls to a value of 175 V, then after applying a delay time 4 s, the R contact is switched off. The operational relay R will be switched back on when the voltage value at the given phase rises to 180 V. A rapid phase loss is treated as a phase sequence error and no delay is then applied.

ASYM D - Asymmetry monitoring (with delayed disconnection of contact R).



The operational relay R switches to the off position when the asymmetry exceeds the setpoint value (diagram: switching threshold of asymmetry error 60 V). The asymmetry caused by the return voltage of the receiver (e.g. a motor that still operates in only two phases) does not disconnect.

SEQ D - Phase sequence monitoring (without delay for disconnection of contact R).

If all the phases are connected to the terminals in the correct sequence (L1->L1, L2->L2, L3->L3) or in a consecutive sequence, then the operational relay R switches on. When the phase sequence changes, the operational relay R is immediately switched off.

Allowed connections combinations phases with terminal:

Terminal	Phase
L1 ->	L1
L2 ->	L2
L3 ->	L3
L1 ->	L2
L2 ->	L3
L3 ->	L1
L1 ->	L3
L2 ->	L1
L3 ->	L2

L1: misalignment phase 0°
L2: misalignment phase 2π/3=120°
L3: misalignment phase 4π/3=240°

L1, **L2**, **L3** - phase supply voltages; **R** - output state of the relay;
T - delay time; t - time axis

Additional functions

LEDs: two-colour (green/red) LOST+ASYM, SEQ - are lit permanently or flashes at 500 ms period where it is lit for 50% of the time, and off for 50% of the time. Yellow R is lit permanently.

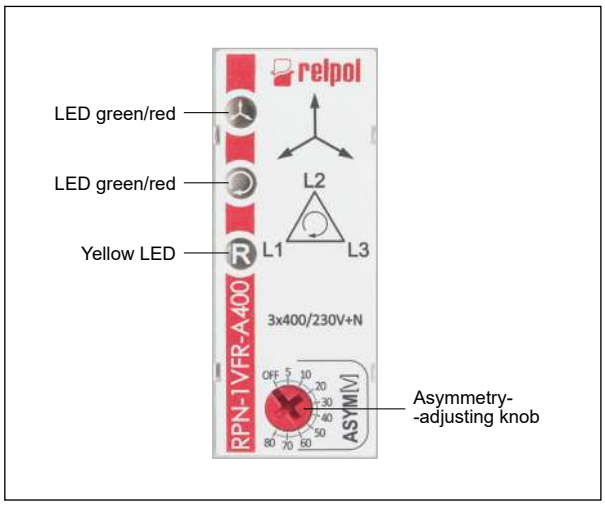
Adjustment of the set values: the value of range of asymmetry is read in the course of the relay's operation. The set value may be modified at any moment.

Supply: the relay may be supplied with AC voltage 48...63 Hz of 161...264,5 V.

LED indication	LOST+ASYM	SEQ	R
green lights up all the time	power supply and asymmetry are correct	correct phase sequence	–
red lights up all the time	ERROR power supply or asymmetry	ERROR phase sequence	–
red flashes	ERROR power supply or asymmetry ❼	–	–
yellow does not light up	–	–	contact R disconnected
yellow lights up all the time	–	–	contact R connected

❼ Measurement of the tripping delay time (disconnection of contact R) after has occurred a phase failure or asymmetry error.

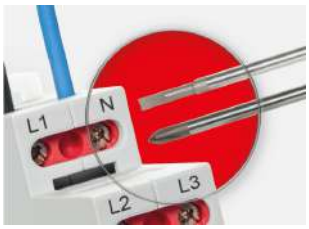
Front panel description



Mounting

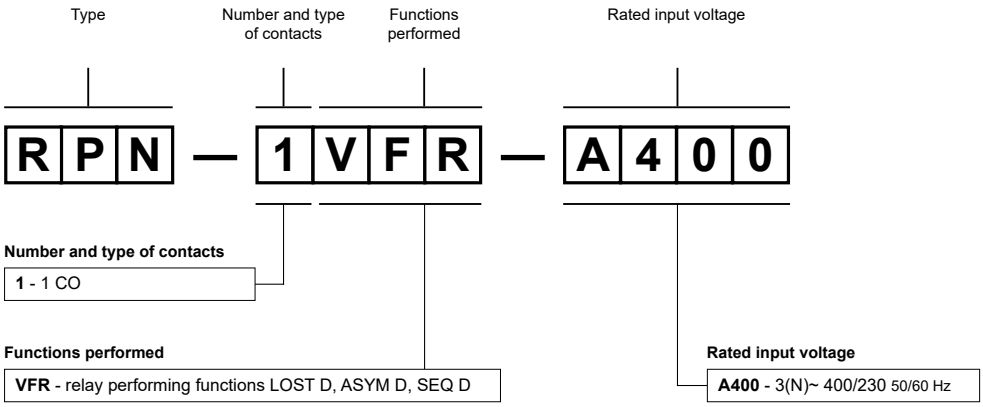
Relays **RPN-1VFR-A400** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes



Example of ordering codes:

RPN-1VFR-A400 monitoring relay **RPN-1VFR-A400**, multifunction (relay perform 3 functions), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage = monitoring 3(N)~ 400/230 V AC 50/60 Hz

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RPN-1VFT-A400
monitoring relays

RPN-1VFT-A400

NEW

- **Multifunctions monitoring relays**
  (AC voltage monitoring in 3-phase network - 3(N)~ 400/230 V)
- Monitoring of phase failure, asymmetry, phase sequence
- Histeresis mode • Adjustment of tripping delay
- Cadmium - free contacts 1 CO • AC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Compliance with standard EN 50178
- Recognitions, certifications, directives: RoHS,

Output circuit - contact data

Number and type of contacts		1 CO
Contact material		$AgSnO_2$
Max. switching voltage		300 V AC
Rated load	AC1	12 A / 250 V AC
	DC1	12 A / 24 V DC
	DC1	0,3 A / 250 V DC
Rated current		12 A / 250 V AC
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		1 W 10 mA
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	600 cycles/hour

Input circuit

Supply voltage	AC	= monitoring voltage
Rated voltage	50/60 Hz AC	3(N)~ 400/230 V terminals (N)-L1-L2-L3
Must release voltage		AC: ≥ 0,2 U_n
Operating range of supply voltage		when supplied from at least two phases: 0,7...1,15 U_n when supplied from single phase: 0,85...1,15 U_n
Rated power consumption		1,2 W
Range of supply frequency	AC	48...63 Hz
Measuring circuit ❶		
• measured value		electrical voltage, RMS value, 50 Hz 3(N)~, sinus, 48...63 Hz
• measuring inputs		= supply voltage AC: 3(N)~ 400/230 V
• measuring terminals		(N)-L1-L2-L3
• measuring range		0,7...1,15 U_n
• overload capacity		≥ 1,2 U_n
• hysteresis H		5 V
• switching thresholds for single phase		ERROR: ≤ 175 V AC OK: > 175 V AC OK (when returning after an error): ≥ 180 V AC
• switching thresholds for asymmetry		smooth adjustment: ERROR: > 5...80 V AC OK: ≤ 5...80 V AC OK (when returning after an error): ≤ 0...75 V AC
• switching thresholds for phase sequence		OK: correct sequence of phase connection to the terminals ERROR: phase connection to terminals other than OK status

Insulation according to EN 60664-1

Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2
Flammability class		V-0 for modular cover, UL 94
Dielectric strength		
• input - output		4 000 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection

❶ The measuring circuit is not galvanically insulated from the relay supply circuit.

General data

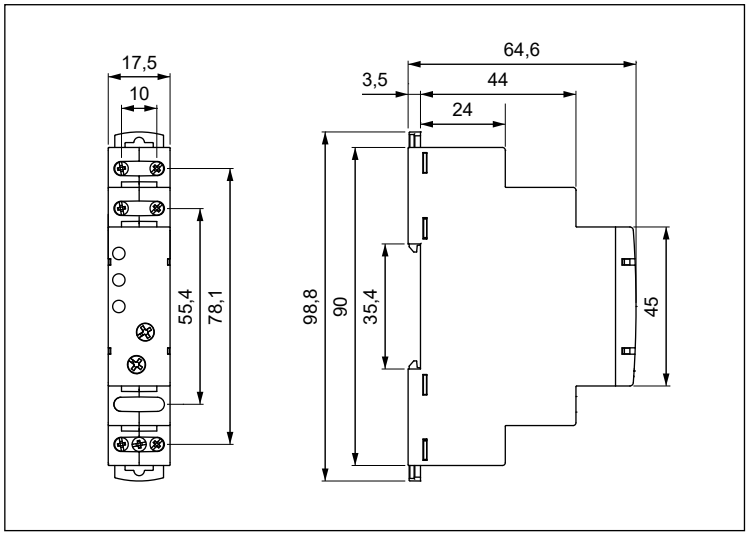
Electrical life	• resistive AC1	> 0,5 x 10^5 12 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		90 ❷ x 17,5 x 64,6 mm
Weight		72 g
Ambient temperature	• storage	-40...+70 °C
(non-condensation and/or icing)	• operating	-35...+60 °C
Cover protection category		IP 20 EN 60529
Relative humidity		up to 85%
Shock resistance		15 g
Vibration resistance		0,35 mm DA 10...55 Hz

Meassuring circuit data ❶

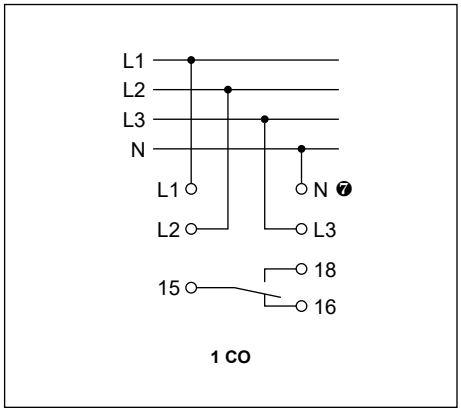
Functions	LOST D - phase failure monitoring ASYM D - asymmetry monitoring SEQ D - phase sequence monitoring histeresis mode
Ranges of asymmetry	smooth adjustment: OFF - permanent switching off; 5...80 V AC
Time ranges of tripping delay	step adjustment: OFF - permanent switching off; (1 s; 2 s ❸); 3 s; 4 s; 5 s; 6 s; 7 s; 8 s; 9 s
Base accuracy	voltage measurement: ± 5% ❹
Accuracy of asymmetry settings	threshold limits: ± 10% ❺
Accuracy of delay time settings	threshold limits: ± 5% ❺ ❸
Values affecting the timing adjustment • temperature • supply voltage	 ± 0,05% / °C ± 0,01% / V
Recovery time	200 ms
LED indicator ❻	two-colour LEDs (green/red) LOST+ASYM, SEQ: indication of supply voltage U, error, tripping delay yellow LED R - output relay status

❶ The measuring circuit is not galvanically insulated from the relay supply circuit. ❷ Length with 35 mm rail catches: 98,8 mm. ❸ For initial ranges (1 s; 2 s) setting accuracy is smaller than the given ones in technical parameters (significant influence of the operational relay operating time, processor start-time, and the moment of supply switching as referred to the AC supply course). ❹ From a measured value in the range of 100...230 V. ❺ Calculated from the final range values, for the setting direction from minimum to maximum. ❻ LED indication - see "Additional functions", page 546.

Dimensions



Connection diagram



❼ Requires terminal (N) connection to the neutral wire.

MONITORING

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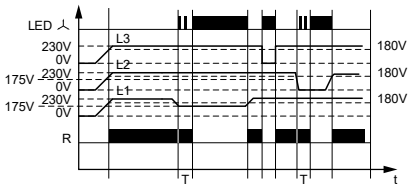
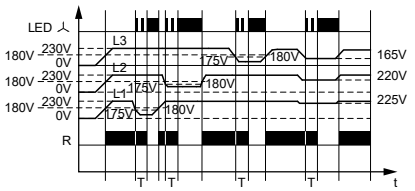
Functions

LOST D - Phase failure monitoring (with delayed disconnection of contact R).



If the voltage at all phases will exceed 175 V and no error condition occurred earlier, then the operational relay R is switched on. If voltage at one of the three phases, L1, L2, L3 falls to a value of 175 V, then after applying a setpoint delay time, the R contact is switched off. The operational relay R will be switched back on when the voltage value at the given phase rises to 180 V. A rapid phase loss is treated as a phase sequence error and no delay is then applied.

ASYM D - Asymmetry monitoring (with delayed disconnection of contact R).



The operational relay R switches to the off position when the asymmetry exceeds the setpoint value (diagram: switching threshold of asymmetry error 60 V). The asymmetry caused by the return voltage of the receiver (e.g. a motor that still operates in only two phases) does not disconnect.

SEQ D - Phase sequence monitoring (without delay for disconnection of contact R).

If all the phases are connected to the terminals in the correct sequence (L1->L1, L2->L2, L3->L3) or in a consecutive sequence, then the operational relay R switches on. When the phase sequence changes, the operational relay R is immediately switched off.

Allowed connections combinations phases with terminal:

Terminal	Phase
L1 ->	L1
L2 ->	L2
L3 ->	L3
L1 ->	L2
L2 ->	L3
L3 ->	L1
L1 ->	L3
L2 ->	L1
L3 ->	L2

L1: misalignment phase 0°
L2: misalignment phase 2π/3=120°
L3: misalignment phase 4π/3=240°

L1, **L2**, **L3** - phase supply voltages; **R** - output state of the relay;
T - delay time; t - time axis

Additional functions

LEDs: two-colour (green/red) LOST+ASYM, SEQ - are lit permanently or flashes at 500 ms period where it is lit for 50% of the time, and off for 50% of the time. Yellow R is lit permanently.

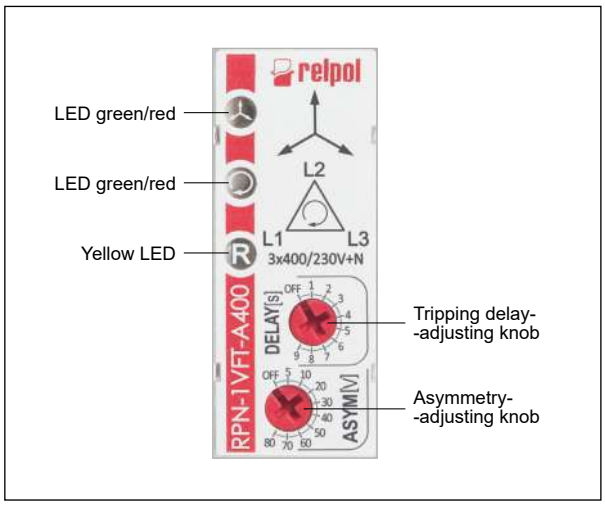
Adjustment of the set values: the values of range of asymmetry and tripping delay are read in the course of the relay's operation. The set values may be modified at any moment.

Supply: the relay may be supplied with AC voltage 48...63 Hz of 161...264,5 V.

LED indication	LOST+ASYM	SEQ	R
green lights up all the time	power supply and asymmetry are correct	correct phase sequence	–
red lights up all the time	ERROR power supply or asymmetry	ERROR phase sequence	–
red flashes	ERROR power supply or asymmetry ❽	–	–
yellow does not light up	–	–	contact R disconnected
yellow lights up all the time	–	–	contact R connected

❽ Measurement of the tripping delay time (disconnection of contact R) after has occurred a phase failure or asymmetry error.

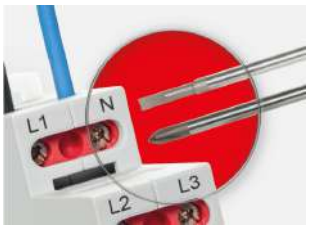
Front panel description



Mounting

Relays **RPN-1VFT-A400** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes

Type	Number and type of contacts	Functions performed		Rated input voltage			
R	P	N	—	1	V	F	T	—	A	4	0	0

Number and type of contacts

1 - 1 CO

Functions performed

VFT - relay performing functions LOST D, ASYM D, SEQ D

Rated input voltage

A400 - 3(N)~ 400/230 50/60 Hz

Example of ordering codes:

RPN-1VFT-A400 monitoring relay **RPN-1VFT-A400**, multifunction (relay perform 3 functions), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage = monitoring 3(N)~ 400/230 V AC 50/60 Hz

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RPN-1A..-A230
monitoring relays

RPN-1A16-A230

NEW

- **Multifunctions monitoring relays (6 versions of relays, AC current monitoring in 1-phase network, with adjustable thresholds ❶)**
- Minimum and maximum value monitoring • Windowfunction
- Fault latch mode • Tripping delay
- Cadmium - free contacts 1 CO • AC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Compliance with standard EN 50178
- Recognitions, certifications, directives: RoHS,

Output circuit - contact data

Number and type of contacts		1 CO
Contact material		$AgSnO_2$
Max. switching voltage		300 V AC
Rated load	AC1	12 A / 250 V AC
	DC1	12 A / 24 V DC
	DC1	0,3 A / 250 V DC
Rated current		12 A / 250 V AC
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		1 W 10 mA
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	600 cycles/hour

Input circuit

Supply voltage	AC	230 V
Rated voltage	50/60 Hz AC	230 V terminals (N)-L
Must release voltage		AC: ≥ 0,1 U_n
Operating range of supply voltage		0,85...1,15 U_n
Rated power consumption		0,6 W
Range of supply frequency	AC	48...63 Hz

Measuring circuit ❷

• measured value: electrical current AC, RMS value, 50 Hz
AC sinus, 48...63 Hz

	RPN-1A05	RPN-1A1	RPN-1A2	RPN-1A5	RPN-1A8	RPN-1A16
• measuring range	0,5 A	1 A	2 A	5 A	8 A	16 A
• overload capacity	2 A	4 A	8 A	6,5 A	11 A	20 A

• measuring terminals	Lk-N
• measuring range	0,05...1,0 I_n
• input resistance	< 5 mΩ
• switching thresholds	MIN: 0,05...0,95 I_n MAX: 0,1...1,0 I_n

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2
Flammability class		V-0 for modular cover, UL 94
Dielectric strength		
• input - output		4 000 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection

❶ Codes of versions - see "Ordering codes", page 552.
❷ The measuring circuit is not galvanically insulated from the relay supply circuit.

General data

Electrical life	• resistive AC1	> 0,5 x 10^5 12 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		90 ❸ x 17,5 x 64,6 mm
Weight		72 g
Ambient temperature	• storage	-40...+70 °C
(non-condensation and/or icing)	• operating	-20...+60 °C
Cover protection category		IP 20 EN 60529
Relative humidity		up to 85%
Shock resistance		15 g
Vibration resistance		0,35 mm DA 10...55 Hz
Meassuring circuit data ❷		
Functions		OD (OVER D), OD+L (OVER D + LATCH), UD (UNDER D), UD+L (UNDER D + LATCH), WD (WIN D), WD+L (WIN D + LATCH)
Current ranges		MIN - smooth adjustment: 5...95% MAX - smooth adjustment: 10...100%
Time ranges of tripping delay		step adjustment: OFF - permanent switching off; 0,5 s; 1 s; 1,5 s; 2 s; 2,5 s; 5 s; 10 s; 15 s; 20 s
Current setting accuracy		threshold limits: ± 10% ❹
Accuracy of delay time settings		threshold limits: ± 5% ❺
Values affecting the timing adjustment		
• temperature		± 0,05% / °C
• supply voltage		± 0,01% / V
Recovery time		≤ 200 ms
LED indicator ❻		green LED U - indication of supply voltage U, tripping delay, fault latch red LED I - indication of error yellow LED R - output relay status

❷ The measuring circuit is not galvanically insulated from the relay supply circuit. ❸ Length with 35 mm rail catches: 98,8 mm. ❹ From a measured value in the range of 0,2...1,0 In. ❺ Calculated from the final range values, for the setting direction from minimum to maximum. ❻ LED indication - see "Additional functions", page 551.

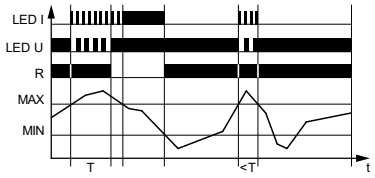
MONITORING

Export Sales Department: phone +48 68 47 90 832, 951, export@relpol.com.pl

Functions

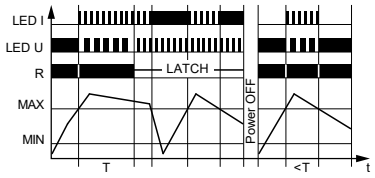
General principle: for the correct operation of the relay the current setpoints should meet the MAX > MIN condition.

OD (OVER D) - Overcurrent monitoring (with delayed disconnection of contact R).



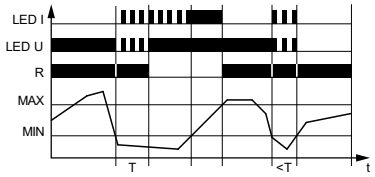
If the measured current has a value lower than MAX, then the operational relay R is switched on. When the measured current exceeds the MAX value, then after the set delay time the operational relay R will be switched off.
The operational relay R will be switched on again when the current falls below the MIN value.

OD+L (OVER D+LATCH) - Overcurrent monitoring with fault latch (with delayed disconnection of contact R).



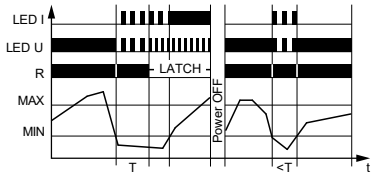
If the measured current has a value lower than MAX, then the operational relay R is switched on. When the measured current exceeds the MAX value, then after the set delay time the operational relay R will be switched off.
The operational relay R will remain switched on until the “error memory” is reset (the supply voltage is disconnected and connected again). After resetting the power supply voltage the operational relay R is switched on if the measured current has a value lower than MAX. The control of the current in the circuit is then commenced in accordance with the selected function.

UD (UNDER D) - Undercurrent monitoring (with delayed disconnection of contact R).



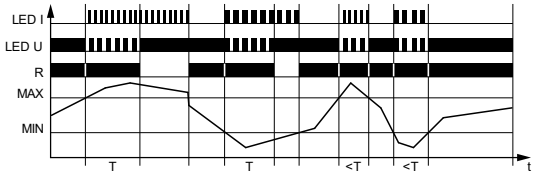
If the measured current has a value higher than MIN, then the operational relay R is switched on. When the measured current is lower than MIN, then after the set delay time the operational relay R will be switched off.
The operational relay R will be switched on again when the current exceeds the MAX value.

UD+L (UNDER D+LATCH) - Undercurrent monitoring with fault latch (with delayed disconnection of contact R).



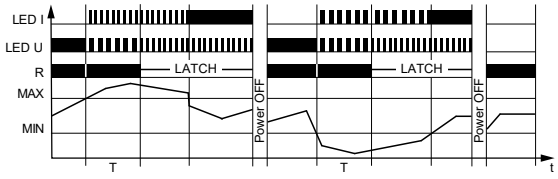
If the measured current has a value higher than MIN, then the operational relay R is switched on. When the measured current is lower than MIN, then after the set delay time the operational relay R will be switched off.
The operational relay R will remain switched on until the “error memory” is reset (the supply voltage is disconnected and connected again). After resetting the power supply voltage the operational relay R is switched on if the measured current has a value higher than MIN. The control of the current in the circuit is then commenced in accordance with the selected function.

WD (WIN D) - Current monitoring in windowfunction between MIN and MAX values (with delayed disconnection of contact R).



If the measured current is within the set window (MIN < measured I < MAX), then the operational relay R is switched on. When the measured current exceeds the set window between MIN and MAX (measured I < MIN or measured I > MAX), then after the set delay time the operational relay R will be switched off.
The operational relay R will be switched on again when the current is back within the set window (MIN < measured I < MAX).

WD+L (WIN D+LATCH) - Current monitoring in windowfunction between MIN and MAX values with fault latch (with delayed disconnection of contact R).



If the measured current is within the set window (MIN < measured I < MAX), then the operational relay R is switched on. When the measured current exceeds the set window between MIN and MAX (measured I < MIN or measured I > MAX), then after the set delay time the operational relay R will be switched off.
The operational relay R will remain switched on until the “error memory” is reset (the supply voltage is disconnected and connected again). After resetting the power supply voltage the operational relay R is switched on if the measured current is within the set window. The control of the current in the circuit is then commenced in accordance with the selected function.

U - supply voltage; **I** - current; **MIN, MAX** - set current thresholds; **R** - output state of the relay; **LATCH** - fault latch;
T - delay time; t - time axis

Additional functions

LEDs: green U, red I - are lit permanently or flashes at 500 ms and 250 ms period where it is lit for 50% of the time, and off for 50% of the time. Yellow R is lit permanently.

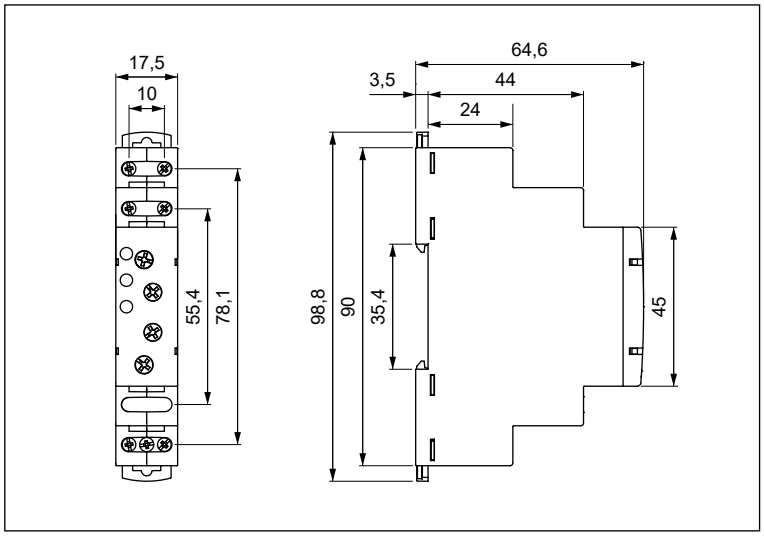
Adjustment of the set values:
- the values of range of current and tripping delay are read in the course of the relay's operation. The set values may be modified at any moment,
- it is possible to change the function during operation of the relay, which results in triggering operation with a new setting. It is not necessary to switch the supply off and on again for the relay to start operating with a new setting.

Supply: the relay may be supplied with AC voltage 48...63 Hz of 195,5...264,5 V.

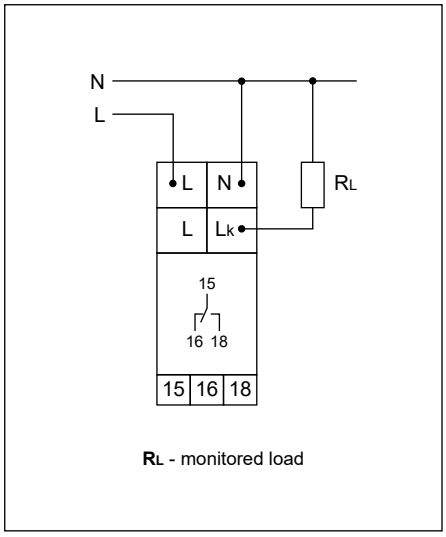
LED indication	U	I	R
green does not light up	power supply turned off	–	–
green lights up all the time	correct power supply	–	–
green slow flashes	measurement of the tripping delay time	–	–
green fast flashes	necessary error memory reset (power off and on)	–	–
red does not light up	–	function performed correctly	–
red lights up all the time	–	setting error ❼ or function error	–
red slow flashes	–	there has been an excess of less than MIN	–
red fast flashes	–	there has been an excess above MAX	–
yellow does not light up	–	–	contact R disconnected
yellow lights up all the time	–	–	contact R connected

❼ Measured current outside the range of MIN and MAX threshold limits - required correction of settings.

Dimensions



Connection diagram



RL - monitored load

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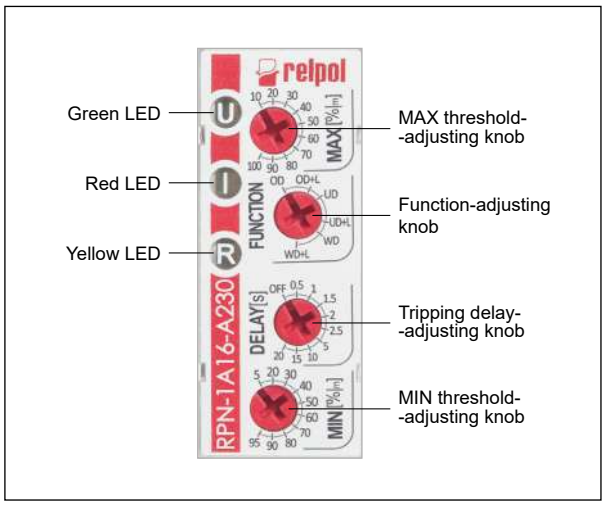
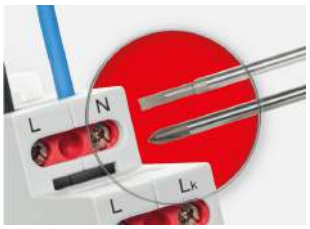
Front panel description



Mounting

Relays **RPN-1A..-A230** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes

Type	Number and type of contacts	Measuring range		Rated input voltage			
R	P	N	—	1	A			—	A	2	3	0

Number and type of contacts

1 - 1 CO

Measuring range

A05 - relay monitoring current 0,5 A
A1 - relay monitoring current 1 A
A2 - relay monitoring current 2 A
A5 - relay monitoring current 5 A
A8 - relay monitoring current 8 A
A16 - relay monitoring current 16 A

Rated input voltage

A230 - 230 V AC 50/60 Hz

Examples of ordering codes:

RPN-1A05-A230 monitoring relay **RPN-1A05-A230**, multifunction (relay perform 6 functions), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage 230 V AC 50/60 Hz, monitored current max. 0,5 A / 230 V AC

RPN-1A16-A230 monitoring relay **RPN-1A16-A230**, multifunction (relay perform 6 functions), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage 230 V AC 50/60 Hz, monitored current max. 16 A / 230 V AC

RPN-1TMP-A230

NEW

- **Single-functions monitoring relays (motor temperature monitoring)** • Short circuit monitoring of the thermistor line
- Fault latch mode • Switching/tripping delay
- Test functions: built-in TEST/RESET button, connection of the external RESET button (optional)
- Cadmium - free contacts 1 CO • AC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Compliance with standard EN 60947-8
- Recognitions, certifications, directives: RoHS,

Output circuit - contact data

Number and type of contacts		1 CO
Contact material		$AgSnO_2$
Max. switching voltage		300 V AC
Rated load	AC1	12 A / 250 V AC
	DC1	12 A / 24 V DC
	DC1	0,3 A / 250 V DC
Rated current		12 A / 250 V AC
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity		1 W 10 mA
Contact resistance		≤ 100 mΩ
Max. operating frequency		
• at rated load	AC1	600 cycles/hour

Input circuit

Supply voltage	AC	230 V
Rated voltage	50/60 Hz AC	230 V terminals A1-A2
Must release voltage		AC: ≥ 0,1 U_n
Operating range of supply voltage		0,85...1,15 U_n
Rated power consumption		0,6 W
Range of supply frequency	AC	48...63 Hz
Measuring circuit		
• measured value		resistance ❶
• measuring sensor		max. 6 PTC thermistor sensors, connected in series
• measuring terminals		T1, T2
• input resistance		≤ 4 kΩ
• measuring voltage		≤ 7,5 V EN 60947-8
• rated resistance of the measuring sensor		≤ 1,5 kΩ
• switching thresholds		MIN: 1,65 kΩ WARNING: 3,3 kΩ MAX: 3,6 kΩ
• short-circuit detection		≤ 10 Ω
• the ability to reset after a short-circuit		≥ 20 Ω
• correct operation range		20 Ω ≤ R ≤ 3,6 kΩ
• measurement accuracy for threshold limits		± 5% in the range of 1,5...4 kΩ
• sensor galvanic separation		no
External reset button		
• function		Reset
• terminals		R1-R2
• load		no
• min. time of pulse duration ❷		≥ 50 ms
• max. length of control line		10 m

Insulation according to EN 60664-1

Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2
Flammability class		V-0 for modular cover, UL 94
Dielectric strength		
• input - output		4 000 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection

❶ The indirect measurement of the motor winding temperature through resistance measurement of the standardised measurement sensor (acc. to DIN 44081, characteristics acc. to EN 60947-8). ❷ Where the control signal is recognizable.

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General data

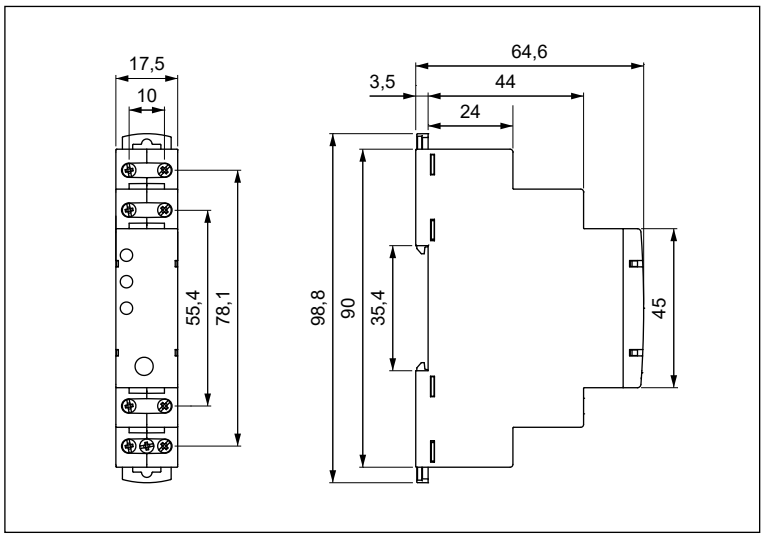
Electrical life	• resistive AC1	> 0,5 x 10^5	12 A, 250 V AC
Mechanical life (cycles)		> 3 x 10^7	
Dimensions (L x W x H)		90 ❸ x 17,5 x 64,6 mm	
Weight		70 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+60 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock resistance		15 g	
Vibration resistance		0,35 mm DA	10...55 Hz

Meassuring circuit data

Functions	TEMP - temperature monitoring of the motor winding fault latch mode test functions: built-in TEST/RESET button, connection of the external RESET button (optional)
Switching/tripping delay	1 s
Recovery time	250 ms
LED indicator ❹	green LED U - indication of supply voltage U, fault latch red LED °C - indication of error yellow LED R - output relay status

❸ Length with 35 mm rail catches: 98,8 mm. ❹ LED indication - see "Additional functions", page 555.

Dimensions



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← Contents

Functions

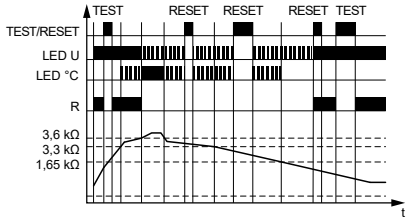
TEMP - Temperature monitoring of the motor winding with fault latch (with delayed connection/disconnection of contact R).

If the supply voltage U is switched on and the total resistance of the PTC sensor circuit is less than 3,6 kΩ (standard motor temperature), the operational relay R switches on. In these conditions pressing the built-in TEST/RESET button will activate the "Test" function - switching off the operational relay R. The operational relay R will remain switched on as long as the TEST/RESET button is pressed, activating the "Test" function. The test function does not work with the use of the external RESET button.

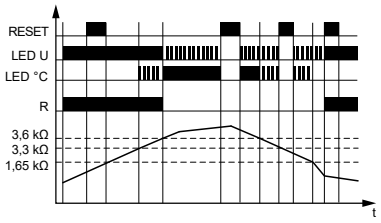
When the total resistance of the PTC circuit exceeds 3,6 kΩ (temperature increases), the operational relay R will be disconnected. The operational relay R will be switched back on when the total resistance of the sensors falls below 1,65 kΩ (the system is cooled) and one of the three conditions below is met:
- the TEST/RESET button is pressed (the "Reset" function),
- the external RESET button is pressed (NO type, connected between the R1, R2 terminals),
- the supply voltage is switched off and back on again.

In case of a sensor short-circuit, when the resistance of the connected sensors falls below 10 Ω, the operational relay R will be disconnected. The operational relay R will be switched back on the moment the sensor resistance increases back above 20 Ω and one of the three conditions below is met:
- the TEST/RESET button is pressed (the "Reset" function),
- the external RESET button is pressed (NO type, connected between the R1, R2 terminals),
- the supply voltage is switched off and back on again.

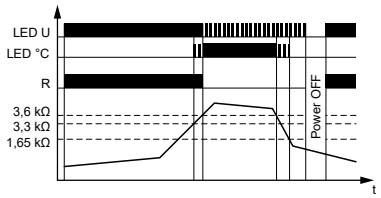
Application of built-in **TEST/RESET** button.



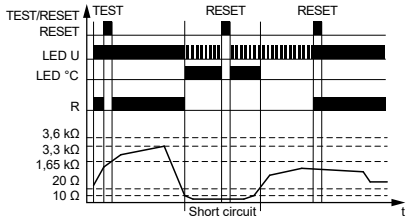
Application of an external **RESET** button.



Reset by power supply voltage.



Sensor short-circuit.



Additional functions

LEDs: green U, red °C - are lit permanently or flashes at 250 ms period where it is lit for 50% of the time, and off for 50% of the time. Yellow R is lit permanently.

Supply: the relay may be supplied with AC voltage 48...63 Hz of 195,5...264,5 V.

LED indication	U	°C	R
green does not light up	power supply turned off	–	–
green lights up all the time	correct power supply	–	–
green flashes	necessary error memory reset (power off and on)	–	–
red does not light up	–	no error ❺	–
red lights up all the time	–	temperature above the MAX threshold	–
red flashes	–	temperature close to MAX threshold ❻	–
yellow does not light up	–	–	contact R disconnected
yellow lights up all the time	–	–	contact R connected

❺ Total resistance of the PTC circuit below a value of 3,6 kΩ.
❻ Total resistance of the PTC circuit between 3,3 kΩ and 3,6 kΩ (WARNING threshold - increased temperature condition).

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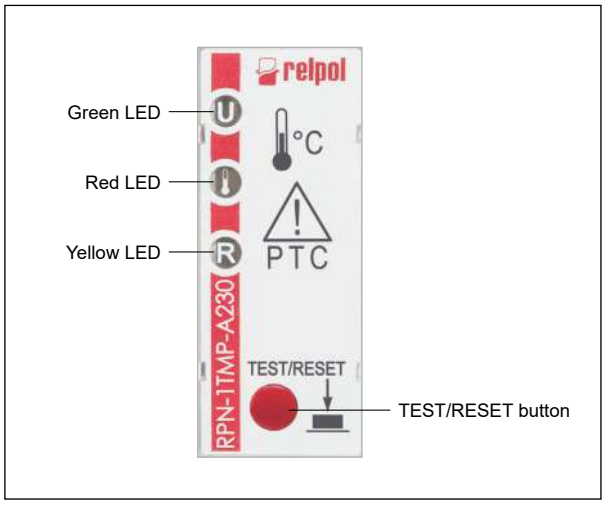
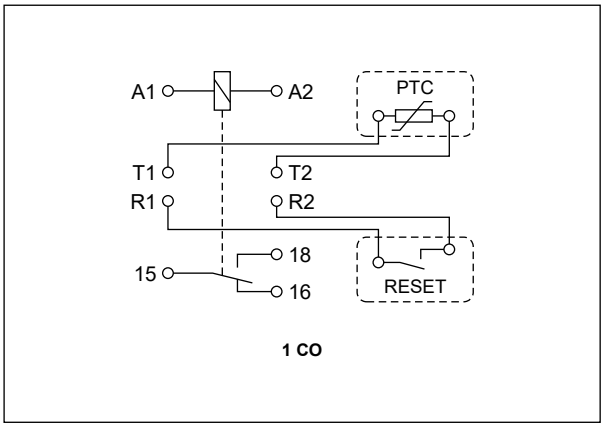
Front panel description



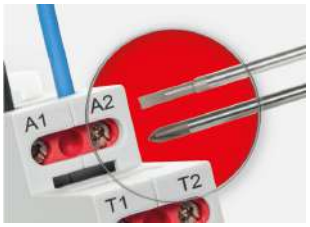
Connection diagram



Mounting

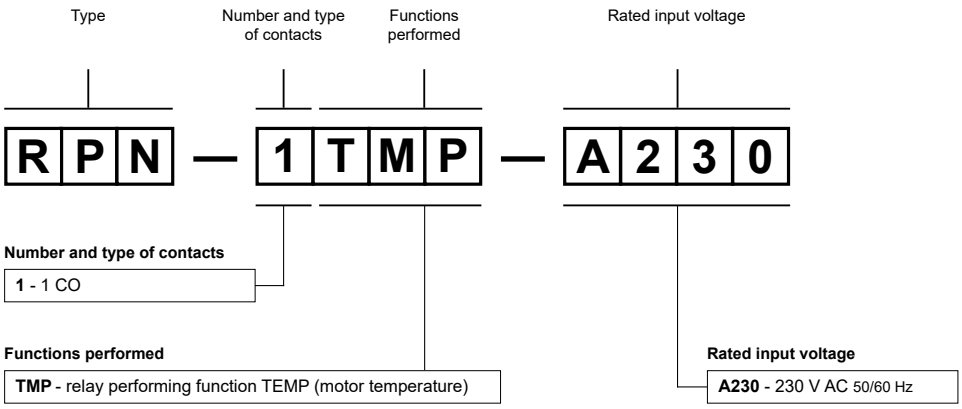
Relays **RPN-1TMP-A230** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches: easy mounting on 35 mm rail, firm hold (top and bottom).



Mounting wires in clamps: universal screw (cross-recessed or slotted head).

Ordering codes



Example of ordering codes:

RPN-1TMP-A230 monitoring relay **RPN-1TMP-A230**, single-function (relay perform function TEMP), cover - modular, width 17,5 mm, one changeover contact, contact material $AgSnO_2$, rated input voltage 230 V AC 50/60 Hz

- **Multifunctions monitoring relays (DC and AC voltage monitoring in 1-phase network, with adjustable thresholds)**
- Minimum value monitoring with the histeresis mode
- Supply voltage = monitoring voltage
- Output: 1 CO (1 changeover contact)
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Recognitions, certifications, directives: RoHS, CE

Output circuit - contact data

Number and type of contacts		1 CO
Rated voltage		250 V AC
Max. breaking capacity	AC1	1 250 VA (5 A / 250 V AC)
Max. operating frequency • at resistive load 100 VA • at resistive load 1 000 VA		 3 600 cycles/hour 360 cycles/hour

Input circuit

Supply voltage		= monitoring voltage
Rated voltage	AC DC	24, 230 V 24 V
Must release voltage		determined by undervoltage detection (see measured circuit)
Operating range of supply voltage		0,75...1,2 U_n
Rated power consumption	AC DC	230 V AC: 10,0 VA / 0,6 W 24 V AC: 1,3 VA / 0,8 W 24 V DC: 0,6 W
Range of supply frequency	AC	48...63 Hz
Duty cycle		100%
Measuring circuit • measured value • measuring inputs • overload capacity • switching thresholds • hysteresis H		DC or AC sinus, 48...63 Hz = supply voltage AC: 230 V terminals E-F3 AC: 24 V terminals E-F2 DC: 24 V terminals E-F1 ≥ 1,2 U_n MIN: 0,75...1,15 U_n MAX: 0,8...1,2 U_n see printing on the unit

Insulation according to EN 60664-1

Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2 if built-in: 3

General data

Electrical life	• resistive AC1	> 2 x 10^5 1 000 VA
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		87 x 17,5 x 65 mm
Weight		72 g
Ambient temperature (non-condensation and/or icing)	• storage • operating	-25...+70 °C -25...+55 °C
Cover protection category		IP 20 EN 60529
Relative humidity		15...85%
Shock resistance		15 g 11 ms
Vibration resistance		0,35 mm DA 10...55 Hz

Meassuring circuit data

Functions	UNDER, WIN minimum value monitoring with the histeresis mode
Base accuracy	± 5% (calculated from the final range values)
Setting accuracy	± 5% (calculated from the final range values)
Repeatability	± 2%
Temperature influence	± 1% / °C
Recovery time	500 ms
LED indicator	green LED U ON - indication of supply voltage U red LEDs MIN and MAX ON/OFF - indication of failure ❶ yellow LED R ON/OFF - output relay status

❶ Indication of relay status - according to the set threshold.

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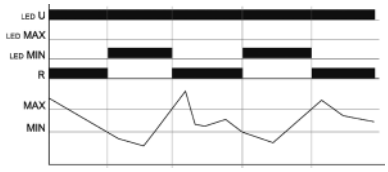
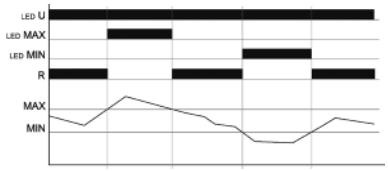
Functions

UNDER - Undervoltage monitoring.



When the supply voltage U is applied, the output relay R switches into on-position, if the measured voltage is beyond the MIN-value. When the measured voltage falls below the MIN-value, the output relay R switches into off-position. The output relay R switches into on-position again, if the voltage exceeds the MAX-value.

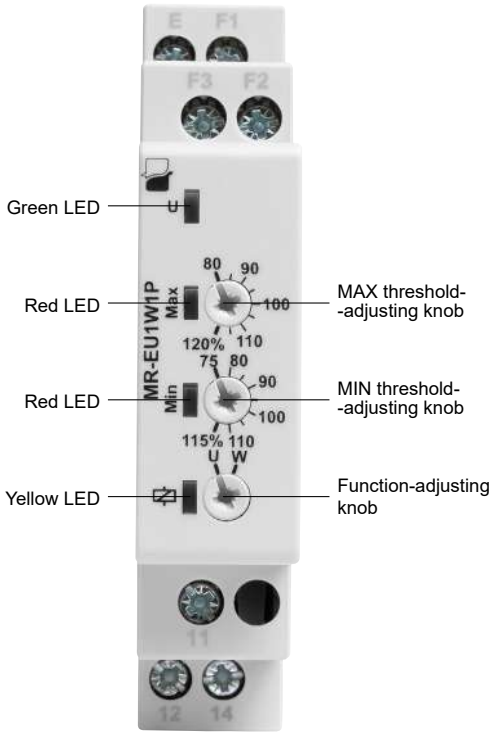
WIN - Voltage monitoring in windowfunction between MIN and MAX values.



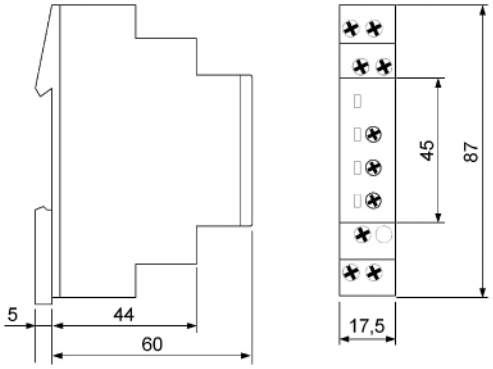
When the supply voltage U is applied, the output relay R switches into on-position, if the measured voltage is within the adjusted window. When the measured voltage left the window between MIN and MAX, the output relay R switches into off-position. The output relay R switches into on-position again, if the voltage re-enter the adjusted window.

U - supply voltage; **R** - output state of the relay; **MIN, MAX** - relay status

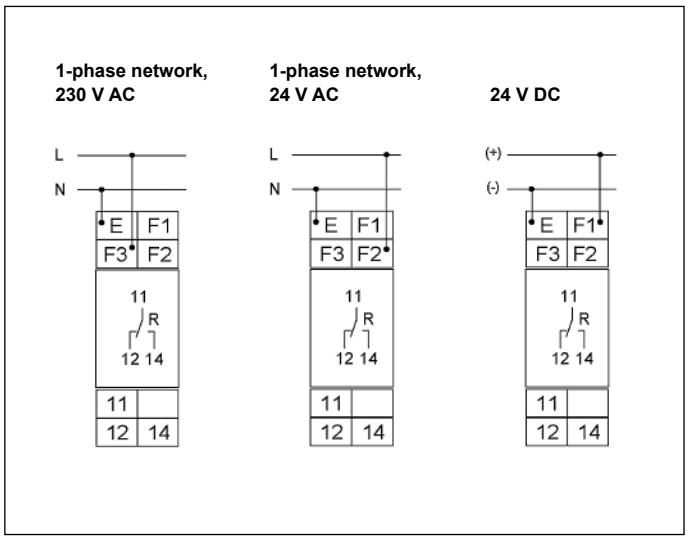
Front panel description



Dimensions



Connection diagrams



Mounting

Relays **MR-EU1W1P** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Terminals - cross section of the connection cables:** 1 x 0,5 ... 2,5 mm^2 with/without multicore cable end, 1 x 4 mm^2 without multicore cable end, 2 x 0,5 ... 1,5 mm^2 with/without multicore cable end, 2 x 2,5 mm^2 flexible without multicore cable end.

Ordering codes

Type

M	R	–	E	U	1	W	1	P

Monitoring

U1 - DC and AC voltage in 1-phase network

Number and type of contacts

1P - 1 CO

Example of ordering code:

MR-EU1W1P monitoring relay **MR-EU1W1P**, multifunction (relay perform 2 functions), cover - modular, width 17,5 mm, one changeover contact, rated monitoring voltages: AC - 230 V, 24 V; DC - 24 V

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MR-EU31UW1P
monitoring relays

- **Multifunctions monitoring relays (AC voltage monitoring in 1-phase network and 3-phase - 3(N)~ 400/230 V, with adjustable thresholds)**
- Monitoring of phase sequence ❶ and phase failure • Connection of neutral wire (optional) • Timing adjustment of tripping delay
- Supply voltage = monitoring voltage • Output: 1 CO (1 changeover contact)
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Recognitions, certifications, directives: RoHS, CE

Output circuit - contact data

Number and type of contacts		1 CO
Rated voltage		250 V AC
Max. breaking capacity	AC1	1 250 VA (5 A / 250 V AC)
Max. operating frequency • at resistive load 100 VA • at resistive load 1 000 VA		 3 600 cycles/hour 360 cycles/hour

Input circuit

Supply voltage		= monitoring voltage
Rated voltage	AC	230 V, 3(N)~ 400/230 V
Operating range of supply voltage		0,7...1,3 U_n
Rated power consumption	AC	8,0 VA / 1,0 W
Range of supply frequency	AC	48...63 Hz
Duty cycle		100%
Measuring circuit • measured value • measuring inputs • overload capacity • switching thresholds		3(N)~, sinus, 48...63 Hz = supply voltage AC: 230 V, 3(N)~ 400/230 V terminals (N)-L1-L2-L3 determined by tolerance specified for supply voltage MIN: 0,7...1,2 U_n MAX: 0,8...1,3 U_n

Insulation according to EN 60664-1

Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2 if built-in: 3

General data

Electrical life	• resistive AC1	> 2 x 10^5 1 000 VA
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		87 x 17,5 x 65 mm
Weight		72 g
Ambient temperature (non-condensation and/or icing)	• storage • operating	-25...+70 °C -25...+55 °C
Cover protection category		IP 20 EN 60529
Relative humidity		15...85%
Shock resistance		15 g 11 ms
Vibration resistance		0,35 mm DA 10...55 Hz

Meassuring circuit data

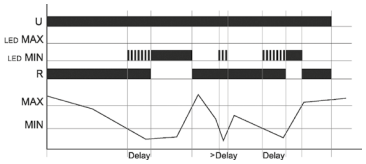
Functions	UNDER, UNDER+SEQ, WIN, WIN+SEQ SEQ - monitoring of phase sequence ❶ and phase failure connection of neutral wire (optional)
Range of delay timing adjustment	tripping delay: 0...10 s
Base accuracy	± 5% (calculated from the final range values)
Setting accuracy	± 5% (calculated from the final range values)
Repeatability	± 2%
Temperature influence	± 0,05% / °C
Recovery time	500 ms
LED indicator	red LEDs MIN and MAX ON/OFF - indication of failure ❷ red LEDs MIN and MAX flashing - indication of tripping delay ❷ red LED SEQ ON - indication of the change of phase sequence yellow LED R ON/OFF - output relay status

❶ Phase sequence monitoring - selectable.
❷ Indication of relay status - according to the set threshold.

Functions

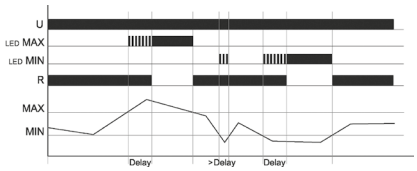
For all functions the LED's MIN and MAX are flashing alternating (the relay is fallen off), when the minimum value for the measured voltage was chosen to be greater than the maximum value. If a failure already exists, when the device is activated, the output relay R remains in off-position and the LED for the corresponding threshold is illuminated. The device includes seperately every phase voltage (L-N) and monitors it according to the selected function (UNDER or WINDOW).

UNDER, UNDER+SEQ - Undervoltage monitoring, undervoltage monitoring with monitoring of phase sequence.



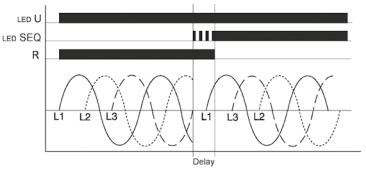
When the measured voltage (one of the phase voltages) falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay begins (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relay R switches into off-position (yellow LED not illuminated). The output relay R switches into on-position again (yellow LED illuminated), when the measured voltage (all phase voltages) exceeds the value adjusted at the MAX-regulator.

WIN, WIN+SEQ - Voltage monitoring in windowfunction between MIN and MAX values, voltage monitoring in windowfunction between MIN and MAX values with monitoring of phase sequence.



The output relay R switches into on-position (yellow LED illuminated), when the measured voltage (all phase voltages) exceeds the value adjusted at the MIN-regulator. When the measured voltage (one of the phase voltages) exceeds the value adjusted at the MAX-regulator, the set interval of tripping delay begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated) the output relay R switches into off-position (yellow LED not illuminated). The output relay R switches into on-position again (yellow LED illuminated) when the measured voltage falls below the value adjusted at the MAX-regulator (red LED MAX not illuminated). When the measured voltage (one of the phase voltage) falls below the value adjusted at the Min-regulator, the set interval of tripping delay begins again (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relay R switches into off-positon (yellow LED not illuminated).

SEQ - Phase sequence monitoring.

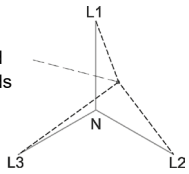


Phase sequence monitoring is selectable for all functions. In single phase circuit, the monitoring of phase sequence must be disconnected. If a change in phase sequence is detected (red LED SEQ illuminated), the output relay R switches into off-position after the set interval of tripping delay has expired (yellow LED not illuminated).

U - supply voltage; **R** - output state of the relay; **MIN, MAX** - relay status; **SEQ** - phase sequence; **Delay** - delay time

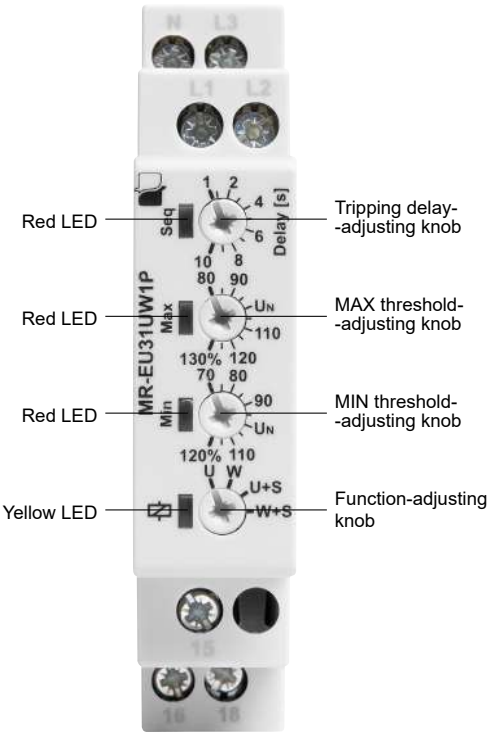
Loss of neutral wire by means of evaluation of asymmetry.

Shift of neutral point caused by asymmetrical phase loads and missing neutral wire



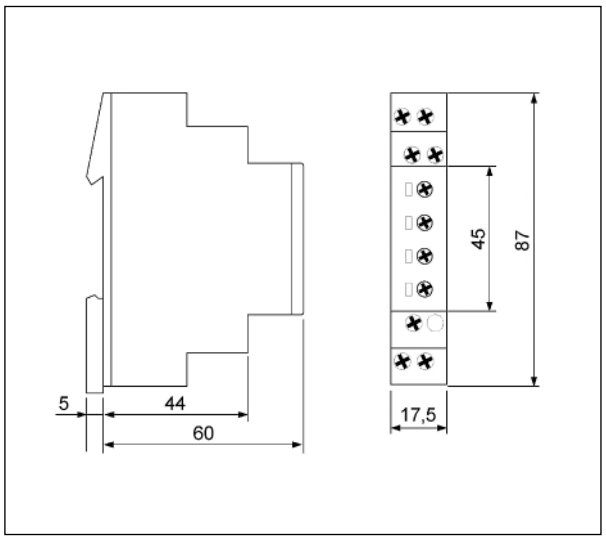
The device monitors every phase (L1, L2 and L3) against the neutral wire N. A shift of neutral point occurs by an asymmetrical phase load if the neutral wire breaks in the power line. If one of the phase voltages exceeds the value adjusted at the trip point, the set interval of tripping delay begins (red LED MIN or MAX flashes). After the interval has expired (red LED MIN or MAX illuminated), the output relay R switches into off-position (yellow LED not illuminated).

Front panel description

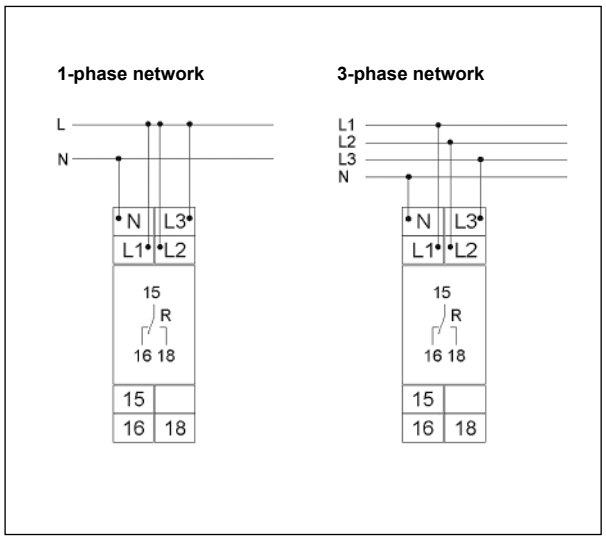


MONITORING

Dimensions



Connection diagrams



Mounting

Relays **MR-EU31UW1P** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Terminals - cross section of the connection cables:** 1 x 0,5 ... 2,5 mm^2 with/without multicore cable end, 1 x 4 mm^2 without multicore cable end, 2 x 0,5 ... 1,5 mm^2 with/without multicore cable end, 2 x 2,5 mm^2 flexible without multicore cable end.

Ordering codes

Type

MR-EU31UW1P

Monitoring

U31 - 3(N)~ 400/230 V voltage in 1-phase network and 3-phase

Number and type of contacts

1P - 1 CO

Example of ordering code:

MR-EU31UW1P monitoring relay **MR-EU31UW1P**, multifunction (relay perform 5 functions), cover - modular, width 17,5 mm, one changeover contact, rated monitoring voltages: AC - 230 V, 3(N)~ 400/230 V

- **Multifunctions monitoring relays (AC voltage monitoring in 3-phase network - 3(N)~ 400/230 V)**
- Monitoring of phase sequence and phase failure • Asymmetry monitoring (adjustable) • Connection of neutral wire (optional)
- Supply voltage = monitoring voltage • Output: 1 CO (1 changeover contact)
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Recognitions, certifications, directives: RoHS, CE

Output circuit - contact data

Number and type of contacts		1 CO
Rated voltage		250 V AC
Max. breaking capacity	AC1	1 250 VA (5 A / 250 V AC)
Max. operating frequency • at resistive load 100 VA • at resistive load 1 000 VA		 3 600 cycles/hour 360 cycles/hour

Input circuit

Supply voltage		= monitoring voltage
Rated voltage	AC	3(N)~ 400/230 V
Must release voltage		AC: ≥ 0,2 U_n
Operating range of supply voltage		0,7...1,3 U_n
Rated power consumption	AC	8,0 VA / 0,8 W
Range of supply frequency	AC	48...63 Hz
Duty cycle		100%
Measuring circuit • measured value • measuring inputs • overload capacity • asymmetry		3(N)~, sinus, 48...63 Hz = supply voltage AC: 3(N)~ 400/230 V terminals (N)-L1-L2-L3 determined by tolerance specified for supply voltage adjustable: 5...25%

Insulation according to EN 60664-1

Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2 if built-in: 3

General data

Electrical life	• resistive AC1	> 2 x 10^5 1 000 VA
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		87 x 17,5 x 65 mm
Weight		63 g
Ambient temperature (non-condensation and/or icing)	• storage • operating	-25...+70 °C -25...+55 °C
Cover protection category		IP 20 EN 60529
Relative humidity		15...85%
Shock resistance		15 g 11 ms
Vibration resistance		0,35 mm DA 10...55 Hz

Meassuring circuit data

Functions	SEQ - monitoring of phase sequence and phase failure ASYM - monitoring of asymmetry (adjustable) connection of neutral wire (optional)
Base accuracy	± 5% (calculated from the final range values)
Setting accuracy	± 5% (calculated from the final range values)
Repeatability	± 2%
Temperature influence	± 0,05% / °C
Recovery time	500 ms
LED indicator	green LED U ON - indication of supply voltage U yellow LED R ON/OFF - output relay status

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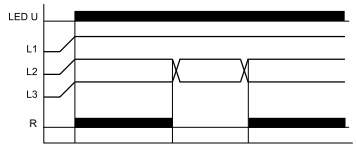
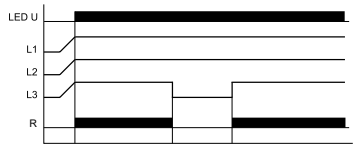
Functions

SEQ - Phase sequence monitoring.



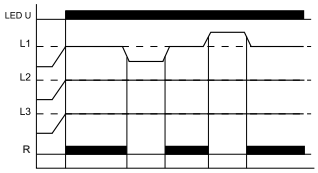
When all the phases are connected in the correct sequence and the measured asymmetry is less than the fixed value, the output relay R switches into on-position (yellow LED illuminated). When the phase sequence changes, the output relay R switches into off-position (yellow LED not illuminated).

SEQ - Phase failure monitoring.



The output relay R switches into off-position (yellow LED not illuminated), when one of the three phases fails.

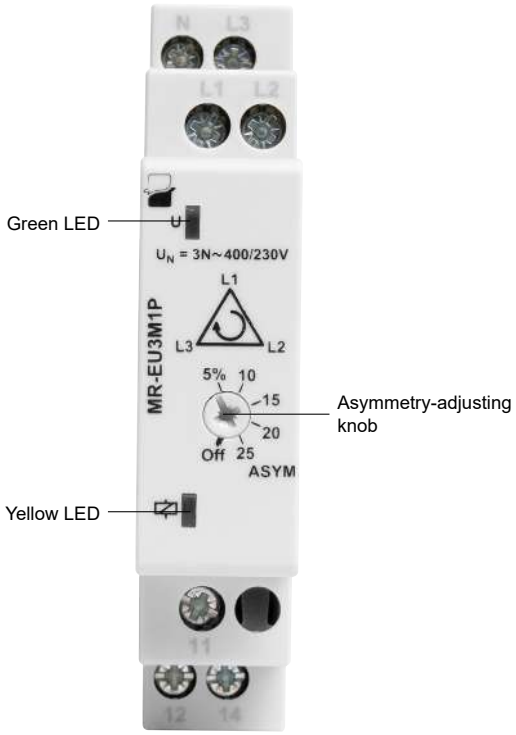
ASYM - Asymmetry monitoring.



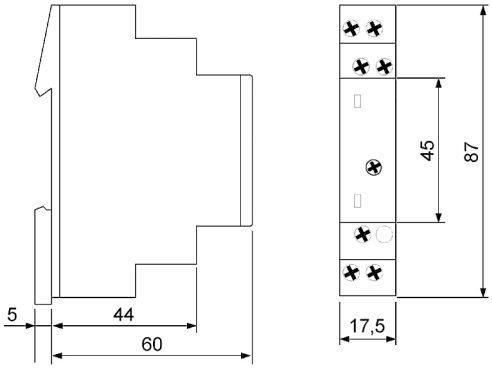
The output relay R switches into off-position (yellow LED not illuminated) when the asymmetrie exceeds the value set at the ASYM-regulator. An asymmetry caused by the reverse voltage of a consumer (e.g. a motor which continues to run on two phases only) does not effect the disconnection.

U - supply voltage; **R** - output state of the relay; **L1**, **L2**, **L3** - phases

Front panel description



Dimensions



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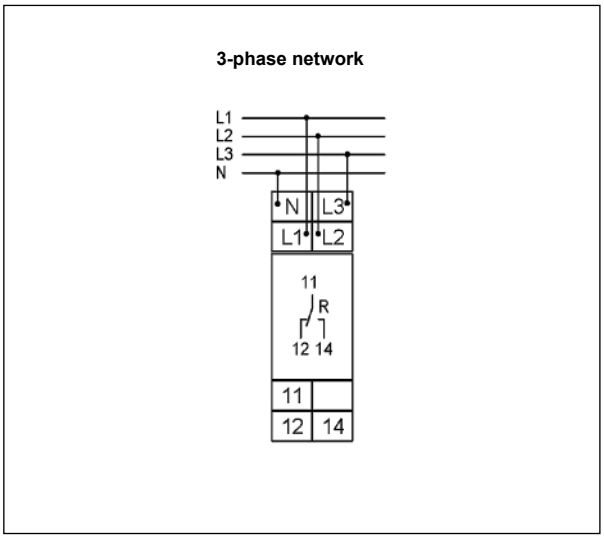
Connection diagram



Mounting

Relays **MR-EU3M1P** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Terminals - cross section of the connection cables:** 1 x 0,5 ... 2,5 mm^2 with/without multicore cable end, 1 x 4 mm^2 without multicore cable end, 2 x 0,5 ... 1,5 mm^2 with/without multicore cable end, 2 x 2,5 mm^2 flexible without multicore cable end.

Ordering codes

Type

M	R	–	E	U	3	M	1	P

Monitoring

U3 - 3(N)~ 400/230 V voltage in 3-phase network

Number and type of contacts

1P - 1 CO

Example of ordering code:

MR-EU3M1P monitoring relay **MR-EU3M1P**, multifunction (relay perform 2 functions), cover - modular, width 17,5 mm, one changeover contact, rated monitoring voltages: AC - 3(N)~ 400/230 V

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MR-EI1W1P
monitoring relays

- **Multifunctions monitoring relays (AC current monitoring in 1-phase network, with adjustable thresholds and adjustable hysteresis)**
- Monitoring windowfunction and histeresis • Timing adjustment of tripping delay • Supply voltage = monitored phase voltage
- Output: 1 CO (1 changeover contact)
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Recognitions, certifications, directives: RoHS, CE

Output circuit - contact data

Number and type of contacts		1 CO
Rated voltage		250 V AC
Max. breaking capacity	AC1	1 250 VA (5 A / 250 V AC)
Max. operating frequency • at resistive load 100 VA • at resistive load 1 000 VA		 3 600 cycles/hour 360 cycles/hour

Input circuit

Supply voltage	AC	230 V terminals (N)-Li
Rated voltage	AC	230 V
Must release voltage		AC: ≥ 0,2 U_n
Operating range of supply voltage		0,85...1,15 U_n
Rated power consumption	AC	5,0 VA / 0,8 W
Range of supply frequency	AC	48...63 Hz
Duty cycle		100%
Measuring circuit • measured value		AC sinus, 48...63 Hz
• measuring inputs		AC: 10 A / 230 V AC terminals (N)-Li-Lk
• overload capacity		13 A
• starting current		1 s: 100 A 3 s: 50 A
• input resistance		3 mΩ
• switching thresholds		MIN: 0,05...0,95 I_n MAX: 0,1...1,0 I_n
• hysteresis H		adjustable setting

Insulation according to EN 60664-1

Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	2 if built-in: 3

General data

Electrical life	• resistive AC1	> 2 x 10^5 1 000 VA
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		87 x 17,5 x 65 mm
Weight		72 g
Ambient temperature	• storage	-25...+70 °C
(non-condensation and/or icing)	• operating	-25...+55 °C
Cover protection category		IP 20 EN 60529
Relative humidity		15...85%
Shock resistance		15 g 11 ms
Vibration resistance		0,35 mm DA 10...55 Hz

Meassuring circuit data

Functions	OVER, OVER+LATCH, UNDER, UNDER+LATCH, WIN, WIN+LATCH monitoring windowfunction and histeresis
Range of delay timing adjustment	tripping delay: 0,1...10 s
Base accuracy	± 5% (calculated from the final range values)
Setting accuracy	± 5% (calculated from the final range values)
Repeatability	± 2%
Temperature influence	± 1% / °C
Recovery time	500 ms
LED indicator	green LED U ON - indication of supply voltage U red LEDs MIN and MAX ON/OFF - indication of failure ❶ red LEDs MIN and MAX flashing - indication of tripping delay ❶ yellow LED R ON/OFF - output relay status

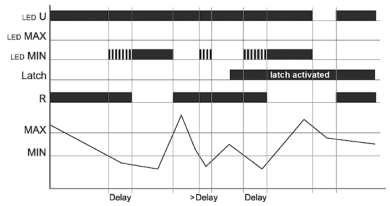
❶ Indication of relay status - according to the set threshold.

Functions

OVER, OVER+LATCH - Overcurrent monitoring, overcurrent monitoring with fault latch.

When the supply voltage U is applied, the output relay R switches into on-position, if the measured current is below the MAX-value. When the measured current exceeds the MAX-value, the output relay R switches into off-position after the interval of the tripping delay has expired.
OVER: the output relay R switches into on-position again, if the current falls below the MIN-value.
OVER+LATCH: the output relay R switches only into on-position again by interrupting and re-applying of the supply voltage, provided that the measured current is below the MAX-value.

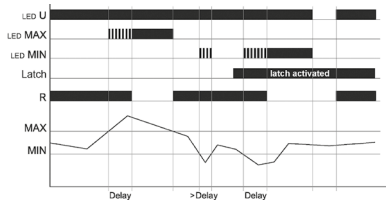
UNDER, UNDER+LATCH - Undercurrent monitoring, undercurrent monitoring with fault latch.



When the supply voltage U is applied, the output relay R switches into on-position, if the measured current is beyond the MIN-value. When the measured current falls below the MIN-value, the output relay R switches into off-position after the interval of the tripping delay has expired.
UNDER: the output relay R switches into on-position again, if the current exceeds the MIN-value.
UNDER+LATCH: the output relay R switches only into on-position again by interrupting and re-applying of the supply voltage, provided that the measured current is beyond the MIN-value.

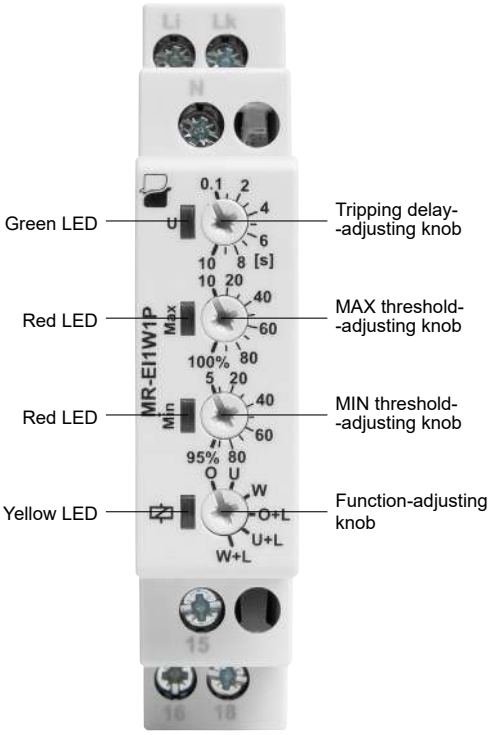
U - supply voltage; **R** - output state of the relay; **MIN, MAX** - relay status; **Latch** - fault latch; **Delay** - delay time

WIN, WIN+LATCH - Current monitoring in windowfunction between MIN and MAX values, current monitoring in windowfunction between MIN and MAX values with fault latch.



When the supply voltage U is applied, the output relay R switches into on-position, if the measured current is within the adjusted window. When the measured current leaves the window between MIN and MAX, the output relay R switches into off-position after the interval of the tripping delay has expired.
WIN: the output relay R switches into on-position again, if the current re-enter the adjusted window.
WIN+LATCH: the output relay R switches only into on-position again by interrupting and re-applying of the supply voltage, provided that the measured current is within the threshold values.

Front panel description



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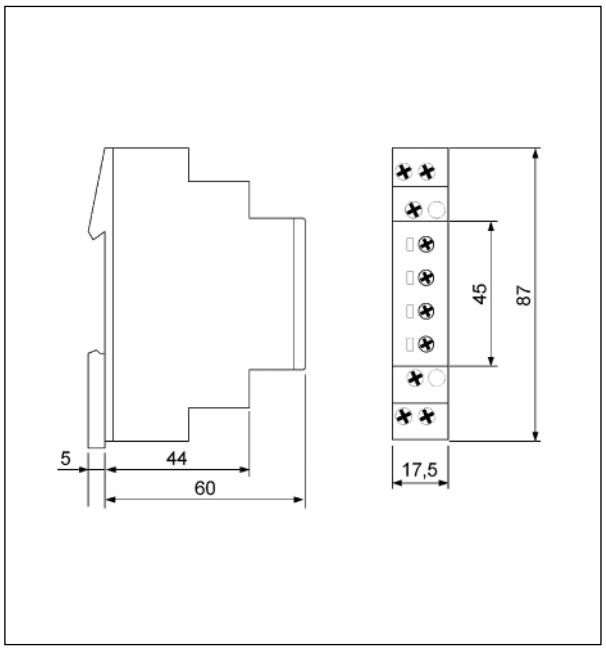
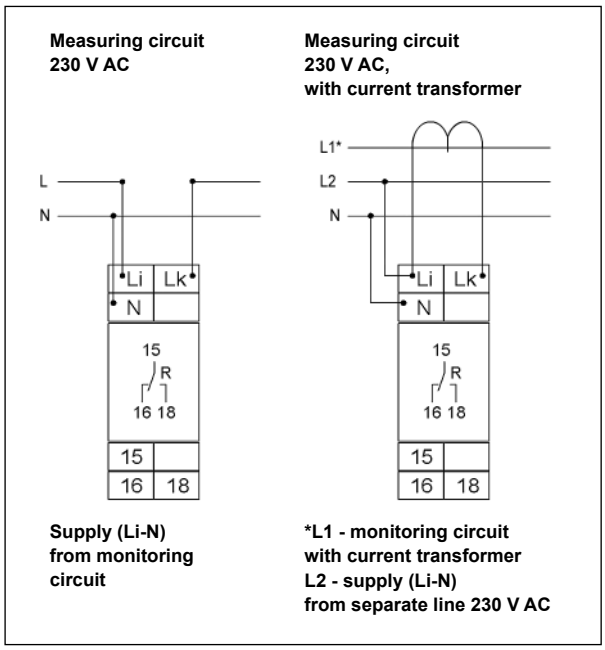
Dimensions



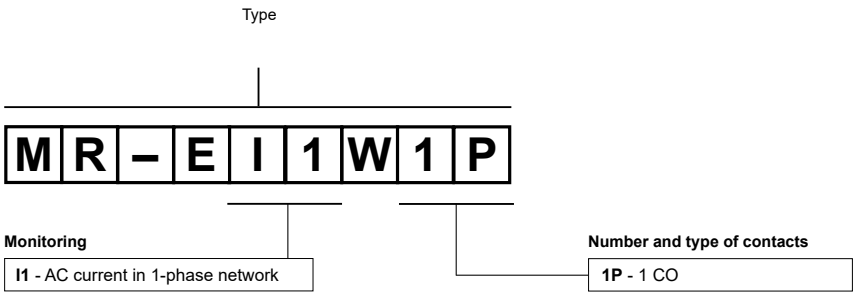
Connection diagrams



Mounting

Relays **MR-EI1W1P** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Terminals - cross section of the connection cables:** 1 x 0,5 ... 2,5 mm² with/without multicore cable end, 1 x 4 mm² without multicore cable end, 2 x 0,5 ... 1,5 mm² with/without multicore cable end, 2 x 2,5 mm² flexible without multicore cable end.

Ordering codes



Example of ordering code:

MR-EI1W1P monitoring relay **MR-EI1W1P**, multifunction (relay perform 6 functions), cover - modular, width 17,5 mm, one changeover contact, rated input voltage (supply): AC - 230 V; monitoring current: max. 10 A / 230 V AC

- **Single-functions monitoring relays (motor temperature monitoring)** • Short circuit monitoring of the thermistor line or thermal contact monitoring ❶ • Test functions: built-in Test/Reset button, connection of the external Reset button (optional)
- Insulation rated voltage on the sensor circuit: 690 V • Output: 1 CO (1 changeover contact) • Cover - modular, width 35 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Recognitions, certifications, directives: RoHS, CE

Output circuit - contact data		
Number and type of contacts		1 CO
Rated voltage		250 V AC
Max. breaking capacity	AC1	1 250 VA (thermal constant current 5 A)
Max. operating frequency • at resistive load 100 VA • at resistive load 1 000 VA		 3 600 cycles/hour 360 cycles/hour
Input circuit		
Supply voltage	AC	230 V terminals A1-A2
Rated voltage	AC	230 V
Must release voltage		AC: ≥ 0,3 U_n
Operating range of supply voltage		0,85...1,1 U_n
Rated power consumption	AC	1,3 VA / 1,0 W
Range of supply frequency	AC	48...63 Hz
Duty cycle		100%
Measuring circuit • terminals • initial resistance • response value • release value • disconnection ❷ • measuring voltage T1-T2		T1-T2 or T1-T3 < 1,5 kΩ relay in OFF-position: ≥ 3,6 kΩ relay in ON-position: ≤ 1,65 kΩ T1-T2: yes T1-T3: no ≤ 7,5 V at R ≤ 4 kΩ EN 60947-8
Control contact • function • load • max. line length • control pulse length • Reset		connection of an external Reset button no R1-R2: 10 m (twisted pair) min. 50 ms contact 1 NO; terminals R1-R2 ❸
Insulation according to EN 60664-1		
Rated surge voltage		6 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		2 if built-in: 3
General data		
Electrical life	• resistive AC1	> 2 x 10^5 1 000 VA
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		87 x 35 x 65 mm
Weight		100 g
Ambient temperature (non-condensation and/or icing)	• storage • operating	-25...+70 °C -25...+55 °C
Cover protection category		IP 20 EN 60529
Relative humidity		15...85%
Meassuring circuit data		
Functions		temperature monitoring of the motor winding, with fault latch (max. 6 PTC - temperature sensors DIN 44081) short circuit monitoring of the thermistor line or thermal contact ❶ test functions: built-in Test/Reset button, connection of the external Reset button (optional)
Base accuracy		± 5% (calculated from the final range values)
Repeatability		± 1%
Temperature influence		± 0,15% / °C
Recovery time		250 ms
LED indicator		green LED U ON - indication of supply voltage U red LED ON/OFF - indication of failure

❶ Only one of this circuit versions (either short circuit monitoring of the thermistor line or thermal contact monitoring) can be executed.
❷ At short circuit.
❸ Terminals R2-T2 are internal affiliated with each other.

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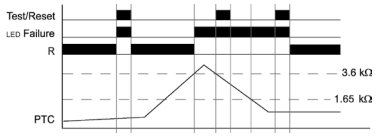
Functions

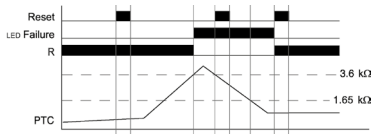
Motor temperature monitoring with fault latch.

If the supply voltage U is applied (green LED illuminated) and the cumulative resistance of the PTC-circuit is less than 3,6 kΩ (standard temperature of the motor), the output relay R switches into on-position. Pressing the Test/Reset button under this conditions forces the output relay R to switch into off-position. It remains in state as long as the Test/Reset button is pressed and thus the switching function can be checked in case of fault. The test function is not effective by using an external Reset button. When the comulative resistance of the PTC-circuit exceeds 3,6 kΩ (at least one of the PTCs has reached the cut-off temperature), the output relay R switches into off-position (red LED illuminated). The output relay R switches into on-position again (red LED not illuminated), if the cumulative resistance drops below 1,65 kΩ by cooling down of the PTC and either a Reset button (internal or external) was pressed or the supply voltage was disconnected and re-applied.

Application of built-in **Test/Reset** button.

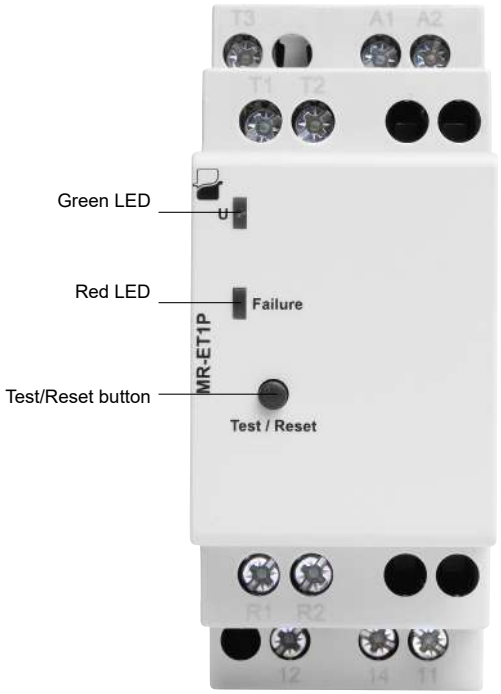


Application of an external **Reset** button.

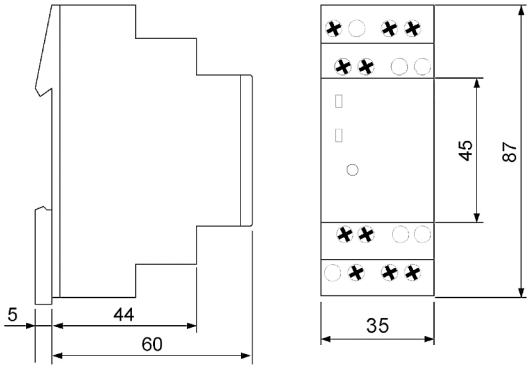


U - supply voltage; **R** - output state of the relay;
PTC - state of sensors; **Failure** - fault latch

Front panel description



Dimensions



MONITORING

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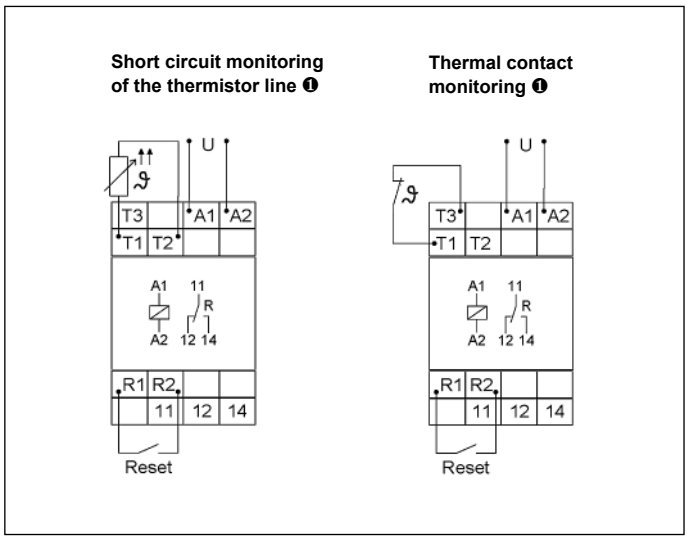
Connection diagrams

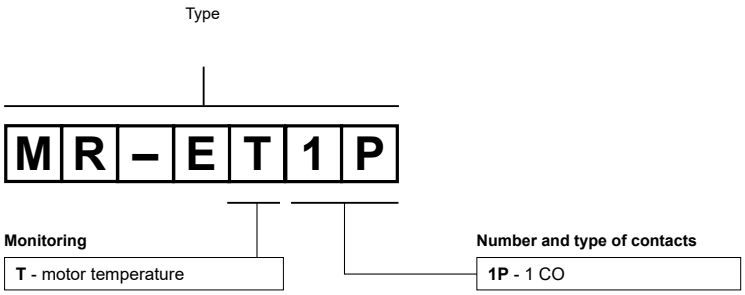


Mounting

Relays **MR-ET1P** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Terminals - cross section of the connection cables:** 1 x 0,5 ... 2,5 mm^2 with/without multicore cable end, 1 x 4 mm^2 without multicore cable end, 2 x 0,5 ... 1,5 mm^2 with/without multicore cable end, 2 x 2,5 mm^2 flexible without multicore cable end.

❶ Only one of this circuit versions (either short circuit monitoring of the thermistor line or thermal contact monitoring) can be executed.

Ordering codes



Example of ordering code:

MR-ET1P monitoring relay **MR-ET1P**, single-function (relay monitors the motor temperature), cover - modular, width 35 mm, one changeover contact, rated input voltage (supply): AC - 230 V

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MR-GU32P-TR2
monitoring relays

- **Multifunctions monitoring relays (AC voltages monitoring in phases - 230 V, 3-phase network 3(N)~ 400/230 V, with adjustable thresholds)** • Fault latch mode • Connection of neutral wire (required)
- Timing adjustment of tripping delay • Supply via TR2 supply transformer ❶ • Measurement inputs: 230 V AC • Output: 2 CO (2 changeover contacts) • Industrial cover, width 22,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Recognitions, certifications, directives: RoHS, CE

Output circuit - contact data

Number and type of contacts		2 CO
Rated voltage		250 V AC
Max. breaking capacity	AC1	750 VA (3 A / 250 V AC) ❷ 1 250 VA (5 A / 250 V AC) ❸
Max. operating frequency • at resistive load 100 VA • at resistive load 1 000 VA		 3 600 cycles/hour 360 cycles/hour

Input circuit

Supply voltage	AC	12, 24, 42, 48, 110, 127, 230, 400 V ❶ terminals A1-A2
Must release voltage		AC: ≥ 0,3 U_n
Operating range of supply voltage		as per the specification of TR2 supply transformer ❶
Rated power consumption	AC	2,0 VA / 1,5 W
Range of supply frequency	AC	as per the specification of TR2 supply transformer ❶
Duty cycle		100%
Measuring circuit • measured value • measuring inputs • overload capacity • input resistance • switching thresholds		AC sinus, 48...63 Hz AC: 230 V terminals N-L1, N-L2, N-L3 440 V AC 3(N)~ 400/230 V: 470 kΩ MIN: 0,7...1,2 U_n MAX: 0,8...1,3 U_n

Insulation according to EN 60664-1

Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3

General data

Electrical life	• resistive AC1	> 2 x 10^5 1 000 VA
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		90 x 22,5 x 108 mm
Weight		100 g
Ambient temperature (non-condensation and/or icing)	• storage • operating	-25...+70 °C -25...+55 °C
Cover protection category		IP 20 EN 60529
Relative humidity		15...85%
Shock resistance		15 g 11 ms
Vibration resistance		0,35 mm DA 10...55 Hz

Meassuring circuit data

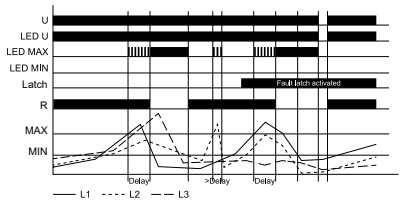
Functions	OVER, OVER+LATCH, UNDER, UNDER+LATCH, WIN, WIN+LATCH fault latch mode, connection of neutral wire (required)
Range of delay timing adjustment	tripping delay: 0,1...10 s
Base accuracy	± 5% (calculated from the final range values)
Setting accuracy	± 5% (calculated from the final range values)
Repeatability	± 2%
Voltage influence	± 0,5%
Temperature influence	± 0,1% / °C
Recovery time	500 ms
LED indicator	green LED U ON - indication of supply voltage U red LEDs MIN and MAX ON/OFF - indication of failure ❹ red LEDs MIN and MAX flashing - indication of tripping delay ❹ yellow LED R ON/OFF - output relay status

❶ Supply voltage depending on the TR2 transformer which shall be ordered as a separate product - see page 587. ❷ If the distance between the relays mounted side by side is less than 5 mm. ❸ If the distance between the relays mounted side by side is greater than 5 mm. ❹ Indication of relay status - according to the set threshold.

Functions

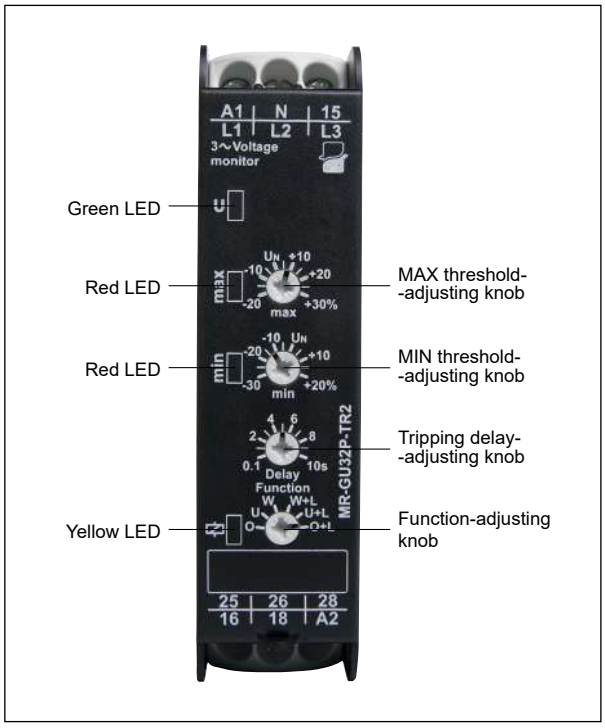
For all functions the LED's MIN and MAX are flashing alternating, when the minimum value for the measured voltage was chosen to be greater than the maximum value. If a failure already exists, when the device is activated, the output relay R remains in off-position and the LED for the corresponding threshold is illuminated.

OVER, OVER+LATCH - Overvoltage monitoring, overvoltage monitoring with fault latch.



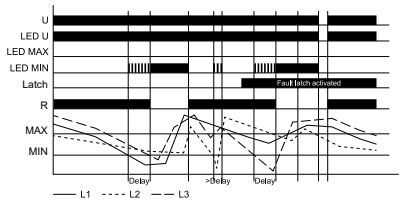
When the measured voltage of one of the phases exceeds the value adjusted at the MAX-regulator, the set interval of the tripping delay begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated), the output relay R switches into off-position (yellow LED not illuminated). The output relay R again switches into on-position (yellow LED illuminated), when the measured voltage of all the phases falls below the value adjusted at the MIN-regulator (red LED MAX not illuminated). If the **fault latch** is activated (OVER+LATCH) and the measured voltage of one of the phases remains above the MAX-value longer than the set interval of the tripping delay, the output relay R remains in the off-position even if the measured voltage of all the phases falls below the value adjusted at the MIN-regulator. After resetting the failure (interrupting and re-applying the supply voltage), the output relay R switches into on-position.

Front panel description



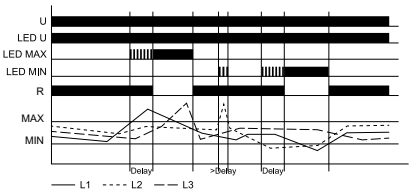
U - supply voltage; **R** - output state of the relay; **MIN, MAX** - relay status; **Latch** - fault latch; **Delay** - delay time

UNDER, UNDER+LATCH - Undervoltage monitoring, undervoltage monitoring with fault latch.

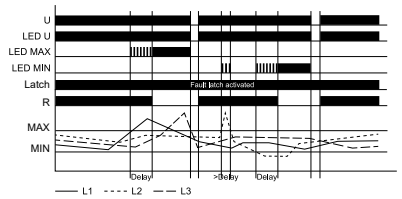


When the measured voltage of one of the phases falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay begins (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relay R switches into off-position (yellow LED not illuminated). The output relay R again switches into on-position (yellow LED illuminated), when the measured voltage of all the phases exceeds the value adjusted at the MAX-regulator.
If the **fault latch** is activated (UNDER+LATCH) and the measured voltage of one of the phases remains below the MIN-value longer than the set interval of the tripping delay, the output relay R remains in the off-position even if the measured voltage of all the phases exceeds the value adjusted at the MAX-regulator. After resetting the failure (interrupting and re-applying the supply voltage), the output relay R switches into on-position.

WIN, WIN+LATCH - Voltage monitoring in windowfunction between MIN and MAX values, voltage monitoring in windowfunction between MIN and MAX values with fault latch.



The output relay R switches into on-position (yellow LED illuminated) when the measured voltage of all the phases exceeds the value adjusted at the MIN-regulator. When the measured voltage of one of the phases exceeds the value adjusted at the MAX-regulator, the set interval of the tripping delay begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated), the output relay R switches into off-position (yellow LED not illuminated). The output relay R again switches into on-position (yellow LED illuminated) when the measured voltage of all the phases falls below the value adjusted at the MAX-regulator (red LED MAX not illuminated). When the measured voltage of one of the phases falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay begins again (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relay R switches into off-position (yellow LED not illuminated).



If the **fault latch** is activated (WIN+LATCH) and the measured voltage of one of the phases remains below the MIN-value longer than the set interval of the tripping delay, the output relay R remains in the off-position even if the measured voltage of all the phases exceeds the value adjusted at the MIN-regulator. If the measured voltage of one of the phases remains above the MAX-value longer than the set interval of the tripping delay, the output relay R remains in the off-position even if the measured voltage of all the phases falls below the value adjusted at the MAX-regulator. After resetting the failure (interrupting and re-applying the supply voltage), the output relay R switches into on-position.

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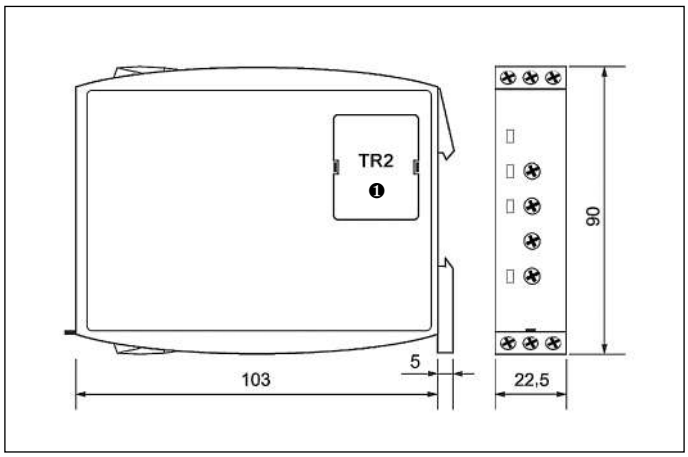
Dimensions



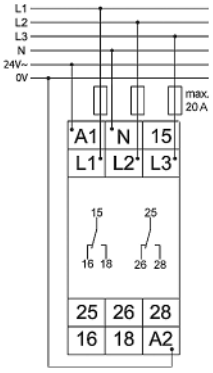
Mounting

Relays **MR-GU32P-TR2** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Terminals - cross section of the connection cables:** 1 x 0,5 ... 2,5 mm² with/without multicore cable end, 1 x 4 mm² without multicore cable end, 2 x 0,5 ... 1,5 mm² with/without multicore cable end, 2 x 2,5 mm² flexible without multicore cable end.

❶ Supply voltage depending on the TR2 transformer which shall be ordered as a separate product - see page 587.

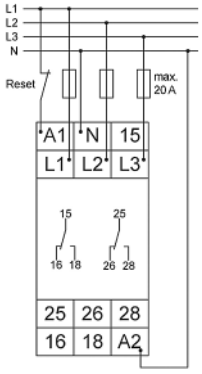
Connection diagrams

Measuring circuit 230 V AC, without fault latch mode



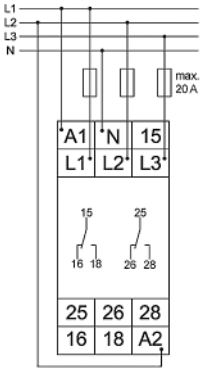
Supply: A1-A2 with TR2 24 V AC ❶

Measuring circuit 230 V AC, with fault latch mode



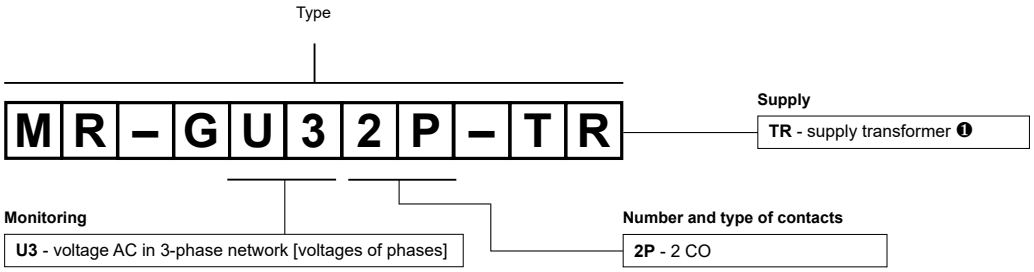
Supply: A1-A2 with TR2 230 V AC ❶

Measuring circuit 230 V AC, without fault latch mode



Supply: A1-A2 with TR2 400 V AC ❶

Ordering codes



Example of ordering code:

MR-GU32P-TR2 monitoring relay **MR-GU32P-TR2**, multifunction (relay perform 6 functions), industrial cover, width 22,5 mm, two changeover contacts, rated input voltage (supply): AC - 12, 24, 42, 48, 110, 127, 230, 400 V AC ❶

- **Multifunctions monitoring relays (AC voltage monitoring in 3-phase network, with adjustable thresholds)** • Monitoring of phase sequence and phase failure • Asymmetry monitoring (adjustable)
- Connection of neutral wire (optional) ❶ • Timing adjustment of tripping delay • Supply via TR2 supply transformer ❷ • Output: 2 CO (2 change-over contacts) • Industrial cover, width 22,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Recognitions, certifications, directives: RoHS, CE

Output circuit - contact data

Number and type of contacts		2 CO
Rated voltage		250 V AC
Max. breaking capacity	AC1	750 VA (3 A / 250 V AC) ❸ 1 250 VA (5 A / 250 V AC) ❹
Max. operating frequency • at resistive load 100 VA • at resistive load 1 000 VA		 3 600 cycles/hour 360 cycles/hour

Input circuit

Supply voltage	AC	12, 24, 42, 48, 110, 127, 230, 400 V ❷ terminals A1-A2
Must release voltage		AC: ≥ 0,3 U_n
Operating range of supply voltage		as per the specification of TR2 supply transformer ❷
Rated power consumption	AC	2,0 VA / 1,5 W
Range of supply frequency	AC	as per the specification of TR2 supply transformer ❷
Duty cycle		100%
Measuring circuit • measured value • measuring inputs • overload capacity • input resistance • switching thresholds • asymmetry		AC sinus, 48...63 Hz AC: 3(N)~ 400/230 V terminals (N)-L1-L2-L3 3(N)~ 600/346 V 3(N)~ 400/230 V: 1 MΩ MIN: 0,7...1,2 U_n MAX: 0,8...1,3 U_n adjustable: 5...25%

Insulation according to EN 60664-1

Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3

General data

Electrical life	• resistive AC1	> 2 x 10^5 1 000 VA
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		90 x 22,5 x 108 mm
Weight		100 g
Ambient temperature (non-condensation and/or icing)	• storage • operating	-25...+70 °C -25...+55 °C
Cover protection category		IP 20 EN 60529
Relative humidity		15...85%
Shock resistance		15 g 11 ms
Vibration resistance		0,35 mm DA 10...55 Hz

Meassuring circuit data

Functions	UNDER, UNDER+SEQ, WIN, WIN+SEQ SEQ - monitoring of phase sequence and phase failure ASYM - monitoring of asymmetry (adjustable) connection of neutral wire (optional) ❶
Range of delay timing adjustment	tripping delay: 0,1...10 s
Base accuracy	± 5% (calculated from the final range values)
Setting accuracy	± 5% (calculated from the final range values)
Repeatability	± 2%
Voltage influence	± 0,5%
Temperature influence	± 0,1% / °C
Recovery time	500 ms
LED indicator	red LED ASYM ON/OFF - indication of asymmetry ❺ red LEDs MIN and MAX ON/OFF - indication of failure ❺ red LEDs MIN and MAX flashing - indication of tripping delay ❺ red LED SEQ ON/OFF - indication of phase sequence ❺ yellow LED R ON/OFF - output relay status

❶ Detection of neutral wire loss. ❷ Supply voltage depending on the TR2 transformer which shall be ordered as a separate product - see page 587. ❸ If the distance between the relays mounted side by side is less than 5 mm. ❹ If the distance between the relays mounted side by side is greater than 5 mm. ❺ Indication of relay status - according to the set threshold.

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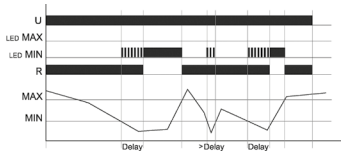
Functions

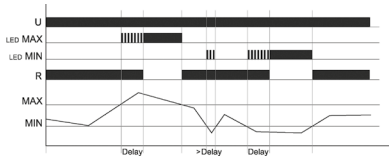
For all functions the LED's MIN and MAX are flashing alternating, when the minimum value for the measured voltage was chosen to be greater than the maximum value. If a failure already exists, when the device is activated, the output relay R remains in off-position and the LED for the corresponding threshold is illuminated.

UNDER, UNDER+SEQ - Undervoltage monitoring, undervoltage monitoring with monitoring of phase sequence.



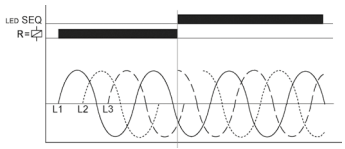
When the measured voltage (mean value of phase-to-phase voltages) falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay begins (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relay R switches into off-position (yellow LED not illuminated). The output relay R again switches into on-position (yellow LED illuminated), when the measured voltage exceeds the value adjusted at the MAX-regulator.

WIN, WIN+SEQ - Voltage monitoring in windowfunction between MIN and MAX values, voltage monitoring in windowfunction between MIN and MAX values with monitoring of phase sequence.



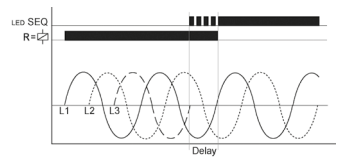
The output relay R switches into on-position (yellow LED illuminated) when the measured voltage (mean value of phase-to-phase voltages) exceeds the value adjusted at the MIN-regulator. When the measured voltage exceeds the value adjusted at the MAX-regulator, the set interval of the tripping delay begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated), the output relay R switches into off-position (yellow LED not illuminated). The output relay R again switches into on-position (yellow LED illuminated) when the measured voltage falls below the value adjusted at the MAX-regulator (red LED MAX not illuminated). When the measured voltage falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay begins again (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relay R switches into off-position (yellow LED not illuminated).

SEQ - Phase sequence monitoring.



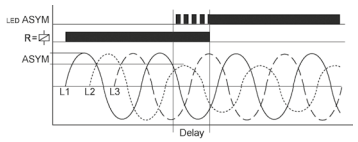
Phase sequence monitoring is selectable for all functions.If a change in phase sequence is detected (red LED SEQ illuminated), the output relay R switches into off-position immediately (yellow LED not illuminated).

SEQ - Phase failure monitoring.



If one of the phase voltages fails, the set interval of the tripping delay begins (red LED SEQ flashes). After the interval has expired (red LED SEQ illuminated), the output relay R switches into off-position (yellow LED not illuminated). Reverse voltages of a consumer (e.g. a motor which continues to run on two phases only) do not effect the disconnection but can be monitored by using a proper value for the asymmetry.

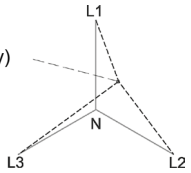
ASYM - Asymmetry monitoring.



If the asymmetry of the phase-to-phase voltages exceeds the value set at the ASYM-regulator, the set interval of the tripping delay begins (red LED ASYM flashes). After the interval has expired (red LED ASYM illuminated), the output relay R switches into off-position (yellow LED not illuminated). If the neutral wire is connected to the device, the asymmetry of the phase voltages referred to the neutral wire (Y-voltage) is monitored also. In that case both values of the asymmetry are evaluated and if one of the values exceeds the value set at the ASYM-regulator, the set interval of the tripping delay begins (red LED ASYM flashes). After the interval has expired (red LED ASYM illuminated), the output relay R switches into off-position (yellow LED not illuminated).

Loss of neutral wire by means of evaluation of asymmetry.

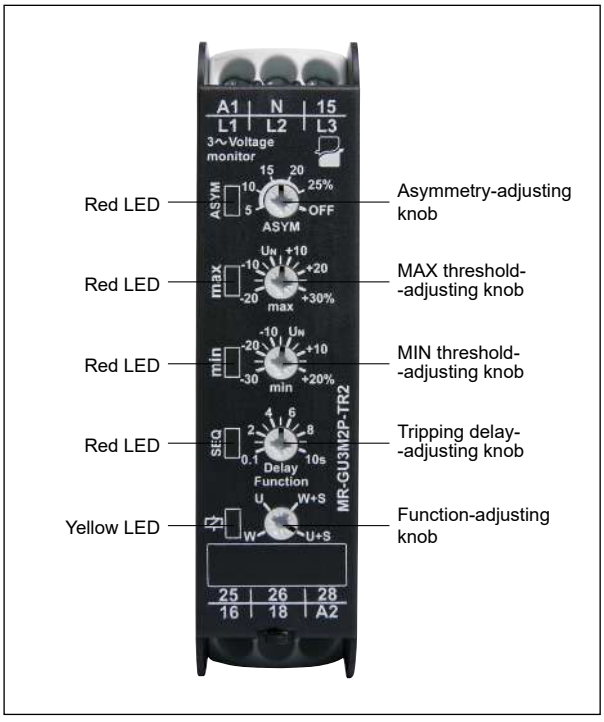
Shift of neutral point (asymmetry) caused by asymmetrical phase loads and missing neutral wire



A break of the neutral wire between power line and machinery is detected as soon as asymmetry between phase-to-phase voltage and neutral wire occurs. If the asymmetry exceeds the value set at the ASYM-regulator, the set interval of the tripping delay begins (red LED ASYM flashes). After the interval has expired (red LED ASYM illuminated), the output relay R switches into off-position (yellow LED not illuminated). A break of the neutral wire between our device and the machinery can not be detected.

U - supply voltage; **R** - output state of the relay; **MIN, MAX** - relay status; **SEQ** - phase sequence; **ASYM** - asymmetry; **Delay** - delay time

Front panel description



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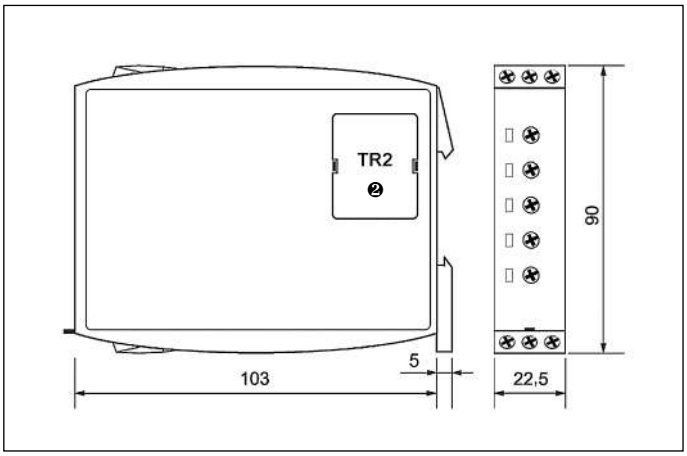
Contents

Dimensions



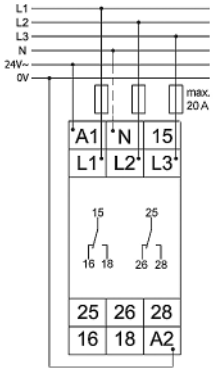
Mounting

Relays **MR-GU3M2P-TR2** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Terminals - cross section of the connection cables:** 1 x 0,5 ... 2,5 mm² with/without multicore cable end, 1 x 4 mm² without multicore cable end, 2 x 0,5 ... 1,5 mm² with/without multicore cable end, 2 x 2,5 mm² flexible without multicore cable end.

❷ Supply voltage depending on the TR2 transformer which shall be ordered as a separate product - see page 587.

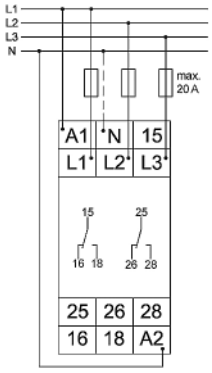
Connection diagrams

Measuring circuit
3(N)~ 400/230 V



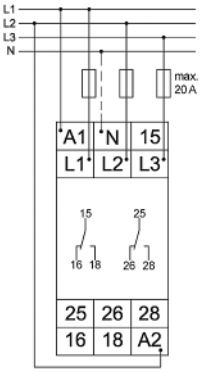
Supply: A1-A2
with TR2 24 V AC ❷

Measuring circuit
3(N)~ 400/230 V



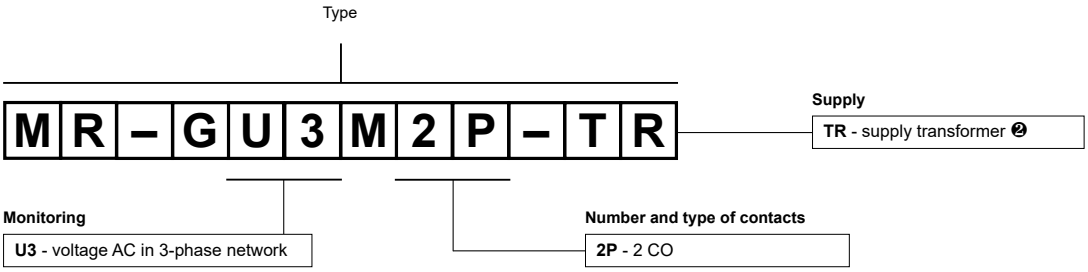
Supply: A1-A2
with TR2 230 V AC ❷

Measuring circuit
3(N)~ 400/230 V



Supply: A1-A2
with TR2 400 V AC ❷

Ordering codes



Example of ordering code:

MR-GU3M2P-TR2 monitoring relay **MR-GU3M2P-TR2**, multifunction (relay perform 6 functions), industrial cover, width 22,5 mm, two changeover contacts, rated input voltage (supply): AC - 12, 24, 42, 48, 110, 127, 230, 400 V AC ❷

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MR-GU3M2P
monitoring relays

- **Multifunctions monitoring relays (AC voltage monitoring in 3-phase network)** • Monitoring of phase sequence and phase failure
- Detection of reverse voltage by means of asymmetry • Connection of neutral wire (optional)
- Supply voltage = monitoring voltage • Output: 2 CO (2 changeover contacts) • Industrial cover, width 22,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Recognitions, certifications, directives: RoHS, CE

Output circuit - contact data

Number and type of contacts		2 CO
Rated voltage		250 V AC
Max. breaking capacity	AC1	750 VA (3 A / 250 V AC) ❶ 1 250 VA (5 A / 250 V AC) ❷
Max. operating frequency • at resistive load 100 VA • at resistive load 1 000 VA		 3 600 cycles/hour 360 cycles/hour

Input circuit

Supply voltage		= monitoring voltage terminals (N)-L1-L2-L3
Must release voltage		AC: ≥ 0,2 U_n
Operating range of supply voltage		3(N)~ 342...457 V
Rated power consumption	AC	9,0 VA
Range of supply frequency	AC	48...63 Hz
Duty cycle		100%
Measuring circuit • measured value • measuring inputs • overload capacity • input resistance • asymmetry		AC sinus, 48...63 Hz AC: 3(N)~ 400/230 V terminals (N)-L1-L2-L3 3(N)~ 457/264 V 3(N)~ 400/230 V: 15 kΩ fixed: typical value 30%

Insulation according to EN 60664-1

Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3

General data

Electrical life	• resistive AC1	> 2 x 10^5 1 000 VA
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		90 x 22,5 x 108 mm
Weight		100 g
Ambient temperature (non-condensation and/or icing)	• storage • operating	-25...+70 °C -25...+55 °C
Cover protection category		IP 20 EN 60529
Relative humidity		15...85%
Shock resistance		15 g 11 ms
Vibration resistance		0,35 mm DA 10...55 Hz

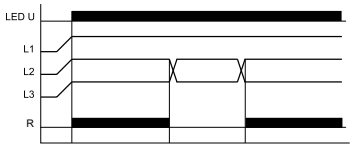
Meassuring circuit data

Functions	SEQ - monitoring of phase sequence and phase failure ASYM - detection of reverse voltage by means of asymmetry connection of neutral wire (optional)
Range of delay timing adjustment	start-up suppression: fixed, max. 0,5 s tripping delay: fixed, max. 0,35 s
Recovery time	100 ms
LED indicator	green LED U ON - indication of supply voltage U yellow LED R ON/OFF - output relay status

❶ If the distance between the relays mounted side by side is less than 5 mm. ❷ If the distance between the relays mounted side by side is greater than 5 mm.

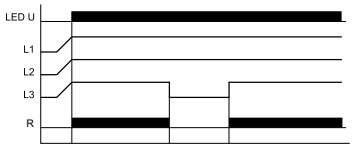
Functions

SEQ - Phase sequence monitoring.



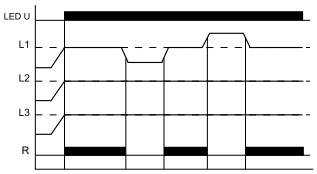
When all the phases are connected in the correct sequence and the measured asymmetry is less than the fixed value, the output relay R switches into on-position (yellow LED illuminated). When the phase sequence changes, the output relay R switches into off-position (yellow LED not illuminated).

SEQ - Phase failure monitoring.



The output relay R switches into off-position (yellow LED not illuminated), when one of the three phases fails.

ASYM - Detection of reverse voltage by means of asymmetry.

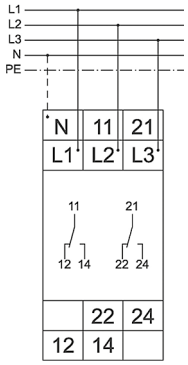


The output relay R switches into off-position (yellow LED not illuminated) when the asymmetry between the phase voltages exceeds the fixed value of the asymmetry. An asymmetry caused by the reverse voltage of a consumer (e.g. a motor which continues to run on two phases only) does not effect the disconnection.

U - supply voltage; **R** - output state of the relay; **L1**, **L2**, **L3** - phases

Front panel description

Connection diagram



MONITORING

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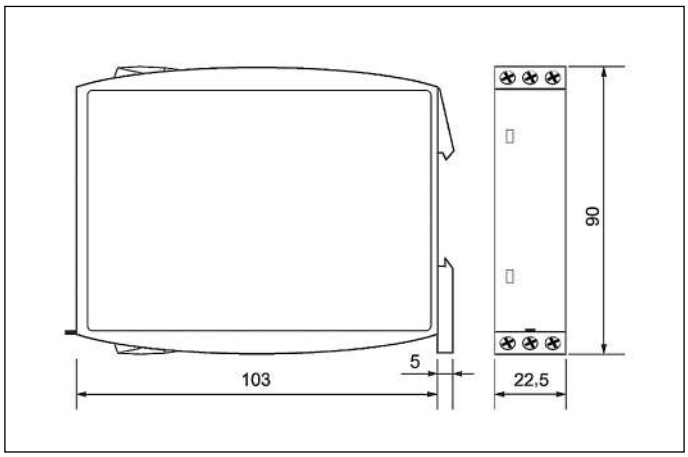
Dimensions



Mounting

Relays **MR-GU3M2P** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Terminals - cross section of the connection cables:** 1 x 0,5 ... 2,5 mm^2 with/without multicore cable end, 1 x 4 mm^2 without multicore cable end, 2 x 0,5 ... 1,5 mm^2 with/without multicore cable end, 2 x 2,5 mm^2 flexible without multicore cable end.

Ordering codes

Type

M	R	–	G	U	3	M	2	P

Monitoring

U3 - voltage AC in 3-phase network

Number and type of contacts

2P - 2 CO

Example of ordering code:

MR-GU3M2P monitoring relay **MR-GU3M2P**, multifunction (relay perform 2 functions), industrial cover, width 22,5 mm, two changeover contacts, rated input voltage (supply): AC - 3(N)~ 400/230 V

- **Multifunctions monitoring relays (DC and AC current monitoring in 1-phase network, with adjustable thresholds)**
- Fault latch mode • Timing adjustment of start-up suppression and tripping delay ❶ • Supply via TR2 supply transformer ❷
- Frequency of supply voltage: 16,6...400 Hz • Output: 2 CO (2 changeover contacts) • Industrial cover, width 22,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Recognitions, certifications, directives: RoHS, CE

Output circuit - contact data

Number and type of contacts		2 CO
Rated voltage		250 V AC
Max. breaking capacity	AC1	750 VA (3 A / 250 V AC) ❸ 1 250 VA (5 A / 250 V AC) ❹
Max. operating frequency • at resistive load 100 VA • at resistive load 1 000 VA		 3 600 cycles/hour 360 cycles/hour

Input circuit

Supply voltage	AC	12, 24, 42, 48, 110, 127, 230, 400 V ❷ terminals A1-A2
Must release voltage		AC: ≥ 0,3 U_n
Operating range of supply voltage		as per the specification of TR2 supply transformer ❷
Rated power consumption	AC	2,0 VA / 1,5 W
Range of supply frequency	AC	as per the specification of TR2 supply transformer ❷
Duty cycle		100%
Measuring circuit • measured value		DC or AC sinus, 16,6...400 Hz (frequency response: -10…+5%)
• measuring inputs		AC/DC: 0,1 A terminals K-I1 AC/DC: 1 A terminals K-I2 AC/DC: 10 A terminals K-I3
• overload capacity		0,1 A AC/DC: 0,8 A 1 A AC/DC: 3 A 10 A AC/DC: 12 A
• input resistance		0,1 A AC/DC: 470 mΩ 1 A AC/DC: 47 mΩ 10 A AC/DC: 5 mΩ
• switching thresholds		MIN: 0,05...0,95 I_n MAX: 0,1...1,0 I_n

Insulation according to EN 60664-1

Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3

General data

Electrical life	• resistive AC1	> 2 x 10^5 1 000 VA
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		90 x 22,5 x 108 mm
Weight		100 g
Ambient temperature	• storage	-25...+70 °C
(non-condensation and/or icing)	• operating	-25...+55 °C
Cover protection category		IP 20 EN 60529
Relative humidity		15...85%
Shock resistance		15 g 11 ms
Vibration resistance		0,35 mm DA 10...55 Hz

Meassuring circuit data

Functions	OVER, OVER+LATCH, UNDER, UNDER+LATCH, WIN, WIN+LATCH fault latch mode
Range of delay timing adjustment	start-up suppression: 0...10 s tripping delay: 0,1...10 s ❶
Base accuracy	± 5% (calculated from the final range values)
Setting accuracy	± 5% (calculated from the final range values)
Repeatability	± 2%
Voltage influence	± 0,5%
Temperature influence	± 0,1% / °C
Recovery time	500 ms
LED indicator	green LED U ON - indication of supply voltage U green LED U flashing - indication of start-up suppression time ❺ red LEDs MIN and MAX ON/OFF - indication of failure ❺ red LEDs MIN and MAX flashing - indication of tripping delay ❺ yellow LED R ON/OFF - output relay status

❶ Separately adjustable (two adjusting knobs). ❷ Supply voltage depending on the TR2 transformer which shall be ordered as a separate product - see page 587. ❸ If the distance between the relays mounted side by side is less than 5 mm. ❹ If the distance between the relays mounted side by side is greater than 5 mm. ❺ Indication of relay status - according to the set threshold.

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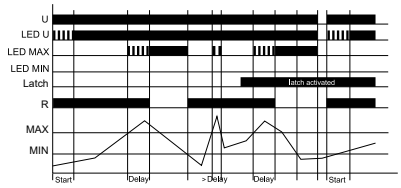
Functions

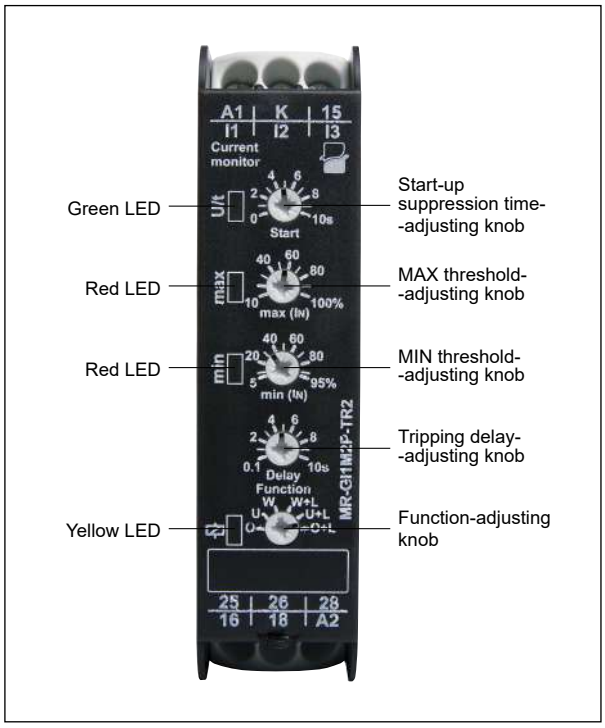
When the supply voltage U is applied, the output relay R switches into on-position (yellow LED illuminated) and the set interval of the start-up suppression (Start) begins (green LED flashes). Changes of the measured current during this period do not affect the state of the output relay R. After the interval has expired the green LED is illuminated steadily. For all the functions the LEDs MIN and MAX are flashing alternating, when the minimum value for the measured current was chosen to be greater than the maximum value.

OVER, OVER+LATCH - Overcurrent monitoring, overcurrent monitoring with fault latch.

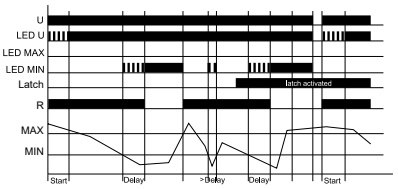


When the measured current exceeds the value adjusted at the MAX-regulator, the set interval of the tripping delay begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated), the output relay R switches into off-position (yellow LED not illuminated). The output relay R again switches into on-position (yellow LED illuminated), when the measured current falls below the value adjusted at the MIN-regulator (red LED MAX not illuminated).
If the **fault latch** is activated (OVER+LATCH) and the measured current remains above the MAX-value longer than the set interval of the tripping delay, the output relay R remains in the off-position even if the measured current falls below the value adjusted at the MIN-regulator. After resetting the failure (interrupting and re-applying the supply voltage), the output relay R again switches into on-position and a new measuring cycle begins with the set interval of the start-up suppression (Start).

Front panel description

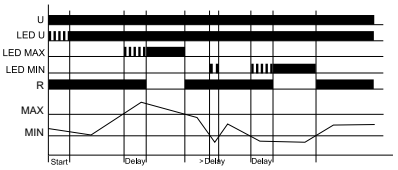


UNDER, UNDER+LATCH - Undercurrent monitoring, undercurrent monitoring with fault latch.

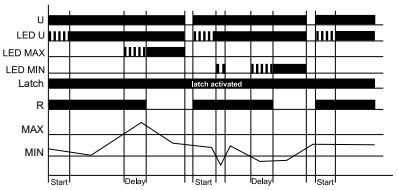


When the measured current falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay begins (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relay R switches into off-position (yellow LED not illuminated). The output relay R again switches into on-position (yellow LED illuminated), when the measured current exceeds the value adjusted at the MAX-regulator. If the **fault latch** is activated (UNDER+LATCH) and the measured current remains below the MIN-value longer than the set interval of the tripping delay, the output relay R remains in the off-position even if the measured current exceeds the value adjusted at the MAX-regulator. After resetting the failure (interrupting and re-applying the supply voltage), the output relay R switches into on-position and a new measuring cycle begins with the set interval of the start-up suppression (Start).

WIN, WIN+LATCH - Current monitoring in windowfunction between MIN and MAX values, current monitoring in windowfunction between MIN and MAX values with fault latch.



The output relay R switches into on-position (yellow LED illuminated) when the measured **current** exceeds the value adjusted at the MIN-regulator. When the measured current exceeds the value adjusted at the MAX-regulator, the set interval of the tripping delay begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated), the output relay R switches into off-position (yellow LED not illuminated). The output relay R again switches into on-position (yellow LED illuminated) when the measured current falls below the value adjusted at the MAX-regulator (red LED MAX not illuminated). When the measured current falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay begins again (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relay R switches into off-position (yellow LED not illuminated).



If the **fault latch** is activated (WIN+LATCH) and the measured current remains below the MIN-value longer than the set interval of the tripping delay, the output relay R remains in the off-position even if the measured current exceeds the value adjusted at the MIN-regulator. If the measured current remains above the MAX-value longer than the set interval of the tripping delay, the output relay R remains in the off-position even if the measured current falls below the value adjusted at the MAX-regulator. After resetting the failure (interrupting and re-applying the supply voltage), the output relay R switches into on-position and a new measuring cycle begins with the set interval of the start-up suppression (Start).

U - supply voltage; **R** - output state of the relay; **MIN, MAX** - relay status; **Latch** - fault latch; **Start**, **Delay** - delay times

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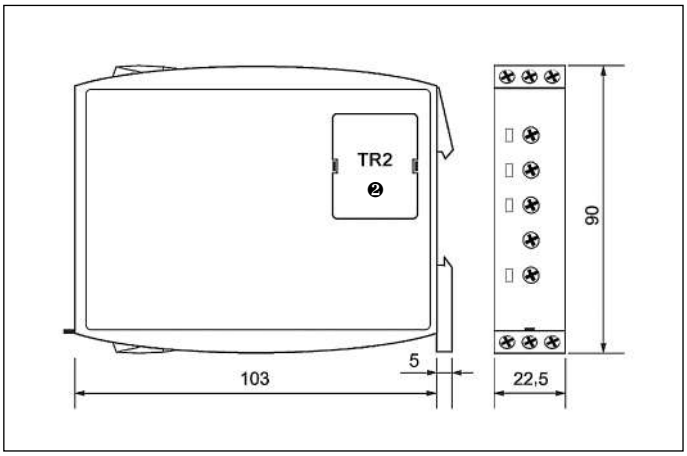
← Contents

Dimensions



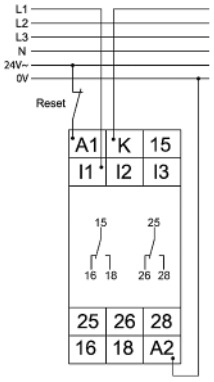
Mounting

Relays **MR-GI1M2P-TR2** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Terminals - cross section of the connection cables:** 1 x 0,5 ... 2,5 mm² with/without multicore cable end, 1 x 4 mm² without multicore cable end, 2 x 0,5 ... 1,5 mm² with/without multicore cable end, 2 x 2,5 mm² flexible without multicore cable end.

❷ Supply voltage depending on the TR2 transformer which shall be ordered as a separate product - see page 587.

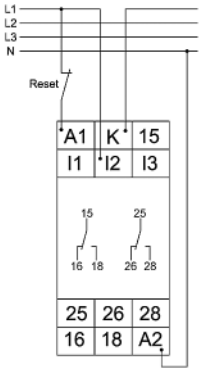
Connection diagrams

Measuring circuit 0,1 A AC/DC, with fault latch mode



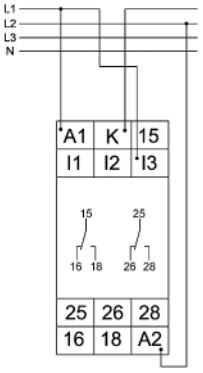
Supply: A1-A2 with TR2 24 V AC ❷

Measuring circuit 1 A AC/DC, with fault latch mode



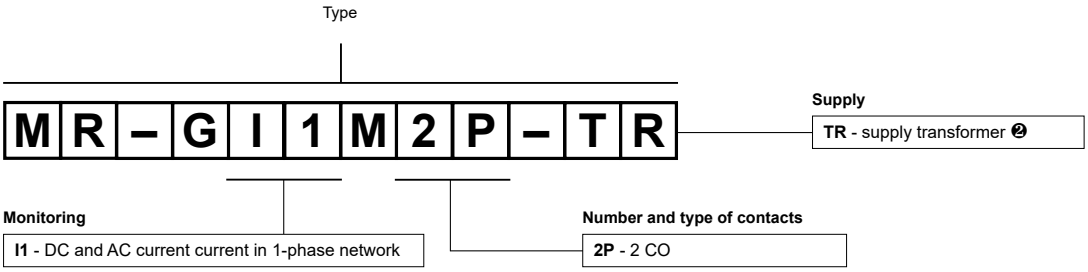
Supply: A1-A2 with TR2 230 V AC ❷

Measuring circuit 10 A AC/DC, without fault latch mode



Supply: A1-A2 with TR2 400 V AC ❷

Ordering codes



Example of ordering code:

MR-GI1M2P-TR2 monitoring relay **MR-GI1M2P-TR2**, multifunction (relay perform 6 functions), industrial cover, width 22,5 mm, two changeover contacts, rated input voltage (supply): AC - 12, 24, 42, 48, 110, 127, 230, 400 V AC ❷

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MR-GT2P-TR2
monitoring relays

- **Single-functions monitoring relays (motor temperature monitoring)** • Test functions: built-in Test/Reset button, connection of the external Reset button (optional)
- Supply via TR2 supply transformer ❶
- Output: 2 CO (2 changeover contacts)
- Industrial cover, width 22,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Recognitions, certifications, directives: RoHS, CE

Output circuit - contact data			
Number and type of contacts			2 CO
Rated voltage			250 V AC
Max. breaking capacity		AC1	750 VA (3 A / 250 V AC) ❷ 1 250 VA (5 A / 250 V AC) ❸
Max. operating frequency • at resistive load 100 VA • at resistive load 1 000 VA			 3 600 cycles/hour 360 cycles/hour
Input circuit			
Supply voltage		AC	12, 24, 42, 48, 110, 127, 230, 400 V ❶ terminals A1-A2
Must release voltage			AC: ≥ 0,3 U_n
Operating range of supply voltage			as per the specification of TR2 supply transformer ❶
Rated power consumption		AC	2,0 VA / 1,5 W
Range of supply frequency		AC	as per the specification of TR2 supply transformer ❶
Duty cycle			100%
Measuring circuit	• terminals		T1-T2
	• initial resistance		< 1,5 kΩ
	• response value		relay in OFF-position: ≥ 3,6 kΩ
	• release value		relay in ON-position: ≤ 1,8 kΩ
	• disconnection ❹		no
	• measuring voltage T1-T2		≤ 2,5 V at R ≤ 4 kΩ EN 60947-8
Control contact	• function		connection of an external Reset button
	• load		no
	• max. line length		R-T2: 10 m (twisted pair)
	• control pulse length		min. 50 ms
	• Reset		contact 1 NO; terminals R-T2
Insulation according to EN 60664-1			
Rated surge voltage			4 000 V 1,2 / 50 µs
Overvoltage category			III
Insulation pollution degree			3
General data			
Electrical life	• resistive AC1		> 2 x 10^5 1 000 VA
Mechanical life (cycles)			> 2 x 10^7
Dimensions (L x W x H)			90 x 22,5 x 108 mm
Weight			100 g
Ambient temperature	• storage		-25...+70 °C
(non-condensation and/or icing)	• operating		-25...+55 °C
Cover protection category			IP 20 EN 60529
Relative humidity			15...85%
Shock resistance			15 g 11 ms
Vibration resistance			0,35 mm DA 10...55 Hz
Meassuring circuit data			
Functions			temperature monitoring of the motor winding, with fault latch (max. 6 PTC - temperature sensors DIN 44081) test functions: built-in Test/Reset button, connection of the external Reset button (optional)
Base accuracy			± 10% (calculated from the final range values)
Repeatability			± 1%
Voltage influence			± 2,2%
Temperature influence			± 0,1% / °C
Recovery time			500 ms
LED indicator			green LED U ON - indication of supply voltage U red LED ON/OFF - indication of failure

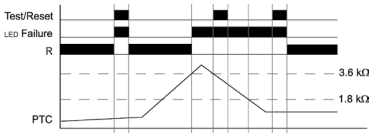
❶ Supply voltage depending on the TR2 transformer which shall be ordered as a separate product - see page 587. ❷ If the distance between the relays mounted side by side is less than 5 mm. ❸ If the distance between the relays mounted side by side is greater than 5 mm. ❹ At short circuit.

Functions

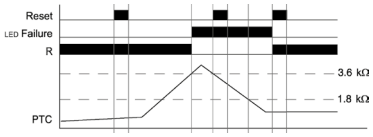
Motor temperature monitoring with fault latch.

If the supply voltage U is applied (green LED illuminated) and the cumulative resistance of the PTC-circuit is less than 3,6 kΩ (standard temperature of the motor), the output relay R switches into on-position. Pressing the Test/Reset button under this conditions forces the output relay R to switch into off-position. It remains in state as long as the Test/Reset button is pressed and thus the switching function can be checked in case of fault. The test function is not effective by using an external Reset button. When the comulative resistance of the PTC-circuit exceeds 3,6 kΩ (at least one of the PTCs has reached the cut-off temperature), the output relay R switches into off-position (red LED illuminated). The output relay R switches into on-position again (red LED not illuminated), if the cumulative resistance drops below 1,8 kΩ by cooling down of the PTC and either a Reset button (internal or external) was pressed or the supply voltage was disconnected and re-applied.

Application of built-in **Test/Reset** button.

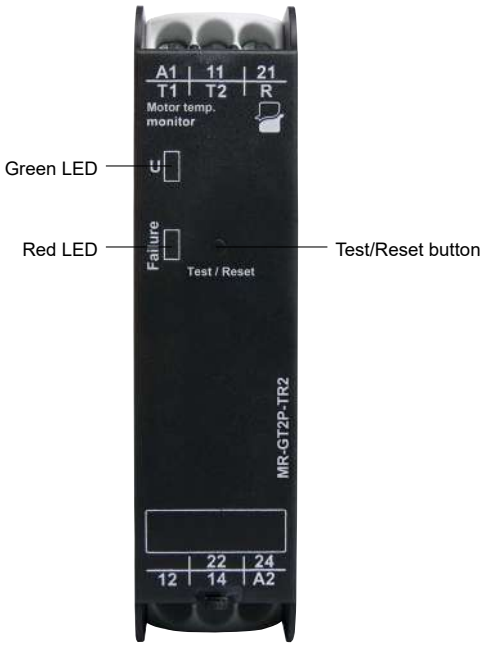


Application of an external **Reset** button.

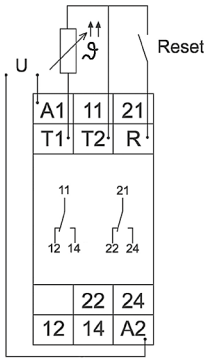


U - supply voltage; **R** - output state of the relay;
PTC - state of sensors; **Failure** - fault latch

Front panel description



Connection diagram



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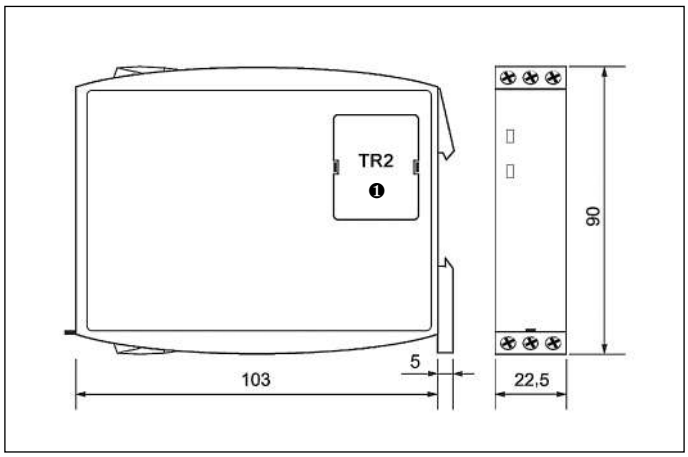
Dimensions

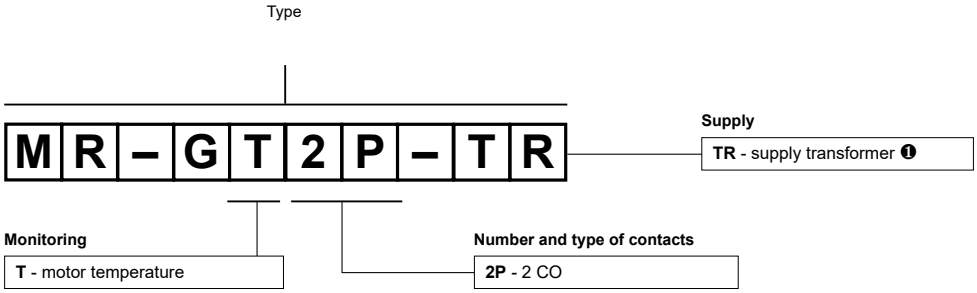


Mounting

Relays **MR-GT2P-TR2** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Terminals - cross section of the connection cables:** 1 x 0,5 ... 2,5 mm^2 with/without multicore cable end, 1 x 4 mm^2 without multicore cable end, 2 x 0,5 ... 1,5 mm^2 with/without multicore cable end, 2 x 2,5 mm^2 flexible without multicore cable end.

❶ Supply voltage depending on the TR2 transformer which shall be ordered as a separate product - see page 587.

Ordering codes



Example of ordering code:

MR-GT2P-TR2 monitoring relay **MR-GT2P-TR2**, single-function (relay monitors the motor temperature), industrial cover, width 22,5 mm, two changeover contacts, rated input voltage (supply): AC - 12, 24, 42, 48, 110, 127, 230, 400 V AC ❶

- Separating TR2... supply transformers for the monitoring relays of MR-G... series to reduce the input voltage applied to the terminals A1 and A2 of monitoring relays to the level required by the internal system
- TR2 transformers shall be ordered as a separate product.

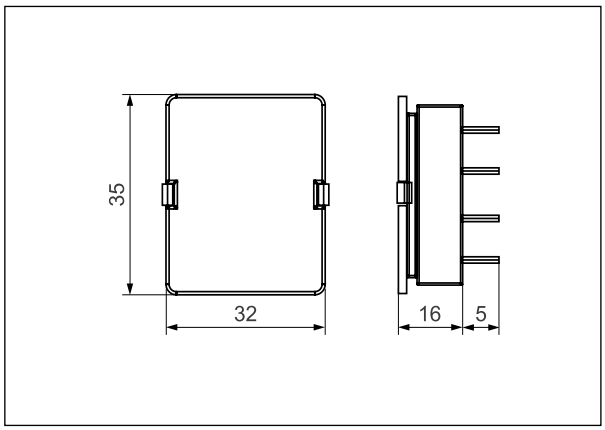
Input circuit

Supply voltage	50/60 Hz AC	12, 24, 42, 48, 110, 127, 230, 400 V
Operating range of supply voltage		0,85...1,1 U_n
Rated power consumption	AC	0,5...2,0 VA
Rated frequency	AC	50/60 Hz
Duty cycle		100%

General data

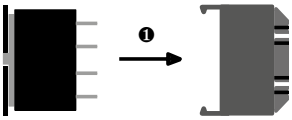
Dimensions (L x W x H)		32 x 35 x 16 mm
Weight		40 g
Ambient temperature	• storage	-25...+70 °C
(non-condensation and/or icing)	• operating	-25...+55 °C
Cover protection category		IP 20
Relative humidity		15...85%

Dimensions

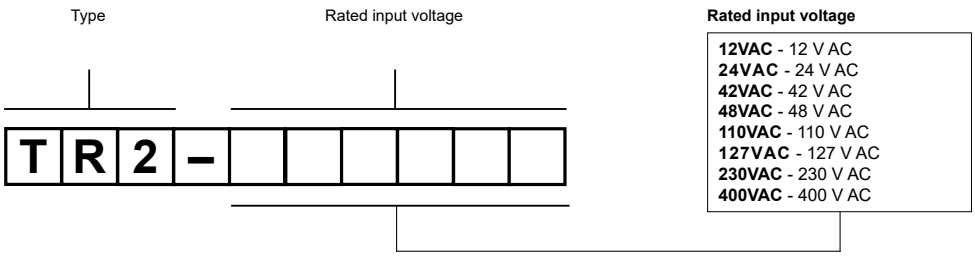


Mounting, mechanical design

TR2 supply transformers are designed for mounting in MR-G... monitoring relays and they are inseparable for their operation. MR-G... relays will not operate without the TR2... transformers. In order to mount the TR2... transformer in the monitoring relay, it is necessary to remove the protective cap ❶ from the relay, which protects the terminals of TR2... Then, TR2... shall be placed in the assembly opening of the MR-G... relay. The cover of TR2... is made of self-extinguishing plastic. When mounted, the tightness of TR2... is IP 20.



Ordering codes



Rated input voltage

12VAC - 12 V AC
24VAC - 24 V AC
42VAC - 42 V AC
48VAC - 48 V AC
110VAC - 110 V AC
127VAC - 127 V AC
230VAC - 230 V AC
400VAC - 400 V AC

Example of ordering code:

TR2-230VAC supply transformer **TR2**, rated input voltage 230 V AC 50/60 Hz

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Signal lamps

relpol® S.A.

Self-operating signal lamps of the RLK series in modular covers, designed for direct mounting on 35 mm rail mount acc. to EN 60715.

They meet the requirements of REACH and RoHS Directive. The lamps are recognized and certified by:

CE EAC

← Contents

RLK-1G RLK-1R RLK-1Y

- **Self-operating signal lamps (optic signaling of AC/DC voltage presence in 1-phase network via lighting of one non-replaceable LED)**
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in low-voltage systems
- Compliance with standards: EN 62094-1, EN 61000-4-2,3,4,5,6,11
- Recognitions, certifications, directives: RoHS, CE EAC

Input circuit

Supply voltage	AC: 50/60 Hz AC/DC	130...260 V	terminals (+)L – (-)N
Operating range of supply voltage		0,85...1,1 U_n	
Rated power consumption	DC	≤ 0,7 W	
Rated current consumption		1,7 mA	
Range of supply frequency	AC	48...63 Hz	
Control circuit	• LED indicator	one LED L ON - indication of supply voltage U ❶: RLK-1G: green RLK-1R: red RLK-1Y: yellow	

Insulation according to EN 60664-1

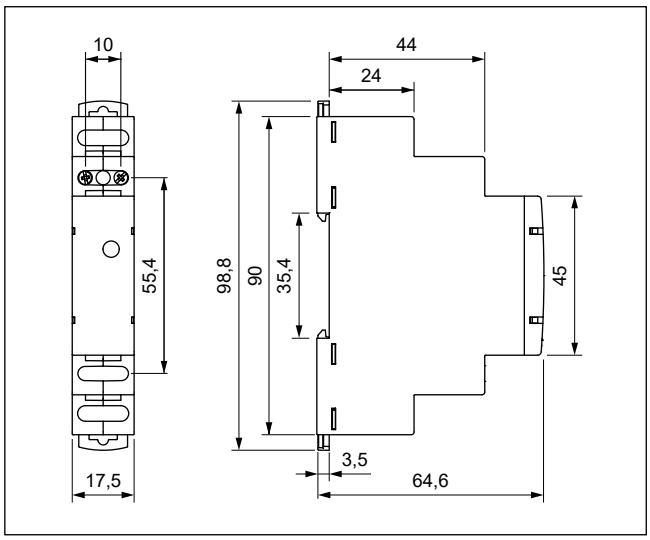
Insulation rated voltage	250 V AC	
Rated surge voltage		
• input	1 000 V	EN 61000-4-5
• 35 mm rail - terminals	4 000 V	1,2 / 50 µs
Protection class	II	
Overvoltage category	II	
Insulation pollution degree	2	
Flammability class	V-0	for modular cover, UL 94
Dielectric strength		
• 35 mm rail - terminals	4 000 V AC	

General data

Dimensions (L x W x H)	90 ❷ x 17,5 x 64,6 mm	
Weight	35 g	
Ambient temperature	• storage	-40...+70 °C
(non-condensation and/or icing)	• operating	-20...+55 °C
Cover protection category	IP 20	EN 60529

❶ With the use of a light element (LED located in the center of the face panel), phase decay is promptly recognizable. The signal of the LED is well visible even at strong light, and its brightness depends on the current value of the supply voltage.
❷ Length with 35 mm rail catches: 98,8 mm.

Dimensions



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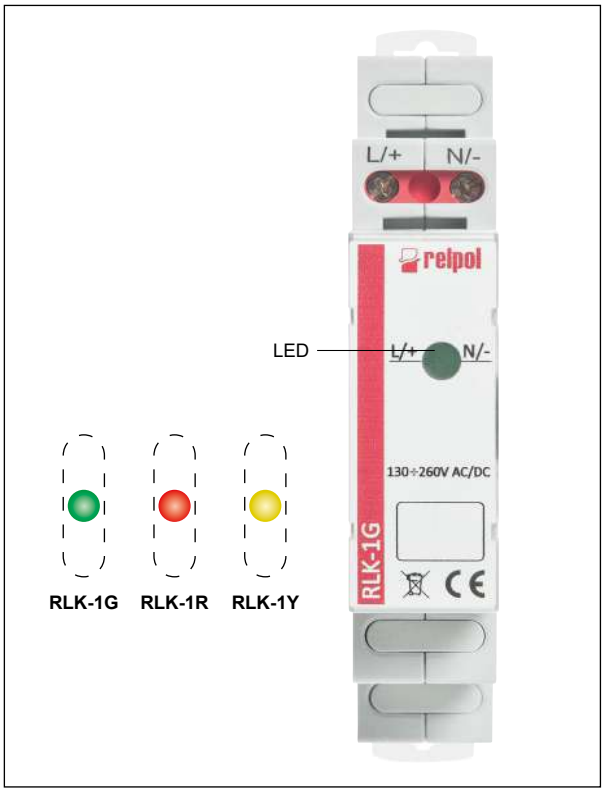
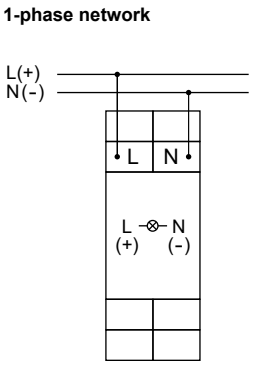
Front panel description

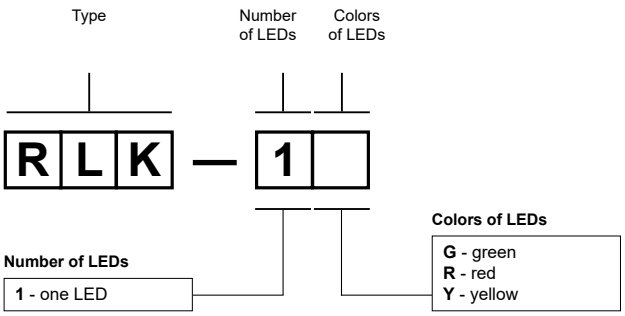


Connection diagram



Note: in case an overcurrent circuit breaker of 25 A or more is installed before the point of connection of the lamp to the mains, the connection circuit of the lamp shall be additionally equipped with a fuse of not more than 6 A.

Ordering codes



Examples of ordering codes:

RLK-1G signal lamp **RLK-1G** with one green LED, supply voltage 130...260 V AC/DC AC: 50/60 Hz

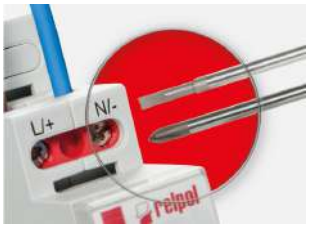
RLK-1R signal lamp **RLK-1R** with one red LED, supply voltage 130...260 V AC/DC AC: 50/60 Hz

RLK-1Y signal lamp **RLK-1Y** with one yellow LED, supply voltage 130...260 V AC/DC AC: 50/60 Hz

Mounting

Lamps **RLK-1.** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm^2 (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches:
easy mounting on 35 mm rail,
firm hold (top and bottom).



Mounting wires in clamps:
universal screw
(cross-recessed or slotted head).

RLK-3G RLK-3R RLK-3K

- **Self-operating signal lamps (optic signaling of AC voltage presence in 3-phase network - 3(N)~ 400/230 V via lighting of three non-replaceable LEDs)**
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Applications: in low-voltage systems
- Compliance with standards: EN 62094-1, EN 61000-4-2,3,4,5,6,11
- Recognitions, certifications, directives: RoHS, CE EAC

Input circuit

Supply voltage	50/60 Hz AC	3(N)~ 400/230 V terminals (N) – L1-L2-L3
Operating range of supply voltage		0,85...1,1 U_n
Rated power consumption	DC	≤ 1,1 W
Rated current consumption		1,7 mA
Range of supply frequency	AC	48...63 Hz
Control circuit	• LED indicator	three LEDs L1, L2, L3 ON - indication of supply voltage U ❶: RLK-3G: green RLK-3R: red RLK-3K: red, yellow, green

Insulation according to EN 60664-1

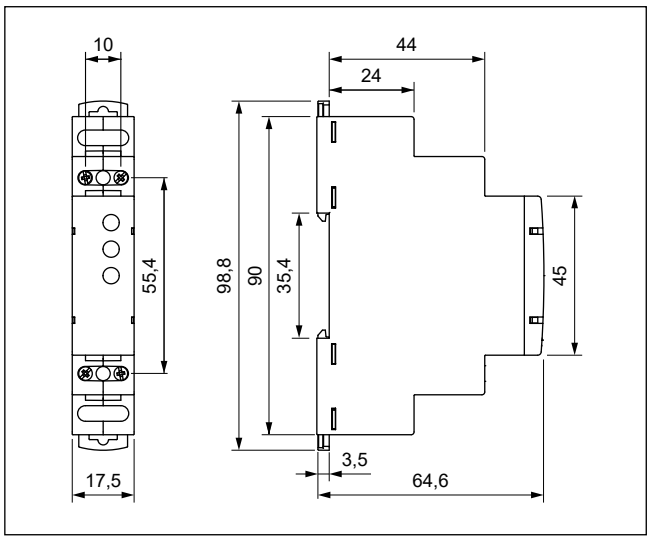
Insulation rated voltage	400 V AC
Rated surge voltage • input • 35 mm rail - terminals	 1 000 V EN 61000-4-5 4 000 V 1,2 / 50 µs
Protection class	II
Overvoltage category	II
Insulation pollution degree	2
Flammability class	V-0 for modular cover, UL 94
Dielectric strength • 35 mm rail - terminals	 4 000 V AC

General data

Dimensions (L x W x H)		90 ❷ x 17,5 x 64,6 mm
Weight		38 g
Ambient temperature (non-condensation and/or icing)	• storage • operating	-40...+70 °C -20...+55 °C
Cover protection category		IP 20 EN 60529

❶ With the use of light elements (three LEDs located in the center of the face panel), any phase decay is promptly recognizable. The signals of the LEDs are well visible even at strong light, and their brightness depends on the current value of the supply voltage.
❷ Length with 35 mm rail catches: 98,8 mm.

Dimensions



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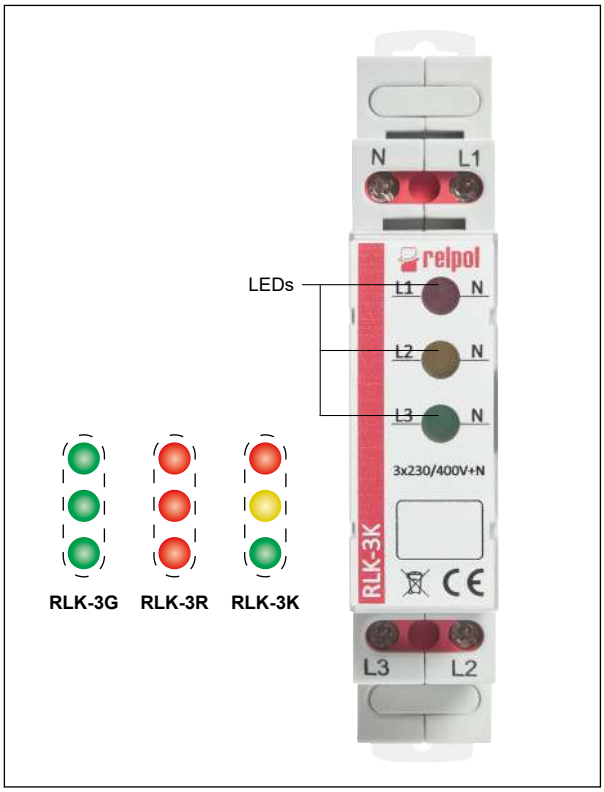
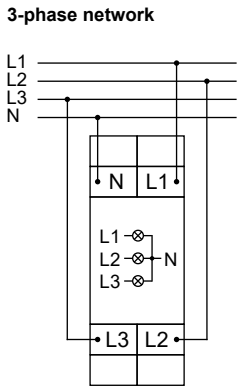
Front panel description



Connection diagram

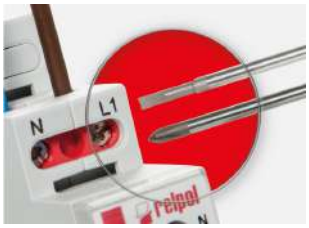


Note: in case an overcurrent circuit breaker of 25 A or more is installed before the point of connection of the lamp to the mains, the connection circuit of the lamp shall be additionally equipped with a fuse of not more than 6 A.

Mounting

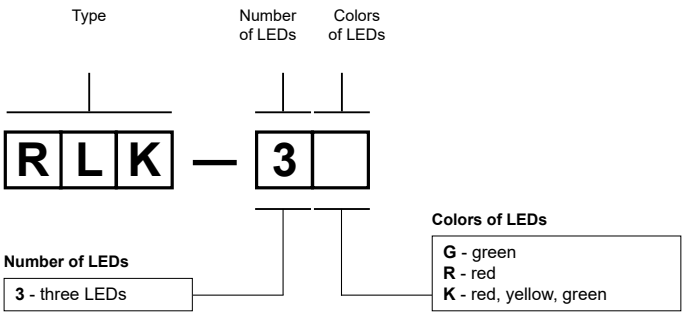
Lamps **RLK-3.** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm² (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

Two catches:
easy mounting on 35 mm rail,
firm hold (top and bottom).



Mounting wires in clamps:
universal screw
(cross-recessed or slotted head).

Ordering codes



Examples of ordering codes:

RLK-3G signal lamp **RLK-3G** with three green LEDs, supply voltage 3(N)~ 400/230 V AC 50/60 Hz

RLK-3R signal lamp **RLK-3R** with three red LEDs, supply voltage 3(N)~ 400/230 V AC 50/60 Hz

RLK-3K signal lamp **RLK-3K** with three LEDs - red, yellow and green, supply voltage 3(N)~ 400/230 V AC 50/60 Hz

Solid state relays

relpol® S.A.

Solid state relays stosowane
do układów sterowania w elektronice
i automatyce przemysłowej.
Zero-crossing or random-on switching.

- For mounting THT (RSR32, RSR35),
on panel or on heatsinks (RSR52, RSR62),
on 35 mm rail mount (RSR72).

- They meet the requirements
of REACH and RoHS Directive.
The relays are recognized and certified by:

CE cULus EAC

miniature

industrial

← Contents

RSR32
single-phase solid state relays, miniature

NEW

- Zero-crossing or random-on switching • DC control input
- TTL drive compatibile • Load current 2 A
- Load voltage 240 V AC (single-phase)
- Dielectric strength 2 500 Vrms (opto-isolation)
- Suitable for PCB mounted
- Recognitions, certifications, directives: RoHS, REACH,

Input data ❶

Control voltage range	RSR32-..D.-5. RSR32-..D.-12. RSR32-..D.-24.	5 V DC 12 V DC 24 V DC	4...6 V DC 9,6...14,4 V DC 19,2...28,8 V DC
Must turn-on voltage		5 V DC 12 V DC 24 V DC	4 V DC 9,6 V DC 19,2 V DC
Must turn-off voltage		1 V DC	
Maximum input current		25 mA	

Output data ❶

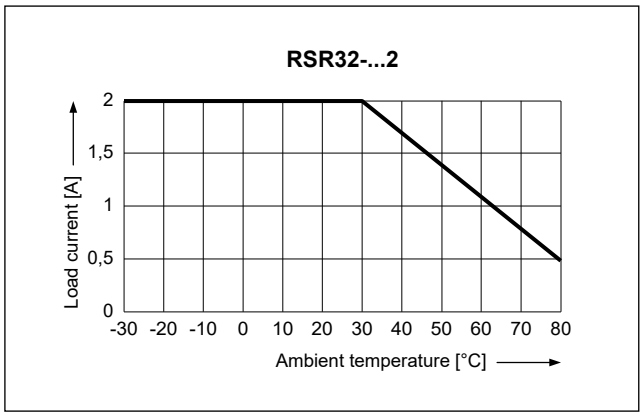
Operational voltage range	RSR32-24...	240 V AC	48...280 V AC
Blocking voltage		600 Vpk	
Load current range		0,1...2 A	
Response time pick-up		DC control (zero-crossing) DC control (random-on)	≤ 1/2 cycle + 1 ms ≤ 1 ms
Response time drop-out		≤ 1/2 cycle + 1 ms	
Maximum surge current	RSR32-...2	40 A 10 ms	
Maximum off-state leakage current		1,5 mA at rated load voltage	
Maximum on-state voltage drop		1,5 Vrms at rated current	
Minimum off-state dV/dt		200 V/µs at max. rated voltage	

General data ❶

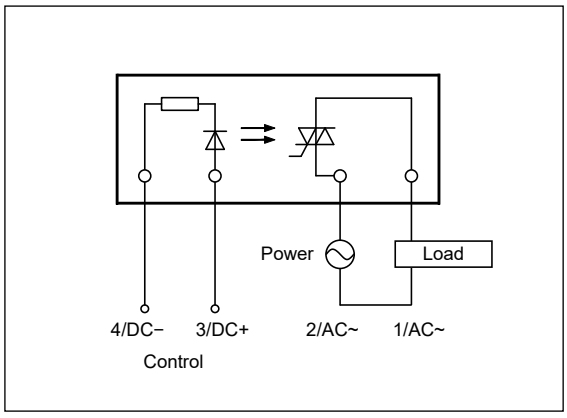
Dielectric strength	• input - output	2 500 Vrms 50/60 Hz	
Minimum insulation resistance		1 000 MΩ 500 V DC	
Dimensions (L x W x H)		28 x 5,2 x 15 mm	
Weight (typical)		4 g	
Ambient temperature (non-condensation and/or icing)	• storage • operating	-30...+80 °C -30...+100 °C	
Soldering time		max. 260 °C max. 350 °C	max. 10 s max. 5 s

❶ Data are given for ambient temperature +25 °C. When temperature is above +25 °C the maximum load current decreases - see "Thermal derating curve", page 594.

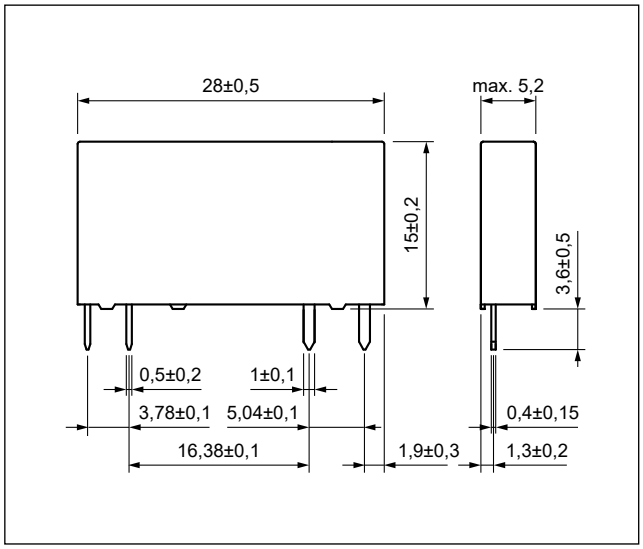
Thermal derating curve



Connection diagram



Dimensions



Pinout (solder side view)

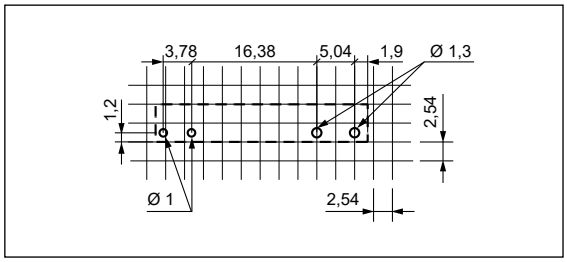


Table of codes

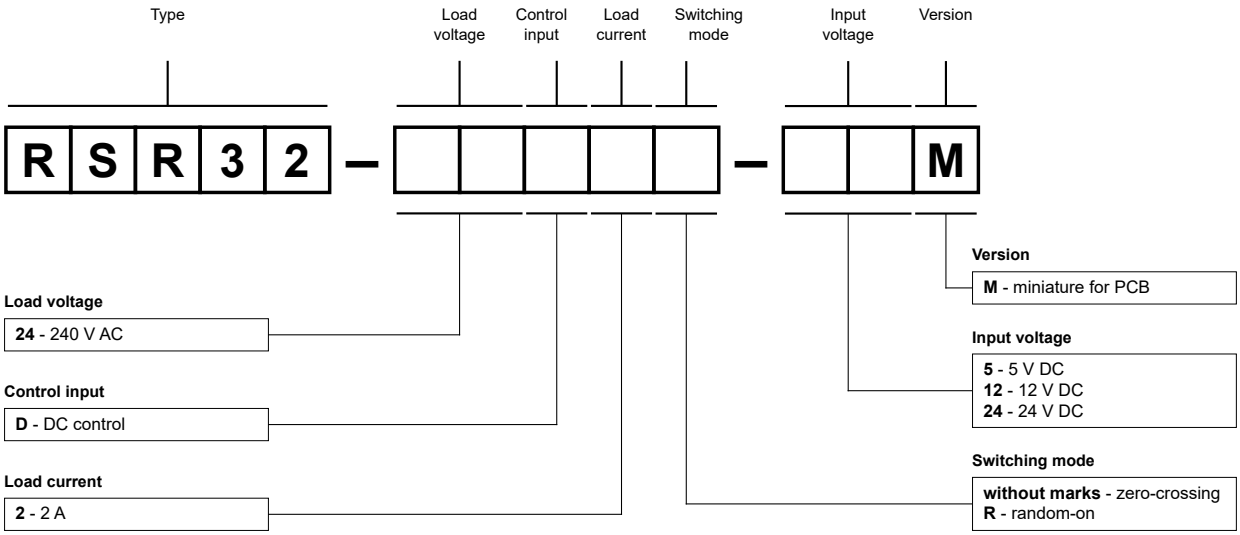
Table 1

zero-crossing switching, DC control	random-on switching, DC control
RSR32-24D2-5M	RSR32-24D2R-5M
RSR32-24D2-12M	RSR32-24D2R-12M
RSR32-24D2-24M	RSR32-24D2R-24M

Mounting

Relays **RSR32** are designed for direct PCB mounting.

Ordering codes



Examples of ordering codes ❷:

RSR32-24D2-5M relay **RSR32**, miniature for PCB, zero-crossing switching, DC control, input voltage 5 V DC, load voltage 240 V AC (single-phase), load current 2 A

RSR32-24D2R-24M relay **RSR32**, miniature for PCB, random-on switching, DC control, input voltage 24 V DC, load voltage 240 V AC (single-phase), load current 2 A

❷ Ordering codes **RSR32** are specified in Table 1.

RSR35
solid state relays, miniature

NEW

- DC switching • DC control input
- Transistor or MOSFET output • Load current 0,1...4 A
- Load voltage 24, 48 V DC
- Dielectric strength 2 500 Vrms (opto-isolation)
- Suitable for PCB mounted
- Recognitions, certifications, directives: RoHS, REACH,

Input data ❶

Control voltage range	RSR35-..D.-5. RSR35-..D.-12. RSR35-..D.-24. RSR35-..D.-48. RSR35-..D.-60.	5 V DC 12 V DC 24 V DC 48 V DC 60 V DC	4...6 V DC 9,6...14,4 V DC 19,2...28,8 V DC 38,4...57,6 V DC 48...72 V DC
Must turn-on voltage		5 V DC 12 V DC 24 V DC 48 V DC 60 V DC	4 V DC 9,6 V DC 19,2 V DC 38,4 V DC 48 V DC
Must turn-off voltage		5 V DC 12, 24 V DC 48, 60 V DC	1 V DC 2,4 V DC 4,8 V DC
Maximum input current		5, 12, 24 V DC 48, 60 V DC	25 mA 23 mA

Output data ❶

Operational voltage range	RSR35-24... RSR35-48...	24 V DC 48 V DC	3...28 V DC 3...58 V DC
Blocking voltage		24 V DC 48 V DC	33 V DC 58 V DC
Load current range		0,1 A 3 A 4 A	0,001...0,1 A 0,002...3 A 0,002...4 A
Response time pick-up		300 µs	
Response time drop-out		300 µs	
Maximum surge current	RSR35-...01 RSR35-...3 RSR35-...4	0,1 A 3 A 4 A	1 A 10 ms 30 A 10 ms 48 A 10 ms
Maximum off-state leakage current		100 µA at rated load voltage	
Maximum on-state voltage drop		0,1 A	1,5 V DC at rated current
Maximum on-state resistance		3 A, 4 A	37 MΩ

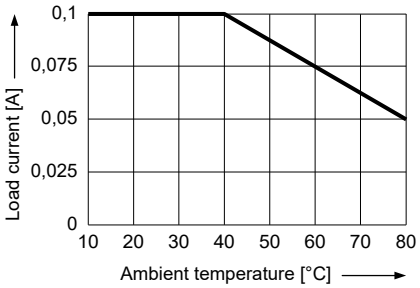
General data ❶

Dielectric strength	• input - output	2 500 Vrms 50/60 Hz	
Minimum insulation resistance		1 000 MΩ 500 V DC	
Dimensions (L x W x H)		28 x 5,2 x 15 mm	
Weight (typical)		4 g	
Ambient temperature (non-condensation and/or icing)	• storage • operating	-30...+80 °C -30...+100 °C	
Soldering time		max. 260 °C max. 350 °C	max. 10 s max. 5 s

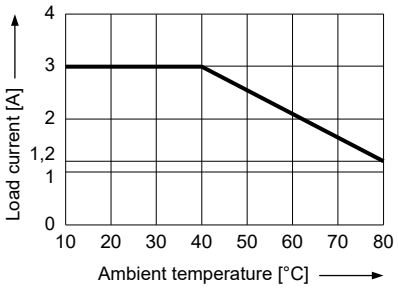
❶ Data are given for ambient temperature +25 °C. When temperature is above +25 °C the maximum load current decreases - see "Thermal derating curves", page 597.

Thermal derating curves

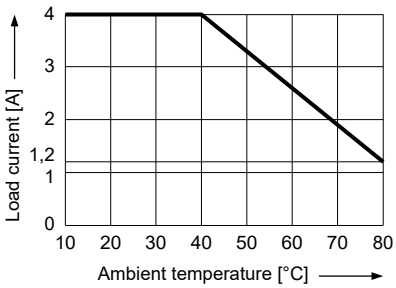
RSR35-...01



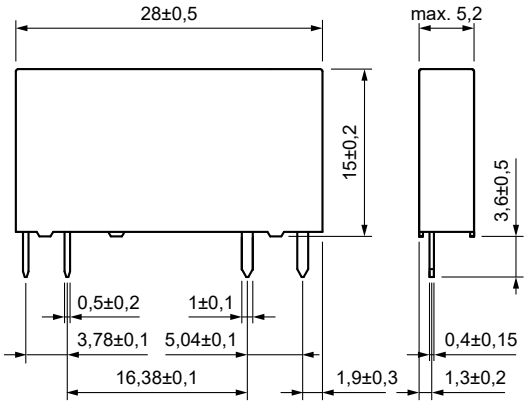
RSR35-...3



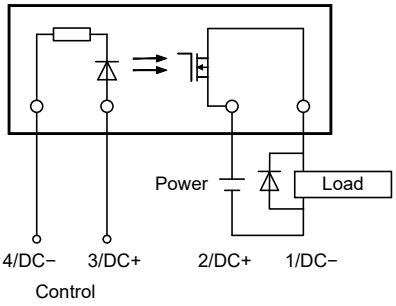
RSR35-...4



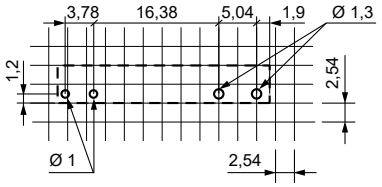
Dimensions



Connection diagram



Pinout (solder side view)



Mounting

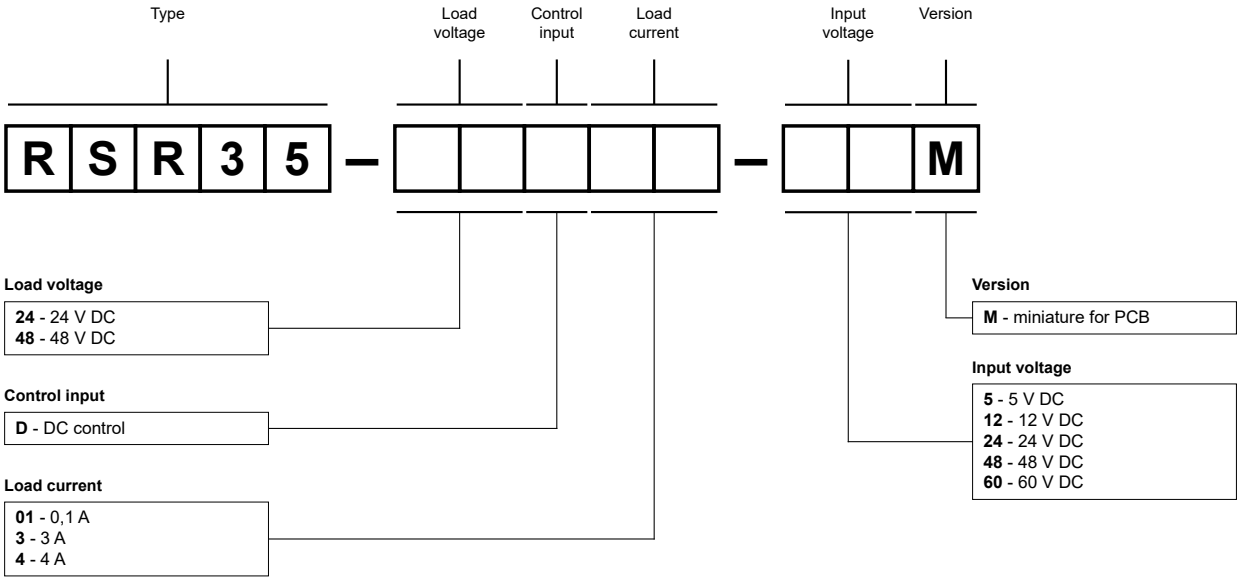
Relays **RSR35** are designed for direct PCB mounting.

Table of codes

Table 1

DC control		
RSR35-48D01-5M	RSR35-48D3-5M	RSR35-24D4-5M
RSR35-48D01-12M	RSR35-48D3-12M	RSR35-24D4-12M
RSR35-48D01-24M	RSR35-48D3-24M	RSR35-24D4-24M
RSR35-48D01-48M	RSR35-48D3-48M	RSR35-24D4-48M
RSR35-48D01-60M	RSR35-48D3-60M	RSR35-24D4-60M

Ordering codes



Examples of ordering codes ❷:

RSR35-48D01-5M relay **RSR35**, miniature for PCB, DC control, input voltage 5 V DC, load voltage 48 V DC, load current 0,1 A

RSR35-48D3-24M relay **RSR35**, miniature for PCB, DC control, input voltage 24 V DC, load voltage 48 V DC, load current 3 A

RSR35-24D4-60M relay **RSR35**, miniature for PCB, DC control, input voltage 60 V DC, load voltage 24 V DC, load current 4 A

❷ Ordering codes **RSR35** are specified in Table 1.

NEW

- Zero-crossing or random-on switching • AC or DC control input
- SCR output (thyristors) • Load current 10...80 A
- Load voltage 240, 480, 600 V AC (single-phase)
- Dielectric strength 4 000 Vrms (opto-isolation)
- MOV protection (built-in varistor) • LED indicator (red)
- Screw terminals • Mounting on panel or on heatsinks
- Applications: temperature chamber, food processing machinery, injection molding machine, incubator, oiling machines, HVAC, lighting, fountain controller
- Recognitions, certifications, directives: RoHS, REACH,

Input data ❶

Control voltage range	RSR52-..A...	AC control	90...280 V AC 50/60 Hz
	RSR52-..D...	DC control	4...32 V DC
Must turn-on voltage		AC control	90 V AC
		DC control	4 V DC
Must turn-off voltage		AC control	10 V AC
		DC control	1 V DC
Maximum input current		25 mA 280 V AC, 50/60 Hz / 32 V DC	

Output data ❶

Operational voltage range	RSR52-24...	240 V AC	48...280 V AC
	RSR52-48...	480 V AC	48...530 V AC
	RSR52-60...	600 V AC	48...660 V AC
Blocking voltage		240 V AC	600 Vpk
		480 V AC	1 200 Vpk
		600 V AC	1 600 Vpk
Response time pick-up		AC control	≤ 40 ms
		DC control (zero-crossing)	≤ 1/2 cycle + 1 ms
		DC control (random-on)	≤ 1 ms
Response time drop-out		AC control	≤ 40 ms
		DC control	≤ 1/2 cycle + 1 ms
Maximum surge current	RSR52-...10	10 A	120 A 10 ms
	RSR52-...25	25 A	250 A 10 ms
	RSR52-...40	40 A	500 A 10 ms
	RSR52-...60	60 A	700 A 10 ms
	RSR52-...80	80 A	1 000 A 10 ms
Maximum I^2t for fusing		10 A	72 A^2s 10 ms
		25 A	312 A^2s 10 ms
		40 A	1 250 A^2s 10 ms
		60 A	2 450 A^2s 10 ms
		80 A	5 000 A^2s 10 ms
Maximum off-state leakage current		10 mA at rated load voltage	
Maximum on-state voltage drop		1,7 Vrms at rated current	
Minimum off-state dV/dt		500 V/µs at max. rated voltage	

General data ❶

Dielectric strength	• input - output	4 000 Vrms 50/60 Hz	
	• input, output - base	2 500 Vrms 50/60 Hz	
Minimum insulation resistance		1 000 MΩ 500 V DC	
Dimensions (L x W x H)		58,6 x 45,7 x 33,5 mm	
Weight (typical)		10 A, 25 A	113 g
		40 A, 60 A	119 g
		80 A	170 g
Ambient temperature (non-condensation and/or icing)	• storage	-30...+100 °C	
	• operating	-30...+80 °C	
Cover protection category		IP 20 EN 60529	

❶ Data are given for ambient temperature +25 °C. When temperature is above +25 °C the maximum load current decreases - see "Thermal derating curves", page 600.

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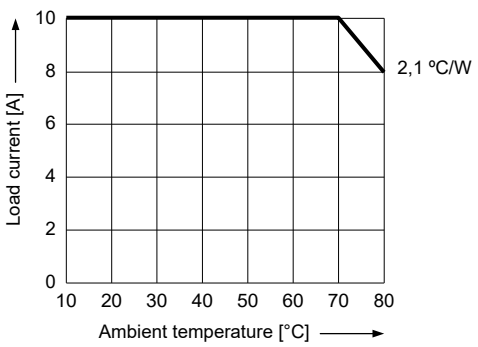
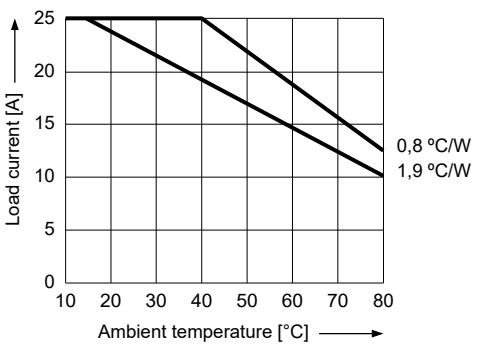
Thermal derating curves

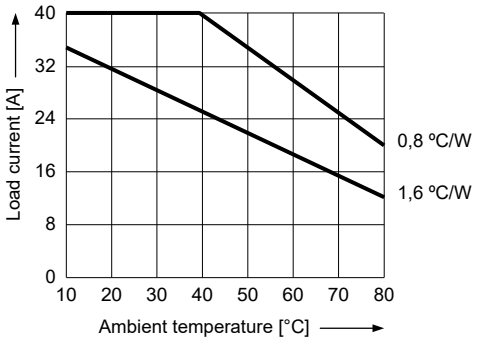
RSR52-...10



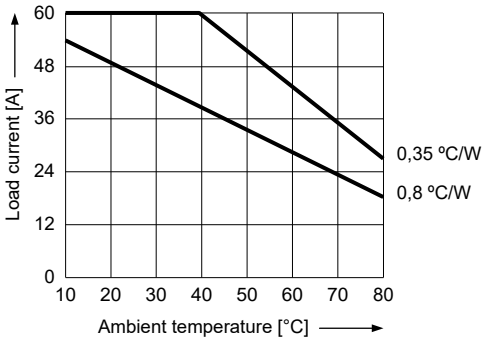
RSR52-...25



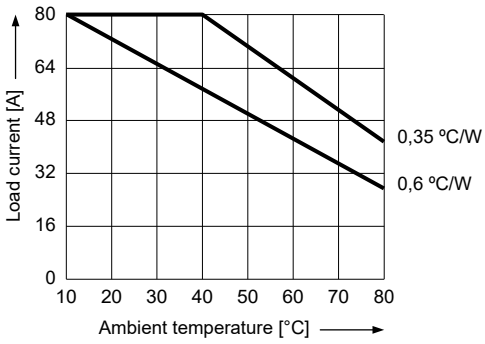
RSR52-...40



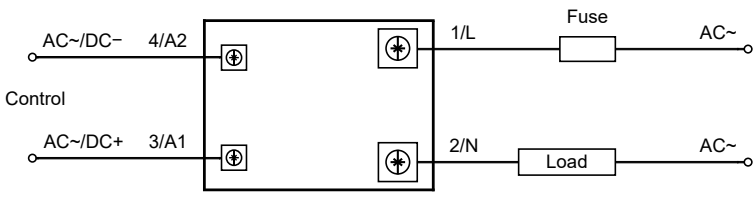
RSR52-...60



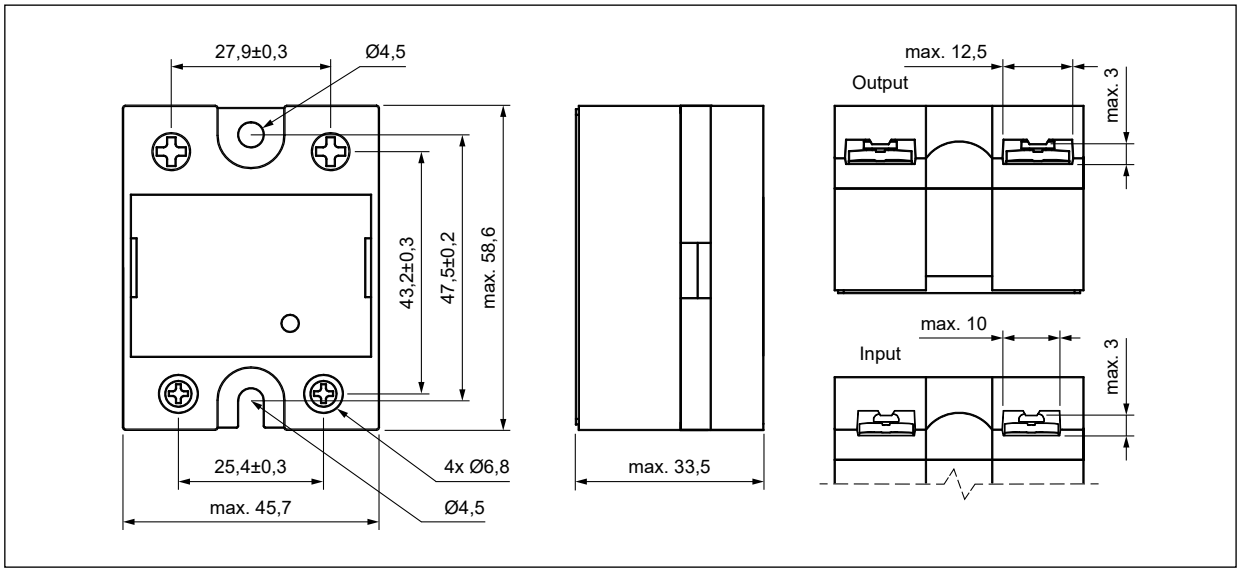
RSR52-...80



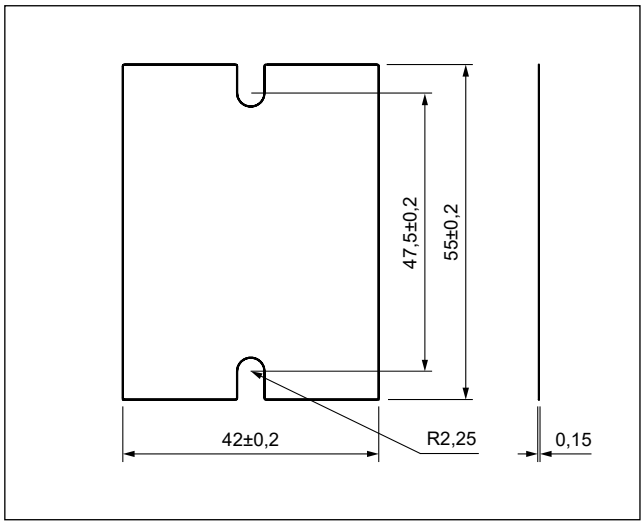
Connection diagram



Dimensions



Solid state relay **RSR52**



Thermal pad **RTP-10**

RH

Heatsinks
for RSR52, RSR62

NEW

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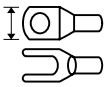
Mounting, accessories for relays

Relays **RSR52** are designed for: • direct mounting on panel • mounting on heatsinks **RH** (see page 615).
For **RSR52** relays we offer thermal pads **RTP-10**.

Mounting on panel or heatsink ❷		Input	Output
Screws		M4	
Tightening moment		0,98...1,37 N•m	
Screw length		7,5 mm	12 mm
Switching terminals ❸		Input	Output
Screws		M3	M4
Tightening moment		0,58...0,98 N•m	0,98...1,37 N•m
Stripping length		8 mm	12 mm
Aperture for termination lug		7,5 mm	12 mm
Cross section of the cables		Input	Output
Rigid (solid & stranded)		1 x 0,5...2,5 mm² (1 x 18...12 AWG) 2 x 0,5...2,5 mm² (2 x 18...12 AWG)	1 x 2,5...6 mm² (1 x 14...10 AWG) 2 x 2,5...6 mm² (2 x 14...10 AWG)
Flexible with end sleeve		1 x 0,5...2,5 mm² (1 x 18...12 AWG) 2 x 0,5...2,5 mm² (2 x 18...12 AWG)	1 x 1...4 mm² (1 x 18...12 AWG) 2 x 1...2,5 mm² (2 x 18...14 AWG) 2 x 2,5...4 mm² (2 x 14...12 AWG)
Flexible without end sleeve		–	1 x 1...6 mm² (1 x 18...10 AWG) 2 x 1...2,5 mm² (2 x 18...14 AWG) 2 x 2,5...6 mm² (2 x 14...10 AWG)

❷ Relay must be mounted to proper sized heatsink, based on "Thermal derating curves". Between relay and heatsink must be used thermal pad.
❸ When connection cables to relay: please ensure, screws are torqued down properly.

RH

Thermal resistance	RH21	2,1 °C/W
	RH19A	1,9 °C/W
	RH19B	1,9 °C/W
	RH17A	1,7 °C/W
	RH17B	1,7 °C/W
	RH06B	1,5 °C/W
	RH16	1,6 °C/W
	RH16-F	0,6 °C/W
	RH11	1,1 °C/W
	RH09	0,9 °C/W
	RH04A-F	0,4 °C/W
	RH08	0,8 °C/W
	RH08-F	0,35 °C/W
	RH04B	0,4 °C/W
	RH04B-F	0,15 °C/W

RTP-10

Material	graphite	
Color	black	
Dimensions (L x W x H)	55 x 42 x 0,15 mm	
Weight (typical)	0,4 g	
Thermal resistance	0,1 °C/W ❹	
Flammability class	V-0	
Temperature range	continuous	-60...+180 °C
Storage conditions	temperature	+23...+27 °C
	humidity	65±20% HR

❹ This value is provided for reference only. Actual application performance is directly related to the surface roughness, flatness and pressure applied.

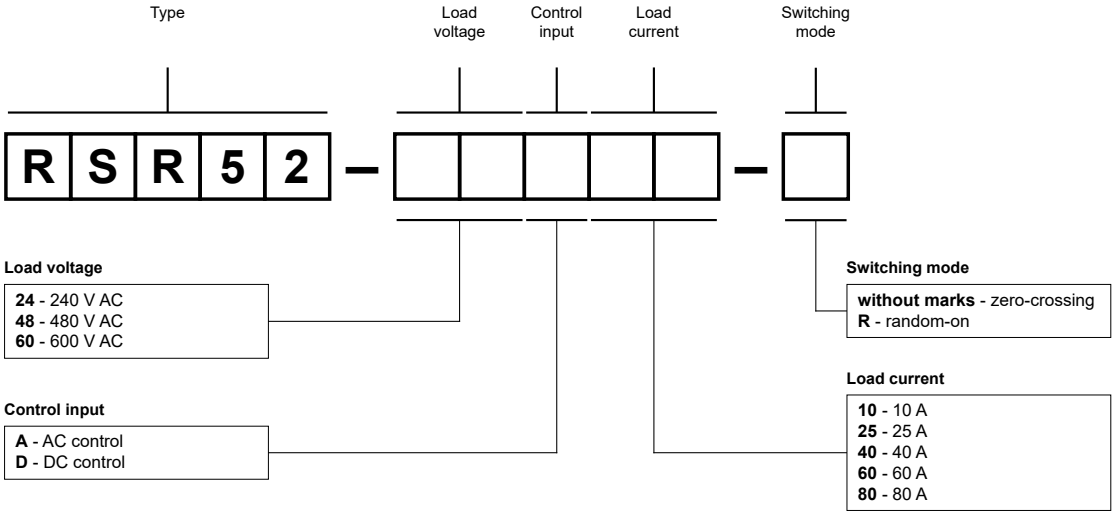
RTP-10

Table of codes

Table 1

zero-crossing switching, AC control	zero-crossing switching, DC control	random-on switching, DC control
RSR52-24A10	RSR52-24D10	–
RSR52-24A25	RSR52-24D25	RSR52-24D25-R
RSR52-24A40	RSR52-24D40	–
RSR52-24A60	RSR52-24D60	RSR52-24D60-R
RSR52-24A80	RSR52-24D80	RSR52-24D80-R
RSR52-48A10	RSR52-48D10	–
RSR52-48A25	RSR52-48D25	RSR52-48D25-R
RSR52-48A40	RSR52-48D40	–
RSR52-48A60	RSR52-48D60	RSR52-48D60-R
RSR52-48A80	RSR52-48D80	RSR52-48D80-R
RSR52-60A25	RSR52-60D25	RSR52-60D25-R
RSR52-60A40	RSR52-60D40	–
RSR52-60A60	RSR52-60D60	RSR52-60D60-R

Ordering codes



Examples of ordering codes ❺:

RSR52-24A10 relay **RSR52**, zero-crossing switching, AC control, load voltage 240 V AC (single-phase), load current 10 A

RSR52-48D40 relay **RSR52**, zero-crossing switching, DC control, load voltage 480 V AC (single-phase), load current 40 A

RSR52-60D60-R relay **RSR52**, random-on switching, DC control, load voltage 600 V AC (single-phase), load current 60 A

❺ Ordering codes **RSR52** are specified in Table 1.

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RSR62
three-phase solid state relays, industrial

NEW

- Zero-crossing or random-on switching • AC or DC control input
- SCR output (thyristors) • Load current 25...80 A
- Load voltage 480, 600 V AC (three-phase)
- Dielectric strength 4 000 Vrms (opto-isolation)
- RC/MOV protection (built-in resistor, capacitor, varistor)
- LED indicators (red) • Screw terminals • Mounting on heatsinks
- Applications: three phase motor control, temperature control, large oven
- Recognitions, certifications, directives: RoHS, REACH,

Input data ❶

Control voltage range	RSR62-..A... RSR62-..D...	AC control DC control	90...280 V AC 50 Hz 4...32 V DC
Must turn-on voltage		AC control DC control	90 V AC 4 V DC
Must turn-off voltage		AC control DC control	15 V AC 1 V DC
Maximum reverse voltage		DC control	32 V DC
Maximum input current		AC control DC control	30 mA 280 V AC, 50 Hz 35 mA 32 V DC

Output data ❶

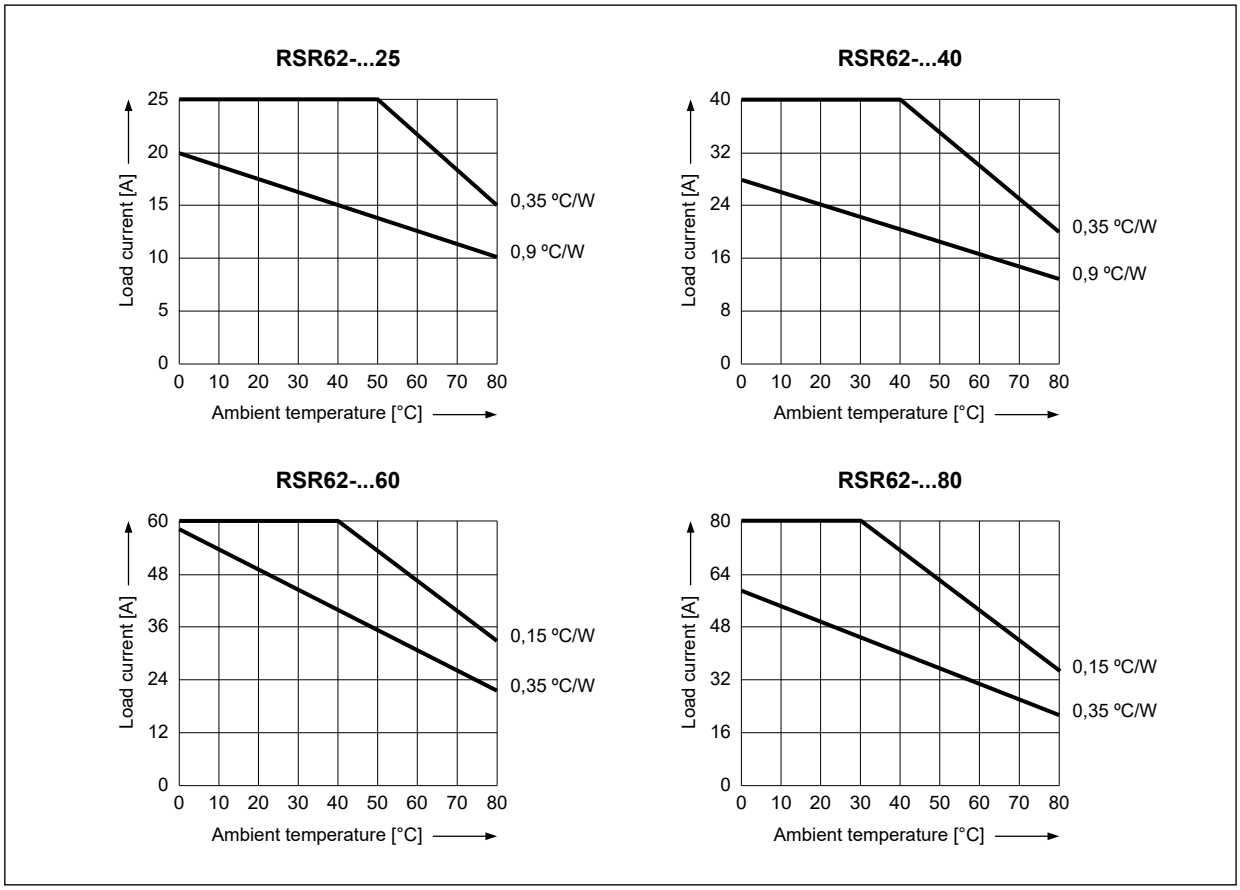
Operational voltage range	RSR62-48... RSR62-60...	480 V AC 600 V AC	24...530 V AC 24...660 V AC
Blocking voltage		480 V AC 600 V AC	1 200 Vpk 1 600 Vpk
Response time pick-up		AC control DC control (zero-crossing) DC control (random-on)	≤ 40 ms ≤ 1/2 cycle + 1 ms ≤ 1 ms
Response time drop-out		AC control DC control	≤ 40 ms ≤ 1/2 cycle + 1 ms
Maximum surge current	RSR62-...25 RSR62-...40 RSR62-...60 RSR62-...80	25 A 40 A 60 A 80 A	300 A 10 ms 500 A 10 ms 600 A 10 ms 1 000 A 10 ms
Maximum I^2t for fusing		25 A 40 A 60 A 80 A	450 A^2s 10 ms 1 250 A^2s 10 ms 1 800 A^2s 10 ms 5 000 A^2s 10 ms
Maximum off-state leakage current		10 mA at rated load voltage	
Maximum on-state voltage drop		1,6 Vrms at rated current	
Minimum off-state dV/dt		500 V/µs at max. rated voltage	

General data ❶

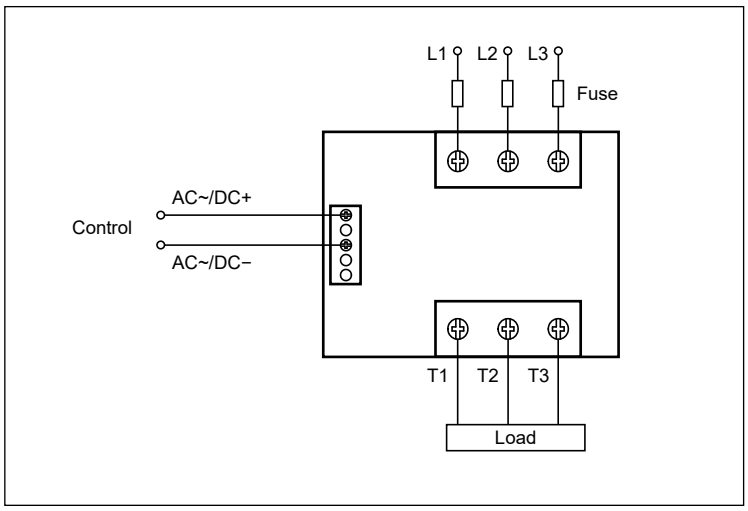
Dielectric strength	• input - output • input, output - base	4 000 Vrms 50/60 Hz 2 500 Vrms 50/60 Hz	
Minimum insulation resistance		1 000 MΩ 500 V DC	
Dimensions (L x W x H)		105 x 78 x 38 mm	
Weight (typical)		25 A, 40 A 60 A, 80 A	385 g 530 g
Ambient temperature (non-condensation and/or icing)	• storage • operating	-30...+100 °C -30...+80 °C	
Cover protection category		IP 20 EN 60529	

❶ Data are given for ambient temperature +25 °C. When temperature is above +25 °C the maximum load current decreases - see "Thermal derating curves", page 605.

Thermal derating curves



Connection diagram



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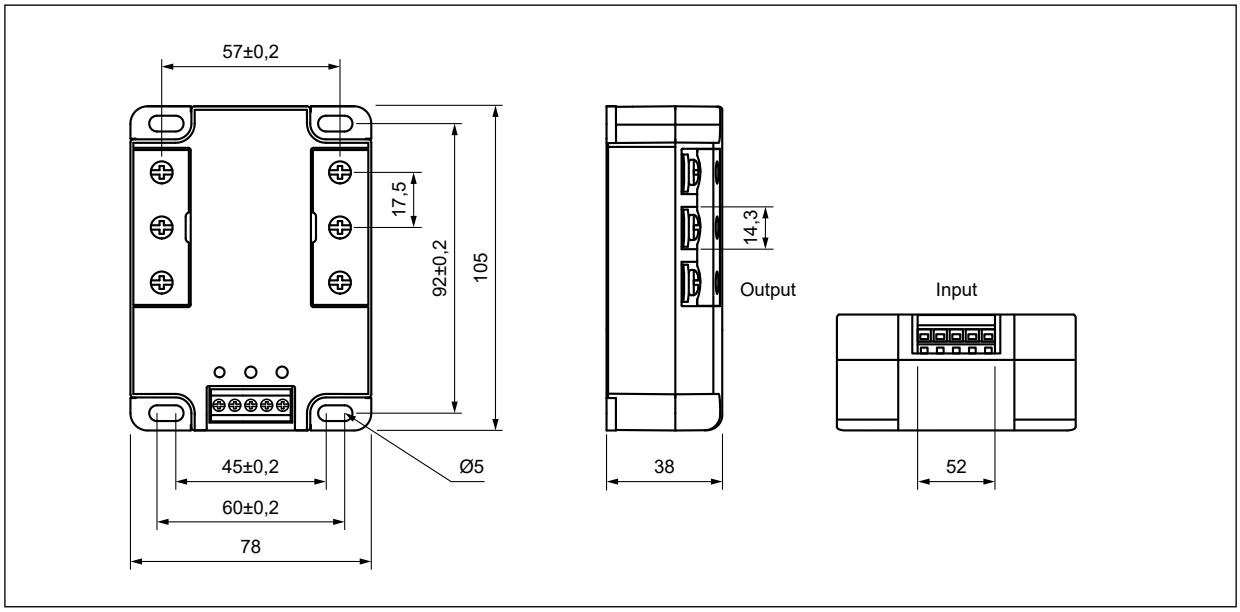
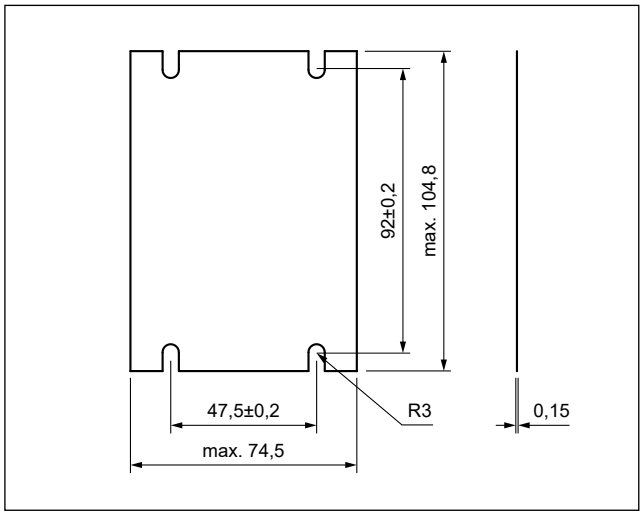
Dimensions



Solid state relay **RSR62**



Thermal pad **RTP-30**

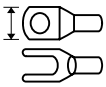
RH

Heatsinks
for RSR52, RSR62

NEW

Mounting, accessories for relays

Relays **RSR62** are designed for mounting on heatsinks **RH** (see page 615).
For **RSR62** relays we offer thermal pads **RTP-30**.

Mounting on heatsink ❷			
Screws		M4	
Tightening moment		0,98...1,37 N•m	
Screw length		12 mm	
Switching terminals ❸		Input	Output
Screws		M3 (plugable connector)	M4
Tightening moment		0,58...0,98 N•m	0,98...1,37 N•m
Stripping length		7 mm	12 mm
Aperture for termination lug		–	12 mm
Cross section of the cables		Input	Output
Rigid (solid & stranded)		1 x 1,5...2 mm² (1 x 16...14 AWG)	1 x 2,5...6 mm² (1 x 14...10 AWG) 2 x 2,5...6 mm² (2 x 14...10 AWG)
Flexible with end sleeve		1 x 1,5...2 mm² (1 x 16...14 AWG)	1 x 1...4 mm² (1 x 18...12 AWG) 2 x 1...2,5 mm² (2 x 18...14 AWG) 2 x 2,5...4 mm² (2 x 14...12 AWG)
Flexible without end sleeve		–	1 x 1...6 mm² (1 x 18...10 AWG) 2 x 1...2,5 mm² (2 x 18...14 AWG) 2 x 2,5...6 mm² (2 x 14...10 AWG)

❷ Relay must be mounted to proper sized heatsink, based on "Thermal derating curves". Between relay and heatsink must be used thermal pad.
❸ When connection cables to relay: please ensure, screws are torqued down properly.

RH

Thermal resistance	RH11	1,1 °C/W
	RH09	0,9 °C/W
	RH04A-F	0,4 °C/W
	RH08	0,8 °C/W
	RH08-F	0,35 °C/W
	RH04B	0,4 °C/W
	RH04B-F	0,15 °C/W

RTP-30

Material	graphite	
Color	black	
Dimensions (L x W x H)	104,8 x 74,5 x 0,15 mm	
Weight (typical)	0,9 g	
Thermal resistance	0,1 °C/W ❹	
Flammability class	V-0	
Temperature range	continuous	-60...+180 °C
Storage conditions	temperature	+23...+27 °C
	humidity	65±20% HR

❹ This value is provided for reference only. Actual application performance is directly related to the surface roughness, flatness and pressure applied.

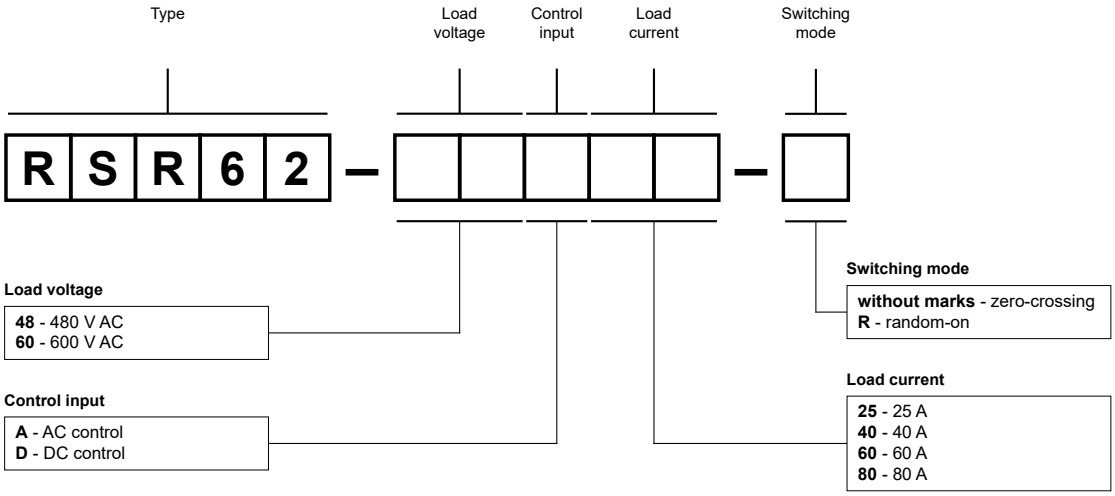
RTP-30

Table of codes

Table 1

zero-crossing switching, AC control	zero-crossing switching, DC control	random-on switching, DC control
RSR62-48A25	RSR62-48D25	–
RSR62-48A40	RSR62-48D40	–
RSR62-48A60	RSR62-48D60	–
RSR62-48A80	RSR62-48D80	–
RSR62-60A25	RSR62-60D25	RSR62-60D25-R
RSR62-60A40	RSR62-60D40	RSR62-60D40-R
RSR62-60A60	RSR62-60D60	RSR62-60D60-R
RSR62-60A80	RSR62-60D80	RSR62-60D80-R

Ordering codes



Examples of ordering codes ❺:

RSR62-48A25 relay **RSR62**, zero-crossing switching, AC control, load voltage 480 V AC (three-phase), load current 25 A

RSR62-48D80 relay **RSR62**, zero-crossing switching, DC control, load voltage 480 V AC (three-phase), load current 80 A

RSR62-60D60-R relay **RSR62**, random-on switching, DC control, load voltage 600 V AC (three-phase), load current 60 A

❺ Ordering codes **RSR62** are specified in Table 1.

NEW

- Zero-crossing or random-on switching • AC or DC control input
- SCR output (thyristors) • Load current 10...75 A
- Load voltage 240, 480, 600 V AC (single-phase)
- Dielectric strength 4 000 Vrms (opto-isolation)
- RC/MOV protection (built-in resistor, capacitor, varistor)
- LED indicator (red) • Screw terminals
- Mounting on 35 mm rail mount acc. to EN 60715 (integrated with heatsink)
- Applications: temperature chamber, injection molding machine, packaging machine
- Recognitions, certifications, directives: RoHS, REACH,

Input data ❶

Control voltage range	RSR72-..A... RSR72-..D...	AC control DC control	90...280 V AC 50 Hz 4...32 V DC
Must turn-on voltage		AC control DC control	90 V AC 4 V DC
Must turn-off voltage		AC control DC control	15 V AC 1 V DC
Maximum input current		25 mA 280 V AC, 50 Hz / 32 V DC	

Output data ❶

Operational voltage range	RSR72-28... RSR72-24... RSR72-48... RSR72-60...	240 V AC (AC control) 240 V AC (DC control) 480 V AC 600 V AC	24...280 V AC 24...280 V AC 24...530 V AC 24...660 V AC
Blocking voltage		240 V AC 480 V AC 600 V AC	600 Vpk 1 200 Vpk 1 600 Vpk
Response time pick-up		AC control DC control (zero-crossing) DC control (random-on)	≤ 40 ms ≤ 1/2 cycle + 1 ms ≤ 1 ms
Response time drop-out		AC control DC control	≤ 40 ms ≤ 1/2 cycle + 1 ms
Maximum surge current	RSR72-...10 RSR72-...20 RSR72-...30 RSR72-...40 RSR72-...75	10 A 20 A 30 A 40 A 75 A	200 A 10 ms 300 A 10 ms 500 A 10 ms 600 A 10 ms 800 A 10 ms
Maximum I^2t for fusing		10 A 20 A 30 A 40 A 75 A	200 A^2s 10 ms 450 A^2s 10 ms 1 250 A^2s 10 ms 1 800 A^2s 10 ms 3 200 A^2s 10 ms
Maximum off-state leakage current		10 mA at rated load voltage	
Maximum on-state voltage drop		1,6 Vrms at rated current	
Minimum off-state dV/dt		500 V/µs at max. rated voltage	

General data ❶

Dielectric strength	• input - output • input, output - base	4 000 Vrms 50/60 Hz 2 500 Vrms 50/60 Hz	
Minimum insulation resistance		1 000 MΩ 500 V DC	
Dimensions (L x W x H)		10 A, 20 A, 30 A 40 A 75 A	100 x 30,5 x 112,5 mm 122 x 50,5 x 110 mm 153 x 105 x 122 mm
Weight (typical)		10 A, 20 A, 30 A 40 A 75 A	355 g 540 g 1 062 g
Ambient temperature (non-condensation and/or icing)	• storage • operating	-30...+100 °C -30...+80 °C	
Cover protection category		IP 20 EN 60529	

❶ Data are given for ambient temperature +25 °C. When temperature is above +25 °C the maximum load current decreases - see "Thermal derating curves", page 610.

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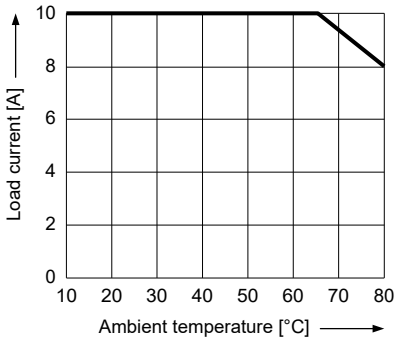
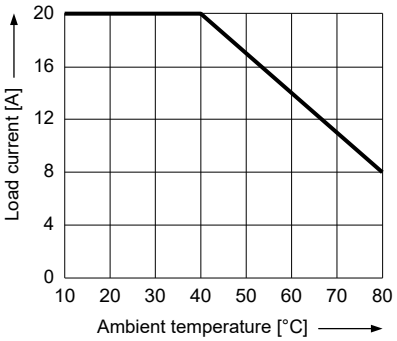
Thermal derating curves

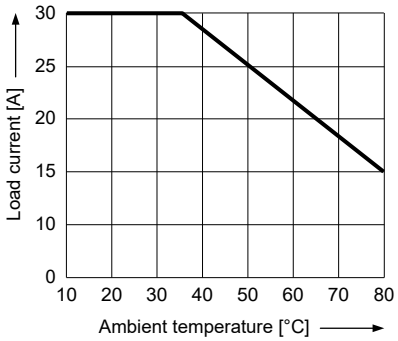
RSR72-...10



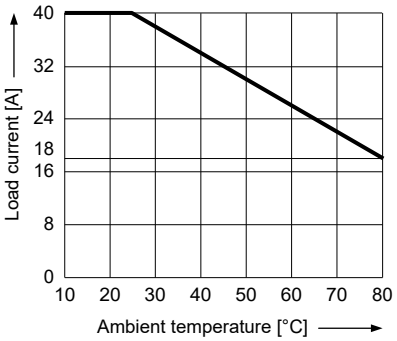
RSR72-...20



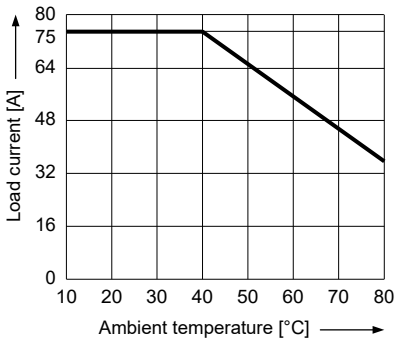
RSR72-...30



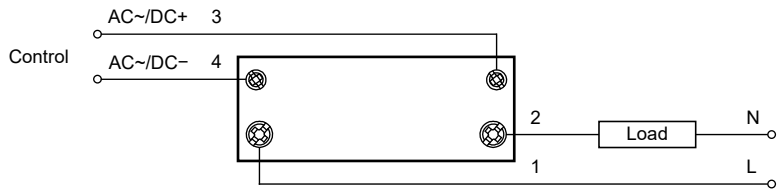
RSR72-...40



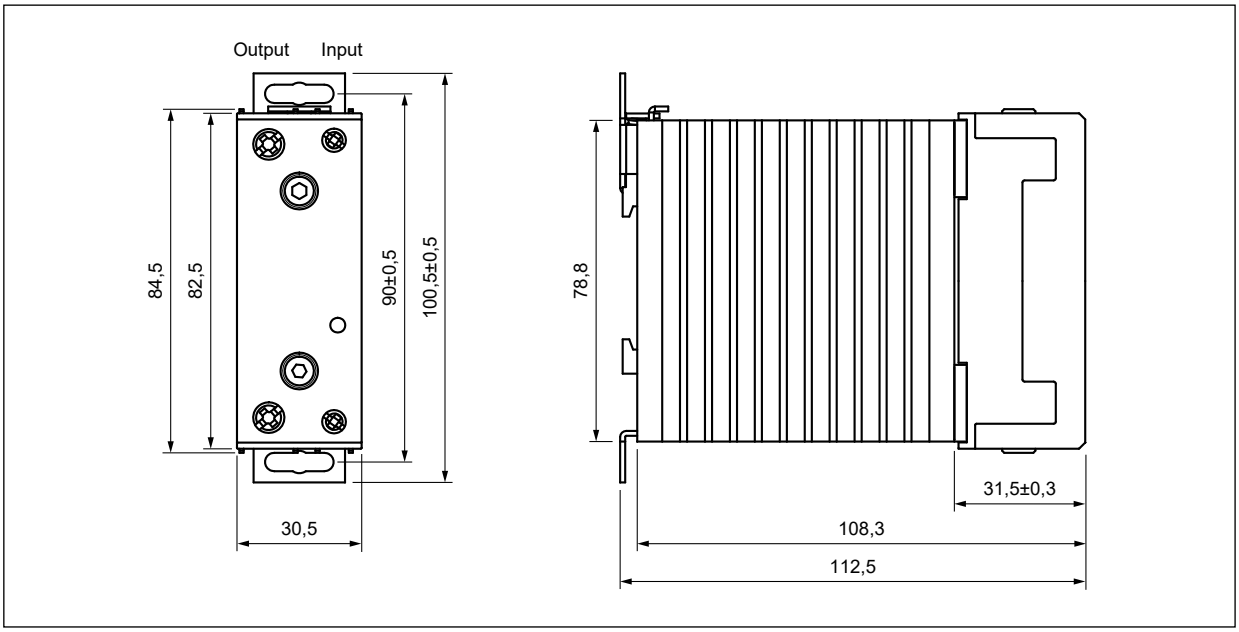
RSR72-...75



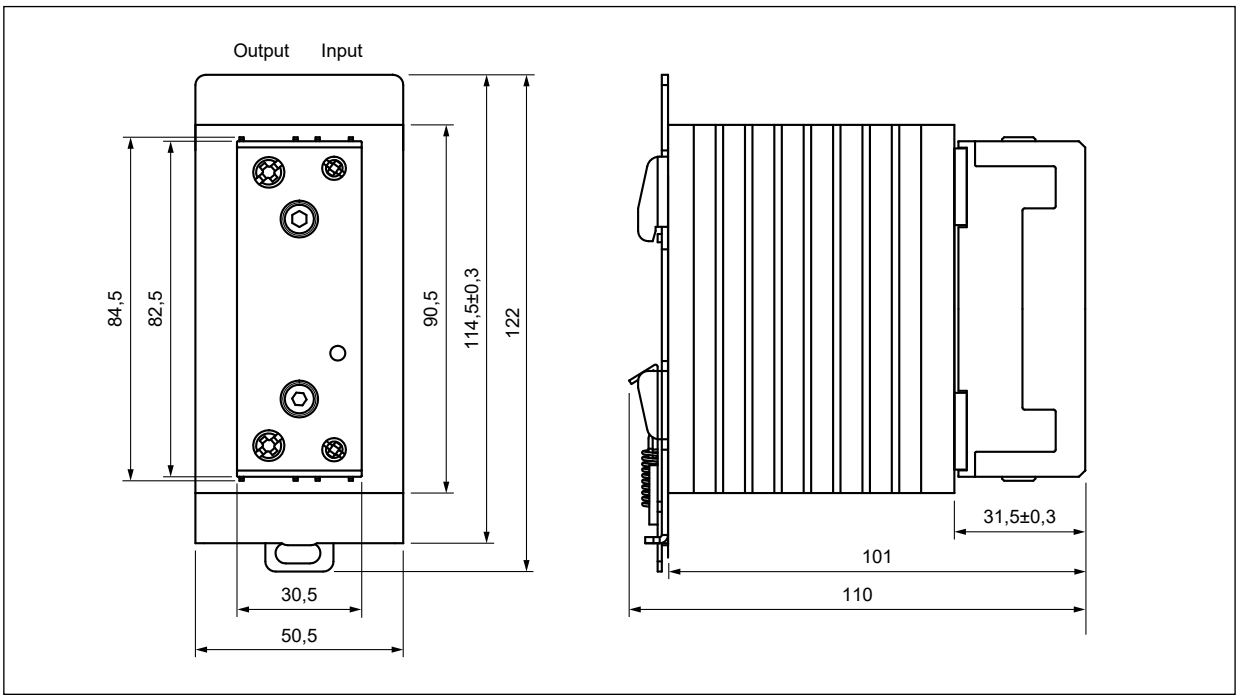
Connection diagram



Dimensions



Solid state relay **RSR72-...10/20/30-.H**



Solid state relay **RSR72-...40-.H**

SOLID STATE

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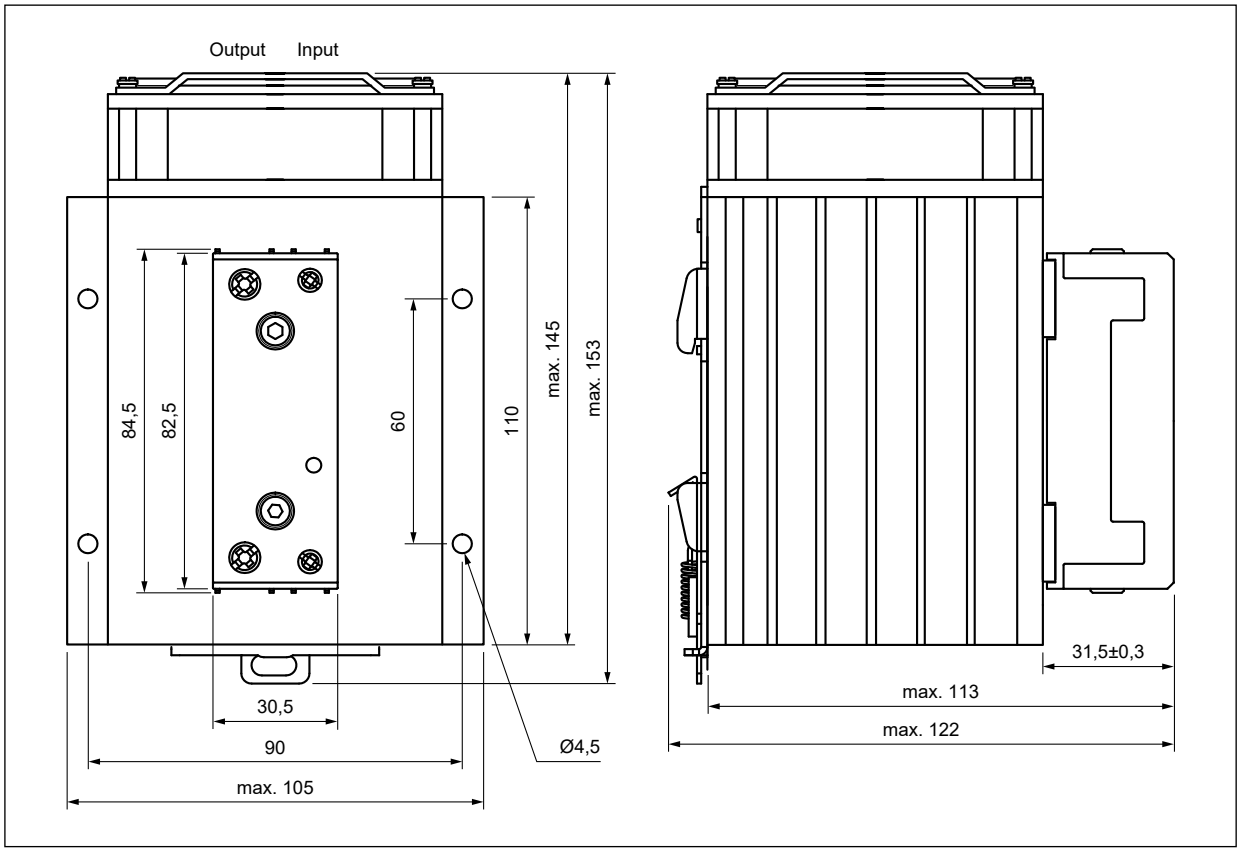
Dimensions



Solid state relay **RSR72-...75-.H**

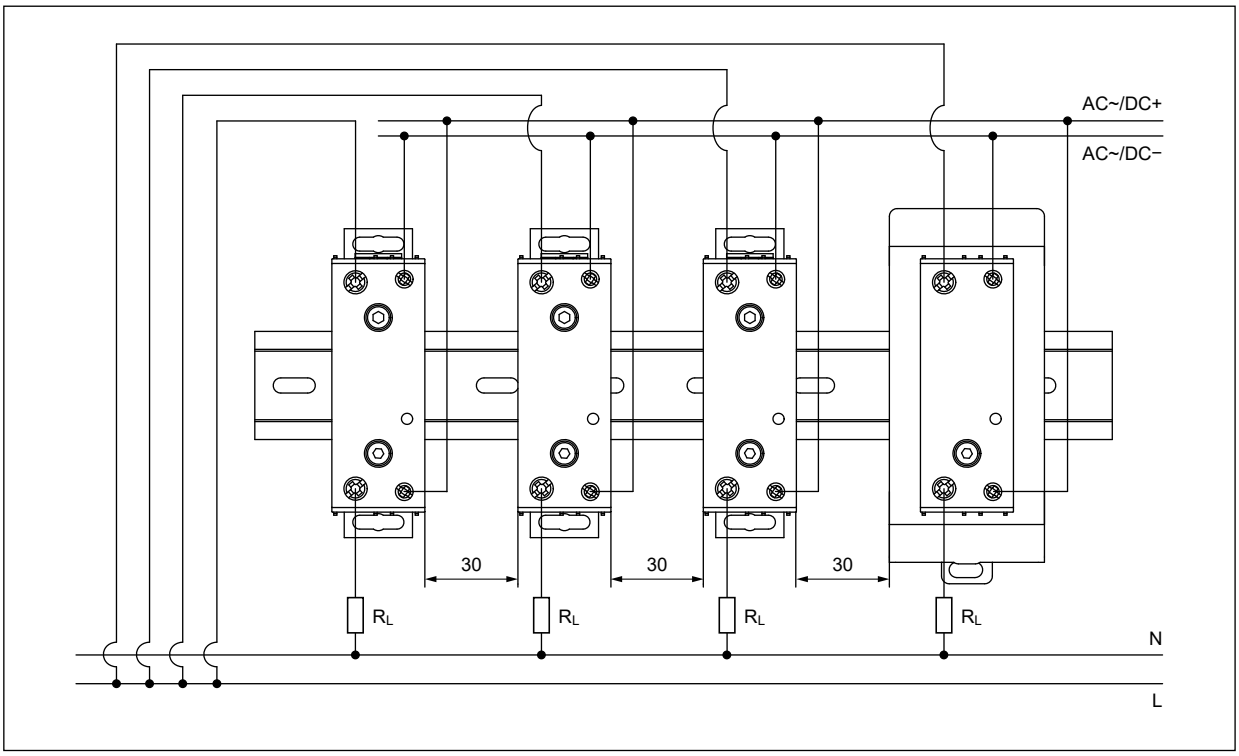
RSR72

Solid state relays with integrated heatsinks

NEW

Mounting, accessories for relays

Relays **RSR72** integrated with heatsinks are designed for direct mounting on 35 mm rail mount acc. to EN 60715. For relays mounted side by side, the recommended minimum distance is 30 mm.



Mounting on heatsink ❷			
Screws		M4	
Tightening moment		0,98...1,37 N•m	
Screw length		12 mm	
Switching terminals ❸		Input	Output
Screws		M3	M4
Tightening moment		0,6 N•m	1 N•m
Stripping length		7 mm	10 mm
Aperture for termination lug		6,5 mm	11,5 mm
Cross section of the cables		Input	Output
Single core cable	–	1 x 0,5...2,5 mm² (1 x 18...12 AWG) 2 x 0,5...1 mm² (2 x 18...17 AWG)	2 x 1,5...6 mm² (2 x 16...10 AWG)
Multi-core cable (with ferrule)	–	1 x 0,5...2,5 mm² (1 x 18...12 AWG) 2 x 0,5...1 mm² (2 x 18...17 AWG)	1 x 1,5...10 mm² (1 x 16...8 AWG) 2 x 1,5...6 mm² (2 x 16...10 AWG)

❷ Relay is mounted to heatsink, based on "Thermal derating curves".
❸ When connection cables to relay: please ensure, screws are torqued down properly.

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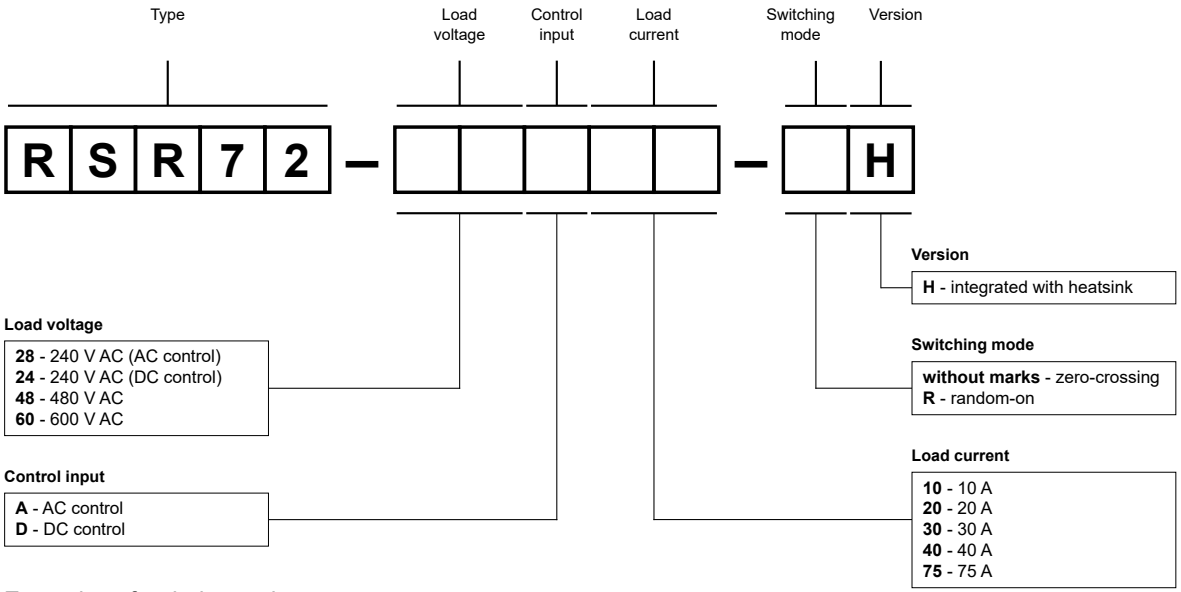
Table of codes

Table 1

Solid state relay code			Heatsink width
zero-crossing switching, AC control	**zero-crossing switching, DC control**	**random-on switching, DC control**	
RSR72-28A10-H	RSR72-24D10-H	–	30,5 mm
RSR72-28A20-H	RSR72-24D20-H	–	30,5 mm
RSR72-28A30-H	RSR72-24D30-H	–	30,5 mm
RSR72-28A40-H	RSR72-24D40-H	–	50,5 mm
RSR72-28A75-H	RSR72-24D75-H	–	105 mm
RSR72-48A10-H	RSR72-48D10-H	RSR72-48D10-RH	30,5 mm
RSR72-48A20-H	RSR72-48D20-H	RSR72-48D20-RH	30,5 mm
RSR72-48A30-H	RSR72-48D30-H	RSR72-48D30-RH	30,5 mm
RSR72-48A40-H	RSR72-48D40-H	RSR72-48D40-RH	50,5 mm
RSR72-48A75-H	RSR72-48D75-H	–	105 mm
–	RSR72-60D20-H	RSR72-60D20-RH	30,5 mm
–	RSR72-60D30-H	RSR72-60D30-RH	30,5 mm
–	RSR72-60D40-H	RSR72-60D40-RH	50,5 mm
–	RSR72-60D75-H	RSR72-60D75-RH	105 mm

Ordering codes



Examples of ordering codes ❺:

RSR72-28A10-H relay **RSR72**, integrated with heatsink, zero-crossing switching, AC control, load voltage 240 V AC (single-phase), load current 10 A

RSR72-24D30-H relay **RSR72**, integrated with heatsink, zero-crossing switching, DC control, load voltage 240 V AC (single-phase), load current 30 A

RSR72-48A40-H relay **RSR72**, integrated with heatsink, zero-crossing switching, AC control, load voltage 480 V AC (single-phase), load current 40 A

RSR72-60D75-RH relay **RSR72**, integrated with heatsink, random-on switching, DC control, load voltage 600 V AC (single-phase), load current 75 A

❺ Ordering codes **RSR72** are specified in Table 1.

RDR-10

	RH21	RH19A	RH19B
			
Applications	for RSR52	for RSR52	for RSR52
Material	aluminum	aluminum	aluminum
Color	black	black	black
Dimensions (L x W x H)	80 x 50 x 50 mm	70 x 50 x 69 mm	81 x 50 x 83 mm
Weight (typical)	115 g	275 g	335 g
Thermal resistance	2,1 °C/W	1,9 °C/W	1,9 °C/W
Additional equipment	–	RDR-10 ❶	–
Mounting	on panel, on 35 mm rail mount	on 35 mm rail mount (with clip RDR-10)	on 35 mm rail mount

RDR-30

	RH17A	RH17B	RH06B
			
Applications	for RSR52	for RSR52	for RSR52
Material	aluminum	aluminum	aluminum
Color	grey	black	black
Dimensions (L x W x H)	90 x 50 x 69 mm	100 x 49 x 81 mm	123 x 76 x 67 mm
Weight (typical)	350 g	255 g	300 g
Thermal resistance	1,7 °C/W	1,7 °C/W	1,5 °C/W
Additional equipment	RDR-30 ❷	–	–
Mounting	on 35 mm rail mount (with clip RDR-30)	on panel	on panel

	RH16	RH16-F	RH11
			
Applications	for RSR52	for RSR52	for RSR52, RSR62
Material	aluminum	aluminum	aluminum
Color	black	black	black
Dimensions (L x W x H)	106 x 50 x 96 mm	106 x 80 x 96 mm	142 x 150 x 55 mm
Weight (typical)	375 g	645 g	539 g
Thermal resistance	1,6 °C/W	0,6 °C/W	1,1 °C/W
Additional equipment	–	built-in fan	–
Mounting	on panel, on 35 mm rail mount	on panel, on 35 mm rail mount	on panel

❶ Clip RDR-10 for heatsink RH19A: for mounting on 35 mm rail mount (including 6 holes on M4 screws).
❷ Clip RDR-30 for heatsink RH17A: for mounting on 35 mm rail mount (including 6 holes on M3 screws).

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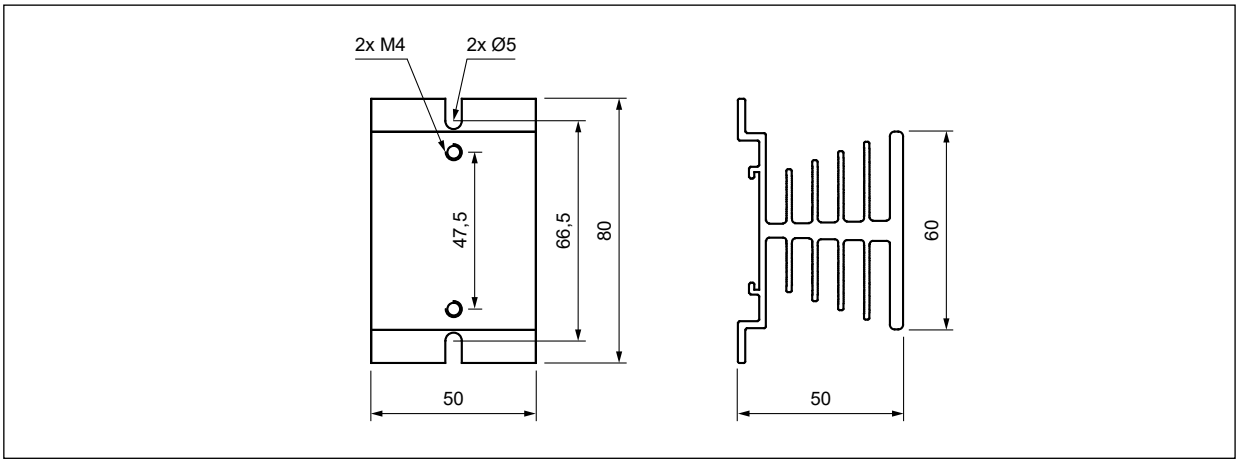
RH
heatsinks for relays RSR52, RSR62

	RH09	RH04A-F
		
Applications	for RSR52, RSR62	for RSR52, RSR62
Material	aluminum	aluminum
Color	black	black
Dimensions (L x W x H)	100 x 110 x 81 mm	100 x 140 x 81 mm
Weight (typical)	560 g	830 g
Thermal resistance	0,9 °C/W	0,4 °C/W
Additional equipment	–	built-in fan
Mounting	on panel	on panel

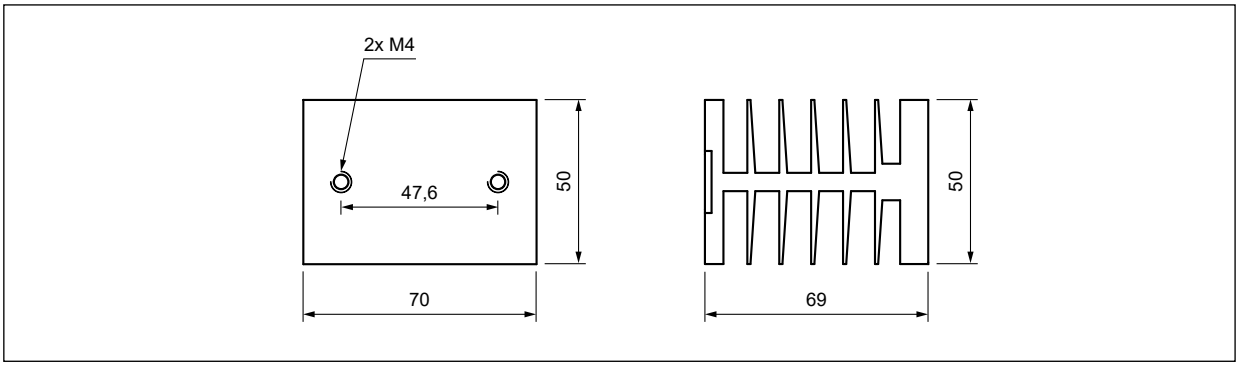
	RH08	RH08-F
		
Applications	for RSR52, RSR62	for RSR52, RSR62
Material	aluminum	aluminum
Color	black	black
Dimensions (L x W x H)	106 x 110 x 96 mm	106 x 140 x 96 mm
Weight (typical)	825 g	1 095 g
Thermal resistance	0,8 °C/W	0,35 °C/W
Additional equipment	–	built-in fan
Mounting	on panel, on 35 mm rail mount	on panel, on 35 mm rail mount

	RH04B	RH04B-F
		
Applications	for RSR52, RSR62	for RSR52, RSR62
Material	aluminum	aluminum
Color	black	black
Dimensions (L x W x H)	125 x 150 x 135 mm	125 x 193 x 135 mm
Weight (typical)	2 320 g	2 590 g
Thermal resistance	0,4 °C/W	0,15 °C/W
Additional equipment	–	built-in fan
Mounting	on panel	on panel

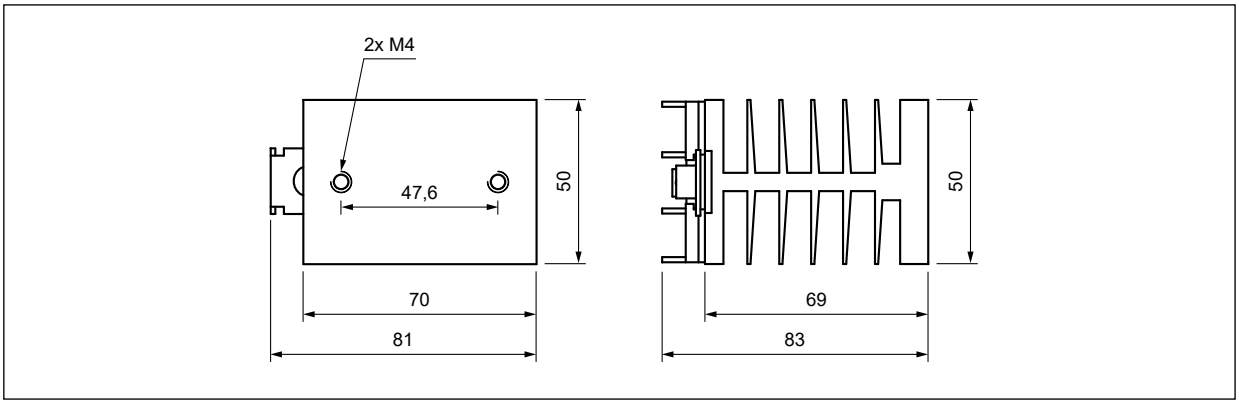
Dimensions



Heatsink **RH21**



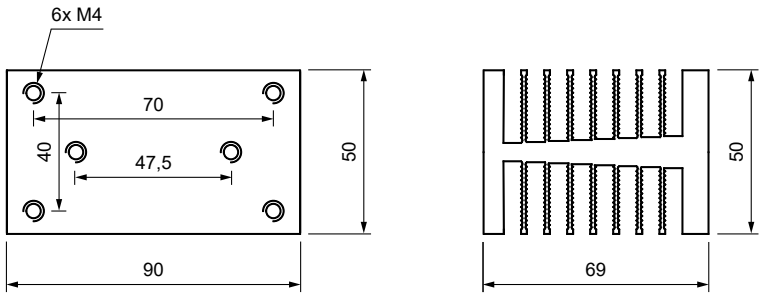
Heatsink **RH19A**



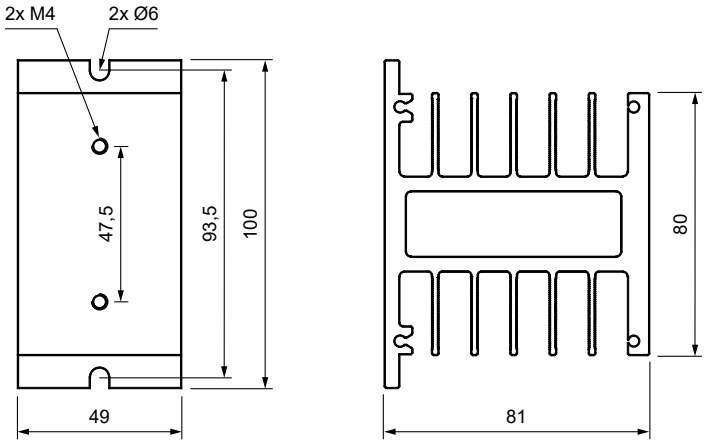
Heatsink **RH19B**

RH
heatsinks for relays RSR52, RSR62

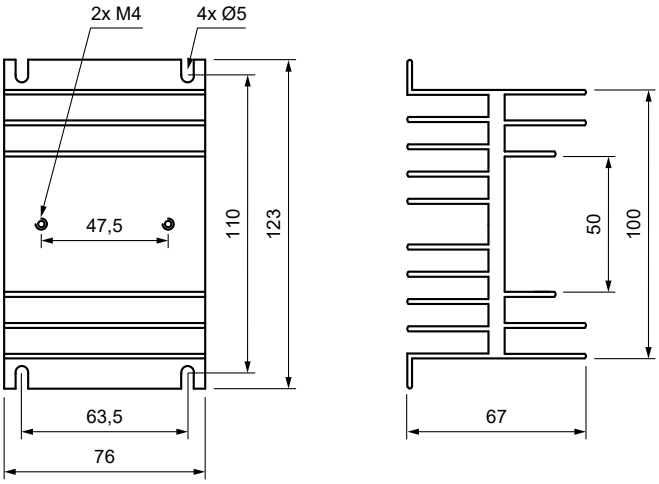
Dimensions



Heatsink **RH17A**

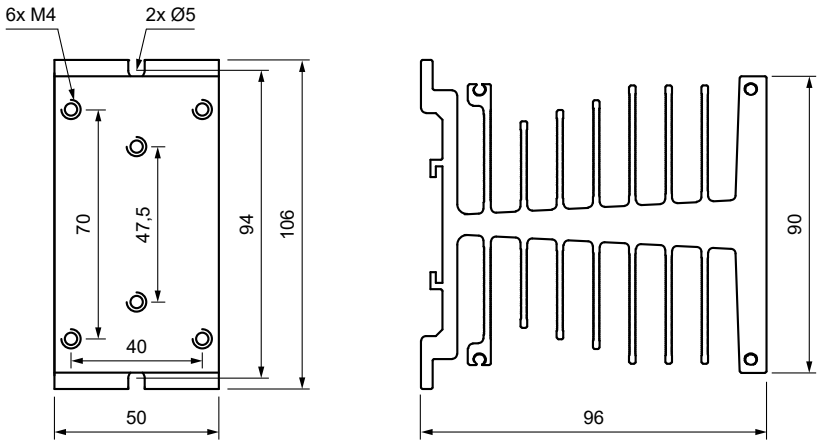


Heatsink **RH17B**

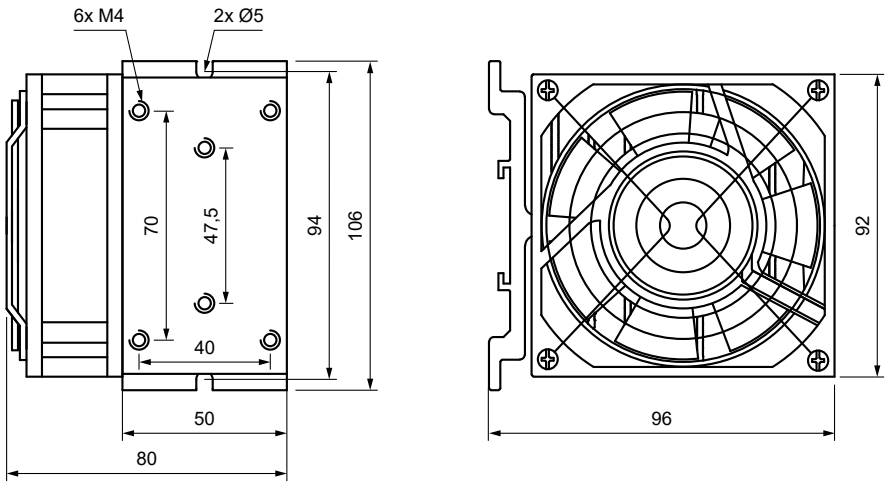


Heatsink **RH06B**

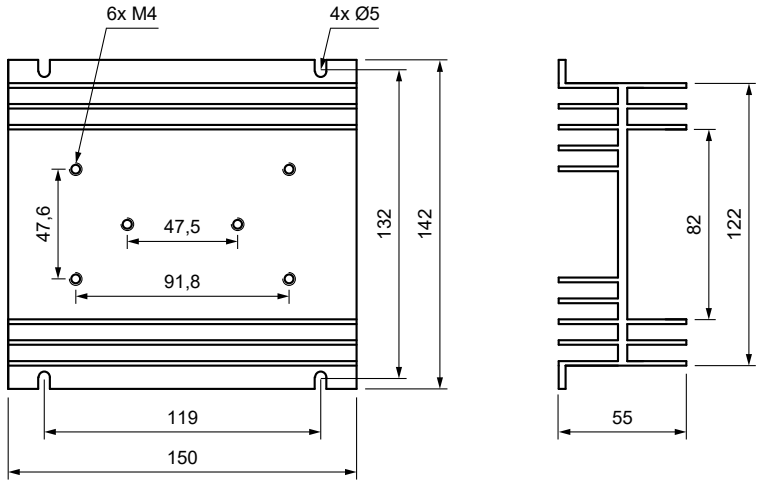
Dimensions



Heatsink **RH16**



Heatsink **RH16-F**



Heatsink **RH11**

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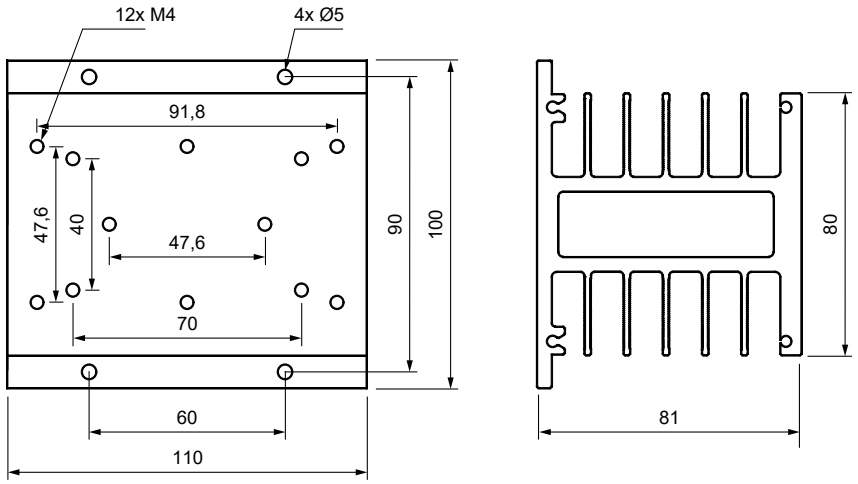
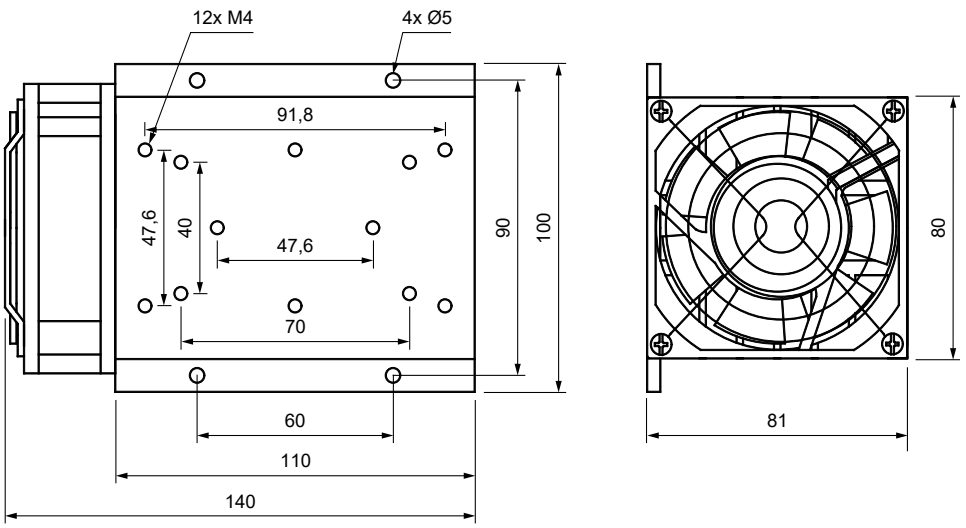
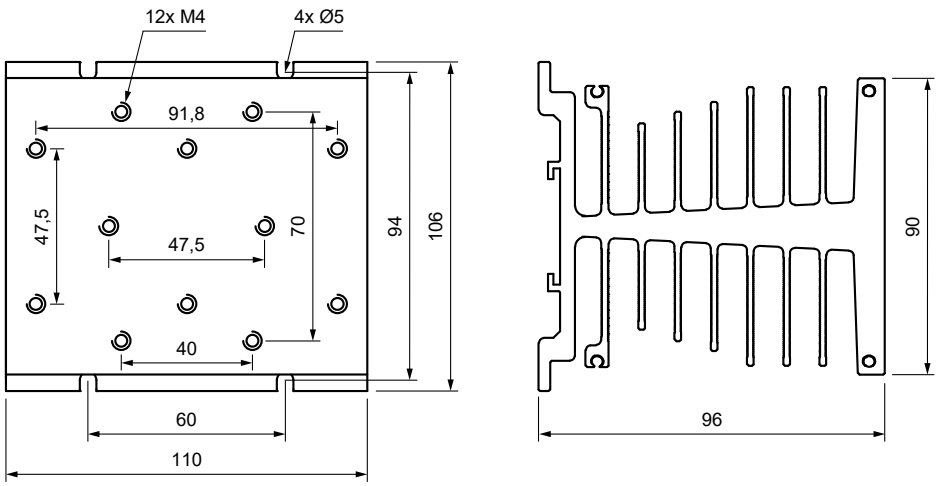
Dimensions



Heatsink **RH09**

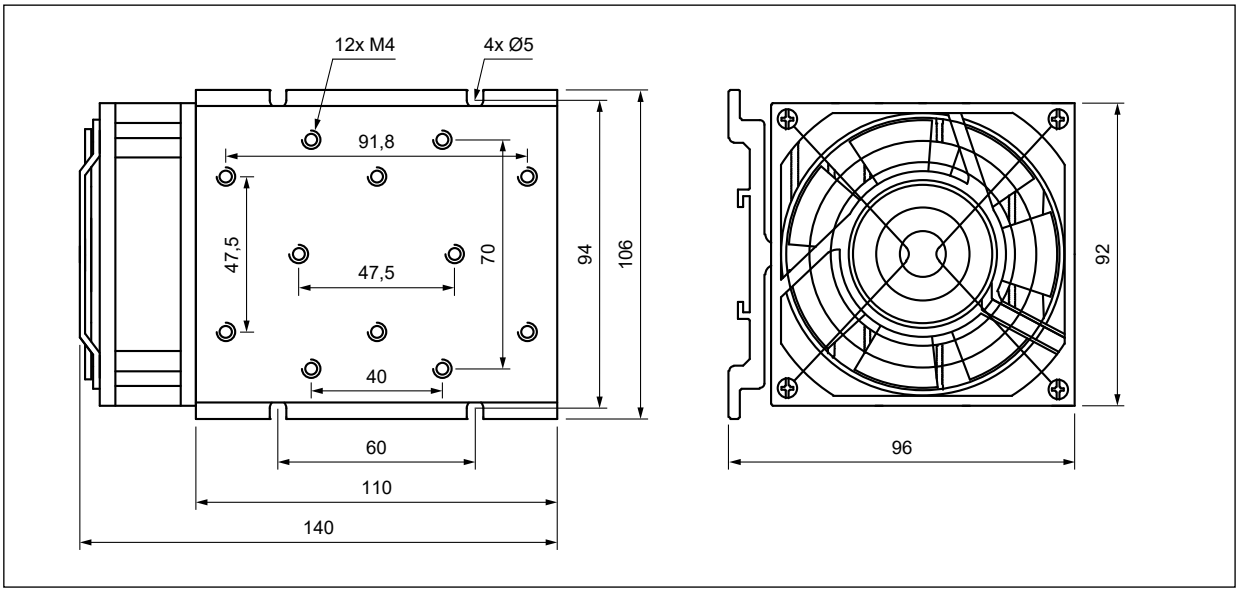


Heatsink **RH04A-F**

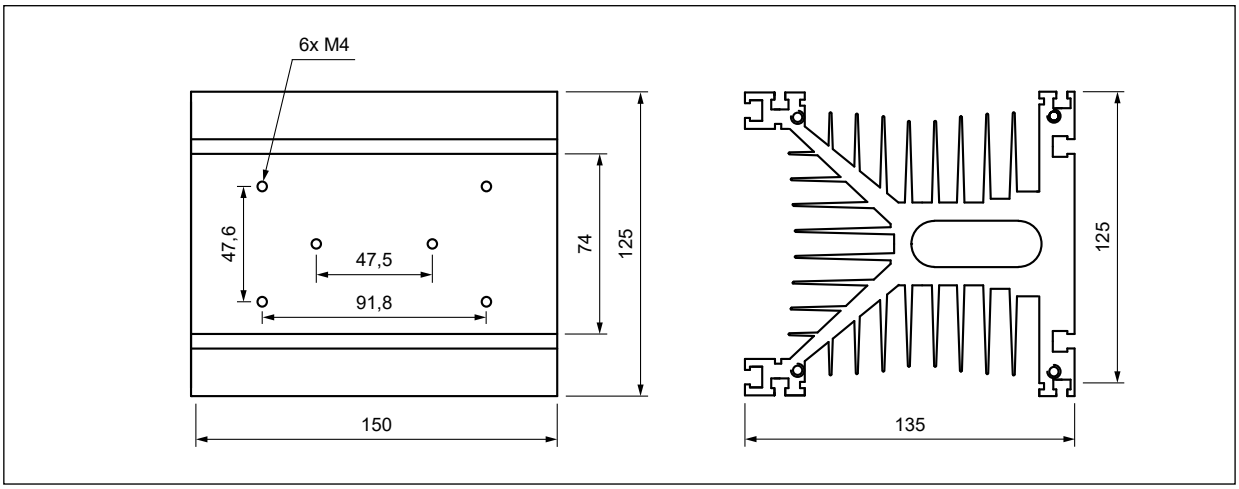


Heatsink **RH08**

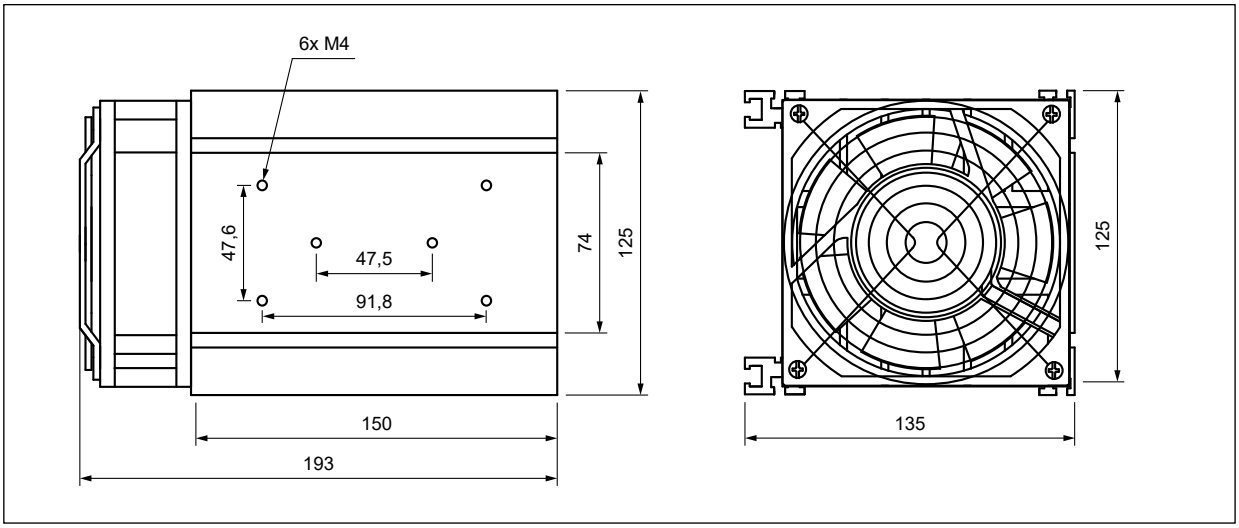
Dimensions



Heatsink **RH08-F**



Heatsink **RH04B**

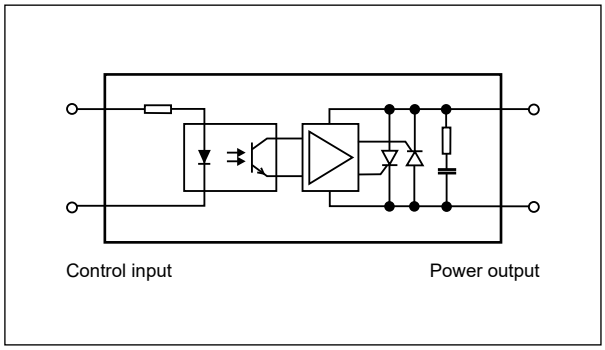


Heatsink **RH04B-F**

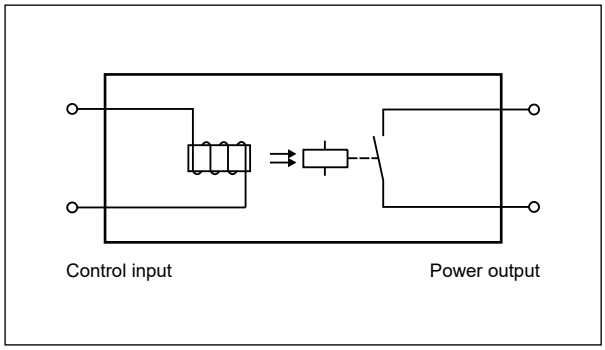
Solid state relays (SSR) and electromagnetic relays (EMR)

At the end of the 1980s, the first solid-state relays appeared on sale. Already at that time the question was asked: will solid state relays (**SSRs**) replace electromechanical relays (**EMRs**)? However, after all these years, both groups are developing side by side and even complement each other.

Solid State Relay - is a static semiconductor relay, which does not have mechanical elements. Connecting element in this case is a semiconductor structure and input circuit (control circuit) is isolated from the output circuit.



Connection diagram of SSR



Connection diagram of EMR

Characteristics of solid state relays (SSR) and electromagnetic relays (EMR)

Systems controlled by solid state or electromagnetic relays have their advantages and disadvantages. Solutions with the use of solid state relays allow to increase the frequency of switching operations and give the possibility to choose the switching method.

Both groups of relays should be treated as separate types of devices.
In order to better understand and use both types of relays, it is good to know the advantages and limitations that result from the design of these relays.

Pros of SSR

- high durability,
- no electrical arc at the contacts,
- no electromechanical interference,
- high resistance to shocks and vibrations,
- high resistance to aggressive environment, dust and chemicals,
- fast switching speeds,
- silent operation,
- low power of the control signal required.

Cons of SSR

- voltage drop across the SSR output terminals,
- necessity to use a heat sink,
- leakage current,
- limited resistance to overvoltages (limitation of current increase -dI/dt, limitation of voltage increase dV/dt),
- can not be used for low signals,
- influence of the electromagnetic environment on their operation.

Pros of EMR

- the same ability to switch AC and DC loads,
- negligible voltage drop across contacts,
- high resistance to overvoltages,
- no leakage current.

Cons of EMR

- contacts wear (shorter service life),
- bounces when connecting and contacts sparking,
- electromagnetic interference,
- long response time,
- insufficient quality when switching on surge currents.

Advantages of solid state relays

Durability
Lack of moving parts ensures high reliability and increases the number of operations repeatedly. The correct usage of the solid state relay increases the number of performed switching operations several times.

No arc on contacts
In case of solid state relays there is no concept of arc because switching occurs inside the semiconductor material. Burnout and contact wear does not occur, which reduces radio frequency emissions and does not cause contact vibration.

No electromechanical interference
Electronic control eliminates interference in the control signal.

High resistance to shocks and vibrations
SSRs do not have moving parts, they are electronic devices. As a consequence, they are very resistant to high vibrations, which applies to both amplitude and frequency.

High resistance to aggressive environment, dust and chemicals
Compared to electromechanical relays, they are minimally exposed to aggressive environments or dust that can damage the contacts.

Fast switching speeds
SSRs can switch up to several dozen times per second, which is not possible when using electromagnetic relays.

Silent operation
There are no moving parts, so the solid state relay does not make noises like electromagnetic relays or contactors when switching the circuit on and off.

Low power of control signal
The solid state relay has no coil. Comparing to EMR, the larger the electromagnetic relay, then the coil is larger, and thus the coil has need for higher current.

SSR or EMR - which relay should I choose?

What should you do to choose the right relay? Should you choose a solid state relay or electromagnetic relay? Differences between electromagnetic and solid state relays described earlier will help us partly to answer those questions.

How many times does the relay have to operate?
Solid state relays are characterized by long, failure-free operation. For example: if an electromagnetic relay has a lifetime of 100,000 connections, then its semiconductor equivalent will operate 1,000,000 connections. A solid state relay should be used in applications requiring long lifetime.

Where do we use the relay?
Referring to the first point, to ensure a reliable and long lifetime of semiconductor device, it should be remembered that solid state relay is much more exposed to overvoltage, electrostatic and switching discharges. On the other hand, the construction of an electromagnetic relay ensures that they are insensitive to those events.

Do you need quiet operation?
The advantage of using a solid state relay is its noiseless operation.

How fast should the relay react?
The solid state relay is ideal for applications requiring fast response times. Electromagnetic relays due to their construction (moving parts), have response times between 7 and 20 ms, while solid state relays are much faster and additionally handle better at high switching frequencies.

How much space do we have available?
When using a solid state relay, we must remember about proper heat dissipation. A heat sink should almost always be used, so more space is needed for the relay and heat sink.

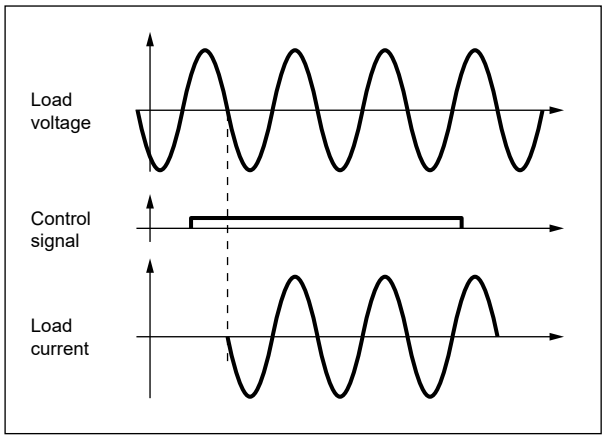
Operation sequence

Due to the way of switching, solid state relays can be divided into two basic groups:
• relays switching at zero-crossing,
• random-on relays.

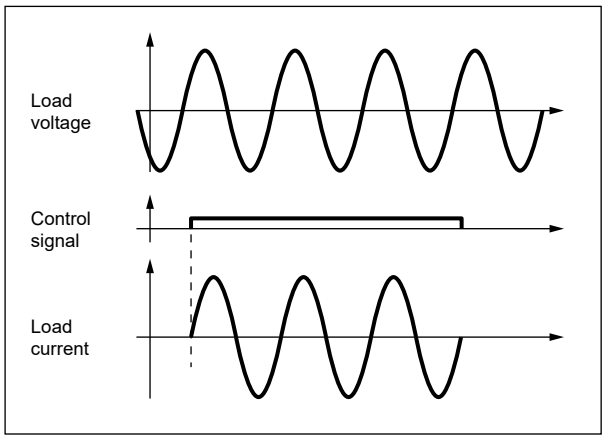
Zero-crossing relays
The relay is switched on when the voltage goes through zero, and it switches off when the current reaches zero. This method of switching allows limiting surge currents generated during switching operations. The relays are recommended for applications controlling resistive, capacitive or slightly inductive loads.

Random-on (instant-on) relays
The relay is activated immediately after the control signal appears (control voltage is applied).
In this case, we have a faster turn on time than when using zero-crossing switching. This type of switching is used for inductive loads in applications where a fast response time is required.

Solid state relays are a good solution as an intermediate element between the control circuit and circuit directly connected to load. Zero-crossing relays and random-on relays are subject to division due to AC or DC control voltage. Relays with AC output are most commonly used.



Zero-crossing switching



Random-on switching

Control signal

Typical control signal voltages for single- and three-phase relays:
• AC control signal: **90...280 V AC**,
• DC control signal: **4...32 V DC**.

Load current

Rated load current of relay for resistive load:
• single-phase: **I=P/220** or **I=P/380**,
• three-phase: **I=P/√3/380**.

Considering the ambient temperature, heat emission and other conditions, include **40...80%** safety margin for load current.

Additional relay protection

For proper protection of the solid state relay, it is recommended to connect in series to the load circuit:
• thermal relay – overcurrent protection,
• ultra-fast fuse with a value less than the I^2t value of the relay – protection against short circuit or overload.

Leakage current

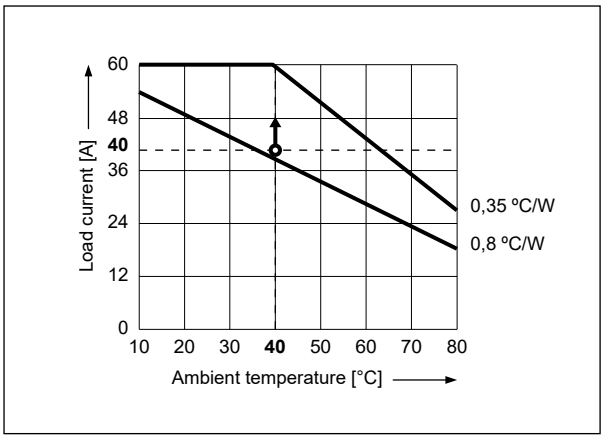
During the SSR is turned-off, we can observe an extremely small current when apply a voltage to SSR output, due to the power component has an impedance. Besides this, the leakage current is caused also by the snubber network which is a resistor and capacitor in series placed in parallel across the output of the SSR. This snubber protects the relay from static and commutating dV/dt.

Selection of heat sink

When a SSR is on, the relay will generate heat. The amount of heat generated is a function of the load current. **The maximum chip temperature for a SCR is 125 °C**, if the SCR exceeds this temperature the relay is damaged. Therefore, the use of heat sinks is required. The heat sink takes the heat generated by the SSR and dissipate it keeping the SSR cooler.

To select the proper sized heat sink:
- determine the load current and the maximum ambient temperature the relay will be exposed to,
- use the ”Thermal derating curves” included in the data sheet of selected SSR.

Example: for a single-phase RSR52 60 A, at 40 A load current and ambient temperature at 40 °C:
- on the Y axis we find the current value for which we draw a line perpendicular to Y,
- on the X axis we find the ambient temperature for which we draw a line perpendicular to X,
- we determine the intersection of both lines,



Thermal derating curve

- read the heat sink rating – **always choose the rating above your point**: we need a 0,35 °C/W sized heat sink, since the 0,8 °C/W heat sink will not ensure sufficient cooling of the solid state relay.

Selection of varistor (MOV)

SSR is used for various applications, overvoltage may occur during its operation. Usage of MOV to suppress the transient voltage on power components and reduce the possibility to damage SSR.

To choose an appropriate MOV, determine:
- circuit conditions such as peak voltage and current during the event,
- number of surges the MOV must survive,
- acceptable let-through voltage for the application.

Example: SSR can work without MOV if transient overvoltage endurance is:
- 800 V – SSR can operate a 220 V AC load, or lower,
- 1 200V – SSR can operate a 380 V AC load, or lower.

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Installation contactors

relpol® S.A.

Installation contactors are built in consumer devices operating in the electrical installations in: dwellings, business premises, hotels, hospitals, shopping centres, sport centres, production halls, warehouses, public places.

They are designed for for remote switching and automatic control of electric devices and equipment: 1-phase and 3-phase motors, different pumps, air-conditioning, electric heating, lighting.

Available in industrial covers (RIK21) and in modular covers (RIK20/25/40/63).

They meet the requirements of REACH and RoHS Directive.
The contactors are recognized and certified by:

CE EAC

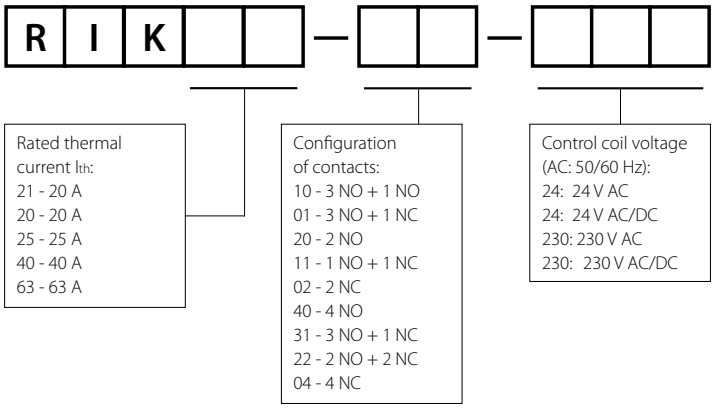
industrial covers

modular covers

← Contents

Selection table

Type of installation contactor	Ordering code of installation contactor	Configuration of contacts	Control coil voltage	Additional auxiliary contacts
RIK21	RIK21-10-24	3 NO + auxiliary contact 1 NO	24 V AC	–
	RIK21-01-24	3 NO + auxiliary contact 1 NC	24 V AC	
	RIK21-10-230	3 NO + auxiliary contact 1 NO	230 V AC	
	RIK21-01-230	3 NO + auxiliary contact 1 NC	230 V AC	
RIK20	RIK20-20-24	2 NO	24 V AC/DC	–
	RIK20-11-24	1 NO + 1 NC	24 V AC/DC	
	RIK20-02-24	2 NC	24 V AC/DC	
	RIK20-20-230	2 NO	230 V AC/DC	
	RIK20-11-230	1 NO + 1 NC	230 V AC/DC	
	RIK20-02-230	2 NC	230 V AC/DC	
RIK25	RIK25-40-24	4 NO	24 V AC/DC	RIKN-20 (2 NO) RIKN-11 (1 NO + 1 NC)
	RIK25-31-24	3 NO + 1 NC	24 V AC/DC	
	RIK25-22-24	2 NO + 2 NC	24 V AC/DC	
	RIK25-40-230	4 NO	230 V AC/DC	
	RIK25-31-230	3 NO + 1 NC	230 V AC/DC	
	RIK25-22-230	2 NO + 2 NC	230 V AC/DC	
RIK40	RIK40-40-24	4 NO	24 V AC/DC	RIKN-20 (2 NO) RIKN-11 (1 NO + 1 NC)
	RIK40-31-24	3 NO + 1 NC	24 V AC/DC	
	RIK40-22-24	2 NO + 2 NC	24 V AC/DC	
	RIK40-04-24	4 NC	24 V AC/DC	
	RIK40-40-230	4 NO	230 V AC/DC	
	RIK40-31-230	3 NO + 1 NC	230 V AC/DC	
	RIK40-22-230	2 NO + 2 NC	230 V AC/DC	
	RIK40-04-230	4 NC	230 V AC/DC	
RIK63	RIK63-40-24	4 NO	24 V AC/DC	RIKN-20 (2 NO) RIKN-11 (1 NO + 1 NC)
	RIK63-31-24	3 NO + 1 NC	24 V AC/DC	
	RIK63-22-24	2 NO + 2 NC	24 V AC/DC	
	RIK63-04-24	4 NC	24 V AC/DC	
	RIK63-40-230	4 NO	230 V AC/DC	
	RIK63-31-230	3 NO + 1 NC	230 V AC/DC	
	RIK63-22-230	2 NO + 2 NC	230 V AC/DC	
	RIK63-04-230	4 NC	230 V AC/DC	



RIK21

❶ RIK20, RIK25, RIK40, RIK63: contactors with a varistor for overvoltage protection and a rectifier enable DC and AC voltage control
❷ RIKN available in versions: RIKN-20 (2 NO) and RIKN-11 (1 NO + 1 NC)
❸ RIKN can not be mounted on contactors RIK20
❹ RIKN increase by 9 mm the width of contactors RIK25, RIK40, RIK63
❺ Recommended ventilation distance between group of contactors mounted side-by-side is 0,5 module width (9 mm)
❻ The data for 1-phase power are valid for contactors RIK..-22 (2 NO + 2 NC)

three-pole

Features

- Control coil voltages of contactors:
  - **RIK21**:
    AC: 24 V, 230 V AC: 50/60 Hz,
  - **RIK20** ❶, **RIK25** ❶, **RIK40** ❶, **RIK63** ❶:
    AC/DC: 24 V, 230 V AC: 50/60 Hz,
- Setting up contacts of contactors:
  - **RIK20**, **RIK25**, **RIK40**, **RIK63**:
    can be used as main or auxiliary contacts,
  - **RIK25**, **RIK40**, **RIK63**:
    additional auxiliary contacts **RIKN** ❷,
    mounted on the side of the contactor.

- Silent operation.
- Protection against direct contact IP 20.
- Compliance with standards:
  IEC/EN 61095, IEC/EN 60947-4-1,
  IEC/EN 60947-5-1, VDE 0660, VDE 0637.
- Recognitions, certifications, directives:
  RoHS, CE

General data

Mechanical life (cycles)		3 x 10^6
Module width		2
Dimensions (L x W x H)		59,5 x 35 x 57 mm
Weight		170 g
Ambient temperature	storage operating	-30…+80 °C -5…+55 °C
Cover protection category (PN-EN 60529)		IP 20
Number of contactors mounted side-by-side ❺	≤ +40 °C +40...+55 °C	no limitation
Max. operating frequency	DC1 AC1 / AC3 / AC5b / AC6b AC15 no load	300 cycles/hour 600 cycles/hour 1 200 cycles/hour 3 000 cycles/hour
Contact reliability		17 V (≥ 50 mA)
Min. distance of open contacts		3,6 mm
Power dissipation per pole		2 W
Overvoltage protection		–
Overload current withstand capability		40 A
Max. back-up fuse for short-circuit protection gL (coordination type 2) **I_v**		20 A

Output circuit – main contacts data

Insulation rated voltage **U_i**		415 V
Rated surge voltage **U_{imp}**		4 000 V
Rated thermal current **I_{th}**		20 A
Rated operational voltage **U_e**		400 V
Rated frequency **f**		50/60 Hz
AC1 / AC7a		
Rated operational current **I_e**		20 A
Operational power **P_e**		
• 1-phase motor	230 V	4 kW
• 3-phase motor	230 V	7,5 kW
	400 V	13 kW
Electrical life (cycles)		2 x 10^5
AC3 / AC7b		
Rated operational current **I_e**		5 A
Operational power **P_e**		
• 1-phase motor	230 V	0,37 kW
• 3-phase motor	230 V	1,1 kW
	400 V	2,2 kW
Electrical life (cycles)		3 x 10^5

RIK20	RIK25	RIK40	RIK63	RIKN
				
double-pole	**four-pole**	**four-pole**	**four-pole**	**auxiliary contacts ❷**
3 x 10^6	3 x 10^6	3 x 10^6	3 x 10^6	3 x 10^6
1 ❸	2	3	3	0,5
85 x 17,5 x 65 mm	85 x 35 x 65 mm ❹	84 x 53,5 x 65,5 mm ❹	84 x 53,5 x 65,5 mm ❹	84 x 9 x 60 mm
130 g	240 g	350 g	350 g	35 g
-30…+80 °C -5…+55 °C	-30…+80 °C -5…+55 °C	-30…+80 °C -5…+55 °C	-30…+80 °C -5…+55 °C	-30…+80 °C -5…+55 °C
IP 20	IP 20	IP 20	IP 20	IP 20
max. 3 max. 2	max. 3 max. 2	no limitation	no limitation	❹
300 cycles/hour 600 cycles/hour 600 cycles/hour 3 000 cycles/hour	300 cycles/hour 600 cycles/hour 600 cycles/hour 3 000 cycles/hour	300 cycles/hour 600 cycles/hour 1 200 cycles/hour 3 000 cycles/hour	300 cycles/hour 600 cycles/hour 1 200 cycles/hour 3 000 cycles/hour	– – 1 200 cycles/hour 3 000 cycles/hour
17 V (≥ 50 mA)	17 V (≥ 50 mA)	17 V (≥ 50 mA)	17 V (≥ 50 mA)	12 V (≥ 5 mA)
3,6 mm	3,6 mm	3,6 mm	3,6 mm	4 mm
1,7 W	2,2 W	4 W	8 W	0,3 W
430 V	430 V	430 V	430 V	–
72 A	68 A	176 A	240 A	–
20 A	25 A	63 A	80 A	6 A
230 V	440 V	440 V	440 V	500 V
4 000 V	4 000 V	4 000 V	4 000 V	4 000 V
20 A	25 A	40 A	63 A	6 A
230 V	400 V	400 V	400 V	230 V, 400 V
50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
non-inductive or slightly inductive loads, resistance furnaces, heaters / slightly inductive loads in household appliances (mixers, blenders)				
20 A	25 A	40 A	63 A	–
4 kW	5,4 kW	8,7 kW	13,3 kW	–
–	9 kW	16 kW	24 kW	–
–	16 kW	26 kW	40 kW	–
2 x 10^5	2 x 10^5	10^5	10^5	–
squirrel-cage motors: starting, switches off motors during running time / motor-loads in household appliances (fans, central vacuum)				
9 A / 6 A (NO/NC)	8,5 A	22 A	30 A	–
1,3 kW / 0,75 kW (NO/NC)	1,3 kW ❻	3,7 kW ❻	5 kW ❻	–
–	2,2 kW	5,5 kW	8,5 kW	–
–	4 kW	11 kW	15 kW	–
3 x 10^5	5 x 10^5	1,5 x 10^5	1,5 x 10^5	–

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Mounting

Installation contactors **RIK** are designed for:
- direct mounting on 35 mm rail mount acc. to PN-EN 60715,
- operational position – see page 634 "Mounting positions",
- application site – mounted in switchboards.

		RIK21
Output circuit – main contacts data		
AC6b		
Switching of capacitors **C**	230 V	36 µF
Electrical life (cycles)		10^5
DC1 (L/R ≤ 1 ms)		
Rated operational current **Ie**		
• 1 pole	U_e = 24 V DC	20 A
	U_e = 48 V DC	12 A
	U_e = 60 V DC	6 A
	U_e = 110 V DC	2 A
	U_e = 220 V DC	0,5 A
• 2 poles	U_e = 24 V DC	20 A
connected in series	U_e = 48 V DC	15 A
	U_e = 60 V DC	10 A
	U_e = 110 V DC	4 A
	U_e = 220 V DC	1,5 A
• 3 poles	U_e = 24 V DC	20 A
connected in series	U_e = 48 V DC	20 A
	U_e = 60 V DC	20 A
	U_e = 110 V DC	6 A
	U_e = 220 V DC	2,5 A
• 4 poles	U_e = 24 V DC	20 A
connected in series	U_e = 48 V DC	20 A
	U_e = 60 V DC	20 A
	U_e = 110 V DC	6 A
	U_e = 220 V DC	3,5 A
Electrical life (cycles)		10^5
DC3 (L/R ≤ 2 ms)		
Rated operational current **Ie**		
• 1 pole	U_e = 24 V DC	10 A
	U_e = 48 V DC	5 A
	U_e = 60 V DC	2 A
	U_e = 110 V DC	1 A
	U_e = 220 V DC	0,1 A
• 2 poles	U_e = 24 V DC	20 A
connected in series	U_e = 48 V DC	10 A
	U_e = 60 V DC	8 A
	U_e = 110 V DC	4 A
	U_e = 220 V DC	0,4 A
• 3 poles	U_e = 24 V DC	20 A
connected in series	U_e = 48 V DC	20 A
	U_e = 60 V DC	15 A
	U_e = 110 V DC	6 A
	U_e = 220 V DC	2,5 A
• 4 poles	U_e = 24 V DC	20 A
connected in series	U_e = 48 V DC	20 A
	U_e = 60 V DC	15 A
	U_e = 110 V DC	6 A
	U_e = 220 V DC	3,5 A
Electrical life (cycles)		10^5

RIK20	RIK25	RIK40	RIK63	RIKN
				switching of capacitor banks
30 µF	36 µF	220 µF	330 µF	–
10^5	10^5	10^5	10^5	–
				non-inductive or slightly inductive loads, resistance furnaces, heaters
20 A	25 A	40 A	63 A	–
15 A	20 A	24 A	26 A	–
10 A	15 A	18 A	20 A	–
6 A	6 A	4 A	4 A	–
0,6 A	0,6 A	1,2 A	1,2 A	–
20 A	25 A	40 A	63 A	–
18 A	25 A	38 A	42 A	–
15 A	20 A	32 A	34 A	–
10 A	10 A	10 A	10 A	–
6 A	6 A	8 A	8 A	–
–	25 A	40 A	63 A	–
–	25 A	40 A	63 A	–
–	25 A	40 A	60 A	–
–	20 A	30 A	35 A	–
–	15 A	20 A	30 A	–
–	25 A	40 A	63 A	–
–	25 A	40 A	63 A	–
–	25 A	40 A	63 A	–
–	20 A	40 A	63 A	–
–	15 A	40 A	63 A	–
10^5	10^5	10^5	10^5	
				shunt-motors: starting, plugging, inching, dynamic breaking of motors
10 A	15 A	22 A	25 A	–
5 A	8 A	10 A	11 A	–
2 A	4 A	5 A	5 A	–
1 A	1,3 A	1,5 A	1,5 A	–
0,1 A	0,2 A	0,3 A	0,3 A	–
20 A	25 A	40 A	45 A	–
10 A	16 A	20 A	22 A	–
8 A	12 A	16 A	18 A	–
4 A	5,5 A	5 A	5 A	–
0,4 A	0,6 A	1 A	1 A	–
–	25 A	40 A	63 A	–
–	25 A	40 A	45 A	–
–	25 A	32 A	35 A	–
–	15 A	15 A	18 A	–
–	3 A	4 A	5 A	–
–	25 A	40 A	63 A	–
–	25 A	40 A	63 A	–
–	25 A	40 A	63 A	–
–	20 A	40 A	63 A	–
–	8 A	10 A	10 A	–
10^5	10^5	10^5	10^5	–

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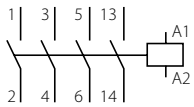
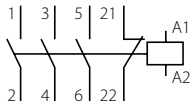
Connections diagrams ❶

three-pole

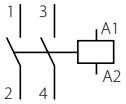


RIK21-10

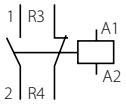


RIK21-01

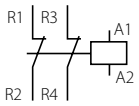
double-pole



RIK20-20

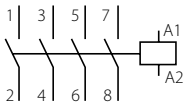


RIK20-11

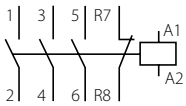


RIK20-02

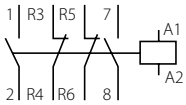
four-pole



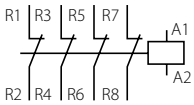
RIK25-40
RIK40-40
RIK63-40



RIK25-31
RIK40-31
RIK63-31

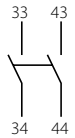


RIK25-22
RIK40-22
RIK63-22

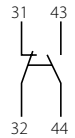


RIK40-04

auxiliary contacts



RIKN-20



RIKN-11

❶ RIK20, RIK25, RIK40, RIK63: contactors with a varistor for overvoltage protection and a rectifier enable DC and AC voltage control
❼ RIK20, RIK25: contactors can be controlled by AC voltage with frequency 40 ... 400 Hz

RIK21

Output circuit – main contacts data

DC5 (L/R ≤ 7,5 ms)		
Rated operational current **Ie**		
• 1 pole	Ue = 24 V DC	10 A
	Ue = 48 V DC	4 A
	Ue = 60 V DC	1 A
	Ue = 110 V DC	0,3 A
	Ue = 220 V DC	0,06 A
• 2 poles connected in series	Ue = 24 V DC	20 A
	Ue = 48 V DC	8 A
	Ue = 60 V DC	6 A
	Ue = 110 V DC	2 A
	Ue = 220 V DC	0,2 A
• 3 poles connected in series	Ue = 24 V DC	20 A
	Ue = 48 V DC	20 A
	Ue = 60 V DC	15 A
	Ue = 110 V DC	5 A
	Ue = 220 V DC	1,5 A
• 4 poles connected in series	Ue = 24 V DC	20 A
	Ue = 48 V DC	20 A
	Ue = 60 V DC	15 A
	Ue = 110 V DC	5 A
	Ue = 220 V DC	3 A
Electrical life (cycles)		10^5
Connections (mounting)		
Max. cross section of the cables (rigid / flexible) **S**		1...2,5 mm² / 1...2,5 mm²
Screws (type / head)		M3,5 / PZ2
Max. tightening moment for the terminal		1,2 Nm

Output circuit – auxiliary contacts data

Insulation rated voltage **Ui**		415 V
Rated surge voltage **Uimp**		4 000 V
Rated thermal current **Ith**		20 A
Rated operational voltage **Ue**		400 V
AC15		
Rated operational current (1-phase) **Ie**	230 V	6 A
	400 V	4 A
Electrical life (cycles)		3 x 10^5

Input circuit – coil data

Control voltage **Uc**		AC: 24 V, 230 V
Range of control voltage **Uc**		0,85 … 1,1 Uc
Rated frequency **f**		AC: 50/60 Hz
Surge immunity test (IEC/EN 61000-4-5)		2 000 V (1,2 / 50 µs)
Coil consumption	switch-on	30 VA / 25 W
	operation	5 VA / 1,5 W
Delays	make	7 ... 20 ms
	break	10 ... 20 ms
Max. cross section of the cables (rigid / flexible) **S**		1...2,5 mm² / 1...2,5 mm²
Screws (type / head)		M3,5 / PZ2
Max. tightening moment for the terminal		0,6 Nm

RIK20	RIK25	RIK40	RIK63	RIKN
				series-motors: starting, plugging, inching, dynamic breaking of motors
10 A	15 A	20 A	25 A	–
4 A	5 A	8 A	10 A	–
1 A	3 A	4 A	5 A	–
0,3 A	0,5 A	1 A	1 A	–
0,06 A	0,1 A	0,2 A	0,2 A	–
20 A	25 A	40 A	45 A	–
8 A	15 A	18 A	20 A	–
6 A	10 A	14 A	15 A	–
2 A	4 A	5 A	5 A	–
0,2 A	0,4 A	0,8 A	0,8 A	–
–	25 A	40 A	63 A	–
–	25 A	40 A	44 A	–
–	20 A	28 A	30 A	–
–	12 A	12 A	15 A	–
–	2 A	3 A	4 A	–
–	25 A	40 A	63 A	–
–	25 A	40 A	63 A	–
–	25 A	40 A	60 A	–
–	15 A	35 A	45 A	–
–	5 A	8 A	10 A	–
10^5	10^5	10^5	10^5	–
1...10 mm^2 / 1...6 mm^2	1...10 mm^2 / 1...6 mm^2	1,5...25 mm^2 / 1,5...16 mm^2	1,5...25 mm^2 / 1,5...16 mm^2	1...2,5 mm^2 / 1...2,5 mm^2
M3,5 / PZ1	M3,5 / PZ1	M5 / PZ2	M5 / PZ2	M3 / PZ1
1,2 Nm	1,2 Nm	3,5 Nm	3,5 Nm	0,6 Nm
230 V	440 V	440 V	440 V	500 V
4 000 V	4 000 V	4 000 V	4 000 V	4 000 V
20 A	25 A	40 A	63 A	6 A
230 V	400 V	400 V	400 V	230 V, 400 V
				control of AC electromagnetic loads
6 A	6 A	6 A	6 A	6 A
–	4 A	4 A	4 A	4 A
3 x 10^5	5 x 10^5	1,5 x 10^5	1,5 x 10^5	0,5 x 10^5
AC/DC ❶: 24 V, 230 V	AC/DC ❶: 24 V, 230 V	AC/DC ❶: 24 V, 230 V	AC/DC ❶: 24 V, 230 V	–
0,85 … 1,1 U_C	0,85 … 1,1 U_C	0,85 … 1,1 U_C	0,85 … 1,1 U_C	–
AC: 50/60 Hz ❼	AC: 50/60 Hz ❼	AC: 50/60 Hz	AC: 50/60 Hz	–
2 000 V (1,2 / 50 µs)	2 000 V (1,2 / 50 µs)	2 000 V (1,2 / 50 µs)	2 000 V (1,2 / 50 µs)	–
2,1 VA / 2,1 W	2,6 VA / 2,6 W	15,4 VA / 6 W	15,4 VA / 6 W	–
2,1 VA / 2,1 W	2,6 VA / 2,6 W	7,7 VA / 3 W	7,7 VA / 3 W	–
15 ... 45 ms	15 ... 45 ms	10 ... 20 ms	15 ... 20 ms	–
20 ... 50 ms	20 ... 70 ms	10 ... 15 ms	35 ... 45 ms	–
1...2,5 mm^2 / 1...2,5 mm^2	1...2,5 mm^2 / 1...2,5 mm^2	1...2,5 mm^2 / 1...2,5 mm^2	1...2,5 mm^2 / 1...2,5 mm^2	–
M3,5 / PZ1	M3,5 / PZ1	M3 / PZ1	M3 / PZ1	–
0,6 Nm	0,6 Nm	0,6 Nm	0,6 Nm	–

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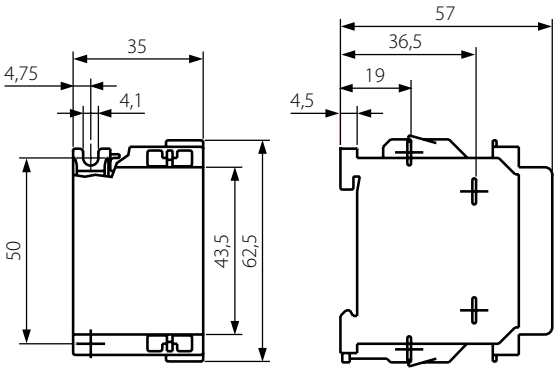
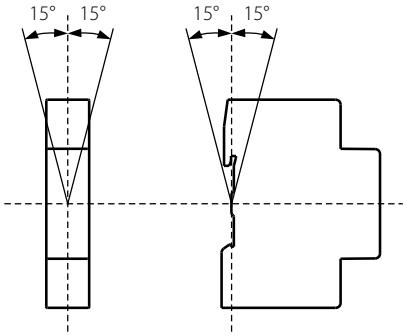
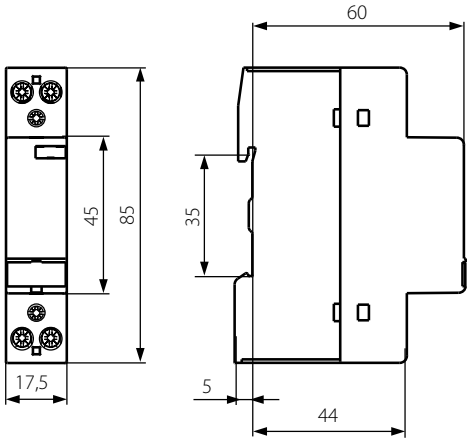
contactors RIK21



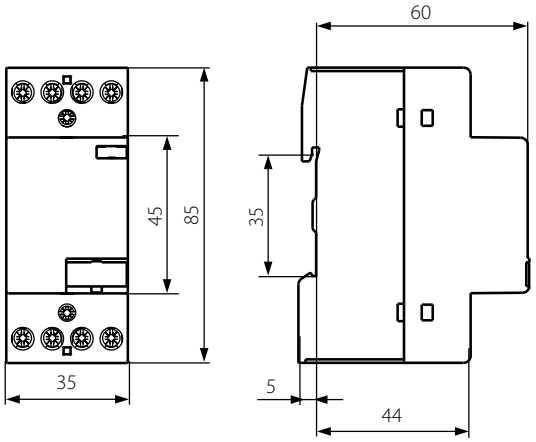
mounting positions RIK20, RIK25, RIK40, RIK63 ❽



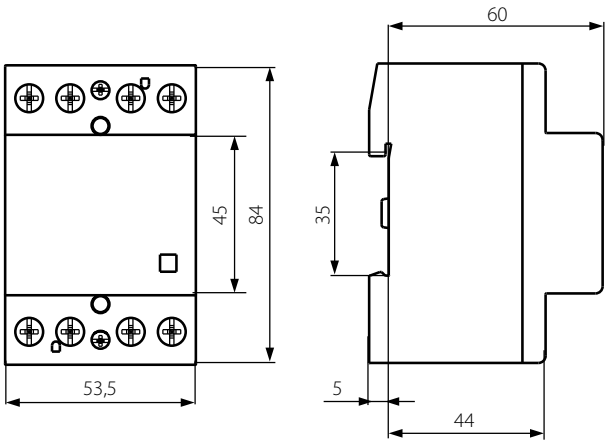
contactors RIK20



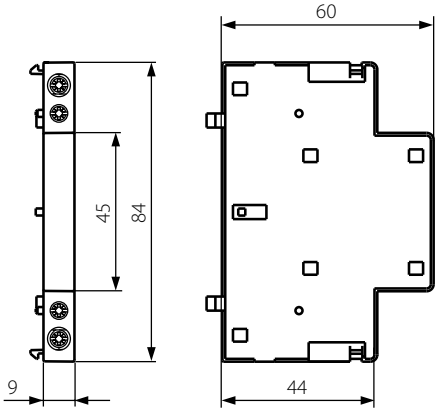
contactors RIK25



contactors RIK40, RIK63

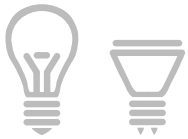


auxiliary contacts RIKN ❹



❹ RIKN increase by 9 mm the width of contactors RIK25, RIK40, RIK63
❽ RIK21: mounting position of contactor is optional

Maximum number of lamps on each pole contactor at 230 V 50 Hz

		Power [W]	Current [A]	Capacitance [µF]	RIK21	RIK20	RIK25	RIK40	RIK63
Incandescent lamps and tungsten halogen lamps									
		15	0,07	–	130	130	130	260	330
		25	0,11	–	80	80	80	160	200
		40	0,18	–	50	50	50	100	125
		60	0,26	–	33	33	33	65	85
		75	0,33	–	26	26	26	53	66
		100	0,44	–	20	20	20	40	50
		150	0,65	–	13	13	13	26	33
		200	0,87	–	10	10	10	20	25
		300	1,3	–	6	6	6	13	16
		500	2,17	–	3	3	3	8	10
		1000	4,35	–	1	1	1	4	5
Energy saving lamps									
		3	0,03	–	50	50	60	150	200
		5	0,04	–	45	45	55	135	180
		7	0,055	–	40	40	50	120	160
		8	0,065	–	35	35	45	110	150
		9	0,075	–	30	30	40	100	140
		10	0,08	–	30	30	40	100	140
		11	0,09	–	30	30	40	100	140
		12	0,1	–	25	25	35	95	120
		14	0,11	–	25	25	35	90	120
		15	0,12	–	20	20	30	85	115
		16	0,13	–	20	20	30	80	105
		18	0,145	–	18	18	26	70	95
		20	0,16	–	17	17	22	65	85
		21	0,17	–	15	15	20	60	80
		23	0,185	–	15	15	20	60	70
		24	0,195	–	15	15	20	55	70
		30	0,16	–	15	15	20	55	70
Metal halide lamps									
	uncorrected	35	0,35	–	18	18	22	43	60
		70	1	–	10	10	12	23	32
		150	1,8	–	5	5	7	12	18
		250	3	–	3	3	4	7	10
		400	3,5	–	3	3	3	6	9
		1000	9,5	–	1	1	1	2	3
		2000	16,5	–	–	–	–	1	1
	parallel correction	35	0,23	6	5	5	6	36	50
		70	0,45	12	2	2	3	18	25
		150	0,75	20	1	1	1	11	15
		250	1,26	33	–	–	–	6	9
		400	2	35	–	–	–	6	8
		1000	5	95	–	–	–	2	3
		2000	10,5	148	–	–	–	1	2
	with electronic control gear ❾	20	0,1	–	9	9	9	18	20
		35	0,2	–	6	6	6	11	13
		70	0,36	–	5	5	5	10	12
		150	0,7	–	4	4	4	8	10

❾ (PCI) + 50...125 I_n lamp for 0,6 ms

CONTACTORS

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Maximum number of lamps on each pole contactor at 230 V 50 Hz

	Power [W]	Current [A]	Capacitance [µF]	RIK21	RIK20	RIK25	RIK40	RIK63
High-pressure mercury-vapour lamps								
uncorrected	50	0,61	–	14	14	18	38	55
	80	0,8	–	10	10	13	29	42
	125	1,15	–	7	7	9	20	29
	250	2,15	–	4	4	5	10	15
	400	3,25	–	2	2	3	7	10
	700	5,4	–	1	1	2	4	6
	1000	7,5	–	1	1	1	3	4
parallel correction	50	0,28	7	4	4	5	31	47
	80	0,41	8	4	4	5	27	41
	125	0,65	10	3	3	4	22	33
	250	1,22	18	1	1	2	12	18
	400	1,95	25	1	1	1	9	13
	700	3,45	45	–	–	–	5	7
	1000	4,8	60	–	–	–	4	5
High-pressure sodium-vapour lamps								
uncorrected	150	1,8	–	5	5	6	17	22
	250	3	–	3	3	4	10	13
	400	4,7	–	2	2	2	6	8
	1000	10,3	–	–	–	1	3	3
correction	150	0,77	20	1	1	1	11	16
	250	1,26	33	–	–	1	6	10
	400	2	48	–	–	–	4	6
	1000	5,1	106	–	–	–	2	3
with electronic control gear ❾	20	0,1	–	9	9	9	18	20
	35	0,2	–	6	6	6	11	13
	70	0,36	–	5	5	5	10	12
	150	0,7	–	4	4	4	8	10
Low-pressure sodium-vapour lamps								
uncorrected	18	0,35	–	22	22	27	71	90
	35	0,6	–	7	7	9	23	30
	55	0,6	–	7	7	9	23	30
	90	0,9	–	4	4	5	14	19
	135	0,9	–	3	3	4	10	13
	180	0,9	–	3	3	4	10	13
parallel correction	18	0,35	5	6	6	7	44	66
	35	0,28	20	1	1	1	11	16
	55	0,35	20	1	1	1	11	16
	90	0,55	26	1	1	1	8	12
	135	0,8	45	–	–	–	4	7
	180	1	40	–	–	–	5	8
Transformers for low-voltage tungsten halogen lamps								
	20	–	–	40	40	52	110	174
	50	–	–	20	20	24	50	80
	75	–	–	13	13	16	35	54
	100	–	–	10	10	12	27	43
	150	–	–	7	7	9	19	29
	200	–	–	5	5	6	14	23
	300	–	–	3	3	4	9	14

❾ (PCI) + 50...125 I_n lamp for 0,6 ms

Maximum number of lamps on each pole contactor at 230 V 50 Hz

		Power [W]	Current [A]	Capacitance [µF]	RIK21	RIK20	RIK25	RIK40	RIK63
Fluorescent lamps									
	uncorrected or series correction	11	0,16	1,3	55	55	70	125	200
		18	0,37	2,7	22	22	24	90	140
		24	0,35	2,5	22	22	24	90	140
		36	0,43	3,4	17	17	20	65	95
		58	0,67	5,3	14	14	17	45	70
		65	0,67	5,3	14	14	17	35	50
		85	0,8	5,3	12	12	15	25	40
	lead-lag circuit	2 x 11	0,07	–	2 x 50	2 x 50	2 x 60	2 x 140	2 x 200
		2 x 18	0,11	–	2 x 30	2 x 30	2 x 40	2 x 100	2 x 150
		2 x 24	0,14	–	2 x 24	2 x 24	2 x 31	2 x 78	2 x 118
		2 x 36	0,22	–	2 x 17	2 x 17	2 x 24	2 x 65	2 x 95
		2 x 58	0,35	–	2 x 10	2 x 10	2 x 14	2 x 40	2 x 60
		2 x 65	0,35	–	2 x 9	2 x 9	2 x 13	2 x 30	2 x 45
		2 x 85	0,47	–	2 x 6	2 x 6	2 x 10	2 x 20	2 x 30
	parallel correction	11	0,16	3,5	9	9	10	62	94
		18	0,37	4,5	7	7	8	48	73
		24	0,35	4,5	7	7	8	48	73
		36	0,34	4,5	7	7	8	48	73
		58	0,67	7	4	4	5	31	47
		65	0,67	7	4	4	5	31	47
		85	0,8	8	3	3	4	27	41
	with electronic control gear (ECG)	18	0,09	–	25	25	35	100	140
		36	0,16	–	15	15	20	52	75
		58	0,25	–	14	14	19	50	72
		2 x 18	0,17	–	2 x 12	2 x 12	2 x 17	2 x 50	2 x 70
		2 x 36	0,32	–	2 x 7	2 x 7	2 x 10	2 x 26	2 x 38
		2 x 58	0,49	–	2 x 7	2 x 7	2 x 9	2 x 25	2 x 36
	T5 with electronic control gear (ECG)	22	0,11	FC	22	22	30	80	110
		40	0,21		12	12	15	40	60
		55	0,28		8	8	12	30	45
		14	0,08	HE	30	30	40	105	150
		21	0,11		22	22	30	80	115
		28	0,14		18	18	22	60	90
		35	0,18		14	14	18	48	70
		24	0,12	HO	20	20	26	70	100
		39	0,2		12	12	16	42	62
		49	0,24		10	10	14	35	52
		54	0,27		9	9	13	32	47
		80	0,39		6	6	8	22	32
		2 x 22	0,23	2 x FC	2 x 11	2 x 11	2 x 15	2 x 40	2 x 55
		2 x 40	0,42		2 x 6	2 x 6	2 x 7	2 x 20	2 x 30
		2 x 55	0,55		2 x 4	2 x 4	2 x 6	2 x 15	2 x 22
		2 x 14	0,15	2 x HE	2 x 15	2 x 15	2 x 20	2 x 52	2 x 75
		2 x 21	0,22		2 x 11	2 x 11	2 x 15	2 x 40	2 x 57
		2 x 28	0,28		2 x 9	2 x 9	2 x 11	2 x 20	2 x 45
		2 x 35	0,36		2 x 7	2 x 7	2 x 9	2 x 24	2 x 35
		2 x 24	0,24	2 x HO	2 x 10	2 x 10	2 x 13	2 x 35	2 x 50
		2 x 39	0,39		2 x 6	2 x 6	2 x 8	2 x 21	2 x 31
		2 x 49	0,48		2 x 5	2 x 5	2 x 7	2 x 17	2 x 26
		2 x 54	0,54		2 x 4	2 x 4	2 x 6	2 x 16	2 x 23
		2 x 80	0,74		2 x 3	2 x 3	2 x 4	2 x 11	2 x 16

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Maximum number of lamps on each pole contactor at 230 V 50 Hz

		Power [W]	Current [A]	Capacitance [µF]	RIK21	RIK20	RIK25	RIK40	RIK63
Compact fluorescent lamps									
	series correction	10	0,19	1,4	50	50	60	105	165
		13	0,18	1,4	50	50	60	105	165
		18	0,23	1,7	40	40	50	85	135
		26	0,33	2,5	30	30	35	60	95
		18	0,38	2,7	25	25	30	50	80
		24	0,35	2,7	25	25	30	50	80
		36	0,44	3,4	20	20	25	45	70
	parallel correction	5	0,18	2,2	13	13	16	100	150
		7	0,18	2,1	14	14	17	104	157
		9	0,17	2	15	15	18	110	165
		10	0,19	2,2	13	13	16	100	150
		11	0,16	1,7	17	17	21	125	194
		13	0,18	1,8	16	16	20	120	183
		18	0,23	2,3	13	13	15	95	143
		26	0,33	3,3	9	9	11	66	100
		18	0,38	4,2	7	7	8	52	78
		24	0,35	3,6	8	8	10	61	91
		36	0,44	4,4	6	6	8	50	75
	with electronic control gear (ECG)	5	0,05	–	45	45	63	180	250
		7	0,05	–	45	45	63	180	250
		9	0,07	–	32	32	45	128	180
		10	0,07	–	32	32	45	128	180
		11	0,07	–	32	32	45	128	180
		13	0,07	–	32	32	45	128	180
		18	0,22	–	10	10	14	40	57
		24	0,22	–	10	10	14	40	57
		26	0,22	–	10	10	14	40	57
		32	0,22	–	10	10	14	40	57
		36	0,22	–	10	10	14	40	57
		40	0,22	–	10	10	14	40	57
		42	0,22	–	10	10	14	40	57
		55	0,28	–	8	8	11	32	45
		57	0,28	–	8	8	11	32	45
		70	0,35	–	6	6	9	25	36
		80	0,41	–	5	5	8	22	30
		120	0,58	–	4	4	5	15	22
		2 x 9	0,11	–	2 x 16	2 x 16	2 x 22	2 x 90	2 x 125
		2 x 10	0,11	–	2 x 16	2 x 16	2 x 22	2 x 90	2 x 125
		2 x 11	0,11	–	2 x 16	2 x 16	2 x 22	2 x 90	2 x 125
		2 x 13	0,11	–	2 x 16	2 x 16	2 x 22	2 x 90	2 x 125
		2 x 18	0,3	–	2 x 5	2 x 5	2 x 7	2 x 20	2 x 28
		2 x 24	0,31	–	2 x 5	2 x 5	2 x 7	2 x 20	2 x 28
		2 x 26	0,31	–	2 x 5	2 x 5	2 x 7	2 x 20	2 x 28
		2 x 32	0,31	–	2 x 5	2 x 5	2 x 7	2 x 20	2 x 28
		2 x 36	0,31	–	2 x 5	2 x 5	2 x 7	2 x 20	2 x 28
		2 x 40	0,4	–	2 x 4	2 x 4	2 x 6	2 x 18	2 x 26
		2 x 42	0,4	–	2 x 4	2 x 4	2 x 6	2 x 18	2 x 26
		2 x 55	0,55	–	2 x 3	2 x 3	2 x 5	2 x 16	2 x 22
		2 x 57	0,55	–	2 x 3	2 x 3	2 x 5	2 x 16	2 x 22

Power supplies

relpol® S.A.

Power supplies for industrial and building automation systems.

Power supplies are available in modular covers (RZI...-M series) and in industrial covers (RZI...-P series, RZI...-R series, RZI...-B series, RZI...UPS).

They meet the requirements of REACH and RoHS Directive. The supplies are recognized and certified by:

CE EAC

modular covers

industrial covers

← Contents

RZI10-12-M, RZI10-24-M
power supplies

- Direct mounting on 35 mm rail mount acc. to EN 60715
- Wide range of ambient temperature: from -25 °C up to +71 °C • Cover - plastic, modular - width 18 mm; for distribution boards and distribution boxes
- Indicator of output voltage presence - green LED (DC OK)
- Cooled by free air flow (convection) • Applications: in industrial automation, for supplying household appliances and building automation
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit		RZI10-12-M	RZI10-24-M
Rated output voltage		12 V DC	24 V DC
Output voltage tolerance		± 2% (initial set point tolerance from factory)	
Output current		0,83 A	0,42 A
Rated output power		10 W	
Line regulation		< 0,5% 90...264 V AC, 100% load	
Load regulation		< 1% 90...264 V AC, 0...100% load	
PARD (20 MHz) ❶		< 100 mVpp	
Rise time		< 70 ms rated voltage, 100% load	
Start-up time		< 3 000 ms rated voltage, 100% load	< 2 000 ms rated voltage, 100% load
Hold-up time		> 10 ms 115 V AC > 60 ms 230 V AC, 100% load	
Dynamic response		± 5% 10...100% load	
Start-up with capacitive loads		max. 3 000 µF	
Input circuit			
Rated input voltage		100...240 V AC 125...375 V DC	
Input voltage range		90...264 V AC	
Rated input frequency		50...60 Hz	
Input frequency range		47...63 Hz	
Input current		< 0,3 A 115 V AC < 0,2 A 230 V AC	
Efficiency at 100% load		> 82% 115 V AC, 230 V AC	> 80% 115 V AC, 230 V AC
Max. inrush current (cold start)		< 15 A 115 V AC < 30 A 230 V AC	
Power factor		conform to EN 61000-3-2	
Leakage current		< 0,25 mA 240 V AC	
General data			
Dimensions (L x W x H)		91 x 18 x 55,6 mm	
Weight		60 g	65 g
Ambient temperature	• storage	-25...+85 °C	
	• operating	-25...+71 °C	
Power de-rating		> 55 °C de-rate power by 2,5% / °C	
Relative humidity		5...95% (non-condensation and/or icing)	
Operating altitude		0...2 000 m	
Shock resistance		IEC 60068-2-27, half sine wave: 4G for a duration of 22 ms, 3 shocks for each 3 directions, 9 times in total	
Vibration resistance		IEC 60068-2-6, sine wave: 10...500 Hz at 19,6 m/s² (peak: 2G), 10 min. per cycle, 60 min. for all directions (X, Y, Z)	
Overvoltage category		II	
Insulation pollution degree		2	
Galvanic isolation	• input - output	3 000 V AC	
Protections			
Overvoltage		< 17,4 V SELV output, Latch-off mode ❷	< 34,8 V SELV output, Latch-off mode ❷
Overload / overcurrent		> 105% of rated load current, Hiccup mode ❸	> 102...108% of rated load current, Fold Forward mode ❹ > 120% of rated load current, Hiccup mode ❸
Overtemperature		> 75 °C ambient temperature, 100% load, Latch-off mode ❷	
Short circuit		Hiccup mode ❸	
Cover protection category		IP 20 EN 60529	
Protection against shock		Class II (double insulation) ❺	

❶ PARD (20 MHz): Periodic and Random Deviation from the power supply's output DC voltage measured at 20 MHz bandwidth. ❷ Latch-off mode: disconnecting the output voltage, restore correct operation after restarting. ❸ Hiccup mode: non-latching, auto-recovery when the fault is removed. ❹ Fold Forward mode: current rises, voltage drops. ❺ Connection of PE protective wire is not required.

Reliability data

MTBF (mean time between failures)	> 500 000 h Telcordia SR-332, I/P: 100 V AC, O/P: 100% load, Ta: 35 °C
Expected lifetime of capacitors	10 years 115 V AC, 230 V AC, 50% load, 40 °C
Safety standards, directives	
Electrical safety	EN 60950-1, Limited Power Source (LPS)
CE	EMC Directive 2014/30/EU Low Voltage Directive 2014/35/EU
Material and parts	RoHS Directive 2011/65/EU
EMC according to Directive 2014/30/EU	
EMC (emissions)	CISPR 32, EN 55032, FCC Title 47: Class B ❽
Immunity to:	EN 55024
• electrostatic discharge (IEC 61000-4-2)	level 3, criteria A ❻ air discharge: 8 kV, contact discharge: 4 kV
• radiated field (IEC 61000-4-3)	level 2, criteria A ❻ 80 MHz...1 GHz, 3 V/M with 1 kHz tone / 80% modulation
• electrical fast transient / burst (IEC 61000-4-4)	level 3, criteria A ❻ 1 kV
• surge (IEC 61000-4-5)	level 3, criteria A ❻ common mode: 2 kV, differential mode: 1 kV ❼
• conducted (IEC 61000-4-6)	level 2, criteria A ❻ 150 kHz...80 MHz, 3 Vrms
• power frequency magnetic fields (IEC 61000-4-8)	criteria A ❻ 1 A/m
• voltage dips (IEC 61000-4-11)	> 95% dip, 0,5 cycle (10 ms)
Voltage fluctuation and flicker	IEC/EN 61000-3-3

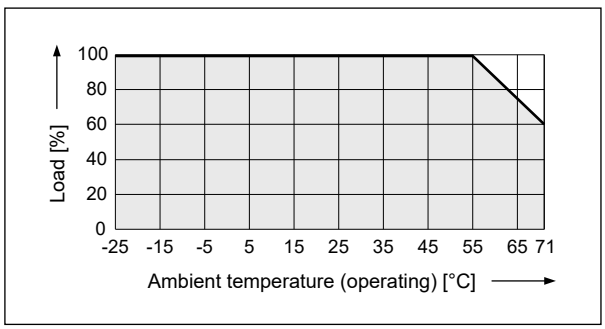
❻ Criteria A: normal performance within the specification limits. ❼ Common mode: asymmetrical (line to earth); differential mode: symmetrical (line to line). ❽ Warning: this is a Class B product. This product meets a strict regulations about the limits of EMC interferences required in a residential environment, regardless of its use in a commercial and light industrial environment.

Mounting

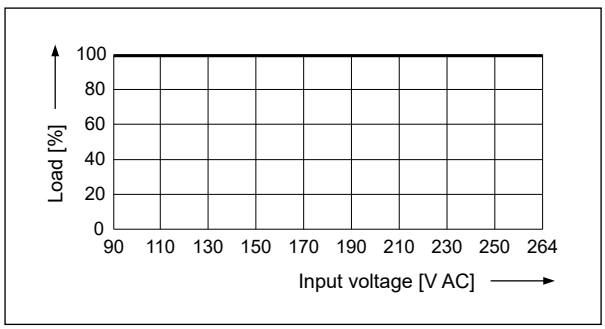
Power supplies **RZI10-12-M**, **RZI10-24-M** ❾ are designed for direct mounting on 35 mm rail mount acc. to EN 60715 - they are delivered ready to install. Operational position - input terminals downwards. **Connections:** conductor cross section: 0,14...4,0 mm² (26...12 AWG), input terminals: 2 screws M4 (16 A / 300 V), output terminals: 2 screws M4 (16 A / 300 V).

❾ Safety instruction for mounting: to guarantee sufficient convection cooling, keep a distance of 50 mm above and below the device as well as a lateral distance of 25 mm to other units.

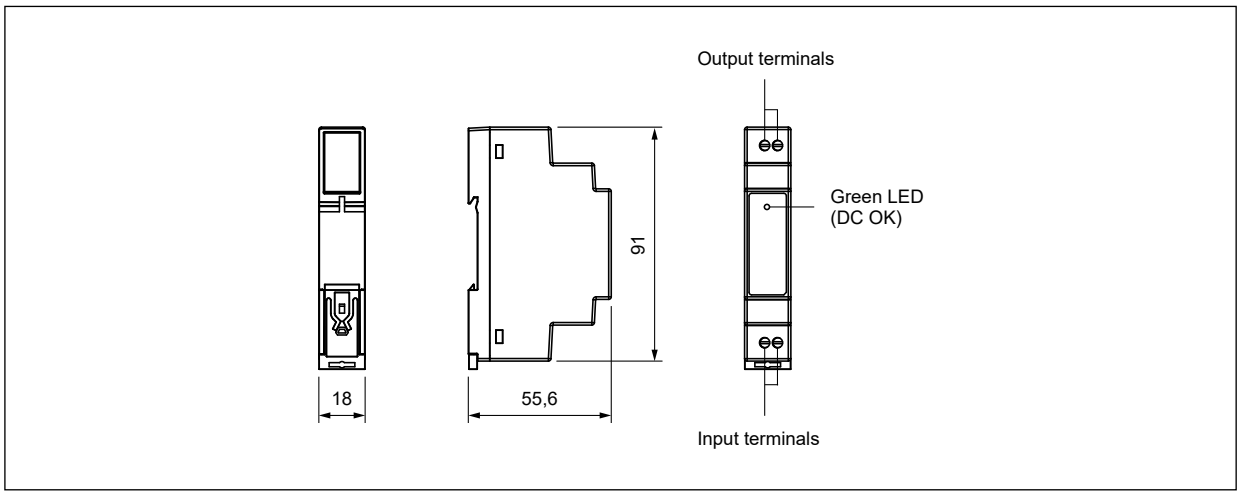
De-rating for vertical mounting orientation. > 55 °C de-rate power by 2,5% / °C Fig. 1



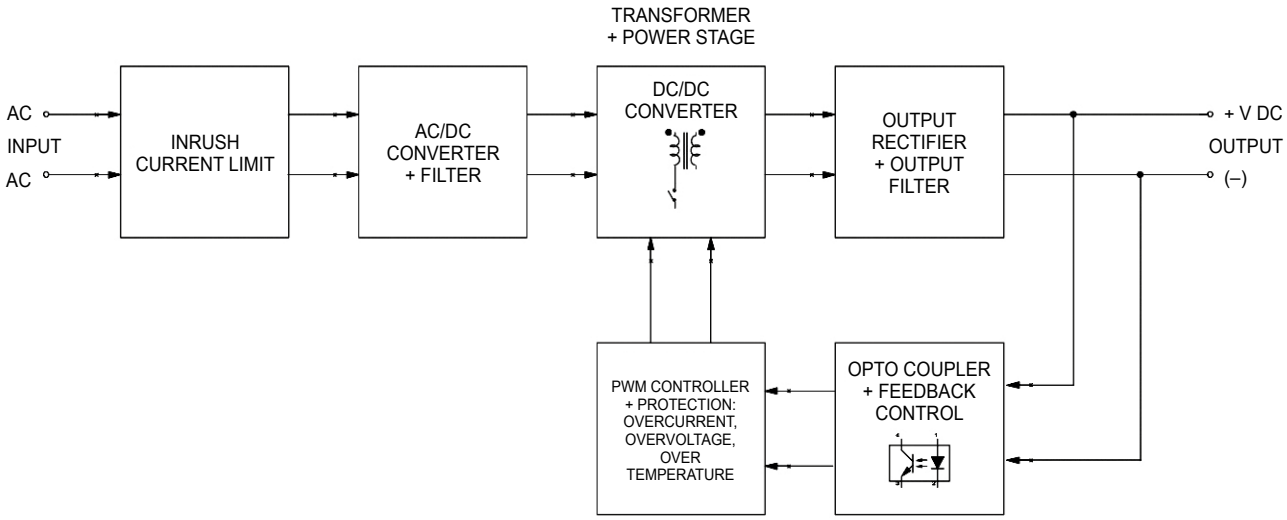
Output de-rating depending on input voltage Fig. 2



Dimensions



Block diagram



Note: all parameters are specified at 25 °C ambient unless otherwise indicated.
"Power supplies - basic information" - see pages 664-670.

- Direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting
- Wide range of ambient temperature: from -25 °C up to +71 °C • Cover - plastic, modular - width 53 mm; for distribution boards and distribution boxes
- Indicator of output voltage presence - green LED (DC OK)
- Cooled by free air flow (convection) • Applications: in industrial automation, for supplying commercial and industrial appliances and building automation
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit		RZI30-12-M	RZI30-24-M
Rated output voltage		12 V DC	24 V DC
Output voltage tolerance		± 2% (initial set point tolerance from factory)	
Output voltage adjustment range		11,5...14,5 V DC	23,52...24,48 V DC
Output current		2,1 A	1,25 A
Rated output power		25 W	30 W
Line regulation		< 0,5% 90...264 V AC, 100% load	
Load regulation		< 1% 90...264 V AC, 0...100% load	
PARD (20 MHz) ❶		< 100 mVpp	
Rise time		< 70 ms rated voltage, 100% load	
Start-up time		< 2 000 ms rated voltage, 100% load	
Hold-up time		> 25 ms 115 V AC > 60 ms 230 V AC, 100% load	
Dynamic response		± 5% 10...100% load	
Start-up with capacitive loads		max. 3 000 µF	
Input circuit			
Rated input voltage		100...240 V AC 125...375 V DC	
Input voltage range		90...264 V AC	
Rated input frequency		50...60 Hz	
Input frequency range		47...63 Hz	
Input current		< 0,8 A 115 V AC < 0,6 A 230 V AC	
Efficiency at 100% load		> 85% 115 V AC, 230 V AC	> 87% 115 V AC, 230 V AC
Max. inrush current		< 25 A 115 V AC < 50 A 230 V AC	
Power factor		conform to EN 61000-3-2	
Leakage current		< 0,25 mA 240 V AC	
General data			
Dimensions (L x W x H)		91 x 53 x 55,6 mm	
Weight		140 g	
Ambient temperature	• storage	-25...+85 °C	
	• operating	-25...+71 °C	
Power de-rating		> 55 °C de-rate power by 2,5% / °C	
Relative humidity		5...95% (non-condensation and/or icing)	
Operating altitude		0...2 000 m	
Shock resistance		IEC 60068-2-27, half sine wave: 4G for a duration of 22 ms, 3 shocks for each 3 directions, 9 times in total	
Vibration resistance		IEC 60068-2-6, sine wave: 10...500 Hz at 19,6 m/s² (peak: 2G), 10 min. per cycle, 60 min. for all directions (X, Y, Z)	
Overvoltage category		II	
Insulation pollution degree		2	
Galvanic isolation	• input - output	3 000 V AC	
Protections			
Overvoltage		< 17,4 V SELV output, Latch-off mode ❷	< 34,8 V SELV output, Latch-off mode ❷
Overload / overcurrent		> 130% of rated load current, Fold Forward mode ❹	> 130% of rated load current, Hiccup mode ❸
Overtemperature		> 75 °C ambient temperature, 100% load, Latch-off mode ❷	
Short circuit		Hiccup mode ❸	
Cover protection category		IP 20 EN 60529	
Protection against shock		Class II (double insulation) ❺	

❶ PARD (20 MHz): Periodic and Random Deviation from the power supply's output DC voltage measured at 20 MHz bandwidth. ❷ Latch-off mode: disconnecting the output voltage, restore correct operation after restarting. ❸ Hiccup mode: non-latching, auto-recovery when the fault is removed. ❹ Fold Forward mode: current rises, voltage drops. ❺ Connection of PE protective wire is not required.

Reliability data

MTBF (mean time between failures)	> 500 000 h Telcordia SR-332, I/P: 100 V AC, O/P: 100% load, Ta: 35 °C
Expected lifetime of capacitors	10 years 115 V AC, 230 V AC, 50% load, 40 °C
Safety standards, directives	
Electrical safety	EN 60950-1, Limited Power Source (LPS)
CE	EMC Directive 2014/30/EU Low Voltage Directive 2014/35/EU
Material and parts	RoHS Directive 2011/65/EU
EMC according to Directive 2014/30/EU	
EMC (emissions)	CISPR 32, EN 55032, FCC Title 47: Class A ❽
Immunity to:	EN 55024
• electrostatic discharge (IEC 61000-4-2)	level 3, criteria A ❻ air discharge: 8 kV, contact discharge: 4 kV
• radiated field (IEC 61000-4-3)	level 2, criteria A ❻ 80 MHz...1 GHz, 3 V/M with 1 kHz tone / 80% modulation
• electrical fast transient / burst (IEC 61000-4-4)	level 3, criteria A ❻ 1 kV
• surge (IEC 61000-4-5)	level 3, criteria A ❻ common mode: 2 kV, differential mode: 1 kV ❼
• conducted (IEC 61000-4-6)	level 2, criteria A ❻ 150 kHz...80 MHz, 3 Vrms
• power frequency magnetic fields (IEC 61000-4-8)	criteria A ❻ 1 A/m
• voltage dips (IEC 61000-4-11)	> 95% dip, 0,5 cycle (10 ms)
Voltage fluctuation and flicker	IEC/EN 61000-3-3

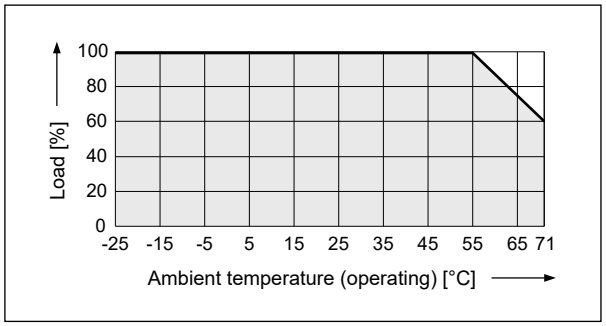
❻ Criteria A: normal performance within the specification limits. ❼ Common mode: asymmetrical (line to earth); differential mode: symmetrical (line to line). ❽ Warning: this is a Class A product. In a residential, commercial or light industrial environment it may cause radio interference. This product is not intended to be installed in a residential environment; in a commercial and light industrial environment with connection to the public mains supply, the user may be required to take adequate measures to reduce interference.

Mounting

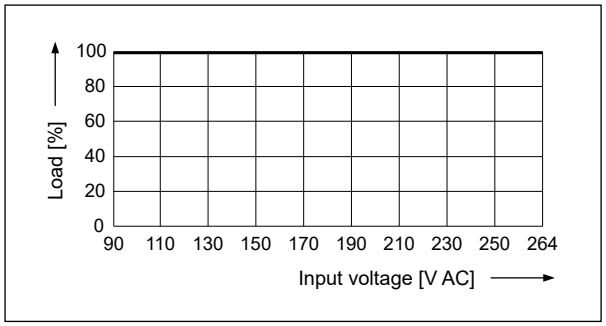
Power supplies **RZI30-12-M**, **RZI30-24-M** ❾ are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws - they are delivered ready to install. Operational position - input terminals downwards. **Connections:** conductor cross section: 0,25...4,0 mm² (24...12 AWG), input terminals: 2 screws M4 (25 A / 300 V), output terminals: 4 screws M4 (25 A / 300 V).

❾ Safety instruction for mounting: to guarantee sufficient convection cooling, keep a distance of 50 mm above and below the device as well as a lateral distance of 25 mm to other units.

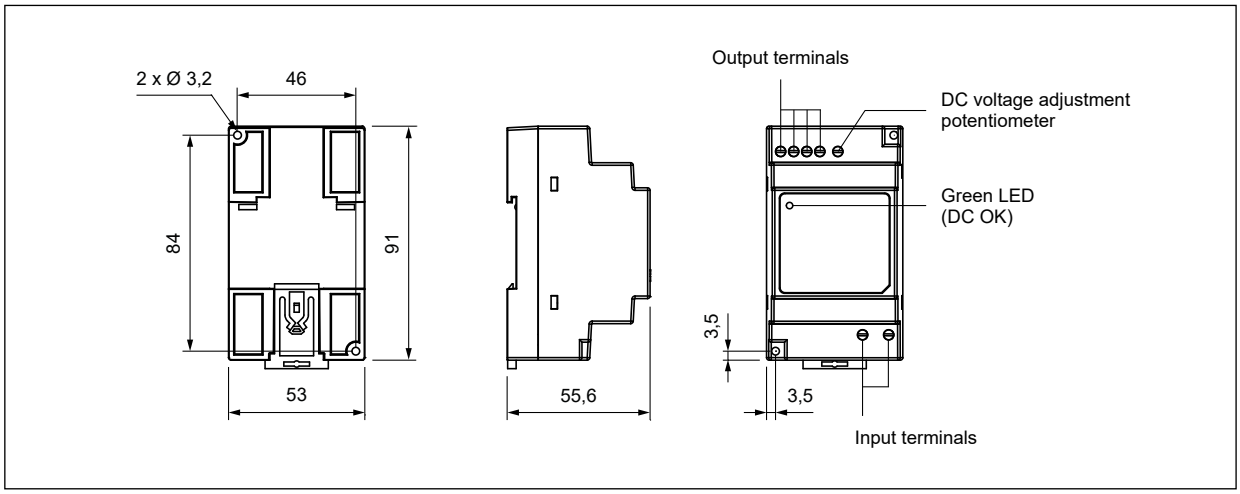
De-rating for vertical mounting orientation.
> 55 °C de-rate power by 2,5% / °C Fig. 1



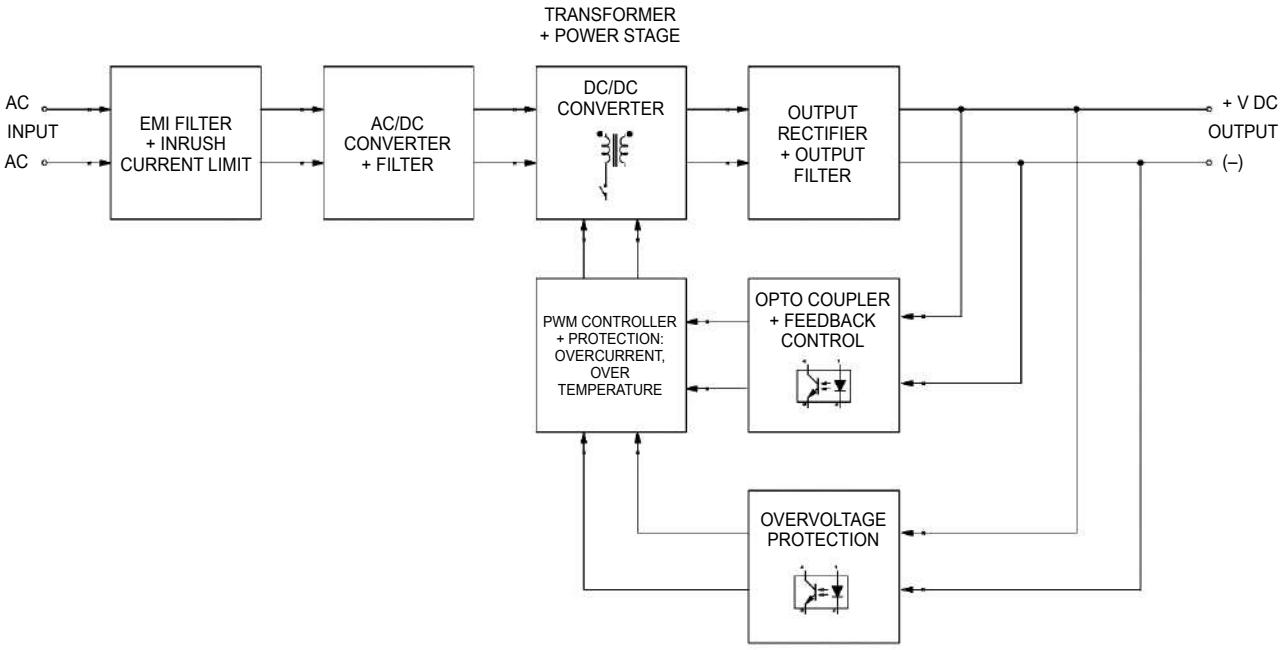
Output de-rating depending on input voltage Fig. 2



Dimensions



Block diagram



Note: all parameters are specified at 25 °C ambient unless otherwise indicated.
"Power supplies - basic information" - see pages 664-670.

RZI60-12-M, RZI60-24-M
power supplies

- Direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting
- Wide range of ambient temperature: from -25 °C up to +71 °C • Cover - plastic, modular - width 71 mm; for distribution boards and distribution boxes
- Indicator of output voltage presence - green LED (DC OK)
- Cooled by free air flow (convection) • Applications: in industrial automation, for supplying commercial and industrial appliances and building automation
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit		RZI60-12-M	RZI60-24-M
Rated output voltage		12 V DC	24 V DC
Output voltage tolerance		± 2% (initial set point tolerance from factory)	
Output voltage adjustment range		11,5...14 V DC	24...28 V DC
Output current		4,5 A	2,5 A
Rated output power		54 W	60 W
Line regulation		< 0,5% 90...264 V AC, 100% load	
Load regulation		< 1% 90...264 V AC, 0...100% load	
PARD (20 MHz) ❶		< 100 mVpp	
Rise time		< 70 ms rated voltage, 100% load	
Start-up time		< 2 000 ms rated voltage, 100% load	
Hold-up time		> 16 ms 115 V AC > 60 ms 230 V AC, 100% load	
Dynamic response		± 5% 10...100% load	
Start-up with capacitive loads		max. 3 000 µF	
Input circuit			
Rated input voltage		100...240 V AC 125...375 V DC	
Input voltage range		90...264 V AC	
Rated input frequency		50...60 Hz	
Input frequency range		47...63 Hz	
Input current		< 1,5 A 115 V AC < 1 A 230 V AC	
Efficiency at 100% load		> 86% 115 V AC, 230 V AC	> 88% 115 V AC, 230 V AC
Max. inrush current		< 30 A 115 V AC < 60 A 230 V AC	
Power factor		conform to EN 61000-3-2	
Leakage current		< 0,25 mA 240 V AC	
General data			
Dimensions (L x W x H)		91 x 71 x 55,6 mm	
Weight		220 g	240 g
Ambient temperature	• storage	-25...+85 °C	
	• operating	-25...+71 °C	
Power de-rating		> 55 °C de-rate power by 2,5% / °C	
Relative humidity		5...95% (non-condensation and/or icing)	
Operating altitude		0...2 000 m	
Shock resistance		IEC 60068-2-27, half sine wave: 4G for a duration of 22 ms, 3 shocks for each 3 directions, 9 times in total	
Vibration resistance		IEC 60068-2-6, sine wave: 10...500 Hz at 19,6 m/s² (peak: 2G), 10 min. per cycle, 60 min. for all directions (X, Y, Z)	
Overvoltage category		II	
Insulation pollution degree		2	
Galvanic isolation	• input - output	3 000 V AC	
Protections			
Overvoltage		< 17,4 V SELV output, Latch-off mode ❷	< 34,8 V SELV output, Latch-off mode ❷
Overload / overcurrent		< 8 A Fold Forward mode ❹	> 110% of rated load current, Hiccup mode ❸
Overtemperature		> 75 °C ambient temperature, 100% load, Latch-off mode ❷	
Short circuit		Hiccup mode ❸	
Cover protection category		IP 20 EN 60529	
Protection against shock		Class II (double insulation) ❺	

❶ PARD (20 MHz): Periodic and Random Deviation from the power supply's output DC voltage measured at 20 MHz bandwidth. ❷ Latch-off mode: disconnecting the output voltage, restore correct operation after restarting. ❸ Hiccup mode: non-latching, auto-recovery when the fault is removed. ❹ Fold Forward mode: current rises, voltage drops. ❺ Connection of PE protective wire is not required.

Reliability data	RZI60-12-M	RZI60-24-M
MTBF (mean time between failures)	> 500 000 h Telcordia SR-332, I/P: 100 V AC, O/P: 100% load, Ta: 35 °C	
Expected lifetime of capacitors	10 years 115 V AC, 230 V AC, 50% load, 40 °C	
Safety standards, directives		
Electrical safety	EN 60950-1, Limited Power Source (LPS)	
CE	EMC Directive 2014/30/EU Low Voltage Directive 2014/35/EU	
Material and parts	RoHS Directive 2011/65/EU	
EMC according to Directive 2014/30/EU		
EMC (emissions)	CISPR 32, EN 55032, FCC Title 47: Class A ❽	
Immunity to:	EN 55024	
• electrostatic discharge (IEC 61000-4-2)	level 3, criteria A ❻ air discharge: 8 kV, contact discharge: 4 kV	
• radiated field (IEC 61000-4-3)	level 2, criteria A ❻ 80 MHz...1 GHz, 3 V/M with 1 kHz tone / 80% modulation	
• electrical fast transient / burst (IEC 61000-4-4)	level 3, criteria A ❻ 1 kV	level 3, criteria A ❻ 2 kV
• surge (IEC 61000-4-5)	level 3, criteria A ❻ common mode: 2 kV, differential mode: 1 kV ❼	
• conducted (IEC 61000-4-6)	level 2, criteria A ❻ 150 kHz...80 MHz, 3 Vrms	
• power frequency magnetic fields (IEC 61000-4-8)	criteria A ❻ 1 A/m	
• voltage dips (IEC 61000-4-11)	> 95% dip, 0,5 cycle (10 ms)	> 95% dip, 0,5 cycle (10 ms), self recoverable
• low energy pulse test (ring wave) (IEC 61000-4-12)		level 3, criteria A ❻ common mode: 2 kV, differential mode: 1 kV ❼
Voltage fluctuation and flicker	IEC/EN 61000-3-3	

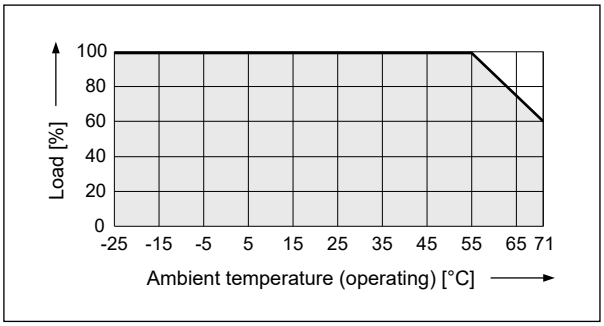
❻ Criteria A: normal performance within the specification limits. ❼ Common mode: asymmetrical (line to earth); differential mode: symmetrical (line to line). ❽ Warning: this is a Class A product. In a residential, commercial or light industrial environment it may cause radio interference. This product is not intended to be installed in a residential environment; in a commercial and light industrial environment with connection to the public mains supply, the user may be required to take adequate measures to reduce interference.

Mounting

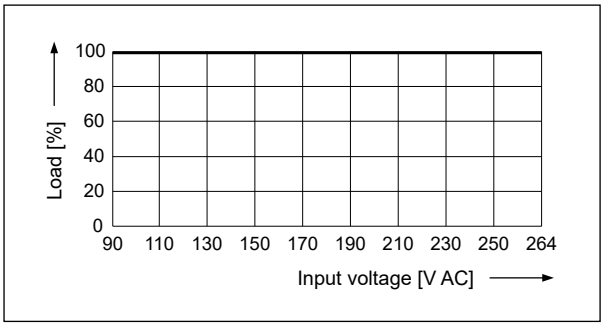
Power supplies **RZI60-12-M**, **RZI60-24-M** ❾ are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws - they are delivered ready to install. Operational position - input terminals downwards. **Connections:** conductor cross section: **RZI60-12-M** - 0,25...4,0 mm² (24...12 AWG), **RZI60-24-M** - 0,34...4,0 mm² (22...12 AWG), input terminals: 2 screws M4 (25 A / 300 V), output terminals: 4 screws M4 (25 A / 300 V).

❾ Safety instruction for mounting: to guarantee sufficient convection cooling, keep a distance of 50 mm above and below the device as well as a lateral distance of 25 mm to other units.

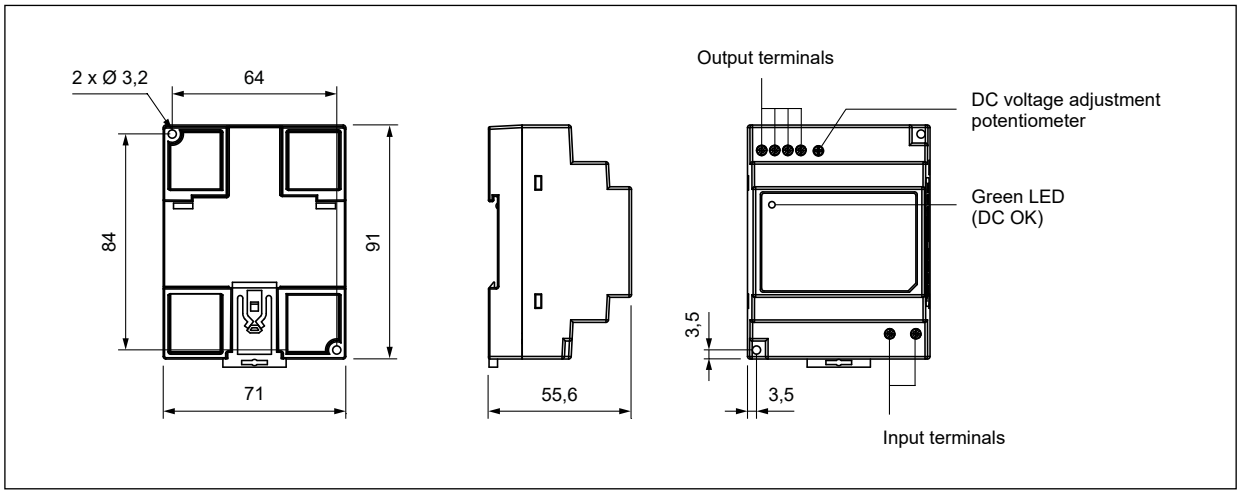
De-rating for vertical mounting orientation. > 55 °C de-rate power by 2,5% / °C Fig. 1



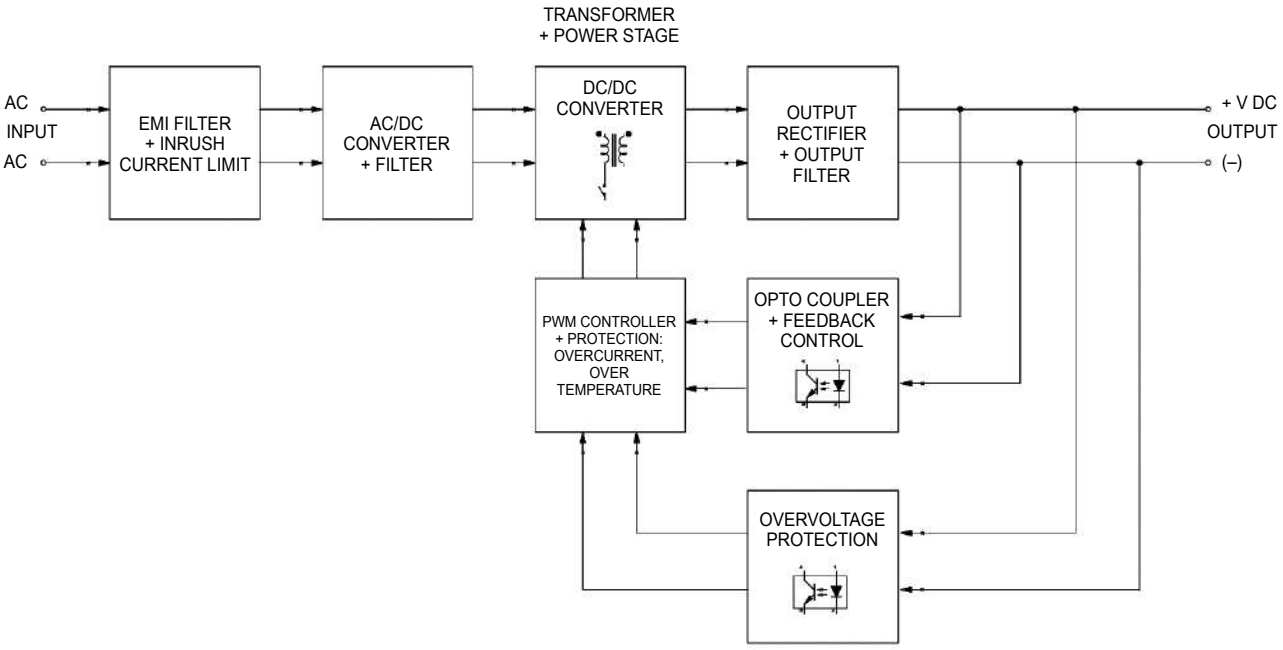
Output de-rating depending on input voltage Fig. 2



Dimensions



Block diagram



Note: all parameters are specified at 25 °C ambient unless otherwise indicated.
"Power supplies - basic information" - see pages 664-670.

- Direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting
- Wide range of ambient temperature: from -25 °C up to +71 °C • Cover - plastic, modular - width 90 mm; for distribution boards and distribution boxes
- Indicator of output voltage presence - green LED (DC OK)
- Cooled by free air flow (convection)
- Applications: in industrial automation, for supplying commercial and industrial appliances and building automation
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit

Rated output voltage	24 V DC
Output voltage tolerance	± 2% (initial set point tolerance from factory)
Output voltage adjustment range	22...24 V DC
Output current	3,8 A
Rated output power	91,2 W
Line regulation	< 0,5% 90...264 V AC, 100% load
Load regulation	< 1% 90...264 V AC, 0...100% load
PARD (20 MHz) ❶	< 100 mVpp
Rise time	< 70 ms rated voltage, 100% load
Start-up time	< 2 000 ms rated voltage, 100% load
Hold-up time	> 10 ms 115 V AC > 60 ms 230 V AC, 100% load
Dynamic response	± 5% 10...100% load
Start-up with capacitive loads	max. 3 000 µF

Input circuit

Rated input voltage	100...240 V AC 125...375 V DC
Input voltage range	90...264 V AC
Rated input frequency	50...60 Hz
Input frequency range	47...63 Hz
Input current	< 2,2 A 115 V AC < 1 A 230 V AC
Efficiency at 100% load	> 87% 115 V AC > 89% 230 V AC
Max. inrush current	< 30 A 115 V AC < 60 A 230 V AC
Power factor	conform to EN 61000-3-2, Class A
Leakage current	< 0,25 mA 240 V AC

General data

Dimensions (L x W x H)		91 x 90 x 55,6 mm
Weight		350 g
Ambient temperature	• storage	-25...+85 °C
	• operating	-25...+71 °C
Power de-rating		> 55 °C de-rate power by 2,5% / °C
Relative humidity		5...95% (non-condensation and/or icing)
Operating altitude		0...2 000 m
Shock resistance		IEC 60068-2-27, half sine wave: 4G for a duration of 22 ms, 3 shocks for each 3 directions, 9 times in total
Vibration resistance		IEC 60068-2-6, sine wave: 10...500 Hz at 19,6 m/s² (peak: 2G), 10 min. per cycle, 60 min. for all directions (X, Y, Z)
Overvoltage category		II
Insulation pollution degree		2
Galvanic isolation	• input - output	3 000 V AC

Protections

Overvoltage	< 34,8 V SELV output, Latch-off mode ❷
Overload / overcurrent	> 102...108% of rated load current, Fold Forward mode ❹
Overtemperature	> 75 °C ambient temperature, 100% load, Latch-off mode ❷
Short circuit	Hiccup mode ❸
Cover protection category	IP 20 EN 60529
Protection against shock	Class II (double insulation) ❺

❶ PARD (20 MHz): Periodic and Random Deviation from the power supply's output DC voltage measured at 20 MHz bandwidth. ❷ Latch-off mode: disconnecting the output voltage, restore correct operation after restarting. ❸ Hiccup mode: non-latching, auto-recovery when the fault is removed. ❹ Fold Forward mode: current rises, voltage drops. ❺ Connection of PE protective wire is not required.

Reliability data

MTBF (mean time between failures)	> 500 000 h Telcordia SR-332, I/P: 100 V AC, O/P: 100% load, Ta: 35 °C
Expected lifetime of capacitors	10 years 115 V AC, 230 V AC, 50% load, 40 °C

Safety standards, directives

Electrical safety	EN 60950-1, Limited Power Source (LPS)
CE	EMC Directive 2014/30/EU Low Voltage Directive 2014/35/EU
Material and parts	RoHS Directive 2011/65/EU

EMC according to Directive 2014/30/EU

EMC (emissions)	CISPR 32, EN 55032, FCC Title 47: Class A ❽
Immunity to:	EN 55024
• electrostatic discharge (IEC 61000-4-2)	level 3, criteria A ❻ air discharge: 8 kV, contact discharge: 4 kV
• radiated field (IEC 61000-4-3)	level 2, criteria A ❻ 80 MHz...1 GHz, 3 V/M with 1 kHz tone / 80% modulation
• electrical fast transient / burst (IEC 61000-4-4)	level 3, criteria A ❻ 1 kV
• surge (IEC 61000-4-5)	level 3, criteria A ❻ common mode: 2 kV, differential mode: 1 kV ❼
• conducted (IEC 61000-4-6)	level 2, criteria A ❻ 150 kHz...80 MHz, 3 Vrms
• power frequency magnetic fields (IEC 61000-4-8)	criteria A ❻ 1 A/m
• voltage dips (IEC 61000-4-11)	> 95% dip, 0,5 cycle (10 ms)
Harmonic current emission	IEC/EN 61000-3-2, Class A
Voltage fluctuation and flicker	IEC/EN 61000-3-3

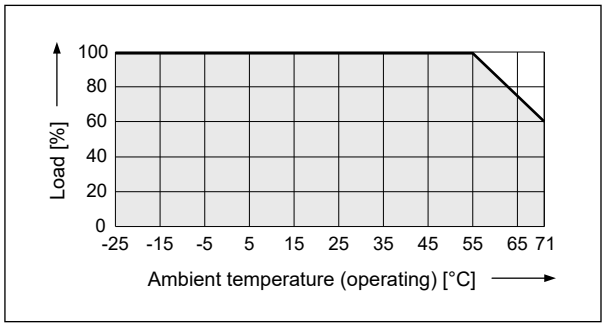
❻ Criteria A: normal performance within the specification limits. ❼ Common mode: asymmetrical (line to earth); differential mode: symmetrical (line to line). ❽ Warning: this is a Class A product. In a residential, commercial or light industrial environment it may cause radio interference. This product is not intended to be installed in a residential environment; in a commercial and light industrial environment with connection to the public mains supply, the user may be required to take adequate measures to reduce interference.

Mounting

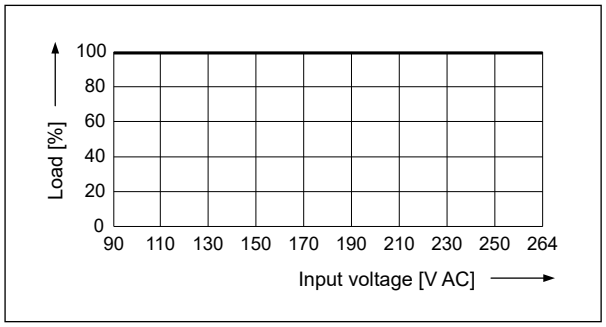
Power supplies **RZI100-24-M** ❾ are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws - they are delivered ready to install. Operational position - input terminals downwards. **Connections:** conductor cross section: 1 piece - 0,34...4,0 mm² (22...12 AWG), 2 pieces - 0,25...4,0 mm² (24...12 AWG), input terminals: 2 screws M4 (25 A / 300 V), output terminals: 4 screws M4 (25 A / 300 V).

❾ Safety instruction for mounting: to guarantee sufficient convection cooling, keep a distance of 50 mm above and below the device as well as a lateral distance of 25 mm to other units.

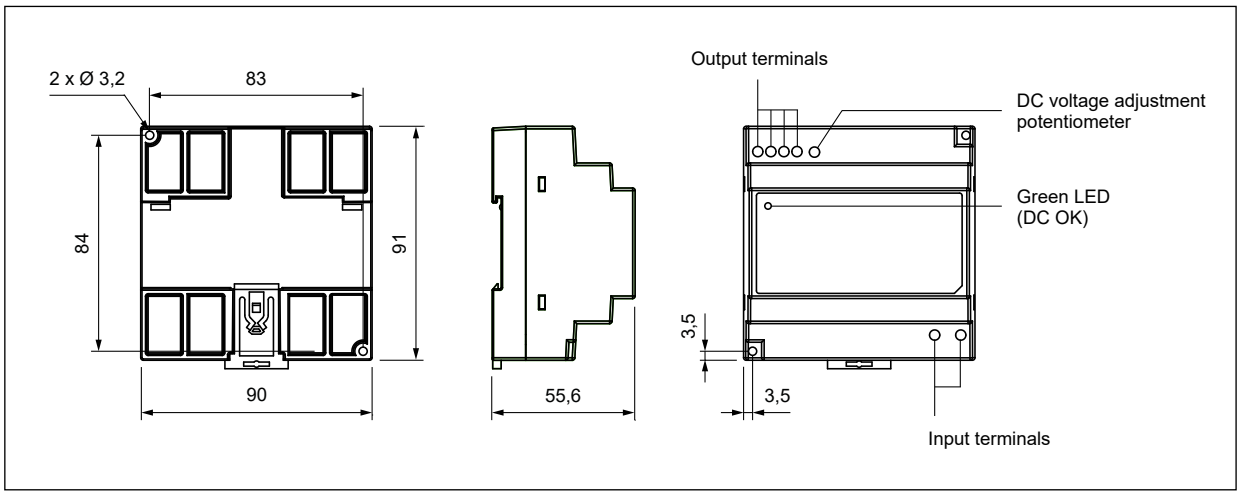
De-rating for vertical mounting orientation. > 55 °C de-rate power by 2,5% / °C Fig. 1



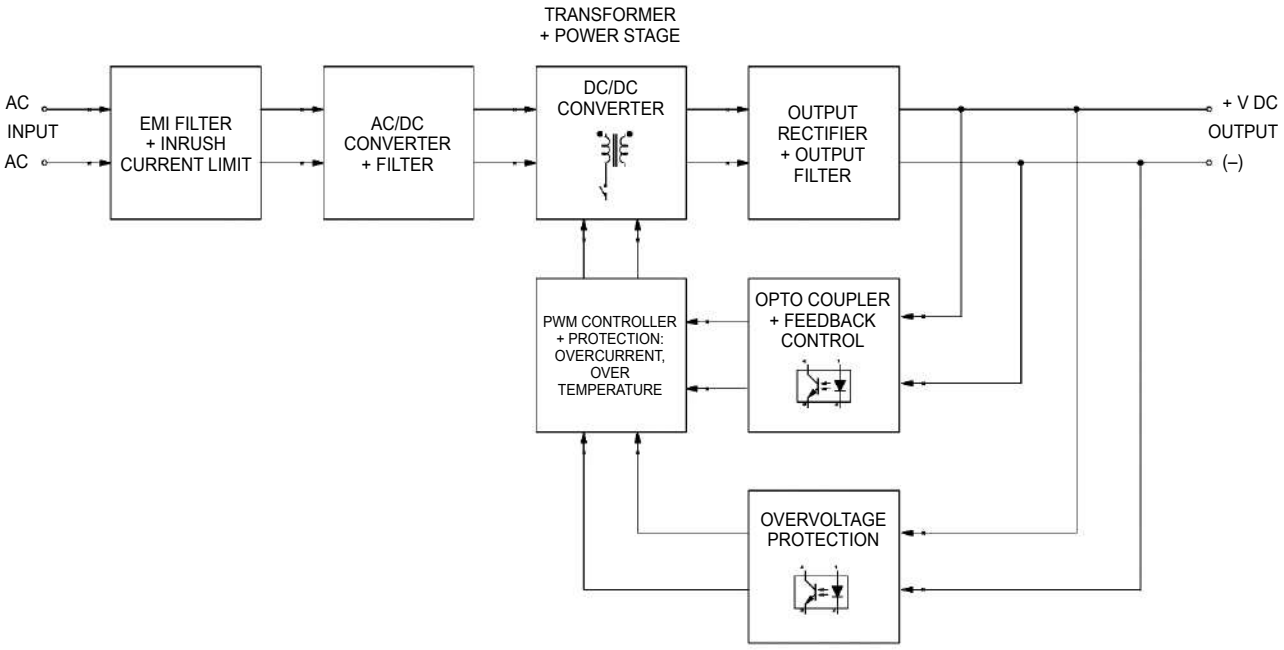
Output de-rating depending on input voltage Fig. 2



Dimensions



Block diagram



Note: all parameters are specified at 25 °C ambient unless otherwise indicated.
"Power supplies - basic information" - see pages 664-670.

RZI60-24-P
power supplies

- Direct mounting on 35 mm rail mount acc. to EN 60715
- Wide range of ambient temperature: from -25 °C up to +80 °C
- Cover - industrial, compact aluminum • Conformal coating PCBA
- Indicator of output voltage presence - green LED (DC OK)
- Cooled by free air flow (convection)
- Applications: in residential environment, in industrial automation, for supplying packing, construction, weaving machines etc.
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit		
Rated output voltage		24 V DC
Output voltage tolerance		± 2% (initial set point tolerance from factory)
Output voltage adjustment range		24...28 V DC
Output current		2,5 A
Rated output power		60 W
Line regulation (typical value)		< 0,5% 85...264 V AC, 100% load
Load regulation (typical value)		< 1% 85...264 V AC, 0...100% load
PARD (20 MHz) ❶		< 150 mVpp 25 °C
Rise time		< 100 ms rated voltage, 100% load, 25 °C
Start-up time		< 2 000 ms rated voltage, 100% load, 25 °C
Hold-up time		> 20 ms 115 V AC > 125 ms 230 V AC, 100% load, 25 °C
Dynamic response		± 5% 10...100% load
Start-up with capacitive loads		max. 8 000 µF
Input circuit		
Rated input voltage		100...240 V AC 125...250 V DC
Input voltage range		85...264 V AC 120...375 V DC
Rated input frequency		50...60 Hz
Input frequency range		47...63 Hz
Input current		< 1,4 A 115 V AC < 0,8 A 230 V AC
Efficiency at 100% load		> 90% 115 V AC, 230 V AC
Max. inrush current (cold start from -40 °C)		< 20 A 115 V AC < 35 A 230 V AC
Power factor		conform to EN 61000-3-2
Leakage current		< 1 mA 240 V AC
General data		
Dimensions (L x W x H)		121 x 32 x 125 mm
Weight		370 g
Ambient temperature	• storage	-40...+85 °C
	• operating	-25...+80 °C (cold start at -40 °C)
Power de-rating		> 50 °C de-rate power by 2,5% / °C, vertical and horizontal mounting
Relative humidity		5...95% (non-condensation and/or icing)
Operating altitude		0...2 500 m
Shock resistance (non-operating)		IEC 60068-2-27, 30G (300 m/s²) for a duration of 18 ms
Vibration resistance (non-operating)		IEC 60068-2-6, 10...500 Hz at 30 m/s² (peak: 3G), 60 min. per axis for all directions (X, Y, Z)
Bump		IEC 60068-2-29, 11 ms / 10 gn
Overvoltage category		III
Insulation pollution degree		2
Galvanic isolation	• input - output	4 000 V AC
	• input - ground	1 500 V AC
	• output - ground	1 500 V AC
Protections		
Overvoltage		< 32 V ±10% SELV output, Hiccup mode ❷
Overload / overcurrent		> 150% of rated load current, Hiccup mode ❷
Overtemperature		< 80 °C ambient temperature, 100% load, Hiccup mode ❷
Short circuit		Hiccup mode ❷
Cover protection category		IP 20 EN 60529
Protection against shock		Class I ❸

❶ PARD (20 MHz): Periodic and Random Deviation from the power supply's output DC voltage measured at 20 MHz bandwidth. ❷ Hiccup mode: non-latching, auto-recovery when the fault is removed. ❸ Connection of PE protective wire is not required.

Reliability data

MTBF (mean time between failures)	> 800 000 h Telcordia SR-332, I/P: 115 V AC, 230 V AC, O/P: 100% load, Ta: 25 °C
Expected lifetime of capacitors	10 years 115 V AC, 230 V AC, 50% load, 40 °C
Safety standards, directives	
Electrical safety	EN 60950-1, EN 60204-1, IEC 62103
CE	EMC Directive 2014/30/EU Low Voltage Directive 2014/35/EU
Material and parts	RoHS Directive 2011/65/EU
EMC according to Directive 2014/30/EU	
EMC (emissions)	CISPR 32, EN 55032, EN 55011, FCC Title 47: Class B ❻
Immunity to:	EN 55024
• electrostatic discharge (IEC 61000-4-2)	level 4, criteria A ❹ air discharge: 15 kV, contact discharge: 8 kV
• radiated field (IEC 61000-4-3)	level 3, criteria A ❹ 80 MHz...1 GHz, 10 V/M with 1 kHz tone / 80% modulation
• electrical fast transient / burst (IEC 61000-4-4)	level 3, criteria A ❹ 2 kV
• surge (IEC 61000-4-5)	level 3, criteria A ❹ common mode: 2 kV, differential mode: 1 kV ❺
• conducted (IEC 61000-4-6)	level 3, criteria A ❹ 150 kHz...80 MHz, 10 Vrms
• power frequency magnetic fields (IEC 61000-4-8)	level 3, criteria A ❹ 3 A/m
• voltage dips (IEC 61000-4-11)	level 3, criteria A ❹ 100% dip, 1 cycle (20 ms), self recoverable
• low energy pulse test (ring wave) (IEC 61000-4-12)	level 3, criteria A ❹ common mode: 2 kV, differential mode: 1 kV ❺
Harmonic current emission	IEC/EN 61000-3-2, Class A
Voltage fluctuation and flicker	IEC/EN 61000-3-3
Low voltage power supplies, DC output	EN 61204-3

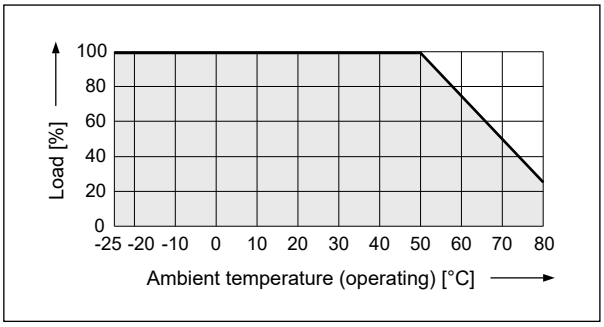
❹ Criteria A: normal performance within the specification limits. ❺ Common mode: asymmetrical (line to earth); differential mode: symmetrical (line to line). ❻ This is a Class B product. This product meets a strict regulations about the limits of EMC interferences required in a residential environment, regardless of its use in a commercial and light industrial environment.

Mounting

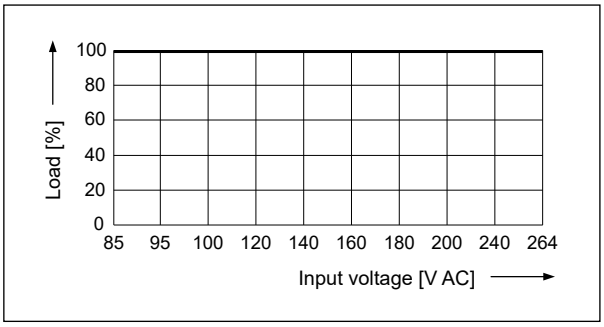
Power supplies **RZI60-24-P** ❼ are designed for direct mounting on 35 mm rail mount acc. to EN 60715 - they are delivered ready to install. Operational position - input terminals downwards. **Connections:** conductor cross section: 0,5...4,0 mm² (20...12 AWG), input terminals: plugable connector, 3 screws M4 (15 A / 300 V), output terminals: plugable connector, 2 screws M4 (15 A / 300 V).

❼ Safety instruction for mounting: to guarantee sufficient convection cooling, keep a distance of 50 mm above and below the device as well as a lateral distance of 20 mm to other units.

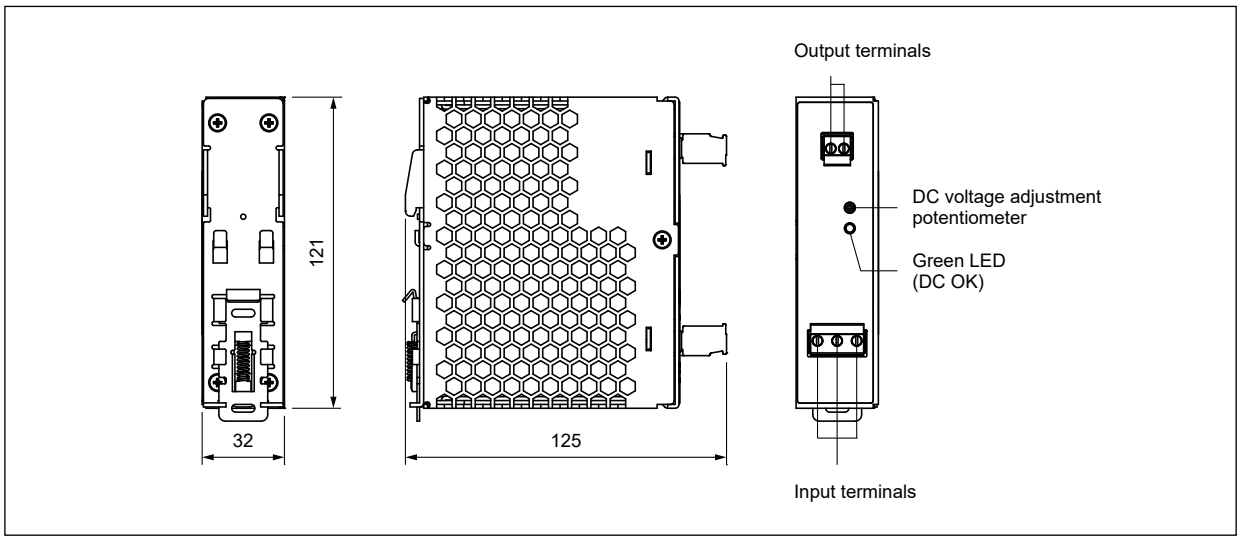
De-rating for vertical and horizontal mounting orientation.
> 50 °C de-rate power by 2,5% / °C Fig. 1



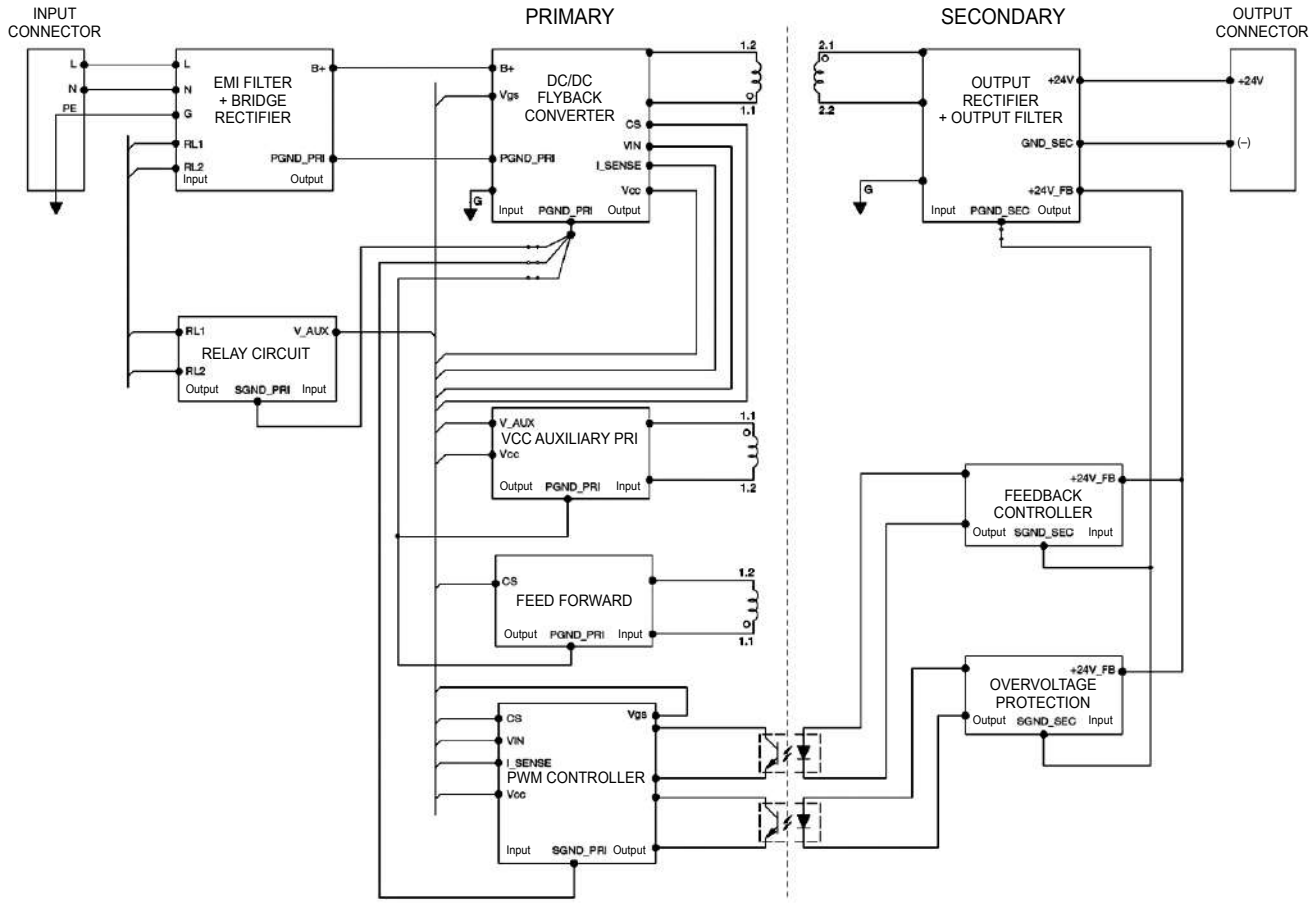
Output de-rating depending on input voltage Fig. 2



Dimensions



Block diagram



Note: all parameters are specified at 25 °C ambient unless otherwise indicated.
"Power supplies - basic information" - see pages 664-670.

- Direct mounting on 35 mm rail mount acc. to EN 60715
- Wide range of ambient temperature: from -25 °C up to +80 °C
- Cover - industrial, compact aluminum • Conformal coating PCBA
- Indicator of output voltage presence - green LED (DC OK)
- Cooled by free air flow (convection)
- Applications: in residential environment, in industrial automation, for supplying packing, construction, weaving machines etc.
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit

Rated output voltage		24 V DC
Output voltage tolerance		± 2% (initial set point tolerance from factory)
Output voltage adjustment range		24...28 V DC
Output current		5 A
Rated output power		120 W
Line regulation (typical value)		< 0,5% 85...264 V AC, 100% load
Load regulation (typical value)		< 1% 85...264 V AC, 0...100% load
PARD (20 MHz) ❶		< 150 mVpp 25 °C
Rise time		< 100 ms rated voltage, 100% load, 25 °C
Start-up time		< 1 000 ms rated voltage, 100% load, 25 °C
Hold-up time		> 20 ms 115 V AC > 115 ms 230 V AC, 100% load, 25 °C
Dynamic response		± 5% 10...100% load
Start-up with capacitive loads		max. 10 000 µF

Input circuit

Rated input voltage		100...240 V AC 125...250 V DC
Input voltage range		85...264 V AC 120...375 V DC
Rated input frequency		50...60 Hz
Input frequency range		47...63 Hz
Input current		< 2,2 A 115 V AC < 1,2 A 230 V AC
Efficiency at 100% load		> 89% 115 V AC > 90% 230 V AC
Max. inrush current (cold start from -40 °C)		< 35 A 115 V AC, 230 V AC
Power factor		conform to EN 61000-3-2
Leakage current		< 1 mA 240 V AC

General data

Dimensions (L x W x H)		121 x 50 x 123,7 mm
Weight		720 g
Ambient temperature	• storage	-40...+85 °C
	• operating	-25...+80 °C (cold start at -40 °C)
Power de-rating		> 50 °C de-rate power by 2,5% / °C, vertical and horizontal mounting
Relative humidity		5...95% (non-condensation and/or icing)
Operating altitude		0...2 500 m
Shock resistance (non-operating)		IEC 60068-2-27, 30G (300 m/s²) for a duration of 18 ms
Vibration resistance (non-operating)		IEC 60068-2-6, 10...500 Hz at 30 m/s² (peak: 3G), 60 min. per axis for all directions (X, Y, Z)
Bump		IEC 60068-2-29, 11 ms / 10 gn
Overvoltage category		III
Insulation pollution degree		2
Galvanic isolation	• input - output	4 000 V AC
	• input - ground	1 500 V AC
	• output - ground	1 500 V AC

Protections

Overvoltage	< 32 V ±10% SELV output, Hiccup mode ❷
Overload / overcurrent	> 150% of rated load current, Hiccup mode ❷
Overtemperature	< 80 °C ambient temperature, 100% load, Hiccup mode ❷
Short circuit	Hiccup mode ❷
Cover protection category	IP 20 EN 60529
Protection against shock	Class I ❸

❶ PARD (20 MHz): Periodic and Random Deviation from the power supply's output DC voltage measured at 20 MHz bandwidth. ❷ Hiccup mode: non-latching, auto-recovery when the fault is removed. ❸ Connection of PE protective wire is not required.

Reliability data

MTBF (mean time between failures)	> 800 000 h Telcordia SR-332, I/P: 115 V AC, O/P: 100% load, Ta: 25 °C
Expected lifetime of capacitors	10 years 115 V AC, 230 V AC, 50% load, 40 °C
Safety standards, directives	
Electrical safety	EN 60950-1, EN 60204-1, IEC 62103
CE	EMC Directive 2014/30/EU Low Voltage Directive 2014/35/EU
Material and parts	RoHS Directive 2011/65/EU
EMC according to Directive 2014/30/EU	
EMC (emissions)	CISPR 32, EN 55032, EN 55011, FCC Title 47: Class B ❻
Immunity to:	EN 55024
• electrostatic discharge (IEC 61000-4-2)	level 4, criteria A ❹ air discharge: 15 kV, contact discharge: 8 kV
• radiated field (IEC 61000-4-3)	level 3, criteria A ❹ 80 MHz...1 GHz, 10 V/M with 1 kHz tone / 80% modulation
• electrical fast transient / burst (IEC 61000-4-4)	level 3, criteria A ❹ 2 kV
• surge (IEC 61000-4-5)	level 3, criteria A ❹ common mode: 2 kV, differential mode: 1 kV ❺
• conducted (IEC 61000-4-6)	level 3, criteria A ❹ 150 kHz...80 MHz, 10 Vrms
• power frequency magnetic fields (IEC 61000-4-8)	level 3, criteria A ❹ 30 A/m
• voltage dips (IEC 61000-4-11)	level 3, criteria A ❹ 100% dip, 1 cycle (20 ms), self recoverable
• low energy pulse test (ring wave) (IEC 61000-4-12)	level 3, criteria A ❹ common mode: 2 kV, differential mode: 1 kV ❺
Harmonic current emission	IEC/EN 61000-3-2, Class A
Voltage fluctuation and flicker	IEC/EN 61000-3-3
Low voltage power supplies, DC output	EN 61204-3

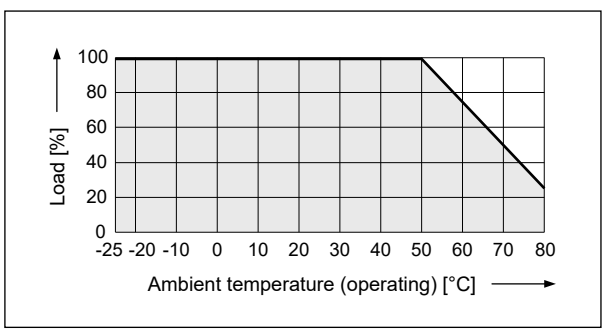
❹ Criteria A: normal performance within the specification limits. ❺ Common mode: asymmetrical (line to earth); differential mode: symmetrical (line to line). ❻ This is a Class B product. This product meets a strict regulations about the limits of EMC interferences required in a residential environment, regardless of its use in a commercial and light industrial environment.

Mounting

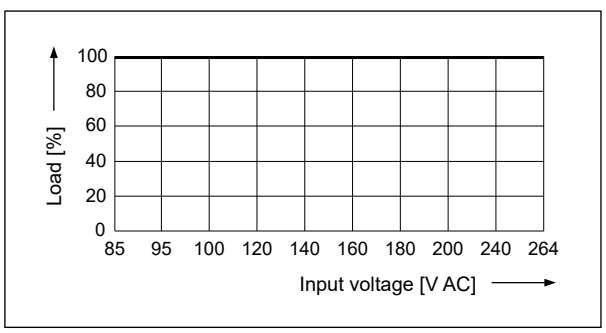
Power supplies **RZI120-24-P** ❼ are designed for direct mounting on 35 mm rail mount acc. to EN 60715 - they are delivered ready to install. Operational position - input terminals downwards. **Connections:** conductor cross section: 0,5...4,0 mm² (20...12 AWG), input terminals: plugable connector, 3 screws M4 (15 A / 300 V), output terminals: plugable connector, 4 screws M4 (15 A / 300 V).

❼ Safety instruction for mounting: to guarantee sufficient convection cooling, keep a distance of 50 mm above and below the device as well as a lateral distance of 20 mm to other units.

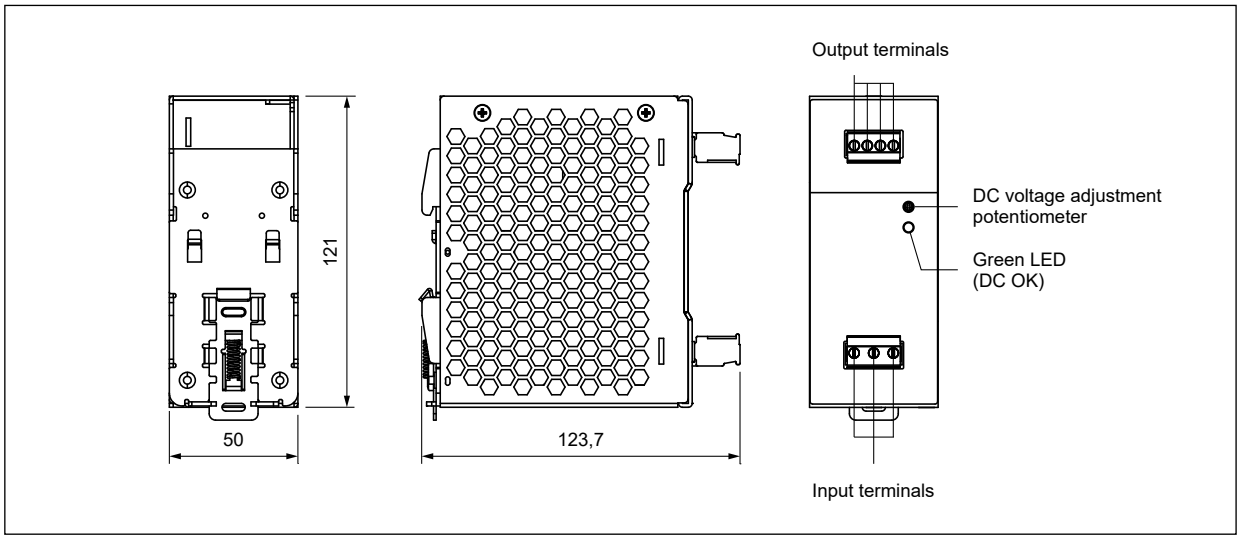
De-rating for vertical and horizontal mounting orientation.
> 50 °C de-rate power by 2,5% / °C Fig. 1



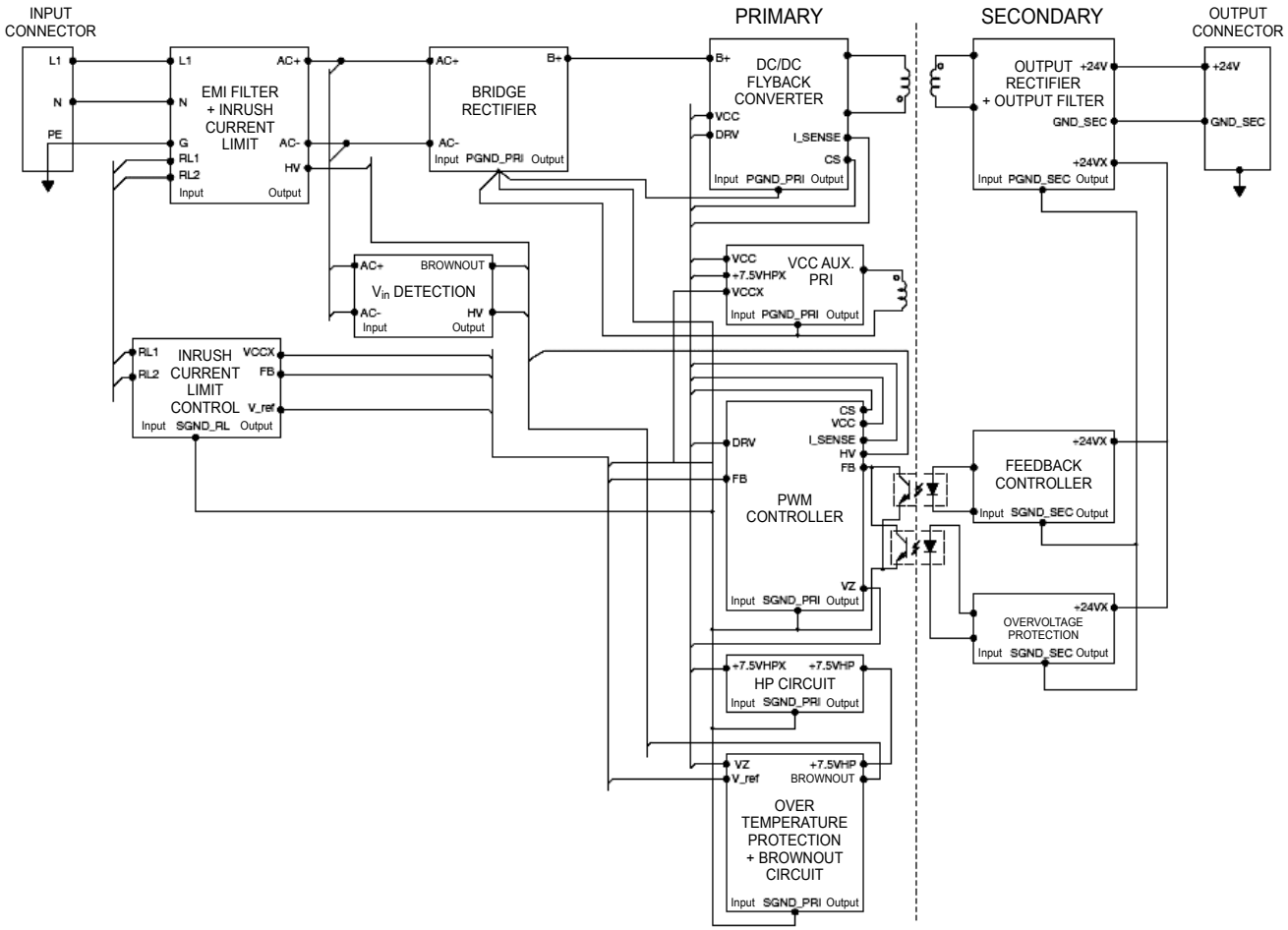
Output de-rating depending on input voltage Fig. 2



Dimensions



Block diagram



Note: all parameters are specified at 25 °C ambient unless otherwise indicated.
"Power supplies - basic information" - see pages 664-670.

RZI240-24-P
power supplies

- Direct mounting on 35 mm rail mount acc. to EN 60715
- Wide range of ambient temperature: from -25 °C up to +80 °C
- Cover - industrial, compact aluminum • Conformal coating PCBA
- Indicator of output voltage presence - green LED (DC OK)
- Cooled by free air flow (convection)
- Applications: in residential environment, in industrial automation, for supplying packing, construction, weaving machines etc.
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit

Rated output voltage	24 V DC
Output voltage tolerance	± 2% (initial set point tolerance from factory)
Output voltage adjustment range	24...28 V DC
Output current	10 A
Rated output power	240 W
Line regulation (typical value)	< 0,5% 85...264 V AC, 100% load
Load regulation (typical value)	< 1% 85...264 V AC, 0...100% load
PARD (20 MHz) ❶	< 150 mVpp 25 °C
Rise time	< 100 ms rated voltage, 100% load, 25 °C
Start-up time	< 1 000 ms rated voltage, 100% load, 25 °C
Hold-up time	> 20 ms 115 V AC, 230 V AC, 100% load, 25 °C
Dynamic response	± 5% 10...100% load
Start-up with capacitive loads	max. 10 000 µF

Input circuit

Rated input voltage	100...240 V AC 125...250 V DC
Input voltage range	85...264 V AC 120...375 V DC
Rated input frequency	50...60 Hz
Input frequency range	47...63 Hz
Input current	< 2,5 A 115 V AC < 1,3 A 230 V AC
Efficiency at 100% load	> 90% 115 V AC > 92% 230 V AC
Max. inrush current (cold start from -40 °C)	< 35 A 115 V AC, 230 V AC
Power factor	conform to EN 61000-3-2
Leakage current	< 1 mA 240 V AC

General data

Dimensions (L x W x H)	121 x 85 x 124,1 mm
Weight	1 100 g
Ambient temperature • storage	-40...+85 °C
• operating	-25...+80 °C (cold start at -40 °C)
Power de-rating	> 50 °C de-rate power by 2,5% / °C, vertical mounting
	> 40 °C de-rate power by 2,5% / °C, horizontal mounting
Relative humidity	5...95% (non-condensation and/or icing)
Operating altitude	0...2 500 m
Shock resistance (non-operating)	IEC 60068-2-27, 30G (300 m/s²) for a duration of 18 ms
Vibration resistance (non-operating)	IEC 60068-2-6, 10...500 Hz at 30 m/s² (peak: 3G), 60 min. per axis for all directions (X, Y, Z)
Bump	IEC 60068-2-29, 11 ms / 10 gn
Insulation pollution degree	2
Galvanic isolation • input - output	4 000 V AC
• input - ground	1 500 V AC
• output - ground	1 500 V AC

Protections

Overvoltage	< 32 V ±10% SELV output, Hiccup mode ❷
Overload / overcurrent	> 150% of rated load current, Hiccup mode ❷
Overtemperature	< 80 °C ambient temperature, 100% load, Hiccup mode ❷
Short circuit	Hiccup mode ❷
Cover protection category	IP 20 EN 60529
Protection against shock	Class I ❸

❶ PARD (20 MHz): Periodic and Random Deviation from the power supply's output DC voltage measured at 20 MHz bandwidth. ❷ Hiccup mode: non-latching, auto-recovery when the fault is removed. ❸ Connection of PE protective wire is not required.

Reliability data

MTBF (mean time between failures)	> 500 000 h Telcordia SR-332, I/P: 115 V AC, O/P: 100% load, Ta: 25 °C
Expected lifetime of capacitors	10 years 115 V AC, 230 V AC, 50% load, 40 °C
Safety standards, directives	
Electrical safety	EN 60950-1, EN 60204-1, IEC 62103
CE	EMC Directive 2014/30/EU Low Voltage Directive 2014/35/EU
Material and parts	RoHS Directive 2011/65/EU
EMC according to Directive 2014/30/EU	
EMC (emissions)	CISPR 32, EN 55032, EN 55011, FCC Title 47: Class B ❻
Immunity to:	EN 55024
• electrostatic discharge (IEC 61000-4-2)	level 4, criteria A ❹ air discharge: 15 kV, contact discharge: 8 kV
• radiated field (IEC 61000-4-3)	level 3, criteria A ❹ 80 MHz...1 GHz, 10 V/M with 1 kHz tone / 80% modulation
• electrical fast transient / burst (IEC 61000-4-4)	level 3, criteria A ❹ 2 kV
• surge (IEC 61000-4-5)	level 3, criteria A ❹ common mode: 2 kV, differential mode: 1 kV ❺
• conducted (IEC 61000-4-6)	level 3, criteria A ❹ 150 kHz...80 MHz, 10 Vrms
• power frequency magnetic fields (IEC 61000-4-8)	level 3, criteria A ❹ 30 A/m
• voltage dips (IEC 61000-4-11)	level 3, criteria A ❹ 100% dip, 1 cycle (20 ms), self recoverable
• low energy pulse test (ring wave) (IEC 61000-4-12)	level 3, criteria A ❹ common mode: 2 kV, differential mode: 1 kV ❺
Harmonic current emission	IEC/EN 61000-3-2, Class A
Voltage fluctuation and flicker	IEC/EN 61000-3-3
Low voltage power supplies, DC output	EN 61204-3

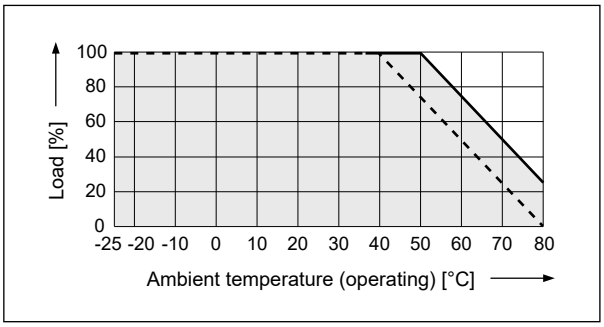
❹ Criteria A: normal performance within the specification limits. ❺ Common mode: asymmetrical (line to earth); differential mode: symmetrical (line to line). ❻ This is a Class B product. This product meets a strict regulations about the limits of EMC interferences required in a residential environment, regardless of its use in a commercial and light industrial environment.

Mounting

Power supplies **RZI240-24-P** ❼ are designed for direct mounting on 35 mm rail mount acc. to EN 60715 - they are delivered ready to install. Operational position - input terminals downwards. **Connections:** conductor cross section: 1,5...4,0 mm² (16...12 AWG), input terminals: plugable connector, 3 screws M4 (15 A / 300 V), output terminals: plugable connector, 4 screws M4 (15 A / 300 V).

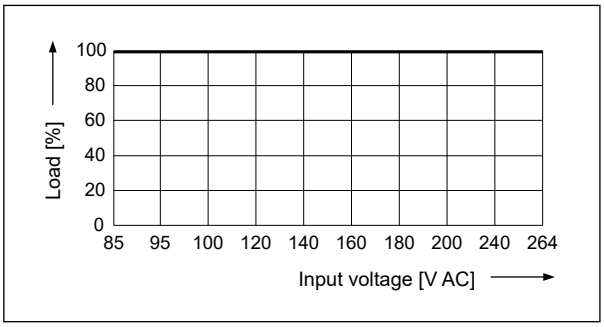
❼ Safety instruction for mounting: to guarantee sufficient convection cooling, keep a distance of 50 mm above and below the device as well as a lateral distance of 20 mm to other units.

De-rating for vertical mounting orientation.
> 50 °C de-rate power by 2,5% / °C [—]
De-rating for horizontal mounting orientation.
> 40 °C de-rate power by 2,5% / °C [- - -] Fig. 1

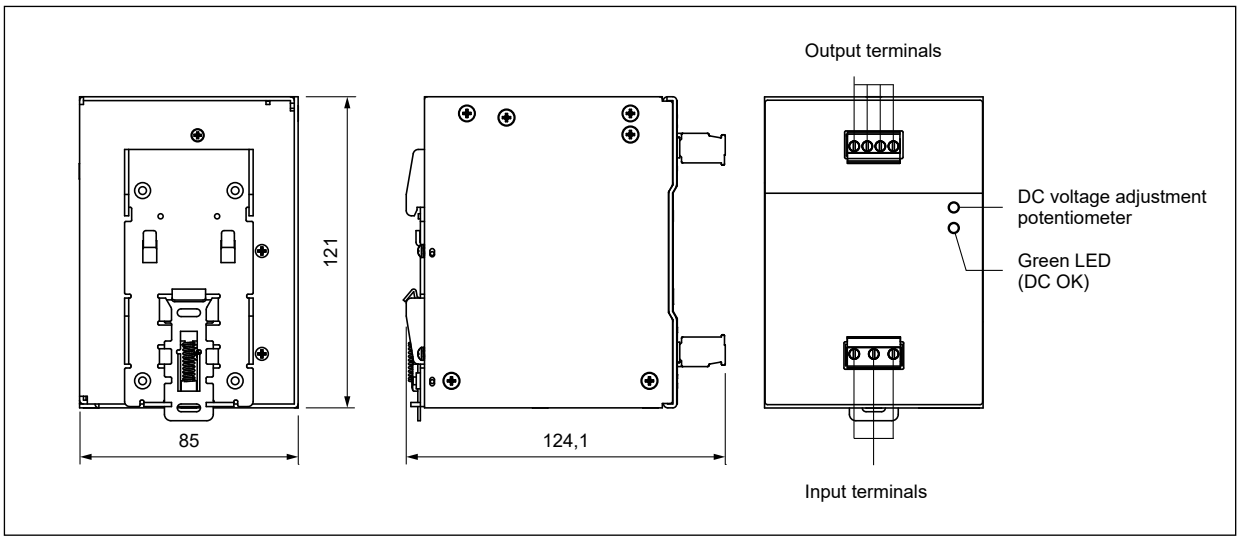


Output de-rating depending on input voltage

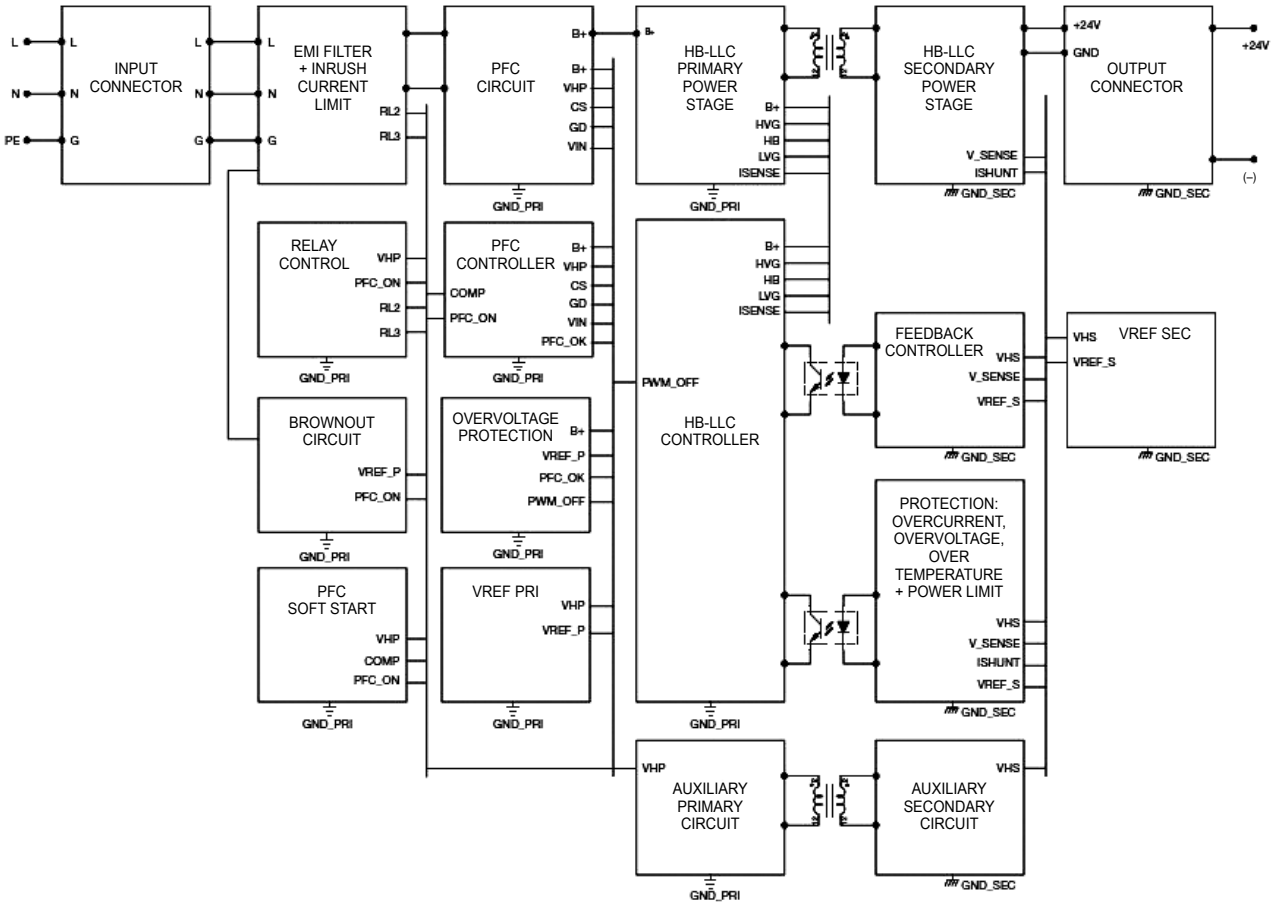
Fig. 2



Dimensions



Block diagram



Note: all parameters are specified at 25 °C ambient unless otherwise indicated.
"Power supplies - basic information" - see pages 664-670.

- Direct mounting on 35 mm rail mount acc. to EN 60715
- Wide range of ambient temperature: from -25 °C up to +75 °C
- Cover - industrial, compact aluminum • Conformal coating PCBA
- Indicator of output voltage presence - green LED (DC OK)
- Cooled by free air flow (convection)
- Applications: in residential environment, in industrial automation, for supplying packing, construction, weaving machines etc.
- Recognitions, certifications, directives: RoHS, CE EAC

Output circuit

Rated output voltage	24 V DC
Output voltage tolerance	± 2% (initial set point tolerance from factory)
Output voltage adjustment range	22...28 V DC
Output current	20 A
Rated output power	480 W
Line regulation (typical value)	< 0,5% 85...264 V AC, 100% load
Load regulation (typical value)	< 1% 85...264 V AC, 0...100% load
PARD (20 MHz) ❶	< 150 mVpp 25 °C
Rise time	< 100 ms rated voltage, 100% load, 25 °C
Start-up time	< 1 000 ms rated voltage, 100% load, 25 °C
Hold-up time	> 20 ms 115 V AC, 230 V AC, 100% load, 25 °C
Dynamic response	± 5% 10...100% load
Start-up with capacitive loads	max. 10 000 µF

Input circuit

Rated input voltage	100...240 V AC 125...250 V DC
Input voltage range	85...264 V AC 120...375 V DC
Rated input frequency	50...60 Hz
Input frequency range	47...63 Hz
Input current	< 5 A 115 V AC < 3 A 230 V AC
Efficiency at 100% load	> 91% 115 V AC > 92% 230 V AC
Max. inrush current (cold start from -40 °C)	< 35 A 115 V AC, 230 V AC
Power factor	> 0,96 115 V AC > 0,95 230 V AC
Leakage current	< 3 mA 240 V AC

General data

Dimensions (L x W x H)	121 x 144 x 118,6 mm
Weight	1 370 g
Ambient temperature • storage	-40...+85 °C
• operating	-25...+75 °C (cold start at -40 °C)
Power de-rating	> 50 °C de-rate power by 2,5% / °C, vertical mounting
	> 70 °C de-rate power by 5% / °C, vertical mounting
Relative humidity	5...95% (non-condensation and/or icing)
Operating altitude	0...2 500 m
Shock resistance (non-operating)	IEC 60068-2-27, 30G (300 m/s²) for a duration of 18 ms
Vibration resistance (non-operating)	IEC 60068-2-6, 10...500 Hz at 30 m/s² (peak: 3G), 60 min. per axis for all directions (X, Y, Z)
Bump	IEC 60068-2-29, 11 ms / 10 gn
Insulation pollution degree	2
Galvanic isolation • input - output	4 000 V AC
• input - ground	1 500 V AC
• output - ground	1 500 V AC

Protections

Overvoltage	< 32 V ±10% SELV output, Hiccup mode ❷
Overload / overcurrent	> 200% of rated load current, Hiccup mode ❷
Overtemperature	< 80 °C ambient temperature, 100% load, Hiccup mode ❷
Short circuit	Hiccup mode ❷
Cover protection category	IP 20 EN 60529
Protection against shock	Class I ❸

❶ PARD (20 MHz): Periodic and Random Deviation from the power supply's output DC voltage measured at 20 MHz bandwidth. ❷ Hiccup mode: non-latching, auto-recovery when the fault is removed. ❸ Connection of PE protective wire is not required.

Reliability data

MTBF (mean time between failures)	> 500 000 h Telcordia SR-332, I/P: 115 V AC, O/P: 100% load, Ta: 25 °C
Expected lifetime of capacitors	10 years 115 V AC, 230 V AC, 50% load, 40 °C
Safety standards, directives	
Electrical safety	EN 60950-1, EN 60204-1, IEC 62103
CE	EMC Directive 2014/30/EU Low Voltage Directive 2014/35/EU
Material and parts	RoHS Directive 2011/65/EU
EMC according to Directive 2014/30/EU	
EMC (emissions)	CISPR 32, EN 55032, EN 55011, FCC Title 47: Class B ❻
Immunity to:	EN 55024
• electrostatic discharge (IEC 61000-4-2)	level 4, criteria A ❹ air discharge: 15 kV, contact discharge: 8 kV
• radiated field (IEC 61000-4-3)	level 3, criteria A ❹ 80 MHz...1 GHz, 10 V/M with 1 kHz tone / 80% modulation
• electrical fast transient / burst (IEC 61000-4-4)	level 3, criteria A ❹ 2 kV
• surge (IEC 61000-4-5)	level 3, criteria A ❹ common mode: 2 kV, differential mode: 1 kV ❺
• conducted (IEC 61000-4-6)	level 3, criteria A ❹ 150 kHz...80 MHz, 10 Vrms
• power frequency magnetic fields (IEC 61000-4-8)	level 3, criteria A ❹ 30 A/m
• voltage dips (IEC 61000-4-11)	level 3, criteria A ❹ 100% dip, 1 cycle (20 ms), self recoverable
• low energy pulse test (ring wave) (IEC 61000-4-12)	level 3, criteria A ❹ common mode: 2 kV, differential mode: 1 kV ❺
Harmonic current emission	IEC/EN 61000-3-2, Class A
Voltage fluctuation and flicker	IEC/EN 61000-3-3
Low voltage power supplies, DC output	EN 61204-3

❹ Criteria A: normal performance within the specification limits. ❺ Common mode: asymmetrical (line to earth); differential mode: symmetrical (line to line). ❻ This is a Class B product. This product meets a strict regulations about the limits of EMC interferences required in a residential environment, regardless of its use in a commercial and light industrial environment.

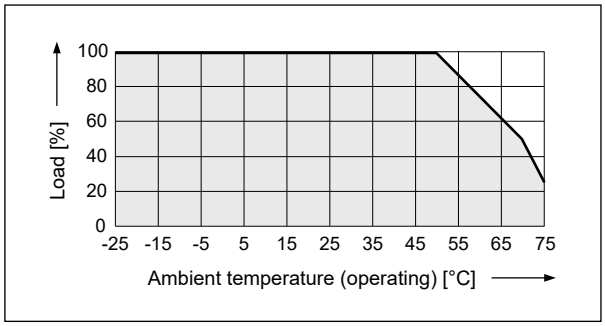
Mounting

Power supplies **RZI480-24-P** ❼ are designed for direct mounting on 35 mm rail mount acc. to EN 60715 - they are delivered ready to install. Operational position - input terminals downwards. **Connections:** conductor cross section: input - 0,75...6,0 mm² (18...10 AWG), output - 4,0...6,0 mm² (12...10 AWG), input terminals: plugable connector, 3 screws M3 (30 A / 300 V), output terminals: plugable connector, 4 screws M3 (30 A / 300 V).

❼ Safety instruction for mounting: to guarantee sufficient convection cooling, keep a distance of 50 mm above and below the device as well as a lateral distance of 20 mm to other units.

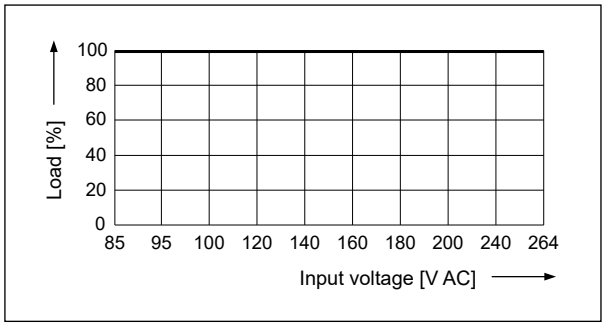
De-rating for vertical mounting orientation.
> 50 °C de-rate power by 2,5% / °C
> 70 °C de-rate power by 5% / °C

Fig. 1

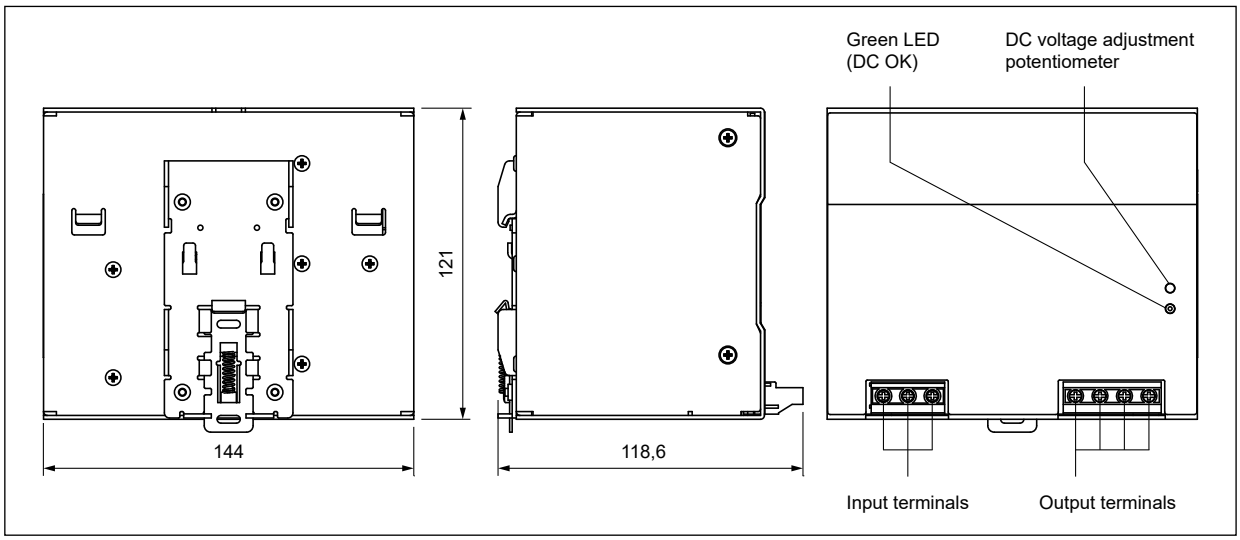


Output de-rating depending on input voltage

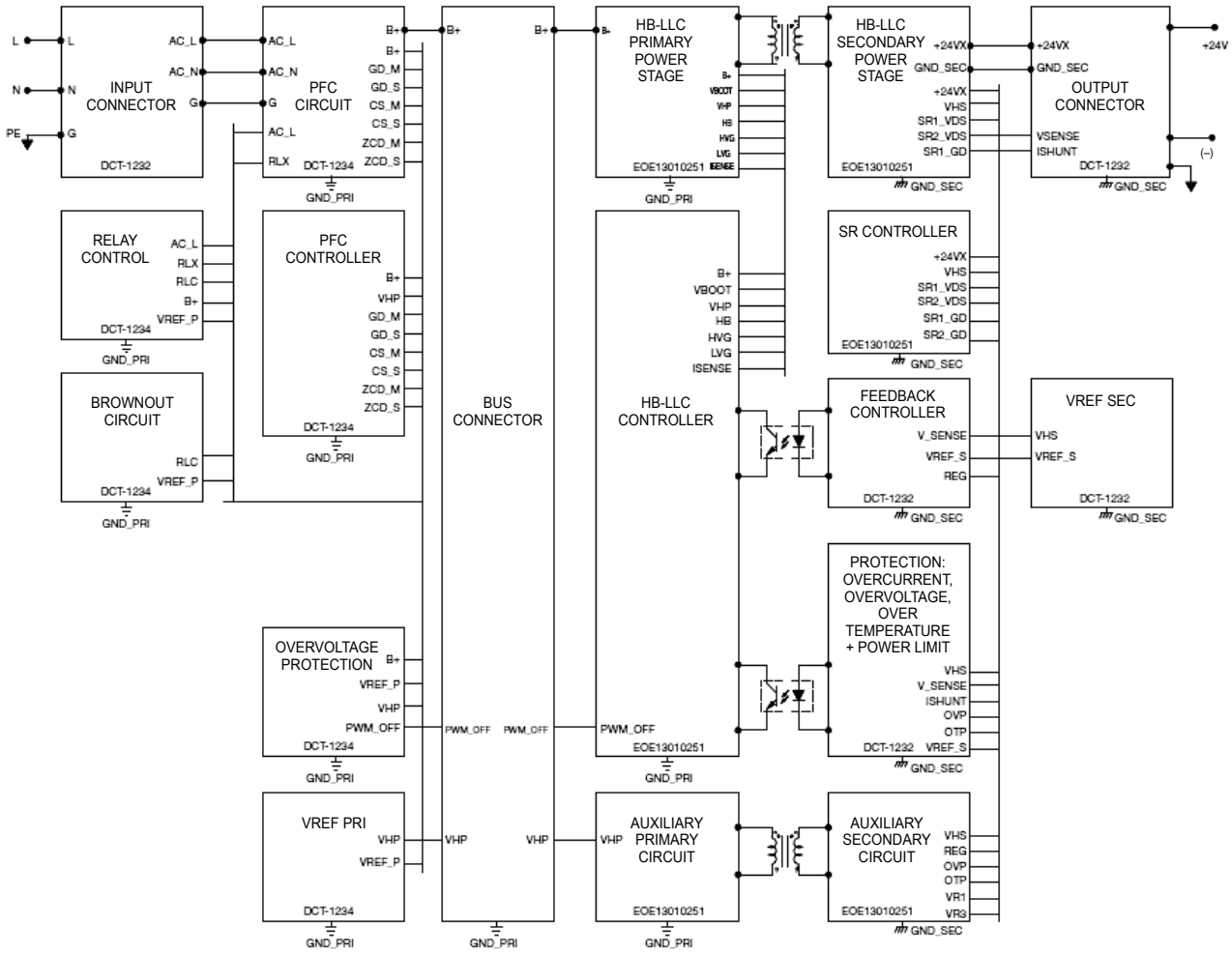
Fig. 2



Dimensions

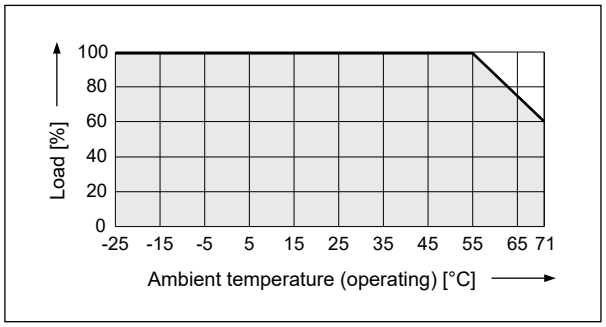


Block diagram

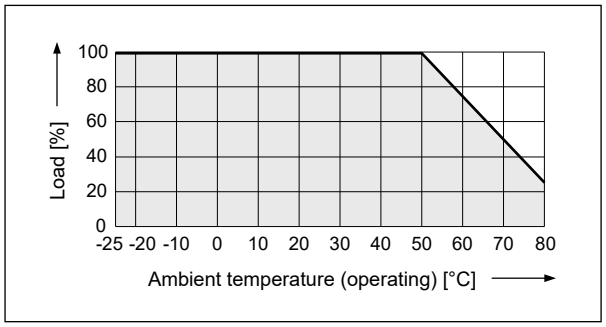


Note: all parameters are specified at 25 °C ambient unless otherwise indicated.
"Power supplies - basic information" - see pages 664-670.

RZI...M Fig. 1
De-rating for vertical mounting orientation.
> 55 °C de-rate power by 2,5% / °C



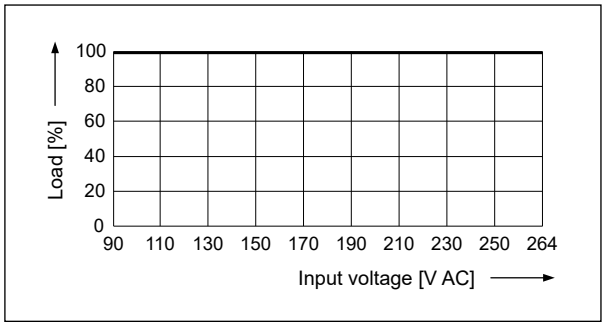
RZI...P Fig. 2
De-rating for vertical mounting orientation.
> 50 °C de-rate power by 2,5% / °C



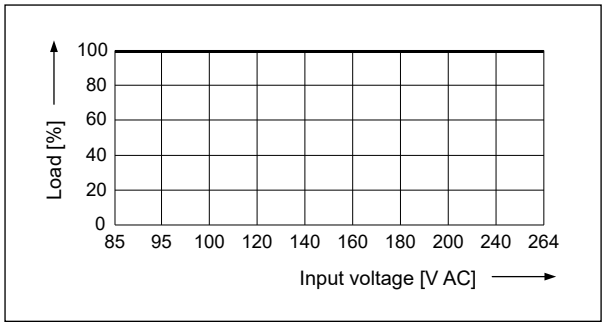
Note:

1. Power supply components may degrade, or be damaged, when the power supply is continuously used outside a shaded area, refer to the graph shown in Fig. 1, 2.
2. For **RZI...M**: if the output capacity is not reduced when the ambient temperature is > 55 °C, the device may run into overtemperature protection. When activated, the output voltage will go into Latch-off mode and may be recovered by AC power recycle.
   For **RZI...P**: if the output capacity is not reduced when ambient temperature is > 50 °C, the device will run into overtemperature protection. When activated, the output voltage will go into Bouncing mode and will recover when the ambient temperature is lowered or the load is reduced as far as necessary to keep the device in working condition.
3. In order for the device to function in the manner intended, it is also necessary to keep a safety distance from adjacent units while the device is in operation (see "Safety distances", page 3).
4. Depending on the ambient temperature and output load delivered by the power supply, the device cover can be very hot!
5. If the device is to be mounted in any other orientation, please do not hesitate to contact us for more details.

RZI...M Fig. 3
Output de-rating depending on input voltage

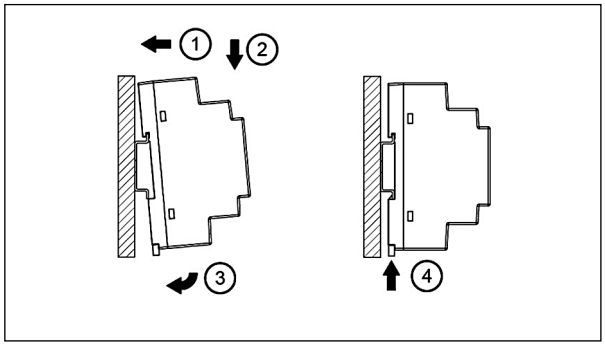


RZI...P Fig. 4
Output de-rating depending on input voltage

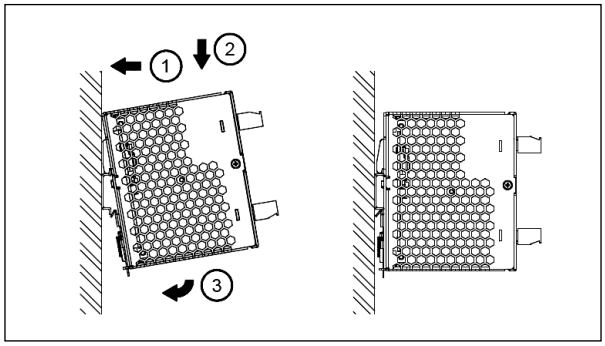


No output power de-rating across the entire input voltage range (Fig. 3, 4).

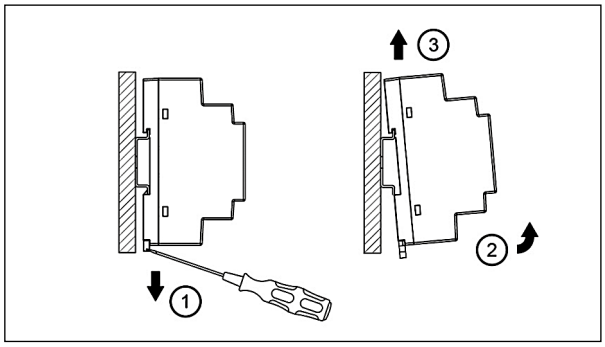
RZI...M Fig. 5
Mounting (35 mm rail mount)



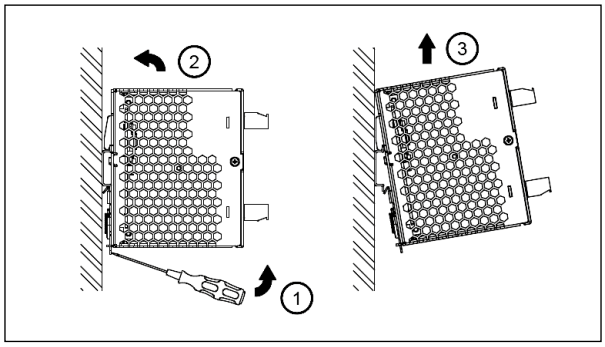
RZI...P Fig. 6
Mounting (35 mm rail mount)



RZI...M Fig. 7
Dismounting (35 mm rail mount)



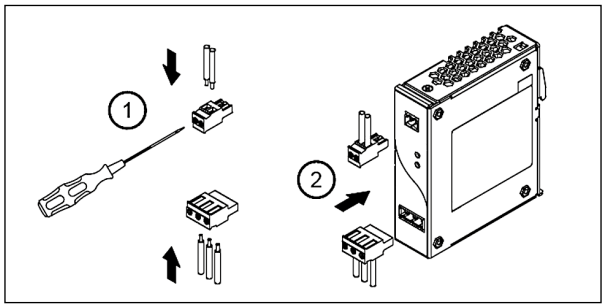
RZI...P Fig. 8
Dismounting (35 mm rail mount)



Snap on the 35 mm rail, as shown in Fig. 5, 6:
- tilt the unit upwards and insert it onto the 35 mm rail,
- push downwards until stopped,
- press against the bottom front side for locking,
- shake the unit slightly to ensure that it is secured.

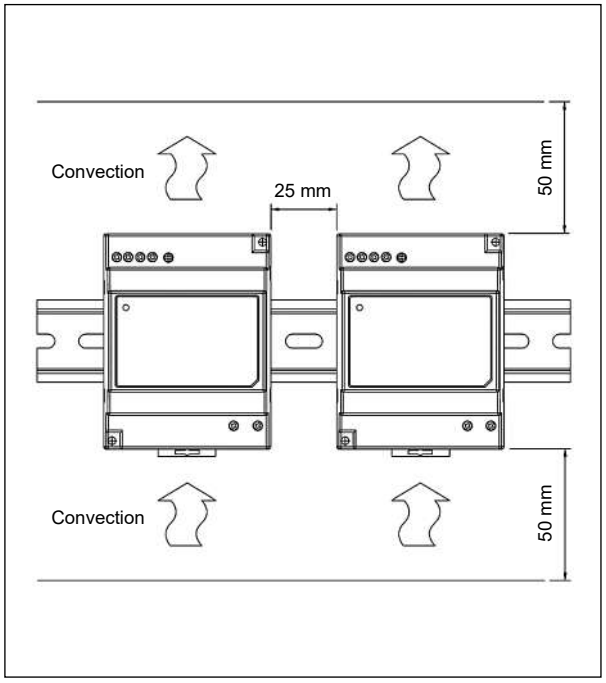
To uninstall, as shown in Fig. 7, 8:
- pull or slide down the latch with screw driver,
- slide the power supply unit in the opposite direction,
- release the latch,
- pull out the power supply unit from the rail.

RZI...P Fig. 9
Connection wires

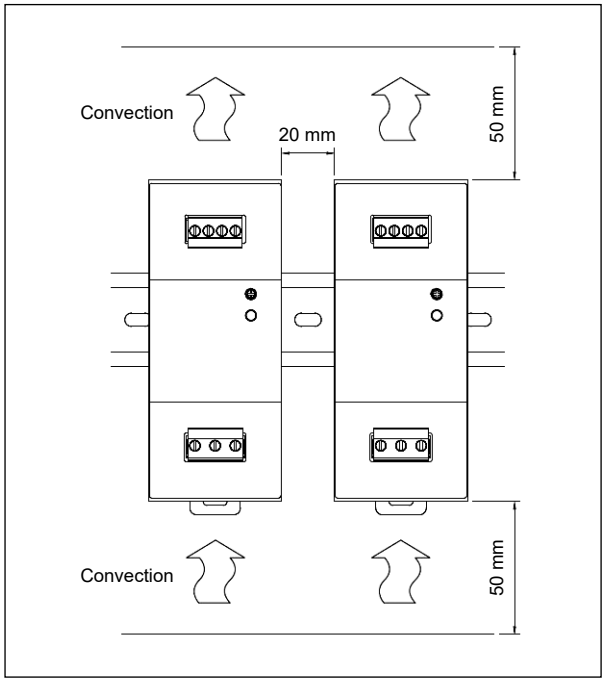


Tighten the wire to cover before plugging into the terminal block connection (Fig. 9). In accordance to EN 60950, flexible cables require ferrules. Use appropriate copper cables designed to sustain operating temperature of 60...75 °C or more, to fulfill EN requirements.

RZI...M Fig. 10
Safety distances



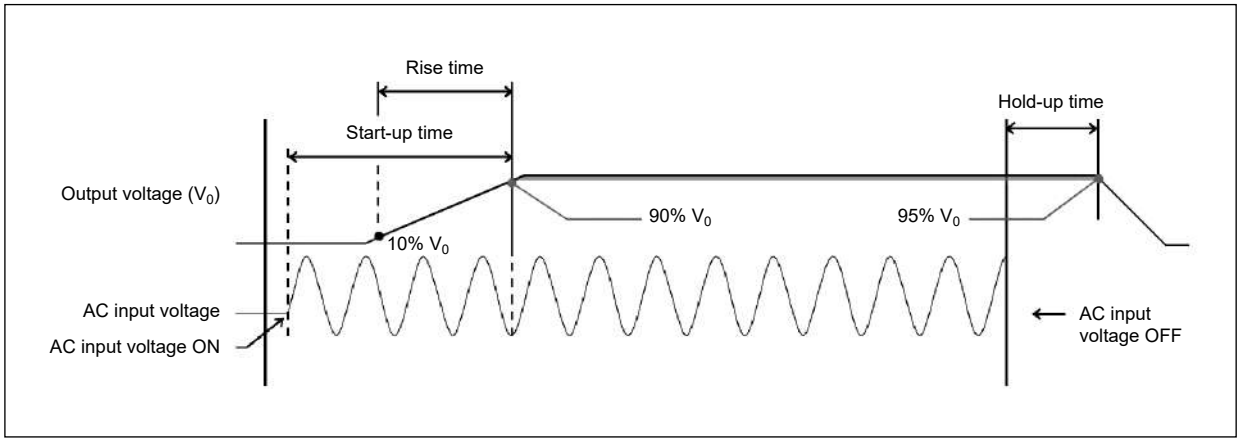
RZI...P Fig. 11
Safety distances



Note:

1. ALWAYS switch the mains of input power OFF before connecting and disconnecting the input voltage to the unit. If the mains are not turned OFF, there is risk of explosion / severe damage.
2. To guarantee sufficient convection cooling, keep a distance of 50 mm above and below the device as well as a lateral distance from other units: 25 mm for **RZI...M** (Fig. 10) or 20 mm for **RZI...P** (Fig. 11).
3. Note that the cover of the device can become very hot depending on the ambient temperature and load of the power supply. Risk of burns!
4. DO NOT insert any objects into the unit.
5. Hazardous voltages may be present for up to 5 minutes after the input mains voltage is disconnected. Do not touch the unit during this time.
6. The power supplies unit should be installed in minimum IP 54 rated cover.
7. The power supplies are built in units and must be installed in a cabinet or room (condensation-free environment and indoor location) that is relatively free of conductive contaminants.
8. For **RZI...P**: only plug in and unplug connectors when power is turned off!

RZI...M, RZI...P Fig. 12
Start-up time, rise time, hold-up time

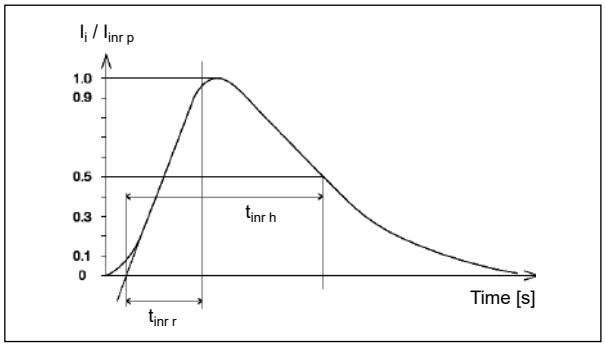


Start-up time
The time required for the output voltage (V_0) to reach 90% of its set value, after the input voltage is applied (Fig. 12).

Rise time
The time required for the output voltage (V_0) to change from 10% up to 90% of its set value (Fig. 12).

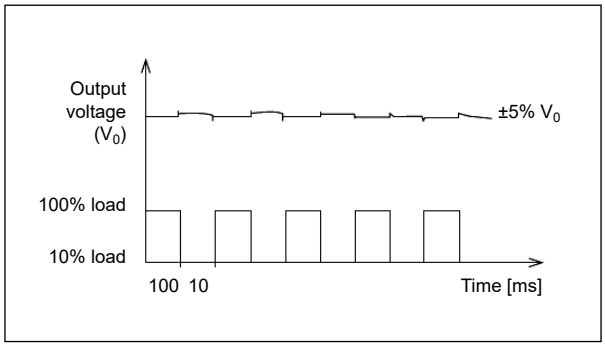
Hold-up time
Hold-up time is the time when the AC input collapses and output voltage retains regulation for a certain period of time. The time required for the output voltage (V_0) to reach 95% of its set value, after the input voltage is removed (Fig. 12).

RZI...M, RZI...P Fig. 13
Inrush current



Inrush current is the peak, instantaneous, measured input current, which occurs when the input voltage is first applied. For AC input voltages, the maximum peak value of inrush current will occur during the first half cycle of the applied AC voltage. This peak value decreases exponentially during subsequent cycles of AC voltage (Fig. 13).

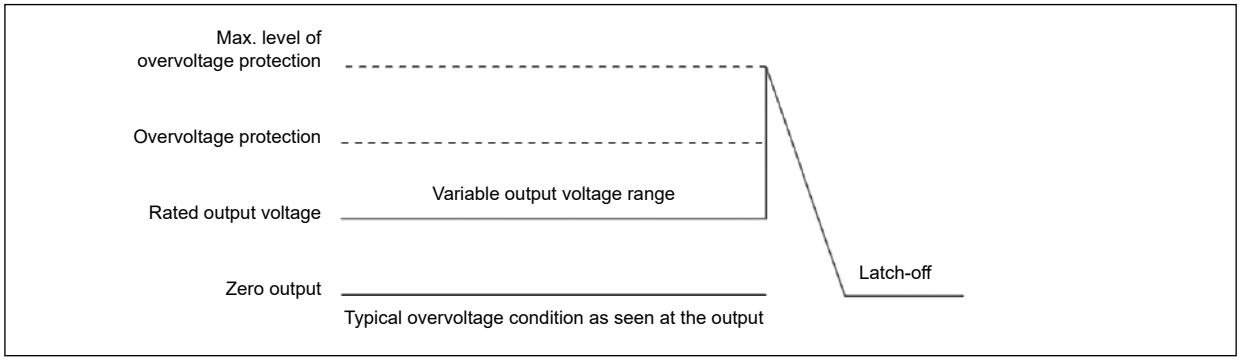
RZI...M, RZI...P Fig. 14
Dynamic response



The power supply output voltage (V_0) will remain within ±5% of its steady state value, when subjected to a dynamic load from 10% up to 100% of its rated current (Fig. 14).

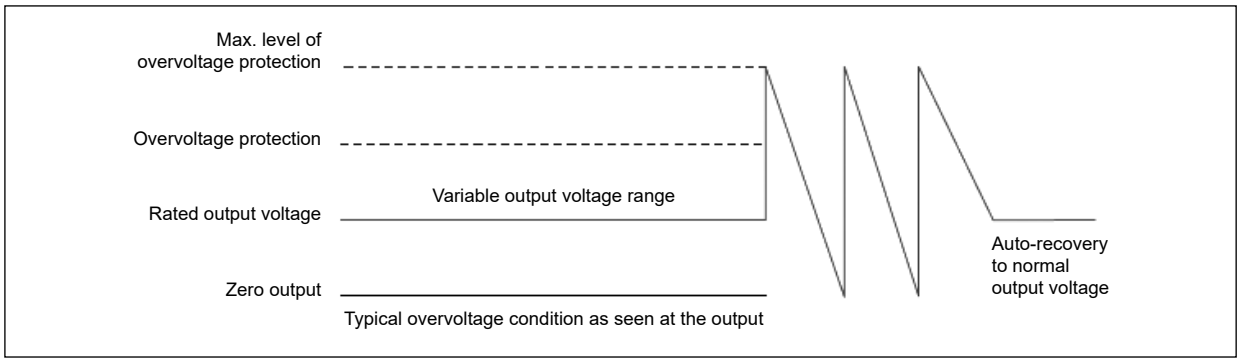
RZI...M
Overvoltage protection

Fig. 15



RZI...P
Overvoltage protection

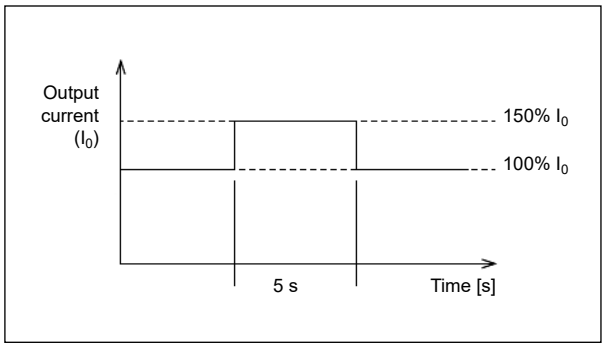
Fig. 16



The power supply's overvoltage circuit will be activated when its internal feedback circuit fails (Fig. 15, 16). The output voltage shall not exceed its specifications defined in the data sheets under "Protections".

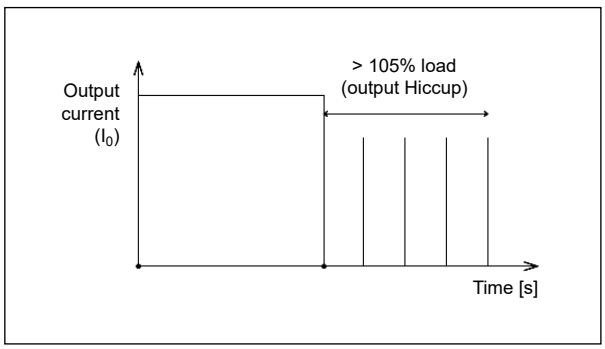
RZI...P
Surge load

Fig. 17



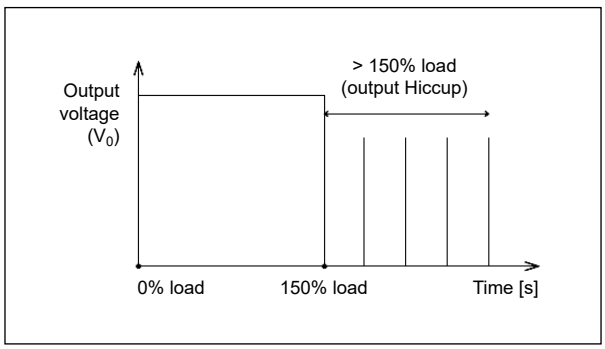
It is the reserve power available constantly that allows reliable startup of loads at high inrush current. After the output has reached its steady state set value, the power supply can support surge loads of up to 150% of maximum rated load (max. I_0), for a maximum duration of 5 seconds. The maximum allowed rate of load change is 0,1 amps per microseconds, and the voltage can vary ±5% from the set value during the duration of the surge load (Fig. 17).

RZI...M Fig. 18
Overload / overcurrent protection



he power supply's overload / overcurrent protection will be activated when output current rapidly exceeds 105% of maximum rated load (max. I_0). In such occurrence, once the power supply has reached its maximum power limit, the protection is activated and the power supply will go into Hiccup mode (auto-recovery). The power supply will recover once the fault condition of the overload / overcurrent protection is removed and rated load (I_0) is back within the specifications (Fig. 18).

RZI...P Fig. 19
Overload / overcurrent protection



The power supply's overload / overcurrent protection will be activated when output current exceeds 150% of maximum rated load (max. I_0). In such occurrence, the output voltage (V_0) will start to droop and once the power supply has reached its maximum power limit, the protection is activated and the power supply will go into Hiccup mode (auto-recovery). The power supply will recover once the fault condition of the overload / overcurrent protection is removed and rated load (I_0) is back within the specifications (Fig. 19).
Additionally, if the rated load (I_0) is < 150%, but > 100%, for a prolong period of time (depending on the load), the overtemperature protection will be activated, due to high temperature on critical components. The power supply will then go into Hiccup mode until the fault is removed.

RZI...M, RZI...P
Overtemperature protection

For **RZI...M**: in the event of a higher operating condition at 100% load, the power supply will run into overtemperature protection when the operating temperature is beyond what is recommended in the de-rating graph. When activated, the output voltage will go into Latch-off mode until the component temperature cools down and the AC power is recycled.

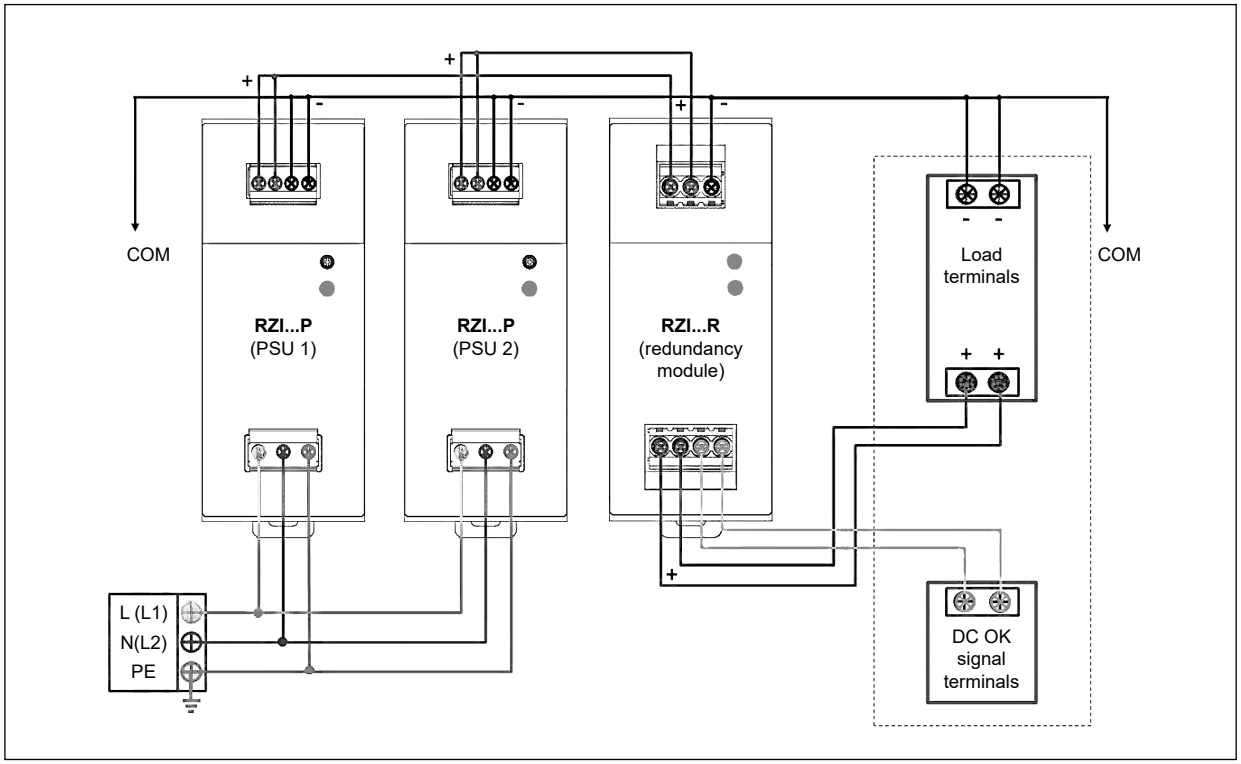
For **RZI...P**: overtemperature protection is activated, when the overload condition persists for an extended duration and the output current is below the overload trigger point, but > 100% load. In the event of a higher operating condition at 100% load, the power supply will run into overtemperature protection, when the ambient temperature is > 50 °C. When activated, the output voltage will go into Bouncing mode until the operating ambient temperature drops to 50 °C or output capacity is reduced as recommended in the de-rating graph.

RZI...M, RZI...P
Short circuit protection

The power supply's output overload / overcurrent protection also provides protection against short circuits. When a short circuit occurs, the output current will operate in Hiccup mode, as shown in Fig. 18, 19. The power supply will return to normal operation after the short circuit is removed.

RZI...P
Redundancy / parallel operation connection diagram

Fig. 20



Redundancy operation

In order to ensure proper redundancy operation for the power supply unit **RZI...P**, ensure that the output voltage difference between the two units is kept at 0,45...0,5 V for 24 V supplies. Follow simple steps given below to verify:

- step 1: measure output voltage (V_0) of RZI...P(1) and RZI...P(2). If RZI...P(1) is the master unit, then V_0 of RZI...P(1) must be higher than V_0 of RZI...P(2). In order to set the output voltage, connect the power supply to 50% load and set the RZI...P(1) and RZI...P(2) output voltage,
- step 2: connect the right **RZI...R** module, 20 A as per the system requirement to the power supply units RZI...P(1) and RZI...P(2) at $V_{in}1$ and $V_{in}2$ respectively,
- step 3: connect the system load from V_{out}. Please note that V_{out} (output voltage from RZI...R module) will be equal V_0 (output voltage of power supply) minus V_{drop} (in RZI...R module). V_{drop} will vary from 0,6 V up to 0,9 V (typical 0,65 V) depending on the load current and ambient temperature.

Parallel operation

These **RZI...R** modules can also be used for parallel function in order to increase the output power by N+1 (e.g. 2,5 A + 2,5 A = 5 A or 2,5 A + 2,5 A + 2,5 A = 7,5 A) or current sharing, and thus increasing the power supply and system reliability. Though the RZI...R is not designed for current sharing, a good current sharing between two power supplies can be achieved by following simple steps as below (see Fig. 20):

- step 1: set output load condition for both supplies at 50% and measure the output voltages,
- step 2: adjust output voltages to the same level or within ±25 mV difference,
- step 3: connect RZI...P(1) and RZI...P(2) with the RZI...R module and measure at $V_{in}1$ and $V_{in}2$ to verify the voltage difference. Ensure the voltages are within ±25 mV,
- step 4: V_{out} (output voltage from RZI...R module) will be equal V_0 (output voltage of power supply) minus V_{drop} (in RZI...R module). V_{drop} will vary from 0,6 V up to 0,9 V (typical 0,65 V) depending on the load current and ambient temperature.

PRECAUTIONS:
1. Ensure that the parameters of the product described in its specification provide a safety margin for the appropriate operation of the device or system and never use the product in circumstances which exceed the parameters of the product. **2.** Never touch any live parts of the device. **3.** Ensure that the product has been connected correctly. An incorrect connection may cause malfunction, excessive heating or risk of fire. **4.** In case of any risk of any serious material loss or death or injuries of humans or animals, the devices or systems shall be designed so to equip them with double safety system to guarantee their reliable operation.

You have not found the relay you wanted? The catalog does not show the information about the switching capacity for the type of load you are looking for? Detailed contact data is presented on the last page of the catalog and at **www.relpol.com.pl**

Trade offer of Relpol S.A.


subminiature relays


miniature relays


industrial relays


interface relays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plug-in sockets for relays


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bistable - impulse relays


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signal lamps


solid state relays


installation contactors


power supplies


overvoltage arresters

Declaration of conformity

RoHS

Relpol S.A. hereby confirms that relays and plug-in sockets for relays supplied by our company meet the requirements laid down in **Directive 2011/65/EU** of the European Parliament and of the Council of 8 June 2011 on the restriction of use of certain hazardous substances in electrical and electronic equipment and **Commission Delegated Directive (EU) 2015/863** of 31 March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances.

Date: 07.05.2019

Quality and Environmental Management
Department Director
Sylwia Sochoń-Miezio

RoHS conform

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Export Sales Department
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rated switching capacity: from 5 A to 80 A, mounting: to plug-in sockets
on 35 mm rail mount acc. to EN 60715 or on panel mounting, for PCB

interface relays
rated switching capacity: from 0,05 A to 16 A, number of contacts: 1, 2, 3, 4

relays for railroad industry
for rail-vehicles and railroad tractions,
rated switching capacity: from 6 A to 16 A, number of contacts: 1, 2, 3, 4

plug-in sockets for relays
for PCB, for 35 mm rail mount acc. to EN 60715 or on panel mounting

programmable relays
versions: 8 inputs / 4 outputs, 16 inputs / 8 outputs, with LCD display,
without display, supply voltages: 12, 24, 220 V DC, 230 V AC,
programming: LAD, STL, LED indicators of the relay and input / output status

installation relays
rated switching capacity: 8 A, 16 A, number of contacts: 1, 2, 3

bistable - impulse relays
type "ON-OFF", rated switching capacity: 8 A, 16 A, number of contacts: 1, 2

time relays
single- and multifunction time relays, wide range of time adjustments

monitoring relays
voltage, current, motor temperature monitoring

signal lamps
single-phase 130...260 V AC/DC (one LED), three-phase 3(N)~ 400/230 V AC (three LEDs)

solid state relays
rated load currents: from 0,1 A to 80 A, zero-crossing or random-on switching

installation contactors
rated switching power: from 2,2 kW to 15 kW (at 400 V AC3)

power supplies
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overvoltage arresters
classes I, II and III, available with changeover signal contact

PRECAUTIONS

1. Ensure that the parameters of the product described in its specification provide a safety margin for the appropriate operation of the device or system and never use the product in circumstances which exceed the parameters of the product.
2. Never touch any live parts of the device.
3. Ensure that the product has been connected correctly. An incorrect connection may cause malfunction, excessive heating or risk of fire.
4. In case of any risk of any serious material loss or death or injuries of humans or animals, the devices or systems shall be designed so to equip them with double safety system to guarantee their reliable operation.

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