relpol® S.A.

Catalogue 2021

Automation is our passion

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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, 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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Signal lamps

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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																		
										RSR30		1 A, 2 A, 2,5 A, 4 A						
										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	direct, with socket	–	with socket	–
RM699BH	direct	–	–	–
RM84	direct, with socket	with socket	with socket	–
RM85	direct, with socket	with socket	with socket	–
RM85 ❶	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 ❷	direct	–	–	–

❶ **RM85** for switching higher voltages ❷ **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 ❸	with socket	–	–
RUC faston 4,8x0,5	direct	with socket ❹ direct	with socket ❹ direct ❺	on request	4,8 x 0,5 mm
RUC faston 6,3x0,8	–	direct	direct ❺	on request	6,3 x 0,8 mm
RUC-M	direct	with socket ❹ direct	with socket ❹ direct ❺	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	–	–

❸ Available sockets for connection behind panel mounting - GZ14Z, GZ14P ❹ 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 ❺ 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			
RSR30	direct, with socket	–	with socket
RSR32	direct	–	–
RSR35	direct	–	–
RSR52	–	with heatsink direct	with heatsink
RSR62	–	with heatsink	with heatsink
RSR72	–	–	direct ❻

❻ 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

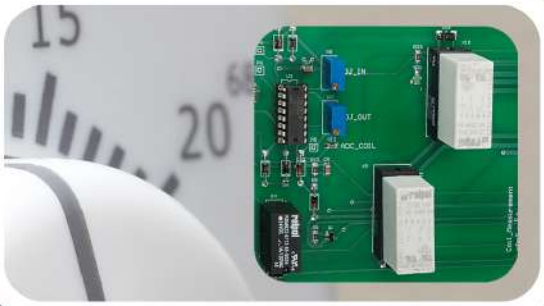
Relays
for electronics

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...

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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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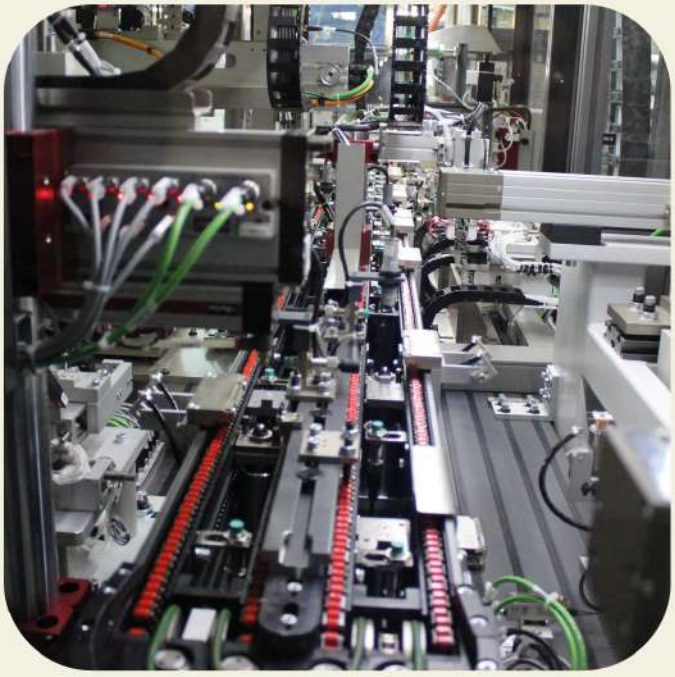

Interface relays (relay coupling modules)

- 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

page 216

R15 - contacts 3 CO

page 216

R15 - contacts 4 CO

page 221

Industrial relays - electromagnetic

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

page 225

RUC faston 6,3 x 0,8

page 225

Industrial relays - electromagnetic

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

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)

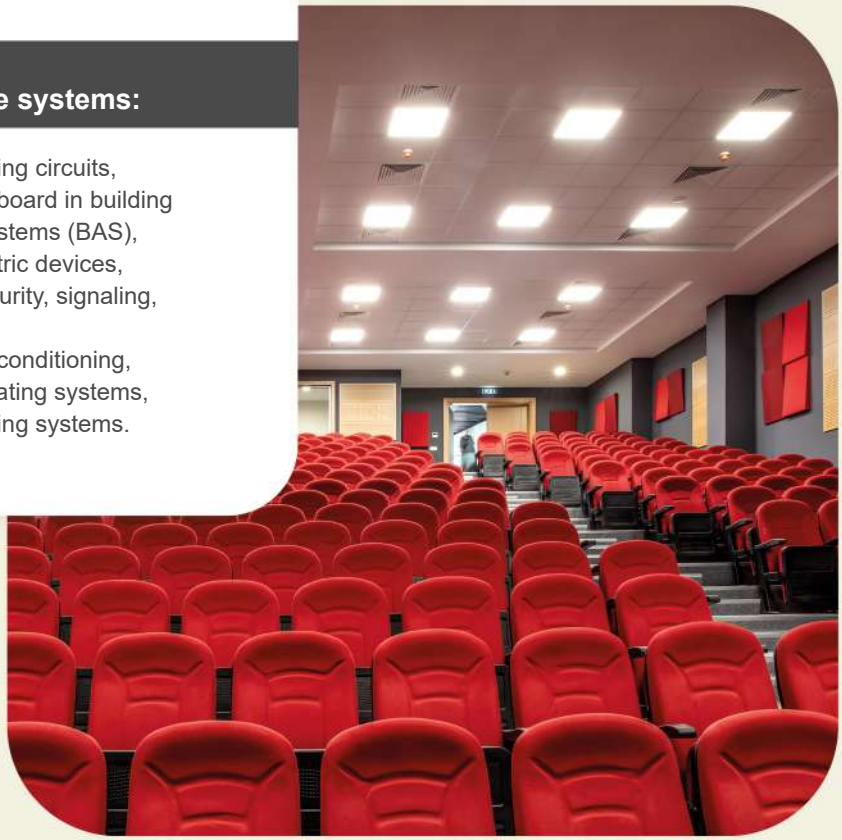
Installation relays

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

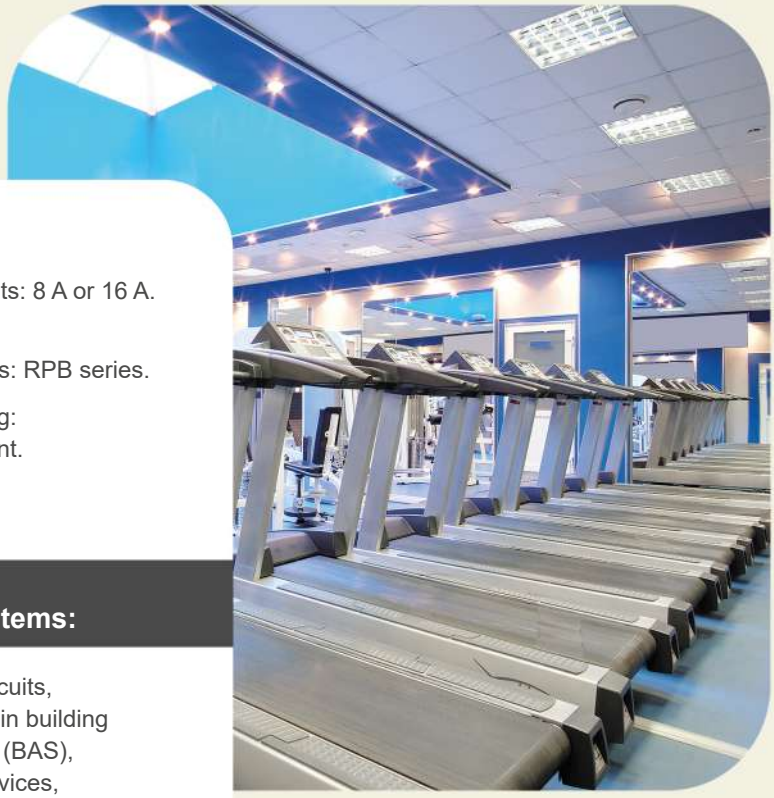
Rated load:
1 NO - **AC1 - 16 A / 250 V AC; DC1 - 16 A / 24 V DC**
2 NO, 3 NO - **AC1 - 8 A / 250 V AC; DC1 - 8 A / 24 V DC**

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

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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

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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.

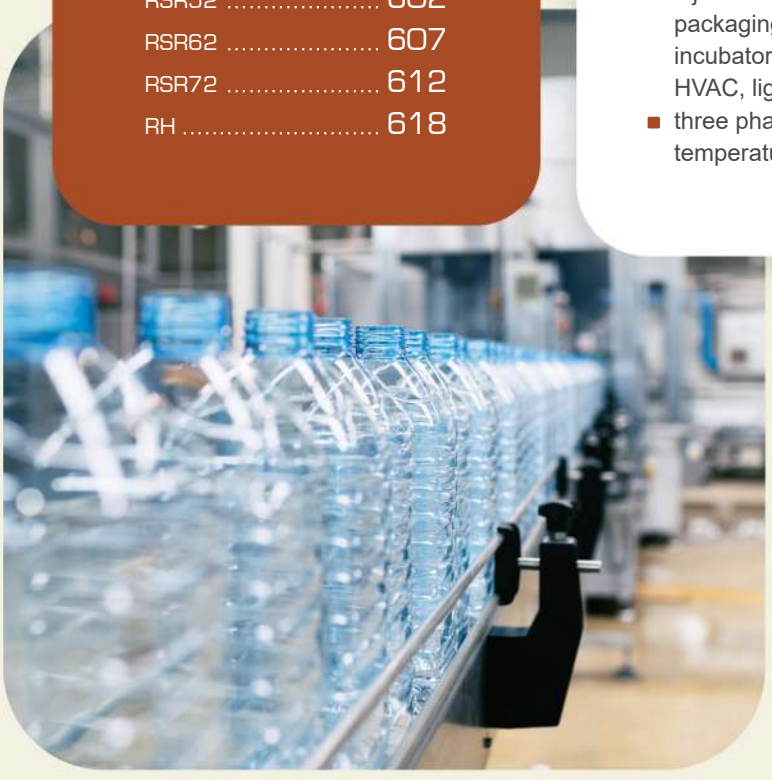
RLK-1.	Signal lamps; modular cover
 **page 589**	Optic signaling of AC/DC voltage presence in 1-phase network Input circuit (supply): AC/DC - 130...260 V Control circuit - indicator: **RLK-1G** - LED diode - green **RLK-1R** - LED diode - red **RLK-1Y** - LED diode - yellow Mounting: direct on 35 mm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



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RSR30

Single-phase solid state relays, miniature

page 594

Switching mode: DC or AC random-on

Output circuit: TTL and CMOS drive compatibile

Rated load: **AC1 - 2 A / 240 V AC**
DC1 - 1 A / 100 V DC; 2,5 A / 48 V DC; 4 A / 24 V DC

Input circuit: DC - 5, 12, 24, 48 V

Mounting: for PCB, for plug-in sockets

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

RSR32

Single-phase solid state relays, miniature

page 597

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

RSR35

Solid state relays, miniature

page 599

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

RSR52

Single-phase solid state relays, industrial

page 602

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 618)**

RSR62

Three-phase solid state relays, industrial

page 607

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 618)**

RSR72

Single-phase solid state relays, with heatsinks

page 612

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)

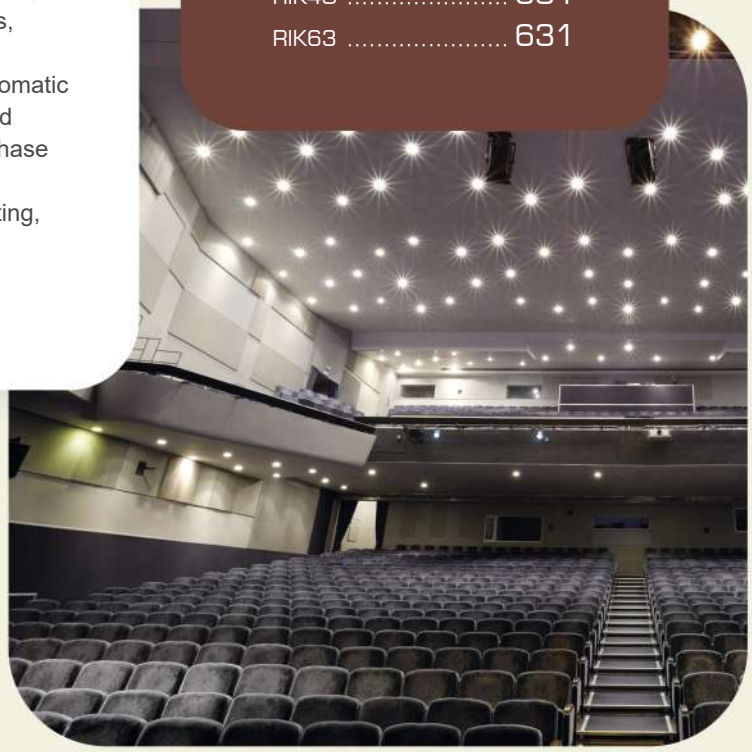
Installation contactors

- 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	630
RIK20	631
RIK25	631
RIK40	631
RIK63	631



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RIK21

Installation contactors; industrial cover

page 630

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 631

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 631

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 631

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 631

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

relpol® S.A.

- 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).

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RZI10-..-M

Power supplies; modular cover

page 643

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 646

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 649

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 652

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 655

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

RZI120-24-P

Power supplies; industrial cover

page 658

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

RZI240-24-P

Power supplies; industrial cover

page 661

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

RZI480-24-P

Power supplies; industrial cover

page 664

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

RZI-..R

RZI-..B

RZI-40UPS

Modules for power supplies RZI...P

Type	Rated load	Input circuit
RZI-20R	20 A / 0,65 V DC	DC - 22...60 V
RZI-40R	40 A / 0,65 V DC	
RZI-20B	20 A / 24 V DC	DC - 22,8...28,8 V
RZI-40B	40 A / 24 V DC	
RZI-40UPS	40 A / 24 V DC	DC - 24...28 V

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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.

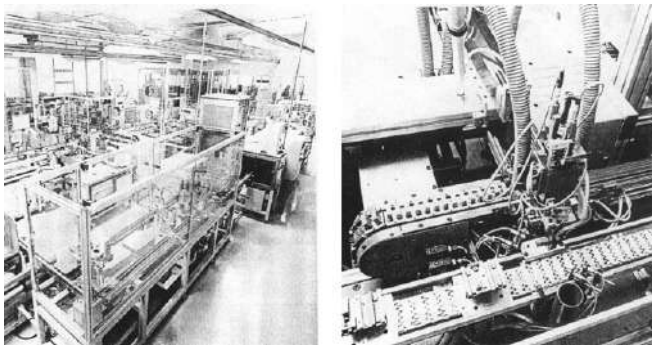
There are numerous applications of relays. Whenever satisfactory operation is needed in electronic and electromechanical conditions, a relay is necessary, e.g. for control equipment, time relays, temperature control, etc.

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

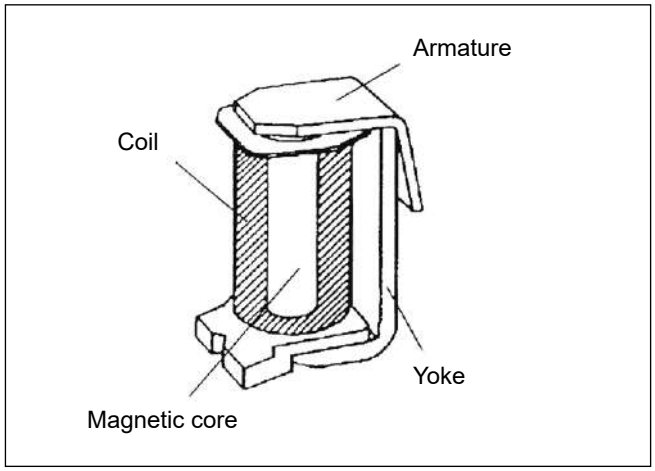


Fig. 2. Classic design of a relay

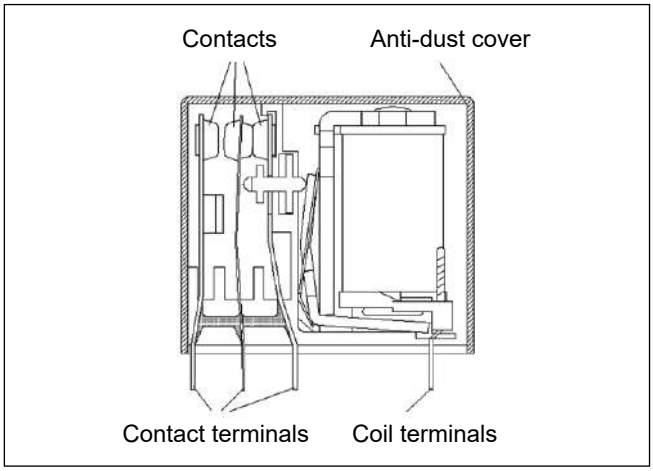


Fig. 1 shows a classic electromagnet unit which consists of four basic parts:
The coil which consists of one or more windings of a copper wire that is usually wound around a spool made of insulating material.
Ferromagnetic core.
Ferromagnetic yoke.
Movable ferromagnetic armature.

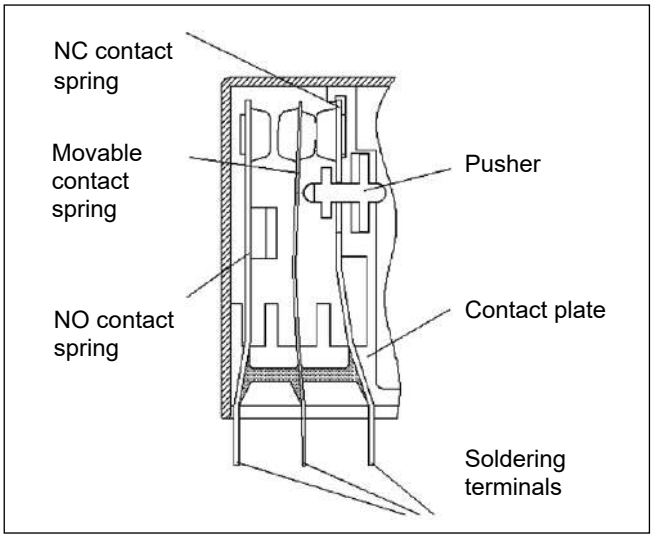
Additional parts:
- Fixed and movable contact springs.
- Contacts.
- Pusher.
- Mounting terminals and coil terminals.
- Contact plate.
- Anti-dust cover.

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

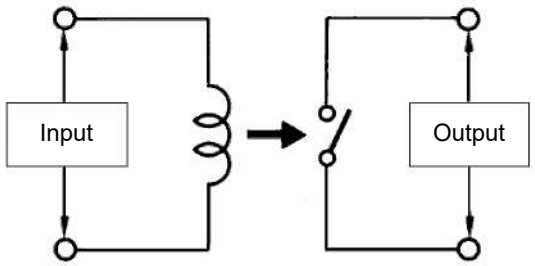


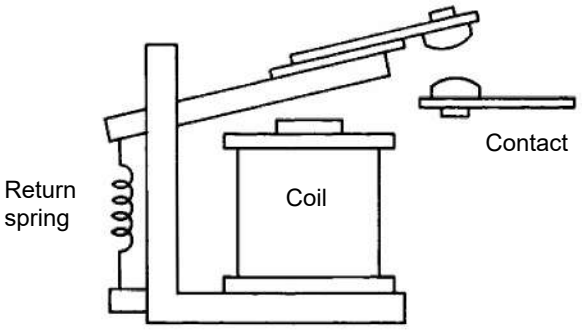
Types of relays

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.



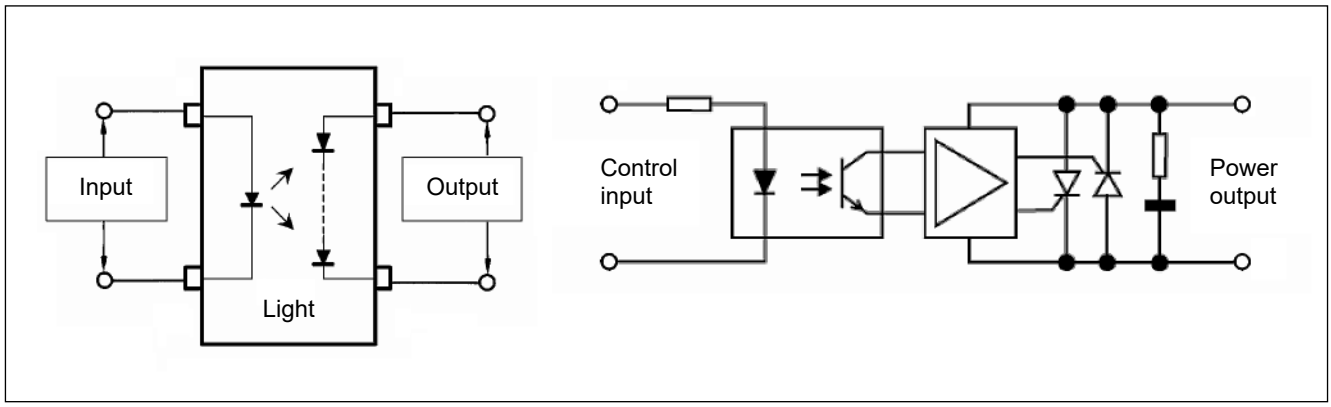


Solid-state relays use an opto-isolator to disconnect the input and output circuits. The opto-isolator changes electrical signal to optic ones and transfers them through the distance which is a galvanic insulation between the input and output sections. SSR's are electronic devices which do not have any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

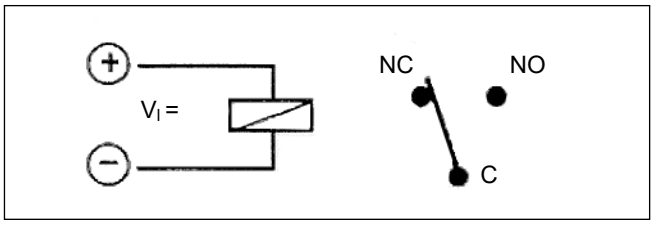
Step relays
The relays have two or more rotational positions, and they move from one step to another in consecutive operations with the use of energizing pulse. They usually move the contacts with the use of cams.

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

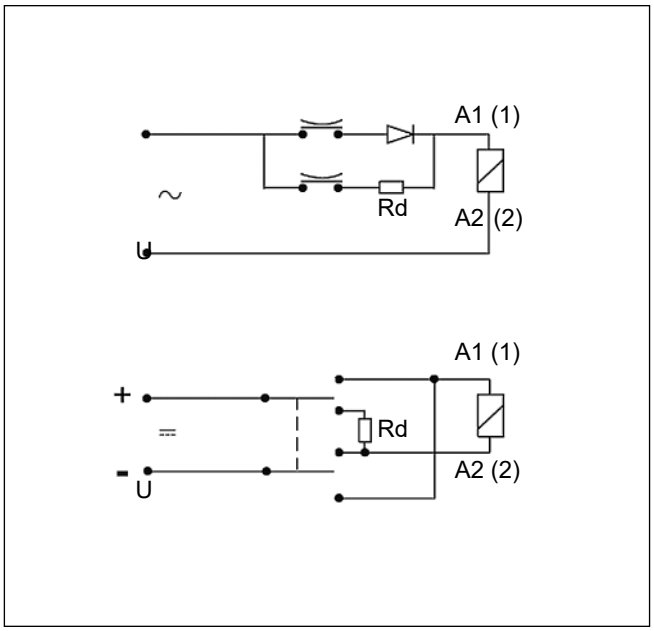


Thus, the magnetic polarization of the relay depends on the polarization of the supply voltage. The relay switches to the OFF state on supply of the voltage of the opposite polarization which changes the magnetic polarization of the core. The sole change of the supply polarization will not cause the 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).

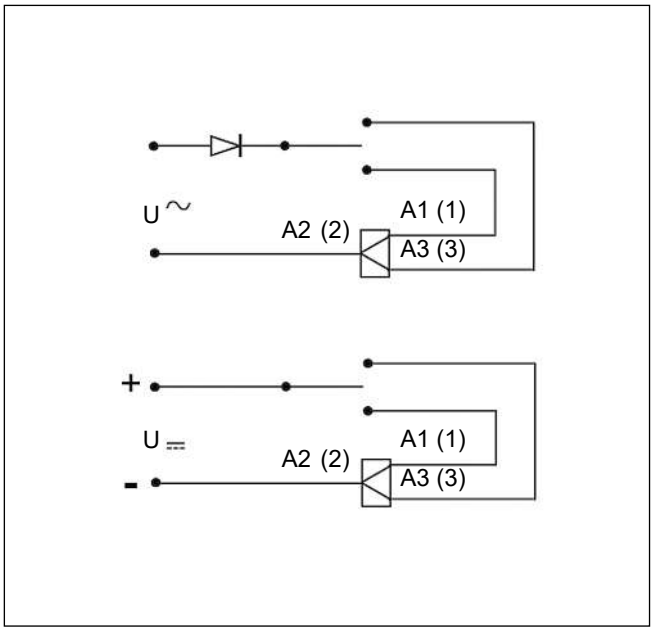
Fig. 5. Circuits with single winding latching relays



- 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

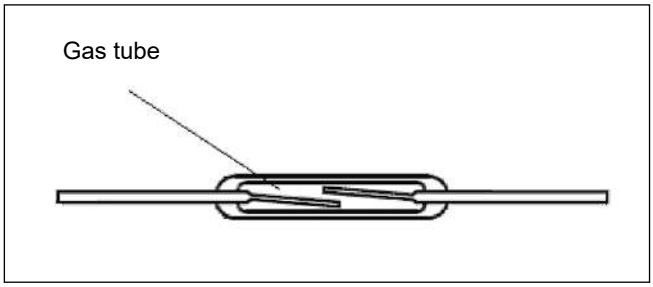
Polarized relay is a relay with permanent magnet which provides additional magnetic force that reduces the energy consumption. The magnetic field required for pulling the armature is partly generated by the coil and partly by the magnet.

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.

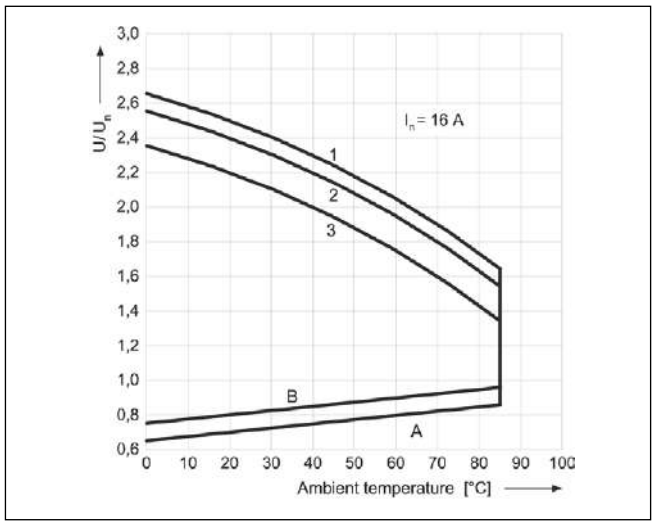
Coil operating voltage range

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

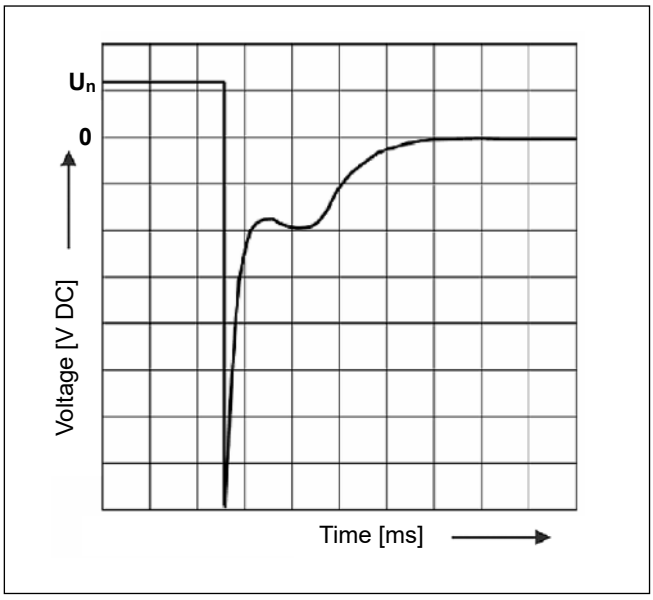
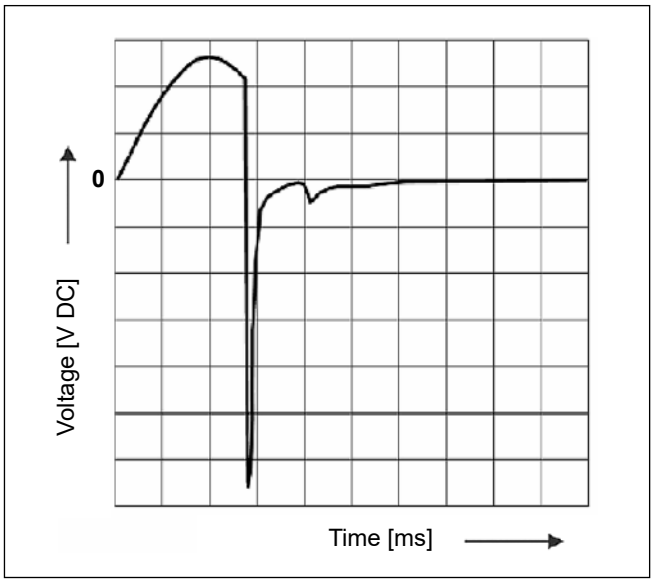


Fig. 10. AC coil voltage during switching off



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

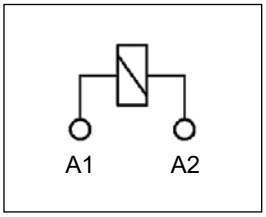
Terminals marking

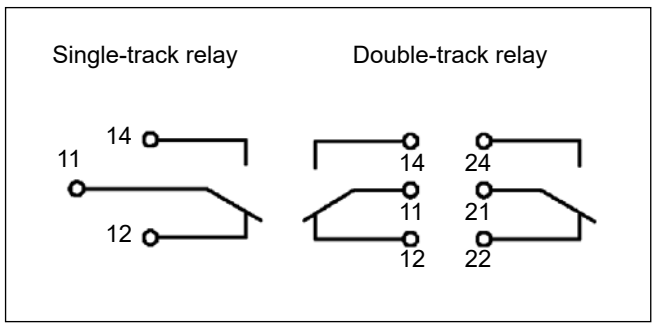
Terminals marking under Polish Standard EN 50005.

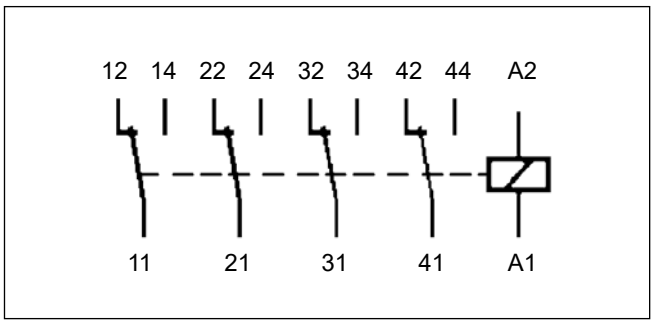
Contacts terminals are always marked numerically with two digits, where:
- the unit digit is the number of functions,
- the decimal digit is the number of sequences.

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

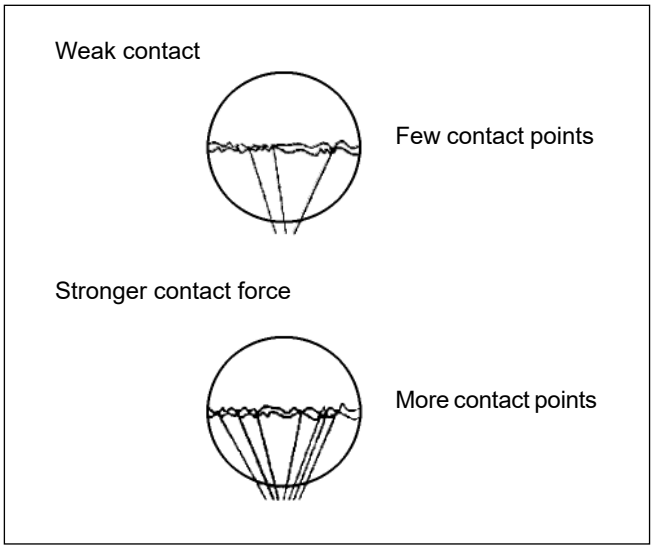
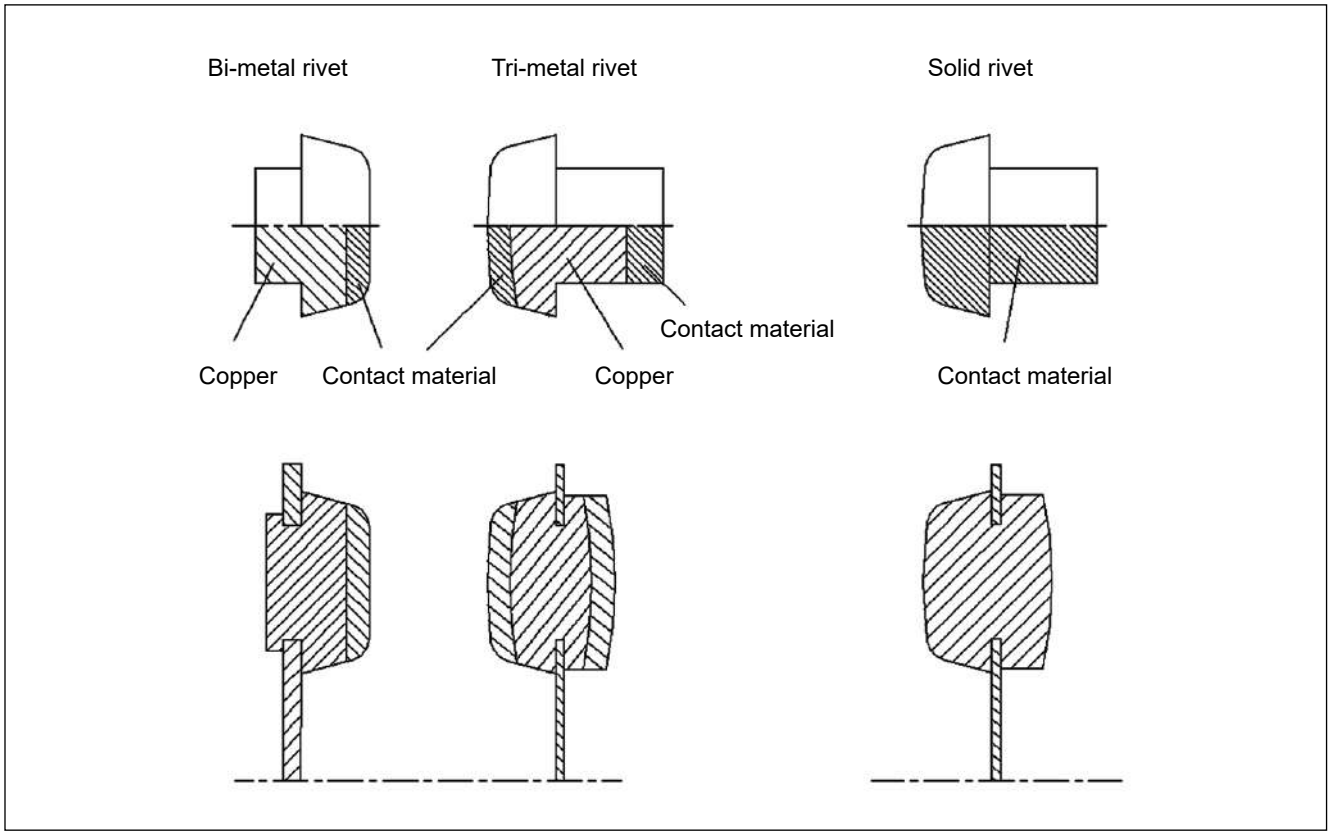


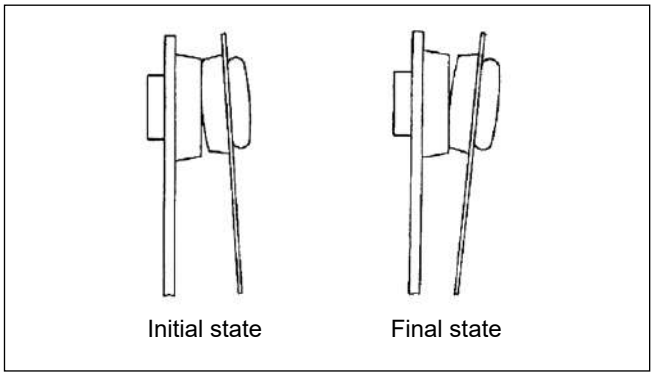
Fig. 12. Shapes of contact rivets



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).

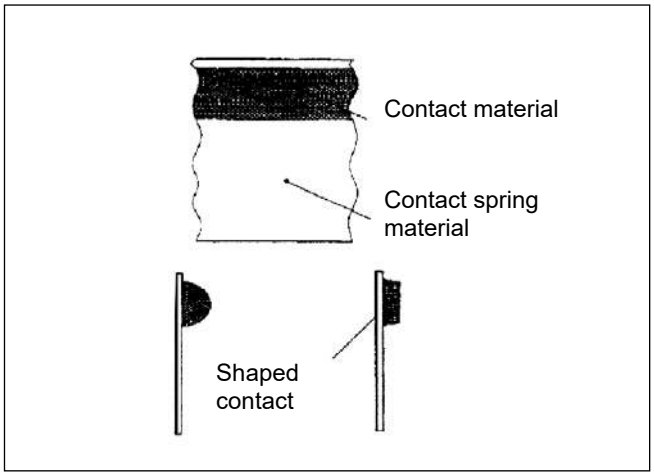
Fig. 13. Contact movement



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.

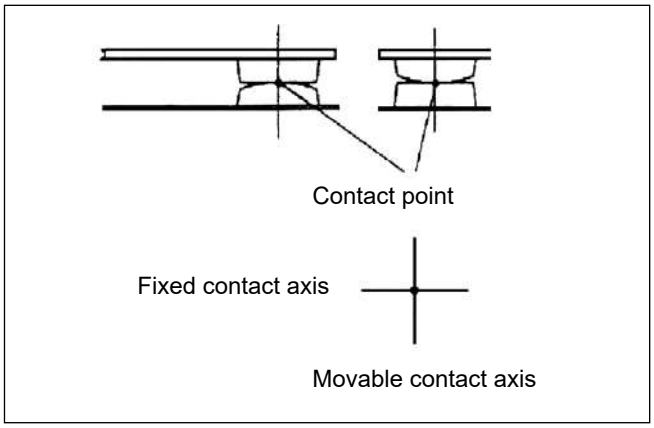
Fig. 14. Small-profile contact



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.

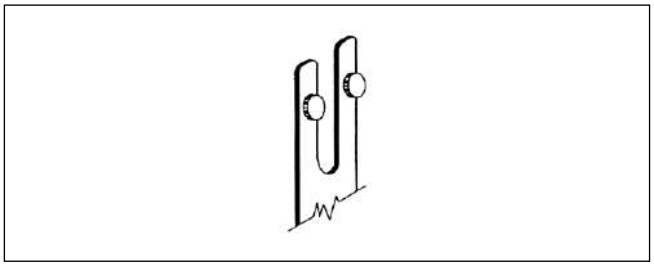
Fig. 15. Cross contact



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**

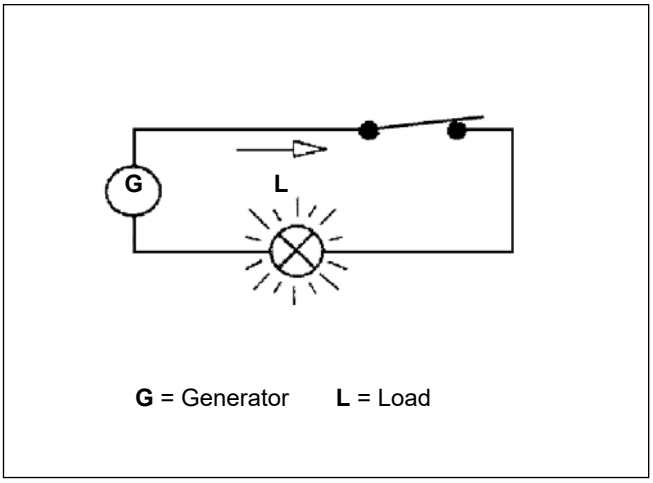
The value of R consists of two different resistances: **circuit resistance R_c and contact resistance R_r**.
Thus:

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

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

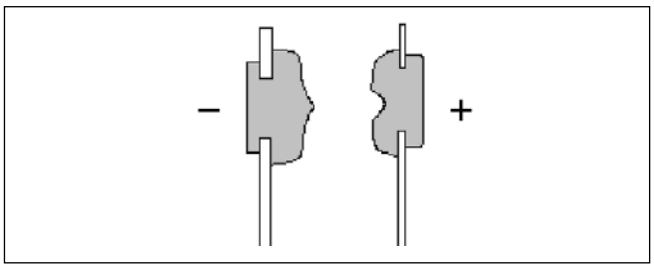
The choice of the contact material depends on the application. The following are the most commonly used materials:

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.

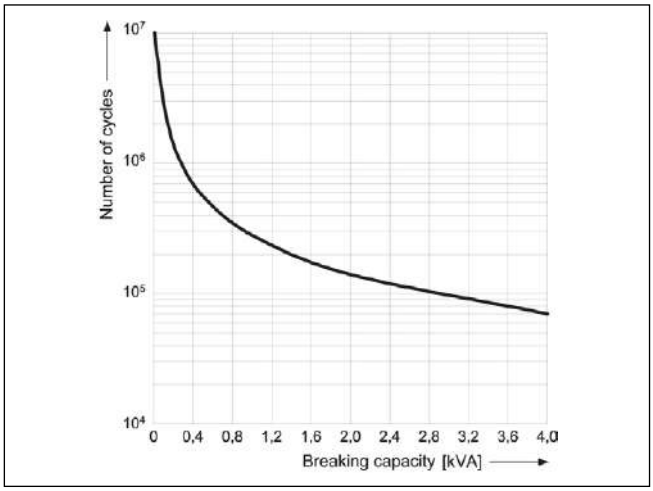
Gilding - Au
Contact gilding with 0,2-0,5 µm gold layer is usually applied in order to protect the basic material from oxidation during product storage. The protective gilding is not resistant to mechanical wear and it is quickly destroyed in course of the relay switching. Contact gilding with 3-5 µm 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).

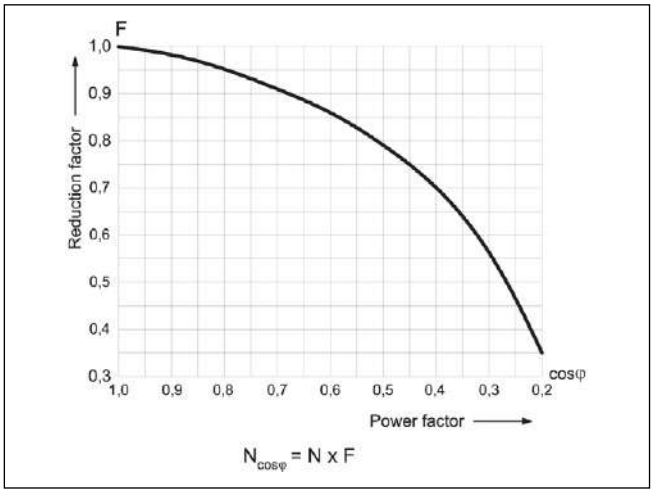
Fig. 19. Chart of electric life of a relay



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

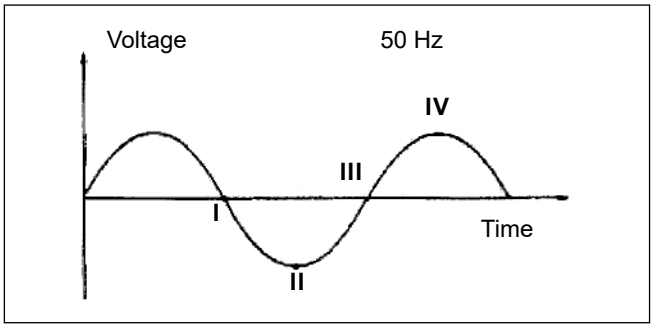
Charts of electric life of a relay in the function of load power are useful in estimating the reliability parameters. The value found in such charts may be used for defining the statistical parameter of B10 life, i.e. the number of cycles following which 10% of the relays population will fail. Electromagnetic 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



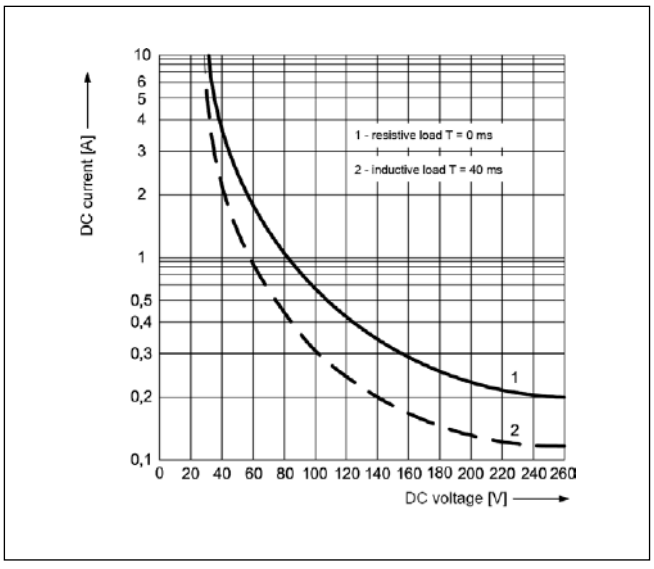
Switching between points I and II:
There may be two situations in which the voltage grows or drops. In both cases, arc discharge occurs but it is suppressed due to the transfer of the voltage via the zero value. The electric arc discharge depends on the voltage value, contact clearance, current intensity, 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



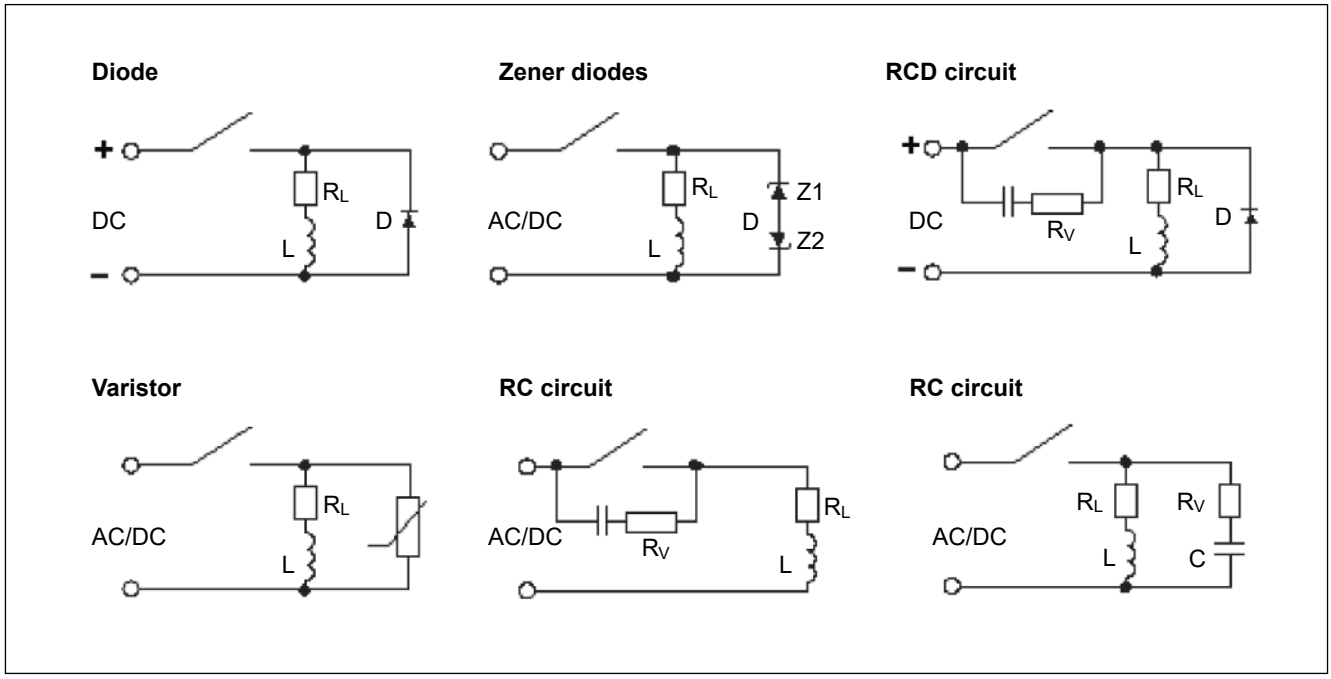
Suppressing circuits

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

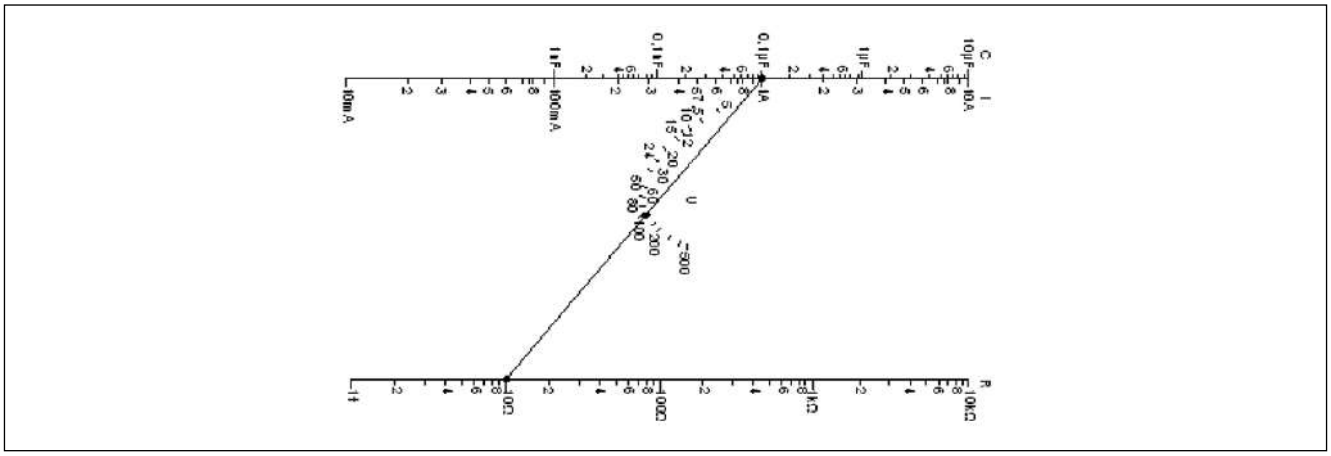


A **varistor** is another protection element of current-voltage ccharacteristics similar to Zener diode. For low voltages it shows high resistance and, then, it is practically disconnected from the circuit whereas when the voltage exceeds certain voltage, characteristic for the given varistor, its resistance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

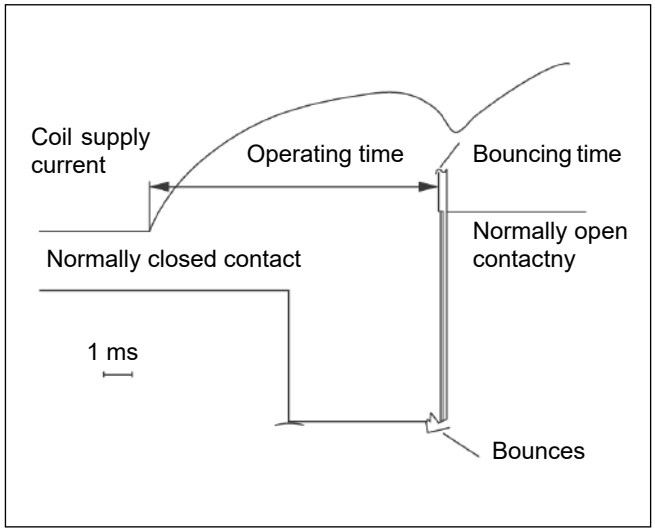
Electromagnetic system

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

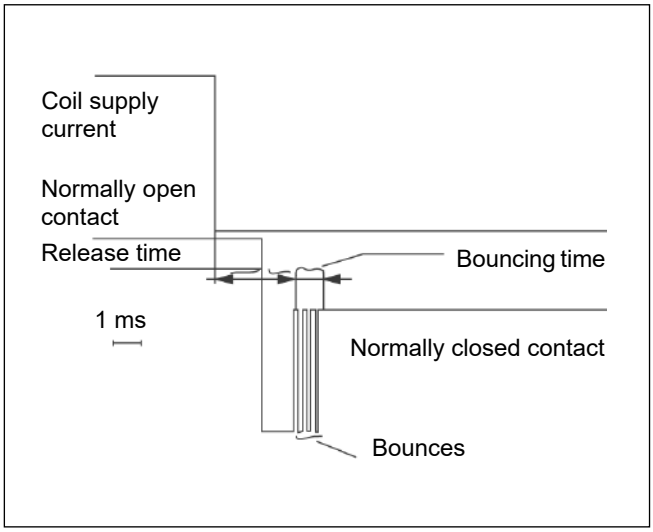
The elastic forces stored in the contacts and springs, and their elastic strain, react to the movement of the relay parts. The phenomenon is also affected by the inertia of the contacts mass. The delay times of the miniature relays usually reach the value of a few milliseconds (5-15 ms) during the switching 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.

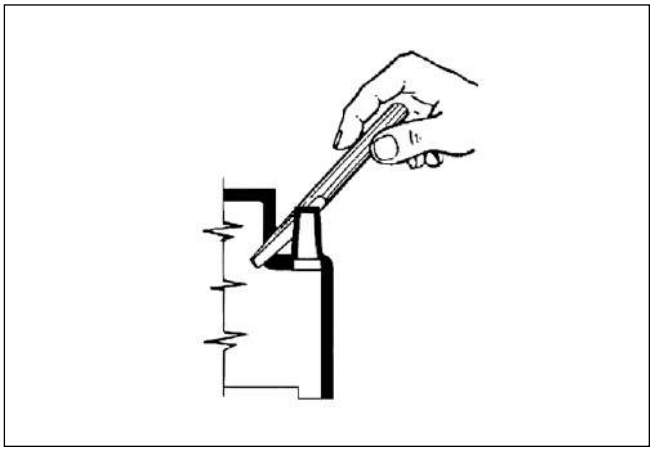
It is recommended to use alcohol-based or aqueous cleaning solvents for PCB cleaning. When using other cleaning solvents, the user should ensure that they do not have a negative impact on the materials from which the relay is built. Unsuitable cleaning solvents include: acetone, ethyl acetate, solutions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

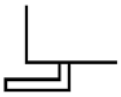
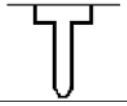
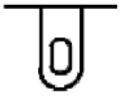
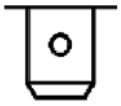


Lead-free soldering

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

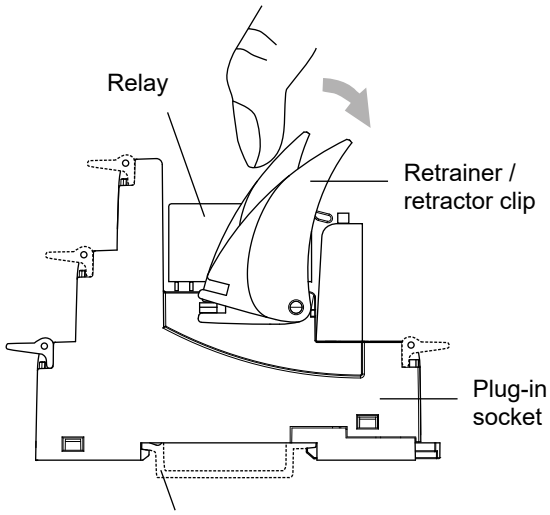
Surface mounted terminals (SMT)	
THT mounted terminals	
Terminals to solder wires and for sockets	
Terminals for flat slide-in (faston) connections	

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.

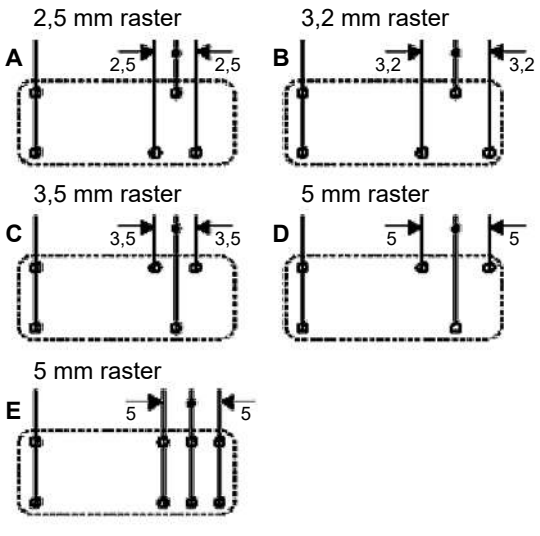
Fig. 28. In course of mounting of the relay in the socket, the clip functions also as a relay protective latch.



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.

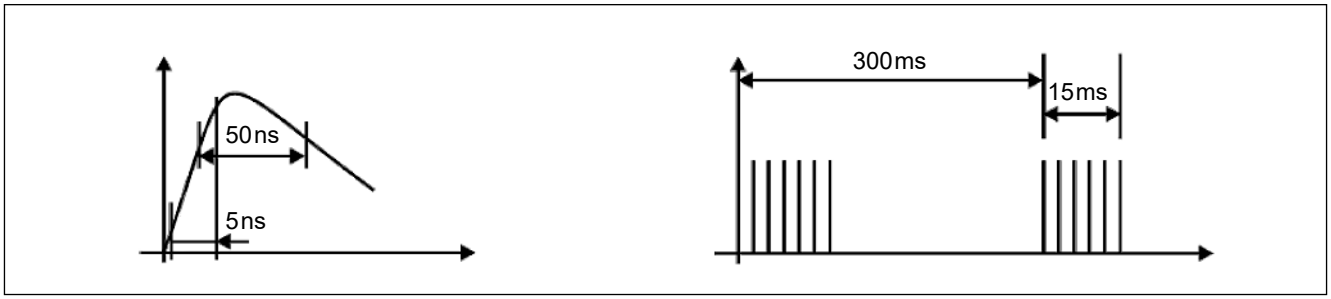
Electromagnetic compatibility

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.

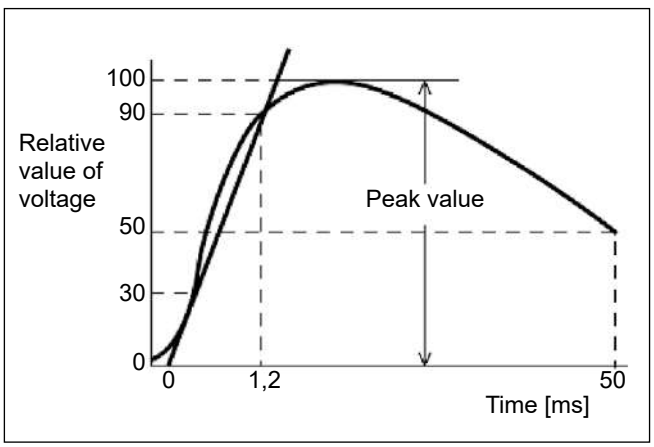
An electromagnetic relay may initiate disturbances, particularly when operating with inductive load of contacts. An electric arc occurring while switching, and overvoltage cause emission of disturbances which may affect the operation of a sensitive electronic appliance in the proximity of the relay. 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

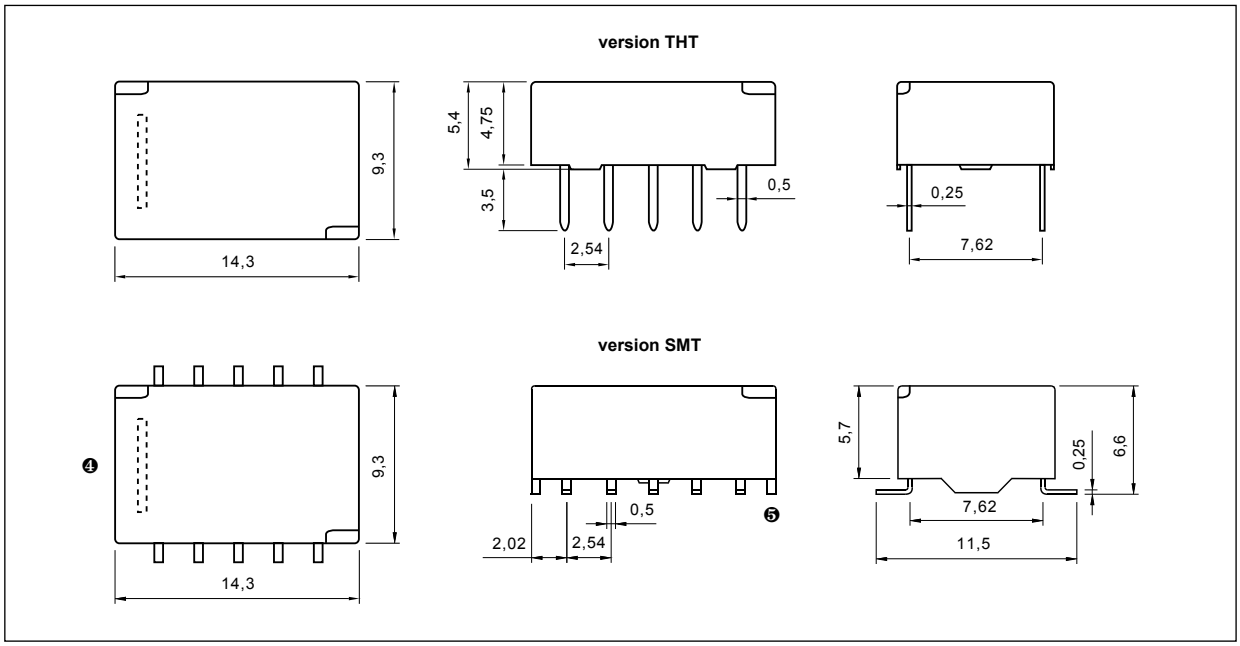
Insulation resistance		1 000 MΩ 500 V DC, 60 s
Dielectric strength		
• between coil and contacts		1 000 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection
• pole - pole		1 000 V AC type of insulation: basic
Contact - coil distance		
• clearance		≥ 0,5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

General data

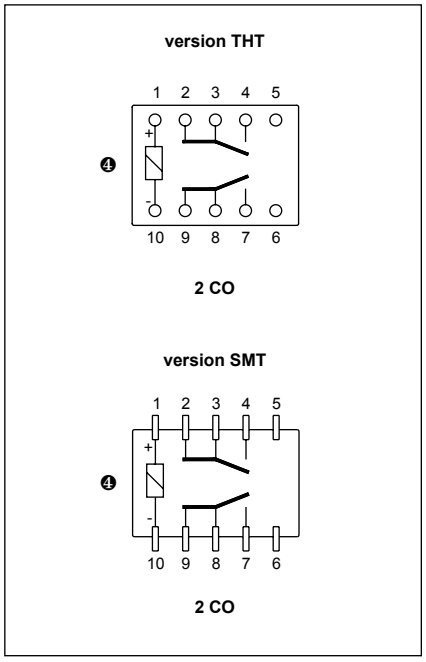
Operating / release time (typical values)		3 ms / 3 ms
Electrical life		
• resistive AC1	1 200 cycles/hour	10^5 0,5 A, 125 V AC
• resistive DC1	1 200 cycles/hour	2×10^5 1 A, 30 V DC
Mechanical life	10 800 cycles/hour	10^8
Dimensions (L x W x H)		THT: 14,3 x 9,3 x 5,4 mm ❷ SMT: 14,3 x 9,3 x 6,6 mm ❸
Weight		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

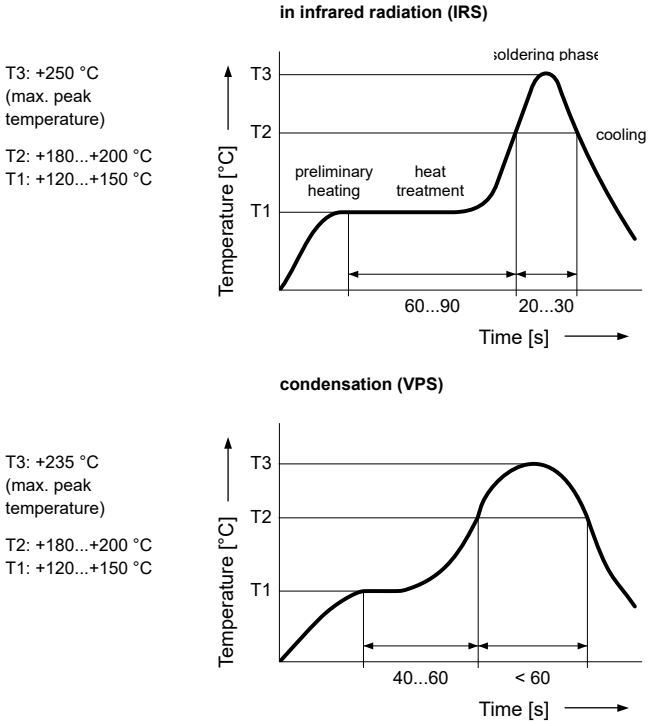


Connection diagrams
(pin side view)



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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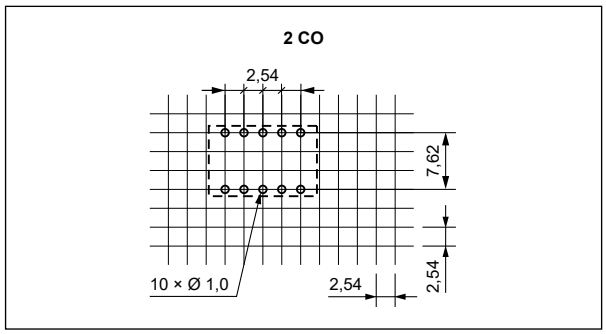
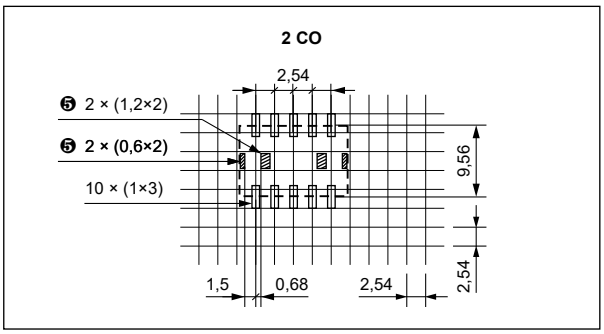
Pinout - version THT (solder side view)



Soldering areas - version SMT (solder side view)



❺ Temporary glue pad on PCB.

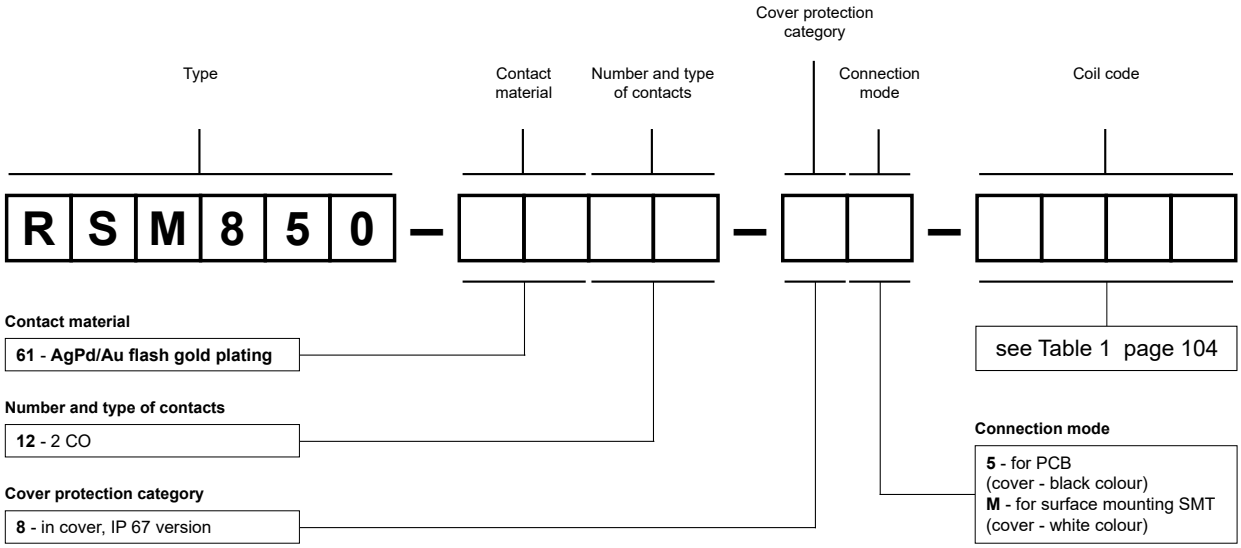
Mounting

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

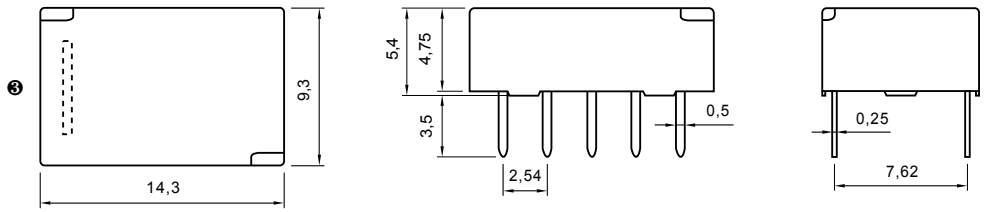
General data

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

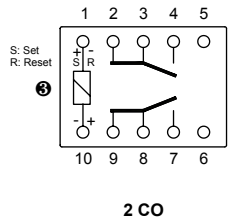
The data in bold type relate to the standard versions of the relays. ❶ Values refer to new relays, which have not been used for signals exceeding the maximum 10 mA and/or 6 V (DC or AC). After the current exceeds 10 mA and/or 6 V (DC or AC) relay can not be used for signals with the minimum values indicated 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

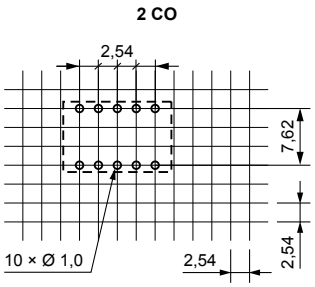
Dimensions



Connection diagram (pin side view)



Pinout (solder side view)



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

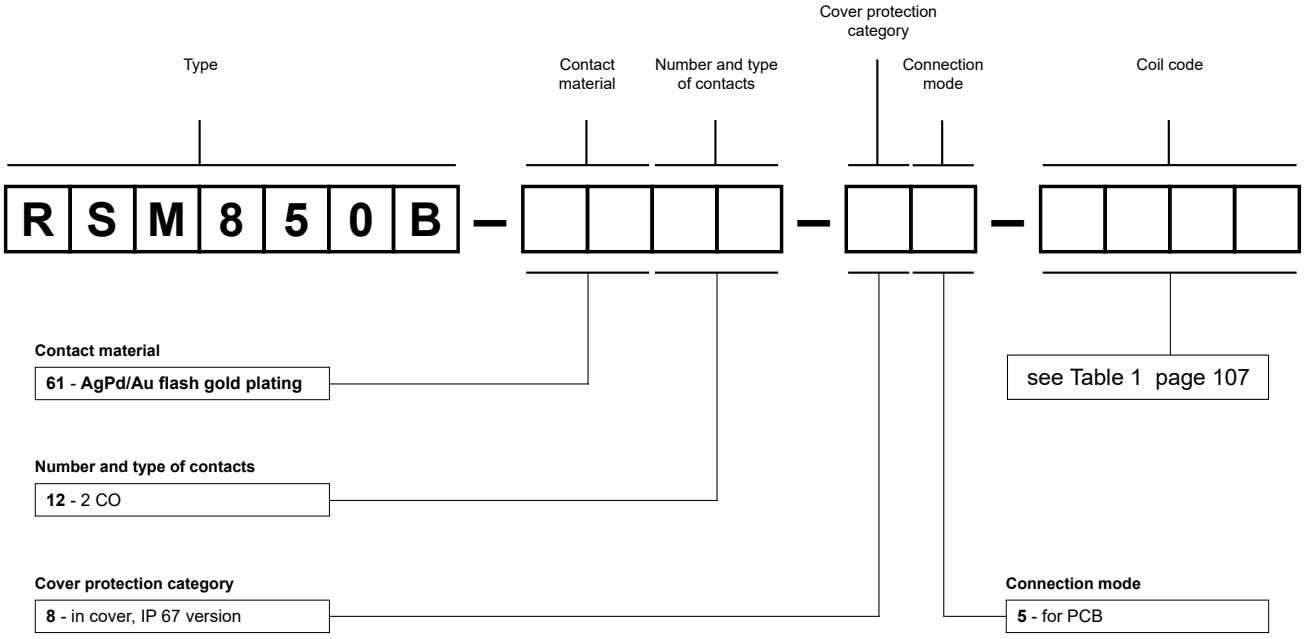
Mounting

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

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

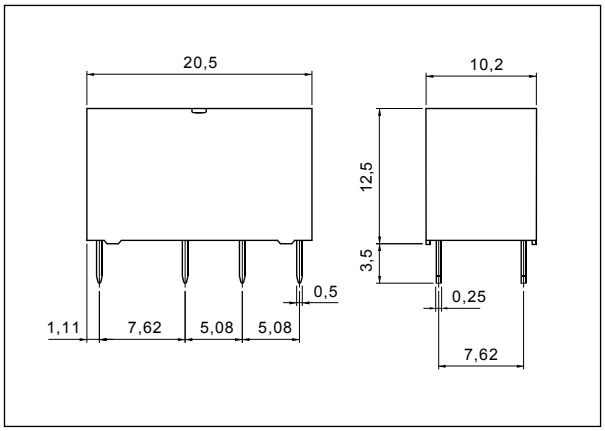
Insulation resistance		> 1 000 MΩ 500 V DC, 60 s
Dielectric strength		
• between coil and contacts		1 000 V AC type of insulation: basic (1500 V AC; 1,2 / 50 µs)
• contact clearance		1 000 V AC type of clearance: micro-disconnection (1500 V AC; 1,2 / 50 µs)
• pole - pole		1 000 V AC type of insulation: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

General data

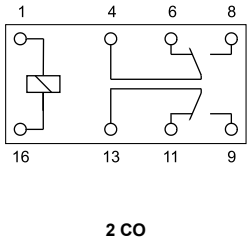
Operating / release time (typical values)		4,5 ms / 1,5 ms
Electrical life (number of cycles)		
• resistive AC1	1 800 cycles/hour	10^5 0,6 A, 125 V AC
• resistive DC1	1 800 cycles/hour	10^5 2 A, 30 V DC
Mechanical life	18 000 cycles/hour	10^8
Dimensions (L x W x H)		20,5 x 10,2 x 12,5 mm
Weight		4,5 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

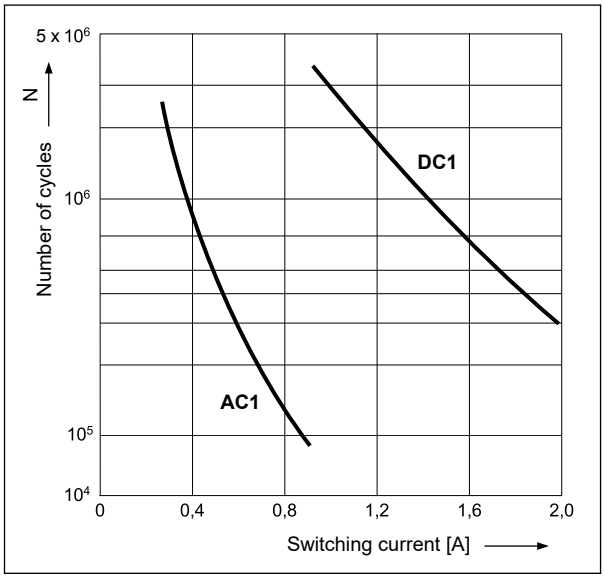


Connection diagram (pin side view)



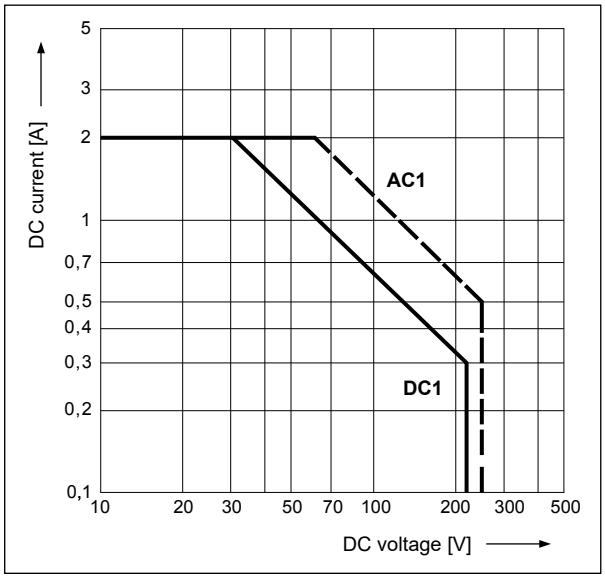
Electrical life at AC resistive current. Switching frequency: 1 800 cycles/hour

Fig. 1

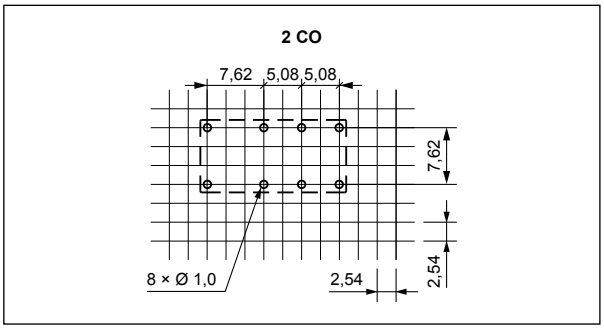


Max. DC resistive load breaking capacity

Fig. 2



Pinout (solder side view)



Mounting

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

RSM822N
subminiature - signal relays

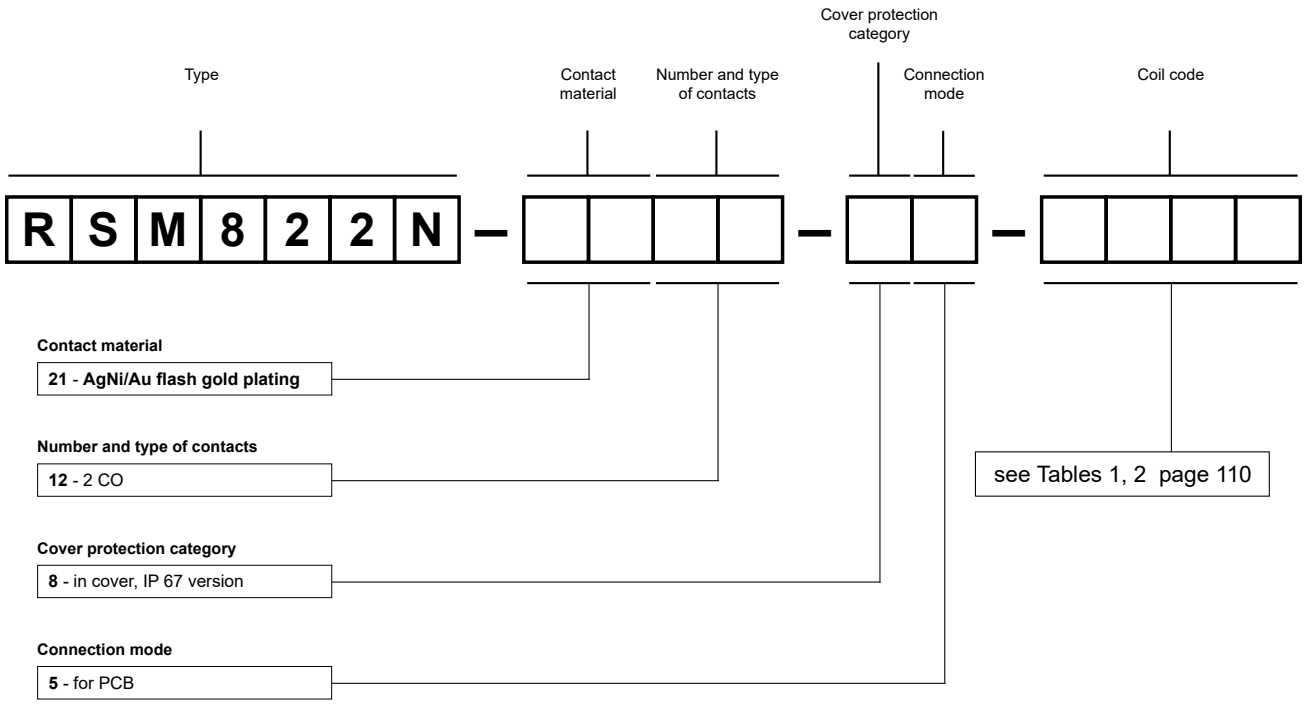
Coil data - DC voltage version, sensitive — Table 1

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

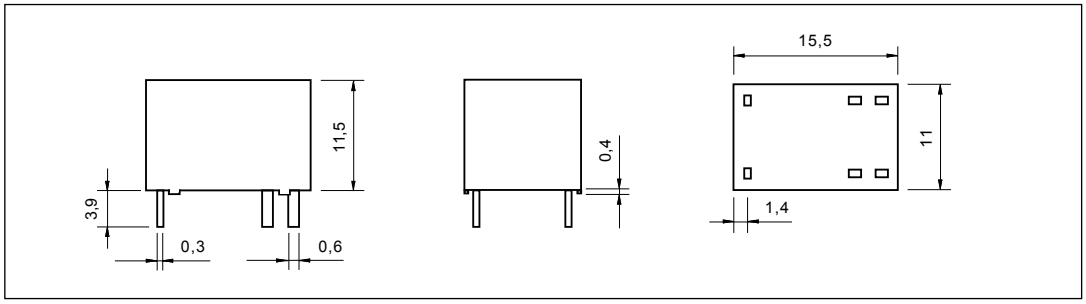
Insulation resistance	100 MΩ	500 V DC, 60 s
Dielectric strength		
• between coil and contacts	1 000 V AC	type of insulation: basic
• contact clearance	500 V AC	type of clearance: micro-disconnection
Contact - coil distance		
• clearance	≥ 1,2 mm	
• creepage	≥ 2 mm	

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



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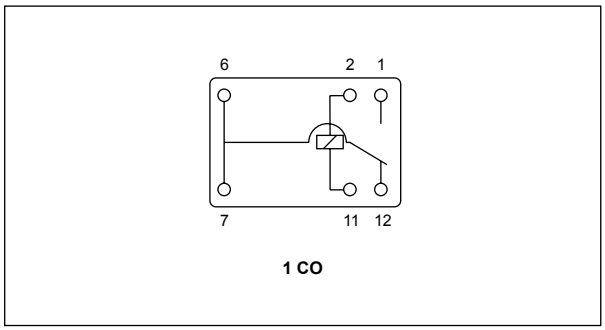
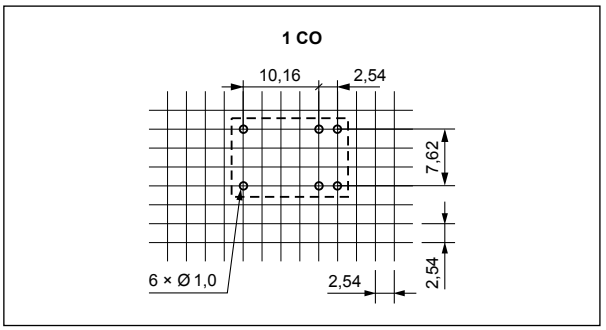
RSM954N
subminiature - signal relays

Connection diagram (pin side view)



Pinout (solder side view)



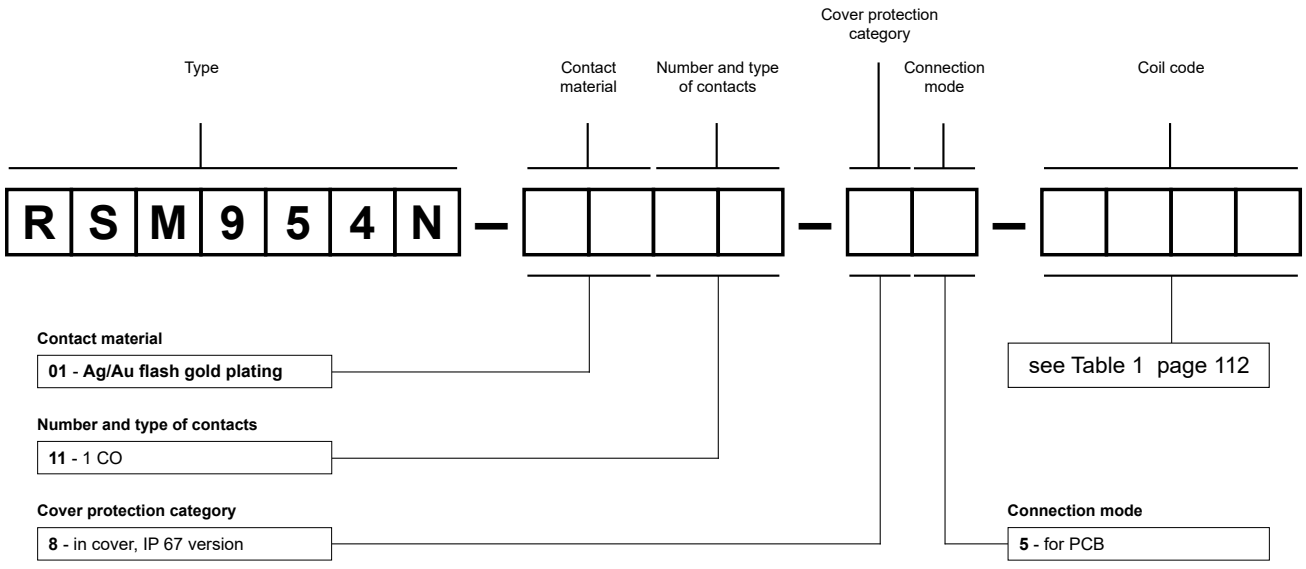
Mounting

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

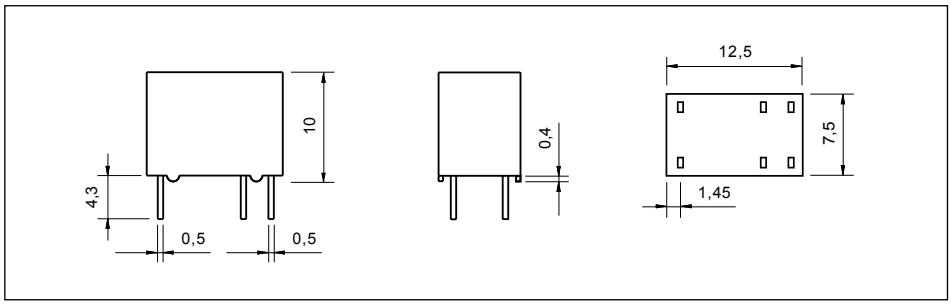
Insulation resistance		> 1 000 MΩ 500 V DC, 60 s
Dielectric strength		
• between coil and contacts		1 000 V AC type of insulation: basic
• contact clearance		400 V AC type of clearance: micro-disconnection
Contact - coil distance		
• clearance		≥ 0,6 mm
• creepage		≥ 0,6 mm

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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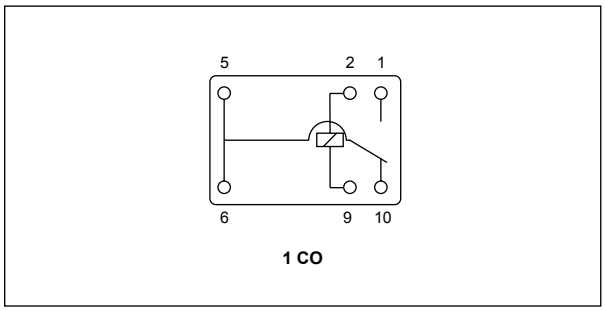
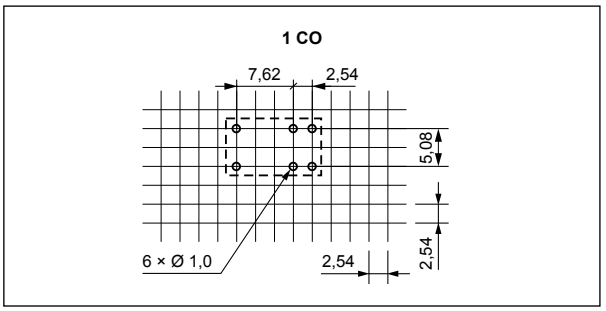
RSM957N
subminiature - signal relays

Connection diagram (pin side view)



Pinout (solder side view)



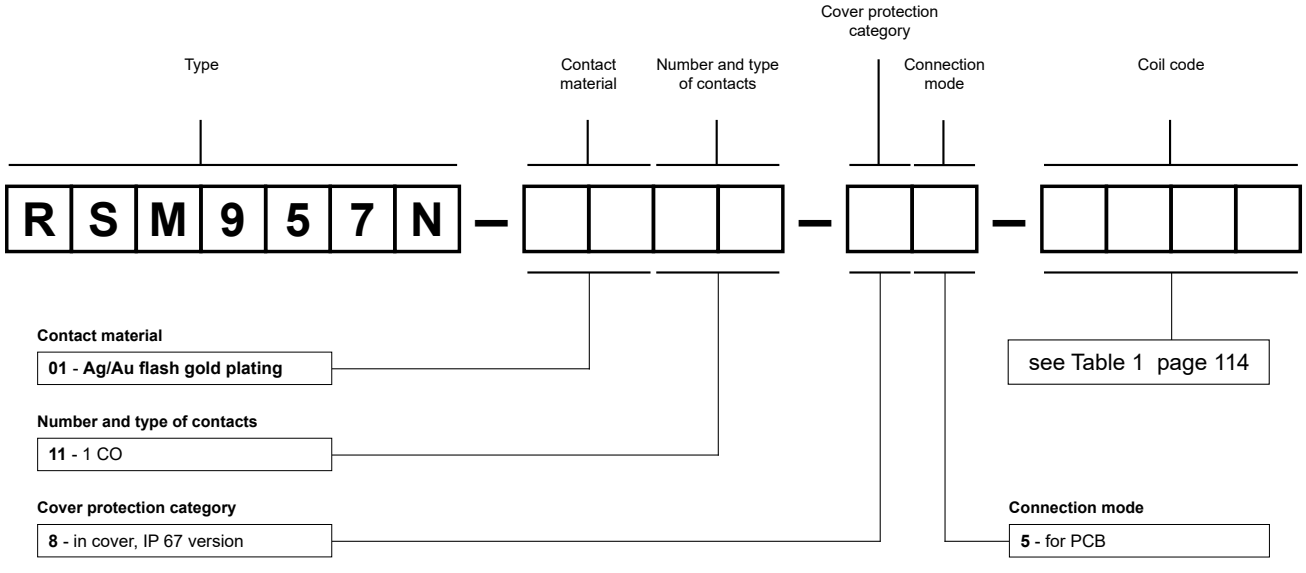
Mounting

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

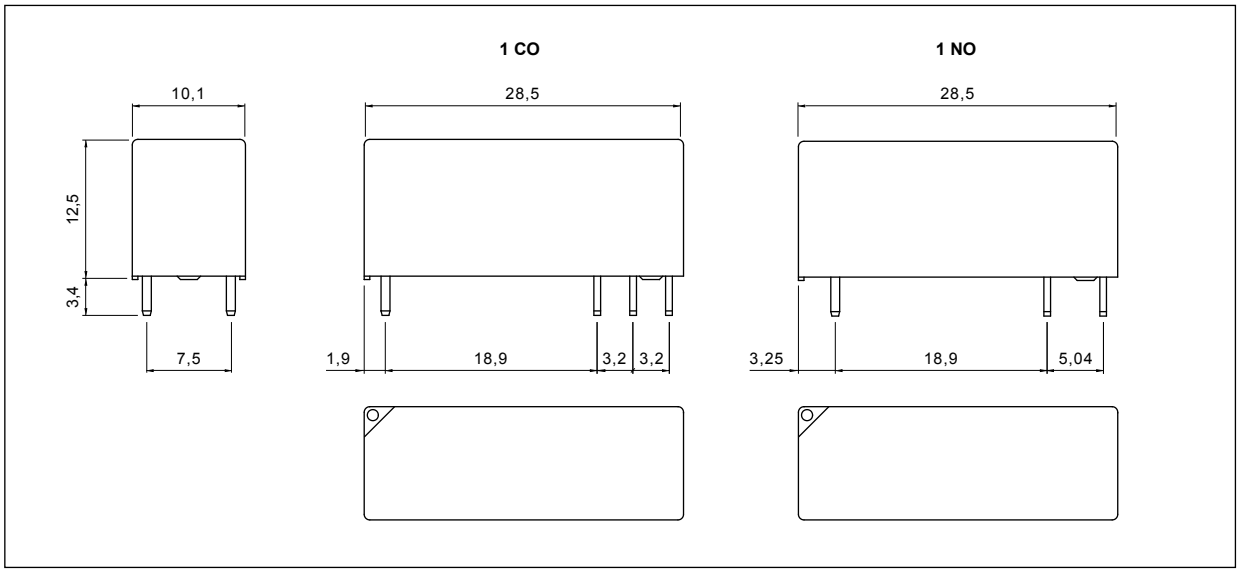
Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III IEC 61810-5
Insulation pollution degree		3
Flammability class		V-0 UL 94
Insulation group (contact plate)		IIIa
Tracking resistance category		2 UL 508
Dielectric strength	• between coil and contacts • 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

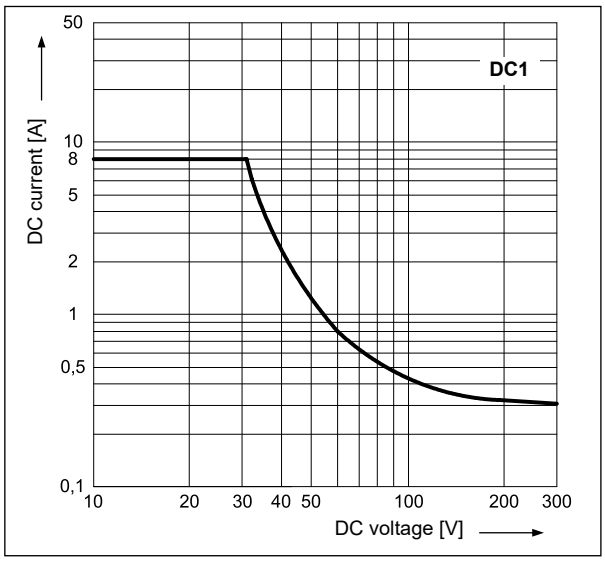
Operating / release time (typical values)		10 ms / 5 ms
Electrical life (number of cycles)	• resistive AC1 • resistive DC1	10^5 1 NO, 8 A, 250 V AC, 70 °C (VDE) $6,5 \times 10^4$ 1 CO (NO side), 8 A, 250 V AC, 70 °C (VDE) 5×10^4 1 NO, 8 A, 250 V AC, 85 °C (VDE) $> 10^5$ 8 A, 24 V DC
Mechanical life	18 000 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.

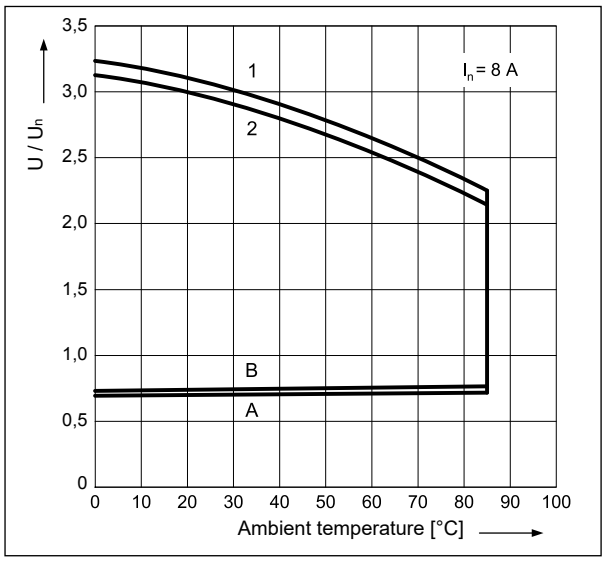
Dimensions



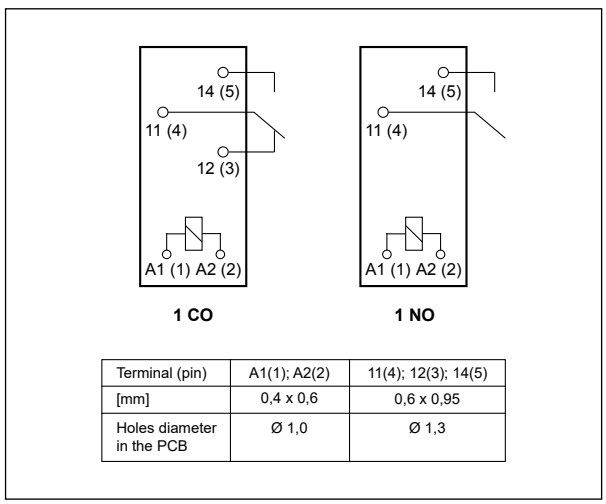
Max. DC resistive load breaking capacity Fig. 1



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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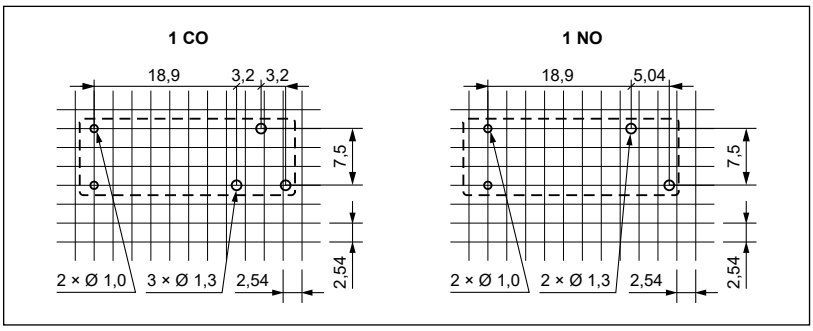
Pinout (solder side view)



Mounting

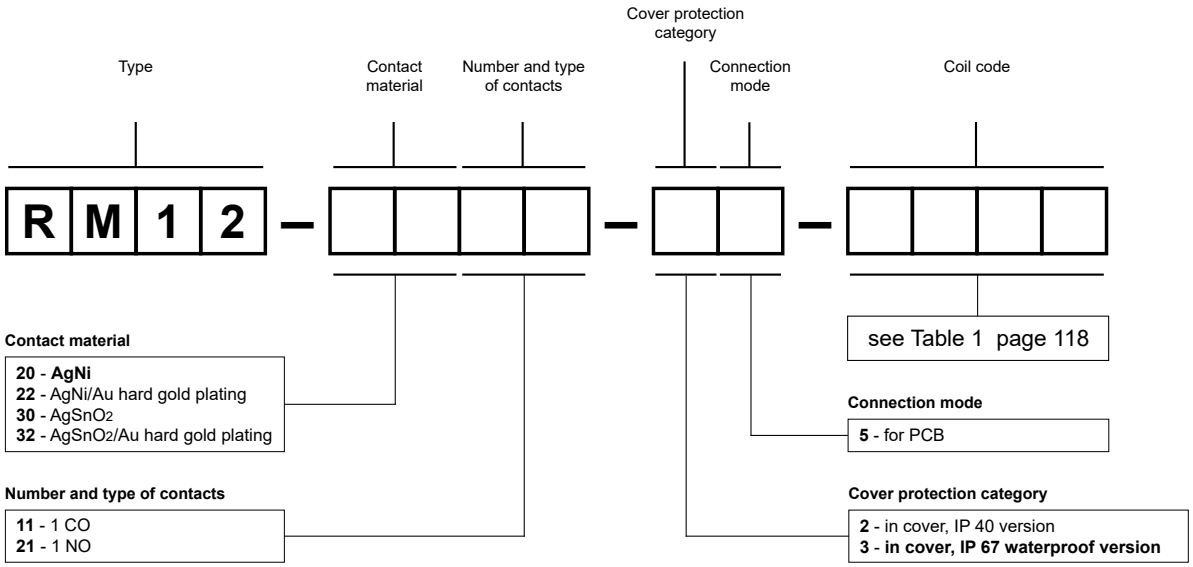
Relays **RM12** are designed for direct PCB mounting.

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

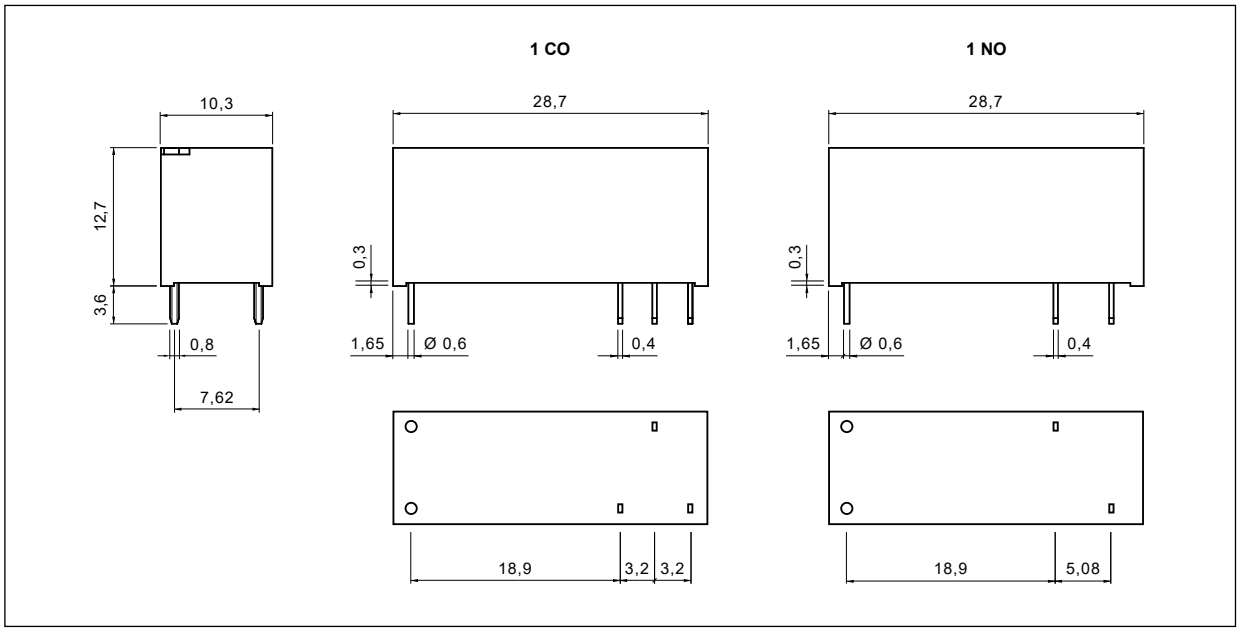
Insulation resistance	> 1 000 MΩ	500 V DC, 60 s
Dielectric strength		
• between coil and contacts	5 000 V AC	type of insulation: reinforced
• contact clearance	1 000 V AC	type of clearance: micro-disconnection
Contact - coil distance		
• clearance	≥ 8 mm	
• creepage	≥ 8 mm	

General data

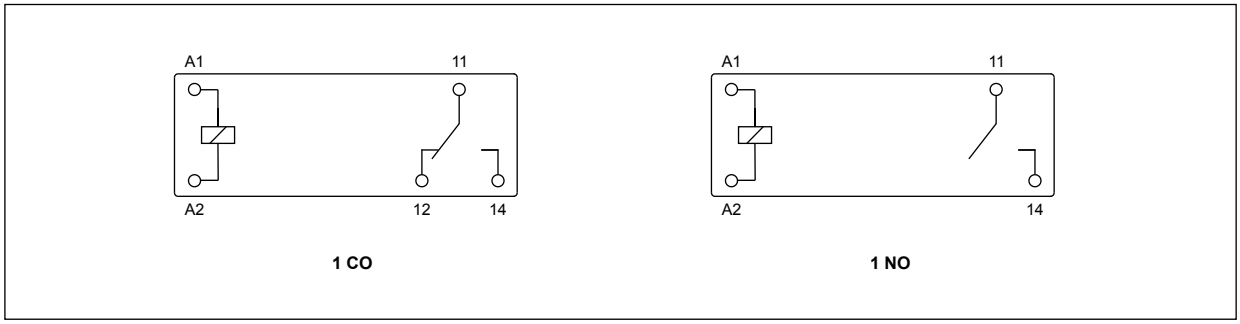
Operating / release time (typical values)		10 ms / 5 ms	
Electrical life (number of cycles)			
• resistive AC1	1 800 cycles/hour	10^5	10 A, 250 V AC
• resistive DC1	1 800 cycles/hour	10^5	10 A, 30 V DC
Mechanical life	18 000 cycles/hour	10^7	
Dimensions (L x W x H)		28,7 x 10,3 x 12,7 mm	
Weight		8 g	
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.

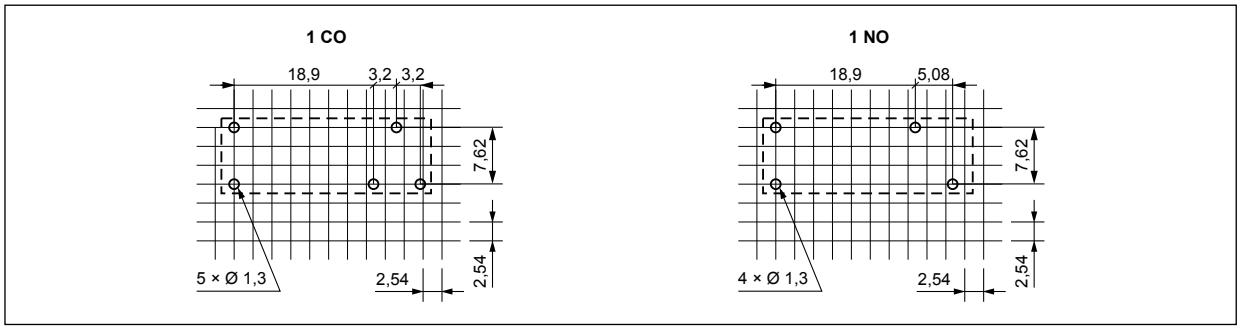
Dimensions



Connection diagrams (pin side view)



Pinout (solder side view)



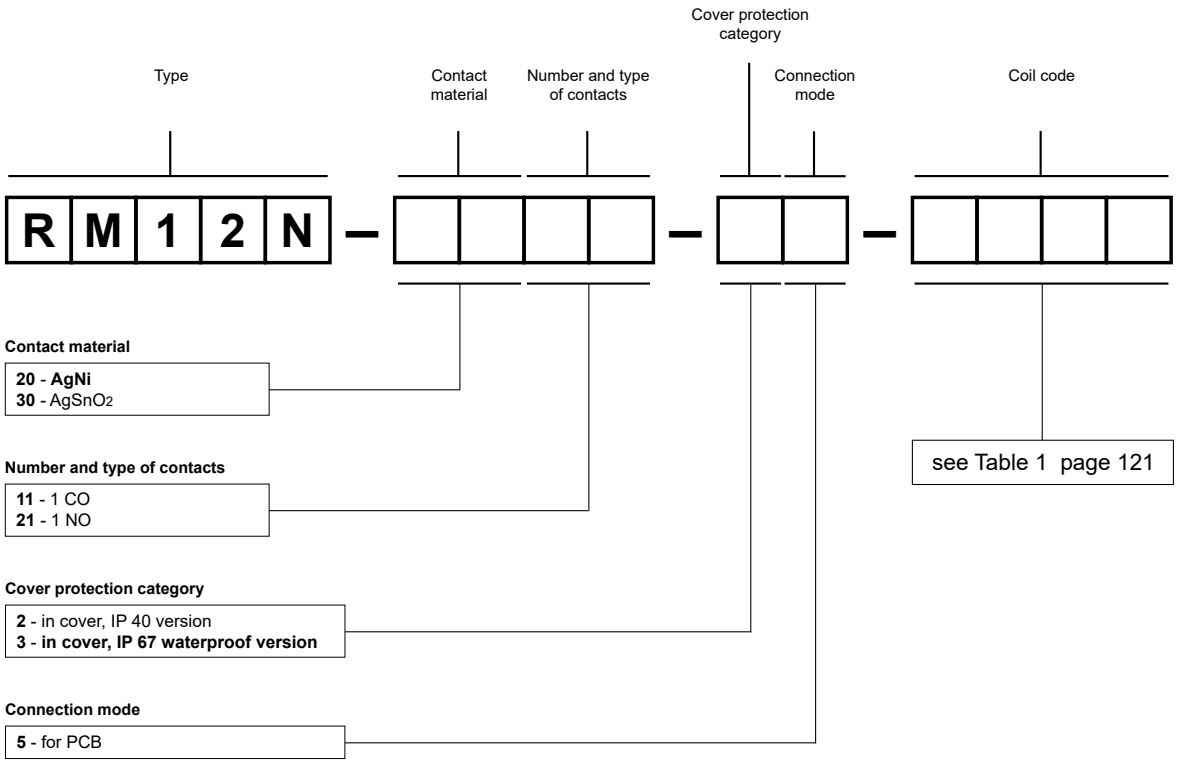
Mounting

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

RM32N
miniature relays

- 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

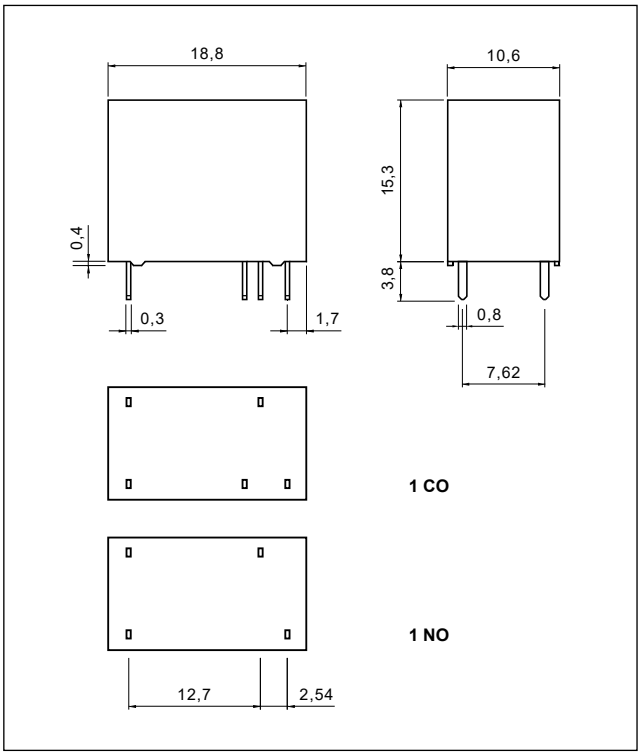
Insulation resistance	100 MΩ	500 V DC, 60 s
Dielectric strength		
• between coil and contacts	2 500 V AC	type of insulation: basic
• contact clearance	1 000 V AC	type of clearance: micro-disconnection

General data

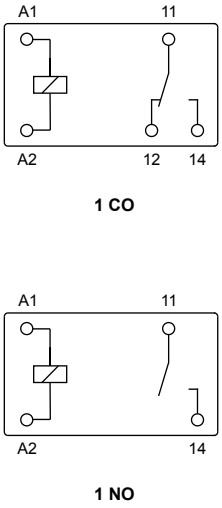
Operating / release time (typical values)		8 ms / 5 ms	
Electrical life (number of cycles)			
• resistive AC1	1 800 cycles/hour	10^5 1 CO: 5 A / 5 A (NO/NC), 250 V AC	1 NO: 5 A, 250 V AC
• resistive DC1	1 800 cycles/hour	10^5 1 CO: 5 A / 5 A (NO/NC), 28 V DC	1 NO: 5 A, 28 V DC
Mechanical life	18 000 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

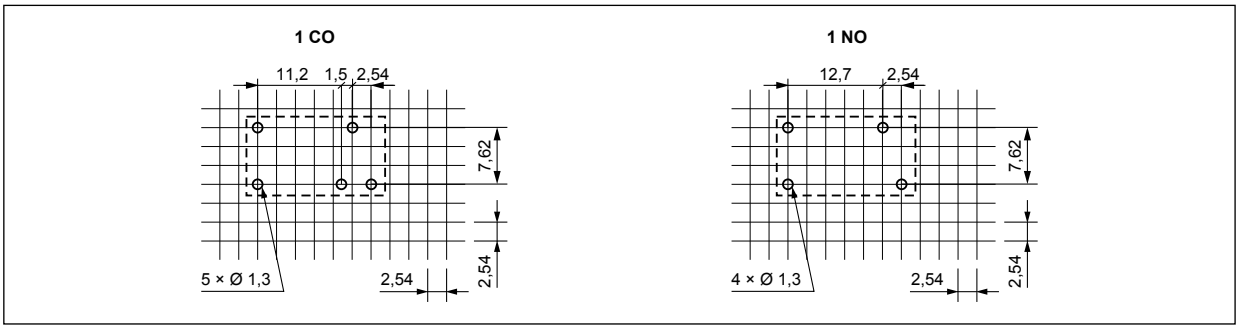
Dimensions



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

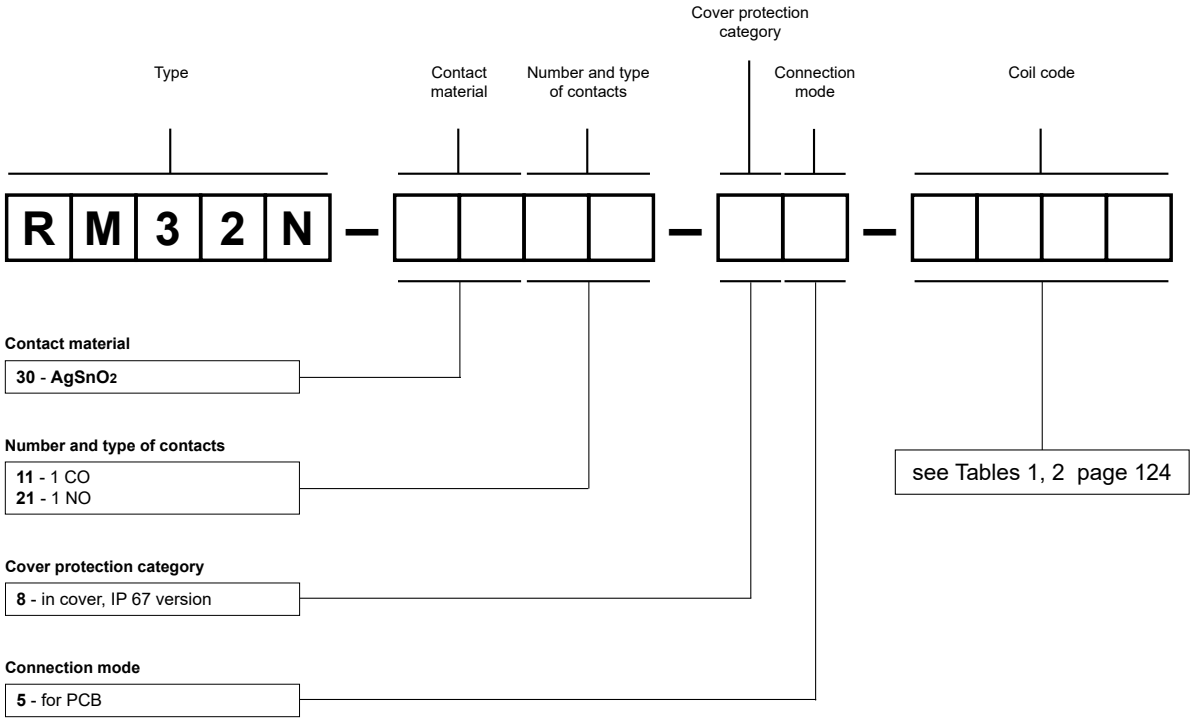
Coil code ❶	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
S005	5	125	± 10%	3,75	6,5
S009	9	405	± 10%	6,75	11,7
S012	12	720	± 10%	9,00	15,6
S018	18	1 620	± 10%	13,50	23,4
S024	24	2 880	± 10%	18,00	31,2

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

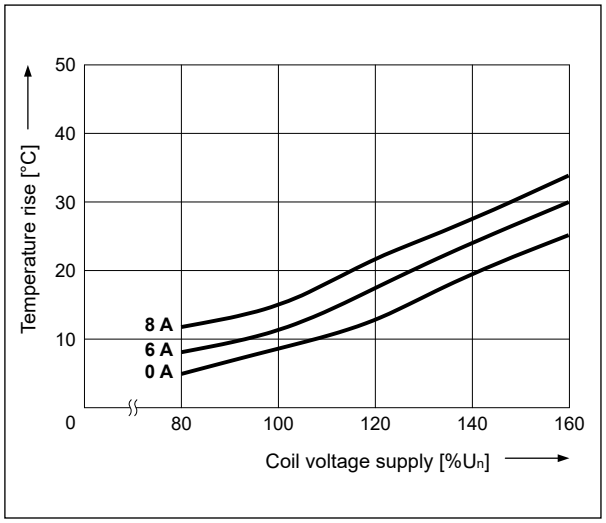
Rated surge voltage		10 000 V 1,2 / 50 µs
Insulation resistance		> 100 MΩ 500 V DC
Dielectric strength		
• between coil and contacts		4 000 V AC type of insulation: reinforced
• contact clearance		1 000 V AC type of clearance: micro-disconnection
Contact - coil distance		
• clearance		≥ 5 mm
• creepage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

General data

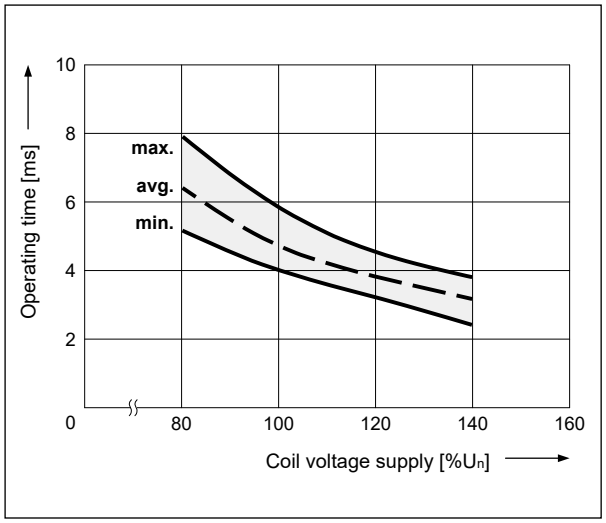
Operating / release time (typical values)		8 ms / 4 ms
Electrical life (number of cycles)		
• resistive AC1	360 cycles/hour	> 10^5 1 CO: 5 A, 250 V AC 1 NO: 8 A, 250 V AC
• resistive DC1	360 cycles/hour	> 10^5 1 CO: 5 A, 30 V DC 1 NO: 8 A, 30 V DC
Mechanical life	18 000 cycles/hour	> 10^7
Dimensions (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.

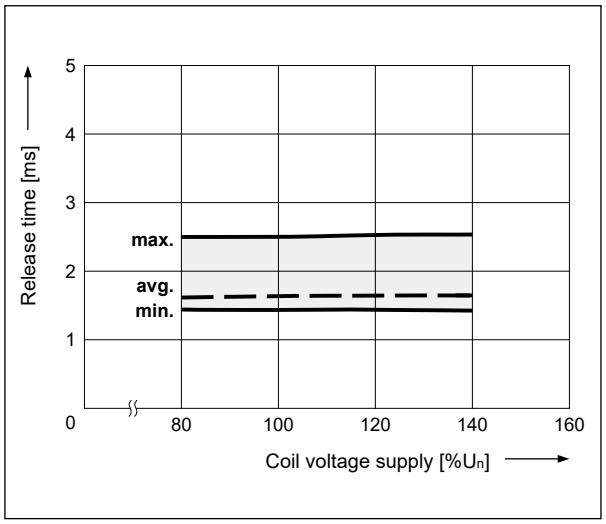
Coil temperature rise at 85 °C — Fig. 1



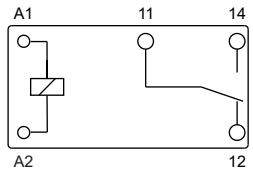
Operating time — Fig. 2



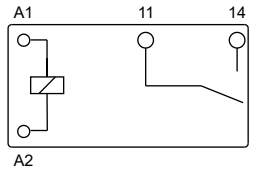
Release time — Fig. 3



Connection diagrams (pin side view)

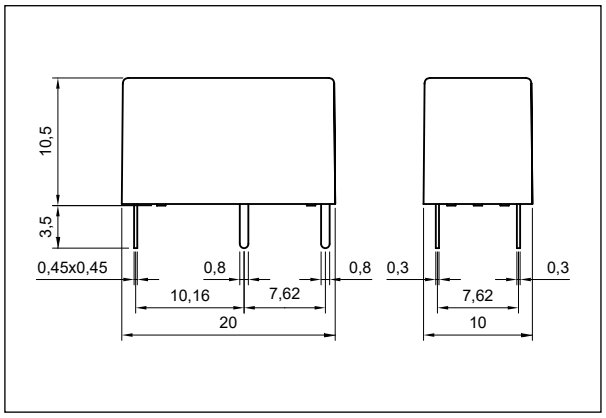


1 CO



1 NO

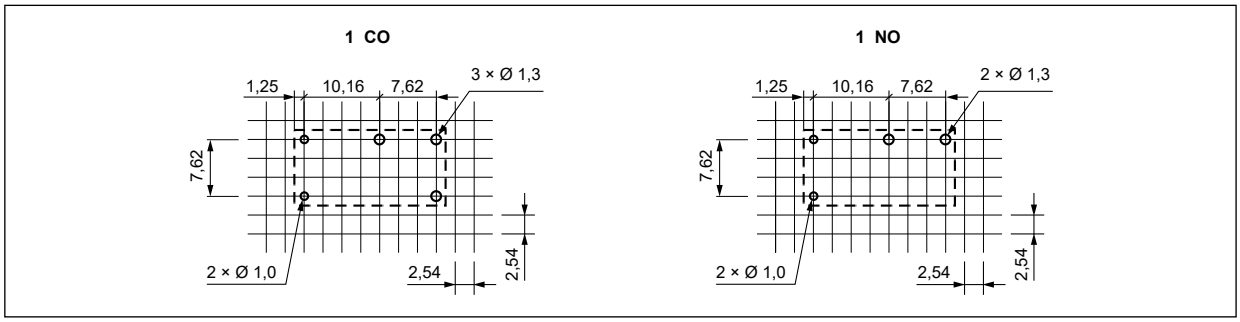
Dimensions



Mounting

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

Pinout (solder side view)

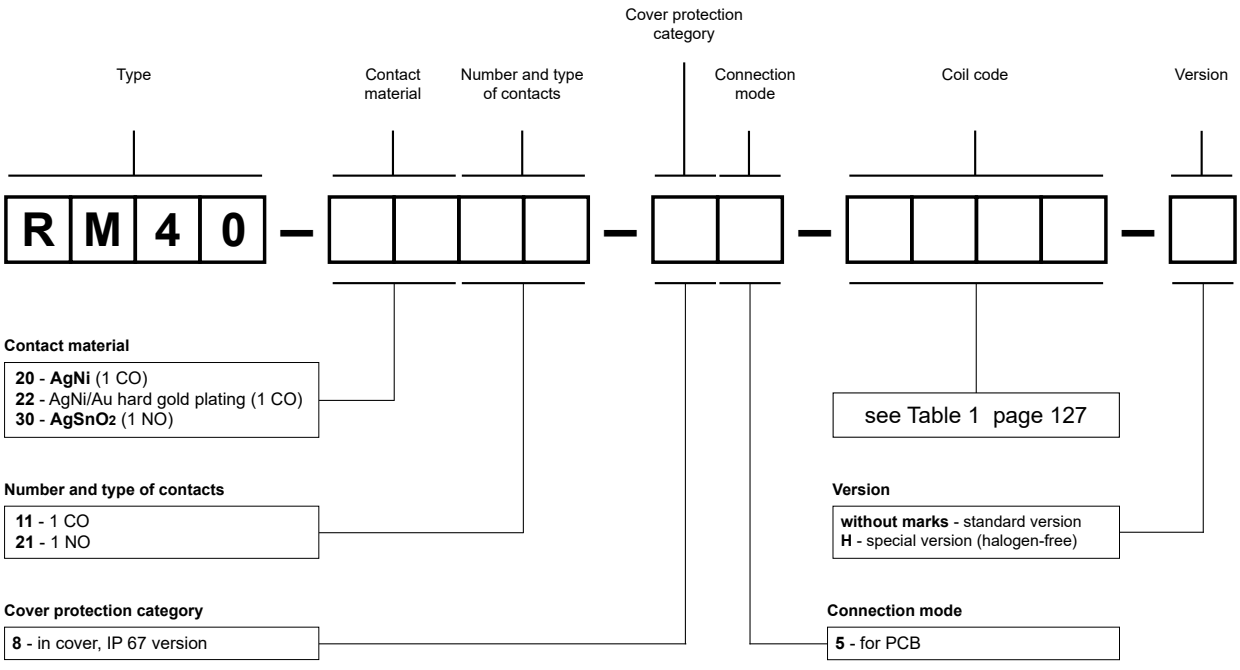


Coil data - DC voltage version

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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RM45N
miniature relays

- 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

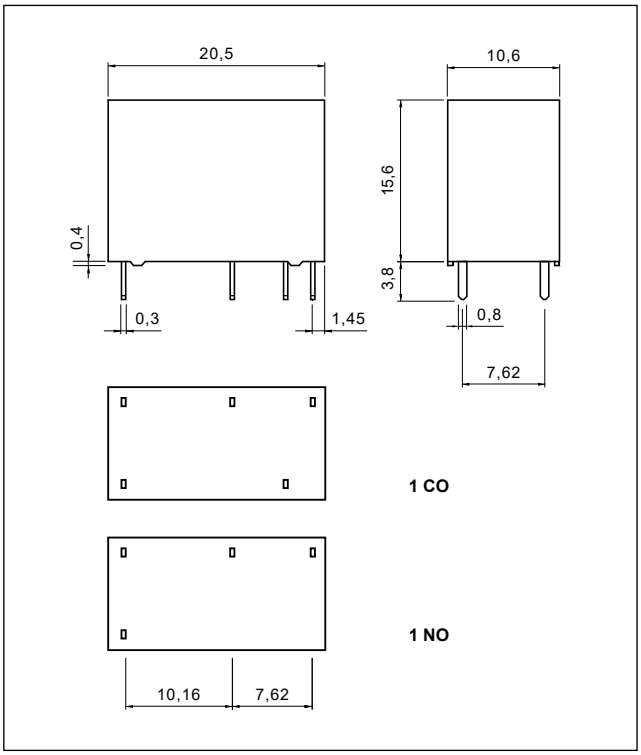
Insulation resistance	100 MΩ	500 V DC, 60 s
Dielectric strength		
• between coil and contacts	4 000 V AC	type of insulation: reinforced
• contact clearance	1 000 V AC	type of clearance: micro-disconnection

General data

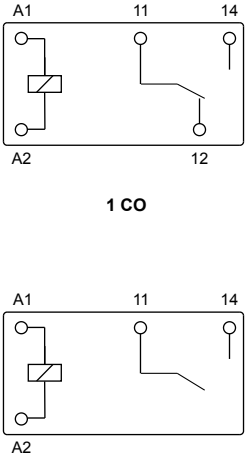
Operating / release time (typical values)		8 ms / 5 ms	
Electrical life (number of cycles)			
• resistive AC1	1 800 cycles/hour	10^5 1 CO: 5 A / 5 A (NO/NC), 250 V AC	1 NO: 5 A, 250 V AC
• resistive DC1	1 800 cycles/hour	10^5 1 CO: 5 A / 5 A (NO/NC), 28 V DC	1 NO: 5 A, 28 V DC
Mechanical life	18 000 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

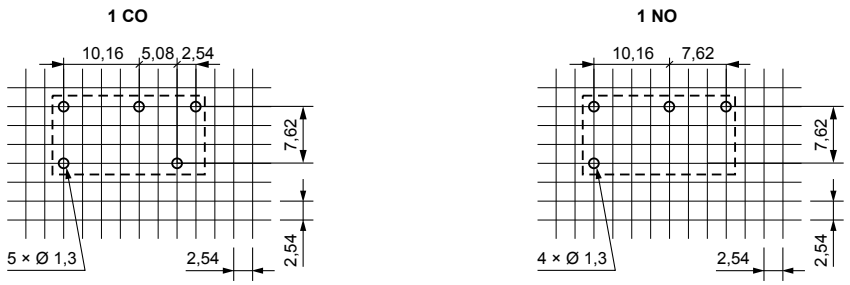
Dimensions



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

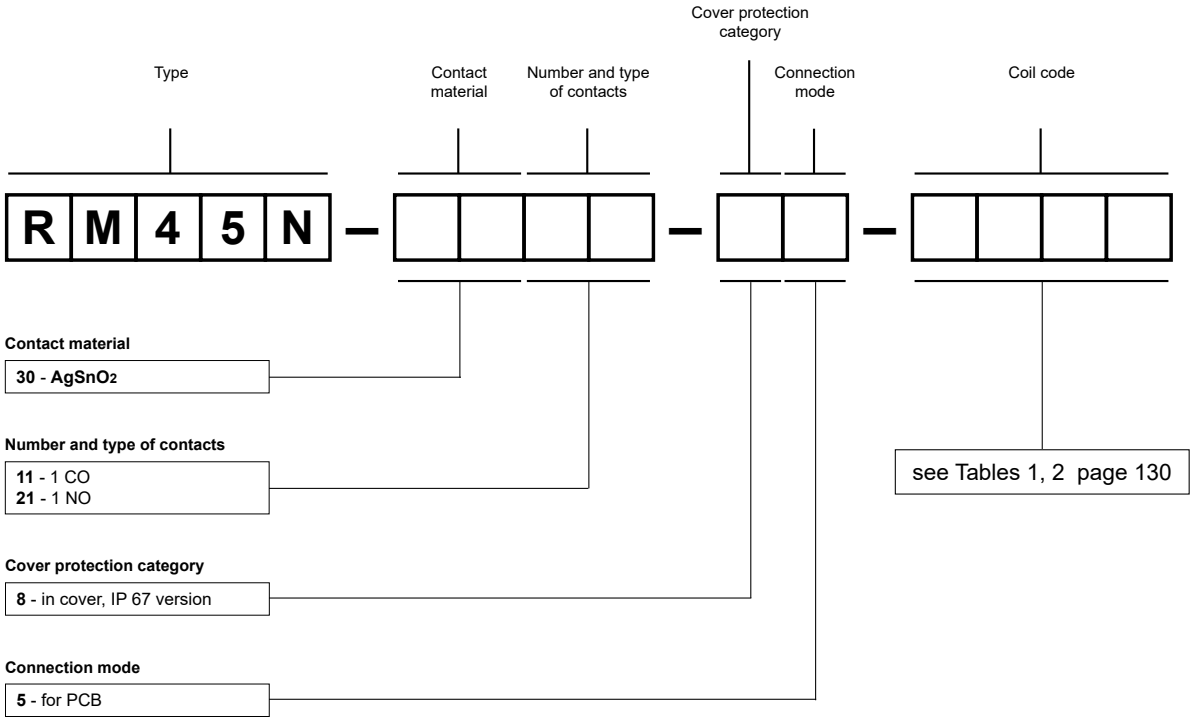
Coil code ❶	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
S005	5	125	± 10%	3,75	5,5
S009	9	405	± 10%	6,75	9,9
S012	12	720	± 10%	9,00	13,2
S024	24	2 880	± 10%	18,00	26,4

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
Rated / max. switching voltage	AC	250 V / 277 V
	DC	28 V / 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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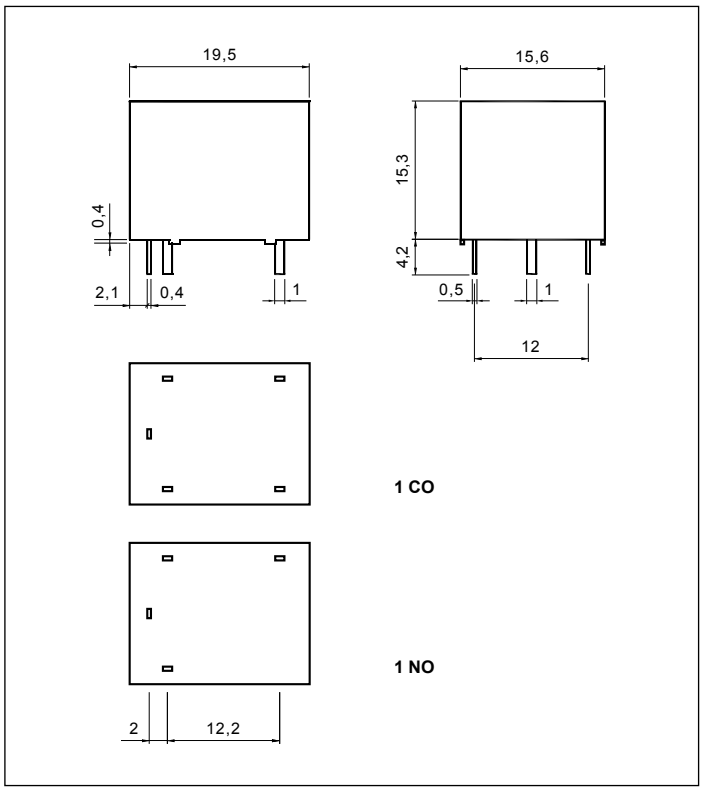
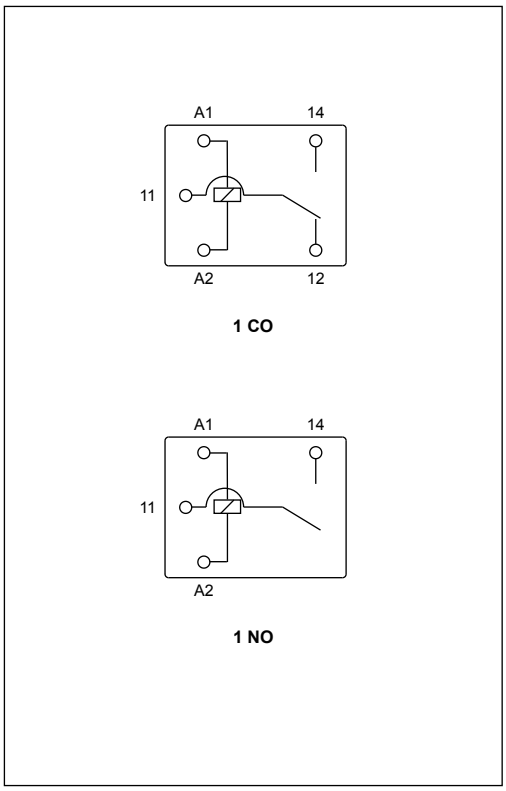
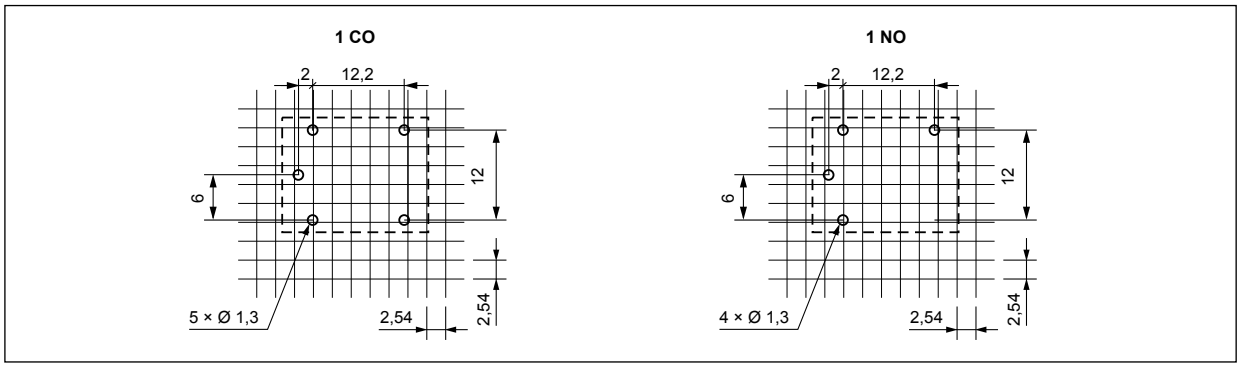
Dimensions



Connection diagrams (pin side view)



Pinout (solder side view)



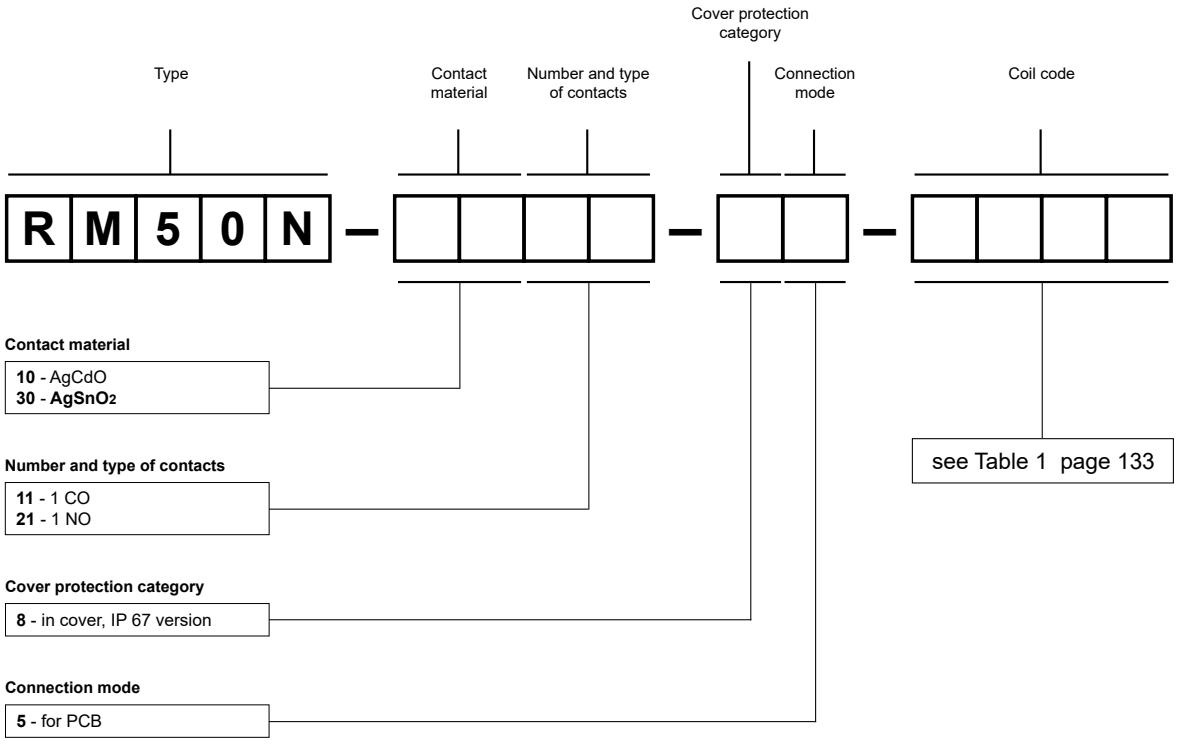
Mounting

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

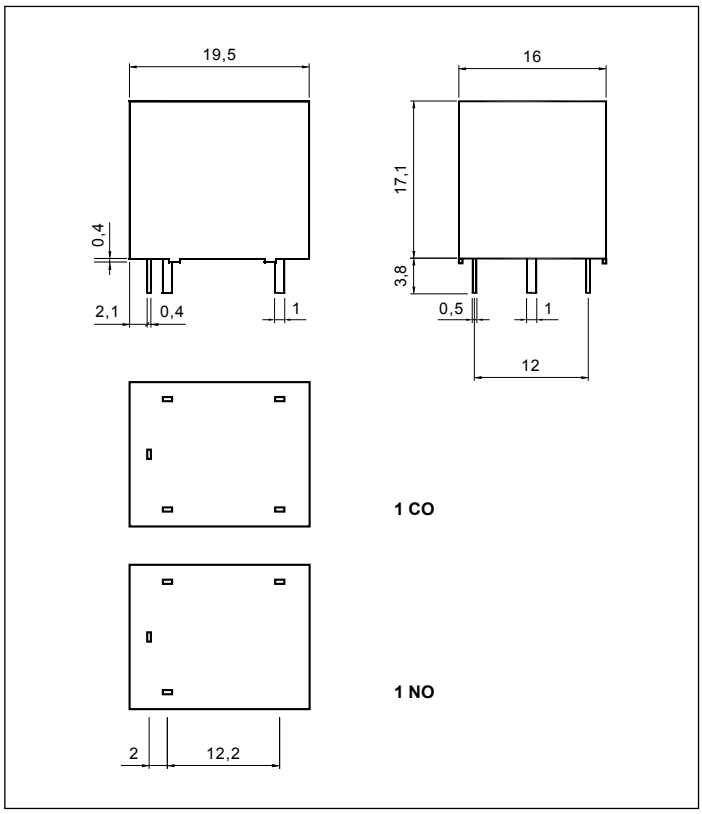
Rated surge voltage		4 000 V 1,2 / 50 µs
Insulation resistance		250 MΩ 500 V DC, 60 s
Dielectric strength		
• between coil and contacts		2 500 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection
Contact - coil distance		
• clearance		≥ 1,9 mm
• creepage		≥ 1,9 mm

General data

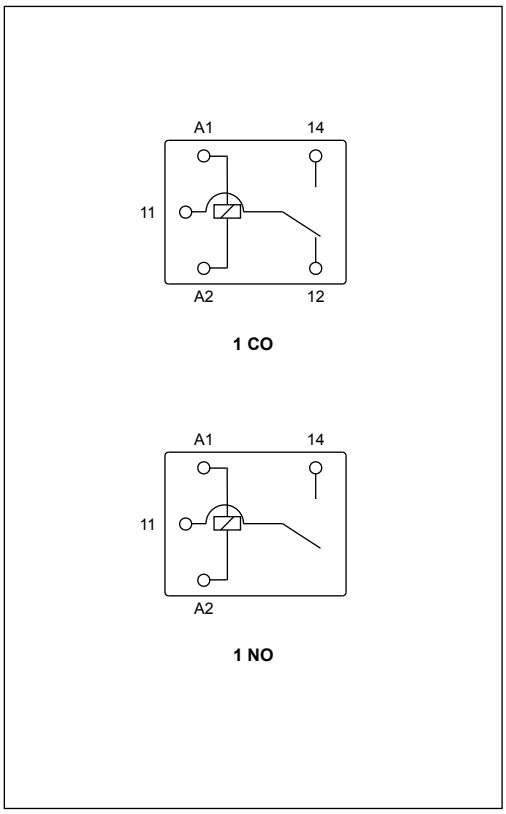
Operating / release time (typical values)		15 ms / 10 ms	
Electrical life (number of cycles)			
• resistive AC1	360 cycles/hour	10^5 1 CO: 10 A / 7 A (NO/NC), 250 V AC	1 NO: 10 A, 250 V AC
• resistive DC1	360 cycles/hour	10^5 1 CO: 10 A / 7 A (NO/NC), 30 V DC	1 NO: 10 A, 30 V DC
Mechanical life	18 000 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.

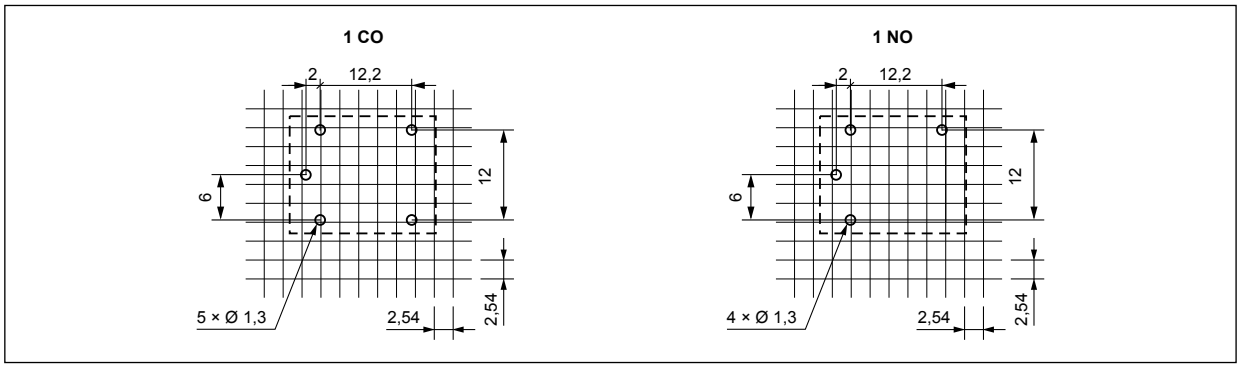
Dimensions



Connection diagrams (pin side view)



Pinout (solder side view)



Mounting

Relays **RM51** are designed for direct PCB mounting.

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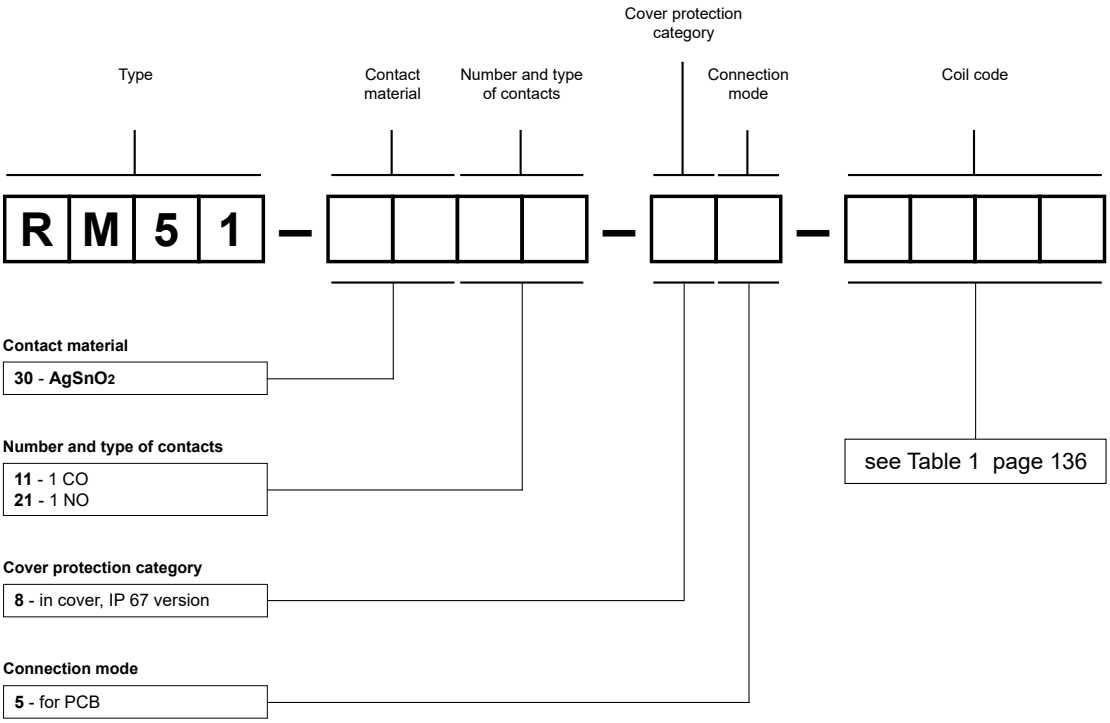
Coil data - DC voltage version Table 1

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

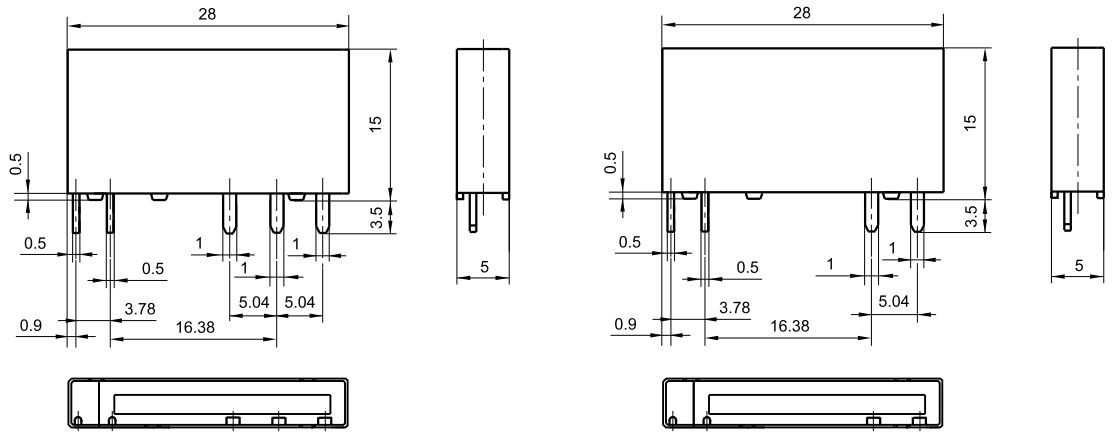
General data

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

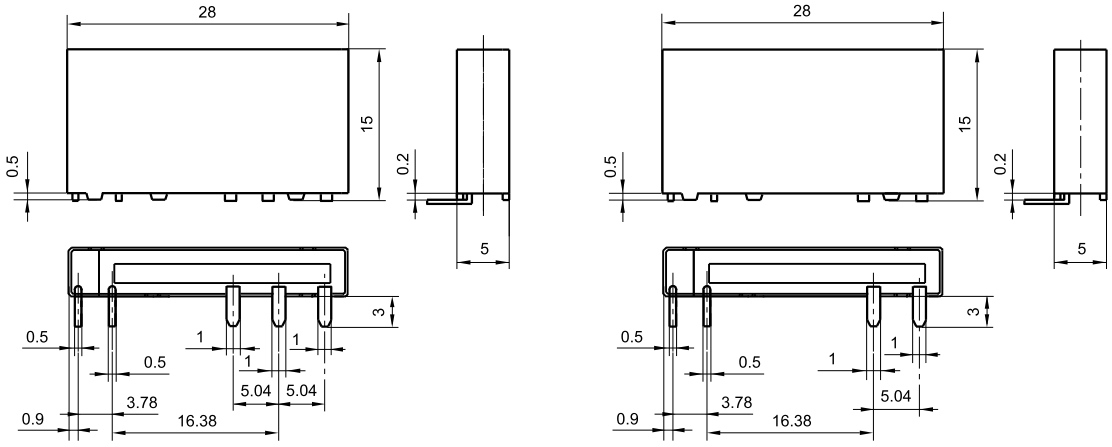
vertical version (V)



1 CO

1 NO

horizontal version (H)

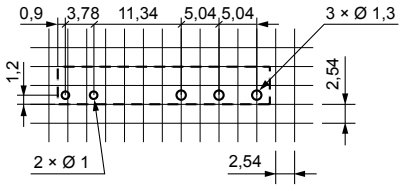


1 CO

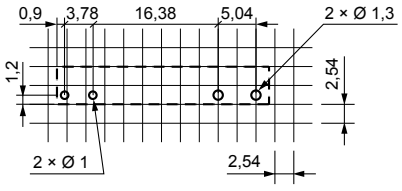
1 NO

Pinout (solder side view)

vertical version (V)

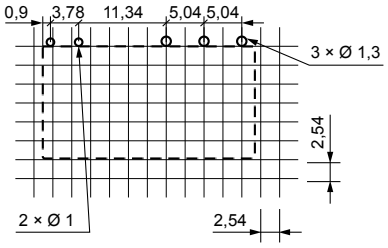


1 CO

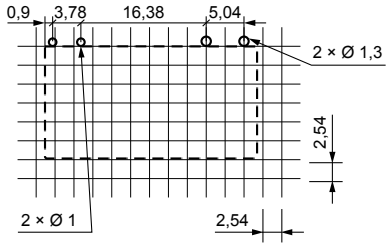


1 NO

horizontal version (H)

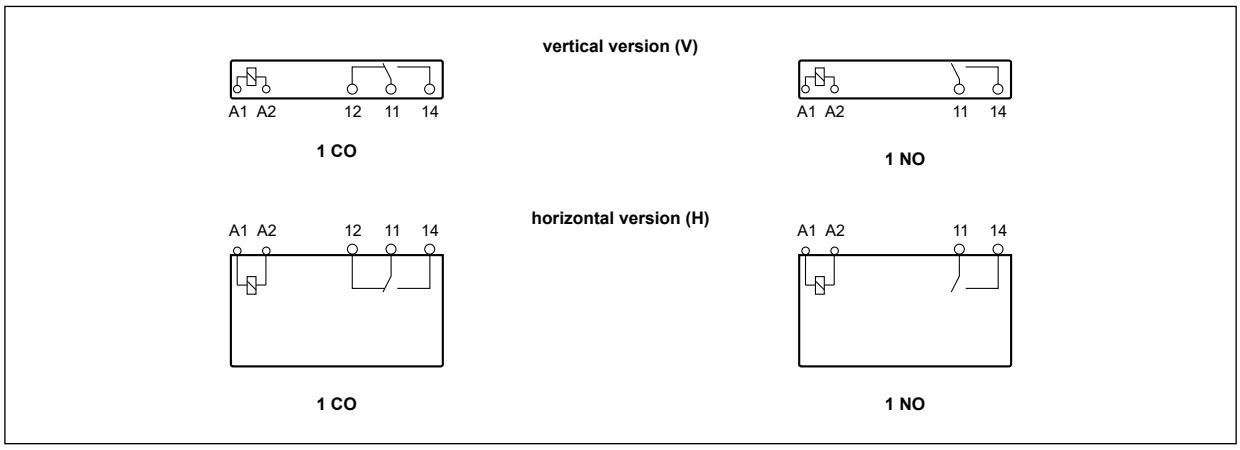


1 CO



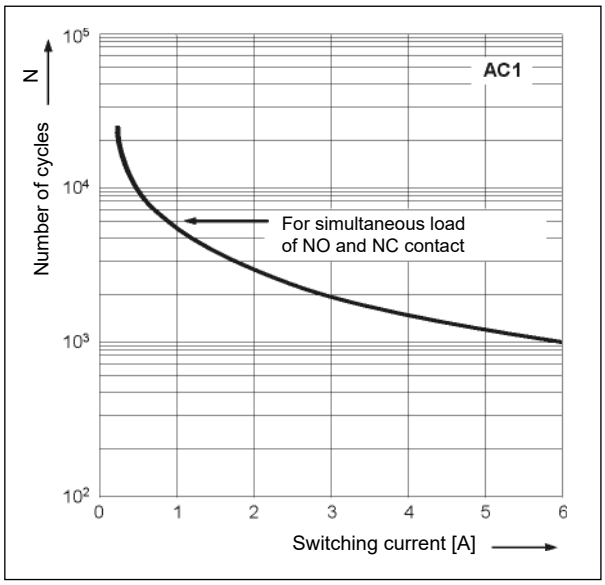
1 NO

Connection diagrams (pin side view)



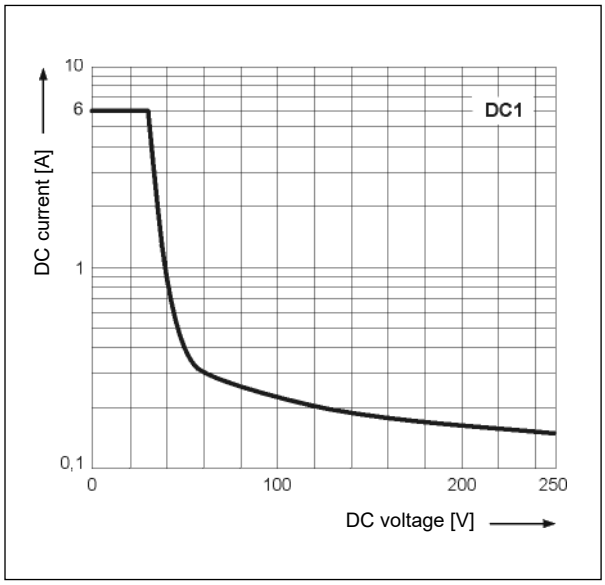
Electrical life at AC resistive current. Switching frequency: 360 cycles/hour

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.

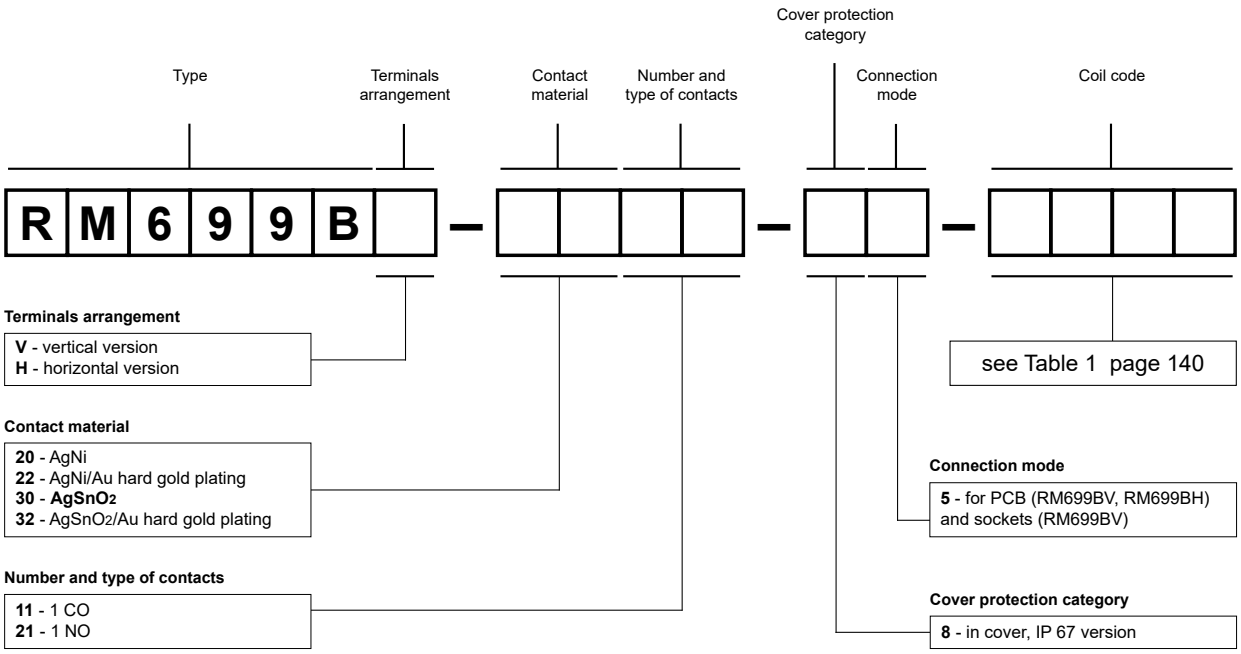
Export Sales Department: phone +48 68 47 90 832, 951, export@relpol.com.pl

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 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 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.

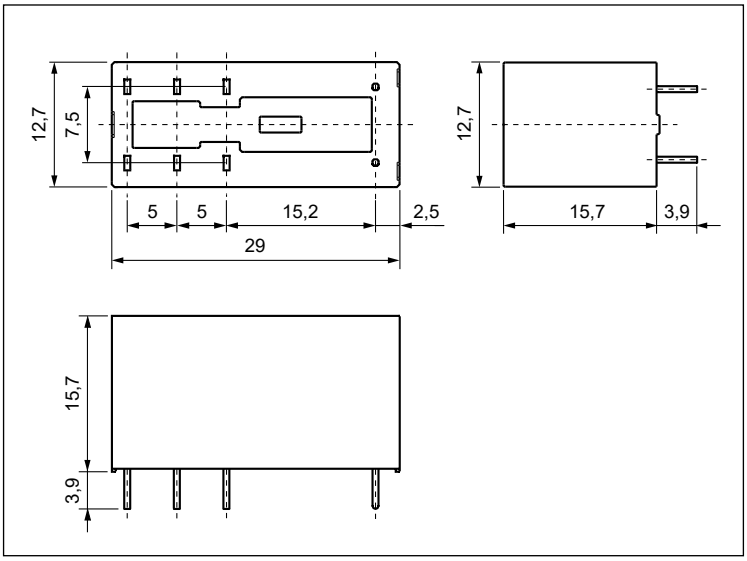
Mounting, sockets and accessories for relays

Relays **RM84** ❹ are designed for: • direct PCB mounting • plug-in sockets.

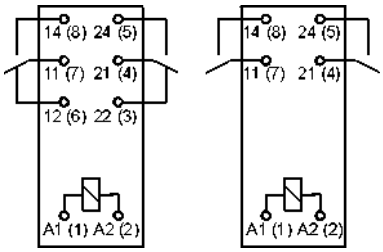
Sockets for RM84	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZT80	GZT80-0040	GZM80-0041	GZT80-0035	M... ❻, ZGGZ80 ❼
GZM80	GZT80-0040	GZM80-0041	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



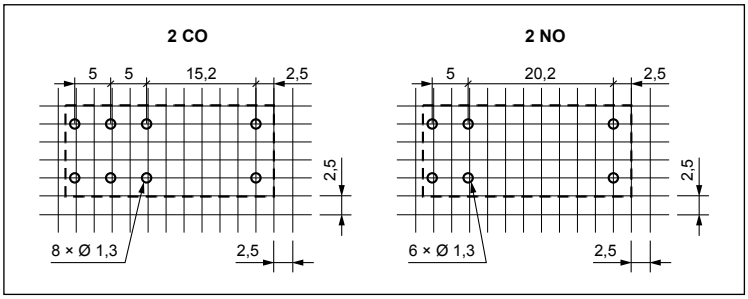
Connection diagrams (pin side view)



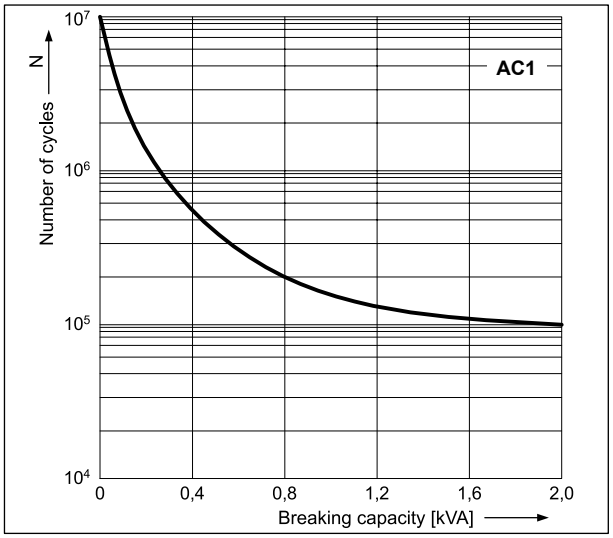
2 CO **2 NO**

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	

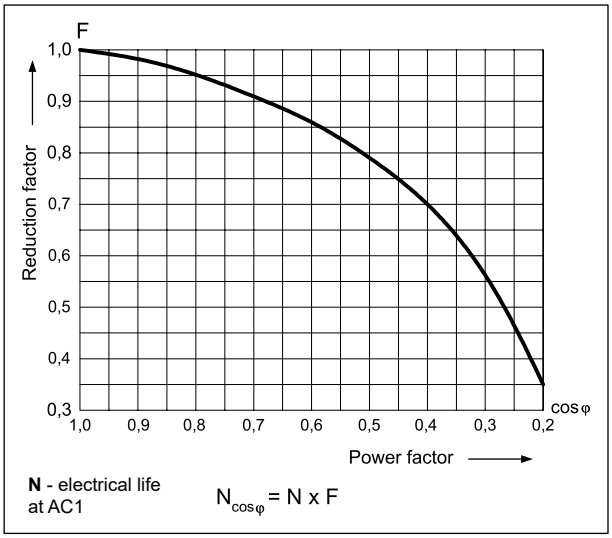
Pinout (solder side view)



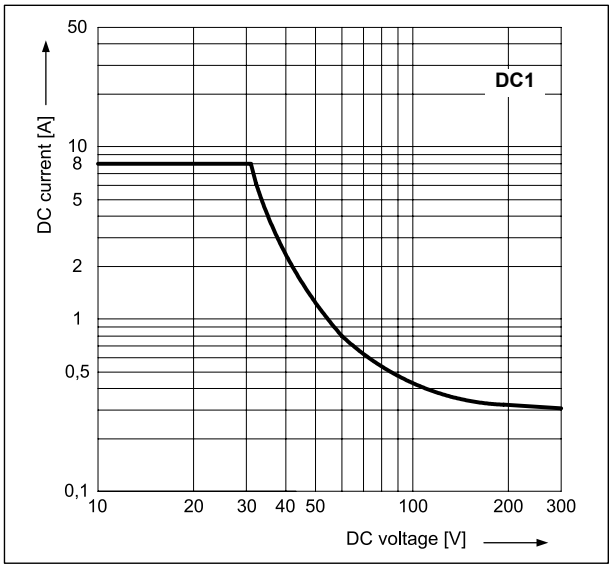
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



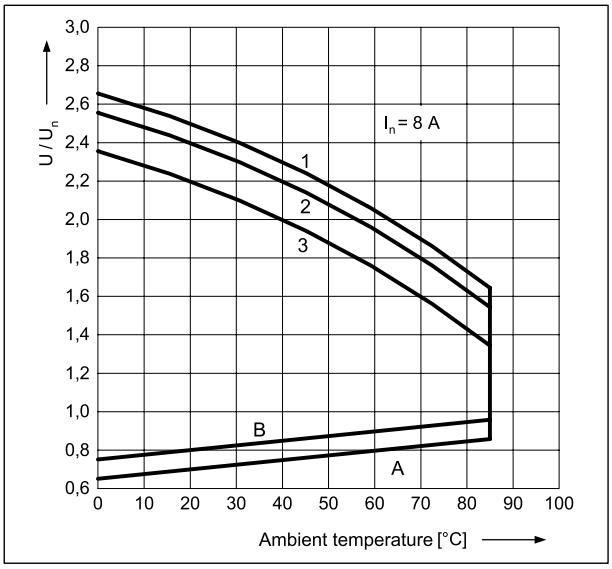
Electrical life reduction factor at AC inductive load Fig. 2



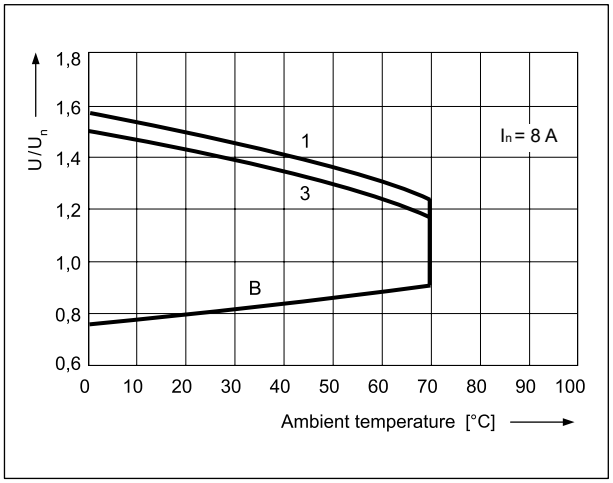
Max. DC resistive load breaking capacity Fig. 3



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

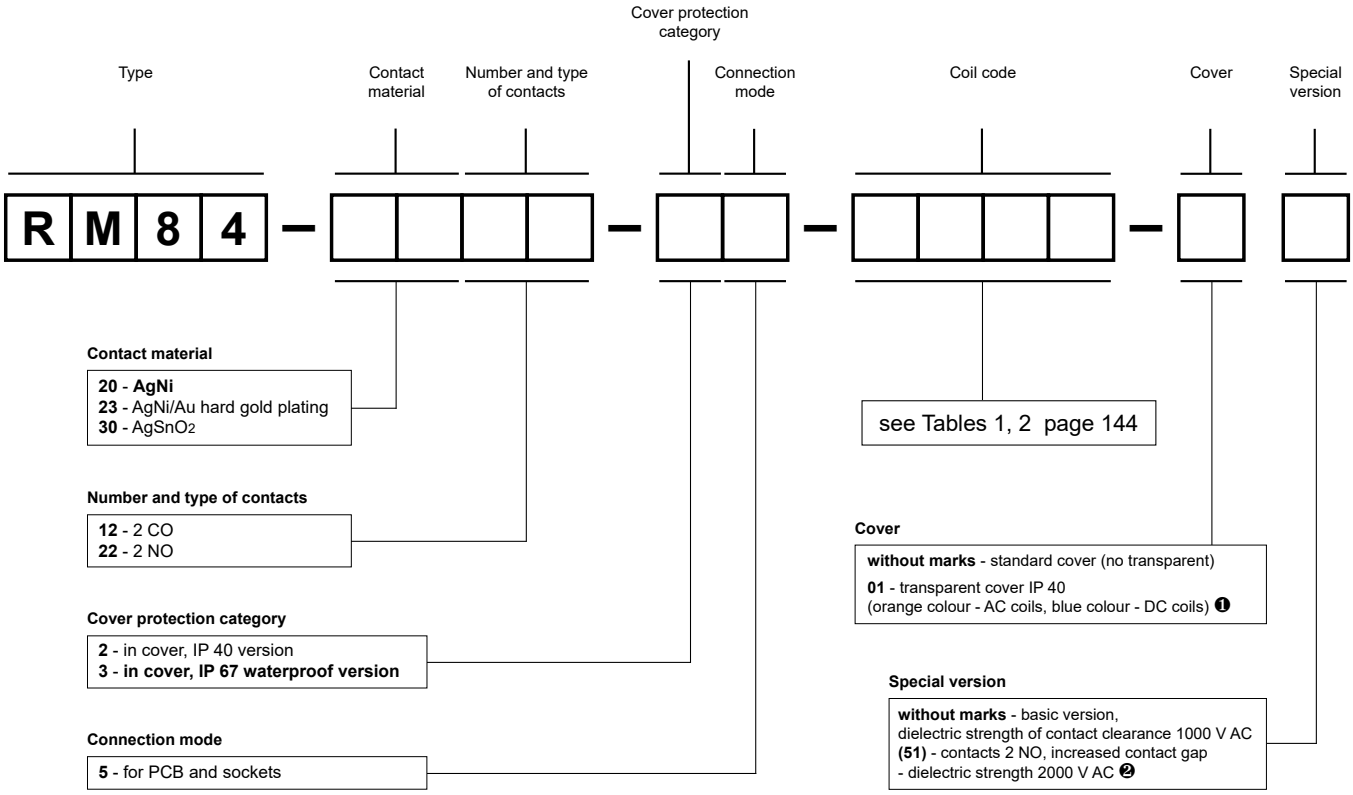
Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC 50 Hz	
				min. (at 20 °C)	max. (at 20 °C)
5012	12	100	± 10%	9,6	13,2
5024	**24**	**400**	**± 10%**	**19,2**	**28,8**
5048	48	1 550	± 10%	38,4	57,6
5060	60	2 600	± 10%	48,0	72,0
5110	110	8 900	± 10%	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

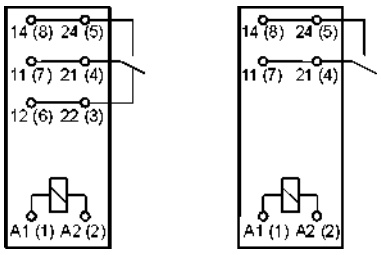
Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Flammability class		V-0 for standard cover (no transparent), UL 94
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact 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)

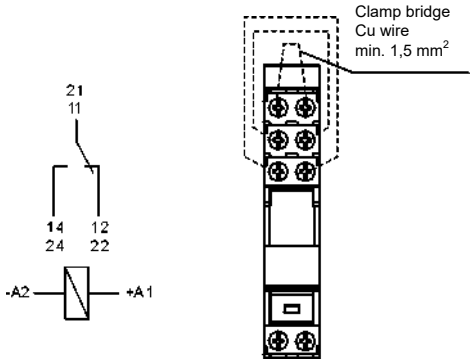


1 CO 1 NO

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).

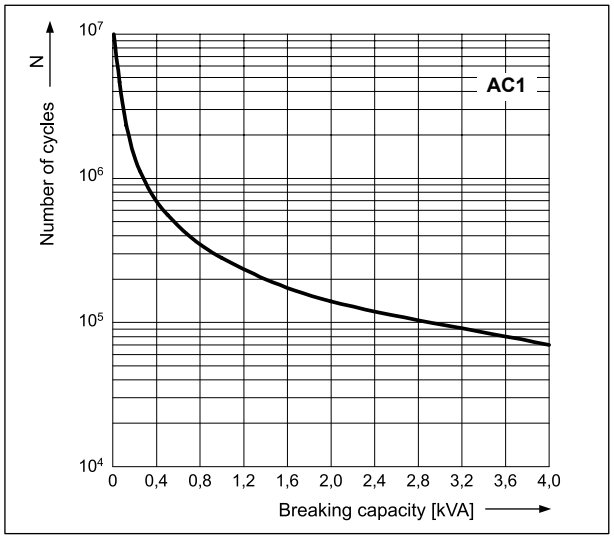
Mounting, sockets and accessories for relays

Relays **RM85** ❹ are designed for: • direct PCB mounting • plug-in sockets.

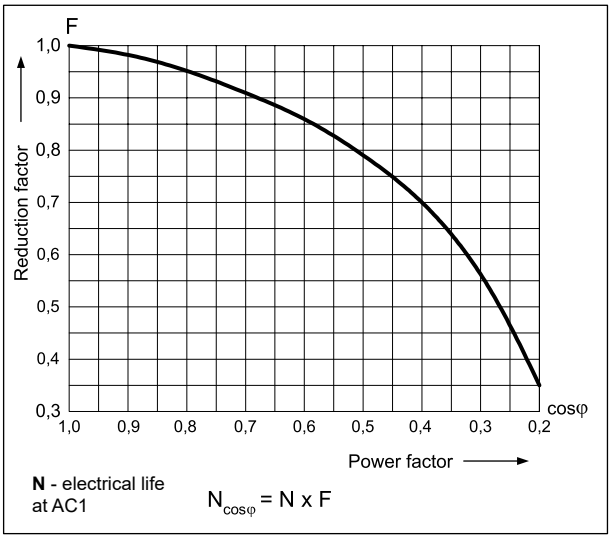
Sockets for RM85	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZT80 ❺	GZT80-0040	GZM80-0041	GZT80-0035	M... ❼, ZGGZ80 ❽
GZM80 ❺	GZT80-0040	GZM80-0041	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.

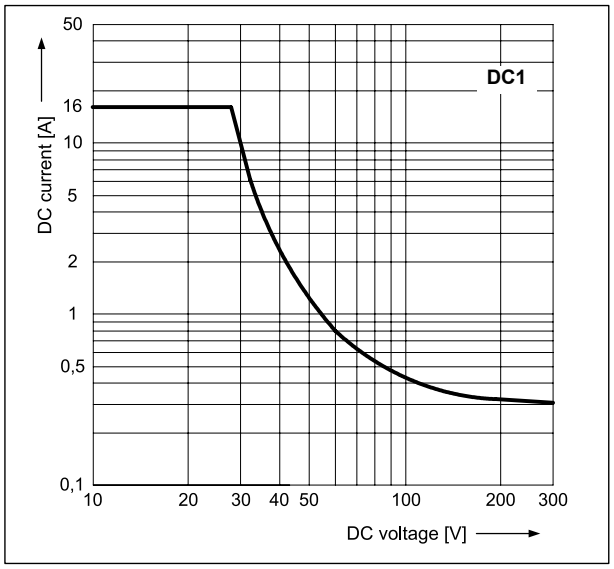
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



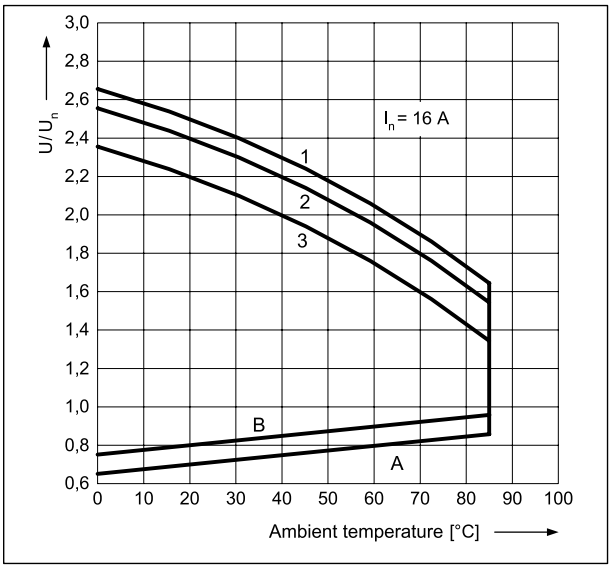
Electrical life reduction factor at AC inductive load Fig. 2



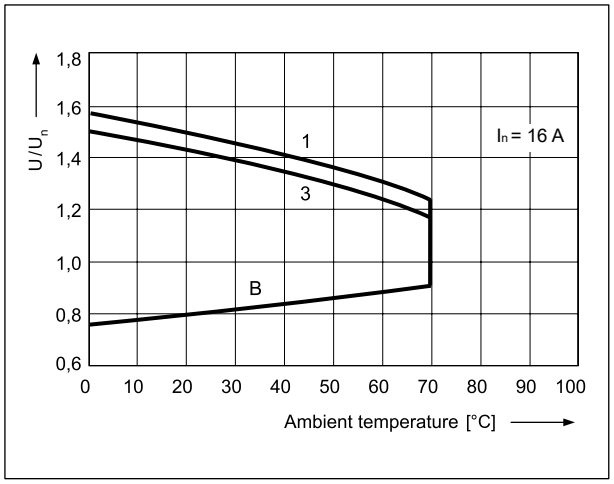
Max. DC resistive load breaking capacity Fig. 3



Coil operating range - DC Fig. 4



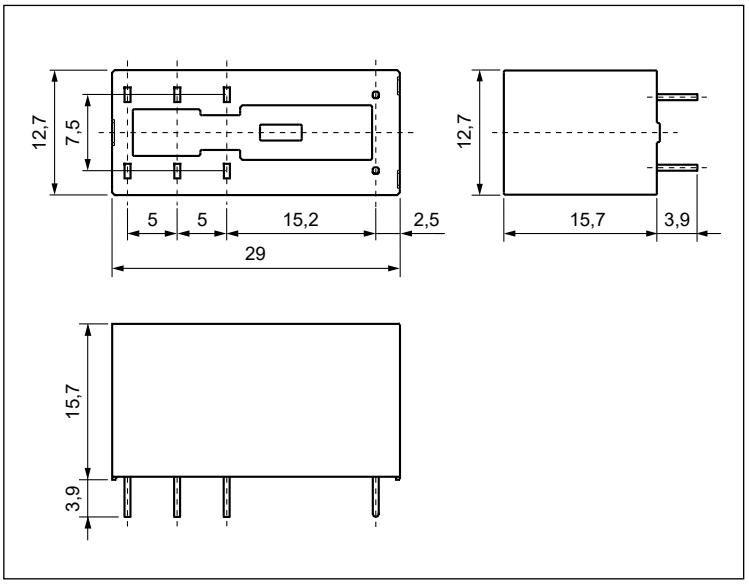
Coil operating range - AC 50 Hz Fig. 5



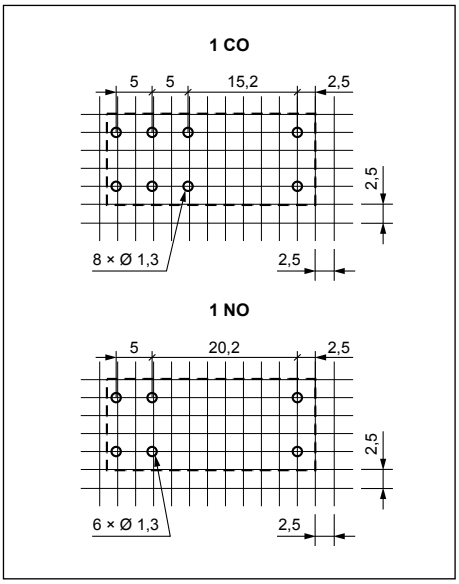
Description of Fig. 4 and 5

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

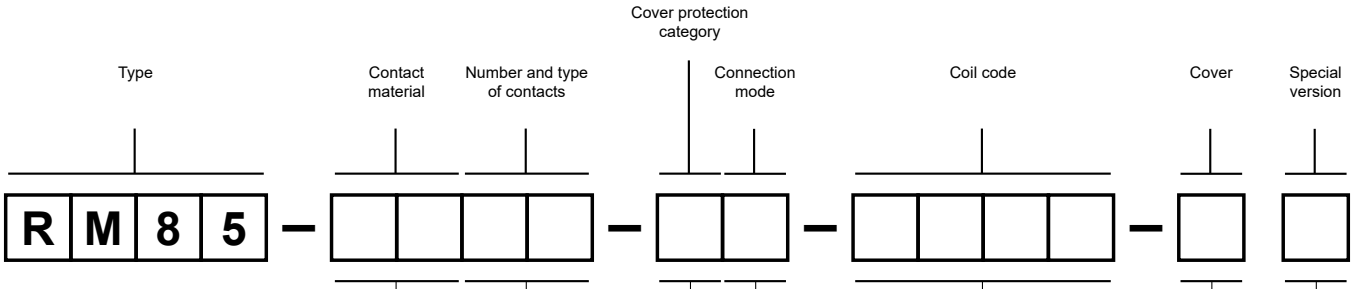
Table 2

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 - $AgSnO_2$

see Tables 1, 2 page 149

Number and type of contacts

11 - 1 CO
21 - 1 NO

Cover

without marks - standard cover (no transparent)
01 - transparent cover IP 40
(orange colour - AC coils, blue colour - DC coils) ❶

Cover protection category

2 - in cover, IP 40 version
3 - **in cover, IP 67 waterproof version**

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

Connection mode

5 - for PCB and sockets

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

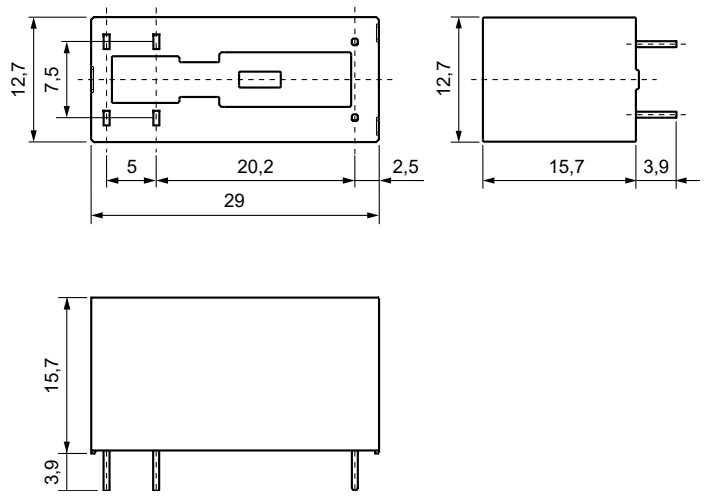
Insulation rated voltage		480 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength		
• between coil and contacts		5 000 V AC type of insulation: reinforced
• contact clearance		2 000 V AC type of clearance: full-disconnection
Contact - coil distance		
• clearance		≥ 10 mm
• creepage		≥ 10 mm

General data

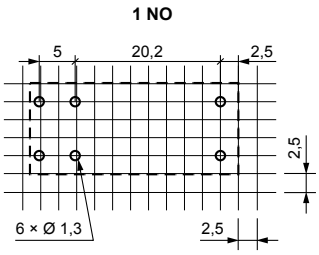
Operating / release time (typical values)		7 ms / 3 ms
Electrical life (number of cycles)		
• resistive AC1		> 4 x 10^4 5 A, 480 V AC
• motor load acc. to UL 508		10^5 5 FLA / 7 LRA, 240 V AC, 65 °C
		10^5 5 FLA / 12 LRA, 24 V DC, 65 °C
Mechanical life	3 600 cycles/hour	> 3 x 10^7
Electromagnetic load 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



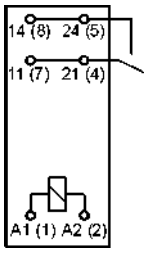
Pinout (solder side view)



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.

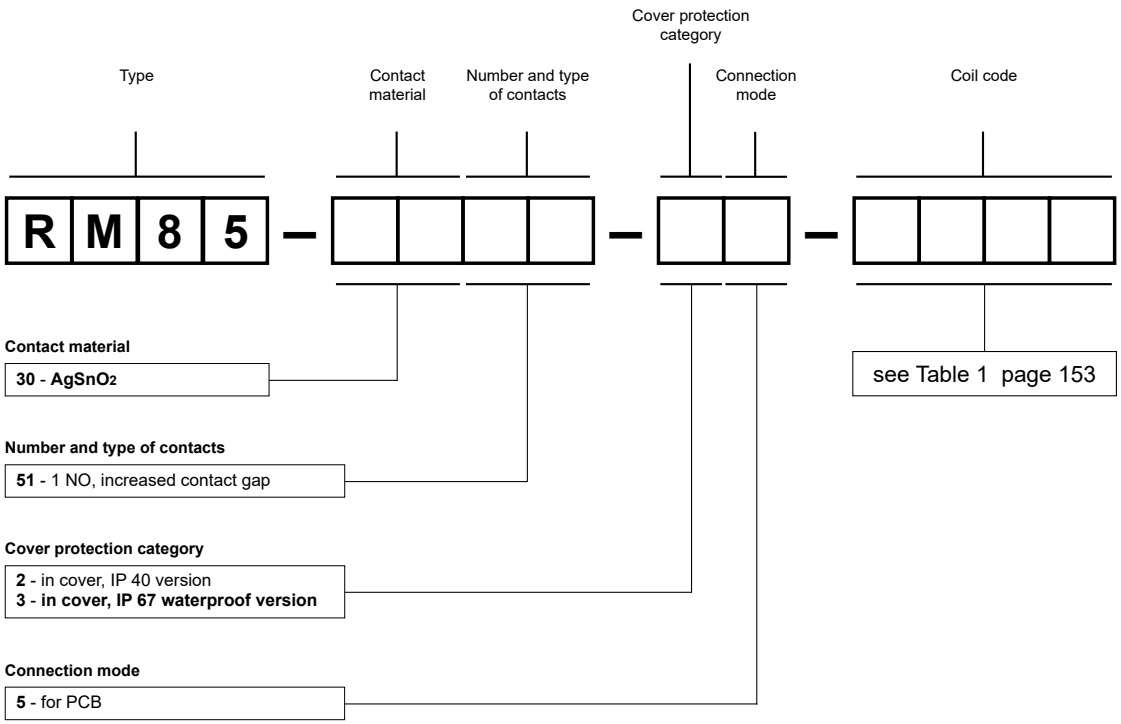
Coil data - DC voltage version

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

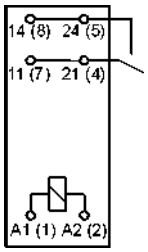
Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength		
• between coil and contacts		5 000 V AC type of insulation: reinforced
• contact clearance		1 000 V AC type of clearance: micro-disconnection
Contact - 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)

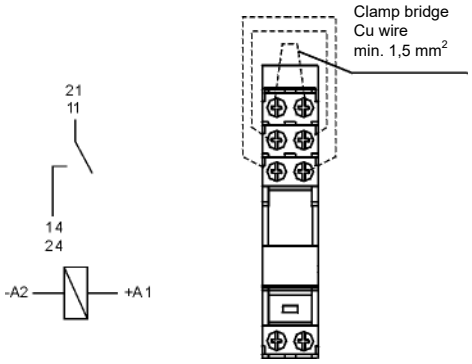


1 NO

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).

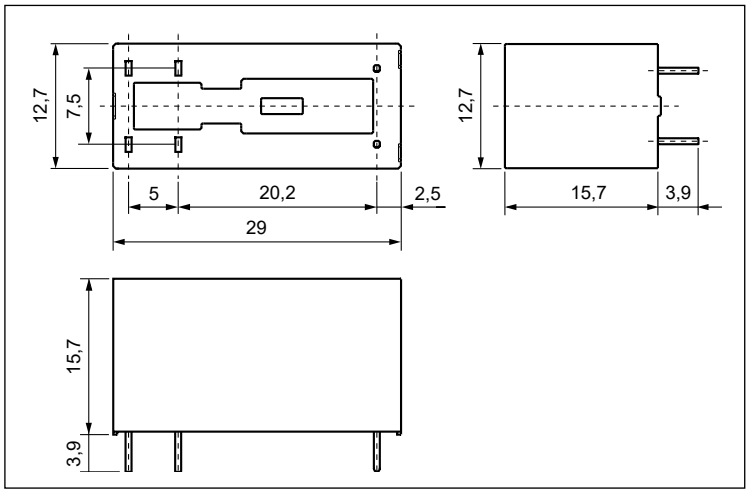
Mounting, sockets and accessories for relays

Relays **RM85 inrush** are designed for: • direct PCB mounting • plug-in sockets.

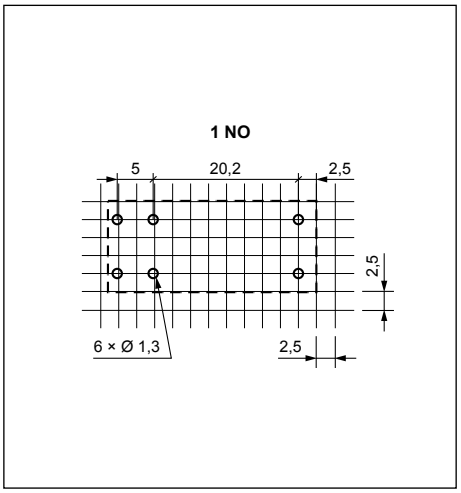
Sockets for RM85 inrush	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZT80 ❷	GZT80-0040	GZM80-0041	GZT80-0035	M... ❹, ZGGZ80 ❺
GZM80 ❷	GZT80-0040	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

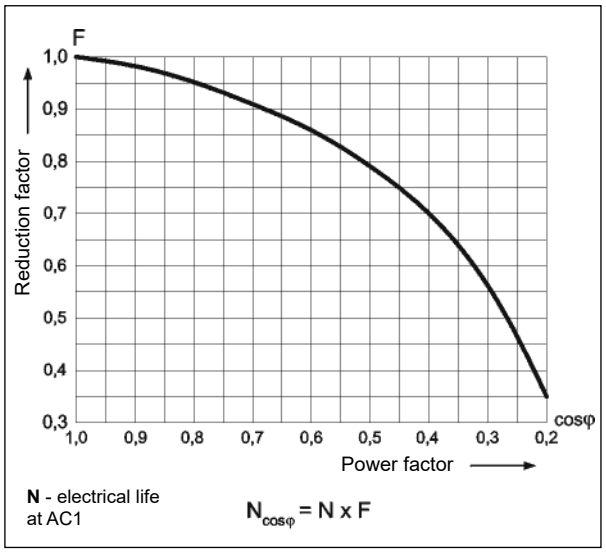


Pinout (solder side view)



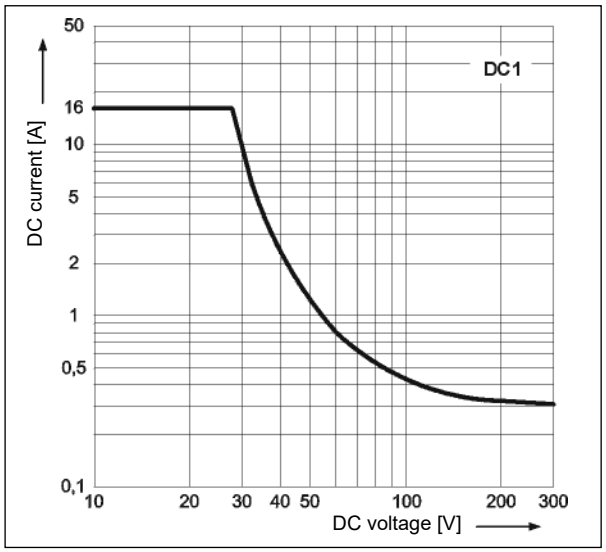
Electrical life reduction factor at AC inductive load

Fig. 1



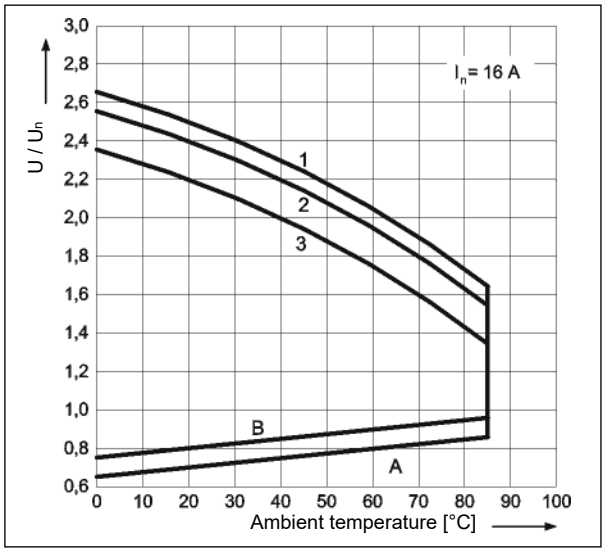
Max. DC resistive load breaking capacity

Fig. 2



Coil operating range - DC

Fig. 3



Description of Fig. 3

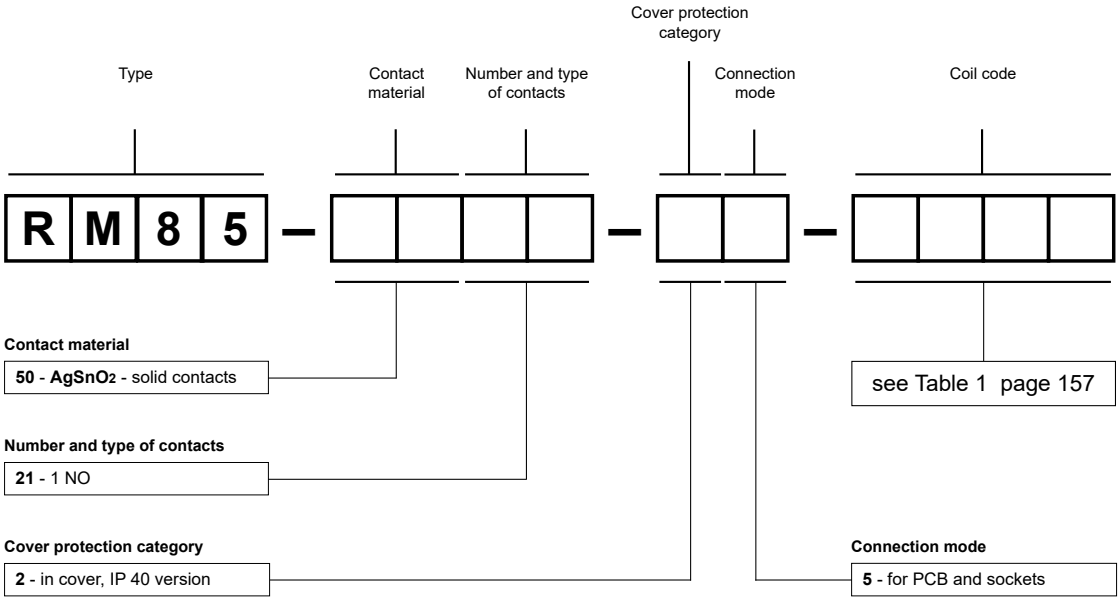
A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature 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

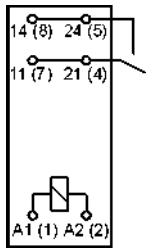
Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
Contact - 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)

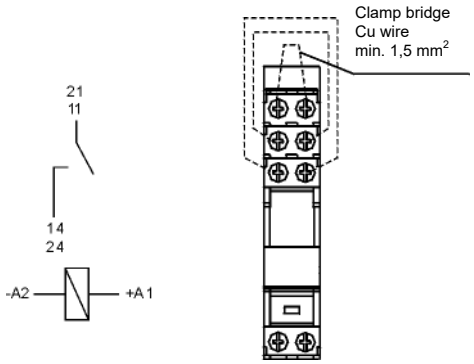


1 NO

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).

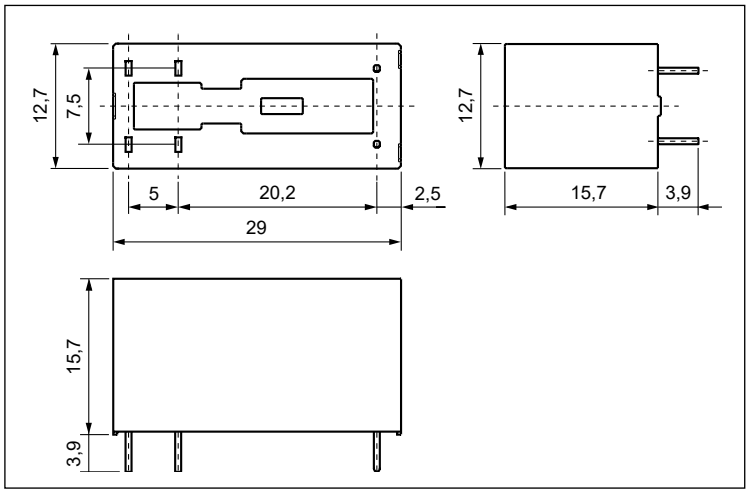
Mounting, sockets and accessories for relays

Relays **RM85 105 °C sensitive** are designed for: • direct PCB mounting • plug-in sockets.

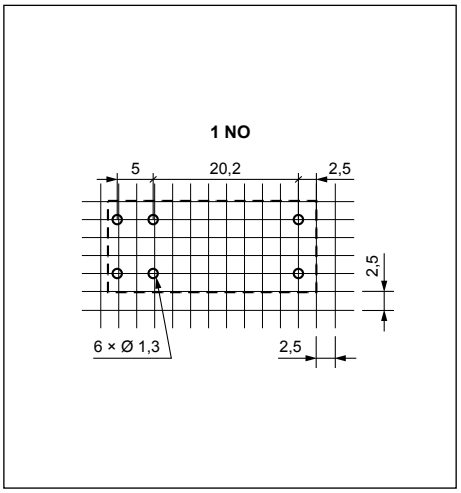
Sockets for RM85 105 °C sensitive	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
GZT80 ❷	GZT80-0040	GZM80-0041	GZT80-0035	M... ❹, ZGGZ80 ❺
GZM80 ❷	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

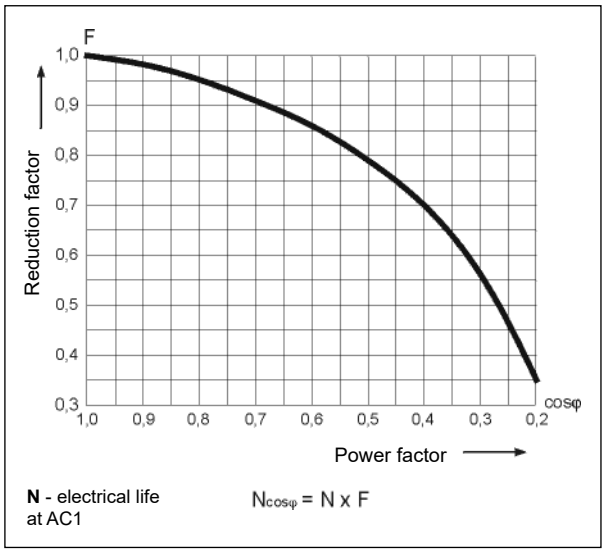


Pinout (solder side view)



Electrical life reduction factor at AC inductive load

Fig. 1

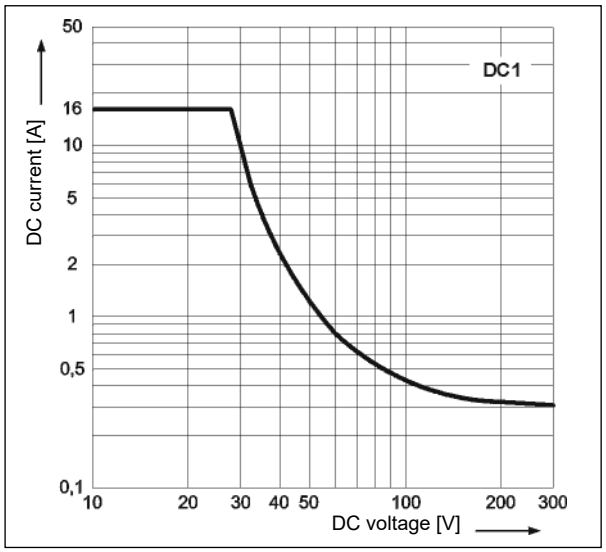


N - electrical life at AC1

$N_{cos\varphi} = N \times F$

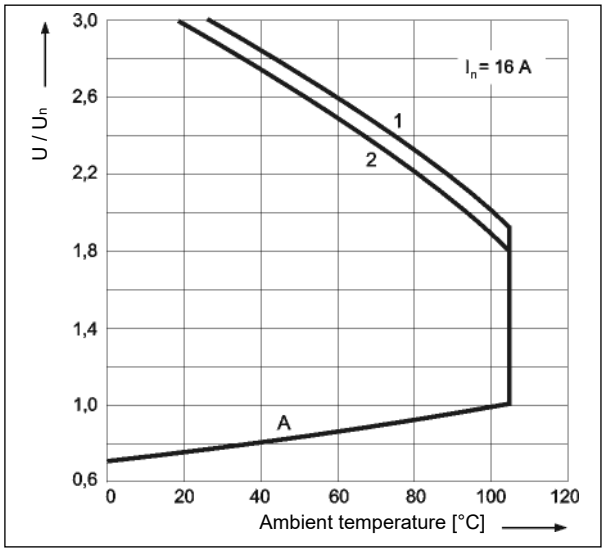
Max. DC resistive load breaking capacity

Fig. 2



Coil operating range - DC

Fig. 3



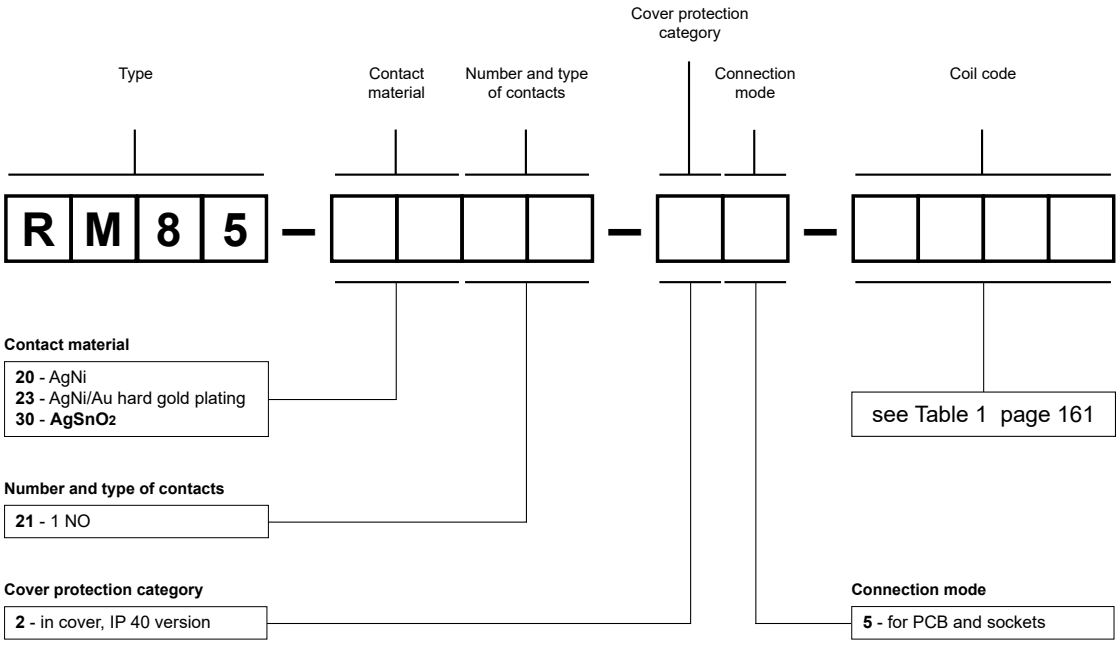
Description of Fig. 3

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

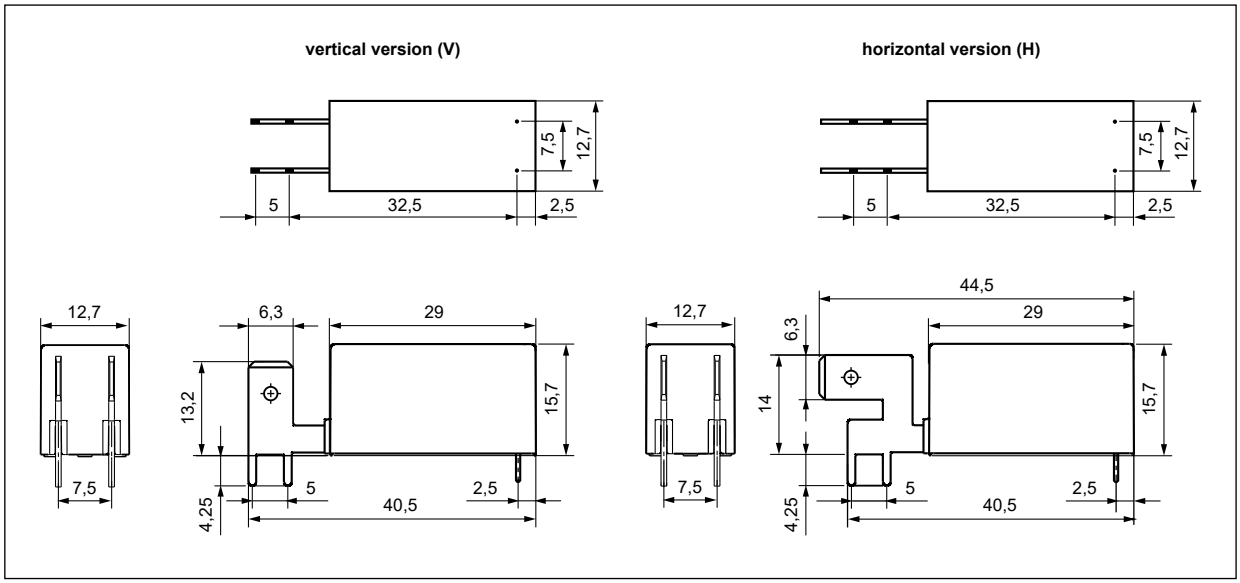
Insulation rated voltage		400 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength		
• between coil and contacts		5 000 V AC type of insulation: reinforced
• contact clearance		1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 10 mm
	• creepage	≥ 10 mm

General data

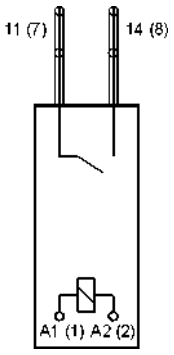
Operating / release time (typical values)		8 ms / 3 ms
Electrical life (number of cycles)		
• resistive AC1		> 10^4 20 A, 250 V AC, 85 °C
		> 1,5 x 10^5 10 A, 250 V AC, 105 °C
• cosφ		see Fig. 1
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		vertical version (V): 40,5 x 12,7 x 15,7 mm
		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)

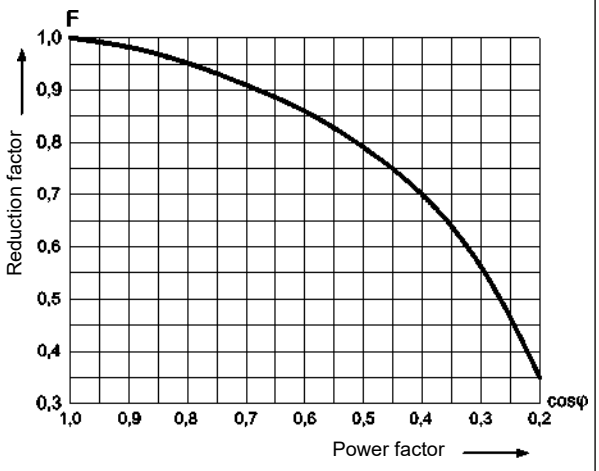


1 NO

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

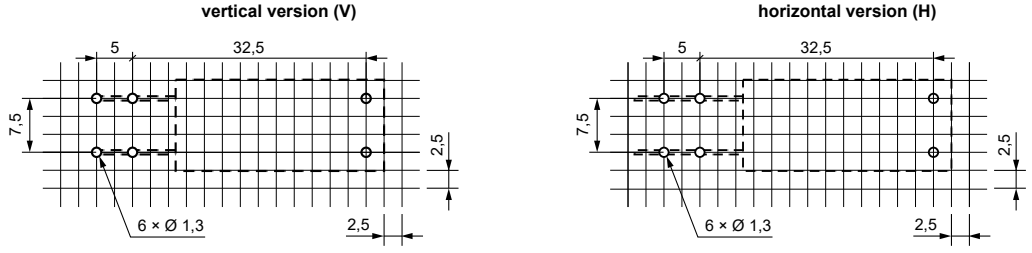
Fig. 1



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

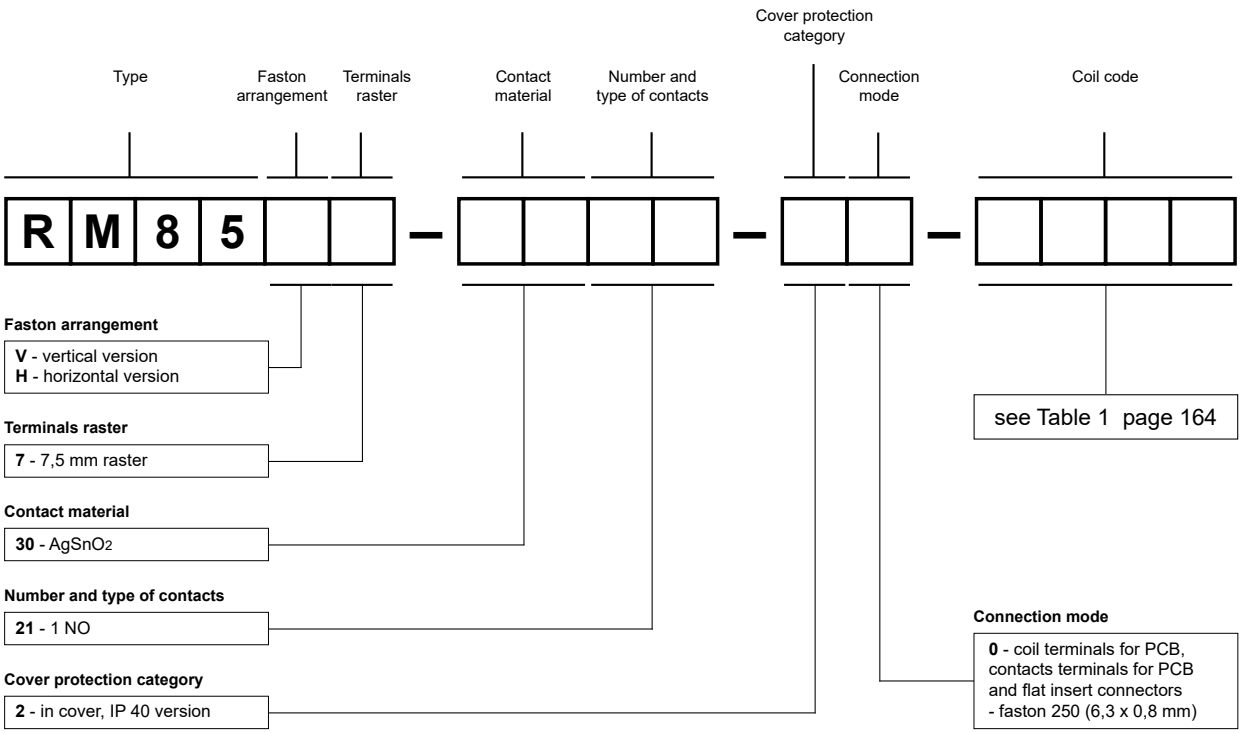
Relays **RM85 faston** are designed for: • direct PCB mounting • connection of load with flat insert connectors - faston 250 (6,3 x 0,8 mm).

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

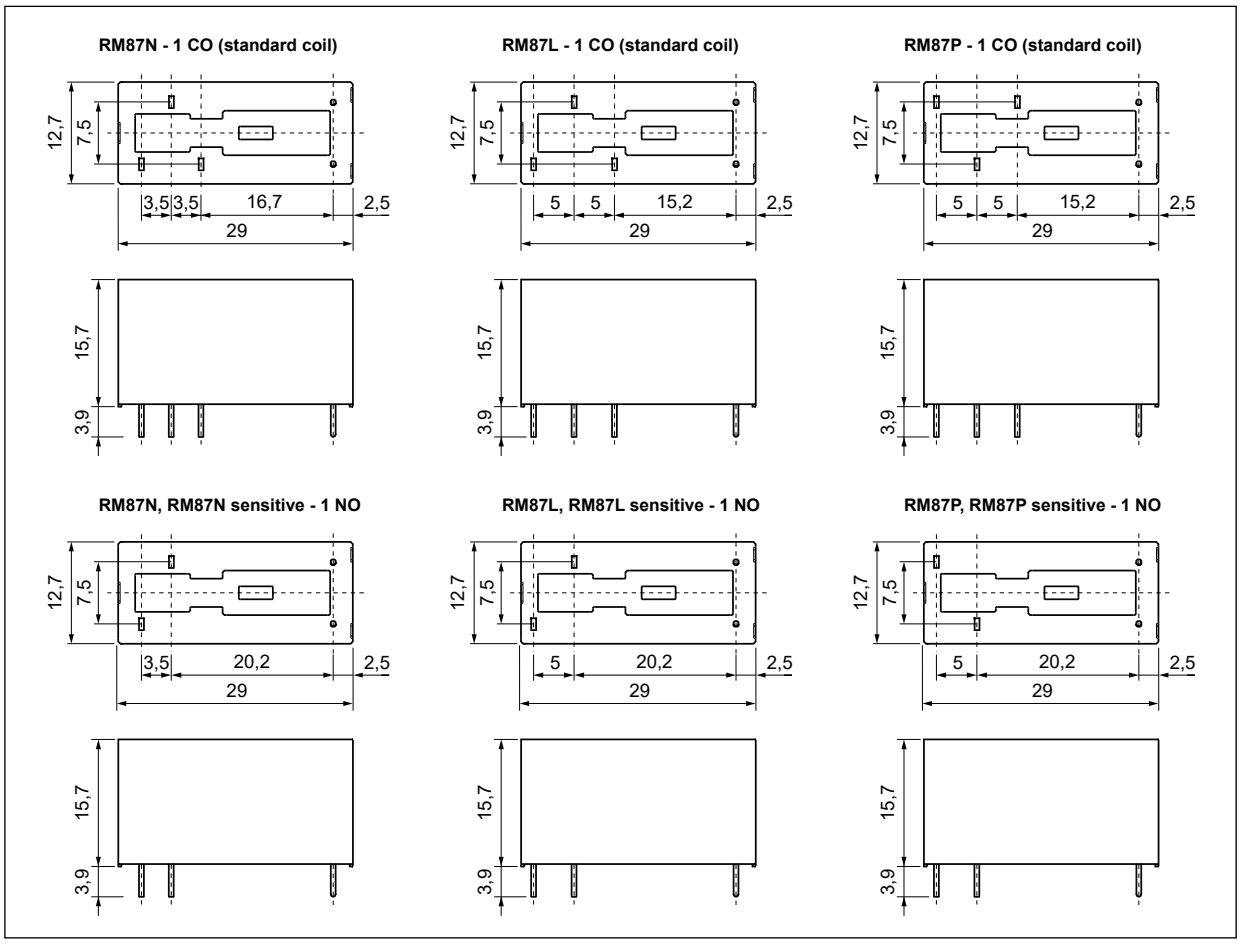
RM87N-...-01 (DC) ❶

- 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	$> 1,7 \times 10^5$ 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)		$> 3 \times 10^7$	
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 / 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



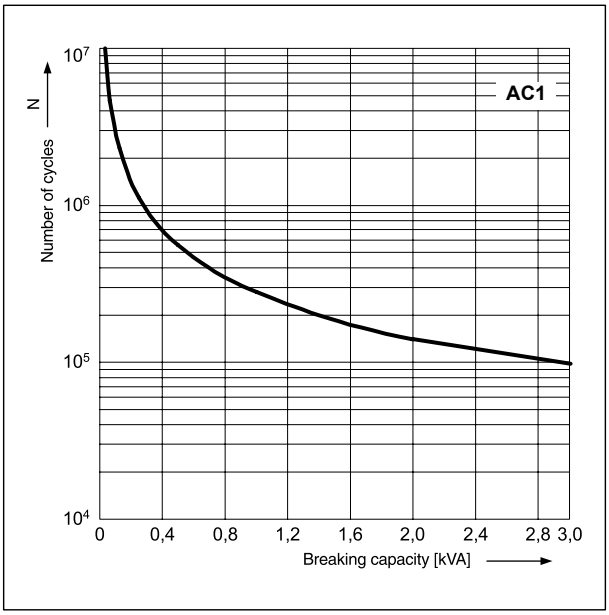
Mounting, sockets and accessories for relays

Relays **RM87N ❹, RM87N sensitive** and **RM87L ❹**, **RM87L sensitive**, **RM87P ❹**, **RM87P sensitive** are designed for: • direct PCB mounting • plug-in sockets.

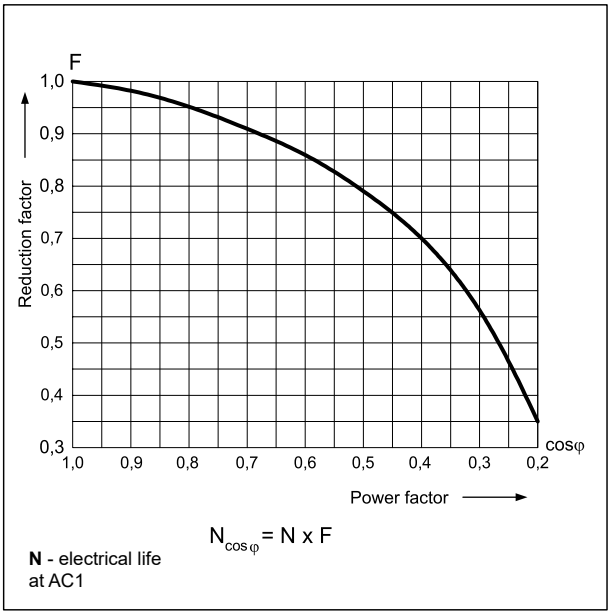
Sockets for RM87N ...	Sockets for RM87L ..., RM87P ...	Accessories			Additional equipment
		Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)					
GZT92	GZT80	GZT80-0040	GZM80-0041	GZT80-0035	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



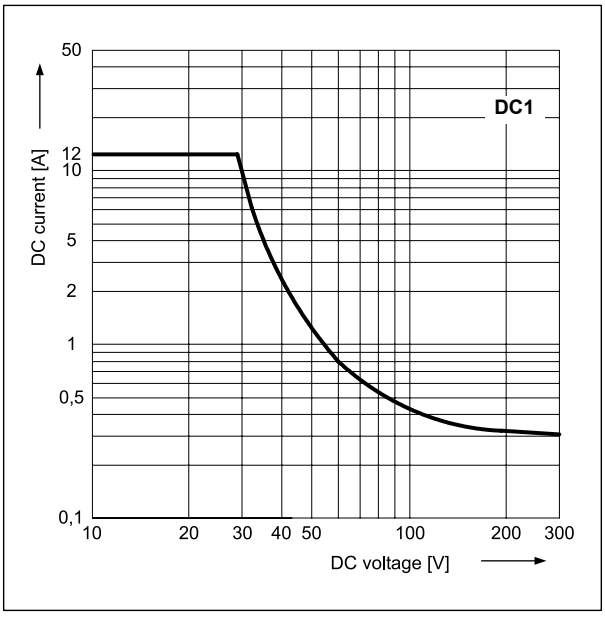
Electrical life reduction factor at AC inductive load Fig. 2



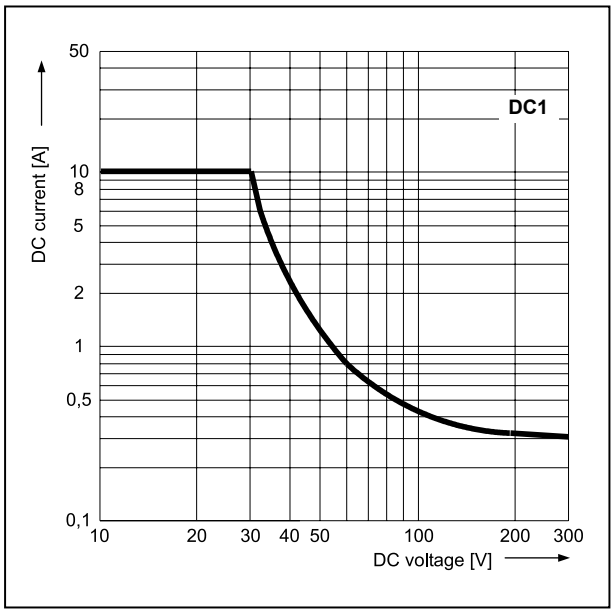
$N_{\cos\varphi} = N \times F$

N - electrical life at AC1

Max. DC resistive load breaking capacity - standard coil Fig. 3



Max. DC resistive load breaking capacity - sensitive coil Fig. 4



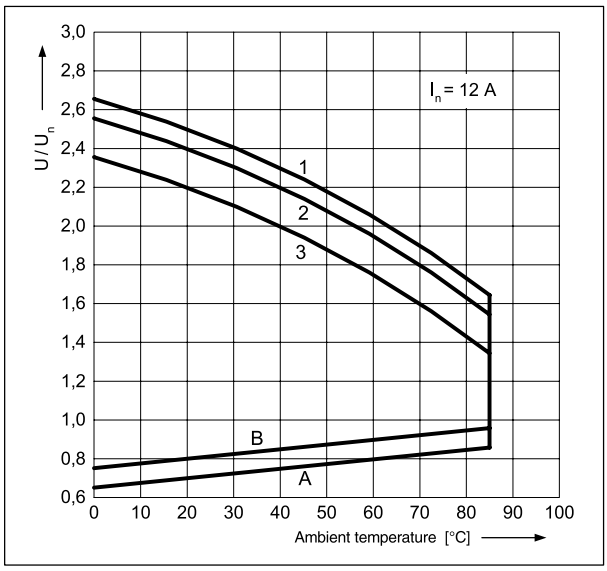
RM87

Transparent cover IP 40, certifications cULus, EAC (orange colour - AC coils, blue colour - DC coils)

NEW

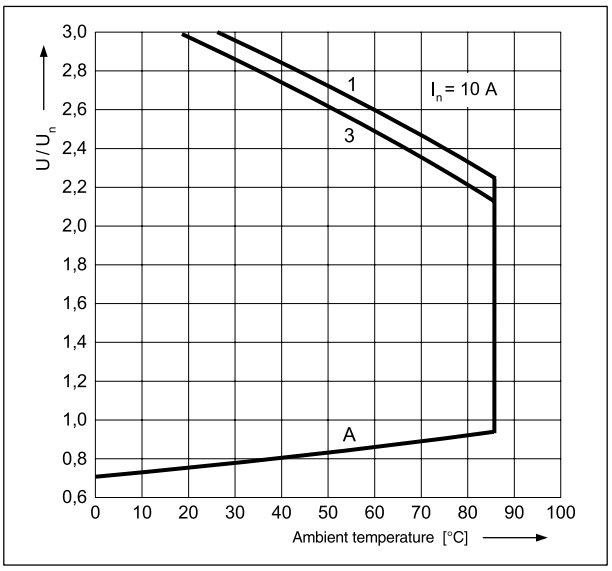
Coil operating range - DC
- standard coil

Fig. 5



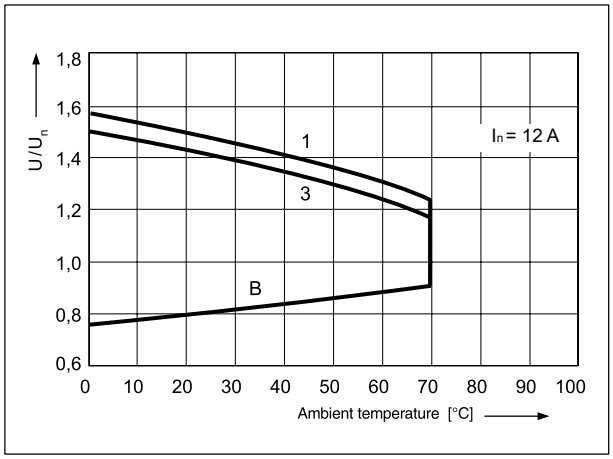
Coil operating range - DC
- sensitive coil

Fig. 6



Coil operating range - AC 50 Hz

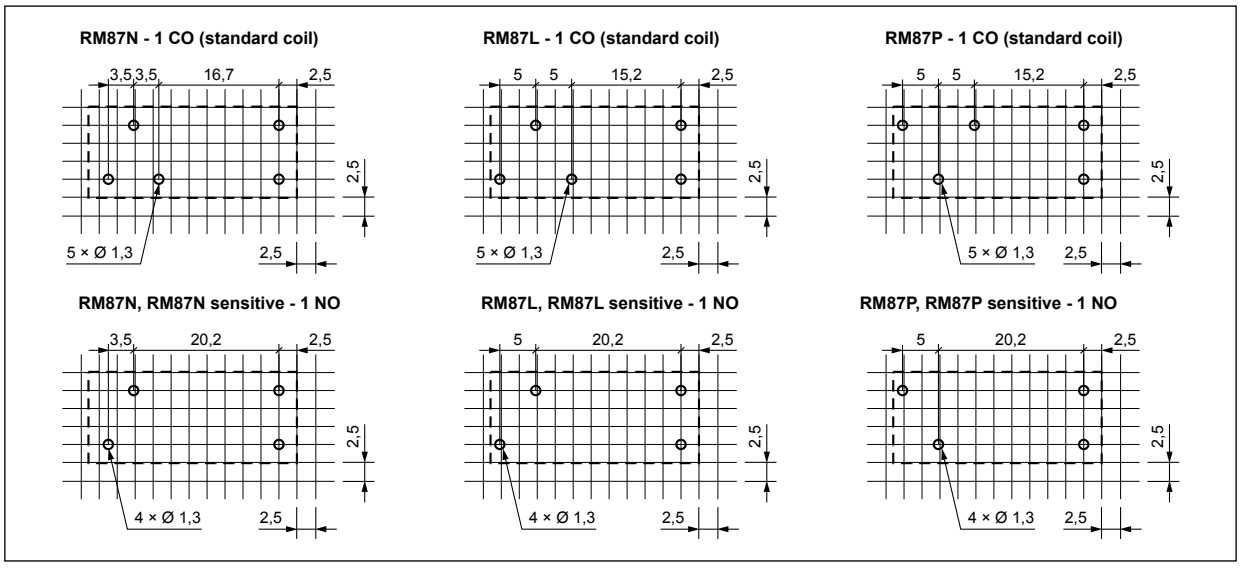
Fig. 7



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

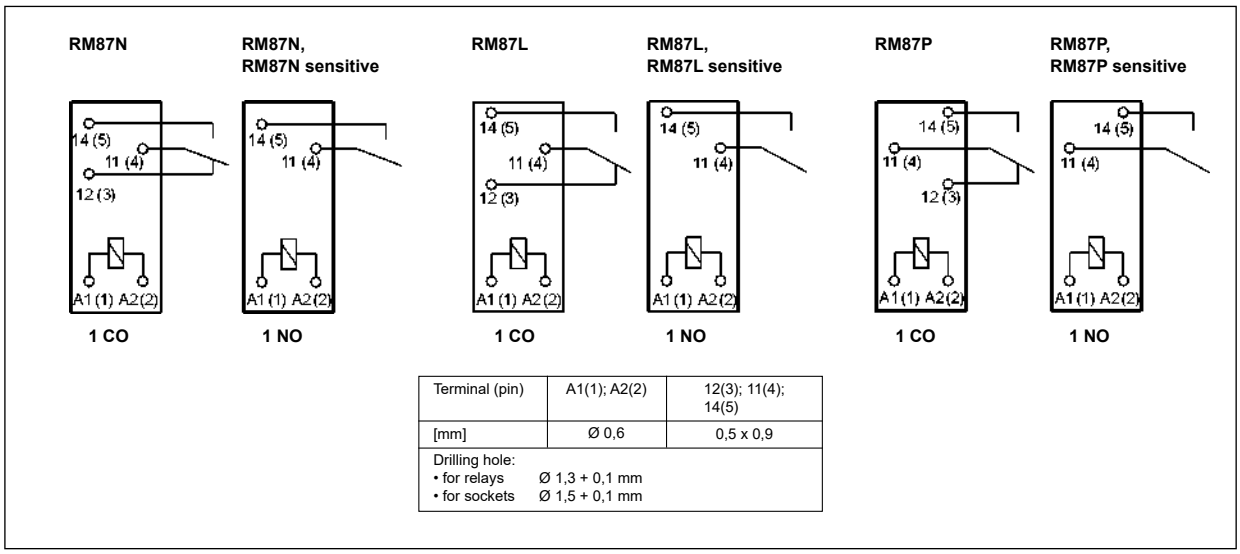
Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
S005	5	102	± 10%	3,75	15,0
S006	6	144	± 10%	4,50	18,0
S009	9	330	± 10%	6,75	27,0
S010	10	400	± 10%	7,50	30,0
S012	12	580	± 10%	9,00	36,0
S018	18	1 300	± 10%	13,50	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.

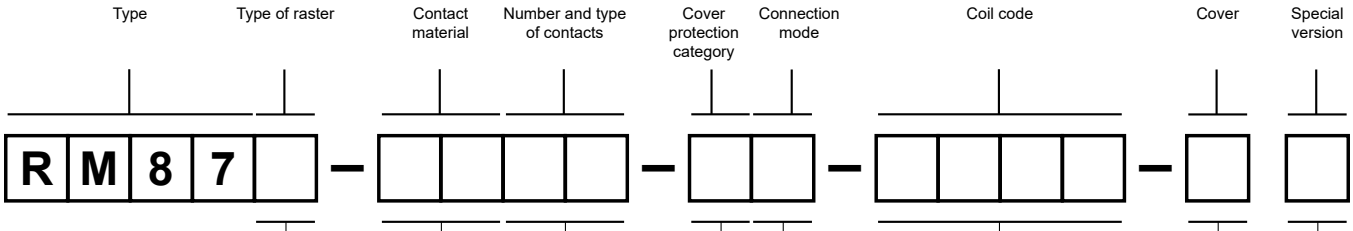
Connection diagrams (pin side view)



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

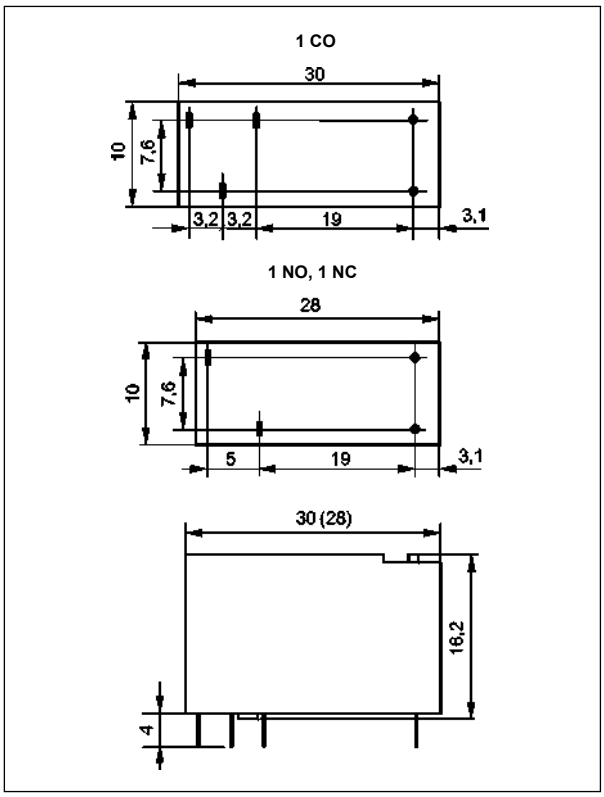
Insulation rated voltage	400 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Dielectric strength	
• between coil and contacts	4 000 V AC type of insulation: reinforced
• contact clearance	1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	
• clearance	≥ 8 mm
• creepage	≥ 8 mm

General data

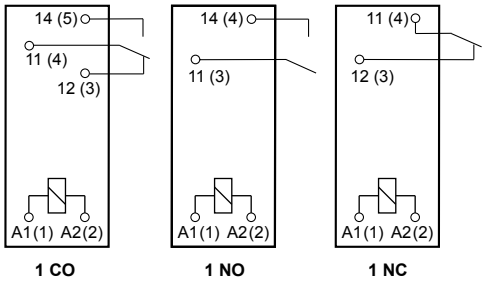
Operating / release time (typical values)		10 ms / 5 ms
Electrical life (number of cycles)		
• resistive AC1		$> 10^5$ 8 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		$> 2 \times 10^7$
Dimensions (L x W x H)		1 CO: 30 x 10 x 16,2 mm
		1 NO, 1 NC: 28 x 10 x 16,2 mm
Weight		11 g
Ambient temperature	• 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

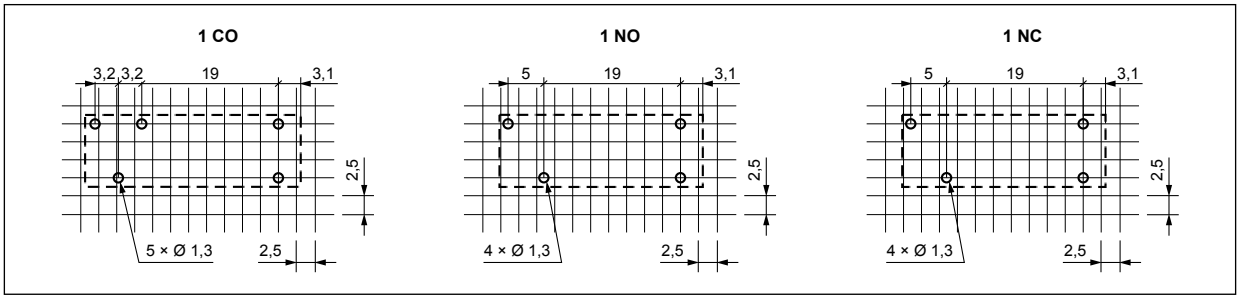


Connection diagrams (pin side view)



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)



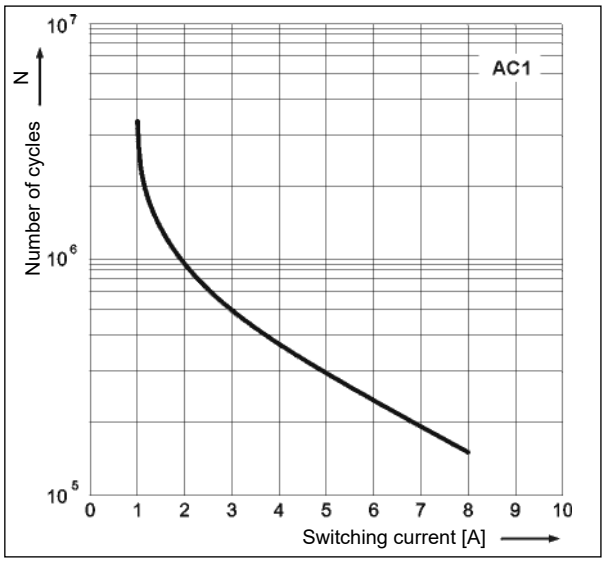
Mounting

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.

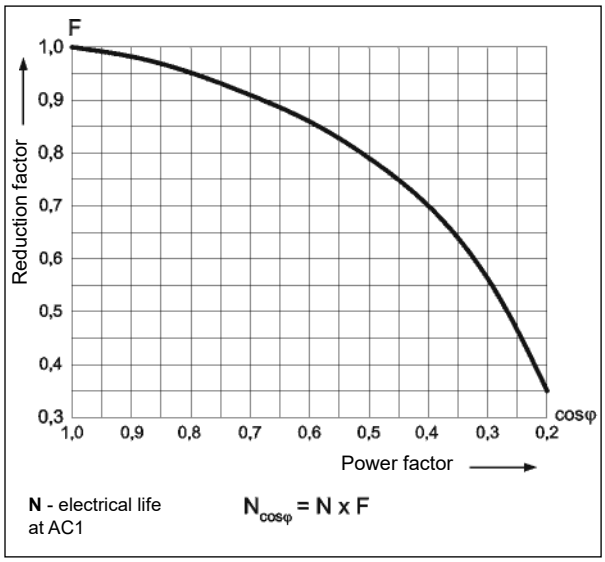
Sockets for RM96 1 CO	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)				
ES 32	MS 16	GZM80-0041	TR	M... ❷, ZGGZ80 ❸

❷ Signalling / protecting modules type M... - see page 399. ❸ Interconnection strips ZGGZ80 - see page 400.

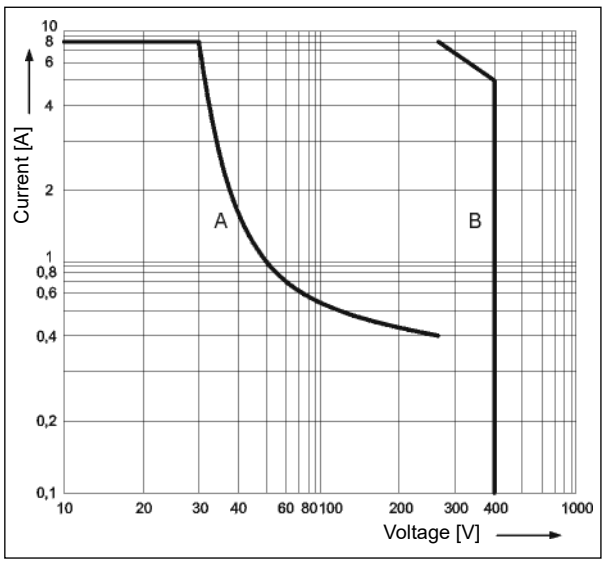
Electrical life at AC resistive current. Fig. 1
U_n = 230 V AC - version 1 NO



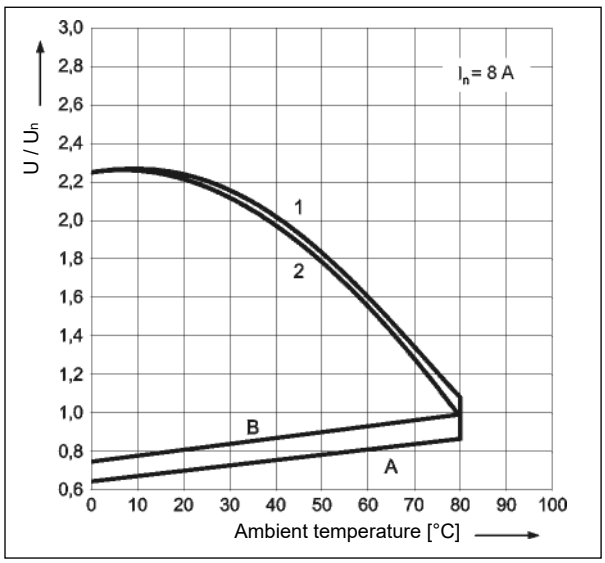
Electrical life reduction factor at AC inductive load Fig. 2



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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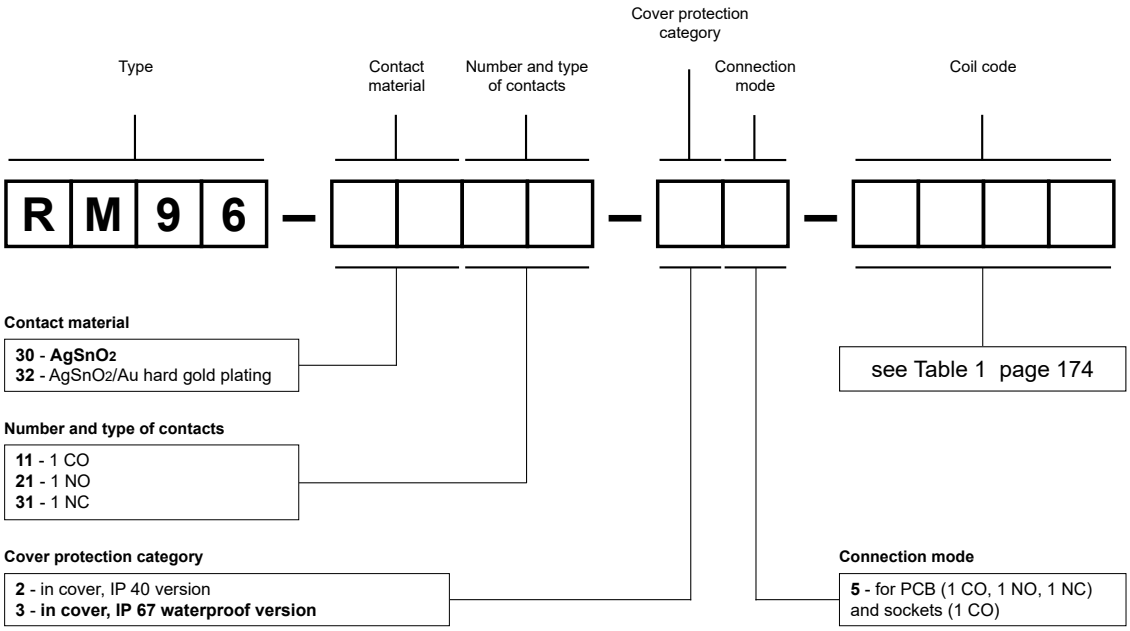
Coil data - DC voltage version Table 1

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

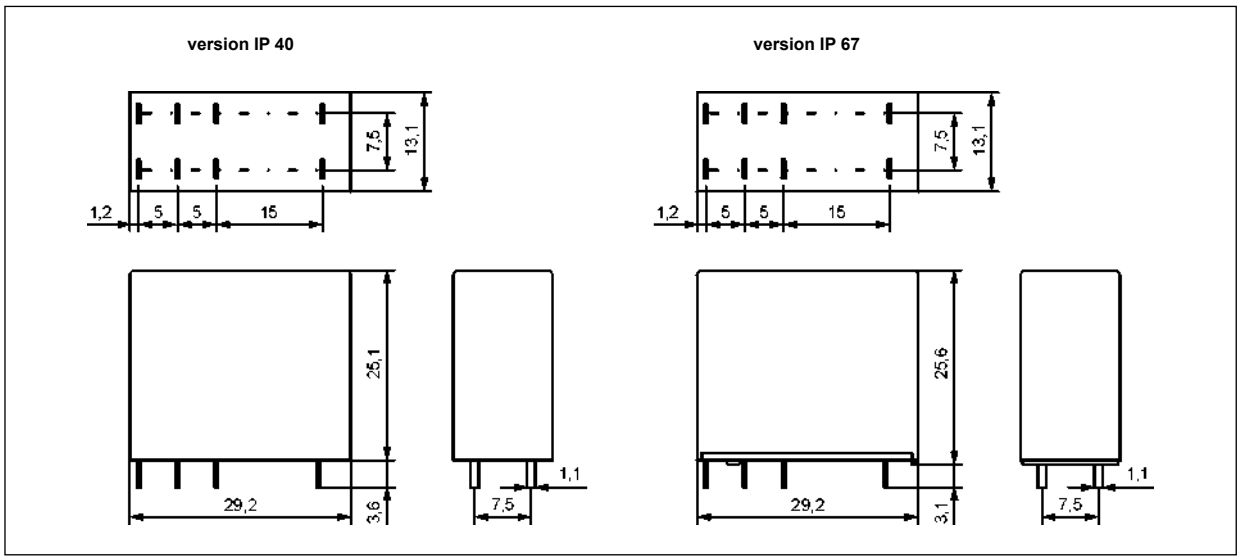
Insulation rated voltage		400 V AC	
Dielectric strength			
• between coil and contacts		4 000 V AC	type of insulation: reinforced
• contact clearance		1 000 V AC	type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 8 mm	
	• creepage	≥ 8 mm	

General data

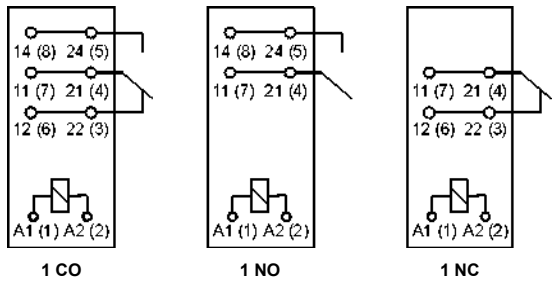
Operating / release time (typical values)		7 ms / 3 ms	
Electrical life (number of cycles)			
• resistive AC1		> 10^5	16 A, 250 V AC
• at incandescent lamp load		> 10^5	1000 W, 230 V AC, 1 NO, $AgSnO_2$
		> 3 x 10^4	3000 W, 230 V AC, 1 NO, $AgSnO_2$
• at halogen lamp load		> 10^4	2500 W, 230 V AC, 1 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



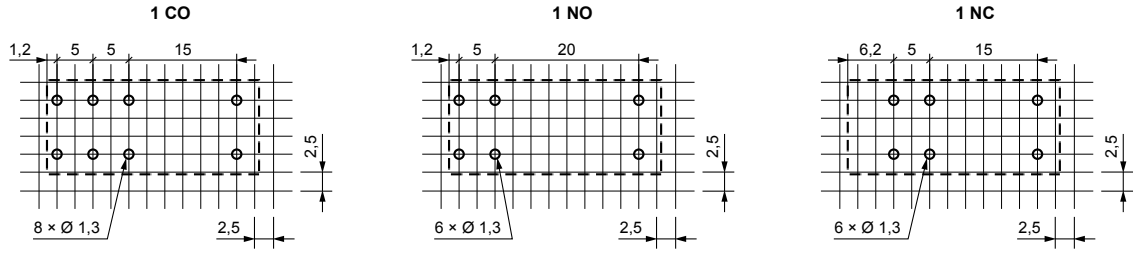
Connection diagrams (pin side view)



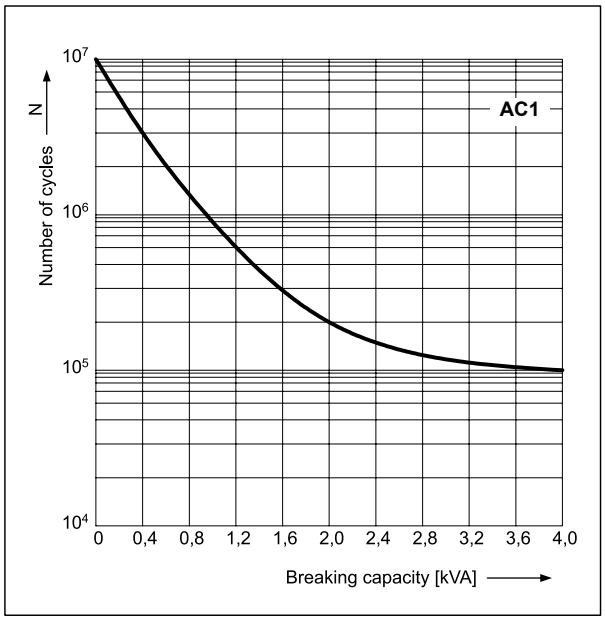
Terminal (pin)	A1(1); A2(2)	21(4); 11(7)	22 (3); 24 (5); 12 (6); 14 (8)
[mm]	0,4 x 1,1	0,2 x 1,1	0,4 x 1,1
Drilling hole: • for relays • for sockets	 Ø 1,3 + 0,1 mm Ø 1,5 + 0,1 mm		

RM83 terminals are doubled for each contact.
Both terminals are to be used while connecting to load.

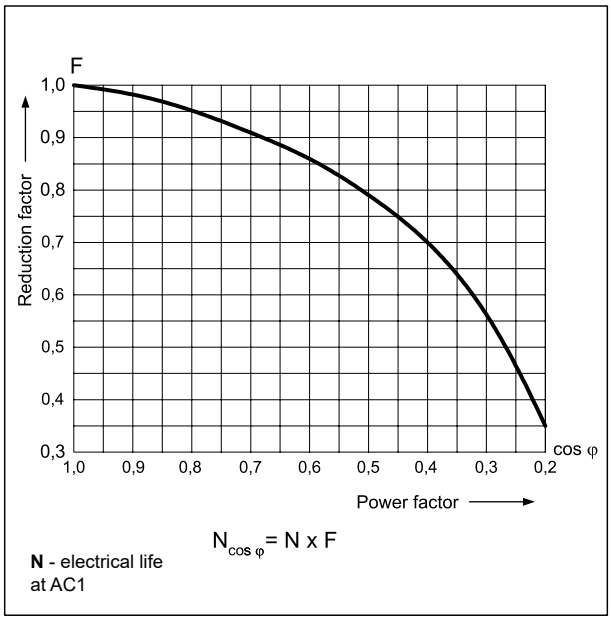
Pinout (solder side view)



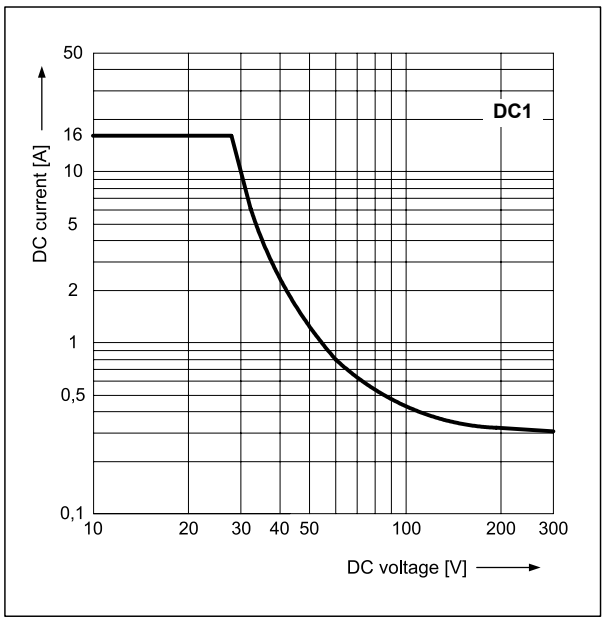
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



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

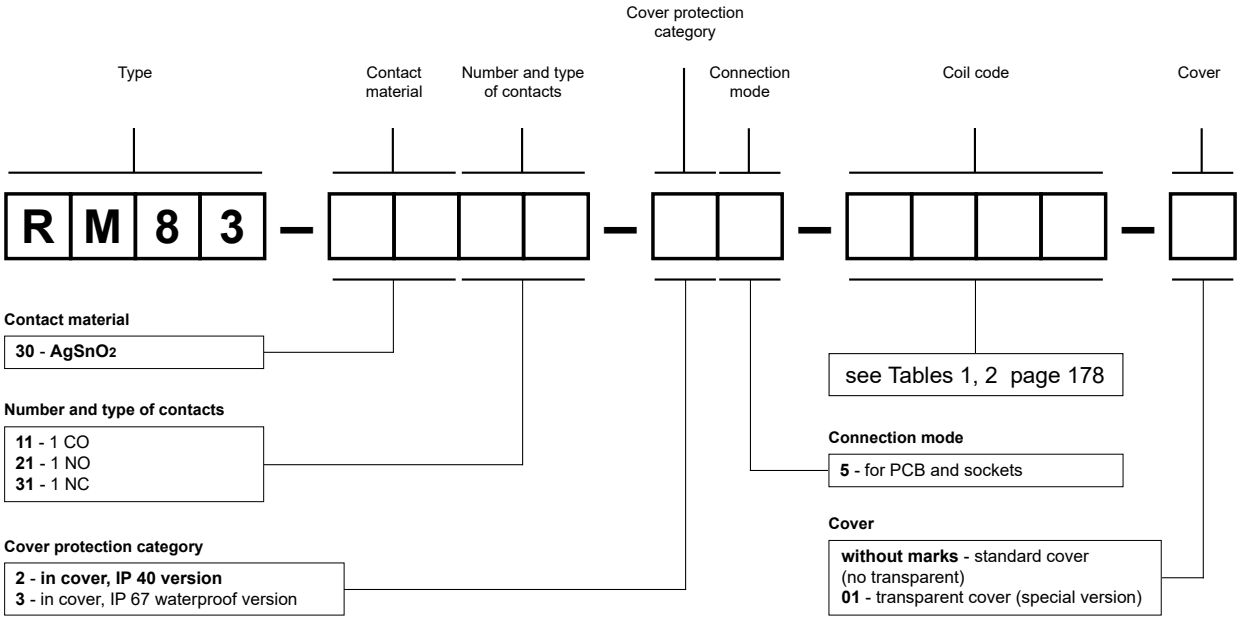
The data in bold type relate to the standard versions of the relays.

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

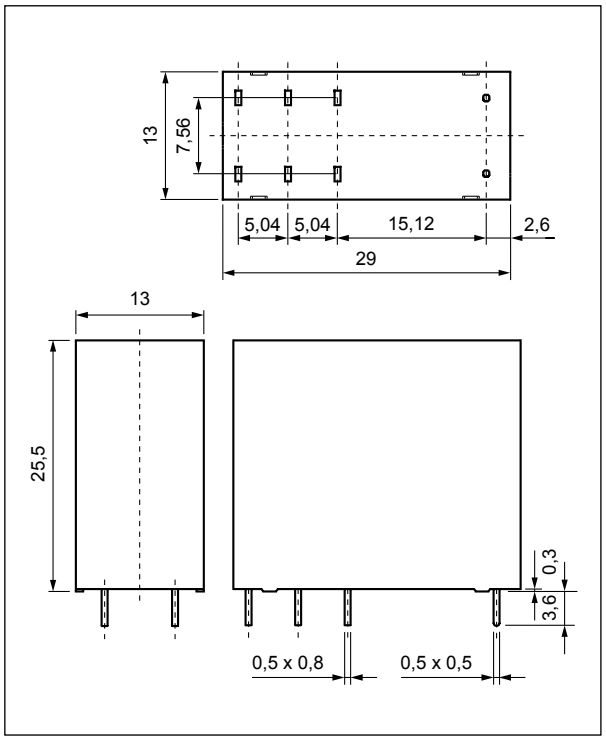
Insulation rated voltage		440 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Insulation resistance		1 000 MΩ 500 V DC
Dielectric strength		
• between coil and contacts		5 000 V AC type of insulation: reinforced
• contact clearance		1 000 V AC type 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

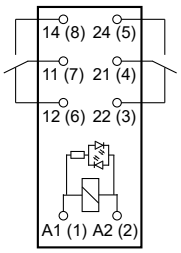
Operating / release time (typical values)		15 ms / 8 ms
Electrical life (number of cycles)	• resistive AC1	> 3 x 10^4 AC coils, 8 A, 250 V AC, ON for 5 s / OFF for 5 s
		> 10^4 DC coils, 8 A, 250 V AC, ON for 5 s / OFF for 5 s
		> 5 x 10^4 8 A, 250 V AC, 70 °C, ON for 1 s / OFF for 9 s
Mechanical life (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.

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)

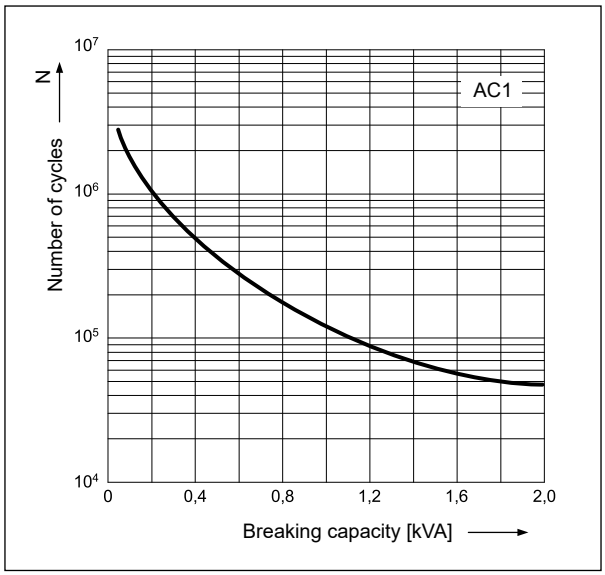
blue
(DC coils)

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.

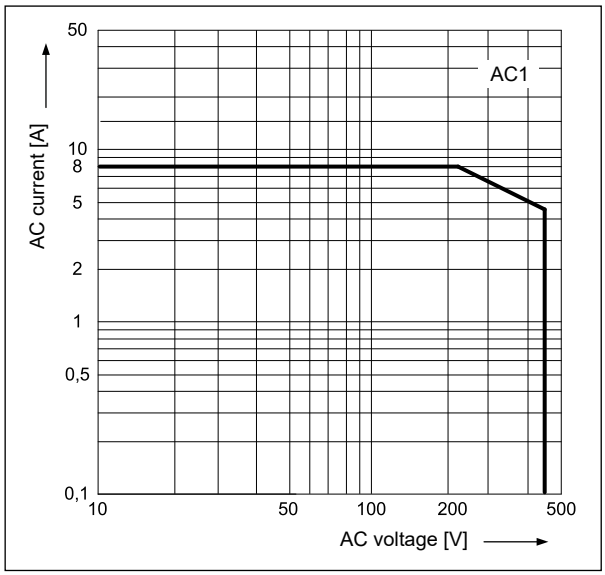
GZF80, GZP80, EC 50, GD50

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.

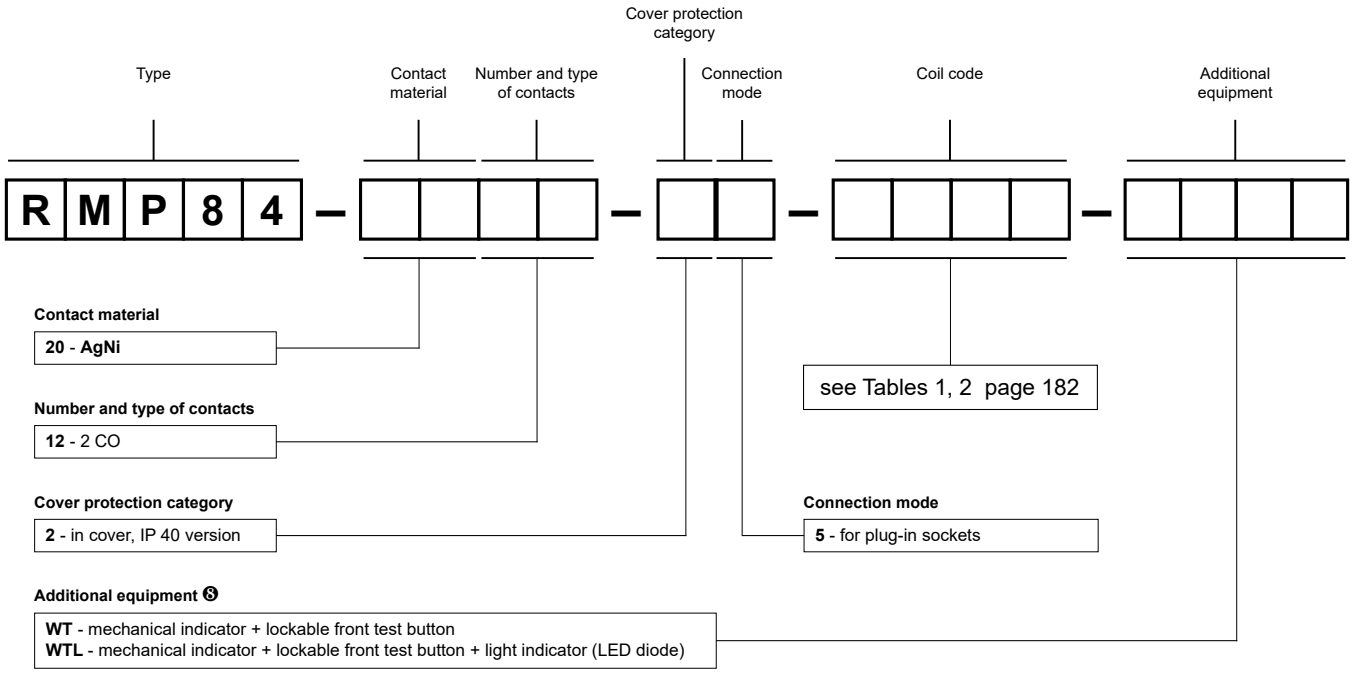
Coil data - AC 50 Hz voltage version

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.

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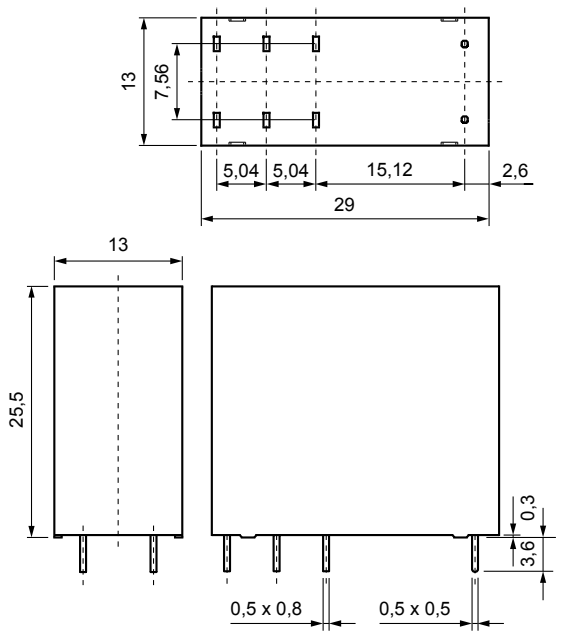
Dimensions



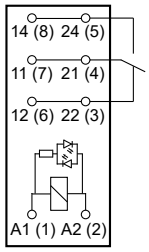
Test buttons type T

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)

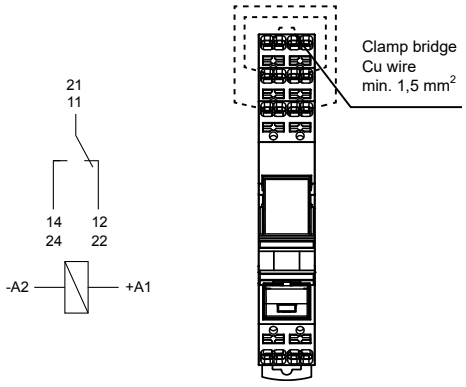


1 CO

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	

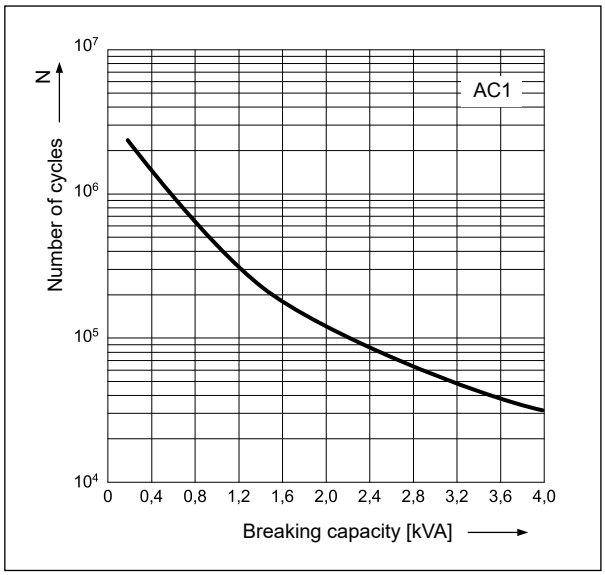
RMP85 terminals are doubled for each contact.
Both terminals are to be used while connecting to load.

Connection of GZ.80 sockets

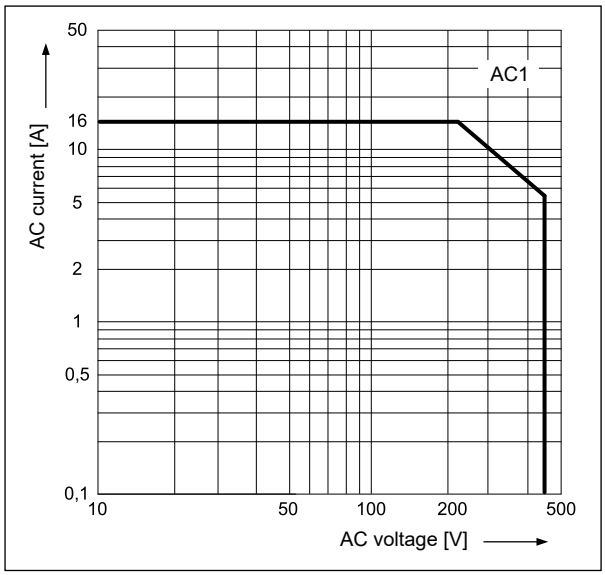


Note: loads above 12 A (GZP80) or 10 A (GZF80) require bridging pairs of spring terminals: 11 with 21, 12 with 22, 14 with 24. Loads up to 10 A do not require bridging of common terminals (such bridges may be fixed, however).

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.

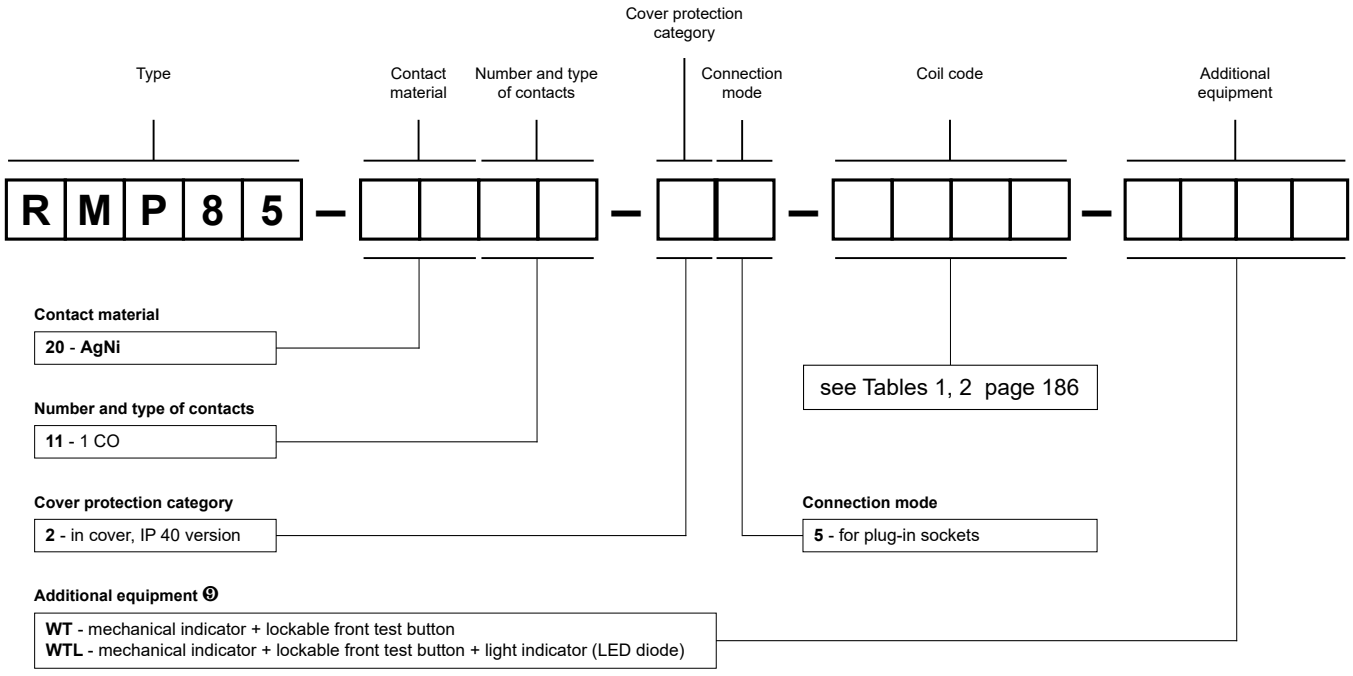
Coil data - AC 50 Hz voltage version

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

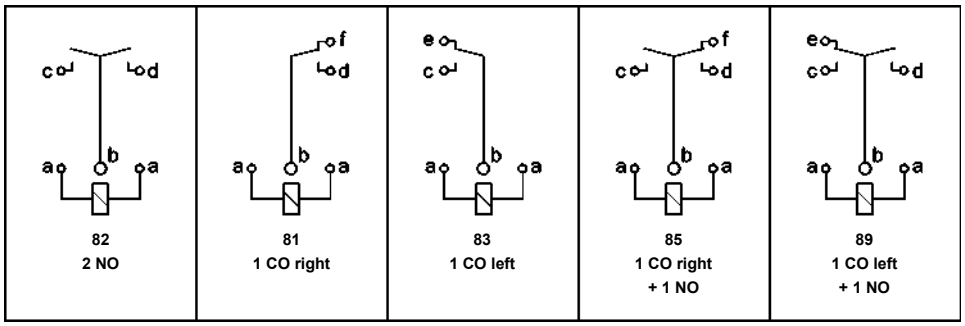
General data

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

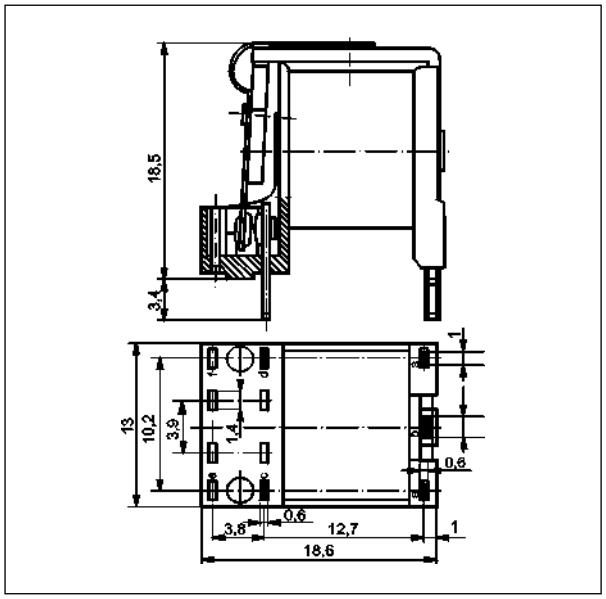
The data in bold type relate to the standard versions of the relays.

Connection diagrams (pin side view)

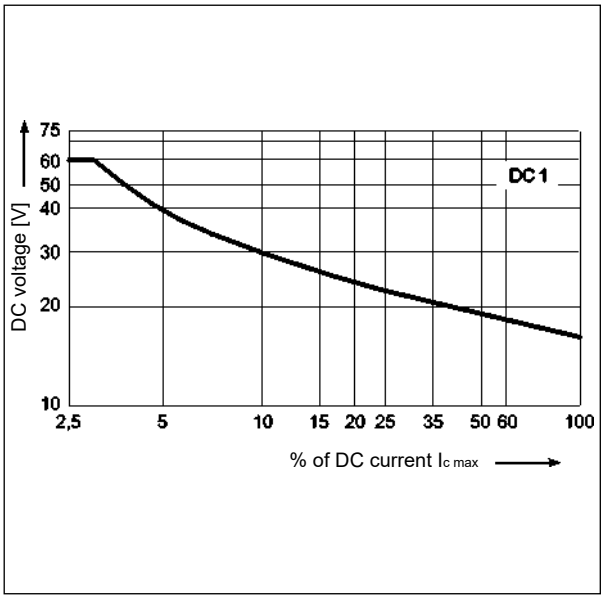
Relay terminals:
c, d, e, f - 0,6 x 1,4 mm **a** - 0,6 x 1,0 mm **b** - 1,0 x 1,5 mm



Dimensions



Max. DC resistive load breaking capacity Fig. 1



Mounting

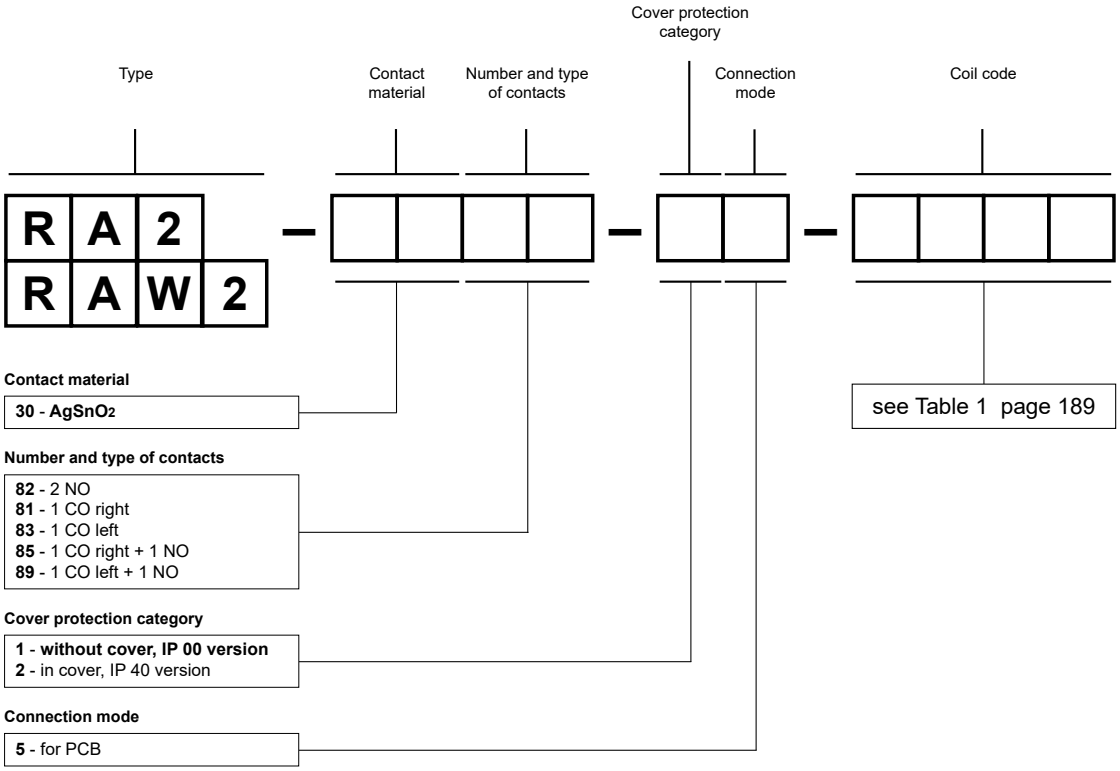
Relays **RA2** are designed for direct PCB mounting.

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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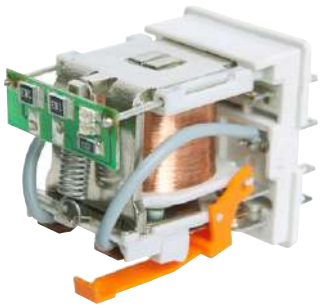
Design

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.

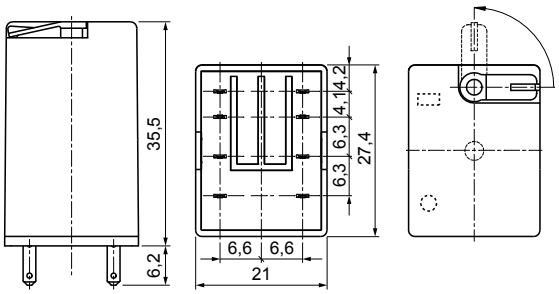


Application of electronics made in the SMD technology: additional equipment L (LED diode) and D (diode) are located on the printed circuit board; the change of the position of the LED diode and optimization of the quality and intensity of its light provide certainty that the relay is in operation status when the LED is on.

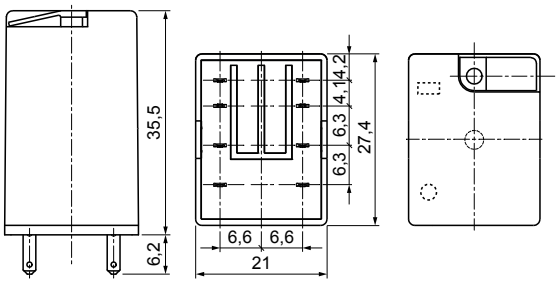
Improvement of the efficiency of the electromagnet: an innovational technology of connecting elements has been introduced, which guarantees more reliable operation of the relay.

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

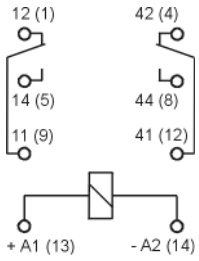


Dimensions - plug-in version, with test button (no latching) or with plug (no manual operation)



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.

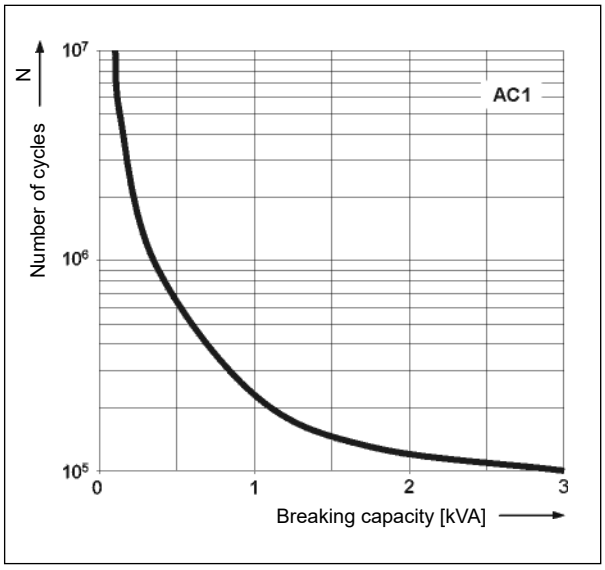
Mounting, sockets and accessories for relays

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**.

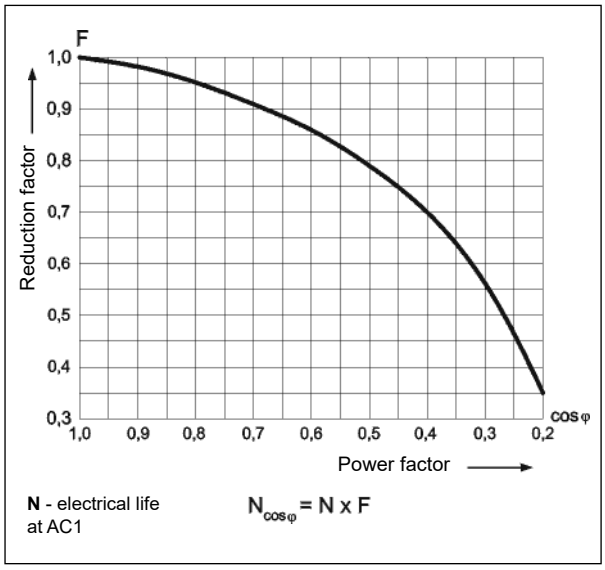
Sockets for R2N	Accessories			Additional equipment
	Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (two M3 screws)				
GZT2	GZT4-0040	G4 1052	GZT4-0035	M... ❸, ZGGZ4 ❹
GZM2	GZT4-0040	G4 1052	GZT4-0035	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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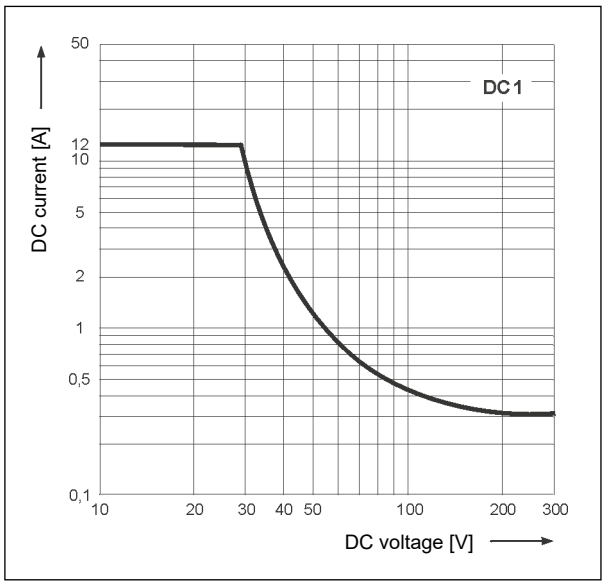
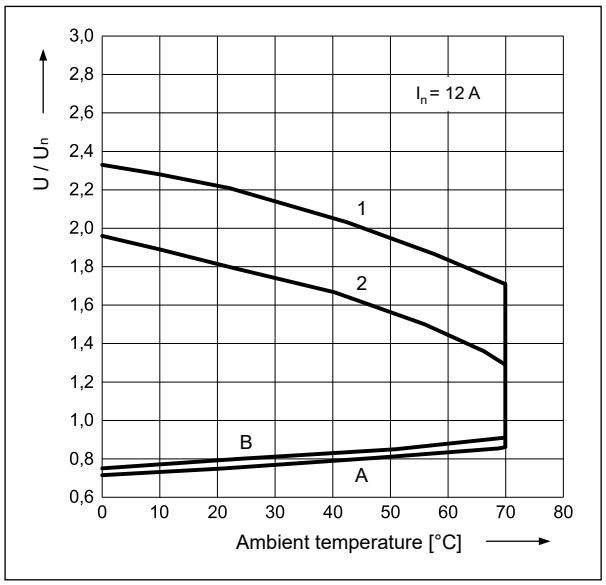
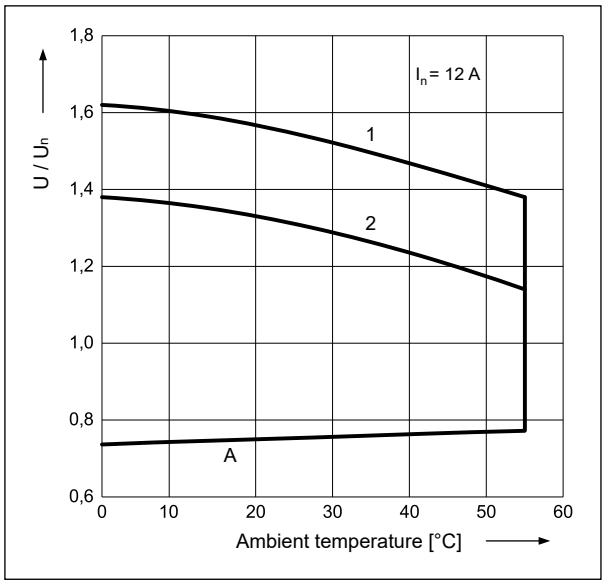
Max. DC resistive load breaking capacity Fig. 3



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

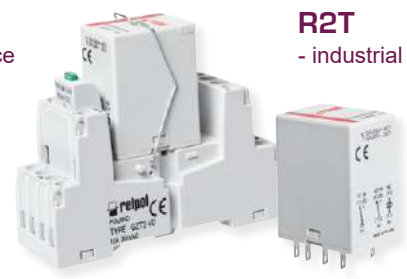
Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
5006	6	9,8	± 10%	4,8	6,6
5012	12	39,5	± 10%	9,6	13,2
5024	**24**	**158**	**± 10%**	**19,2**	**26,4**
5042	42	470	± 10%	33,6	46,2
5048	48	640	± 10%	38,4	52,8
5060	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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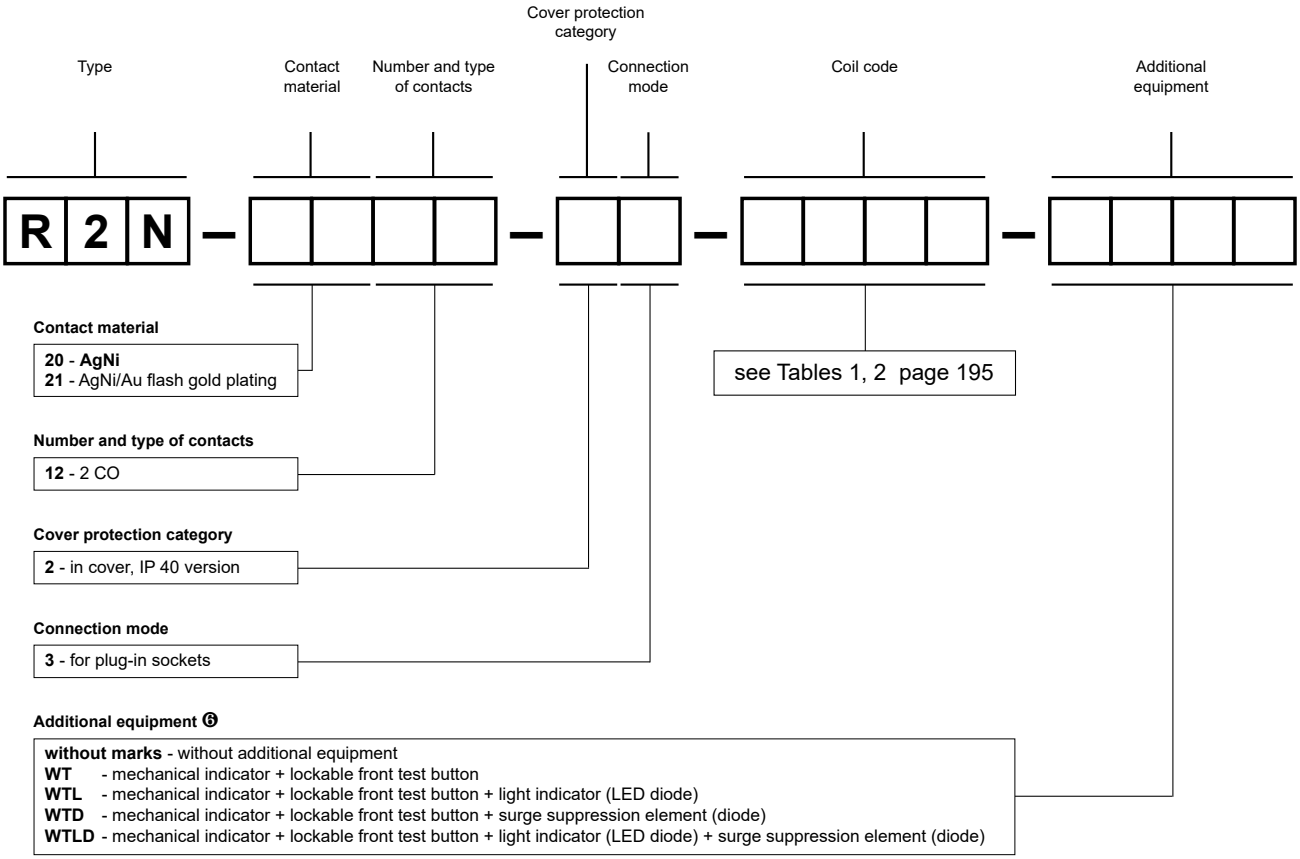
Ordering codes



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

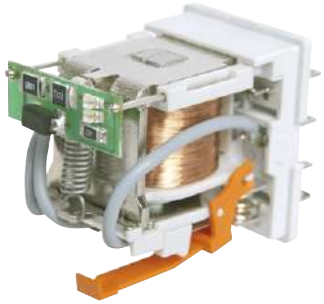
General data

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.

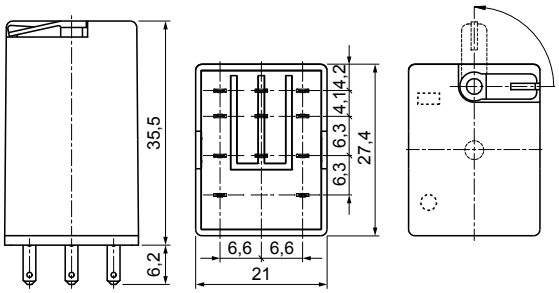


Application of electronics made in the SMD technology: additional equipment L (LED diode) and D (diode) are located on the printed circuit board; the change of the position of the LED diode and optimization of the quality and intensity of its light provide certainty that the relay is in operation status when the LED is on.

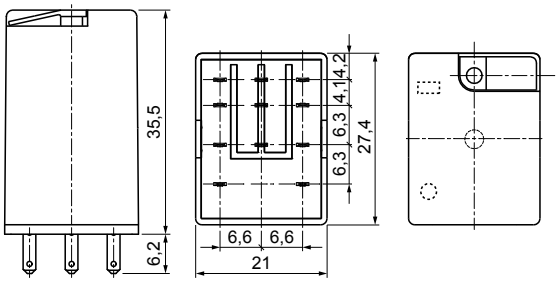
Improvement of the efficiency of the electromagnet: an innovational technology of connecting elements has been introduced, which guarantees more reliable operation of the relay.

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

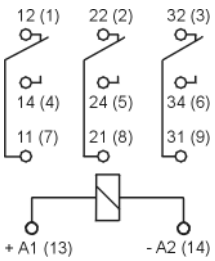


Dimensions - plug-in version, with test button (no latching) or with plug (no manual operation)



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.

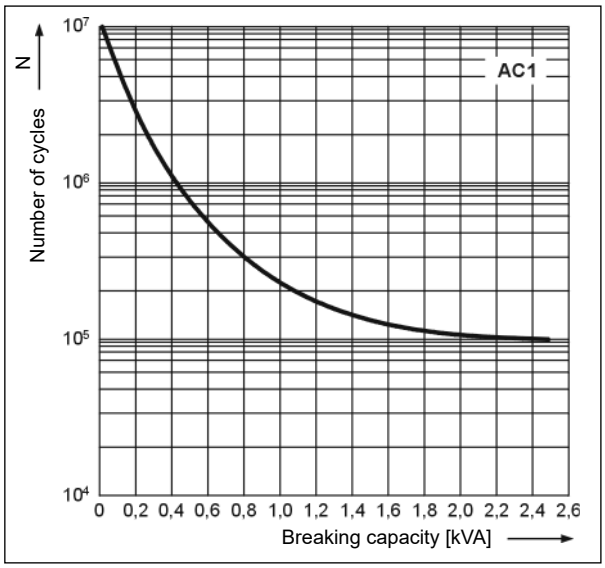
Connection diagram (pin side view)



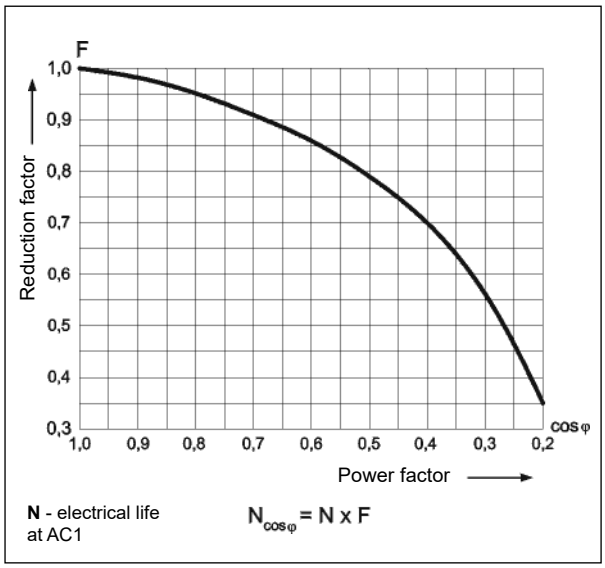
3 CO

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



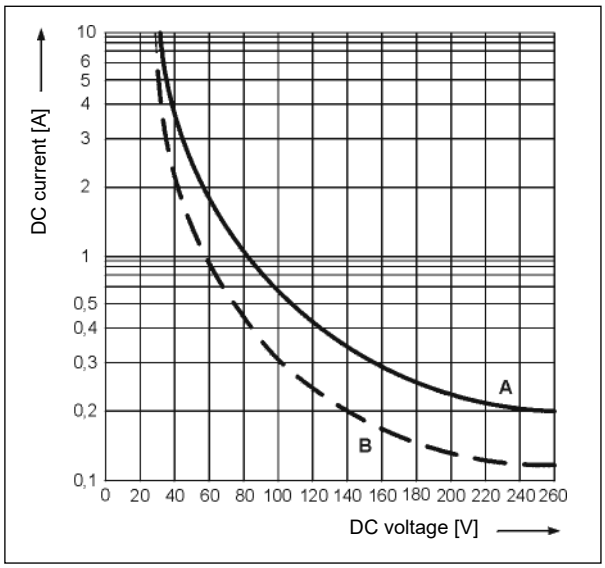
Electrical life reduction factor at AC inductive load Fig. 2



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**

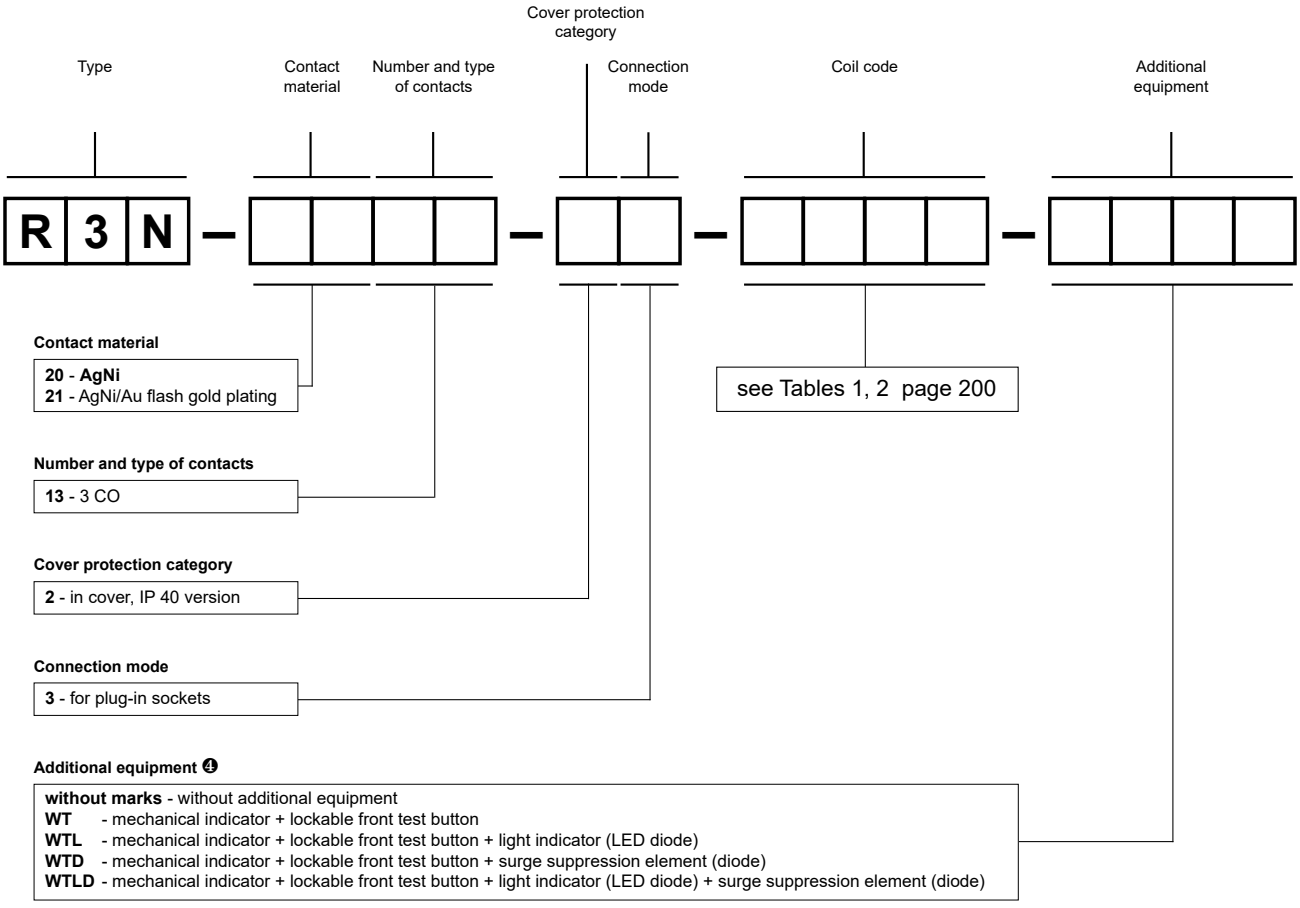
The data in bold type relate to the standard versions of the relays.

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 x 10^4 7 A, 230 V AC (VDE) > 10^5 6 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

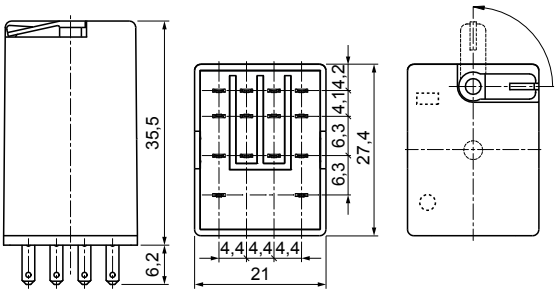
Improvement of the functionality of the mechanical indicator (W): it is mounted on an insulation base of the unit of the movable contacts; the changes provide the appropriate position in the window in the upper side of the housing irrespectively of the number of operations performed by the relay.

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.

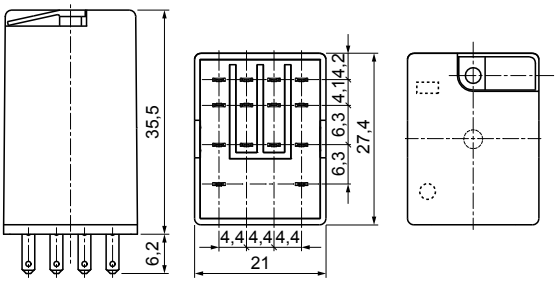
Improvement of the efficiency of the electromagnet: an innovational technology of connecting elements has been introduced, which guarantees more reliable operation of the relay.

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

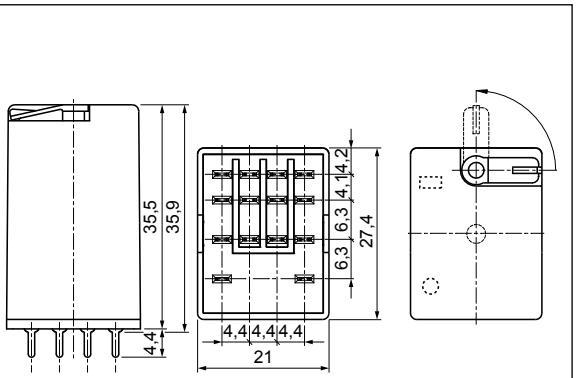


Dimensions - plug-in version, with test button (no latching) or with plug (no manual operation)



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.

Dimensions - PCB version (WT), with lockable front test button type T



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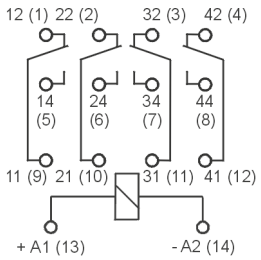
Mounting, sockets and accessories for relays

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)

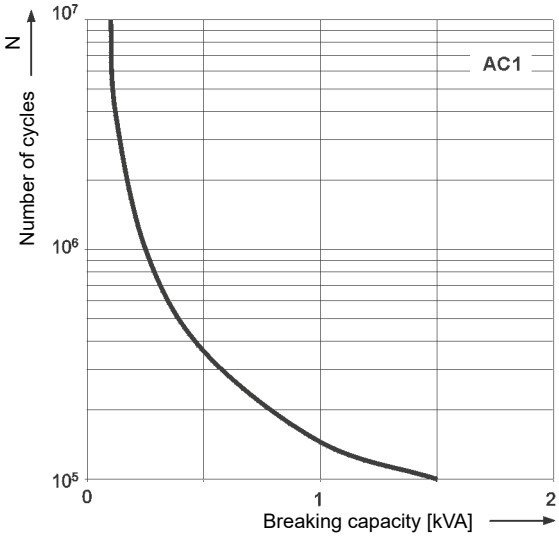


4 CO

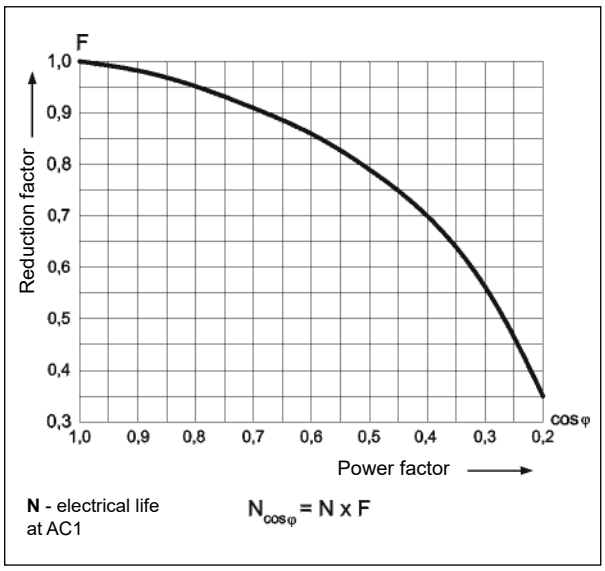
Note: the indicated polarization of the supply refers to the relays with extra equipment **D** - surge suppression element (diode) - for DC coils only.

Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour

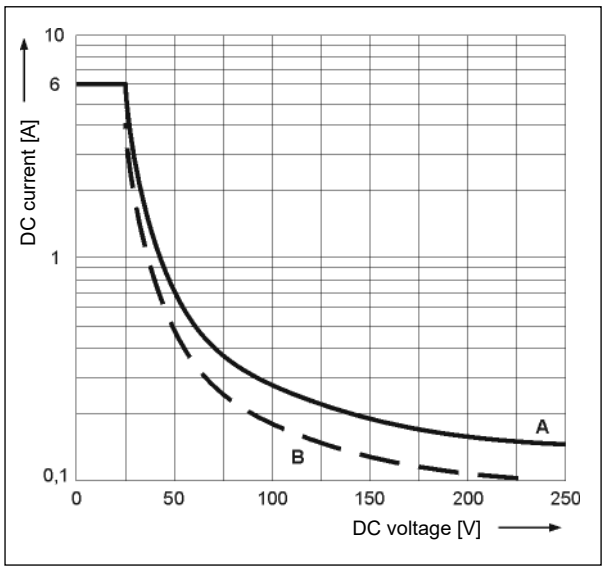
Fig. 1



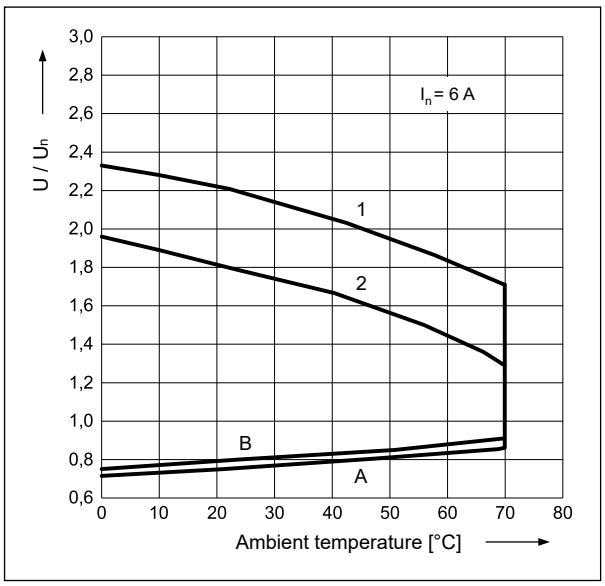
Electrical life reduction factor at AC inductive load Fig. 2



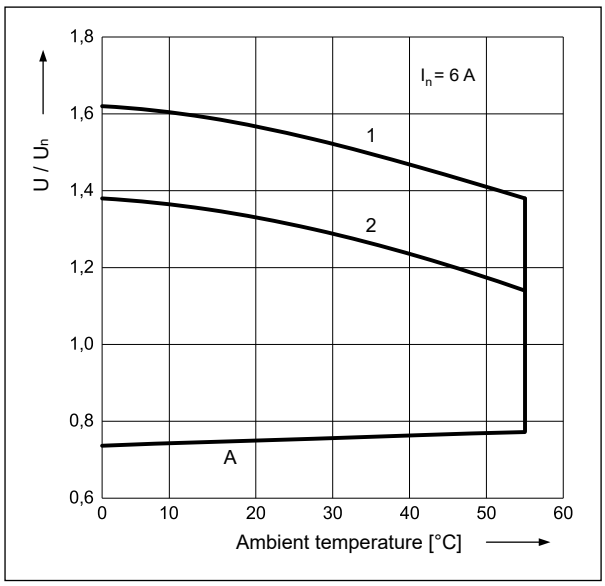
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



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**

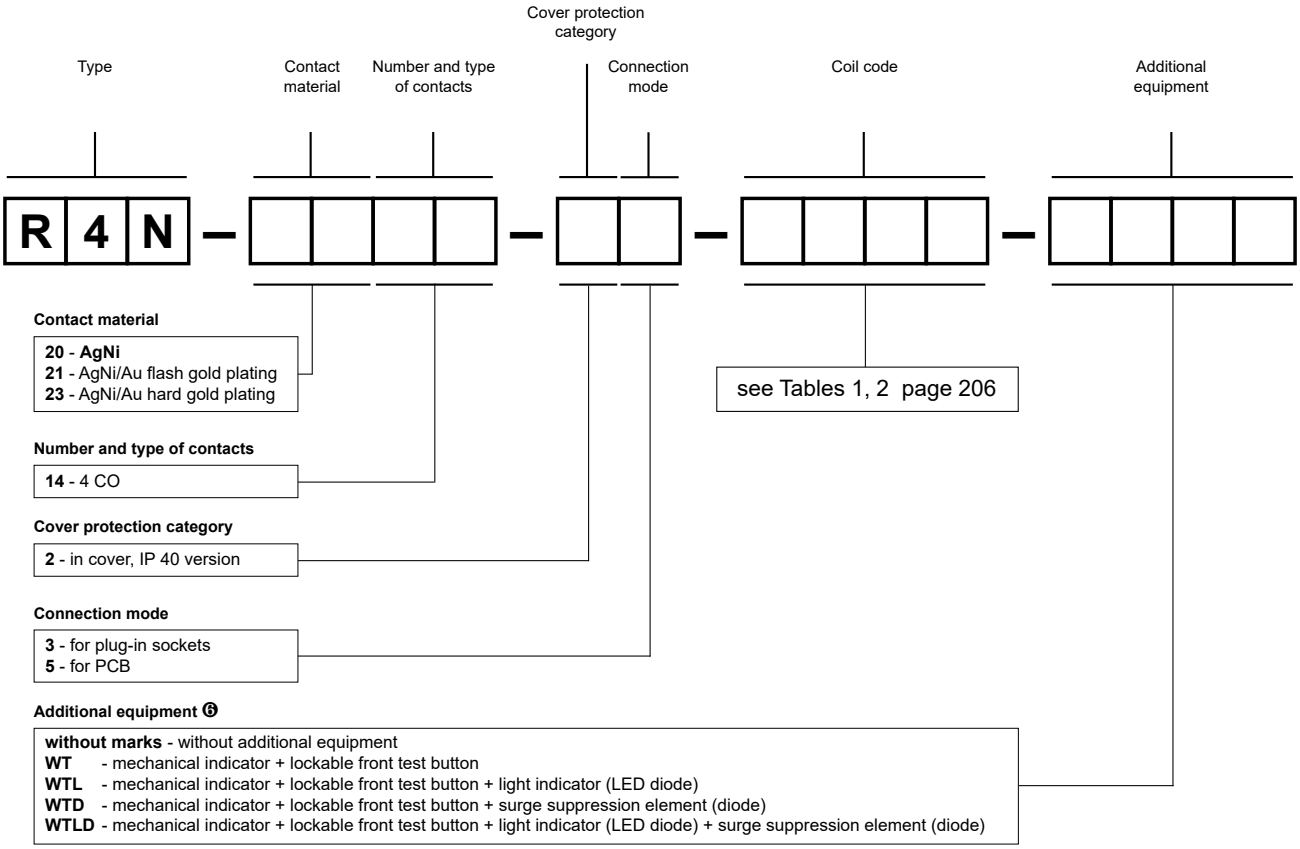
The data in bold type relate to the standard versions of the relays.

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

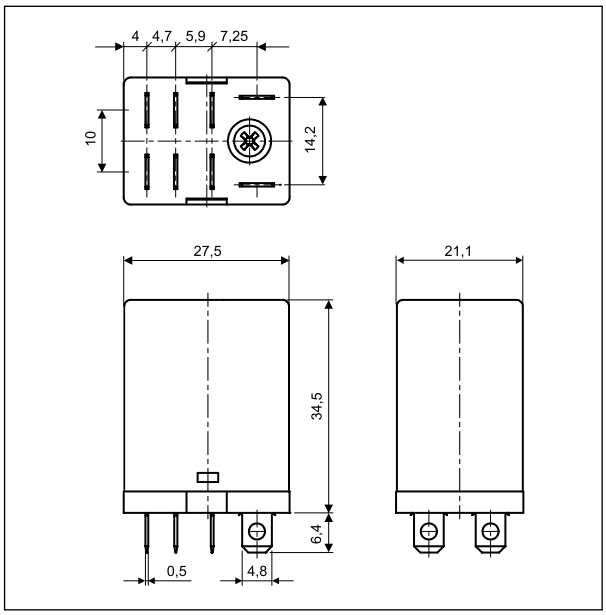
Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength		
• between coil and contacts		2 500 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection
• pole - pole		2 500 V AC type of insulation: basic
Contact - coil distance		
• clearance		≥ 2,6 mm
• creepage		≥ 4 mm

General data

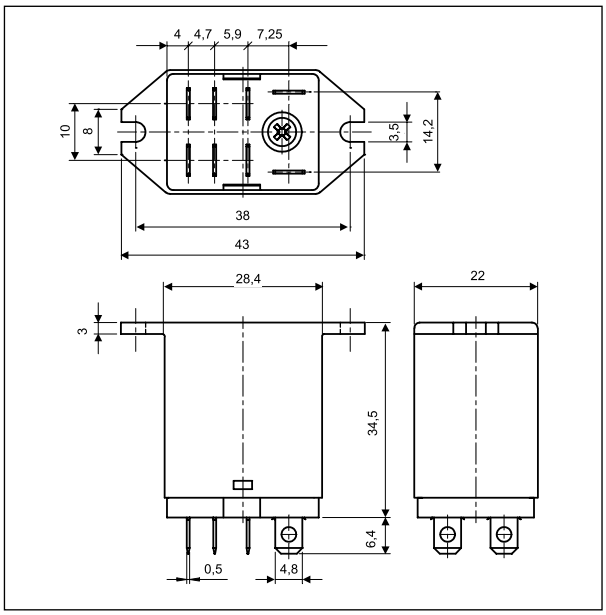
Operating / release time (typical values)		15 ms / 10 ms
Electrical life		
• resistive AC1		> 10^5 12 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 10^7
Dimensions (L x W x H)		27,5 x 21,1 x 34,5 mm ❶
Weight		35 g
Ambient temperature	• storage	-40...+70 °C
(non-condensation and/or icing)	• 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

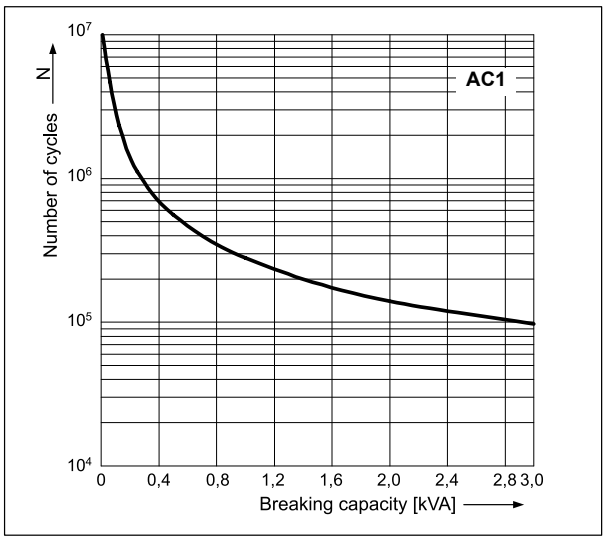
Dimensions - plug-in version (standard)



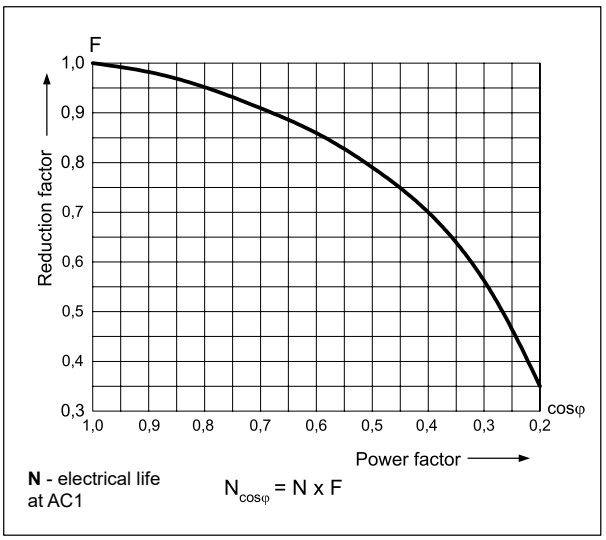
Dimensions - version with mounting flange in the upper wall of the cover



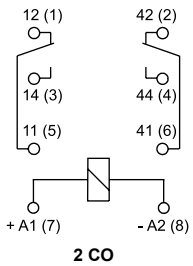
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



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.

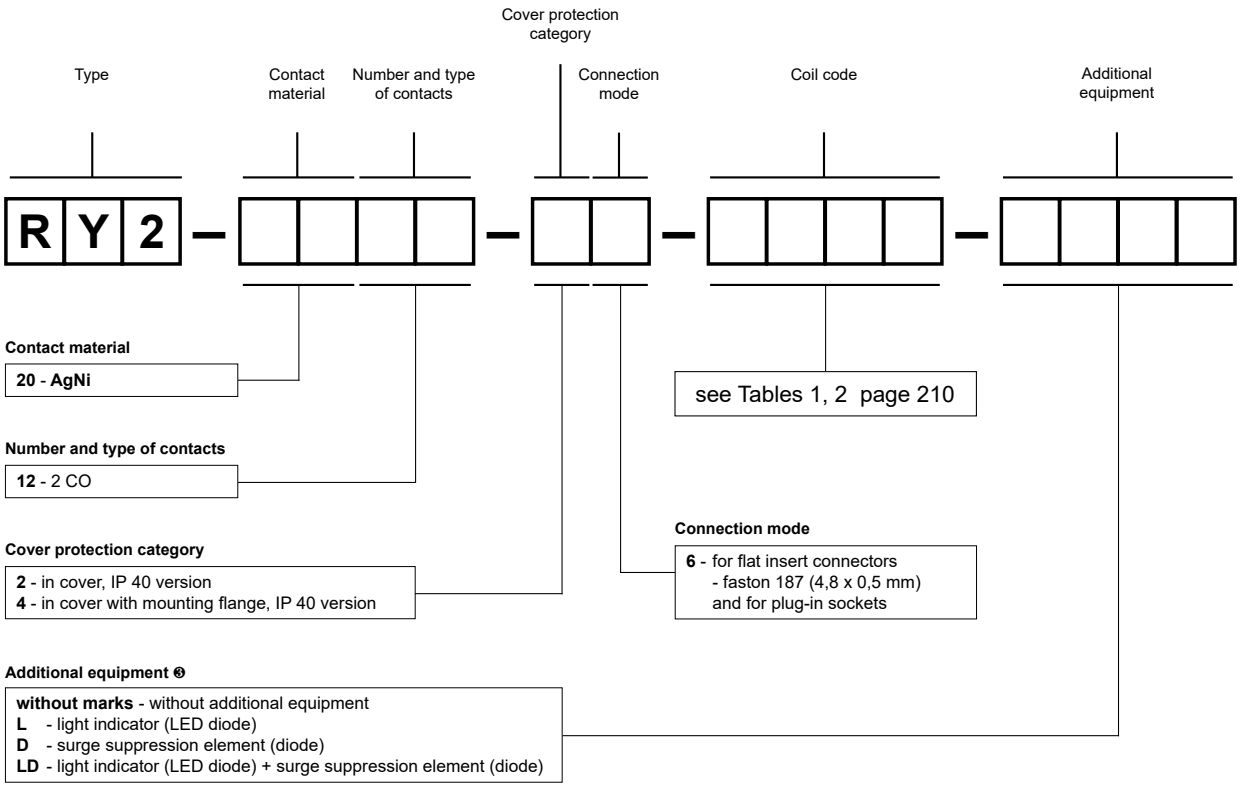
Coil data - DC voltage version — Table 1

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

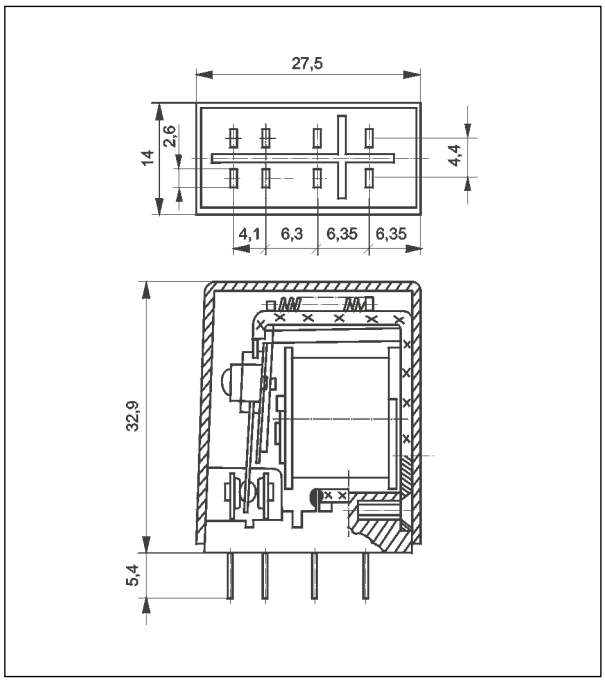
Insulation rated voltage		250 V AC
Rated surge voltage		2 500 V 1,2 / 50 µs
Overvoltage category		II
Insulation pollution degree		3
Dielectric strength		
• between coil and contacts		2 000 V AC type of insulation: basic
• contact clearance		1 000 V AC type of clearance: micro-disconnection
• pole - pole		2 000 V AC type of insulation: basic
Contact - coil distance		
• clearance		≥ 3 mm
• creepage		≥ 4 mm

General data

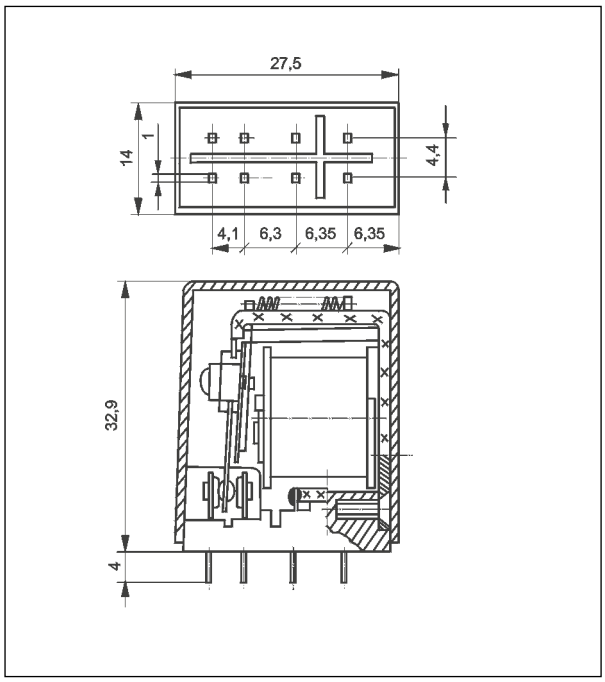
Operating / release time (typical values)		AC: 8 ms / 7 ms DC: 10 ms / 3 ms
Electrical life		
• resistive AC1		> 2 x 10^5 5 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 10^7
Dimensions (L x W x H)		27,5 x 14 x 32,9 mm
Weight		22 g
Ambient temperature	• storage	-40...+70 °C
(non-condensation 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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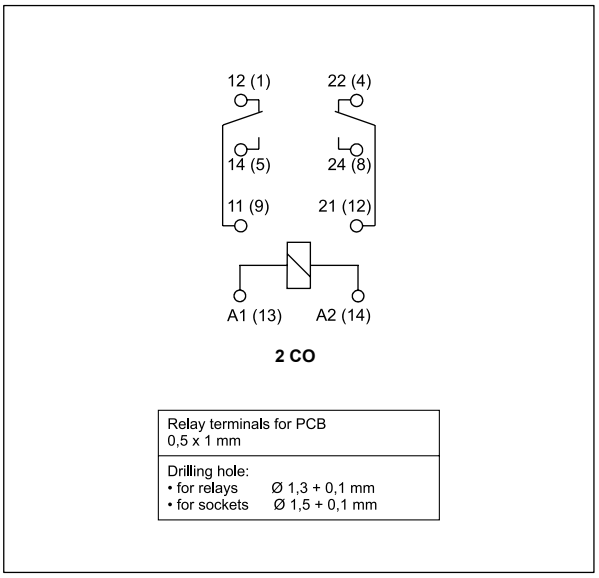
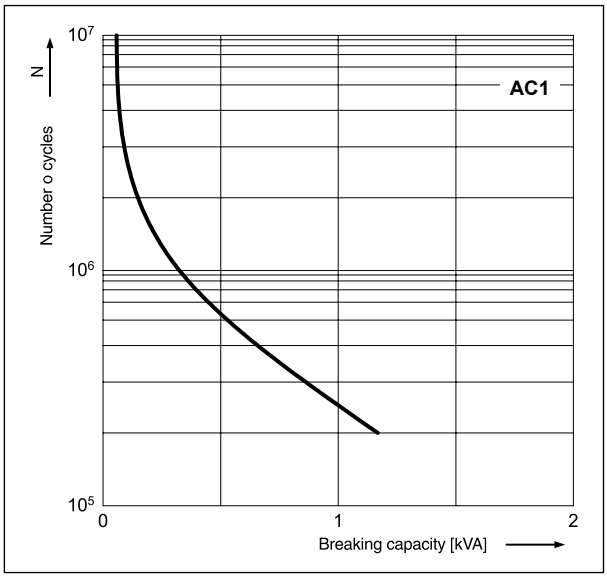
Connection diagram (pin side view)



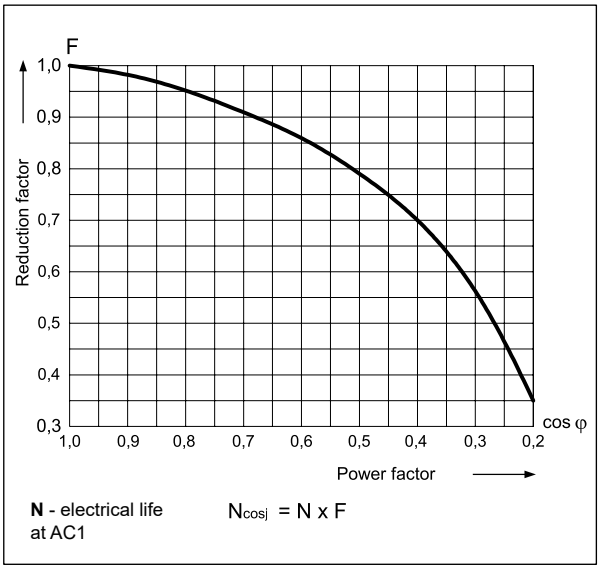
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour

Fig. 1



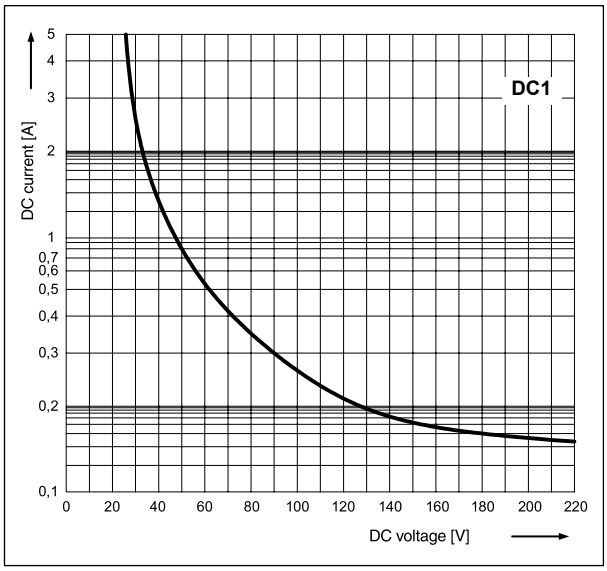
Electrical life reduction factor at AC inductive load

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

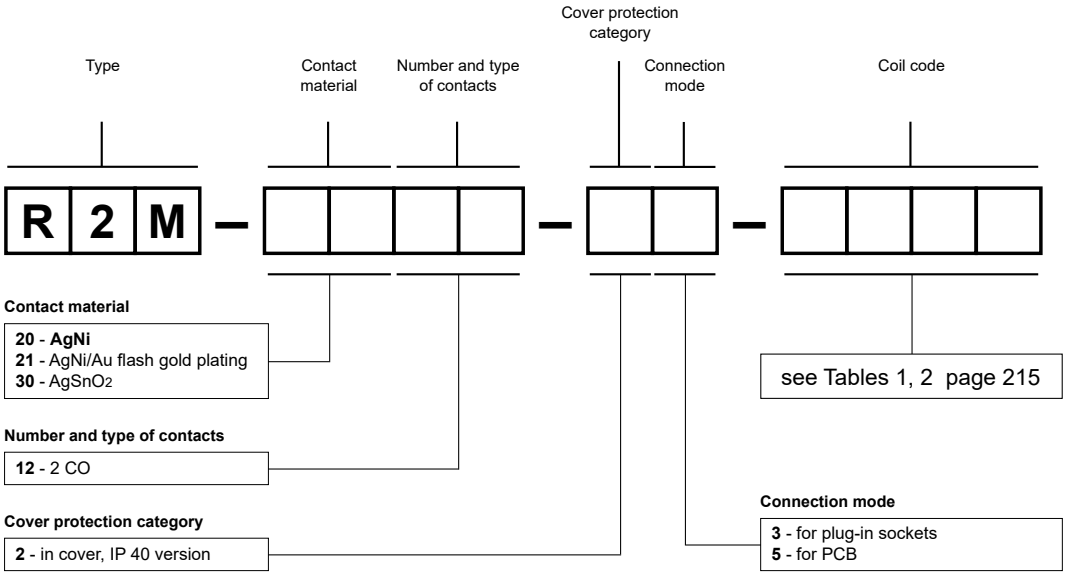
The data in bold type relate to the standard versions of the relays.

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

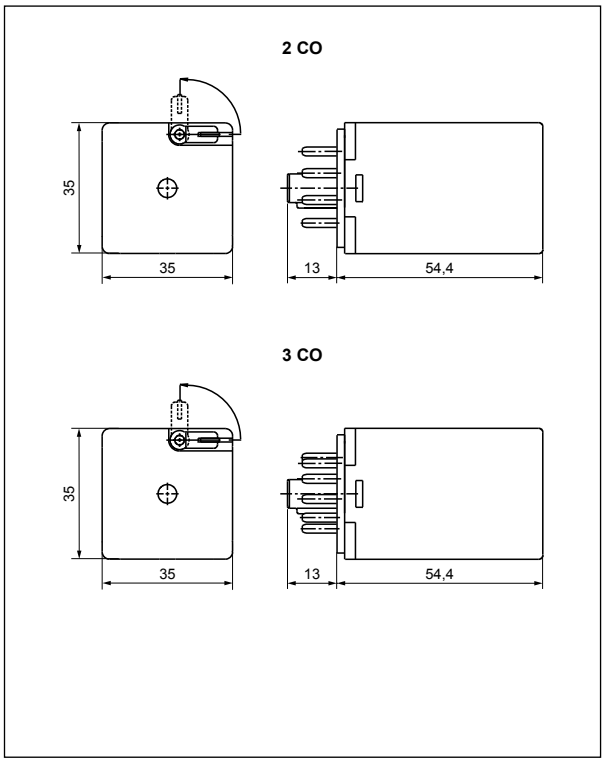
Insulation rated voltage		250 V AC
Rated surge voltage		2 500 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	2 500 V AC type of insulation: basic
	• contact clearance	1 500 V AC type of clearance: micro-disconnection
	• pole - pole	2 000 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 3 mm
	• creepage	≥ 4,2 mm

General data

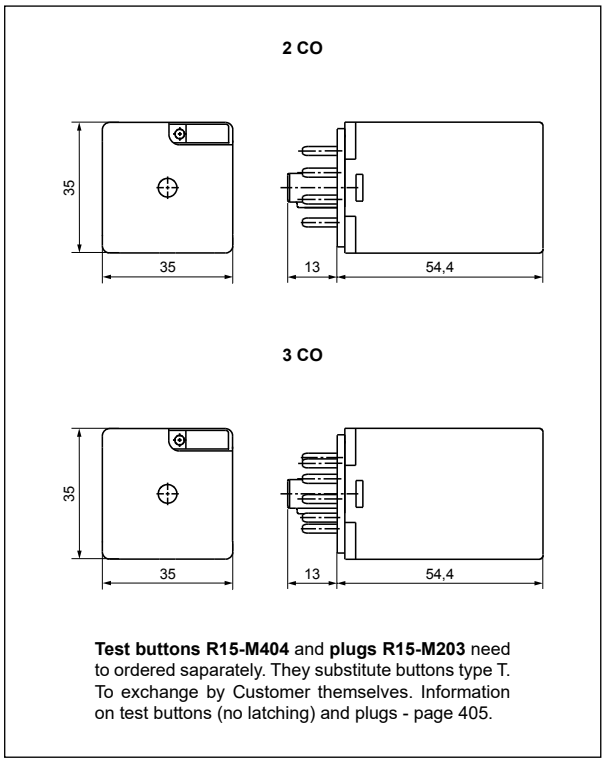
Operating / release time (typical values)		AC: 12 ms / 10 ms DC: 18 ms / 7 ms
Electrical life	• resistive AC1	≥ 2 x 10^5 10 A, 250 V AC
	• cosφ	see Fig. 2
Mechanical life (cycles)		≥ 2 x 10^7
Dimensions (L x W x H) / Weight		35 x 35 x 54,4 mm / 83 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation 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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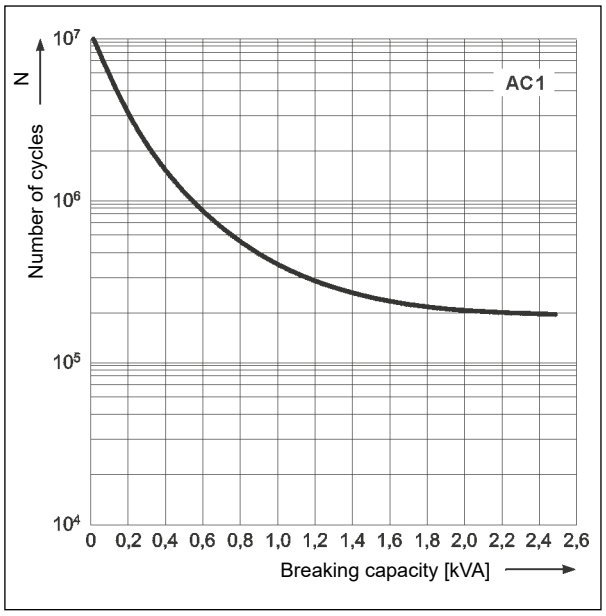
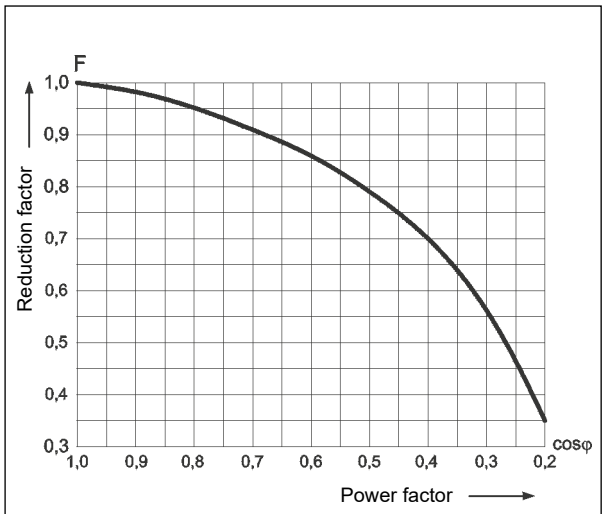
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



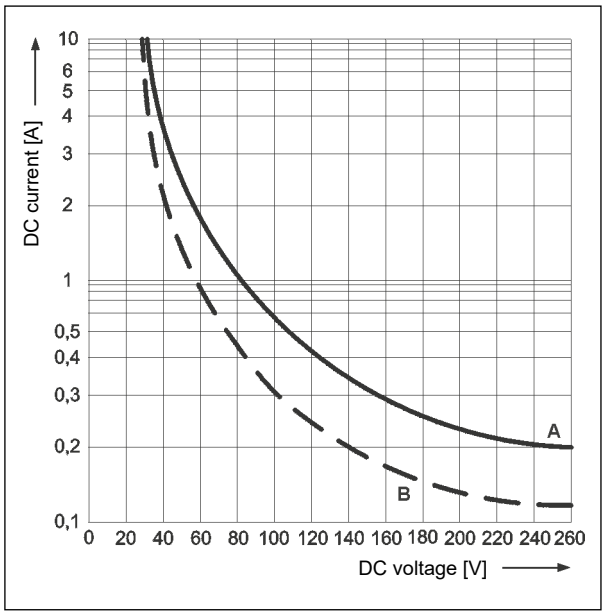
Electrical life reduction factor at AC inductive load Fig. 2



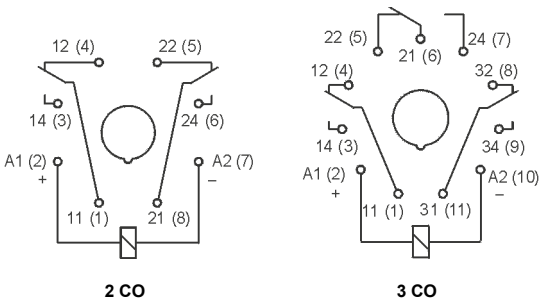
N - electrical life at AC1

$N_{\cos\varphi} = N \times F$

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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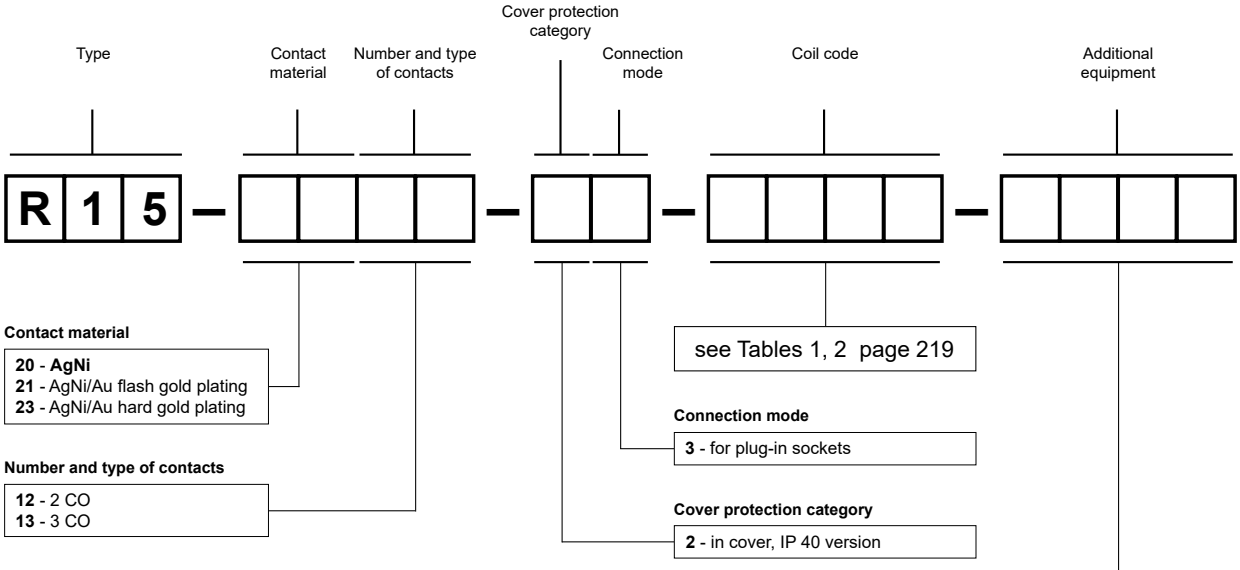
Ordering codes



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	• 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 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.

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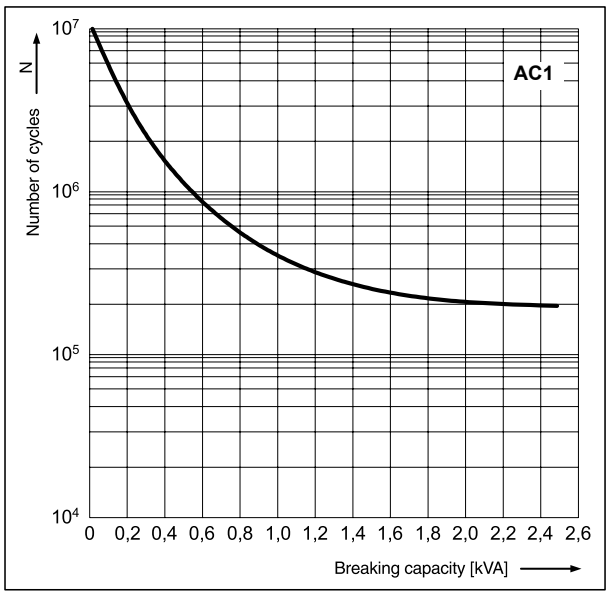
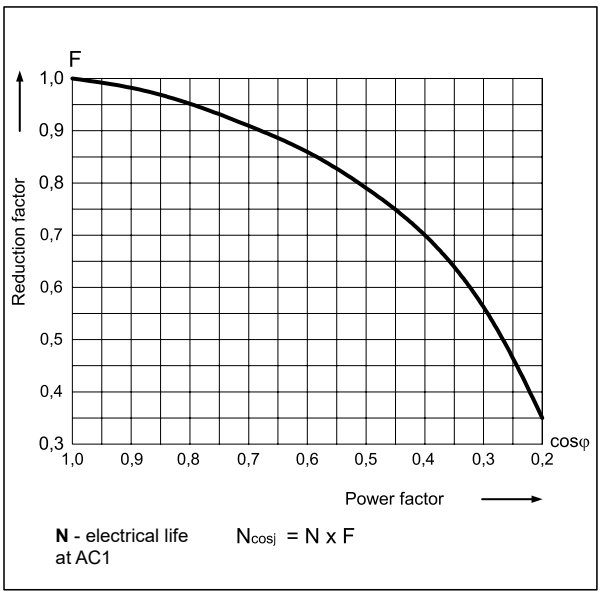
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



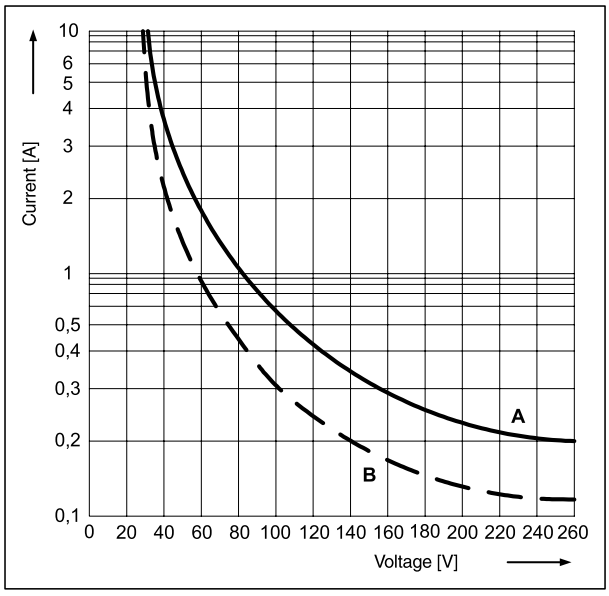
Electrical life reduction factor at AC inductive load Fig. 2



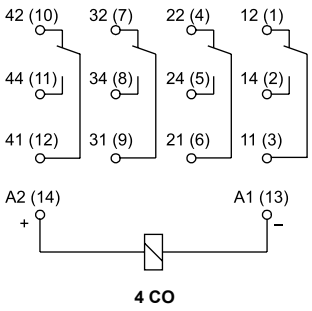
N - electrical life at AC1

$N_{cosj} = N \times F$

Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3

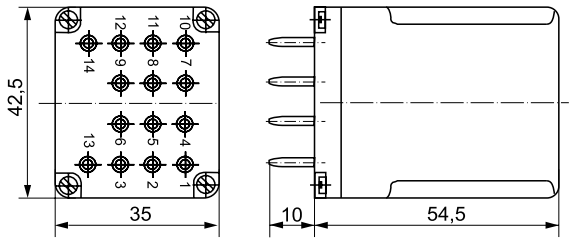


Connection diagram (pin side view)



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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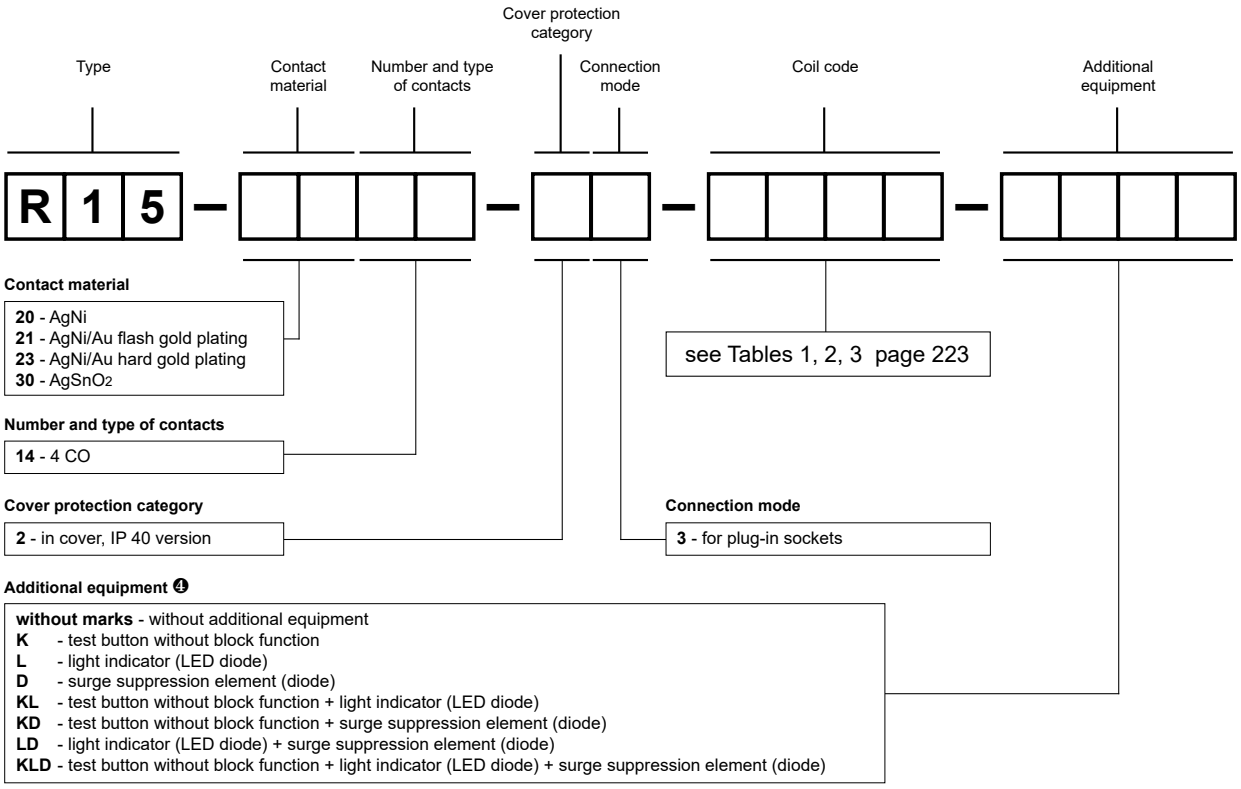
Mounting, sockets and accessories for relays

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.

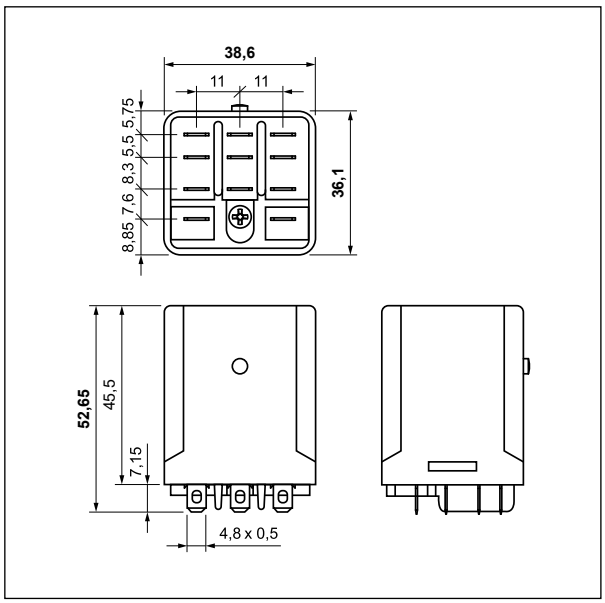
Sockets for RUC faston 4,8 x 0,5	**Accessories**
	Spring wire clips
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715)	
GUC11S-V0 ❶	MBA

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.

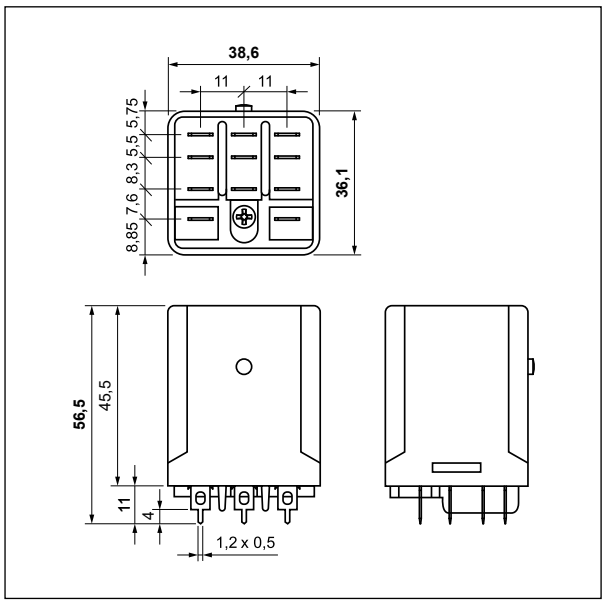
GUC11S-V0

Screw terminals plug-in sockets for RUC faston 4,8 x 0,5, RUC-M
- see page 394.

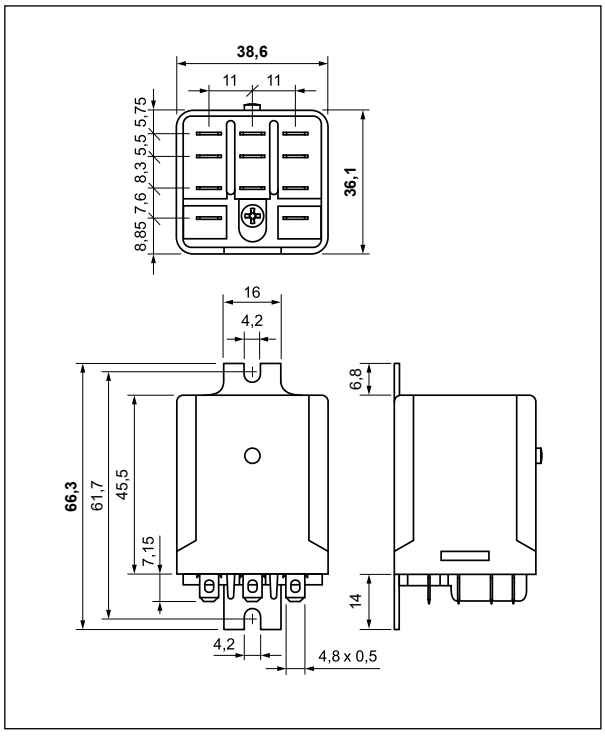
Dimensions - RUC faston 4,8 x 0,5
- plug-in version (standard)



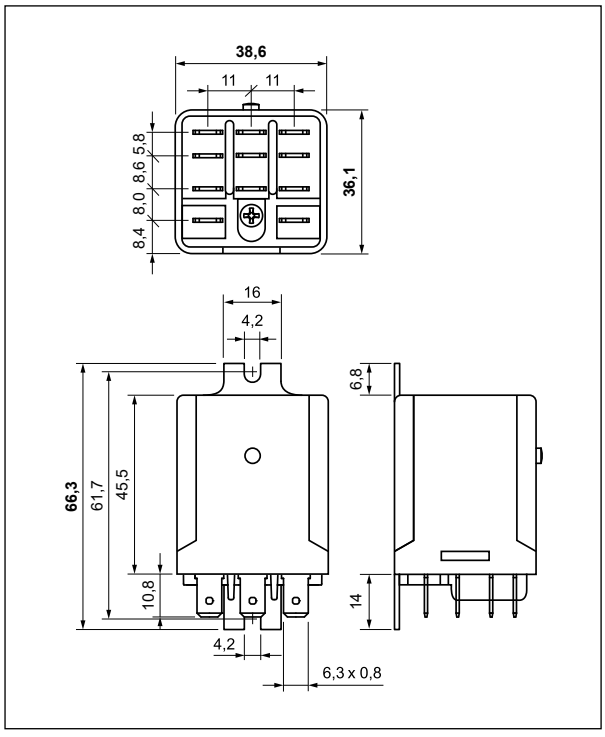
Dimensions - RUC faston 4,8 x 0,5
- PCB version



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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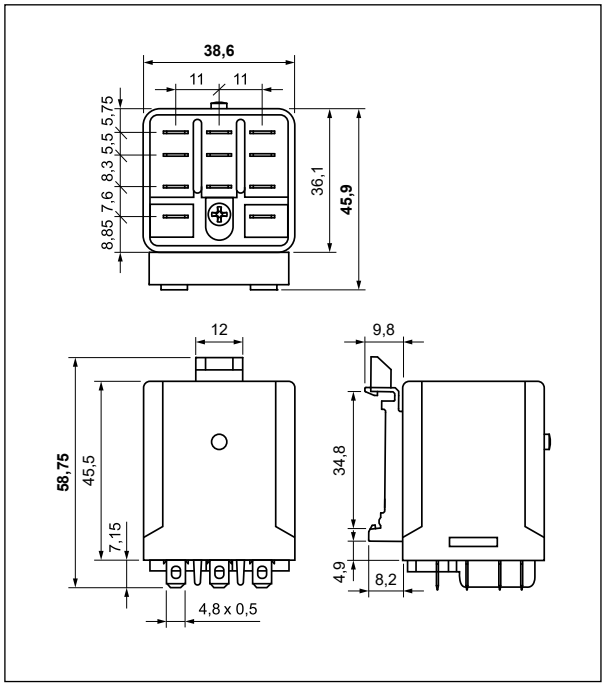
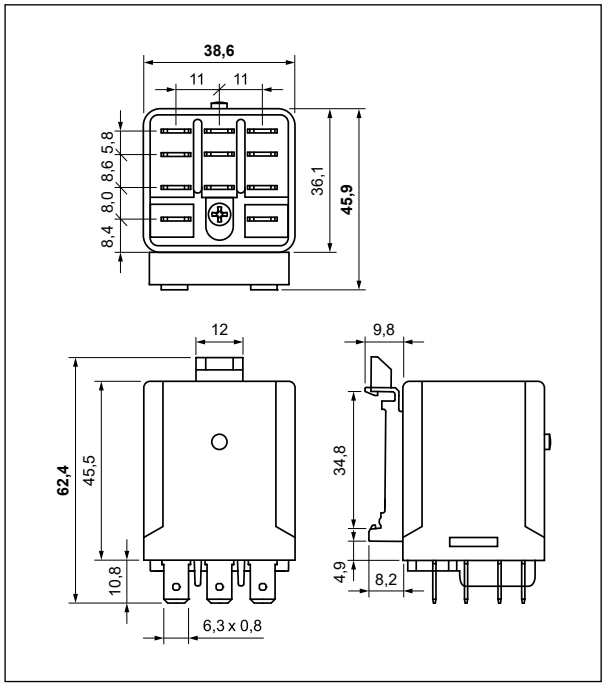
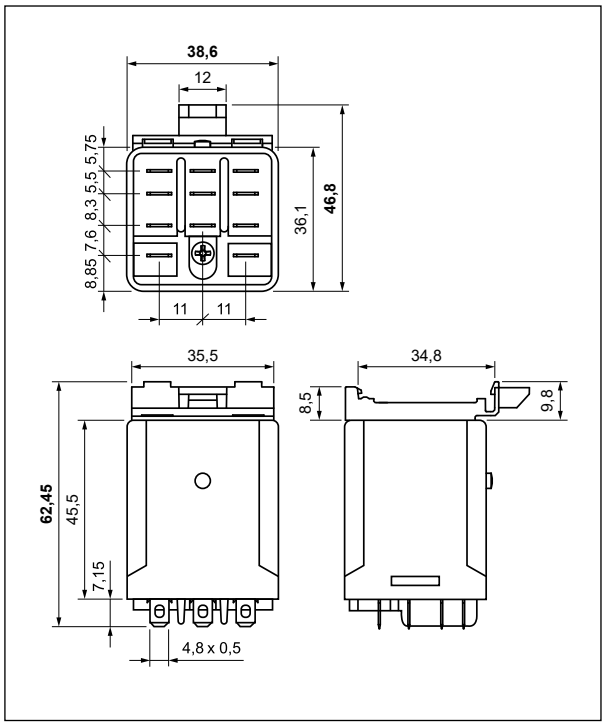
Dimensions - RUC faston 4,8 x 0,5
- version with vertical adaptor (V)



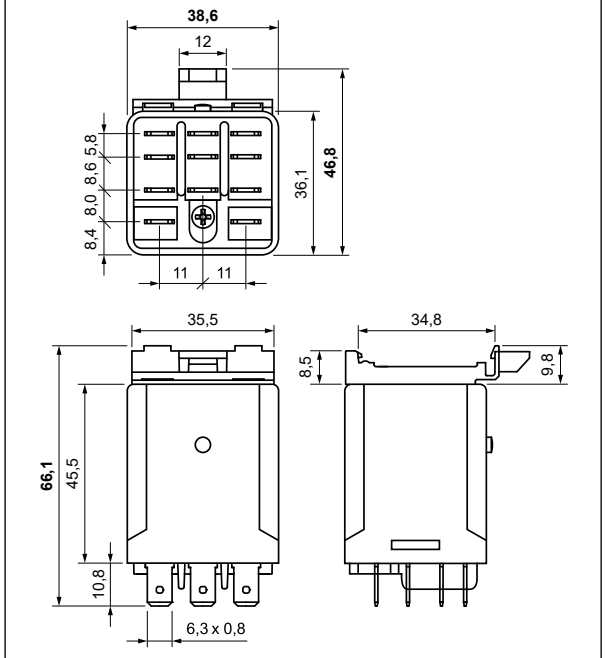
Dimensions - RUC faston 6,3 x 0,8
- version with vertical adaptor (V)



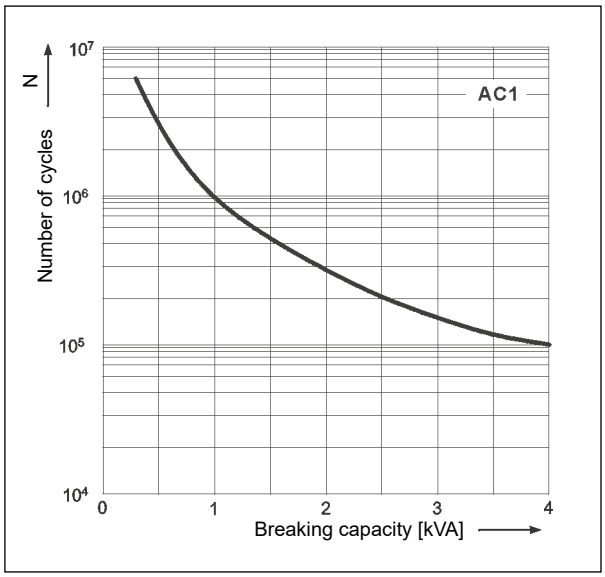
Dimensions - RUC faston 4,8 x 0,5
- version with horizontal adaptor (H)



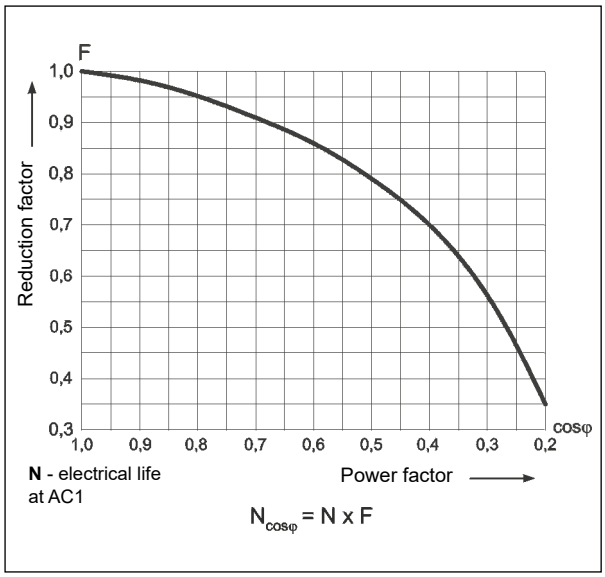
Dimensions - RUC faston 6,3 x 0,8
- version with horizontal adaptor (H)



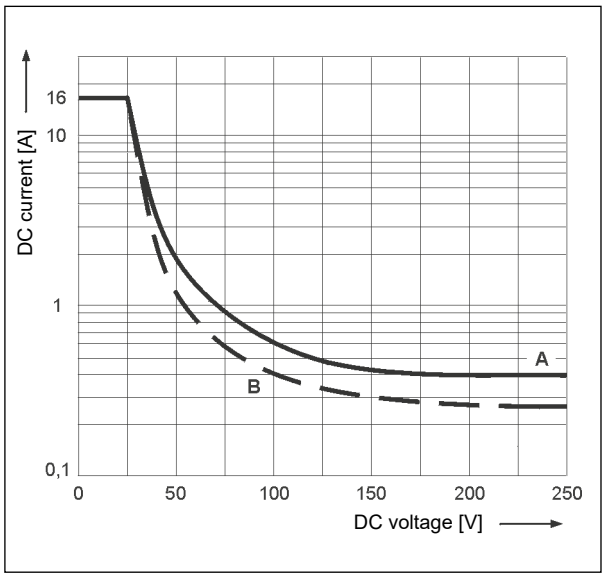
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



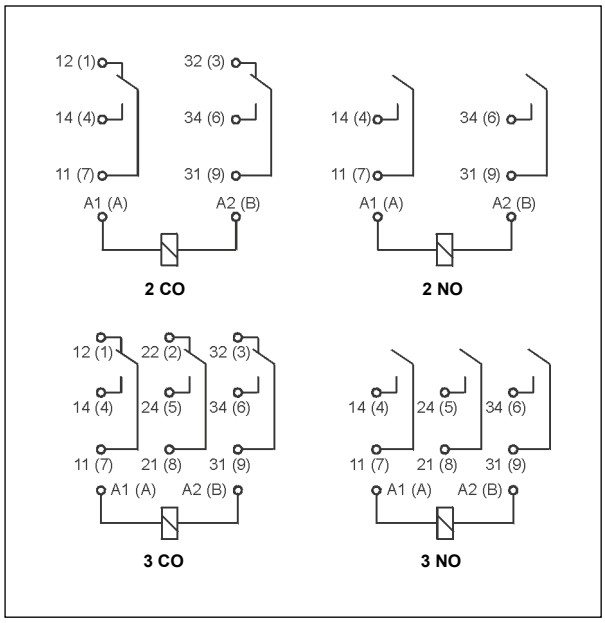
Electrical life reduction factor at AC inductive load Fig. 2



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

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- 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.

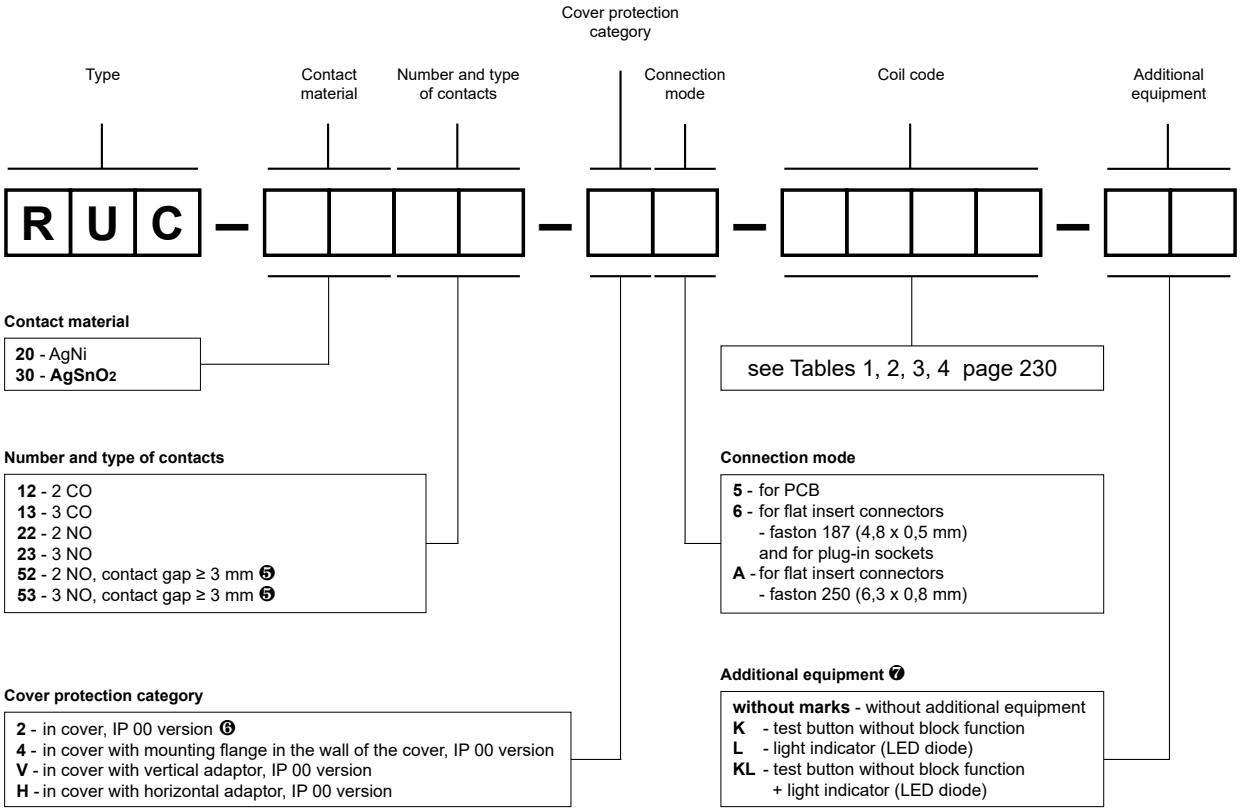
Coil data - AC 50/60 Hz voltage version Table 3

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 • no load	AC1	 1 200 cycles/hour 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

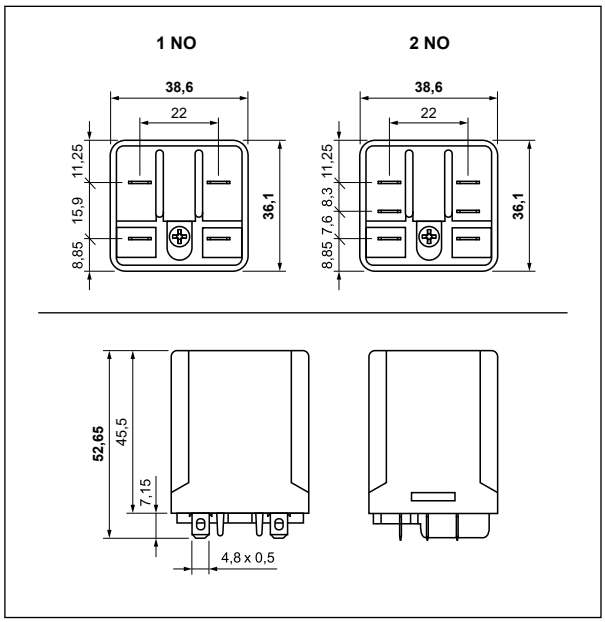
Insulation rated voltage	400 V AC	
Rated surge voltage	4 000 V 1,2 / 50 µs	
Overvoltage category	III	
Insulation pollution degree	3	
Dielectric strength		
• between coil and contacts	2 500 V AC	type of insulation: basic
• contact clearance	4 000 V AC	contact 1 NO, type of clearance: full-disconnection
	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.

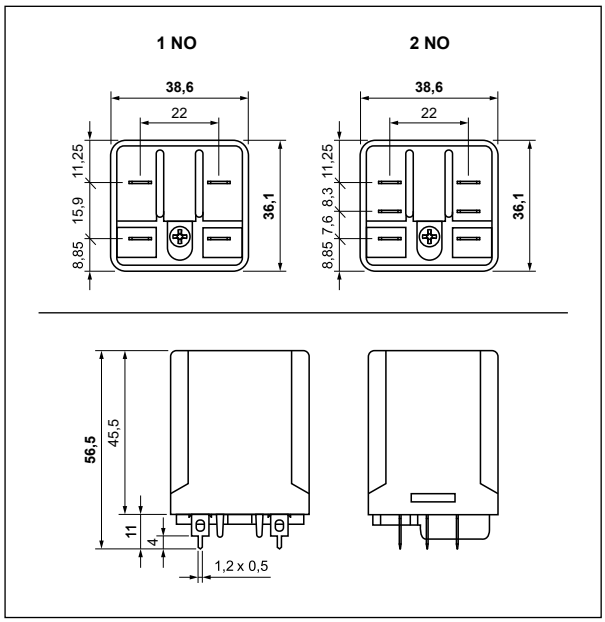
General data

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)



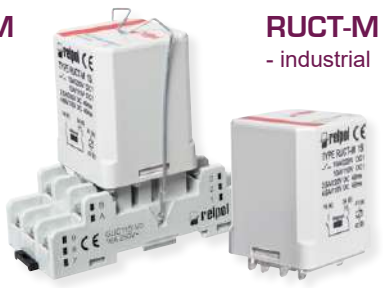
Dimensions - PCB version



Relays for railroad industry

PRUCT-M
- interface

RUCT-M
- industrial



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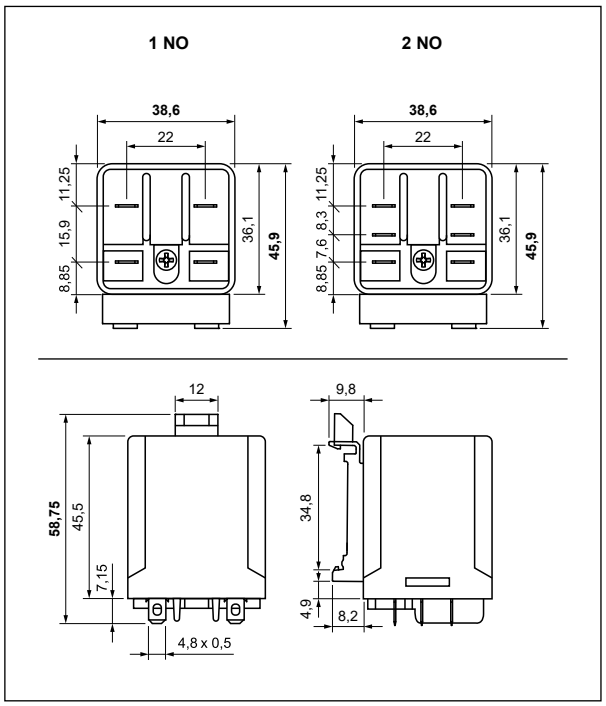
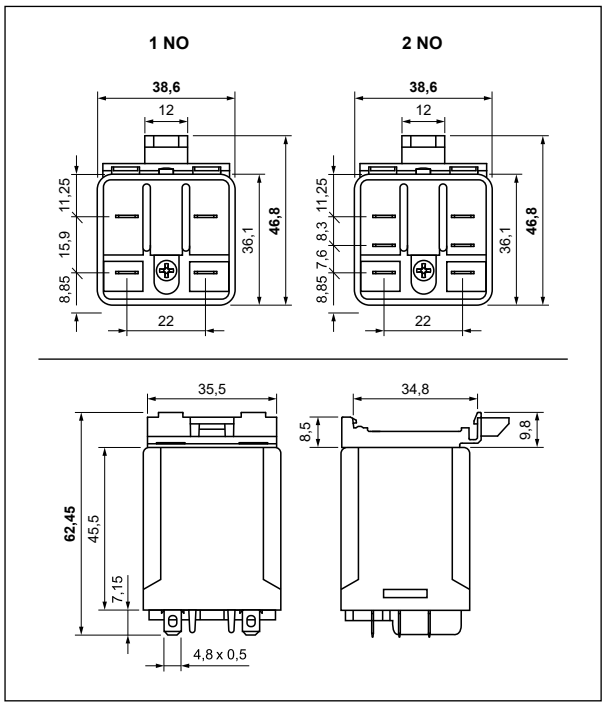
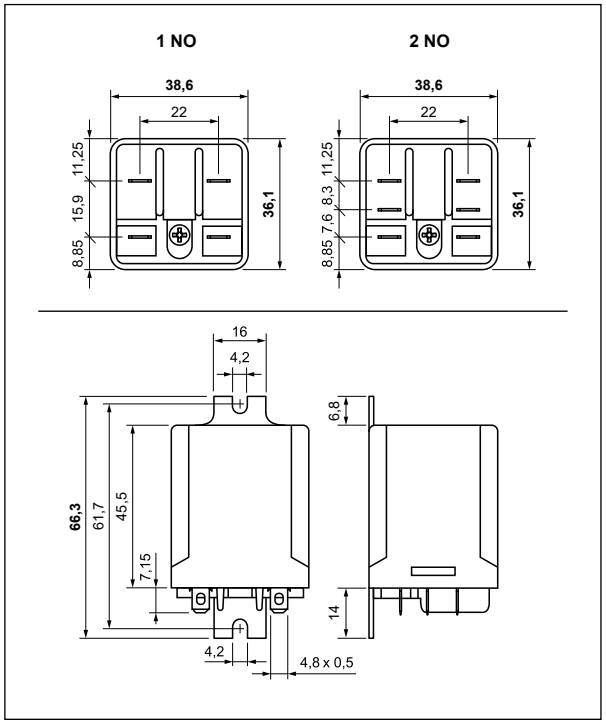
Dimensions - version with vertical adaptor (V)



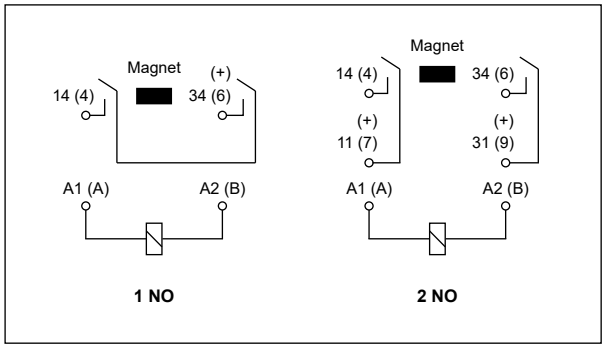
Dimensions - version with horizontal adaptor (H)



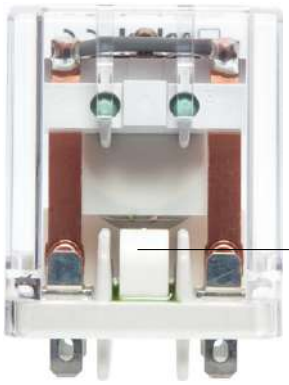
Dimensions - version with mounting flange in the wall of the cover



Connection diagrams (pin side view)

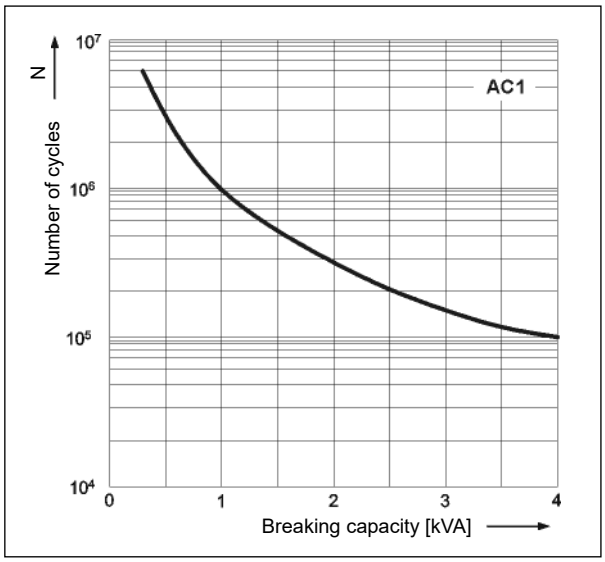


Design

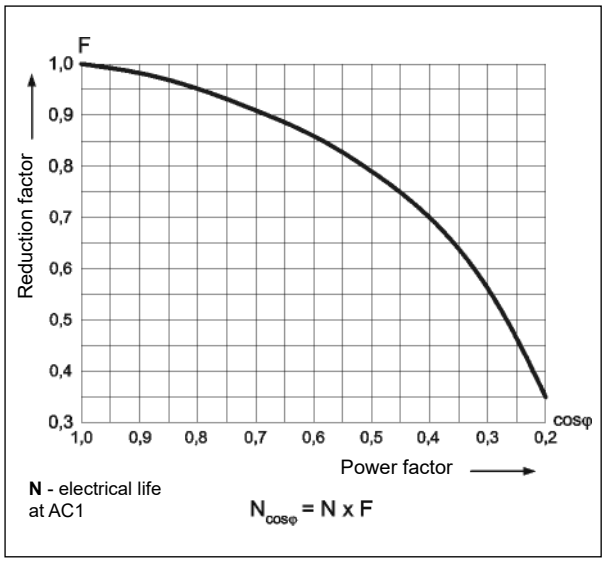


The permanent magnet is fixed on the contact plate. Its magnetic field is directed to the contacts and it blows the electric arc which occurs when the DC load is switched off.

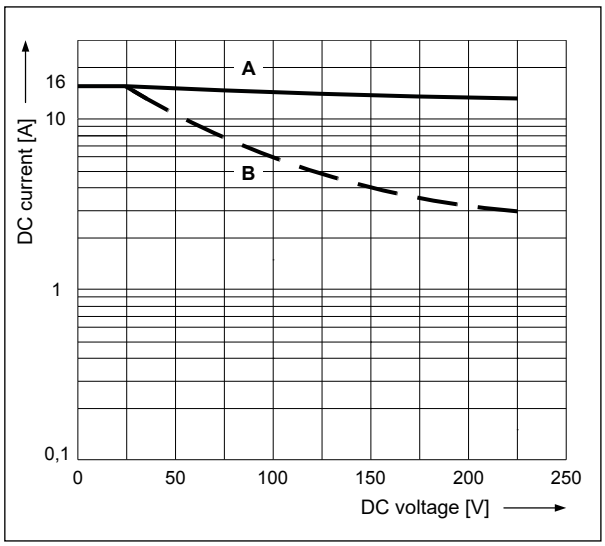
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



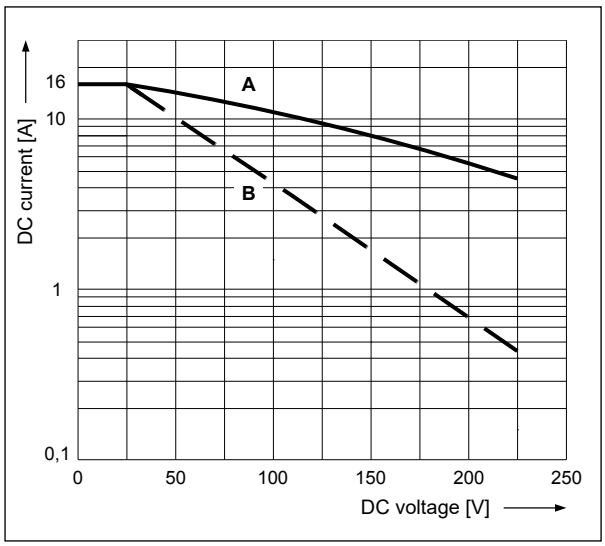
Electrical life reduction factor at AC inductive load Fig. 2



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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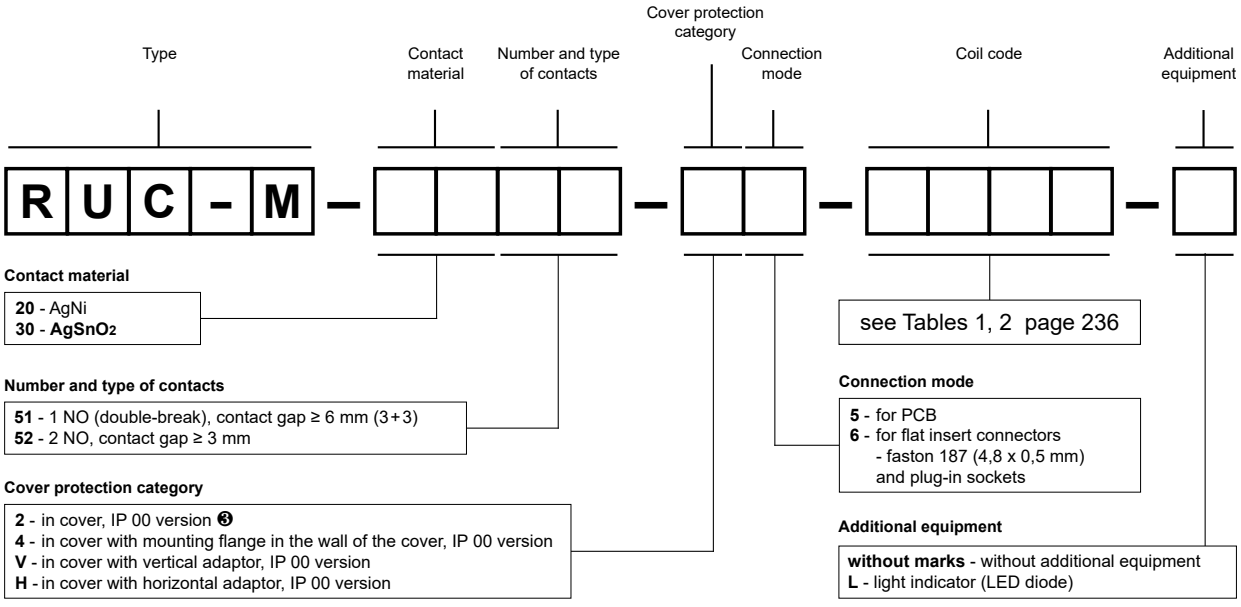
Coil data - DC voltage version, reinforced Table 1

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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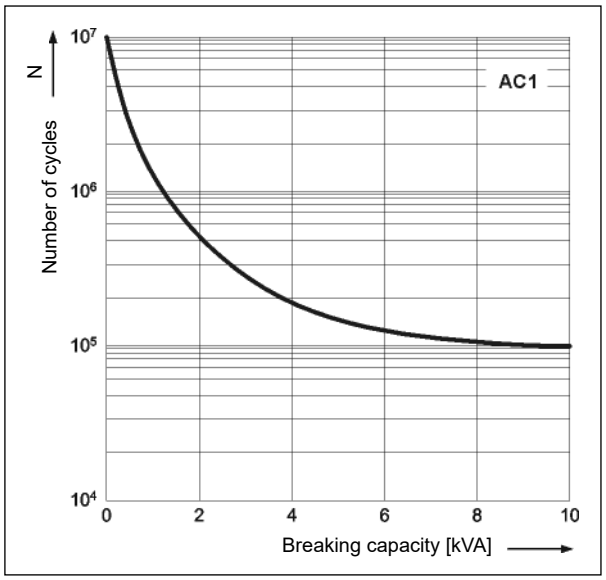
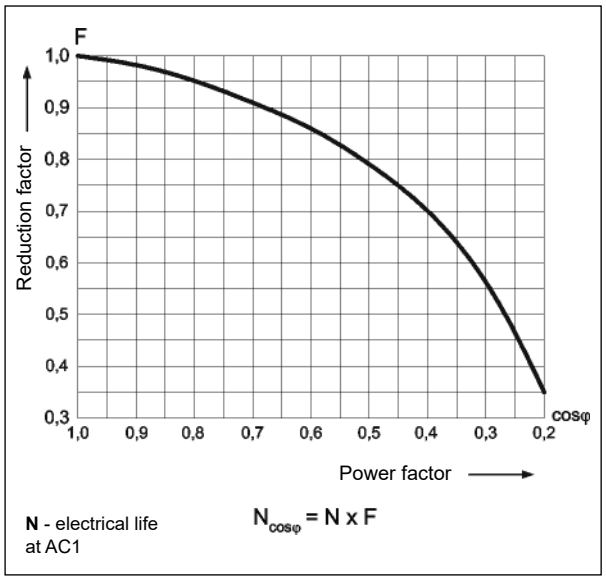
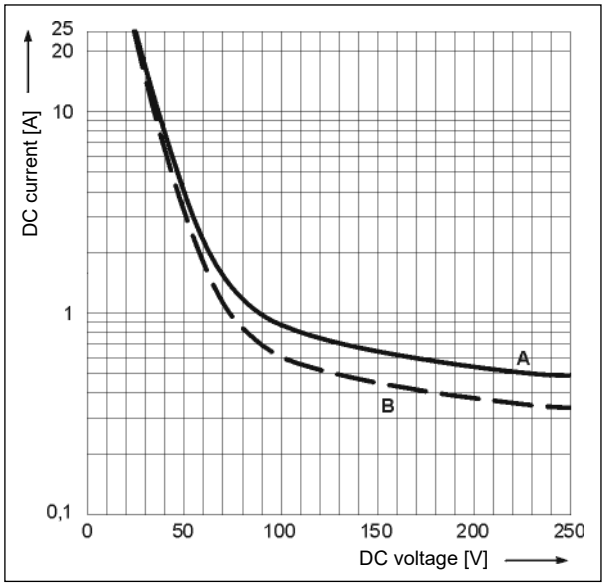
Electrical life at AC resistive load.
Switching frequency: 600 cycles/hour Fig. 1



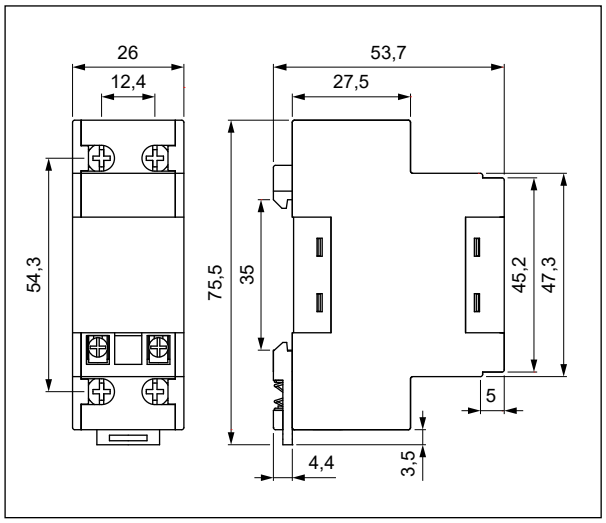
Electrical life reduction factor at AC inductive load Fig. 2



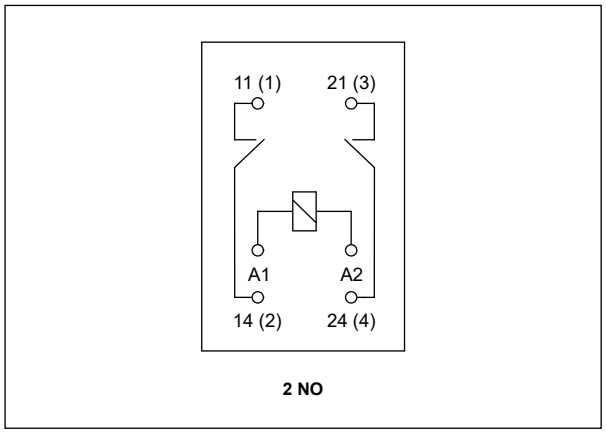
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



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.

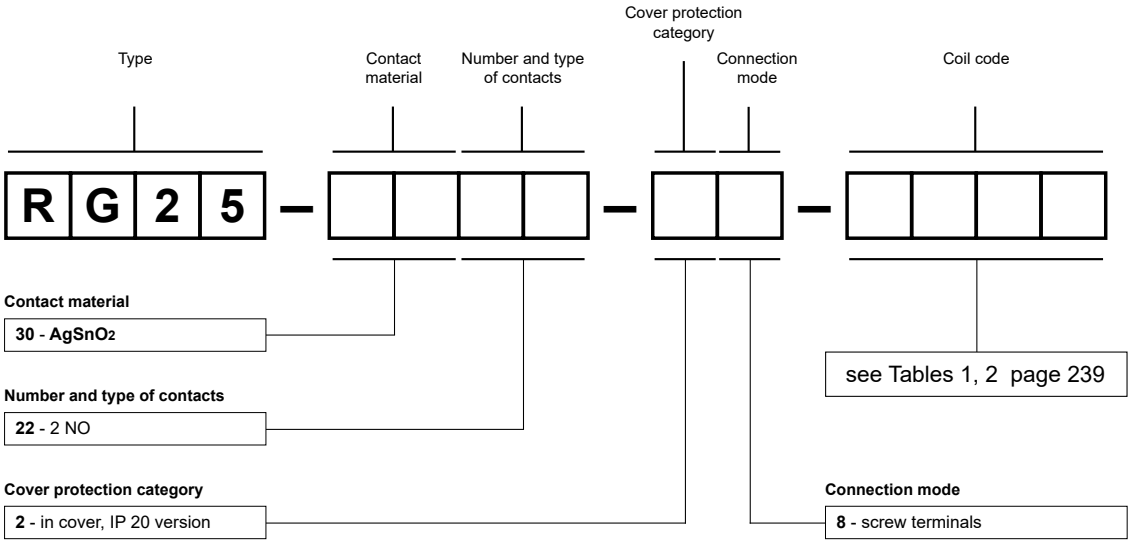
Coil data - AC 50 Hz voltage version

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

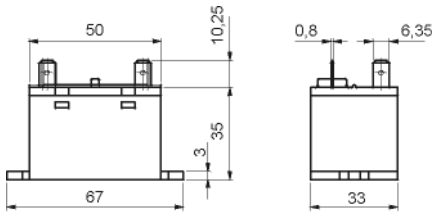
Insulation rated voltage	250 V AC	
Dielectric strength		
• between coil and contacts	4 000 V AC	type of insulation: reinforced
• contact clearance	2 000 V AC	type of clearance: full-disconnection
Contact - coil distance		
• clearance	≥ 9 mm	
• creepage	≥ 11 mm	

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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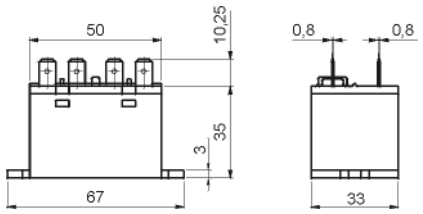
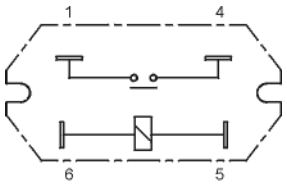


2 NO

Connection diagrams (pin side view)



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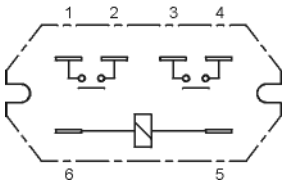
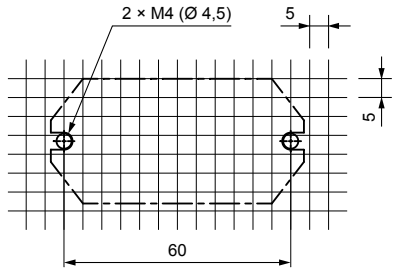


2 NO

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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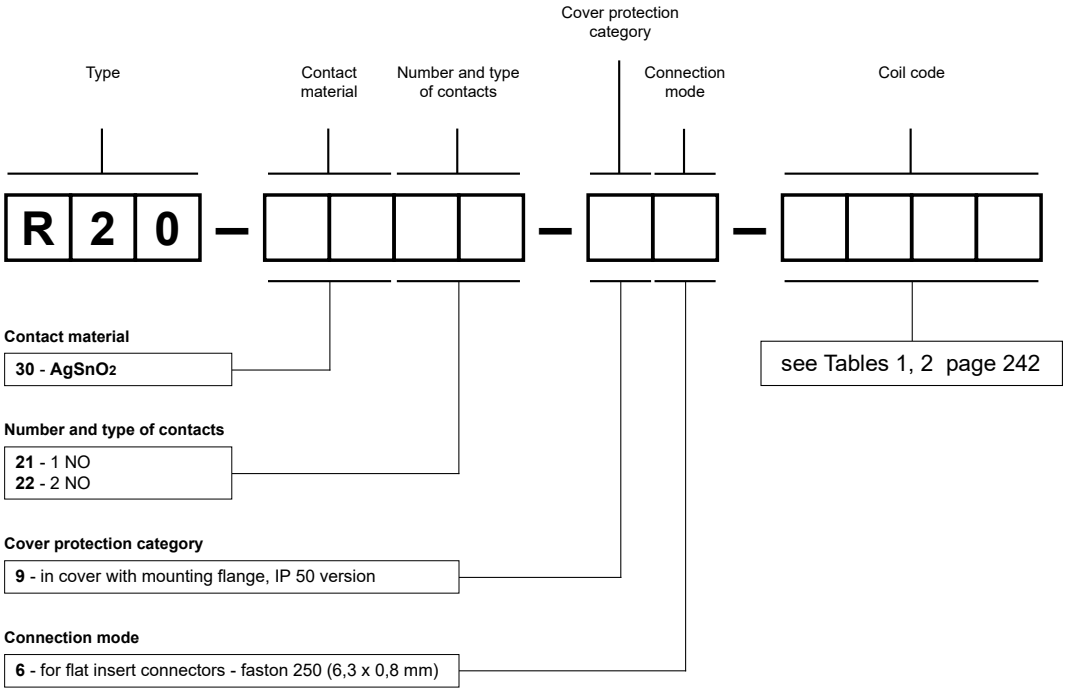
Coil data - DC voltage version Table 1

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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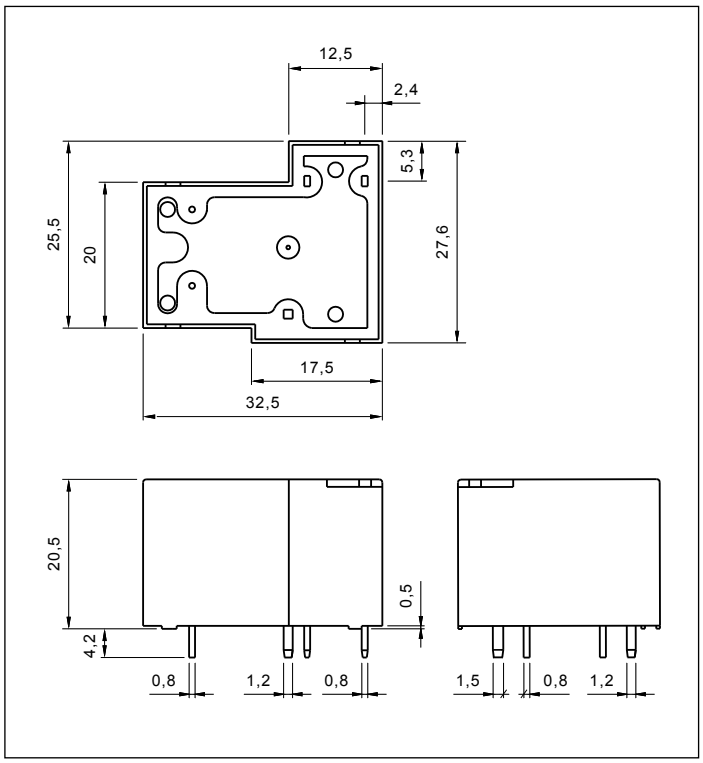
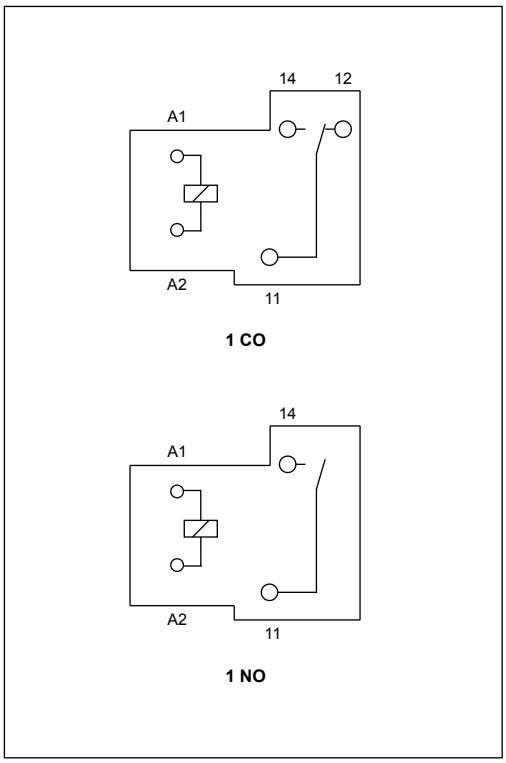
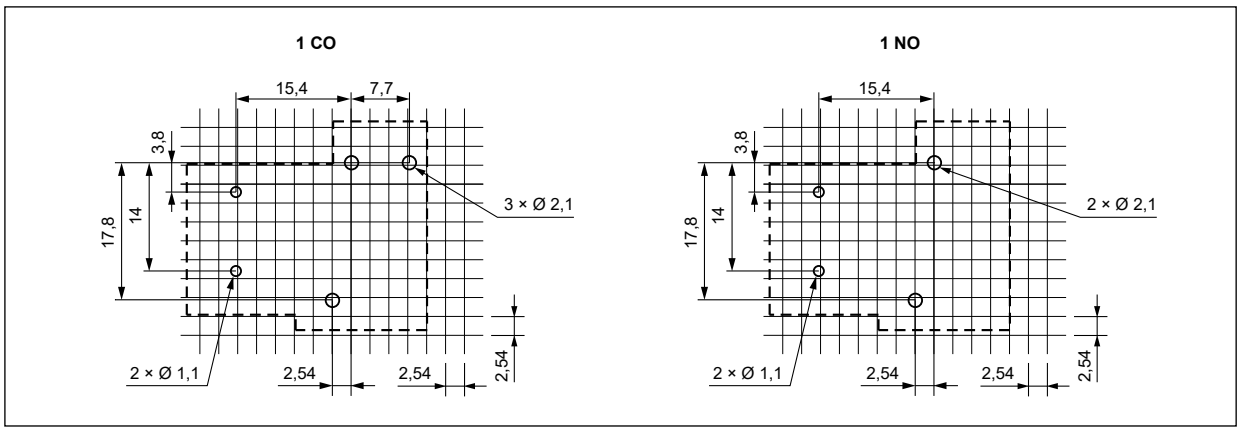
Dimensions



Connection diagrams (pin side view)



Pinout (solder side view)



Mounting

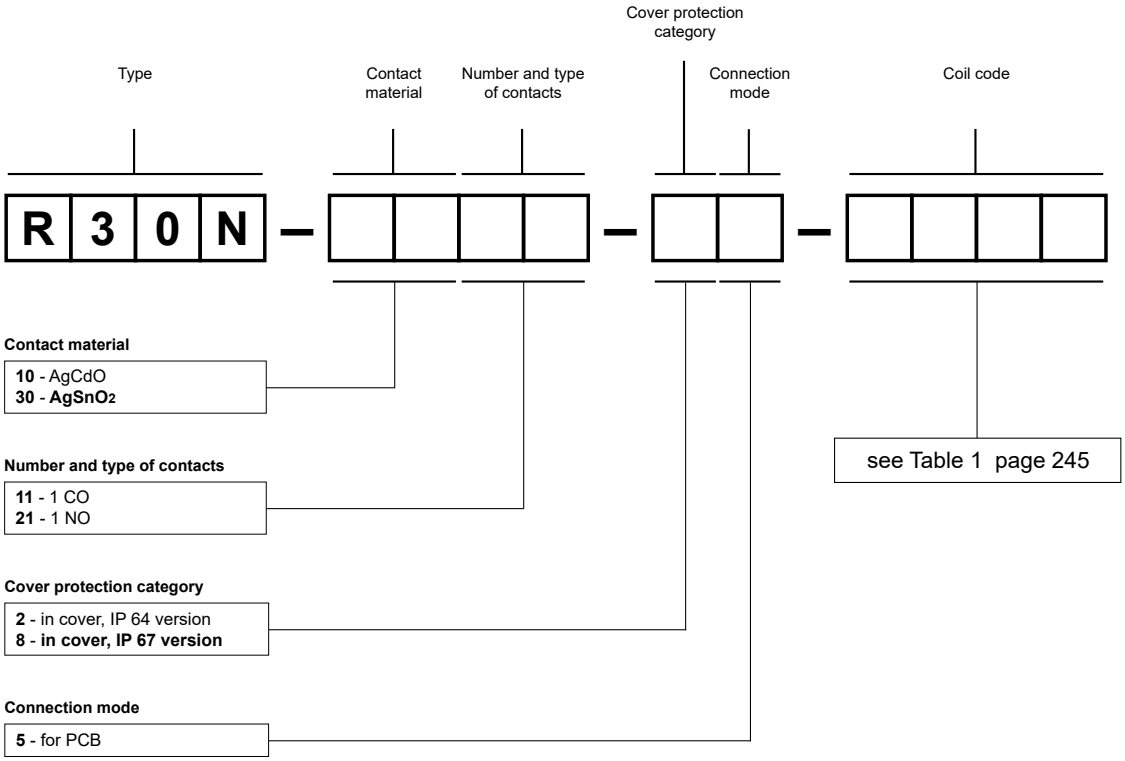
Relays **R30N** are designed for direct PCB mounting.

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

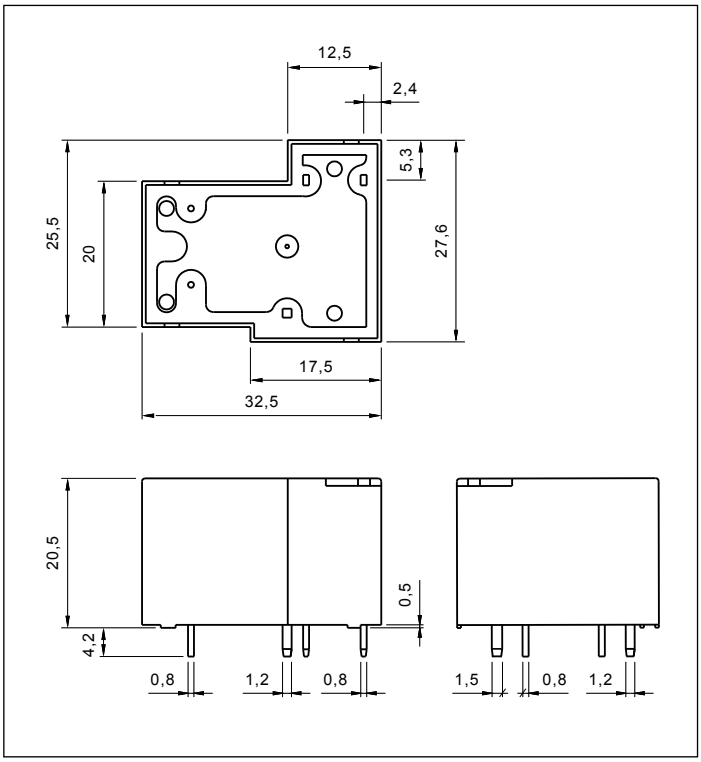
Insulation rated voltage	500 V AC	
Overvoltage category	II	
Flammability class	V-0	UL 94
Insulation resistance	> 1 000 MΩ	500 V DC, 60 s
Dielectric strength		
• between coil and contacts	4 000 V AC	type of insulation: reinforced
• contact clearance	1 500 V AC	type of clearance: micro-disconnection

General data

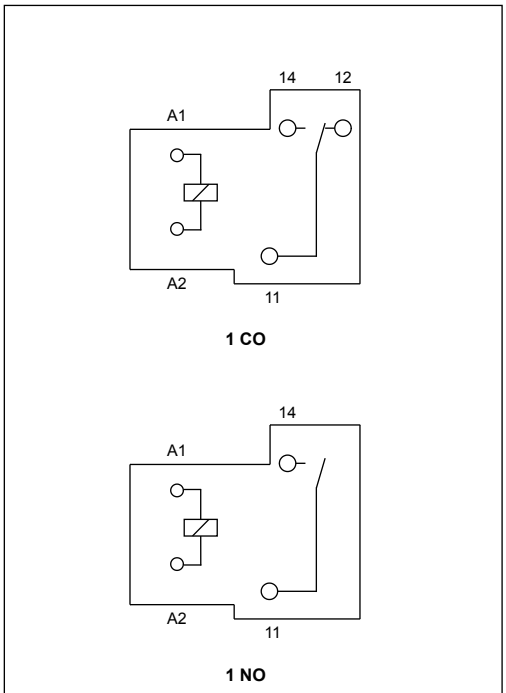
Operating / release time (typical values)		15 ms / 10 ms	
Electrical life			
• resistive AC1	1 200 cycles/hour	10^5 1 CO: 40 A / 30 A (NO/NC), 240 V AC	1 NO: 40 A, 240 V AC
• resistive DC1	1 200 cycles/hour	10^5 1 CO: 40 A / 30 A (NO/NC), 30 V DC	1 NO: 40 A, 30 V DC
Mechanical life (cykle)		10^7	
Dimensions (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.

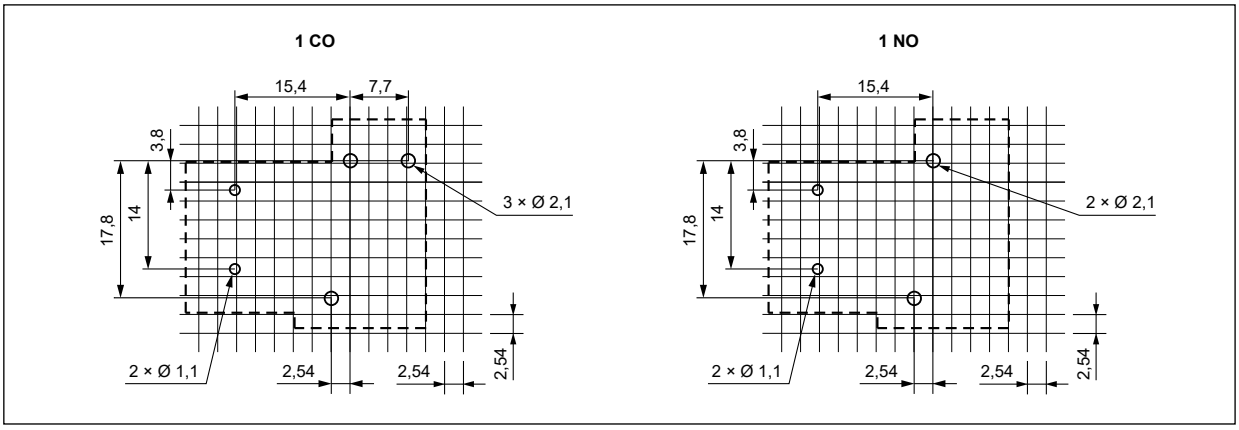
Dimensions



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

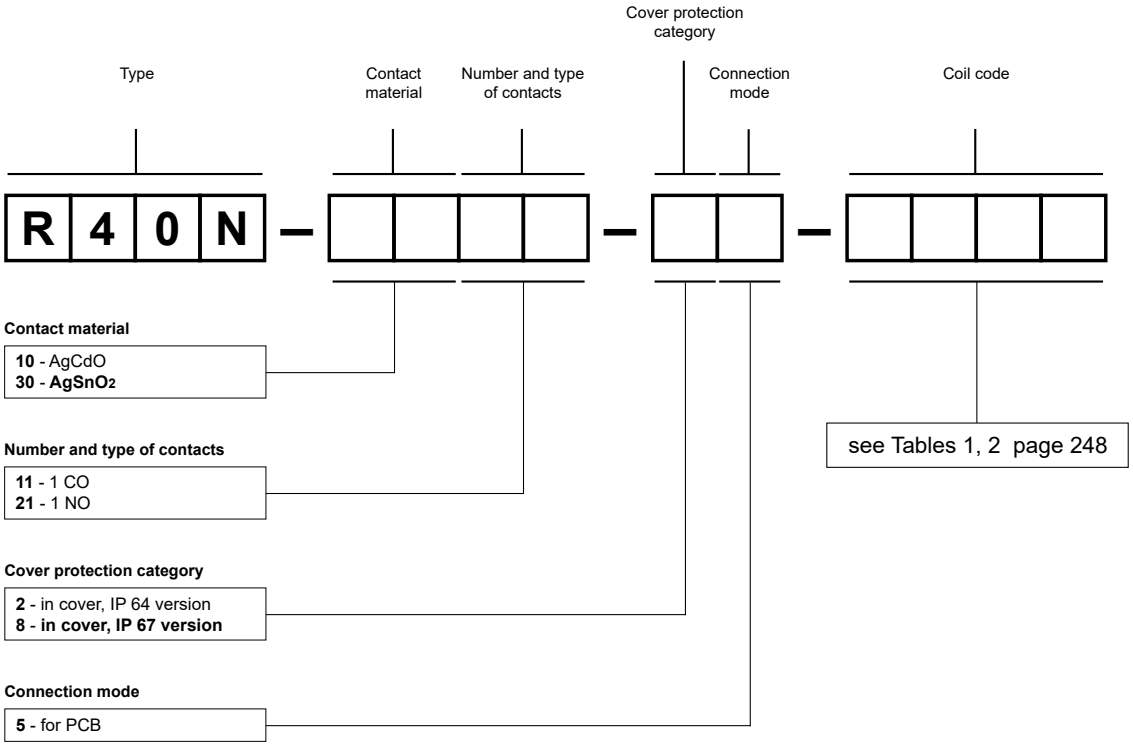
The data in bold type relate to the standard versions of the relays.

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	

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
Max. continuous dissipation		1,9 W 20 °C	
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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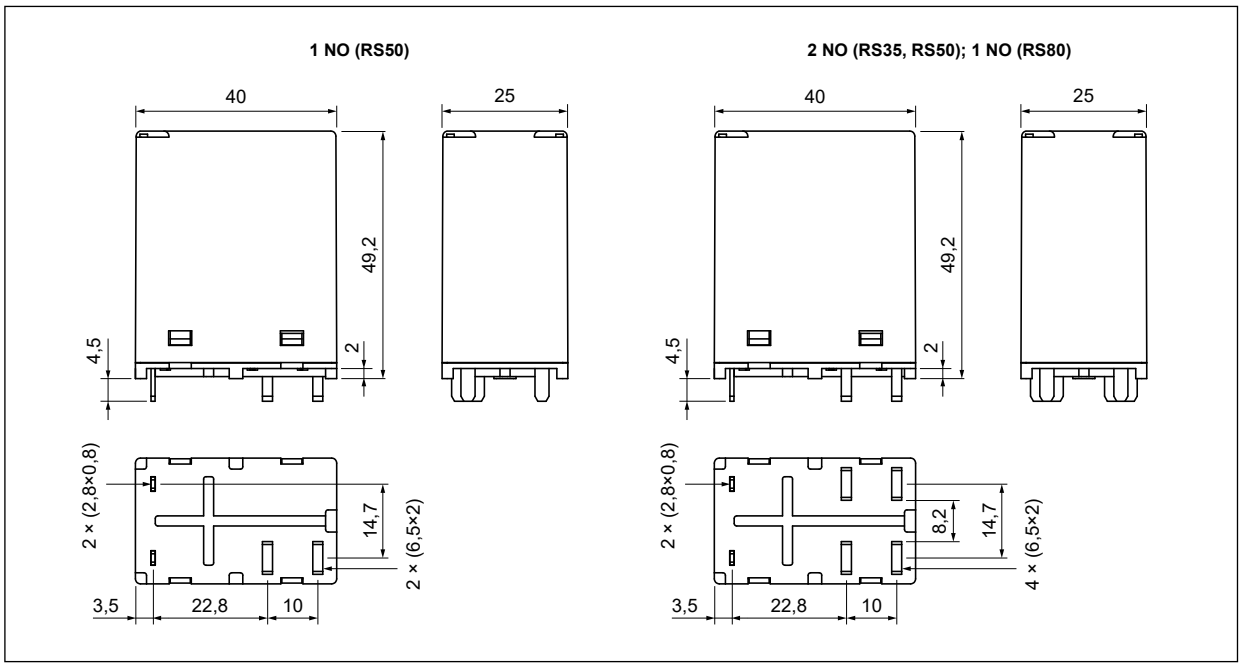
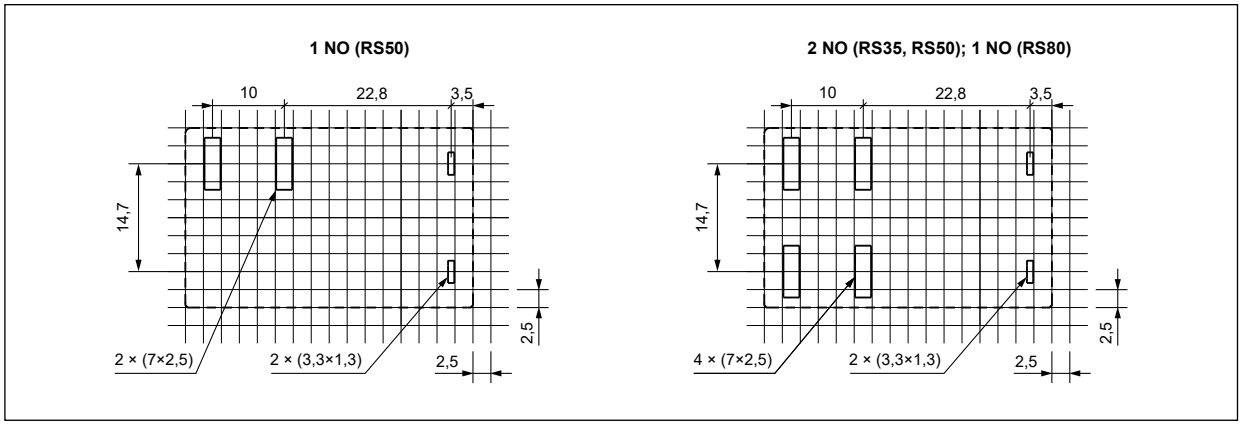
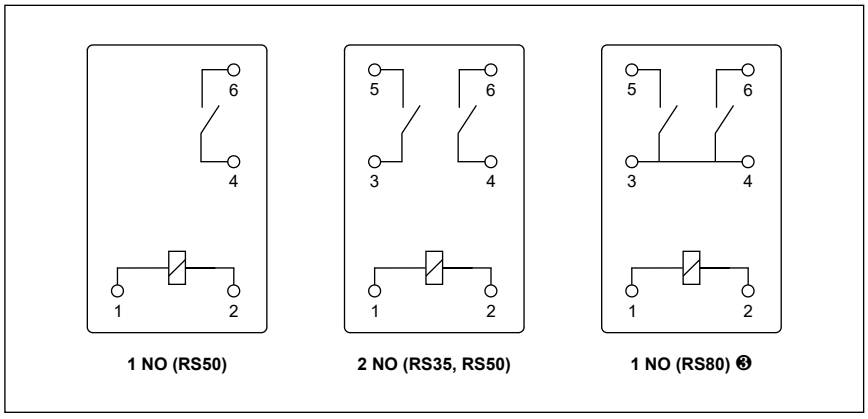
Dimensions



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.

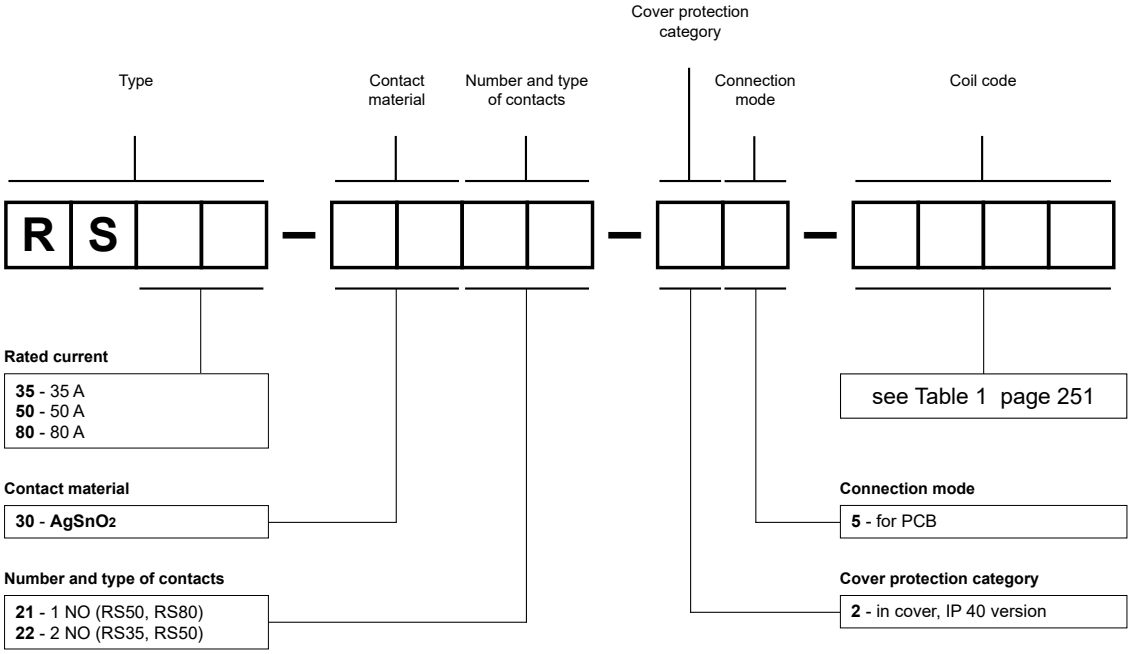
❹ An appropriate cross-section of the PCB must be provided in accordance with design standards, to ensure proper heat dissipation from the contact terminals under load.

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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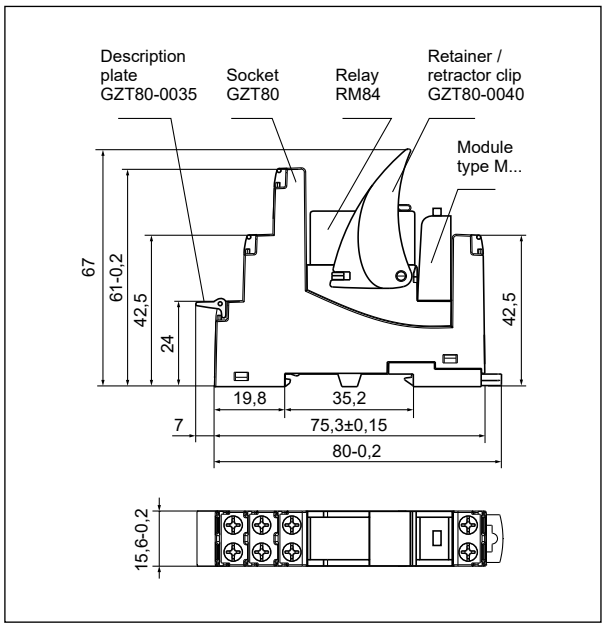
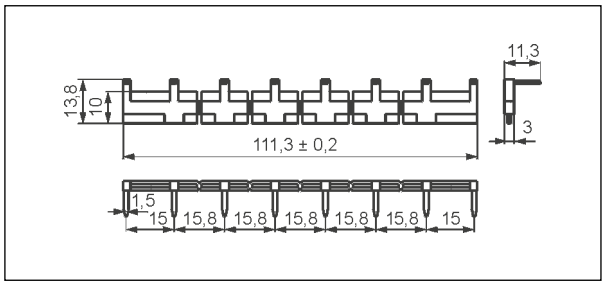
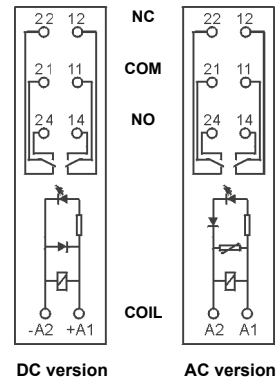
Dimensions



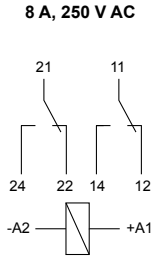


Interconnection strip type **ZGGZ80**

Connection diagrams
(screw terminals side view)

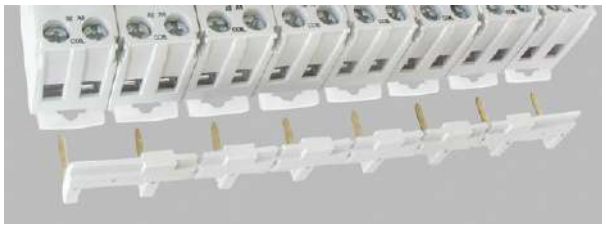


Connection of GZT80 socket



Mounting

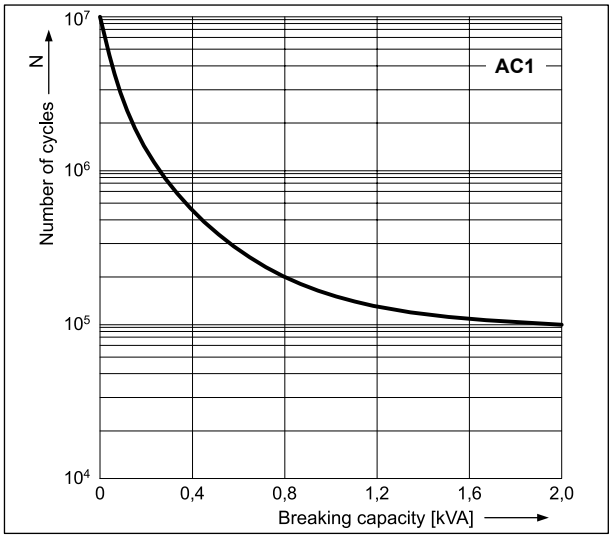
Relays **PI84 with socket GZT80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 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).



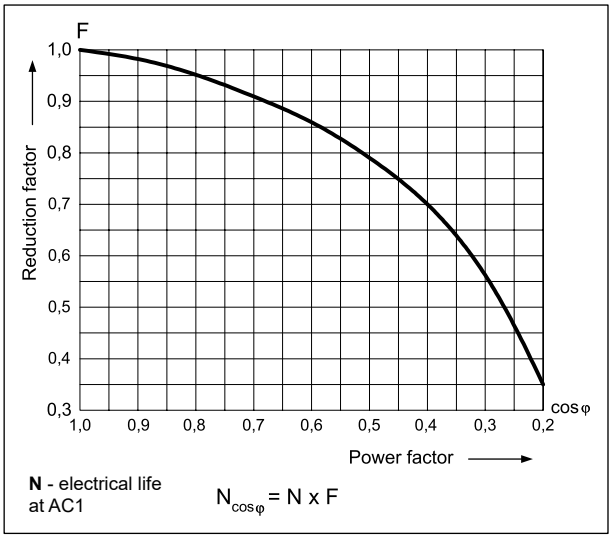
ZGGZ80

Interconnection strip ZGGZ80:
bridging of common input signals.

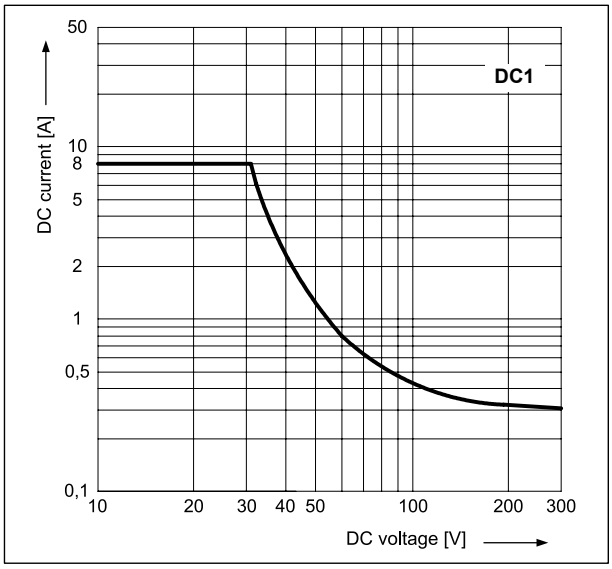
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



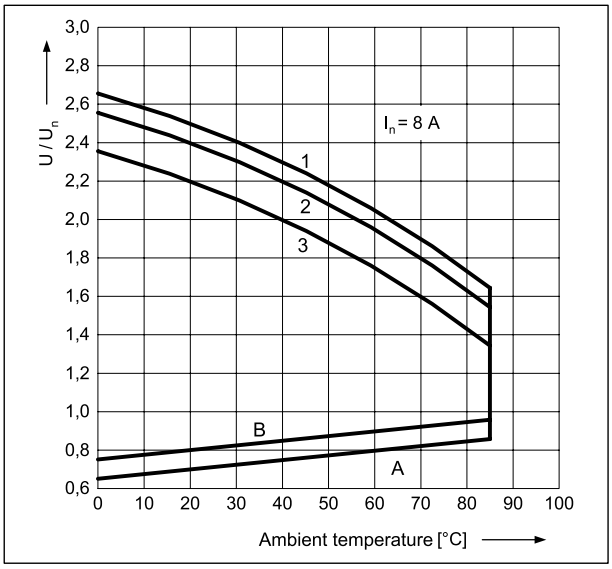
Electrical life reduction factor at AC inductive load Fig. 2



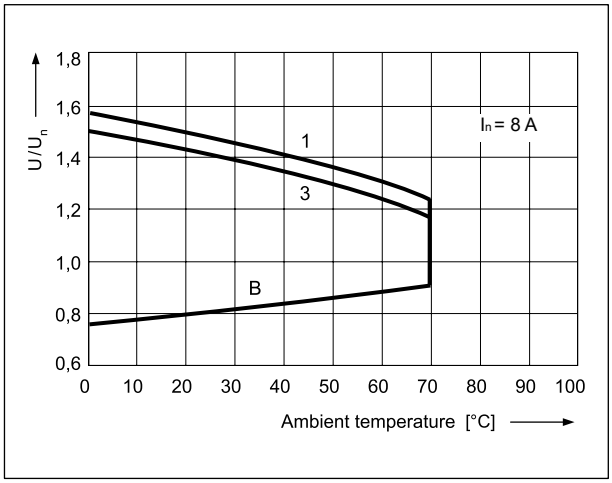
Max. DC resistive load breaking capacity Fig. 3



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

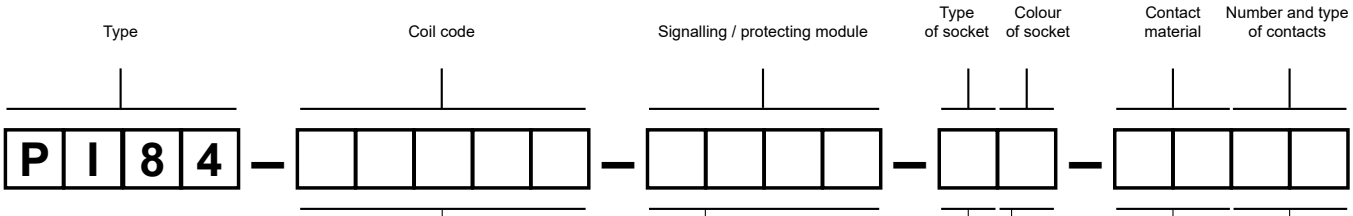
The data in bold type relate to the standard versions of the relays.

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

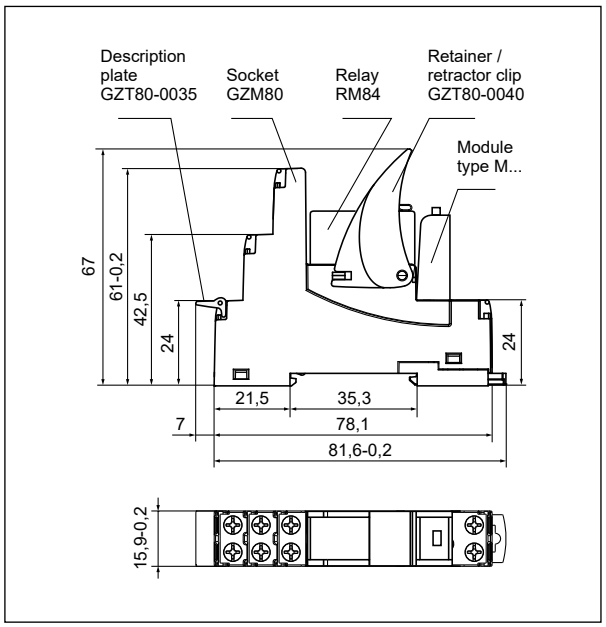
Insulation rated voltage		300 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
	• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 10 mm
	• creepage	≥ 10 mm

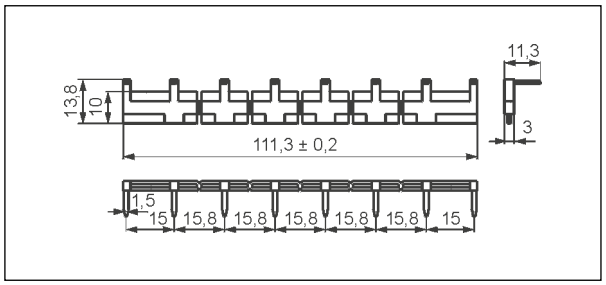
General data

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.

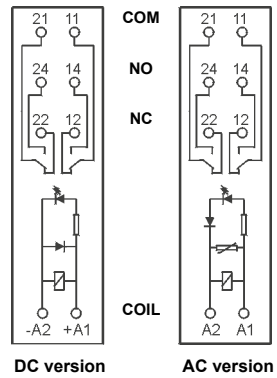
Dimensions



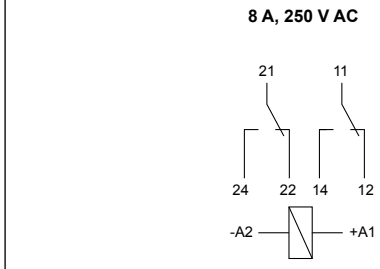


Interconnection strip type **ZGGZ80**

Connection diagrams
(screw terminals side view)

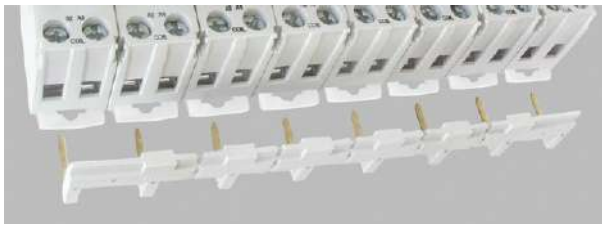


Connection of GZM80 socket



Mounting

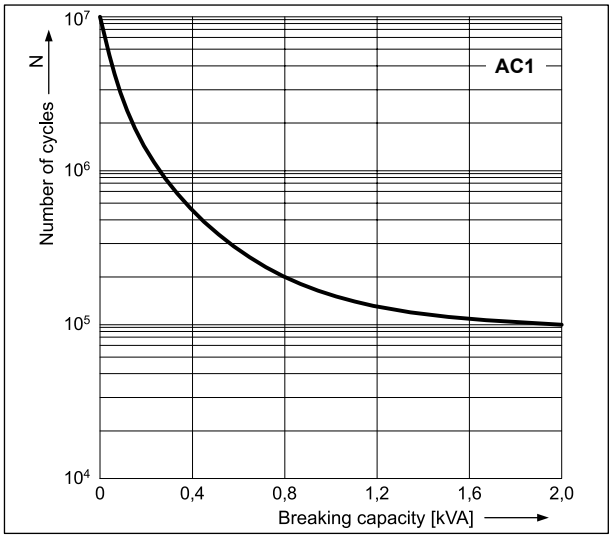
Relays **PI84 with socket GZM80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 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).



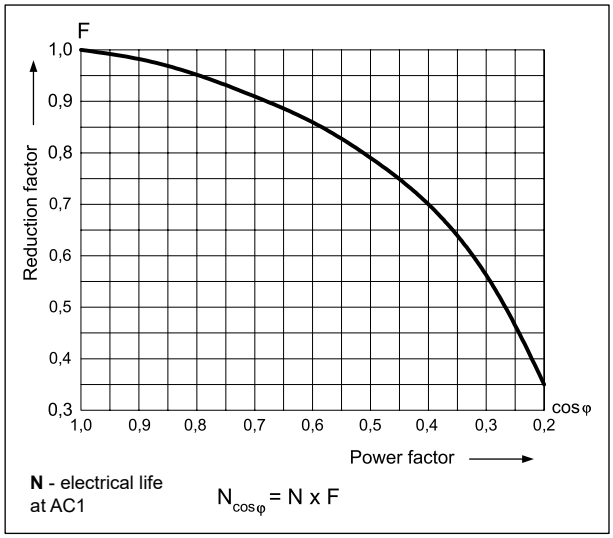
ZGGZ80

Interconnection strip ZGGZ80:
bridging of common input signals.

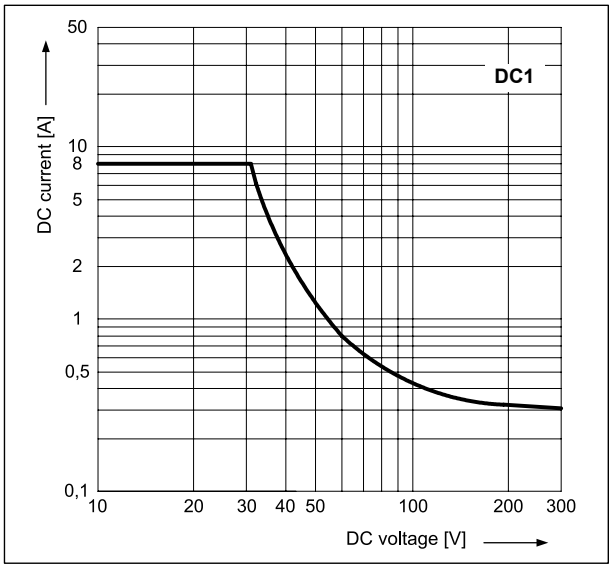
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



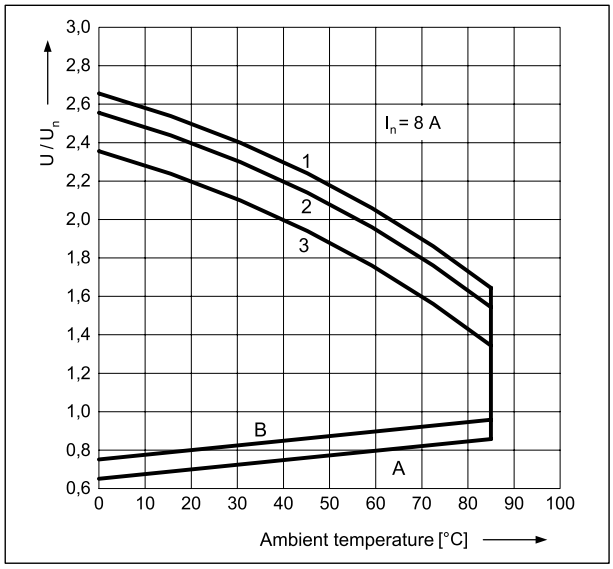
Electrical life reduction factor at AC inductive load Fig. 2



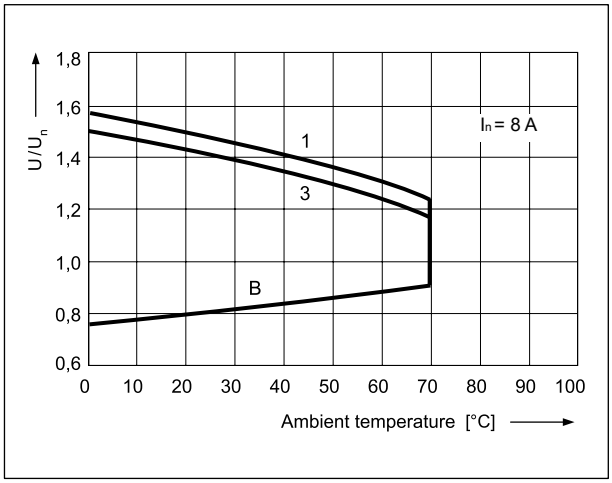
Max. DC resistive load breaking capacity Fig. 3



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

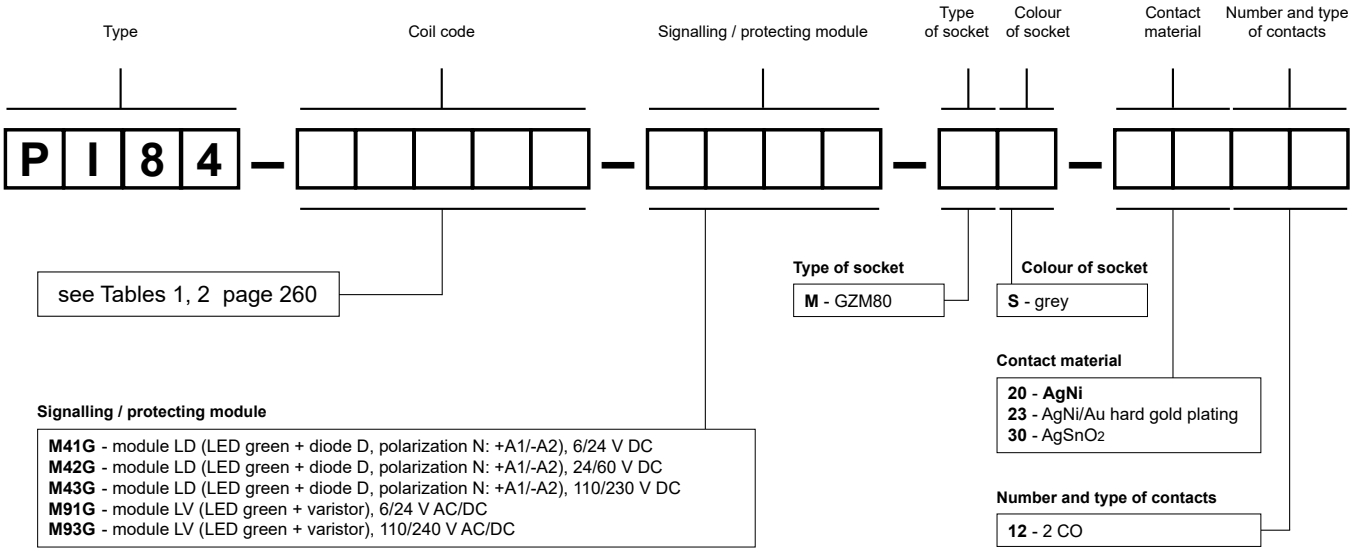
The data in bold type relate to the standard versions of the relays.

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

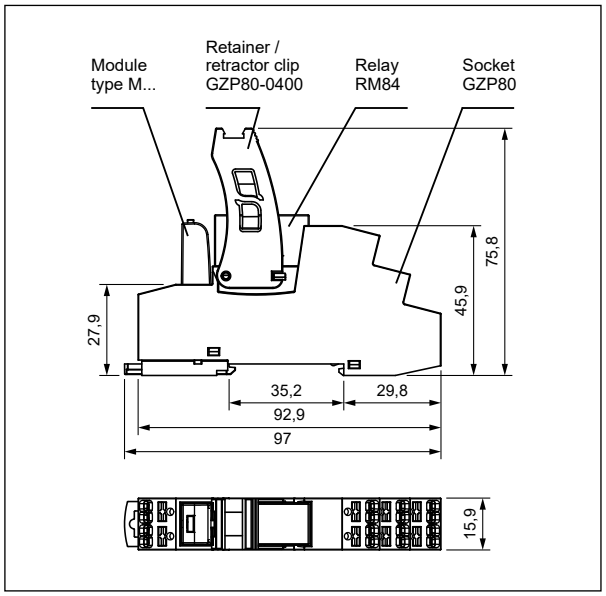
Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		3	
Dielectric strength	• between coil and contacts	5 000 V AC	type of insulation: reinforced
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection
	• pole - pole	2 500 V AC	type of insulation: basic
Contact - coil distance	• clearance	≥ 10 mm	
	• creepage	≥ 10 mm	

General data

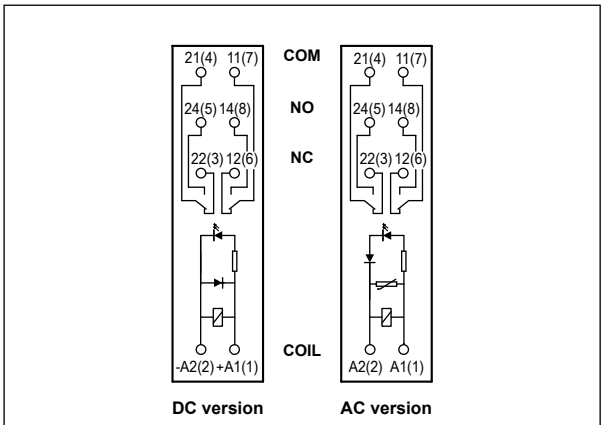
Operating / release time (typical values)		7 ms / 3 ms	
Electrical life	• resistive AC1	> 10^5	8 A, 250 V AC
	• cosφ	see Fig. 2	
	• DC L/R=40 ms	> 10^5	0,15 A, 220 V DC
Mechanical life (cycles)		> 3 x 10^7	
Dimensions (L x W x H)		97 x 15,9 x 75,8 mm	
Weight		65 g	
Ambient temperature	• storage	-40...+85 °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

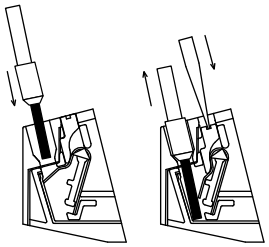


Connection diagrams
(Push-in terminals side view)

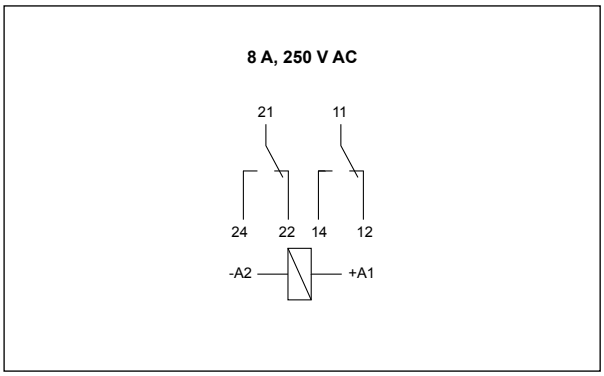


Wire connection

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

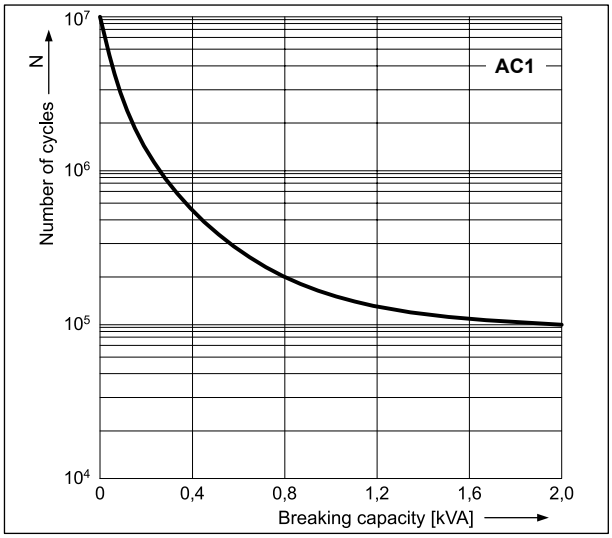
NEW

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.

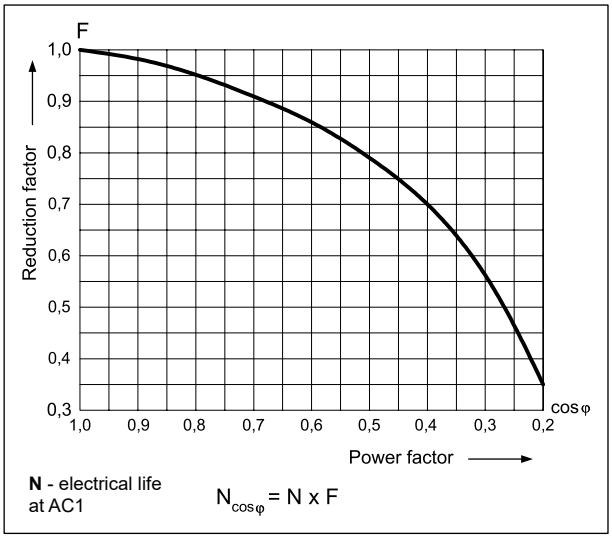
Strips 2-poles ZGZP80-2: free bridging of common input signals and terminals on the contact side, creating parallel connections of outputs in redundancy systems.

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).

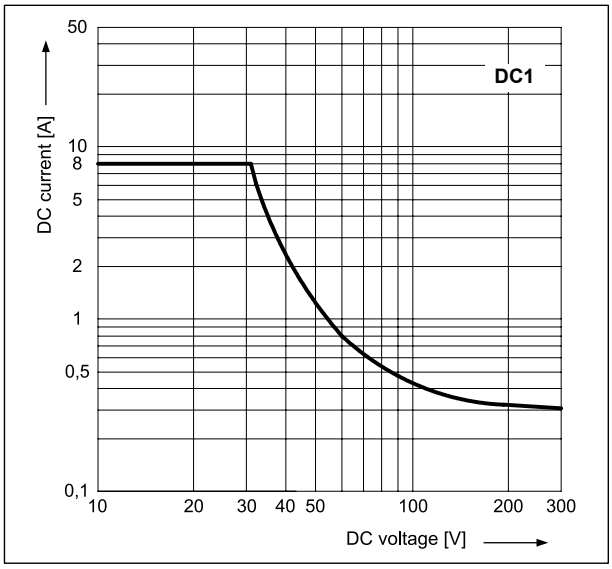
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



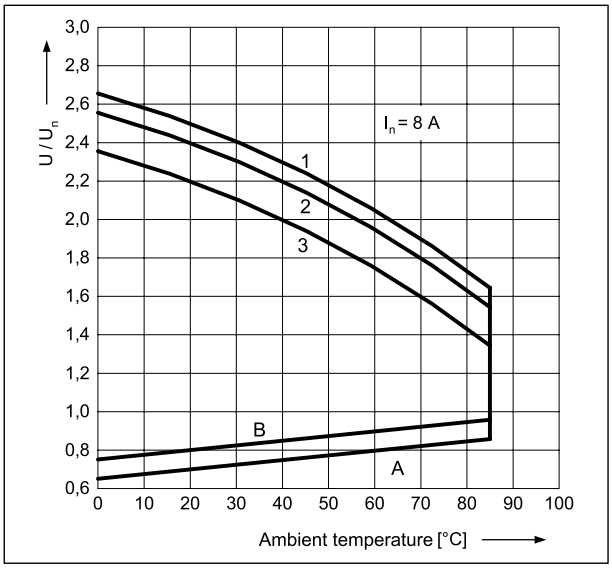
Electrical life reduction factor at AC inductive load Fig. 2



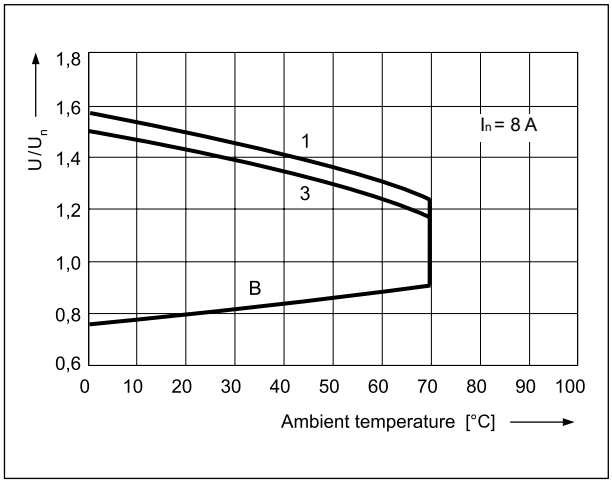
Max. DC resistive load breaking capacity Fig. 3



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

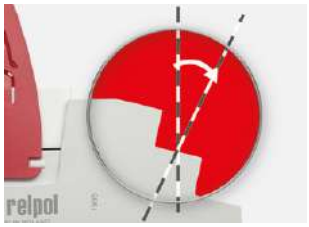
Relays **PI84 with socket GZP80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables: 2 x 1,5 mm^2 (ferrules without insulation), 2 x 1 mm^2 (ferrules with insulation), stripping length: 8...10 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

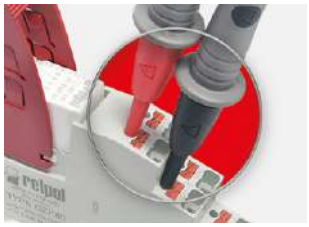
ZGZP80-2

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

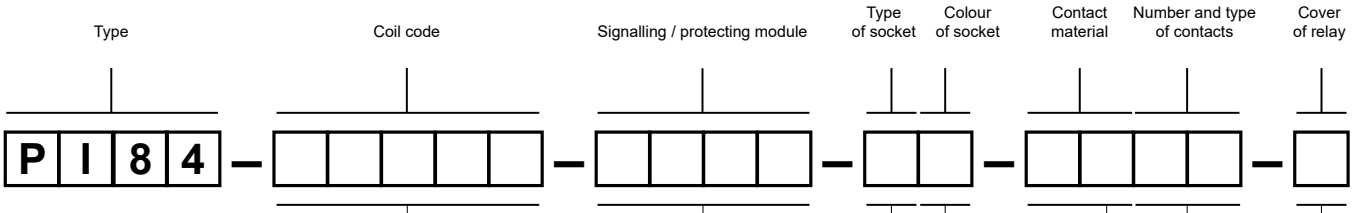
The data in bold type relate to the standard versions of the relays.

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)

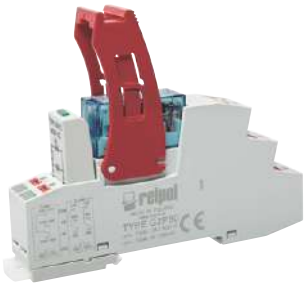
PI84-024AC-M91G-PS-2312-01 interface relay **PI84** consists of: relay **RM84** (orange, two changeover contacts, contact material AgNi/Au hard gold plating, coil voltage 24 V AC 50/60 Hz), socket **GZP80** (grey, Push-in terminals), signalling / protecting module **M91G** (version LV), retainer / retractor 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

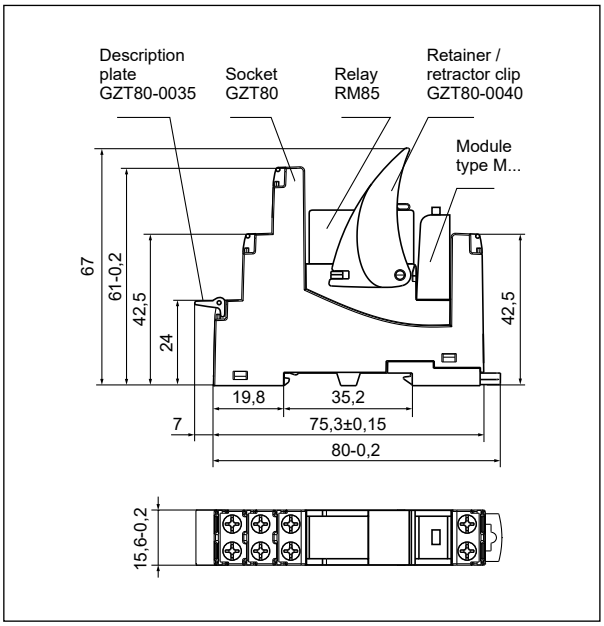
Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 10 mm
	• creepage	≥ 10 mm

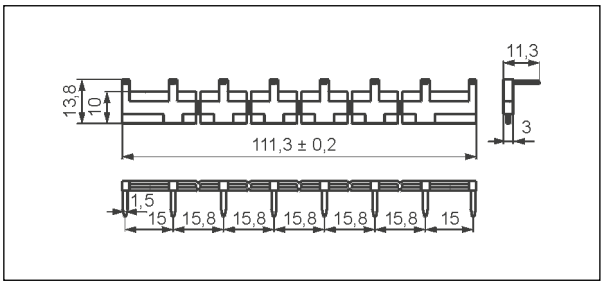
General data

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.

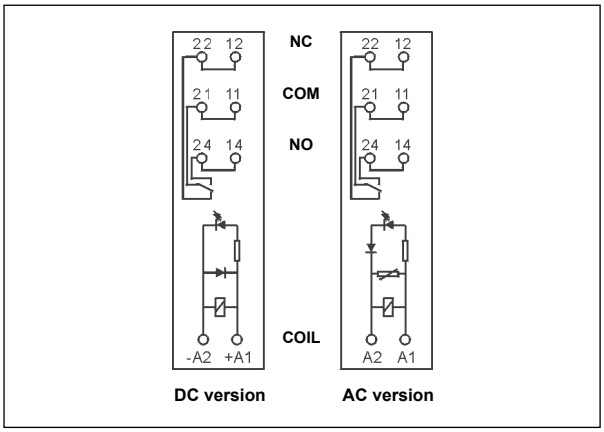
Dimensions



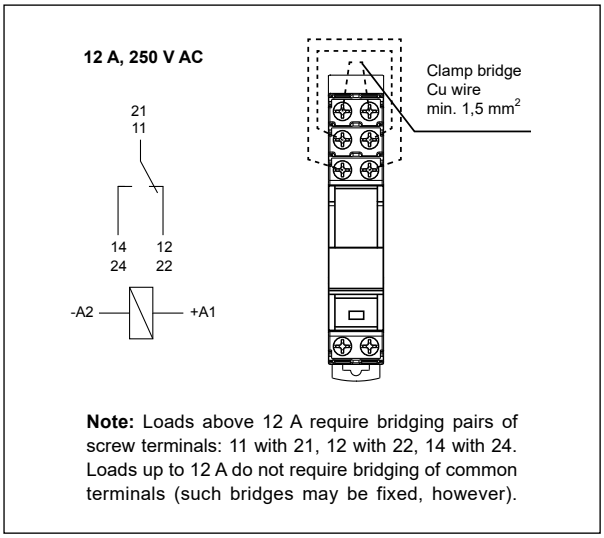


Interconnection strip type **ZGGZ80**

Connection diagrams
(screw terminals side view)



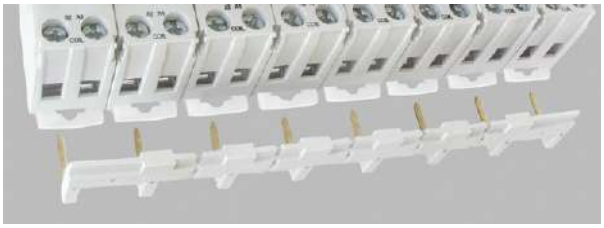
Connection of GZT80 socket



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.

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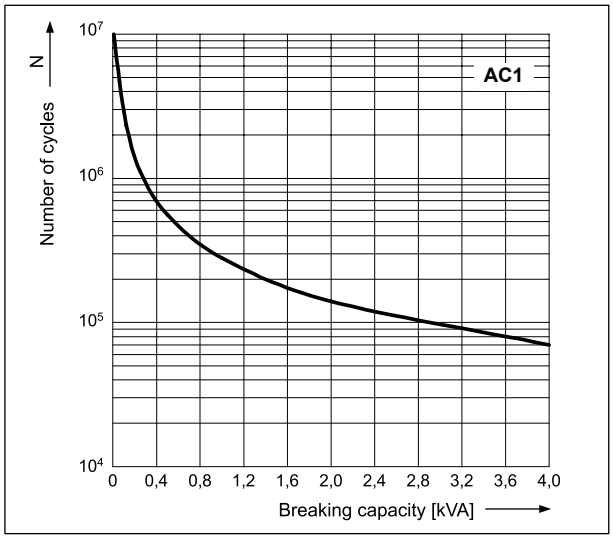
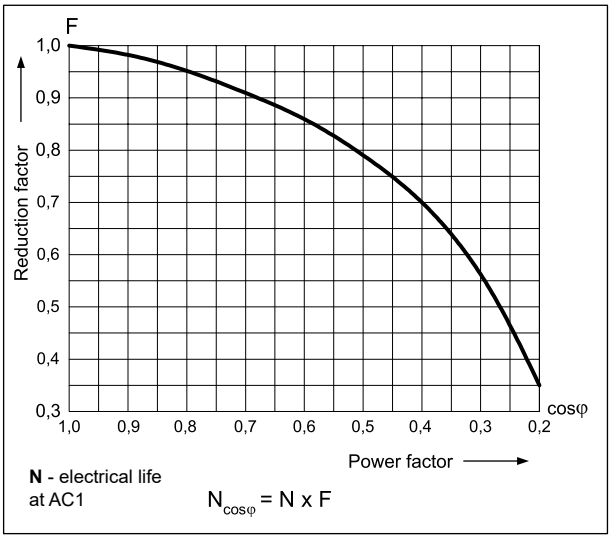
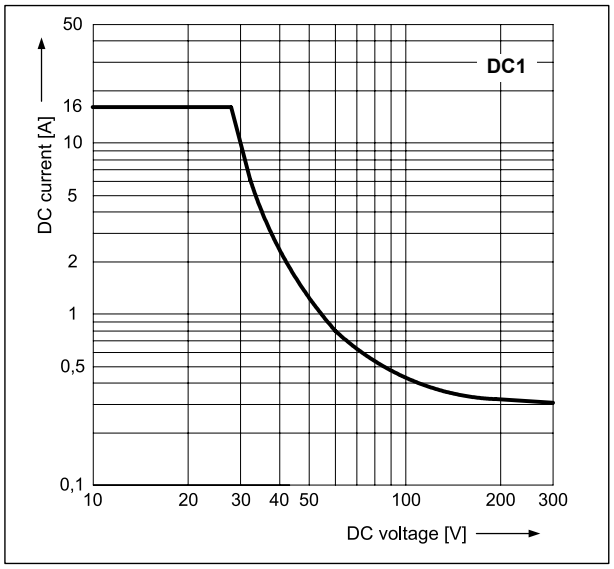
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



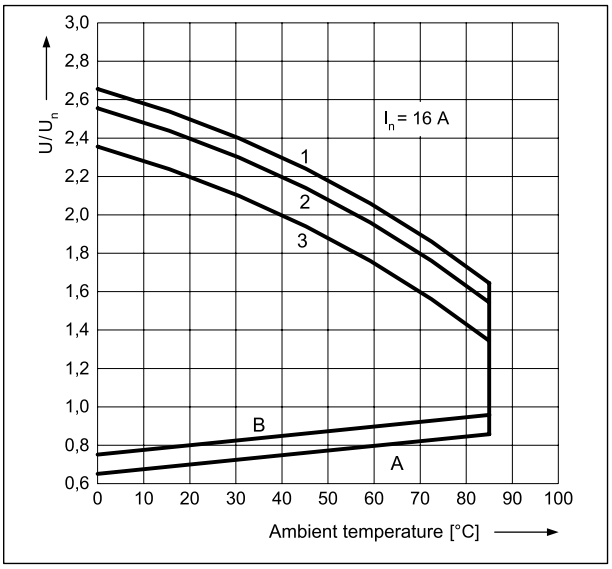
Electrical life reduction factor at AC inductive load Fig. 2



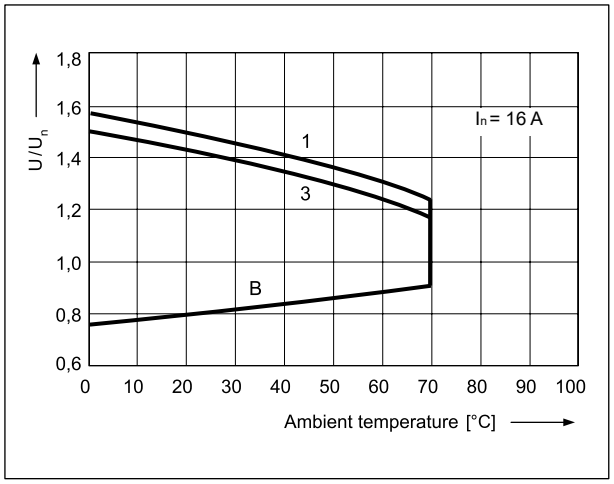
Max. DC resistive load breaking capacity Fig. 3



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
110DC	110	25 200	± 10%	77,0	280,0

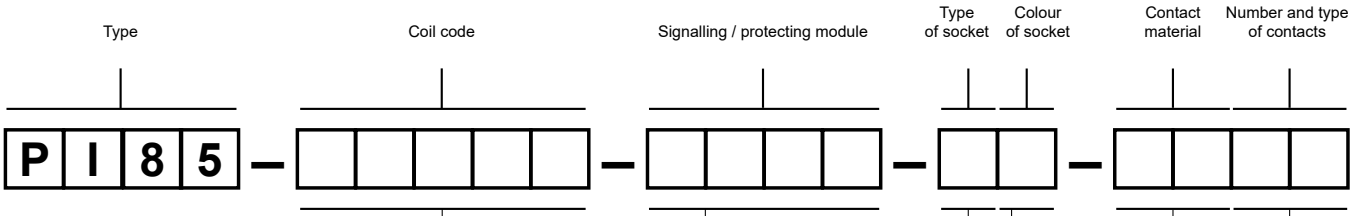
The data in bold type relate to the standard versions of the relays.

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

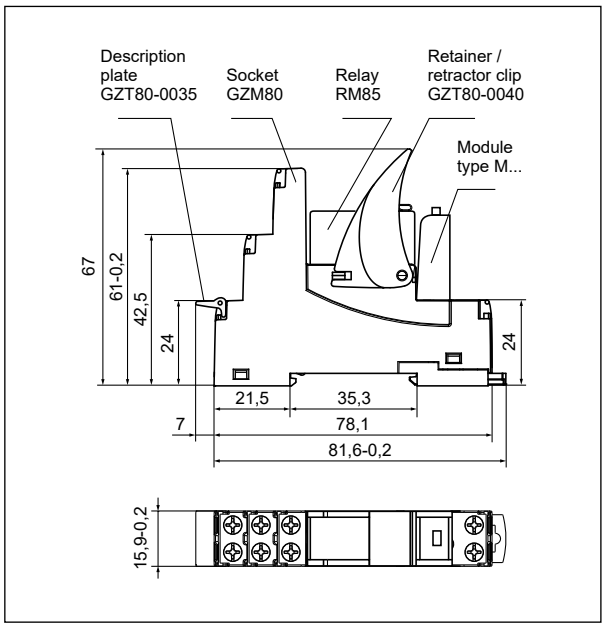
Insulation rated voltage		300 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 10 mm
	• creepage	≥ 10 mm

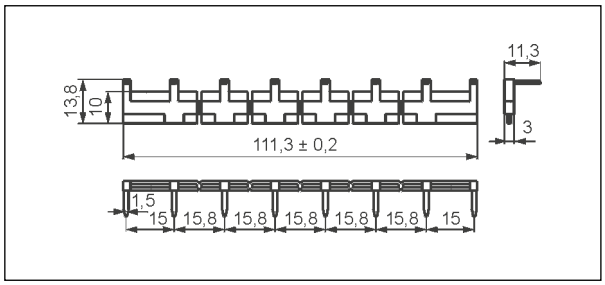
General data

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.

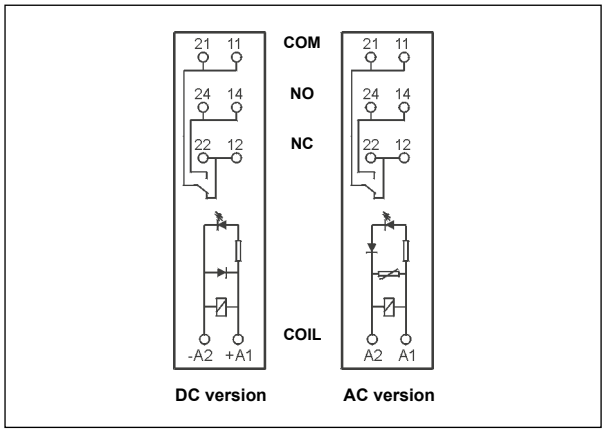
Dimensions



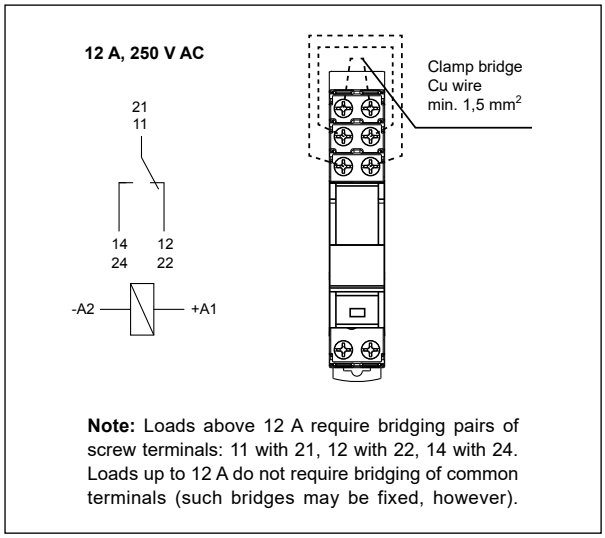


Interconnection strip type **ZGGZ80**

Connection diagrams
(screw terminals side view)



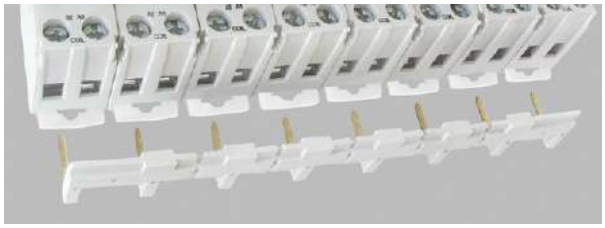
Connection of GZM80 socket



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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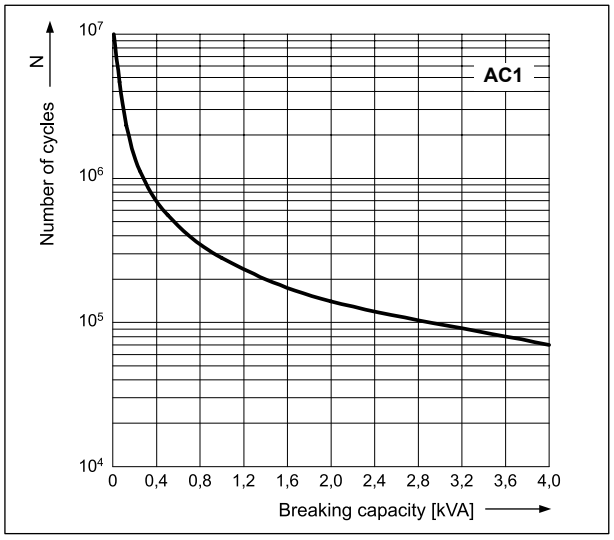
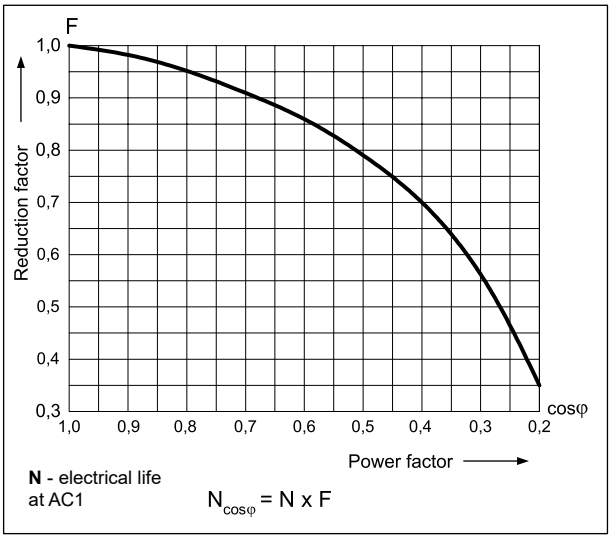
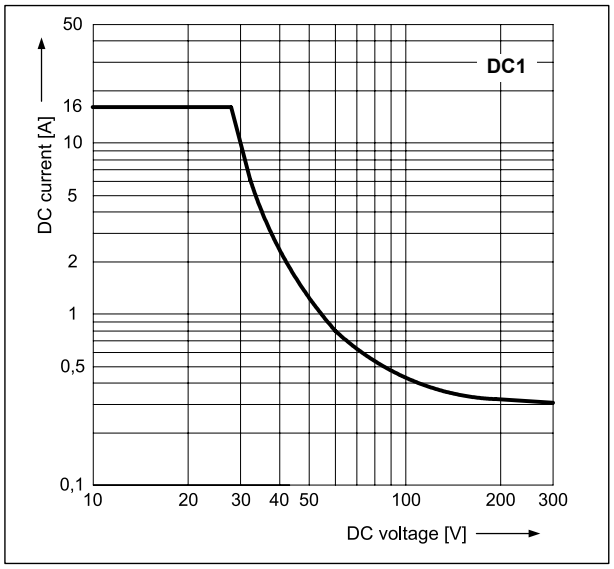
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



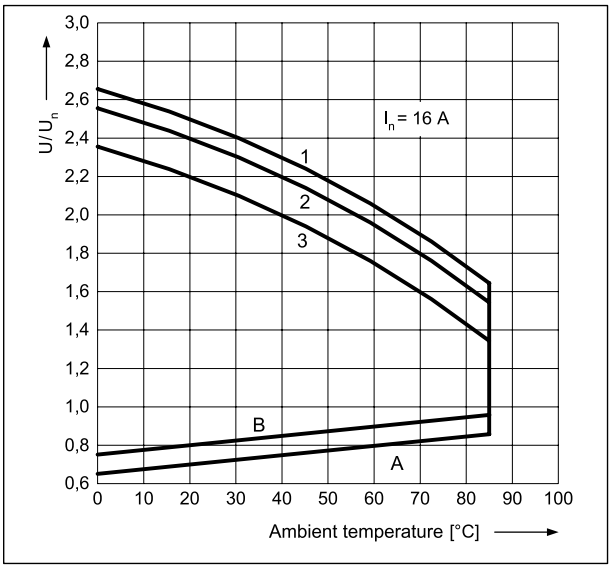
Electrical life reduction factor at AC inductive load Fig. 2



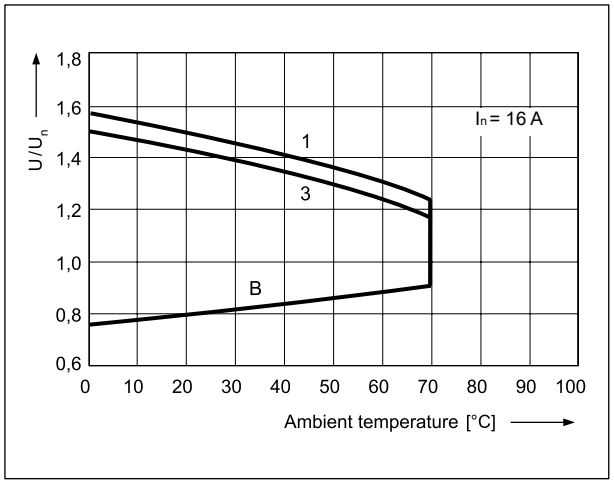
Max. DC resistive load breaking capacity Fig. 3



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

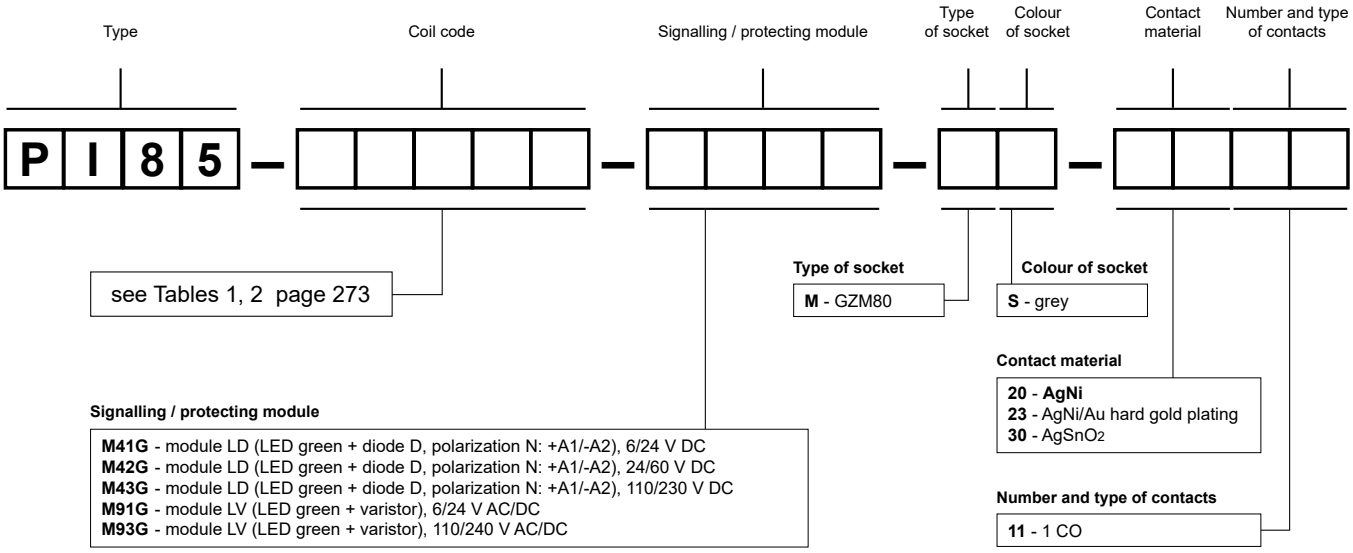
The data in bold type relate to the standard versions of the relays.

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

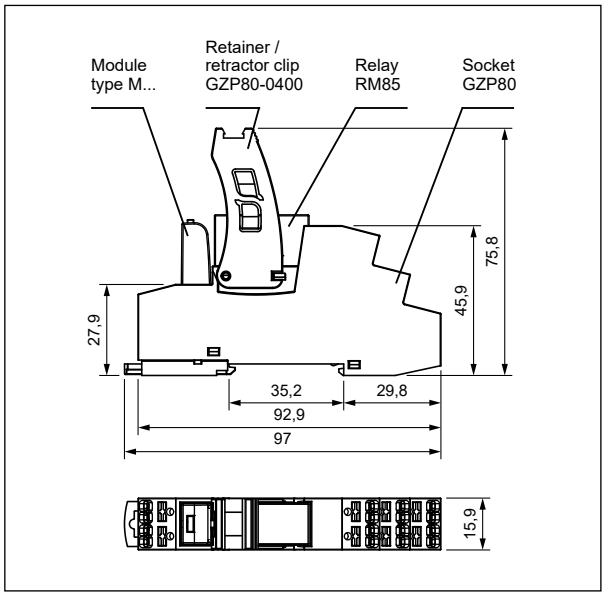
Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		3	
Dielectric strength	• between coil and contacts	5 000 V AC	type of insulation: reinforced
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection
Contact - coil distance	• clearance	≥ 10 mm	
	• creepage	≥ 10 mm	

General data

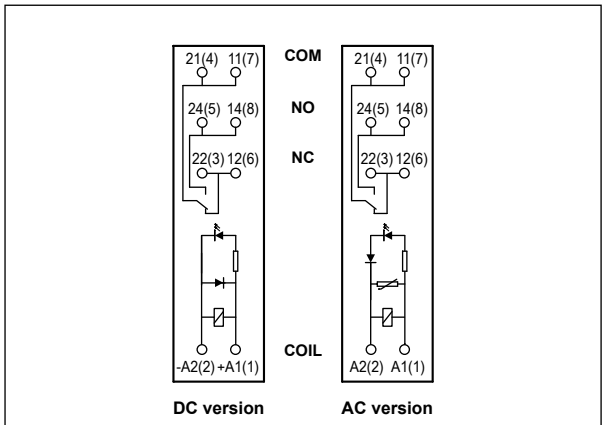
Operating / release time (typical values)		7 ms / 3 ms	
Electrical life	• resistive AC1	> 0,7 x 10^5	16 A, 250 V AC
	• cosφ	see Fig. 2	
	• DC L/R=40 ms	> 10^5	0,15 A, 220 V DC
Mechanical life (cycles)		> 3 x 10^7	
Dimensions (L x W x H)		97 x 15,9 x 75,8 mm	
Weight		65 g	
Ambient temperature	• storage	-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

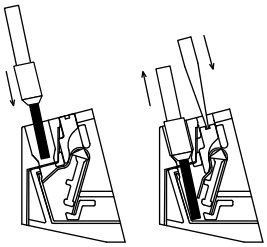


Connection diagrams
(Push-in terminals side view)

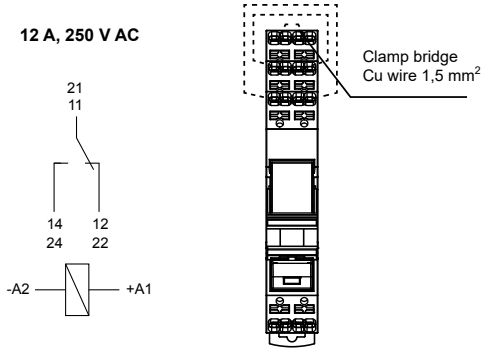


Wire connection

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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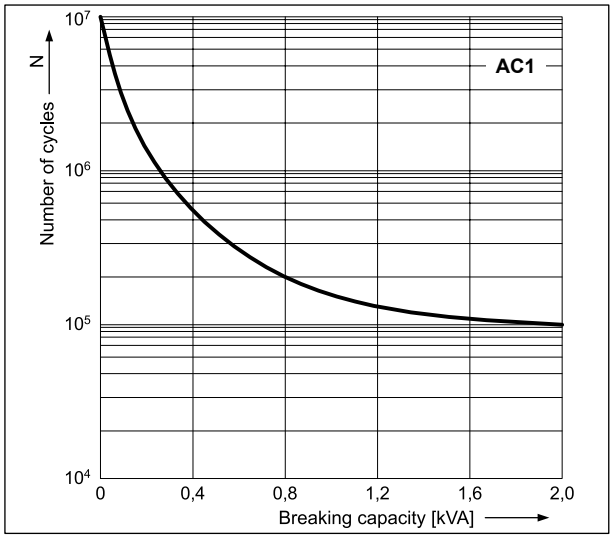
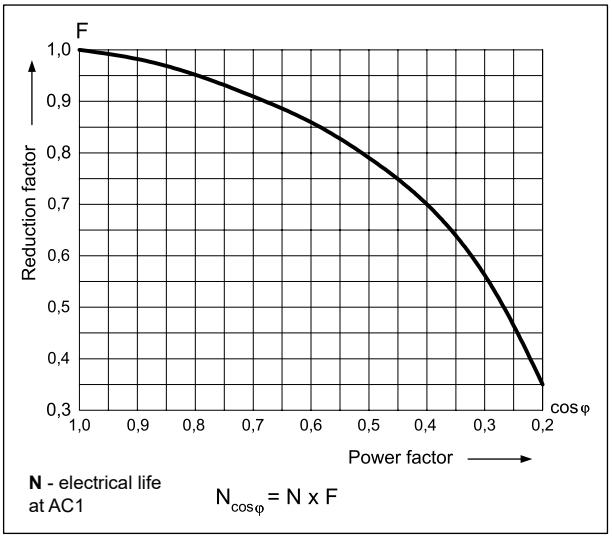
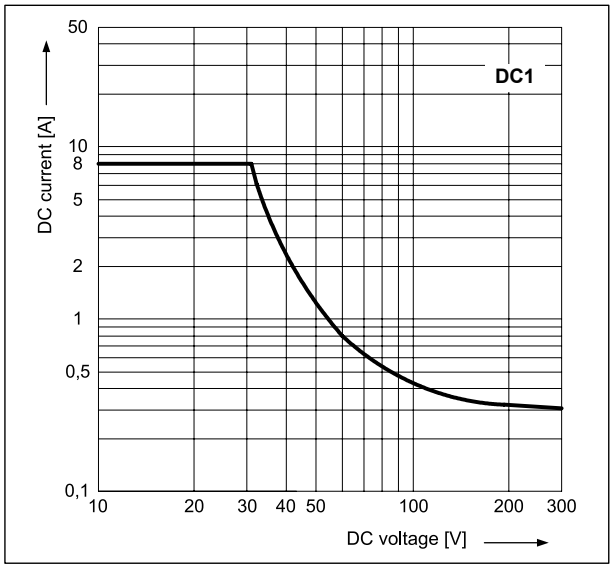
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



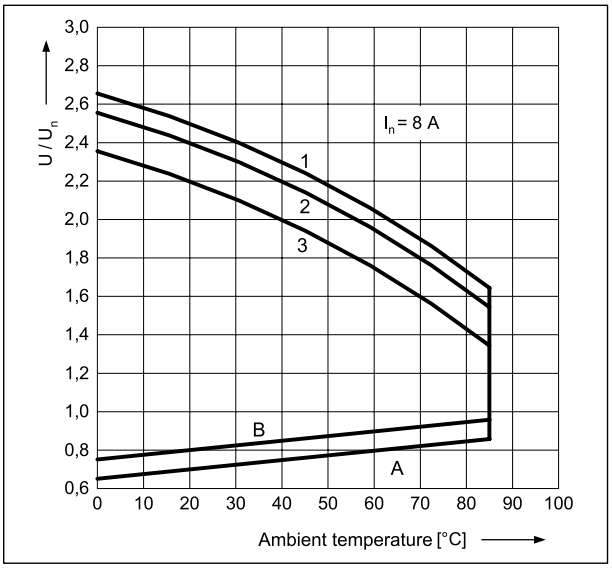
Electrical life reduction factor at AC inductive load Fig. 2



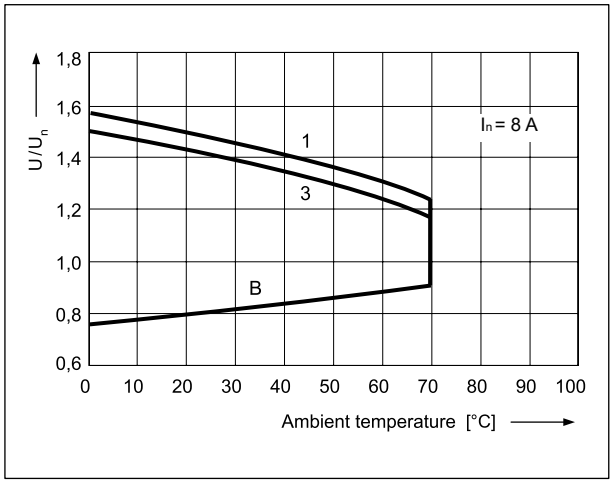
Max. DC resistive load breaking capacity Fig. 3



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

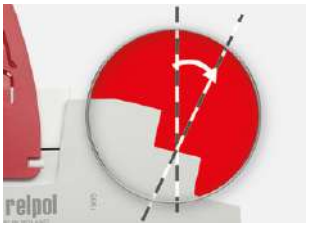
Relays **PI85 with socket GZP80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables: 2 x 1,5 mm^2 (ferrules without insulation), 2 x 1 mm^2 (ferrules with insulation), stripping length: 8...10 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

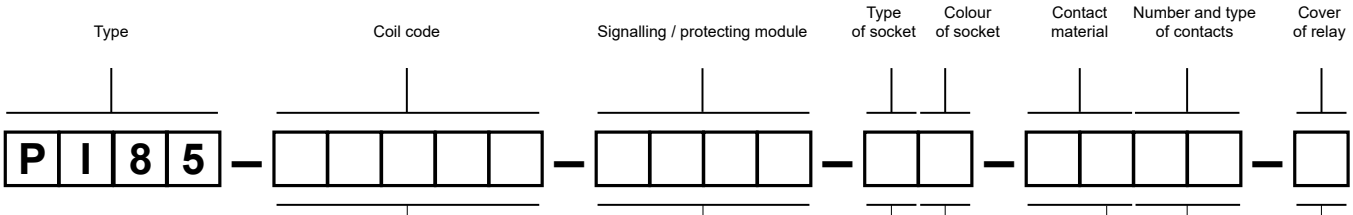
The data in bold type relate to the standard versions of the relays.

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,

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.

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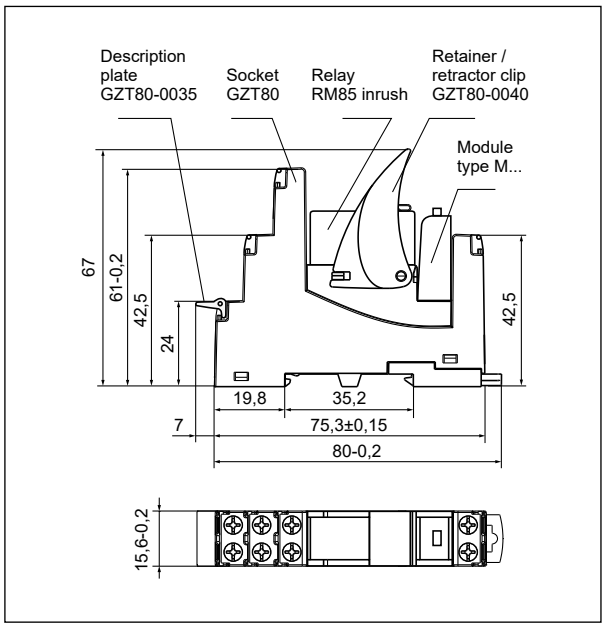
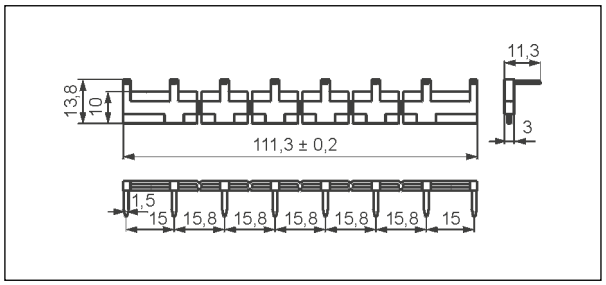
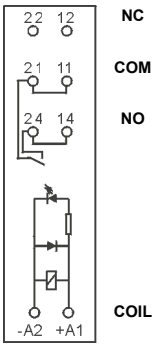
Dimensions





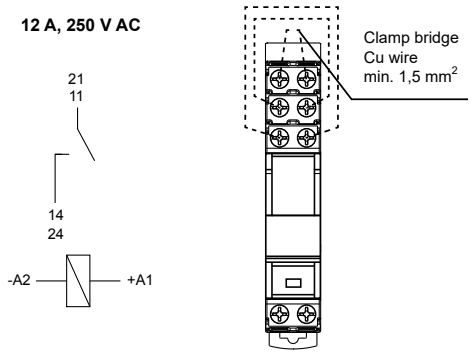
Interconnection strip type **ZGGZ80**

Connection diagram
(screw terminals side view)



DC version

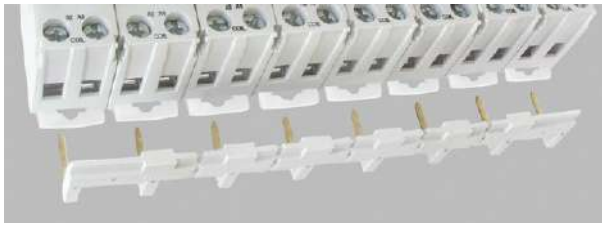
Connection of GZT80 socket



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

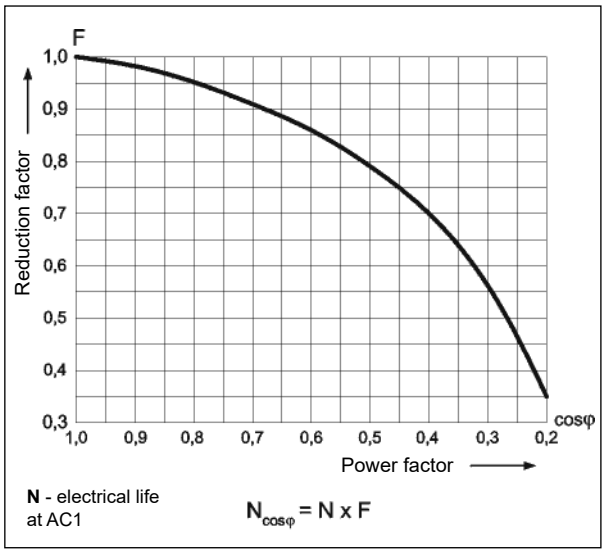
Relays **PI85 inrush with socket GZT80** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with one M3 screw. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm² (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 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).



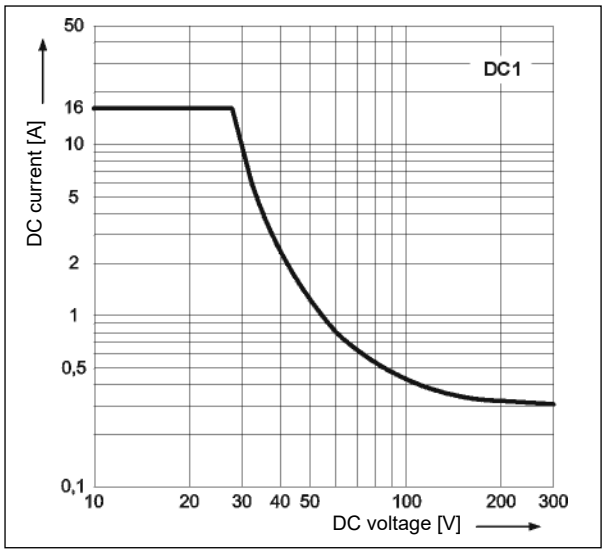
ZGGZ80

Interconnection strip ZGGZ80:
bridging of common input signals.

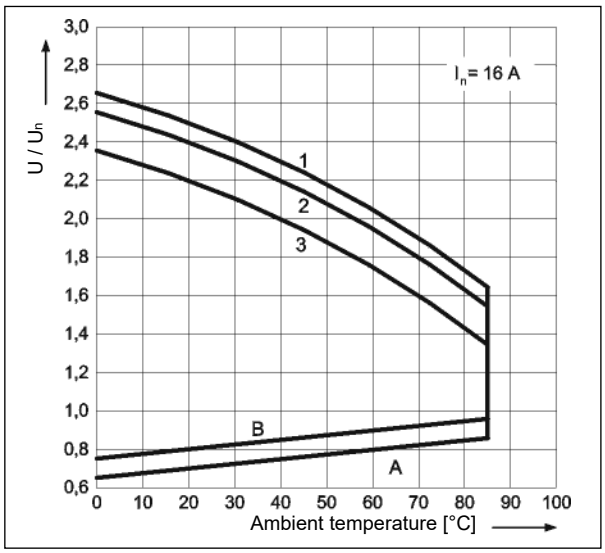
Electrical life reduction factor at AC inductive load Fig. 1



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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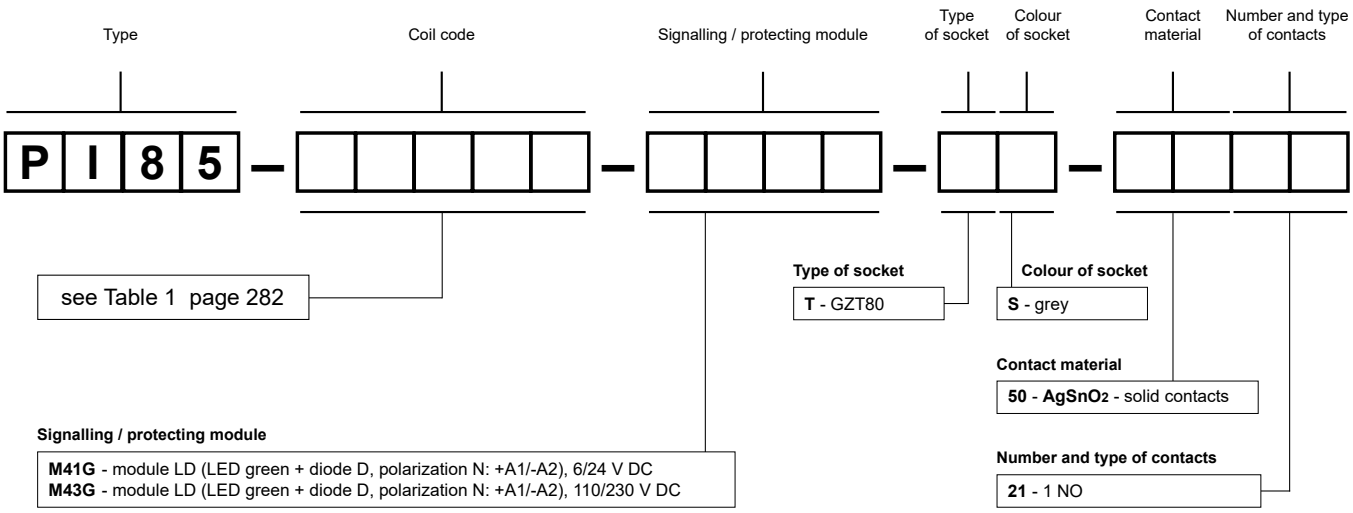
Coil data - DC voltage version Table 1

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

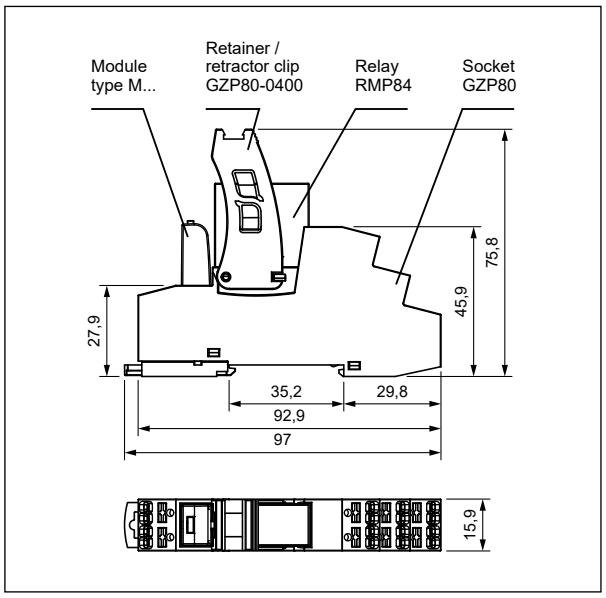
Insulation rated voltage		300 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	5 000 V AC type of insulation: reinforced
	• contact clearance	1 000 V AC type of clearance: micro-disconnection
	• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	• clearance	≥ 8 mm
	• creepage	≥ 8 mm

General data

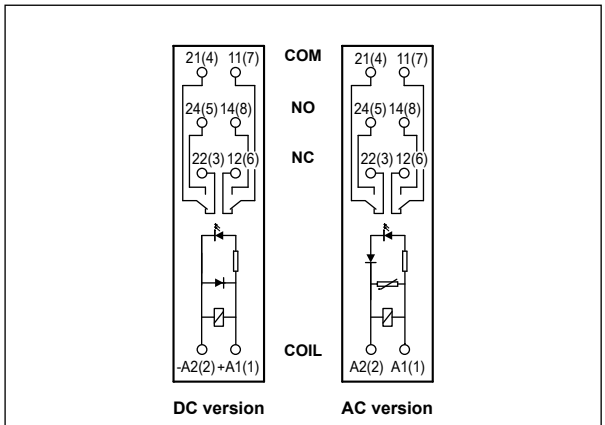
Operating / release time (typical values)		15 ms / 8 ms
Electrical life (number of cycles)	• resistive AC1	> 3 x 10^4 AC coils, 8 A, 250 V AC, ON for 5 s / OFF for 5 s
		> 10^4 DC coils, 8 A, 250 V AC, ON for 5 s / OFF for 5 s
		> 5 x 10^4 8 A, 250 V AC, 70 °C, ON for 1 s / OFF for 9 s
Mechanical life (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

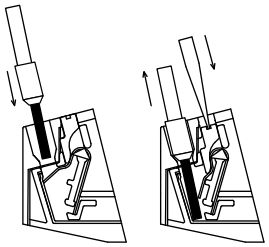


Connection diagrams
(Push-in terminals side view)

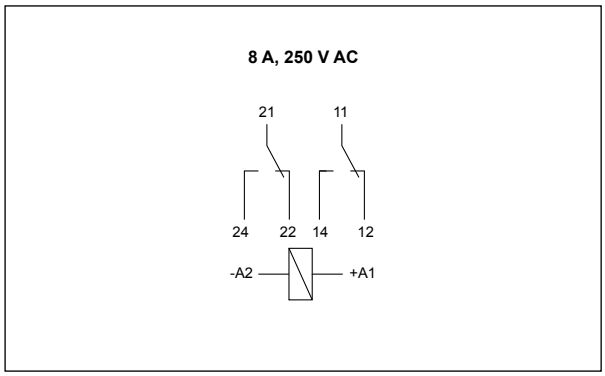


Wire connection

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

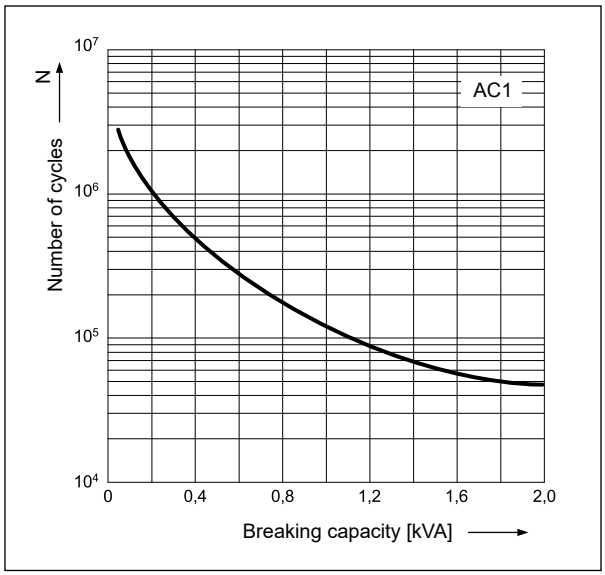
NEW

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.

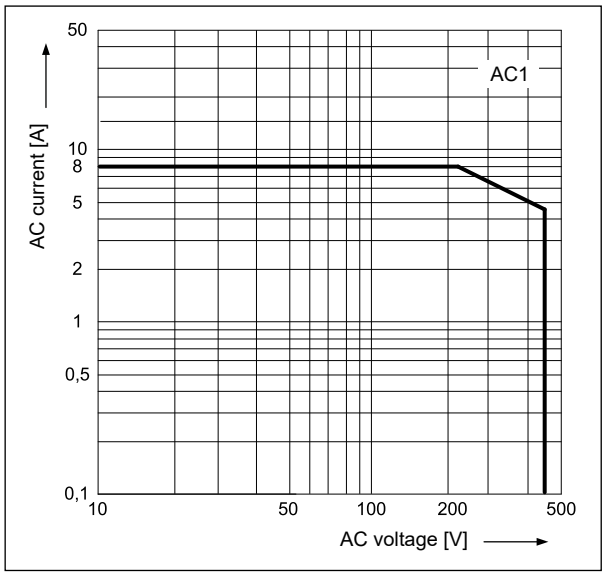
Strips 2-poles ZGZP80-2: free bridging of common input signals and terminals on the contact side, creating parallel connections of outputs in redundancy systems.

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

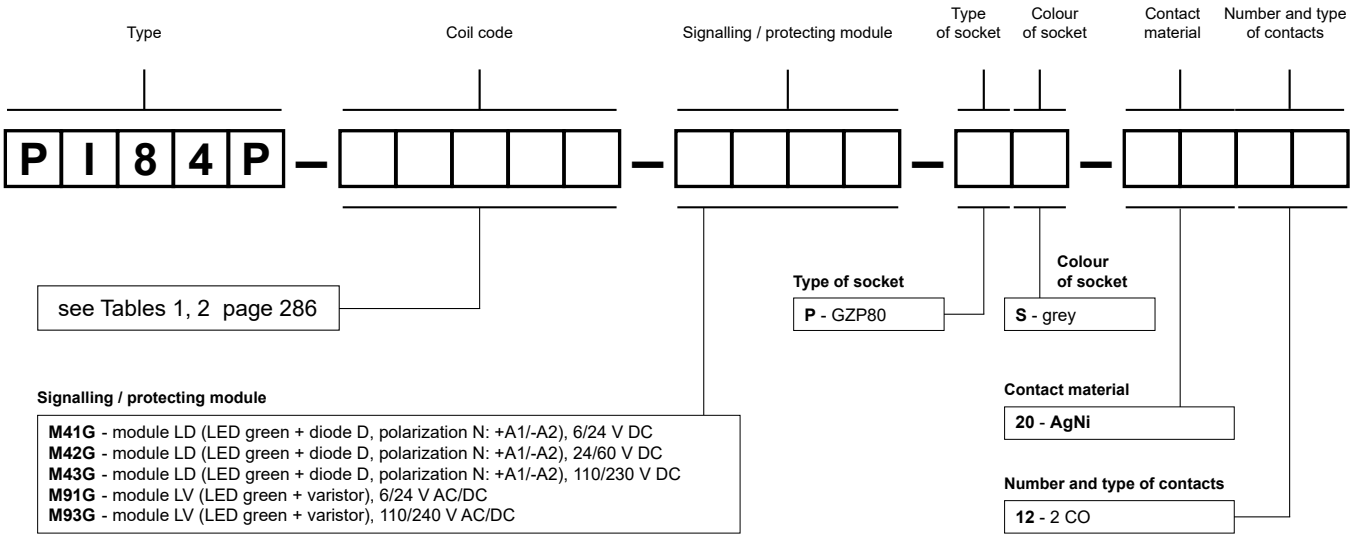
The data in bold type relate to the standard versions of the relays. ❶ The max. allowable voltage is coil overdrive voltage, it is the instantaneous max. voltage which the relay coil could endure in very short time. Relays with 48 V DC and 110 V DC coils shall be absolutely protected against any possibility 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

INTERFACE

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.

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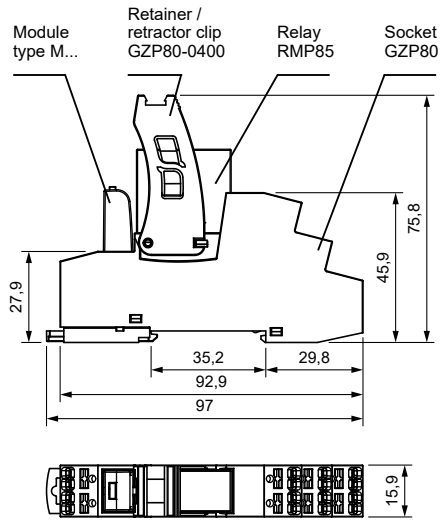
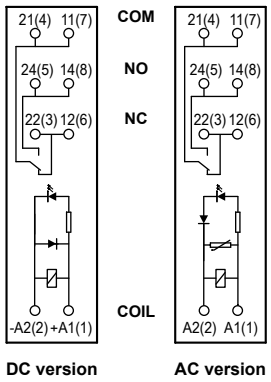
Dimensions

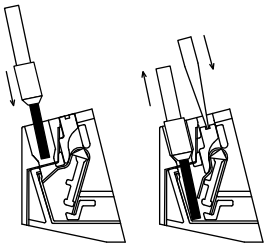


Connection diagrams
(Push-in terminals side view)

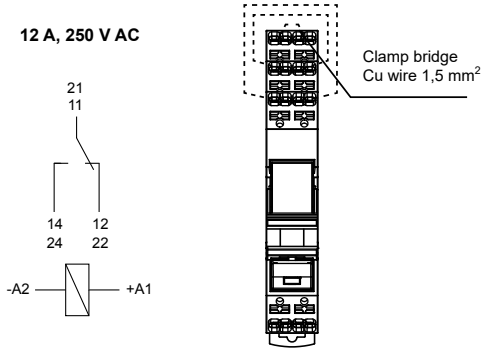


Wire connection

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

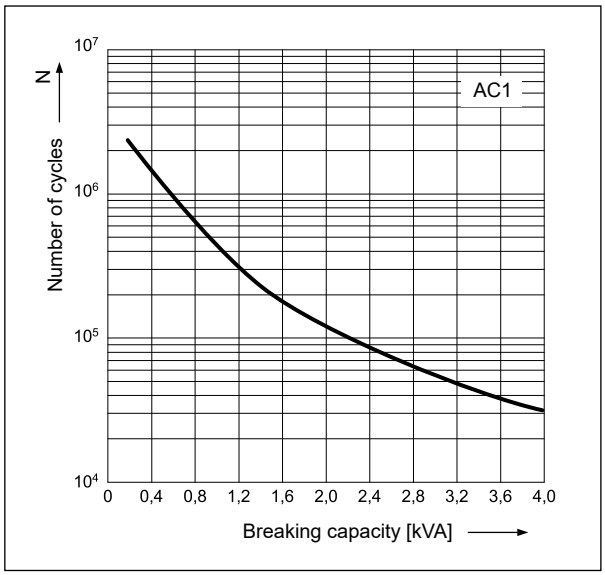
NEW

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.

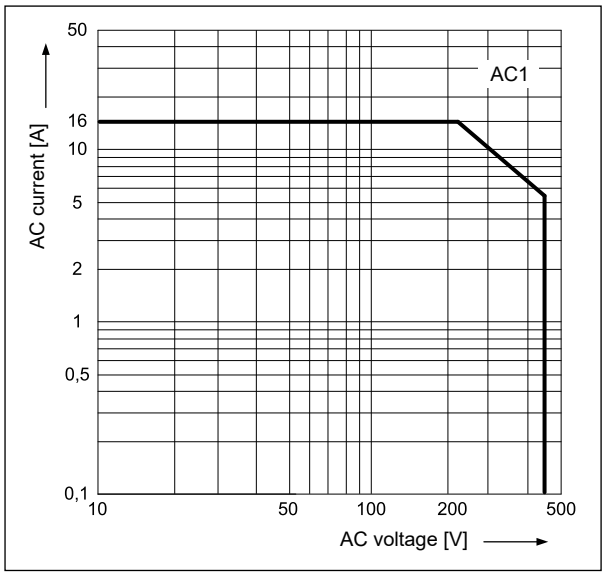
Strips 2-poles ZGZP80-2: free bridging of common input signals and terminals on the contact side, creating parallel connections of outputs in redundancy systems.

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).

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).

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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 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.

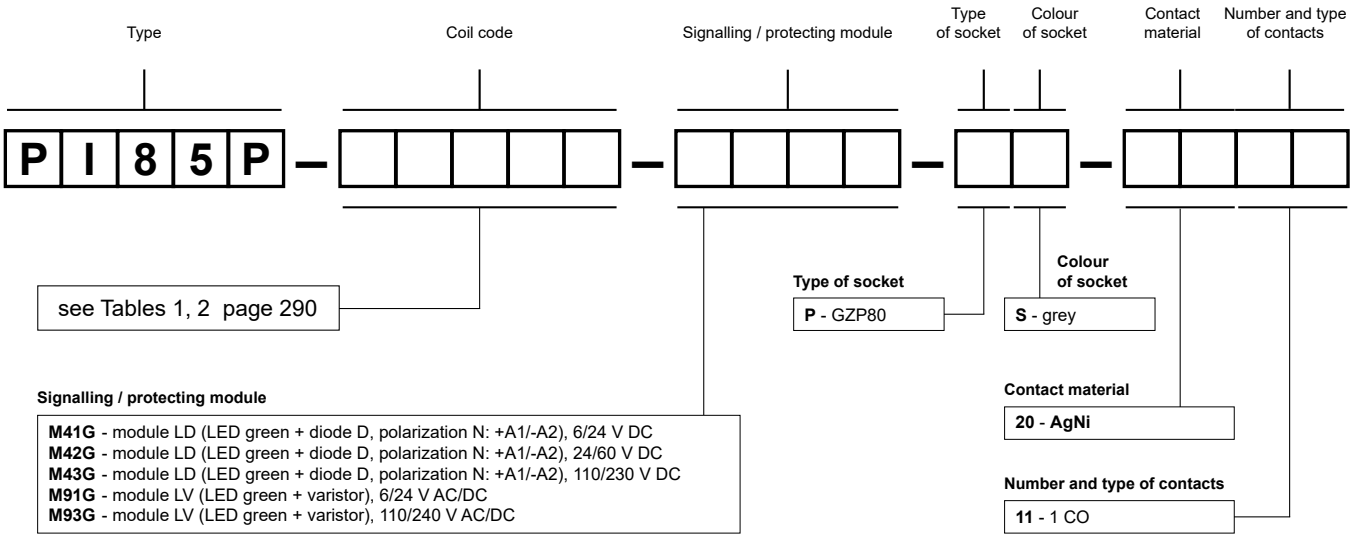
Coil data - AC 50 Hz voltage version

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.

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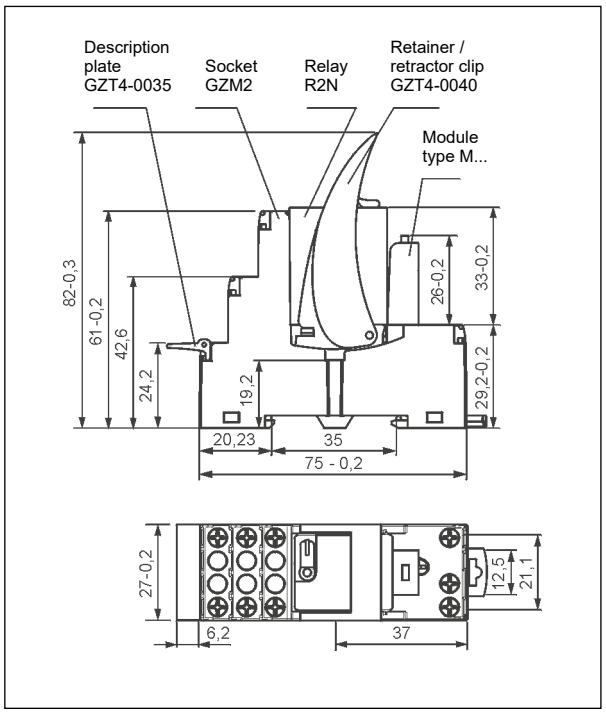
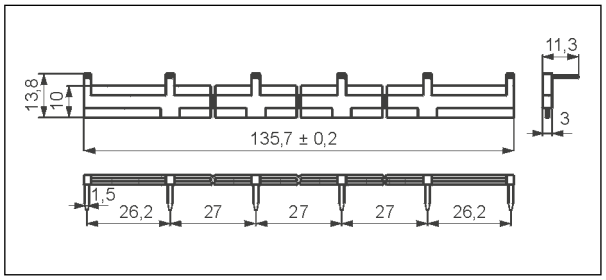
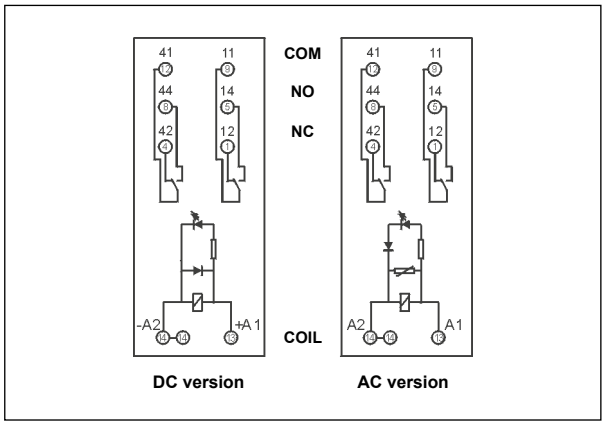
Dimensions





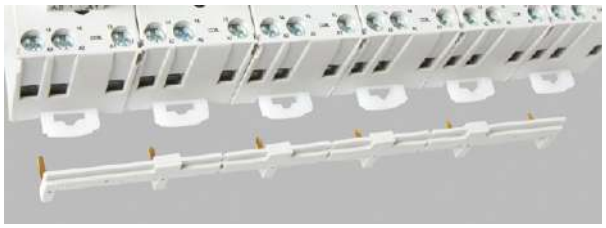
Interconnection strip type **ZGGZ4**

Connection diagrams
(screw terminals side view)



Mounting

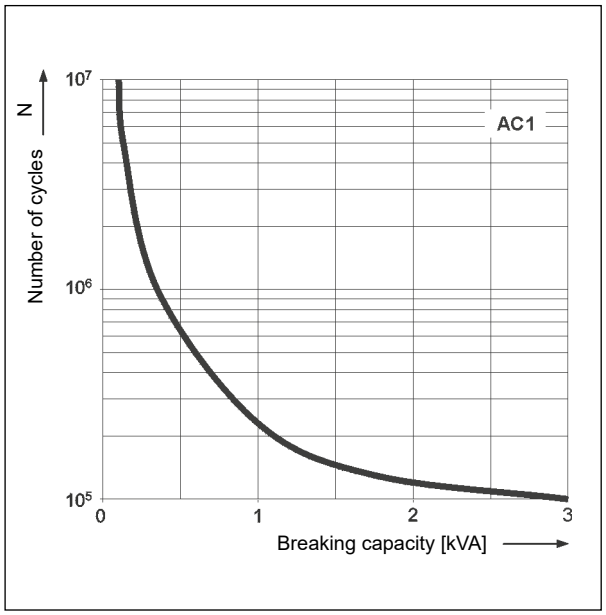
Relays **PIR2 with socket GZM2** are designed for direct mounting on 35 mm rail mount acc. to EN 60715 or on panel mounting with two M3 screws. **Connections:** max. cross section of the cables (stranded): 2 x 2,5 mm^2 (2 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,7 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).



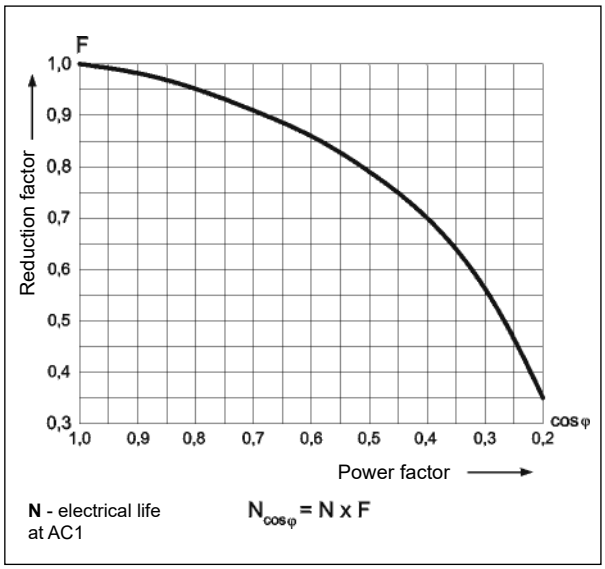
Interconnection strip ZGGZ4:
bridging of common input signals.

ZGGZ4

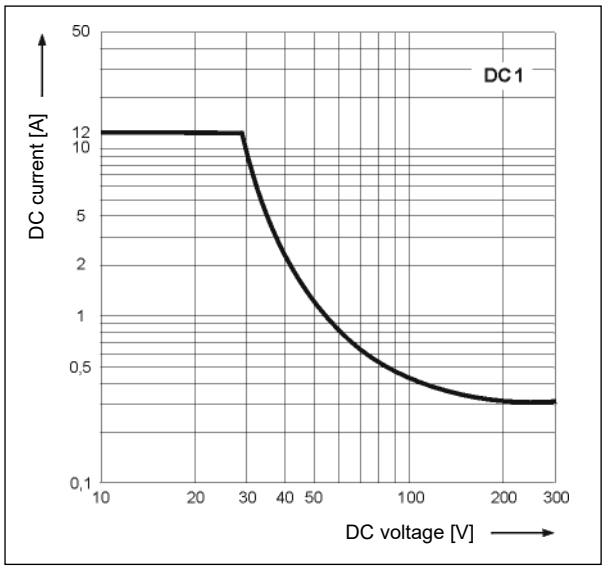
Electrical life at AC resistive load. Fig. 1
Switching frequency: 1 200 cycles/hour



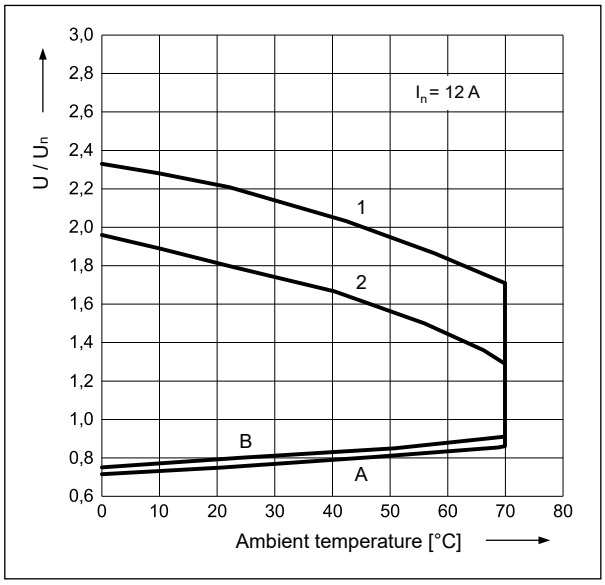
Electrical life reduction factor at AC inductive load Fig. 2



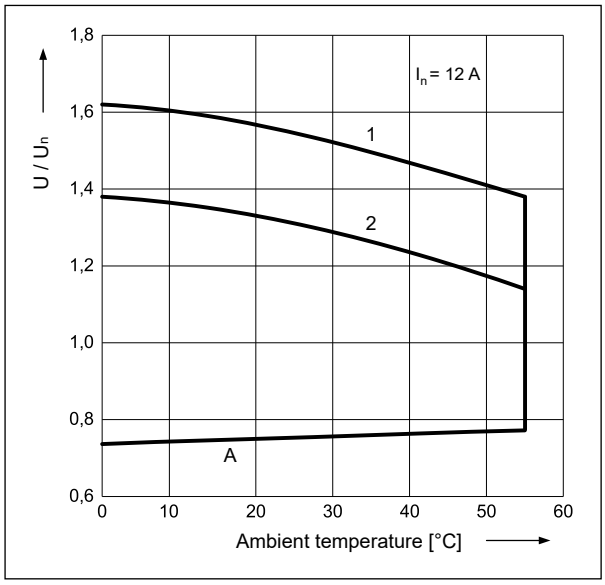
Max. DC resistive load breaking capacity Fig. 3



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

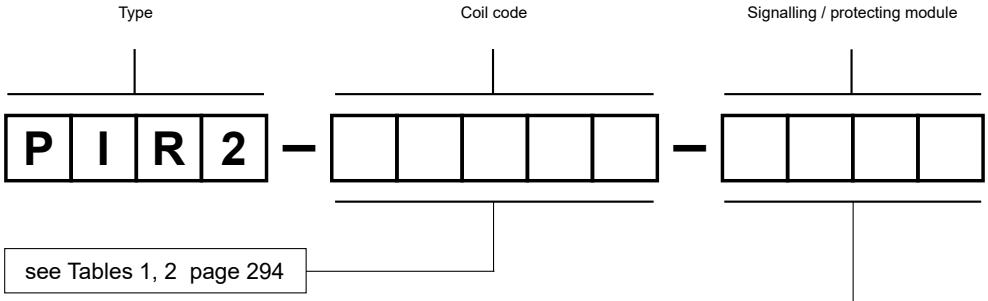
The data in bold type relate to the standard versions of the relays.

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

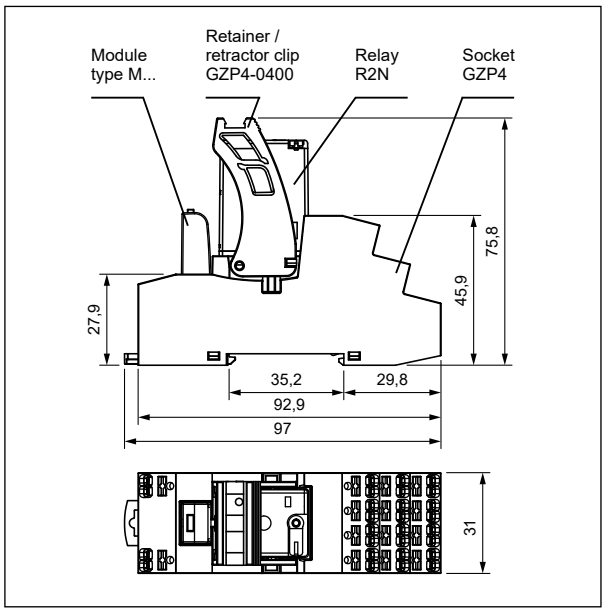
Insulation rated voltage		300 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Dielectric strength	• between coil and contacts	2 500 V AC type of insulation: basic
	• contact clearance	1 500 V AC type of clearance: micro-disconnection
	• pole - pole	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

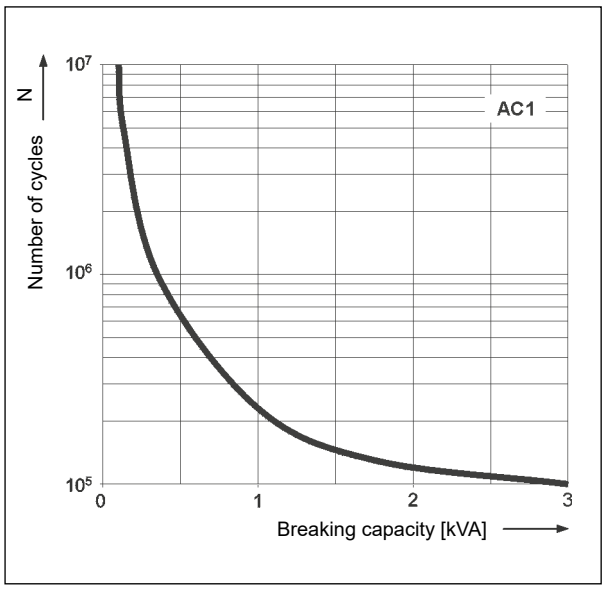
The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Dimensions

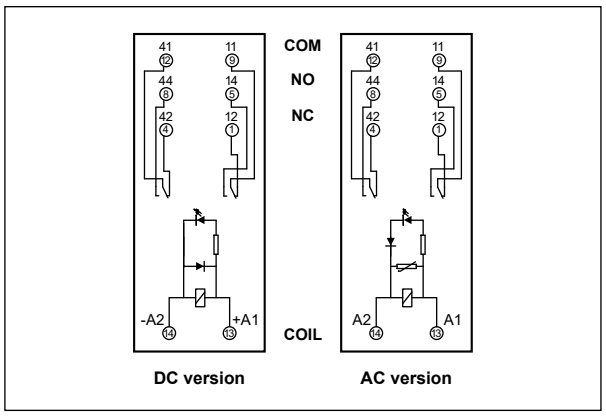


Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour

Fig. 1

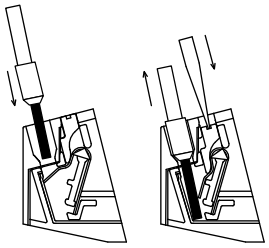


Connection diagrams
(Push-in terminals side view)



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

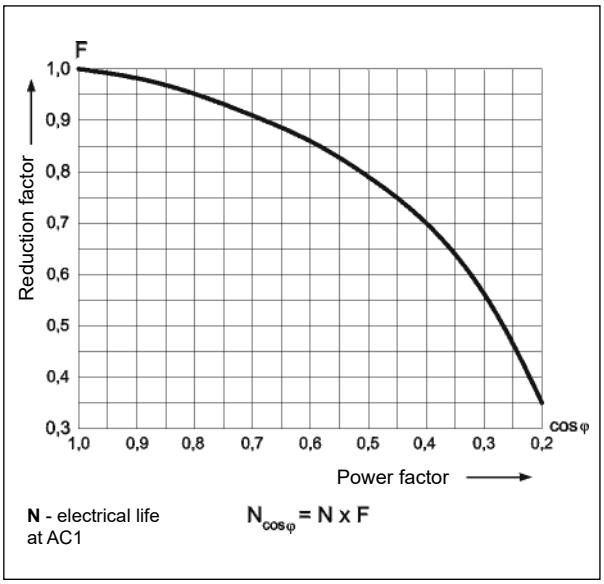
NEW

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.

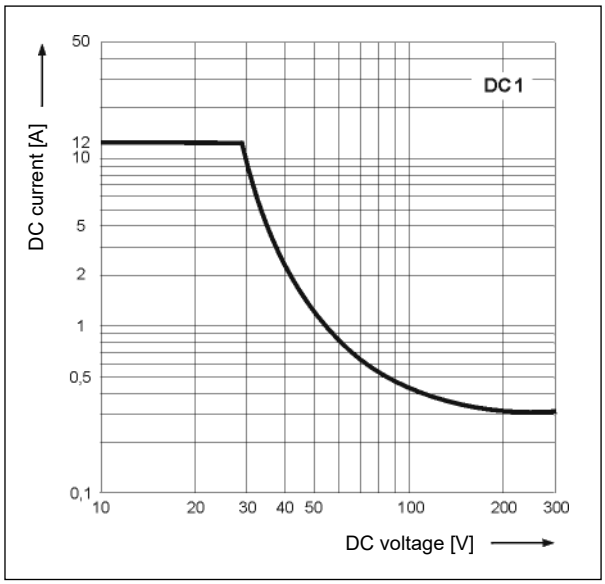
Strips 2-poles ZGZP4-2: free bridging of common input signals and terminals on the contact side, creating parallel connections of outputs in redundancy systems.

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).

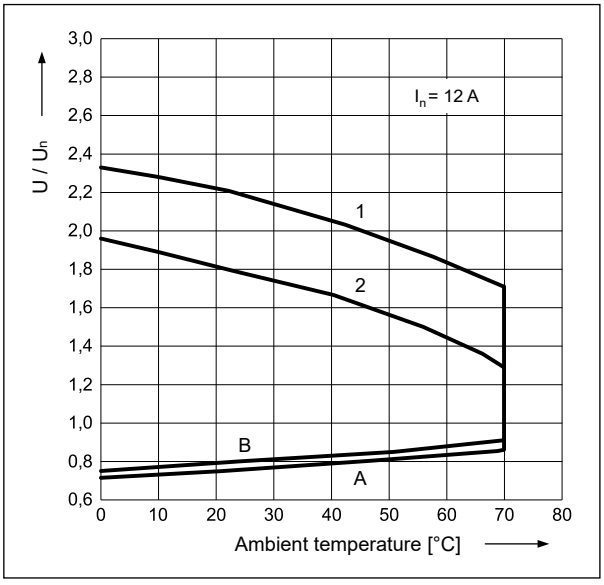
Electrical life reduction factor at AC inductive load Fig. 2



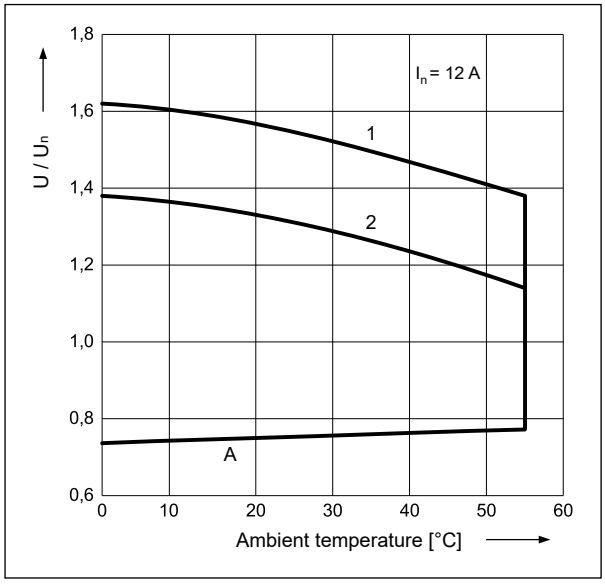
Max. DC resistive load breaking capacity Fig. 3



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

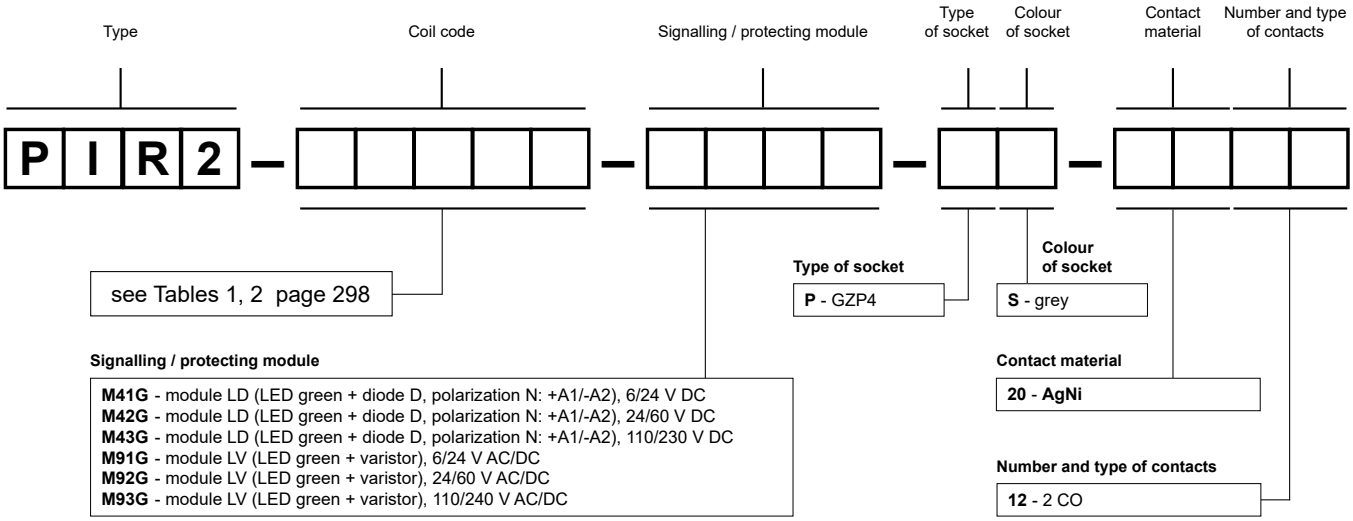
The data in bold type relate to the standard versions of the relays.

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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PIR3 with socket GZM3
interface relays

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

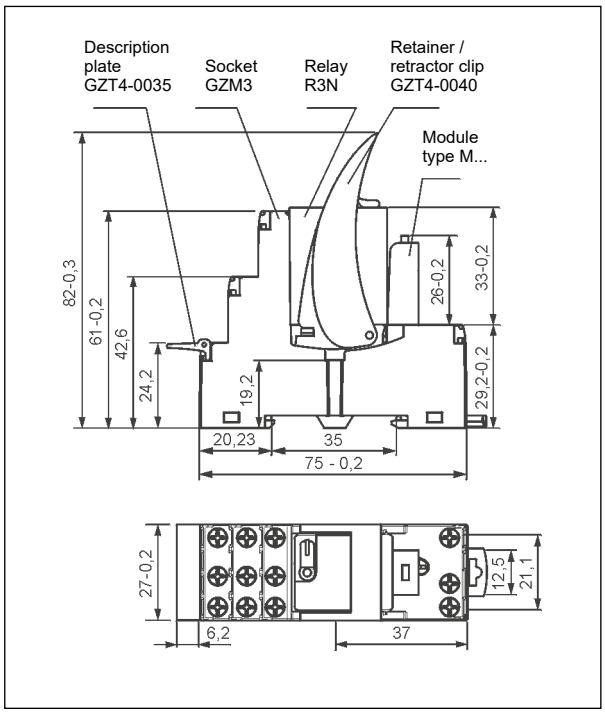
Insulation rated voltage		300 V AC	
Rated surge voltage		4 000 V 1,2 / 50 µs	
Overvoltage category		III	
Insulation pollution degree		2	
Dielectric strength	• between coil and contacts	2 500 V AC	type of insulation: basic
	• contact clearance	1 500 V AC	type of clearance: micro-disconnection
	• pole - pole	2 500 V AC	type of insulation: basic
Contact - coil distance	• clearance	≥ 2,5 mm	
	• creepage	≥ 4 mm	

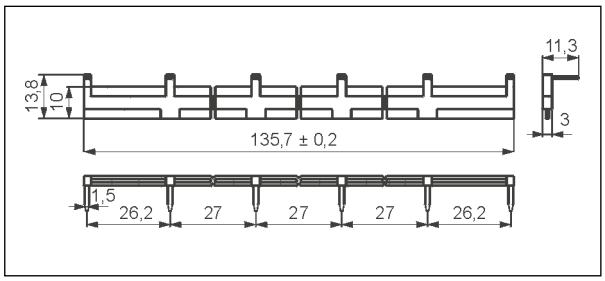
General data

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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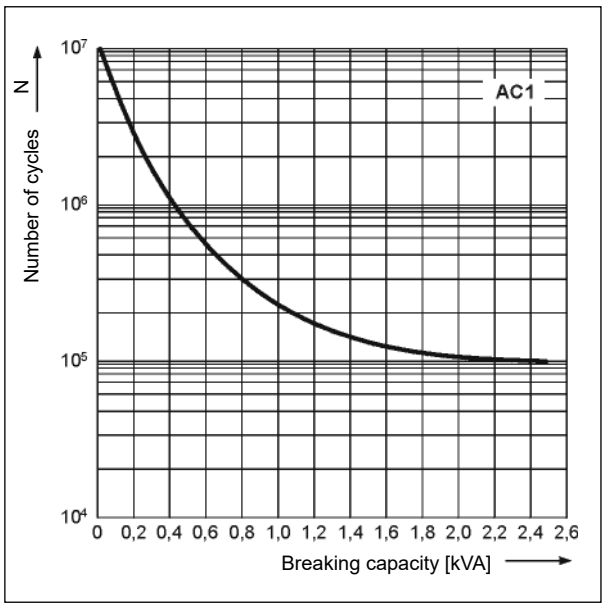
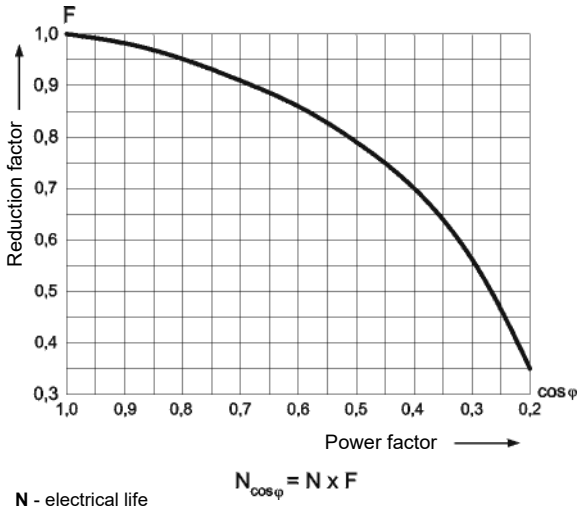
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1

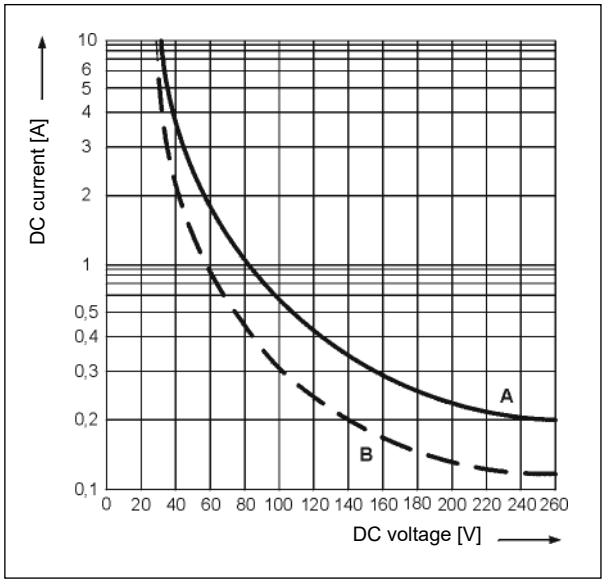


Electrical life reduction factor at AC inductive load Fig. 2

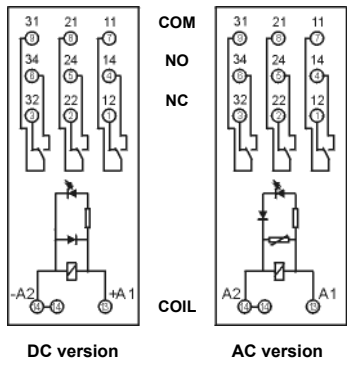


N - electrical life at AC1

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

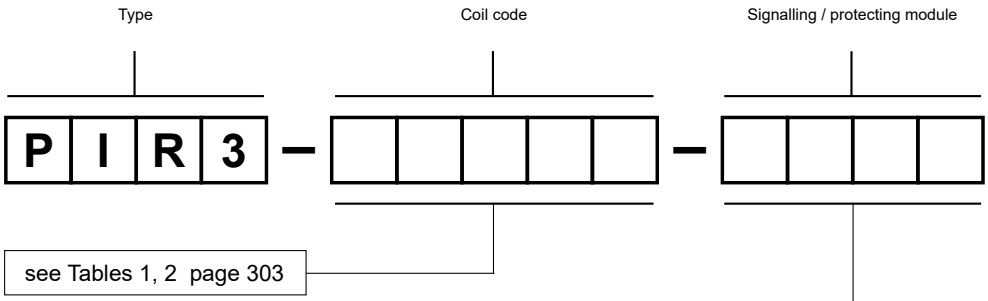
The data in bold type relate to the standard versions of the relays.

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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PIR4 with socket GZM4
interface relays

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

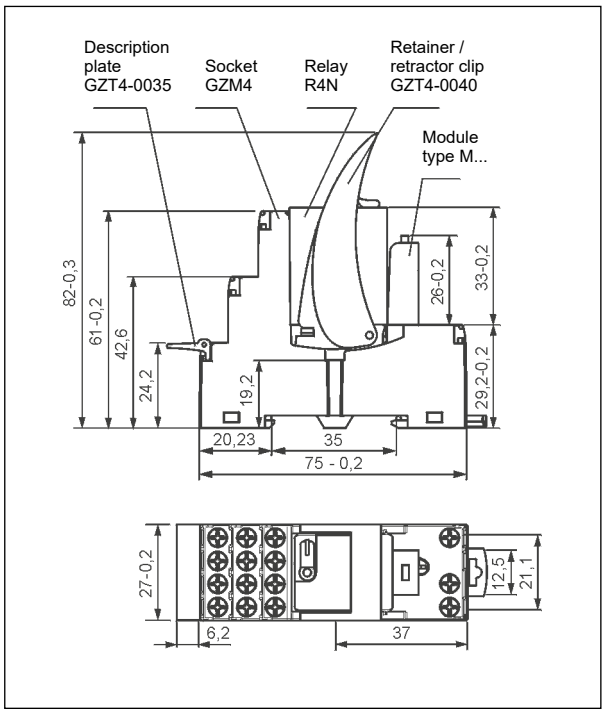
Insulation rated voltage		300 V AC	
Rated surge voltage		2 500 V	1,2 / 50 µs
Overvoltage category		II	
Insulation pollution degree		2	
Dielectric strength	• between coil and contacts	2 500 V AC	type of insulation: basic
	• contact clearance	1 500 V AC	type of clearance: micro-disconnection
	• pole - pole	2 000 V AC	type of insulation: basic
Contact - coil distance	• clearance	≥ 1,6 mm	
	• creepage	≥ 3,2 mm	

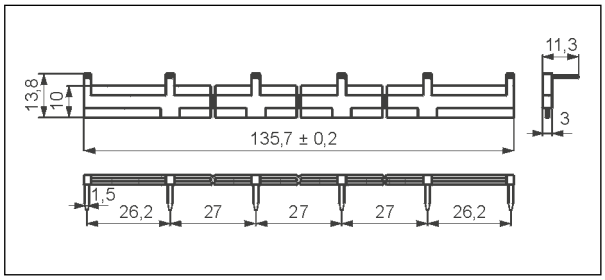
General data

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.

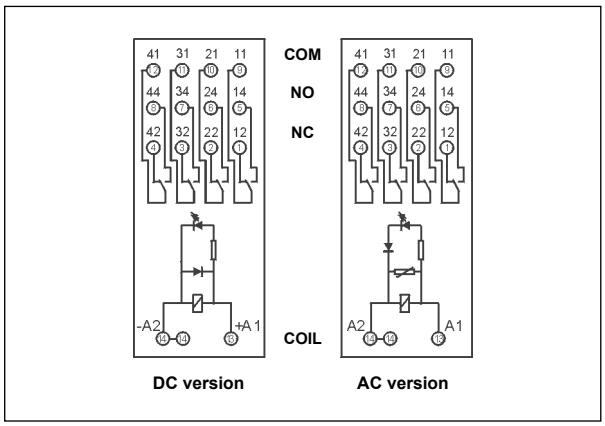
Dimensions





Interconnection strip type **ZGGZ4**

Connection diagrams
(screw terminals side view)



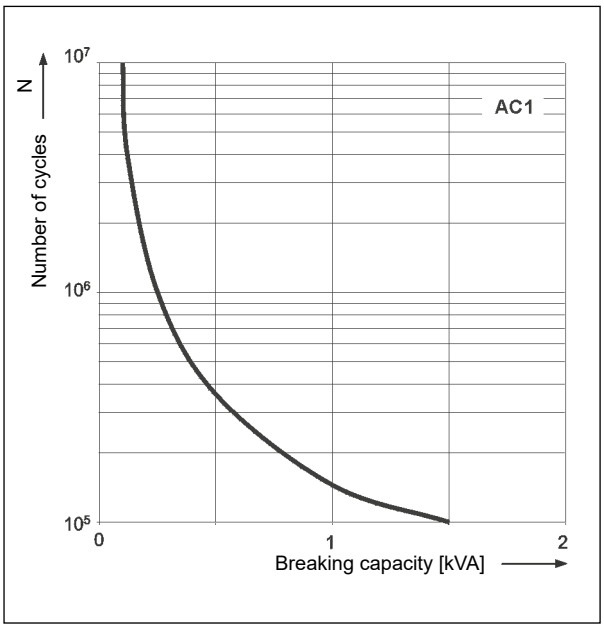
Mounting

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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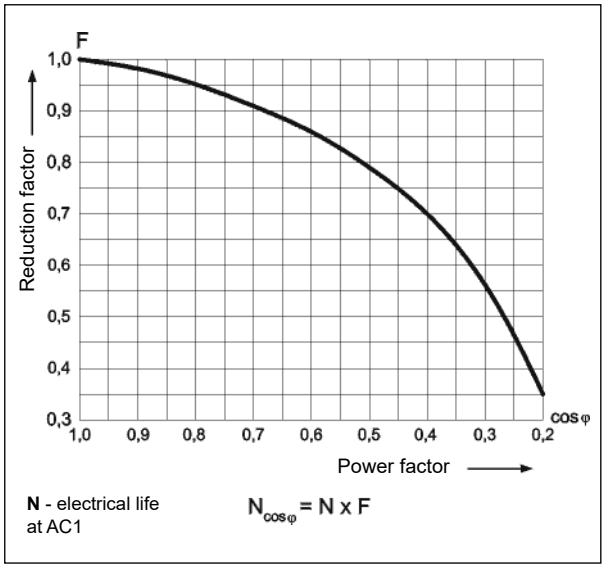
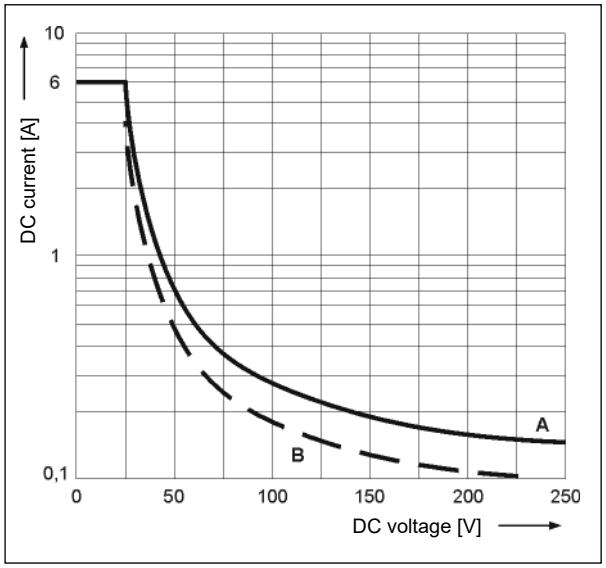
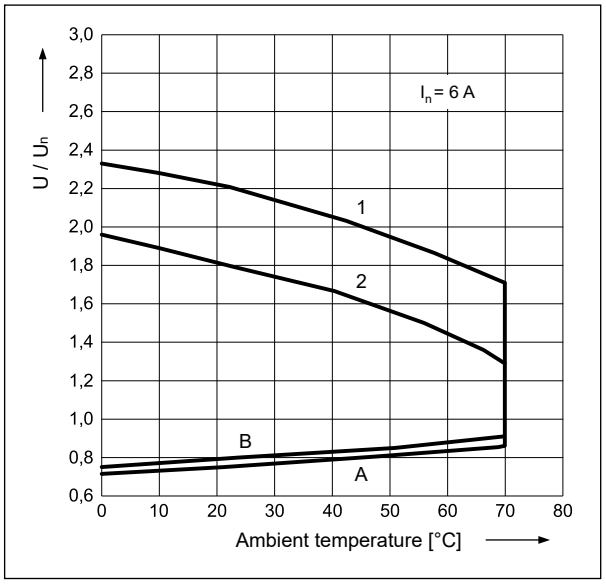
Electrical life reduction factor at AC inductive load Fig. 2



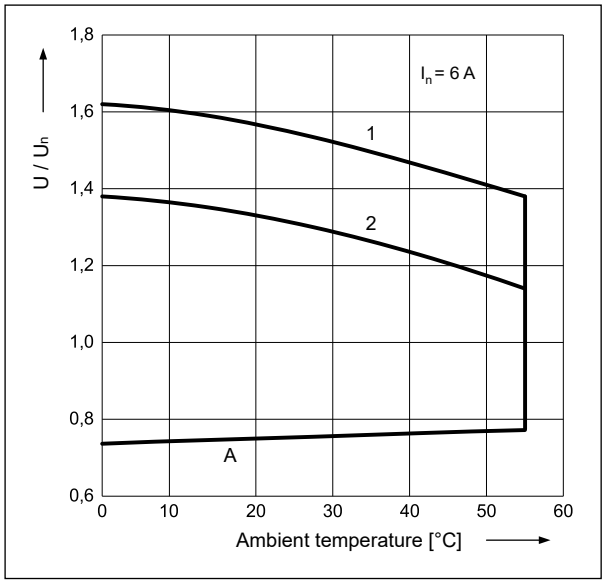
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



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

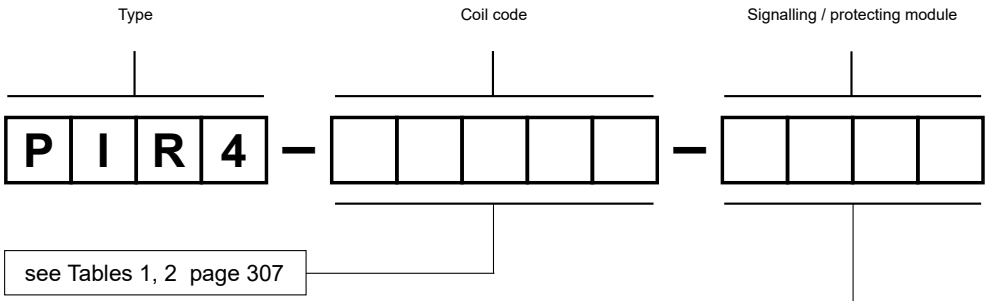
The data in bold type relate to the standard versions of the relays.

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

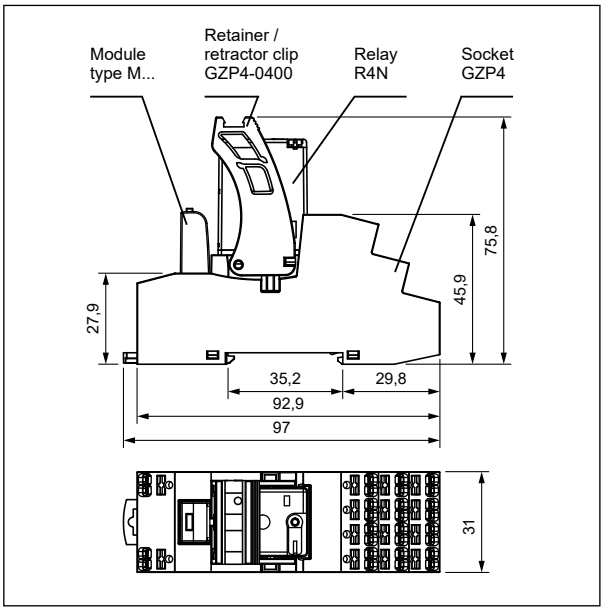
Insulation rated voltage		300 V AC	
Rated surge voltage		2 500 V 1,2 / 50 µs	
Overvoltage category		II	
Insulation pollution degree		2	
Dielectric strength	• between coil and contacts	2 500 V AC	type of insulation: basic
	• contact clearance	1 500 V AC	type of clearance: micro-disconnection
	• pole - 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	

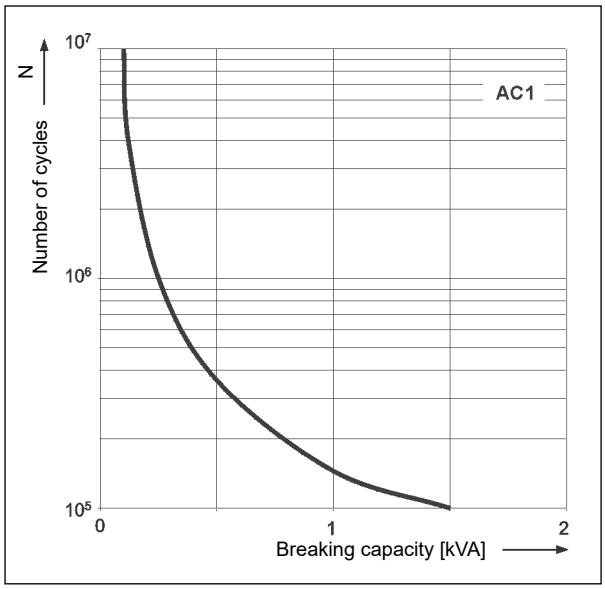
The data in bold type relate to the standard versions of the relays.
❶ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

Dimensions

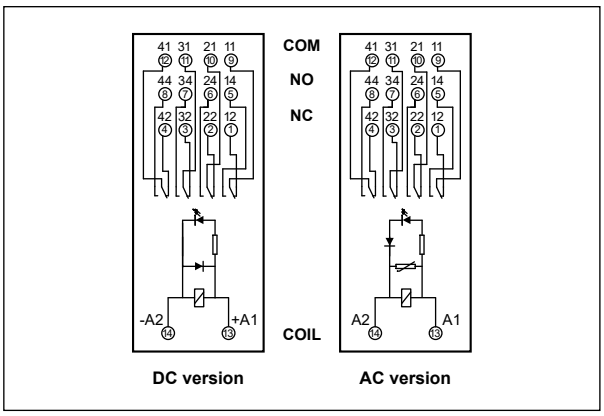


Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour

Fig. 1

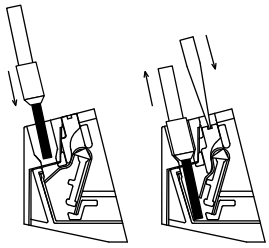


Connection diagrams
(Push-in terminals side view)



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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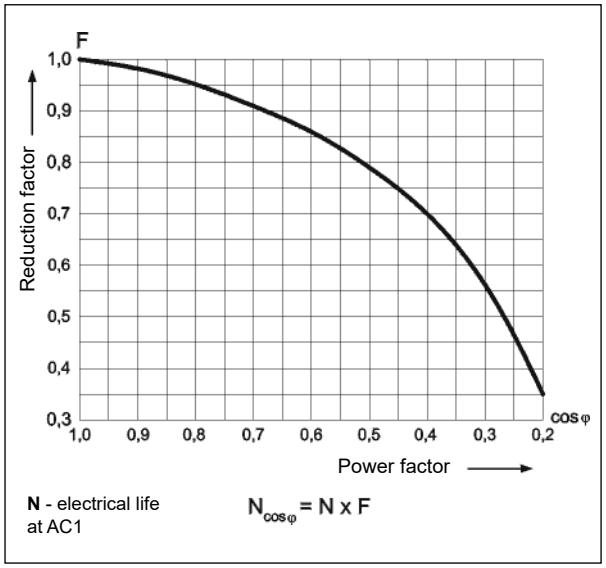
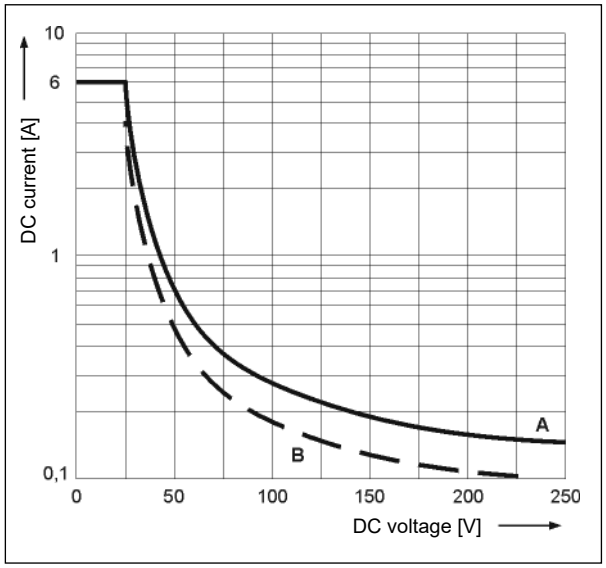
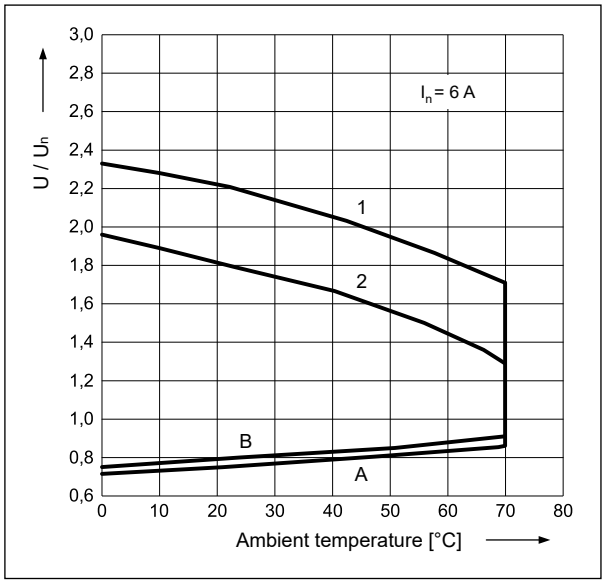
Electrical life reduction factor at AC inductive load Fig. 2



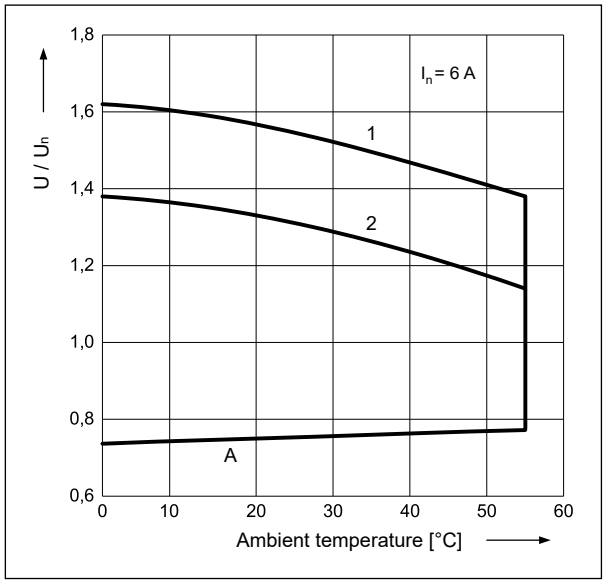
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



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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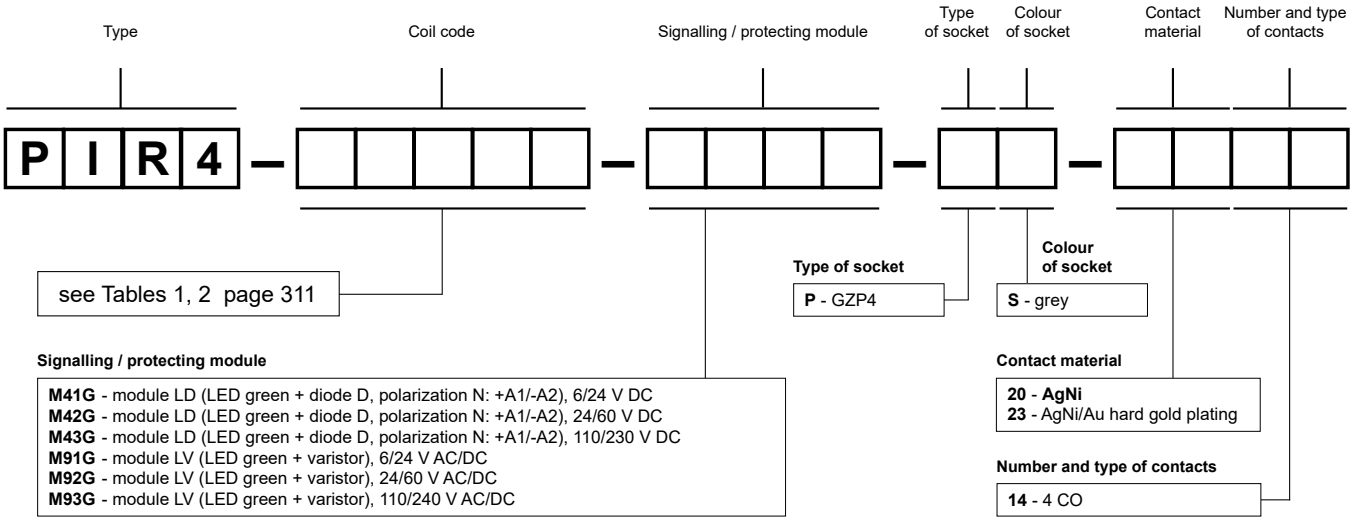
Ordering codes



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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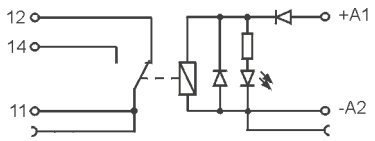
General data

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	

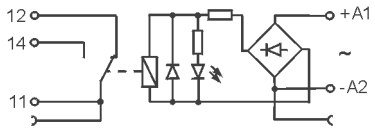
❷ Refers version for long control lines (max. 300 m), with integrated anti-interference filter.

Connection diagrams

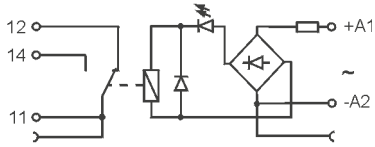
PI6-1P-12VDC, PI6-1P-12VDC-01
PI6-1P-24VDC, PI6-1P-24VDC-01
PI6-1P-36VDC, PI6-1P-36VDC-01



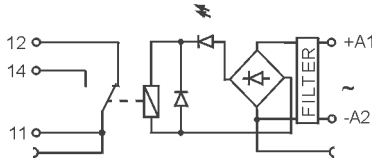
PI6-1P-24VAC/DC, PI6-1P-24VAC/DC-01
PI6-1P-42VAC/DC



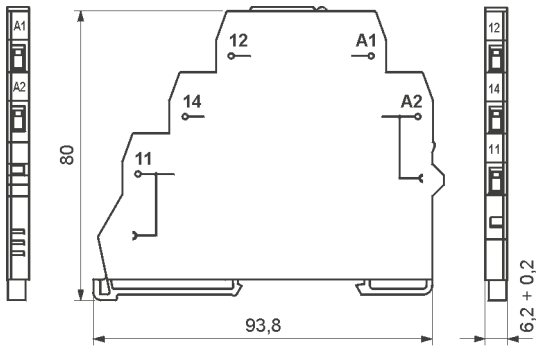
PI6-1P-115VAC/DC
PI6-1P-230VAC/DC, PI6-1P-230VAC/DC-01

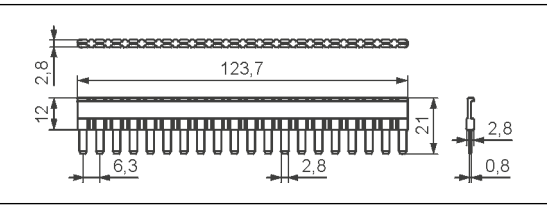


PI6-1P-230VAC/DC-10



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

Export Sales Department: phone +48 68 47 90 832, 951, export@relpol.com.pl

- 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,

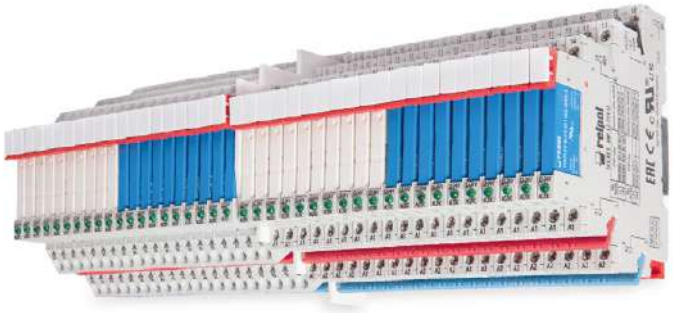
Output circuit - Triac

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-...)

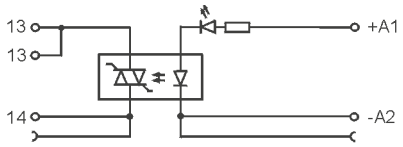
set:
relay RM699BV (RSR30)
+ socket 6W (6WB)

NEW

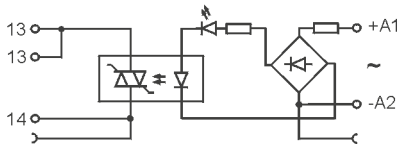


Connection diagrams

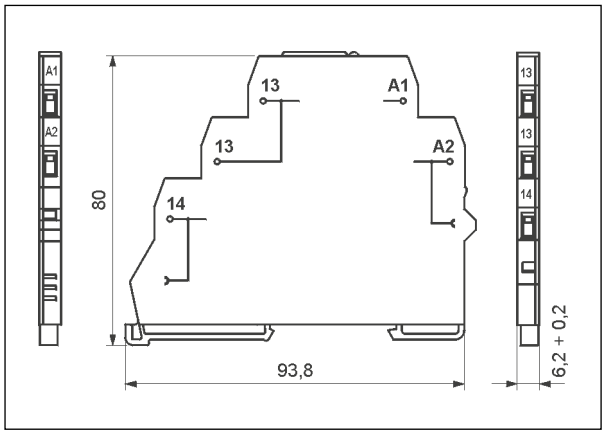
PI6-1T-5...32VDC

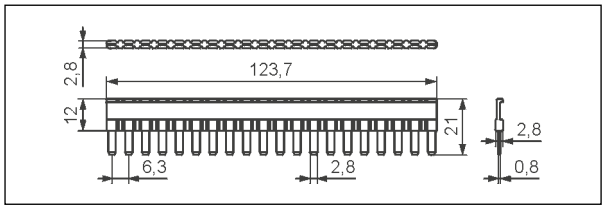


PI6-1T-24VAC/DC
PI6-1T-230VAC/DC



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	

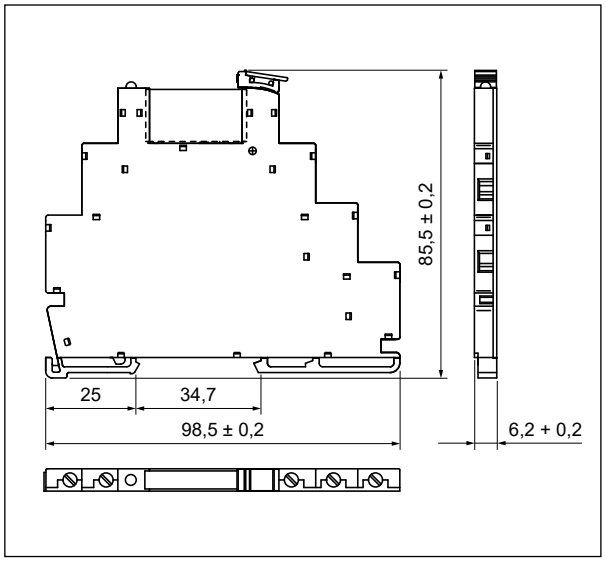
The data in bold type relate to the standard versions of the relays. ❶ Characteristics of the capacity of relays **PIR6W-1P-... with RM699BV** - see page 139. ❷ For gold-plated contacts - when the maximum values given have been exceeded, the gold layer is destroyed. Then, the advantages of gold-plating 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**.

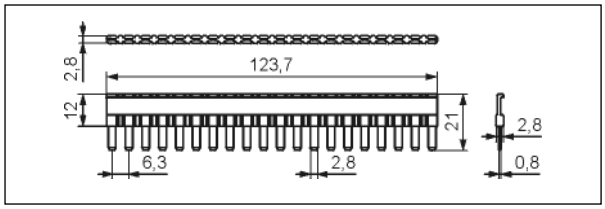
General data

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	

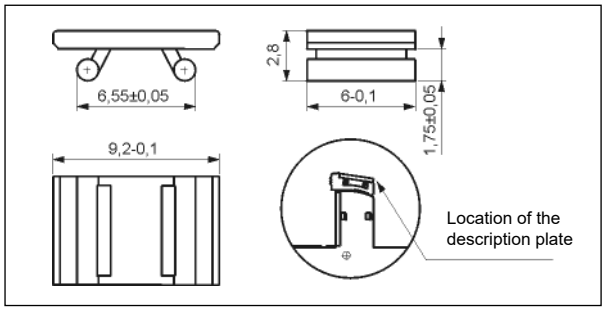
❸ Refers version for long control lines (max. 300 m), with integrated anti-interference filter.
❹ For versions 230VAC/DC and 230VAC/DC-10: the distance at least 5 mm between the relays mounted side by side.

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.

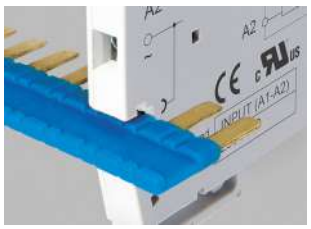
PI6W-1P-...

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-...

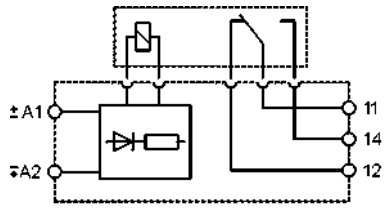
Input data

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

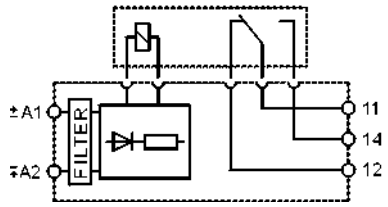


Table of codes

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 capacity of relays **PIR6W-1PS-... with RM699BV** - see page 139, **PIR6W-1PS-... with RSR30** - see page 596. 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

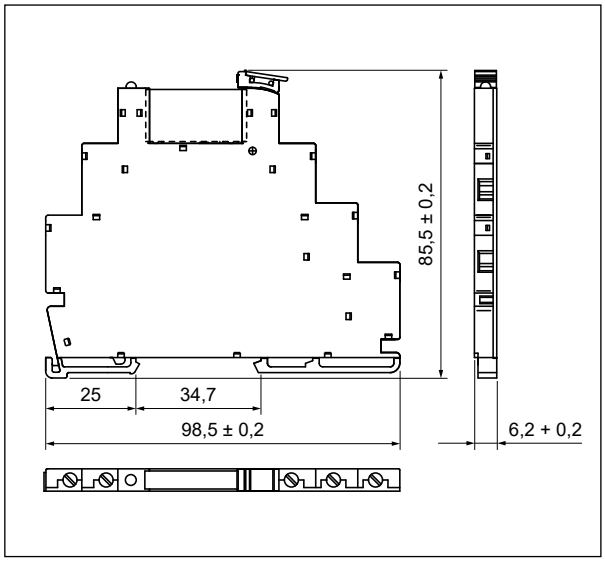
Insulation rated voltage	250 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Dielectric strength	
• input - output	4 000 V AC 50/60 Hz, 1 min., type of insulation: reinforced
• input - output	6 000 V 1,2 / 50 µs
• mass - input, output	2 500 V AC 50/60 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

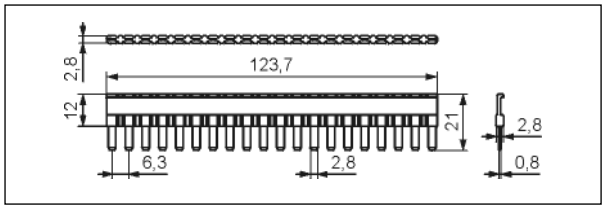
General data

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

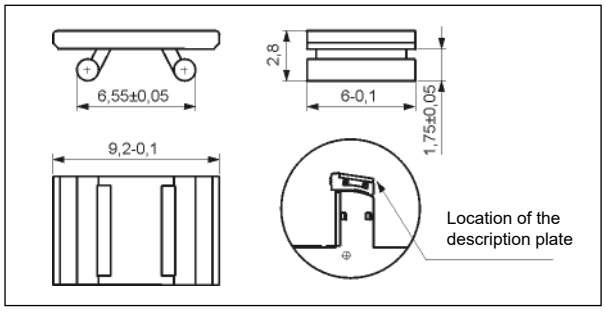
❹ For versions 230VAC/DC: the distance at least 5 mm between the relays mounted side by side.

Dimensions





20-pole interconnection strip type **ZG20**



Description plate **PI6W-1246**

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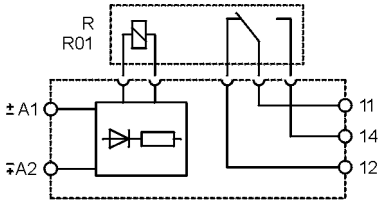
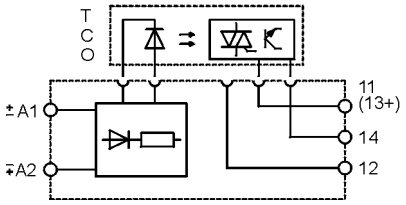
Connection diagrams

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 mm² / 2 x 1,5 mm² (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-...

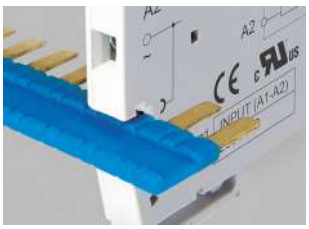
RM699BV

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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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 capacity of relays **PIR6WB-1PS-... with RM699BV** - see page 139, **PIR6WB-1PS-... with RSR30** - see page 596. 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

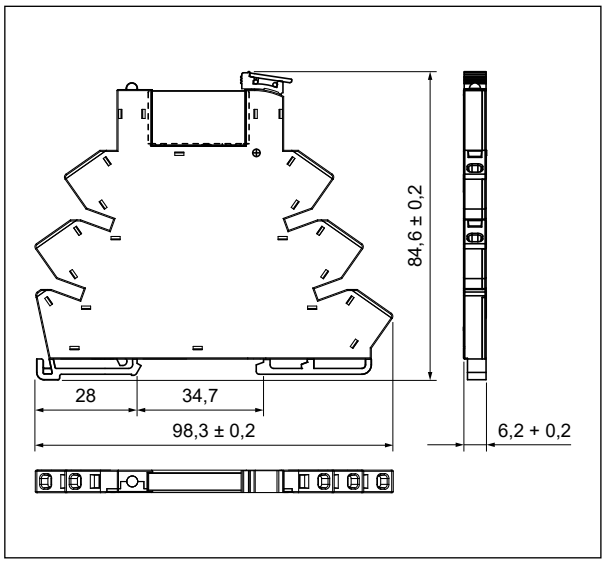
Insulation rated voltage		250 V AC	
Rated surge voltage		4 000 V	1,2 / 50 µs
Overvoltage category		III	
Insulation pollution degree		3	
Dielectric strength	• input - output	4 000 V AC	50/60 Hz, 1 min., type of insulation: reinforced
	• input - output	6 000 V	1,2 / 50 µs
	• mass - input, output	2 500 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	

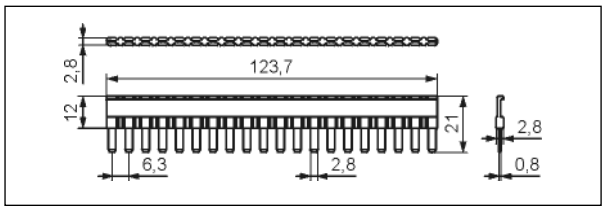
General data

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

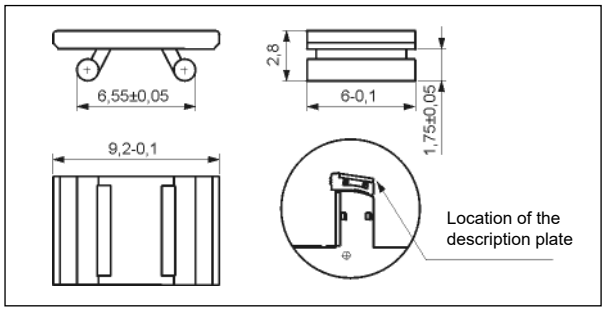
❹ Refers version for long control lines (max. 300 m), with integrated anti-interference filter.
❻ For versions 230VAC/DC and 230VAC/DC-10: the distance at least 5 mm between the relays mounted side by side.

Dimensions





20-pole interconnection strip type **ZG20**



Description plate **PI6W-1246**

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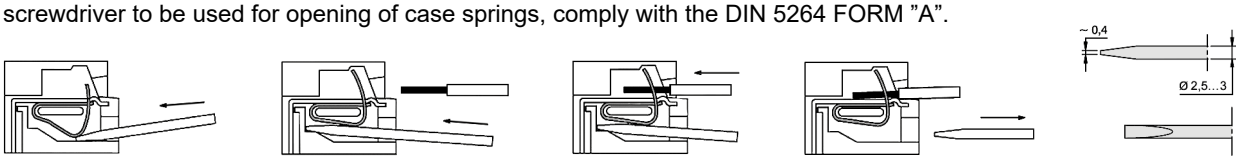
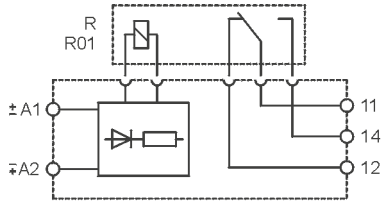
Wire connection

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".

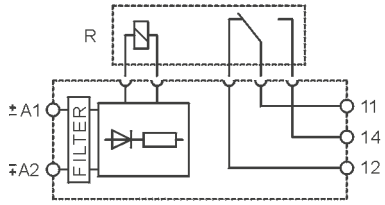


Connection diagrams

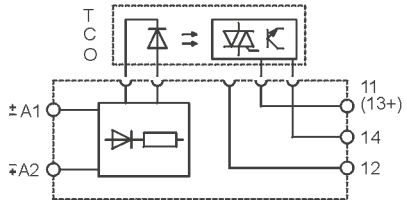
PIR6WB-1PS-...-R, PIR6WB-1PS-...-R01



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

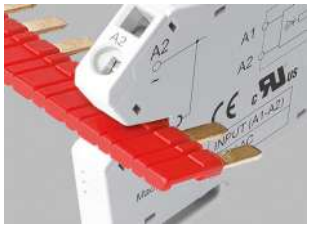
ZG20

PI6W-1246

Ordering codes

Ordering codes **PIR6WB-1PS-...** are specified in Table 1, "Interface relay code" column.

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	

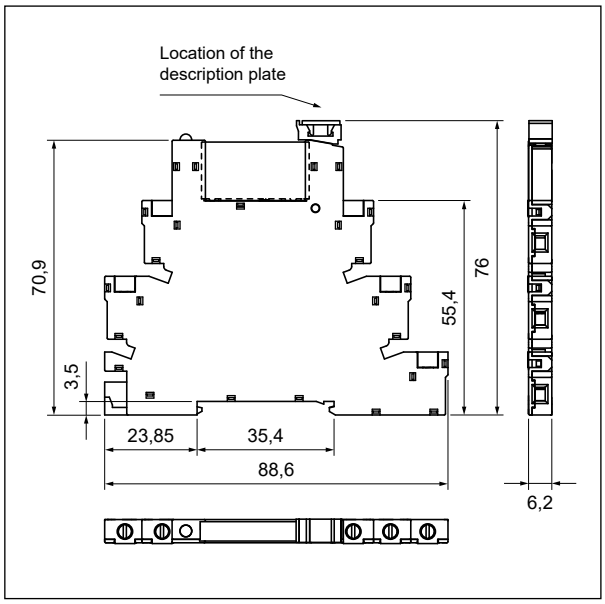
The data in bold type relate to the standard versions of the relays. ❶ Characteristics of the capacity of relays **SIR6W-... with RM699BV** - see page 139, **SIR6W-... with RSR30** - see page 596. ❷ For gold-plated contacts - when the maximum values given have been exceeded, the gold layer is destroyed. 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).

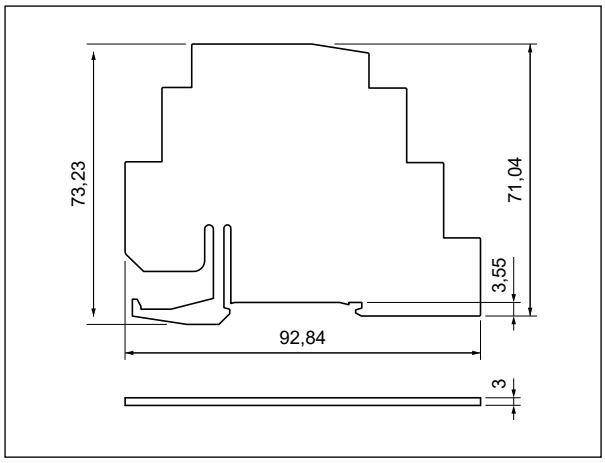
General data

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

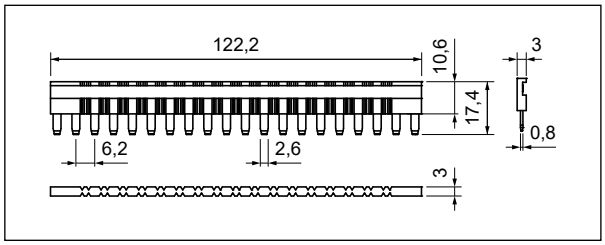
❻ For versions 110...125 V AC/DC and 220...240 V AC/DC: a distance of 5 mm must be maintained between relays operating at an ambient temperature of max. +55 °C, when they are supplied permanently or with a duty cycle > 50% (for groups of relays mounted without ventilation distances, the maximum operating temperature is max. +30 °C).

Dimensions

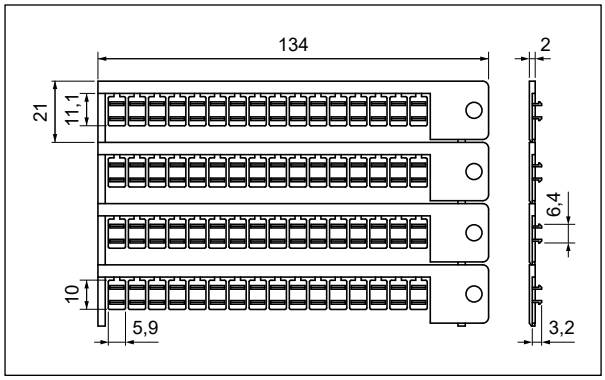




Separator **6W-SEP**



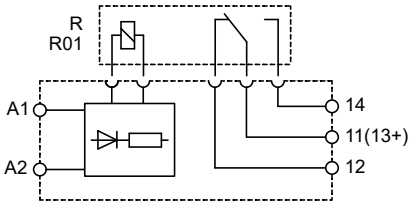
20-pole interconnection strip type **JB20**



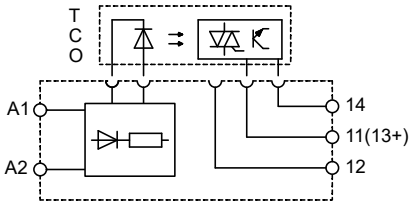
Card of description plates **MP6-C**

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

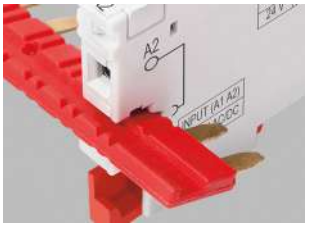
RM699BV

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

Export Sales Department: phone +48 68 47 90 832, 951, export@relpol.com.pl

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	

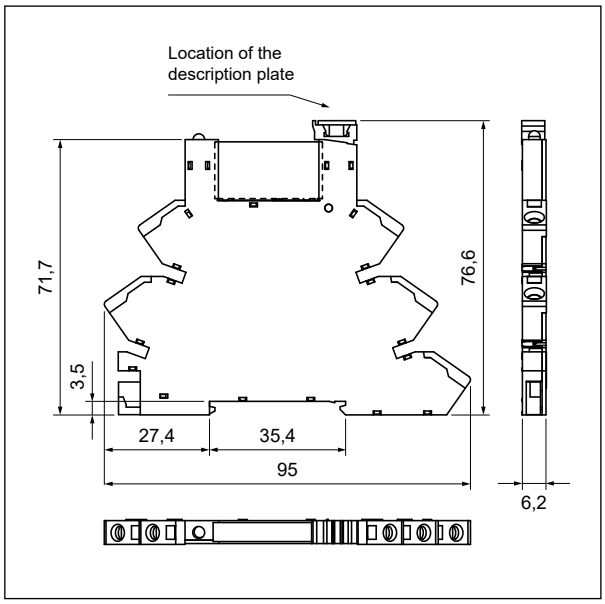
The data in bold type relate to the standard versions of the relays. ❶ Characteristics of the capacity of relays **SIR6WB-... with RM699BV** - see page 139, **SIR6WB-... with RSR30** - see page 596. ❷ For gold-plated contacts - when the maximum values given have been exceeded, the gold layer is destroyed. 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).

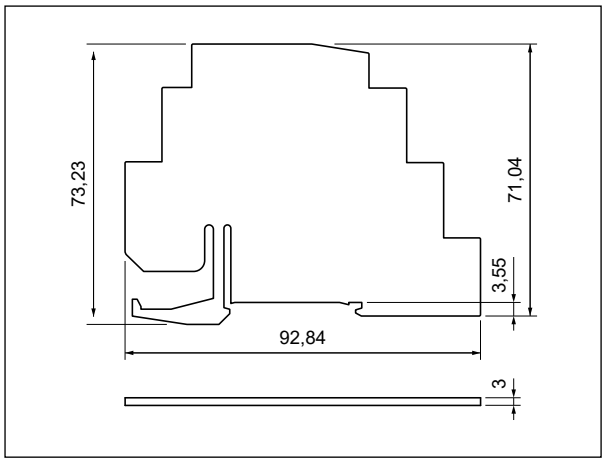
General data

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	

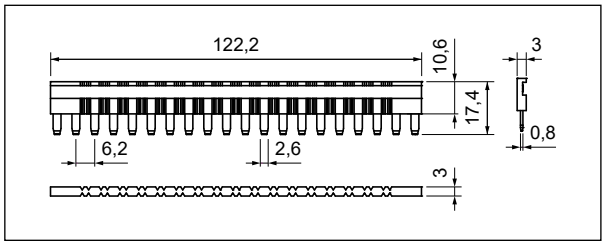
❻ For versions 110...125 V AC/DC and 220...240 V AC/DC: a distance of 5 mm must be maintained between relays operating at an ambient temperature of max. +55 °C, when they are supplied permanently or with a duty cycle > 50% (for groups of relays mounted without ventilation distances, the maximum operating temperature is max. +30 °C).

Dimensions

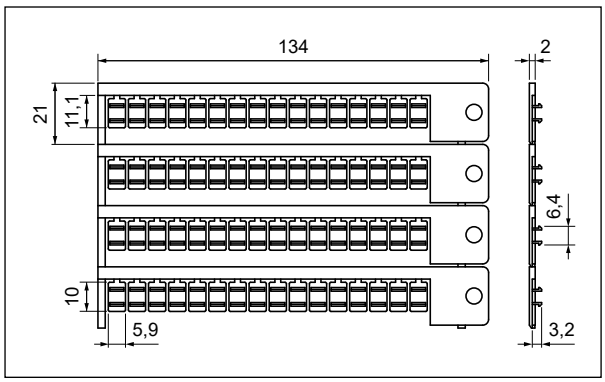




Separator **6W-SEP**



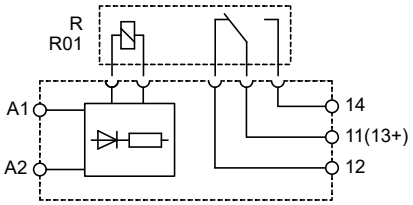
20-pole interconnection strip type **JB20**



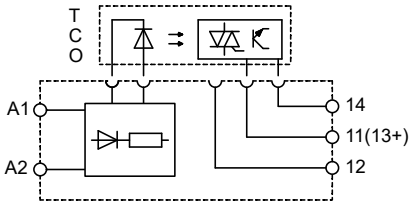
Card of description plates **MP6-C**

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

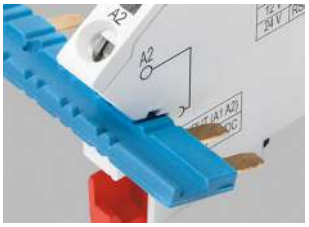
RM699BV

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".

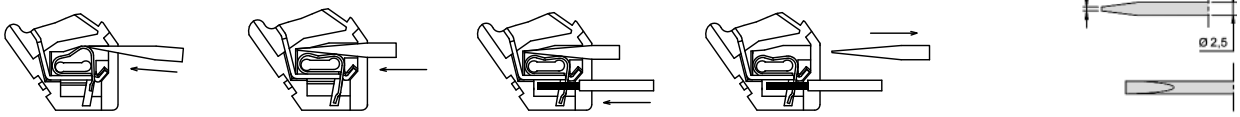


Table of codes

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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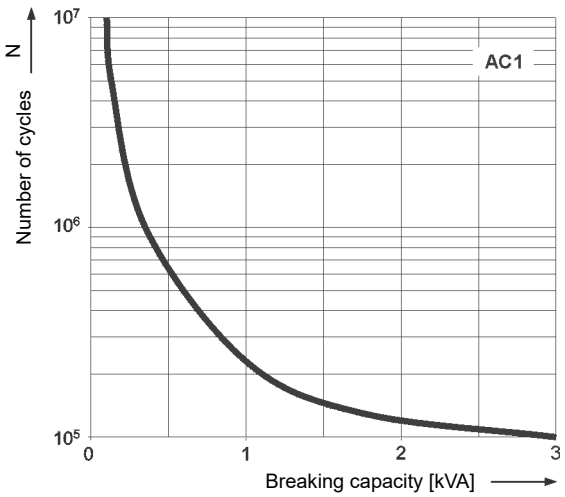
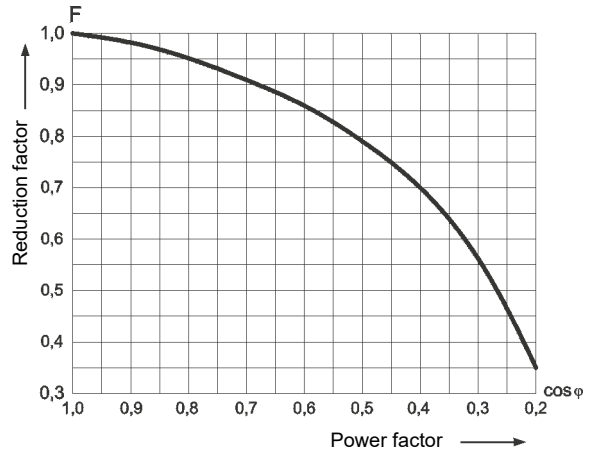
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



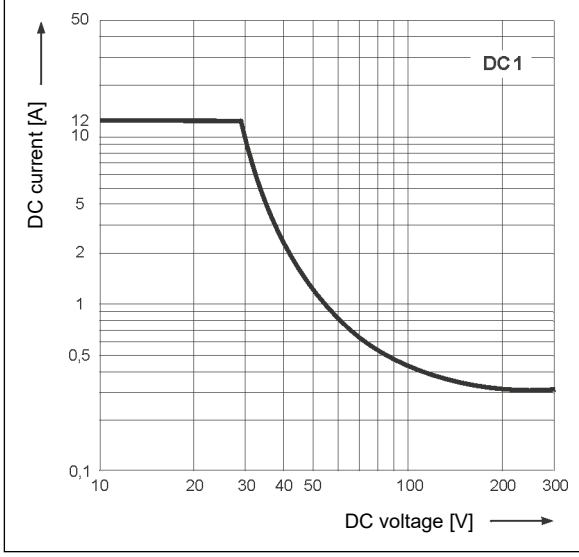
Electrical life reduction factor at AC inductive load Fig. 2



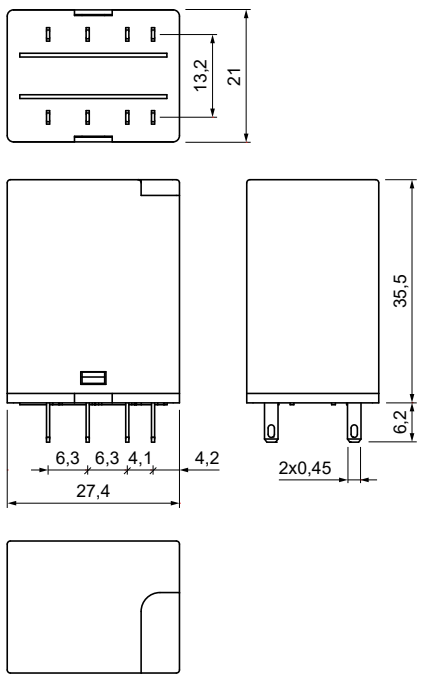
N - electrical life at AC1

$N_{cos\varphi} = N \times F$

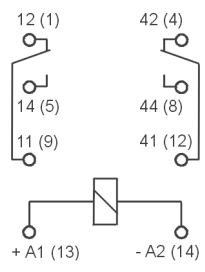
Max. DC resistive load breaking capacity Fig. 3



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.

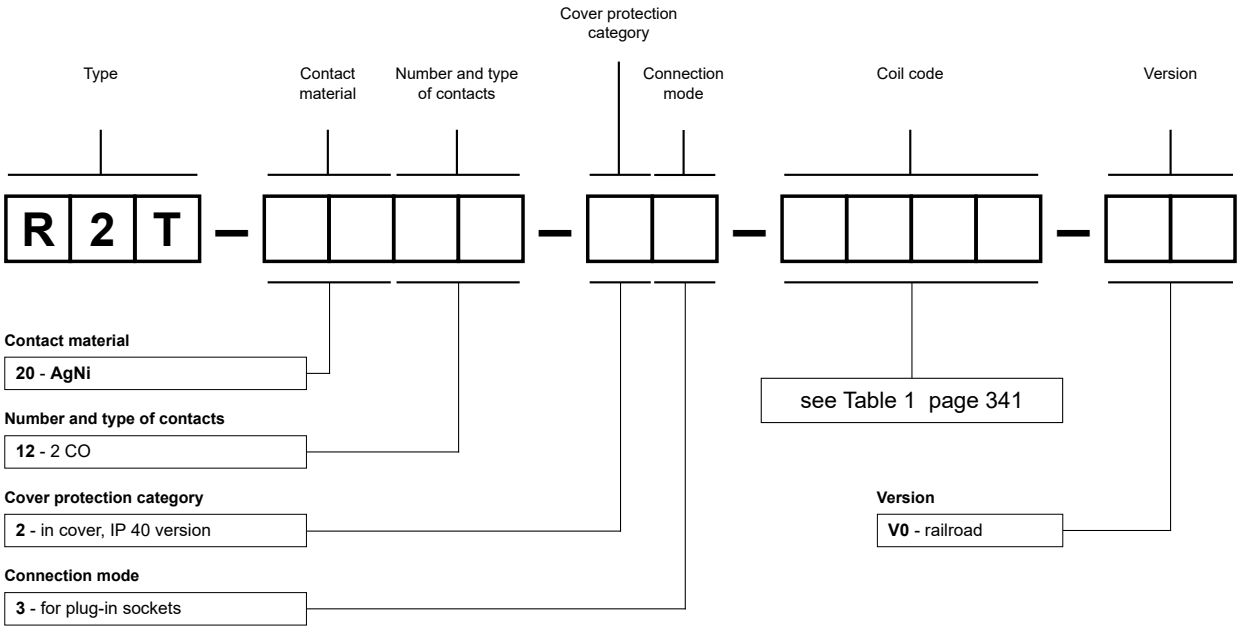
Coil data - DC voltage version

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

R3T
relays for railroad industry - industrial

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

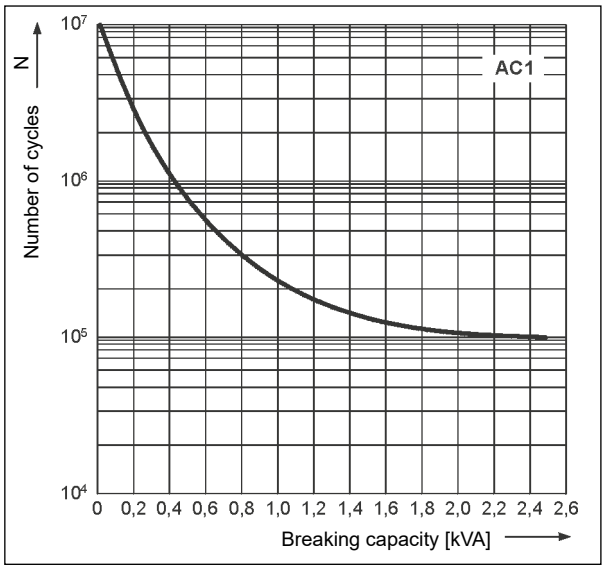
Insulation rated voltage	250 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	2
Flammability class	V-0 UL 94, PN-EN 60695-11-10
Dielectric strength	
• between coil and contacts	2 500 V AC type of insulation: basic
• contact clearance	1 500 V AC type of 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

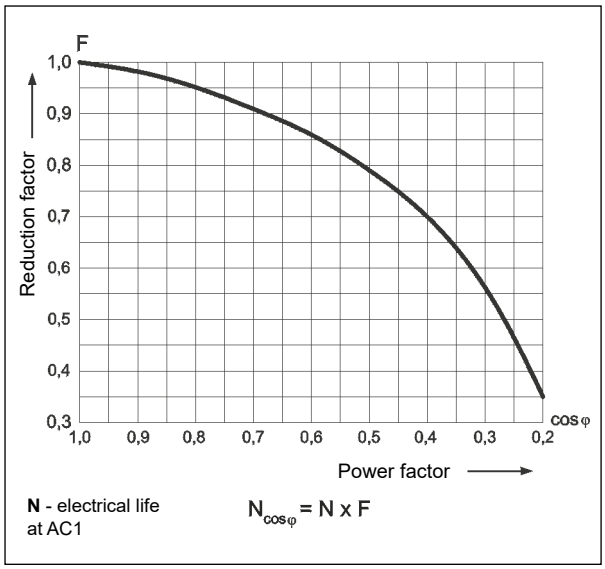
Operating / release time (typical values)		13 ms / 3 ms
Electrical life		
• resistive AC1		> 10^5 10 A, 250 V AC (duty factor 50%)
• cosφ		see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		27,4 x 21 x 35,5 mm
Weight		35 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation 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.

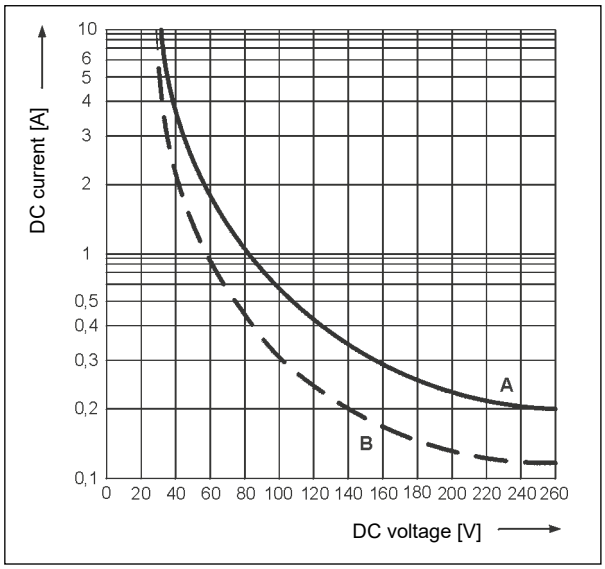
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



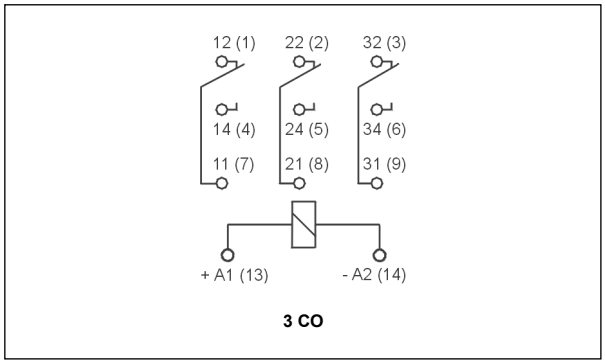
Electrical life reduction factor at AC inductive load Fig. 2



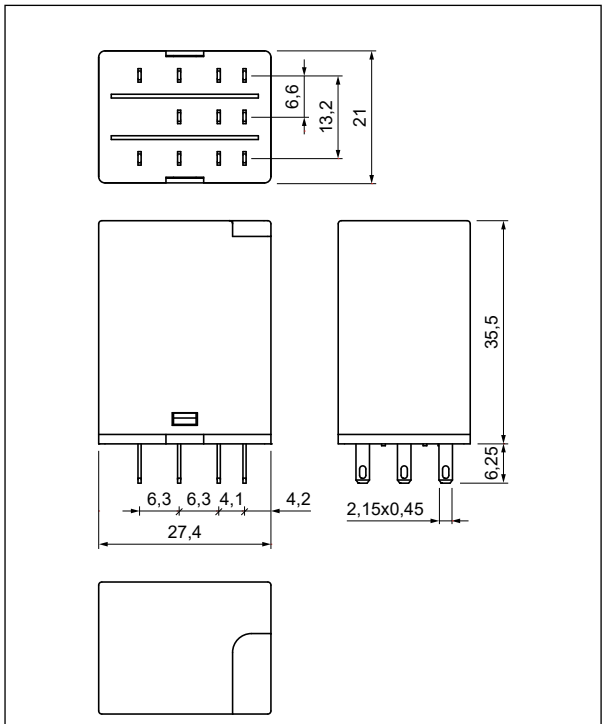
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Connection diagram (pin side view)



Dimensions



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.

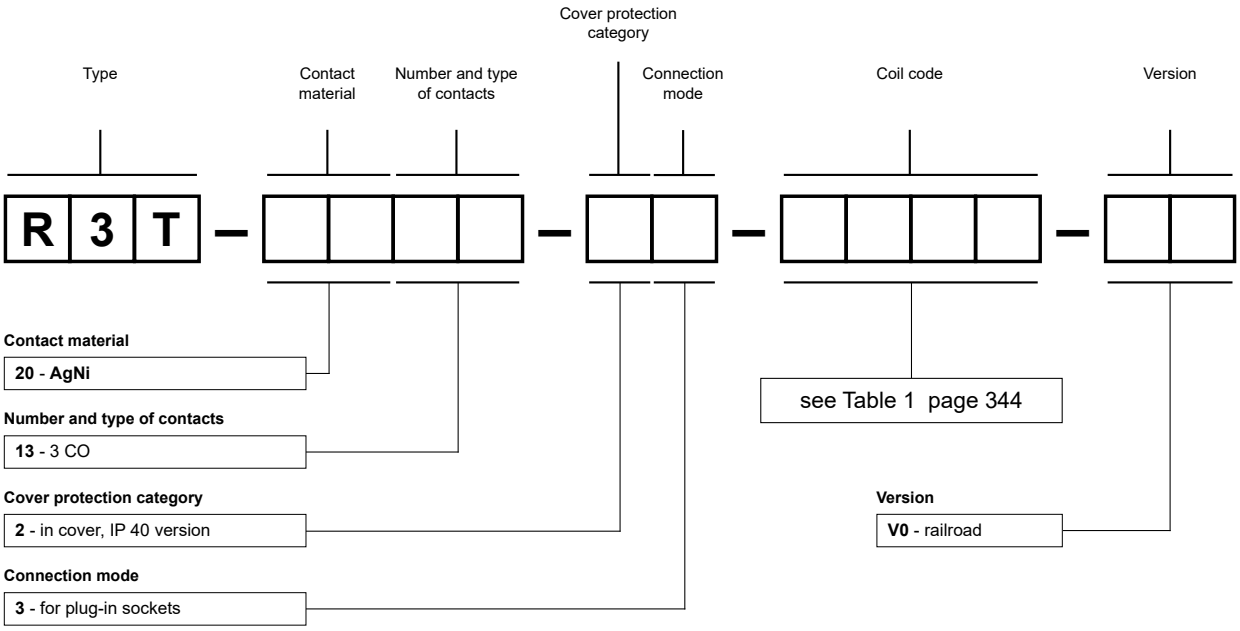
Coil data - DC voltage version

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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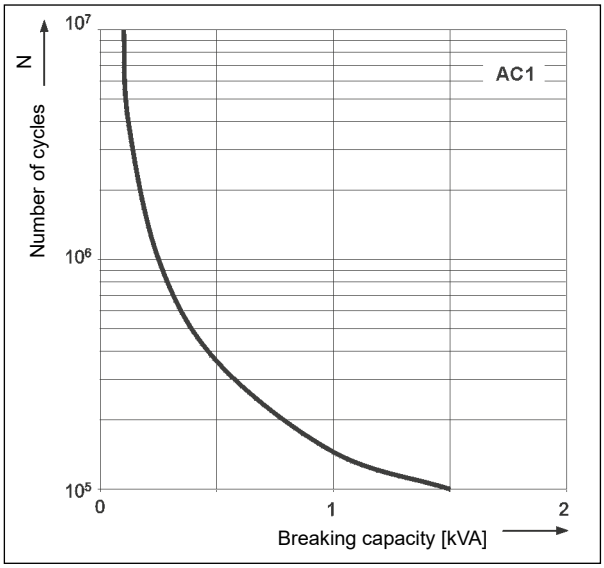
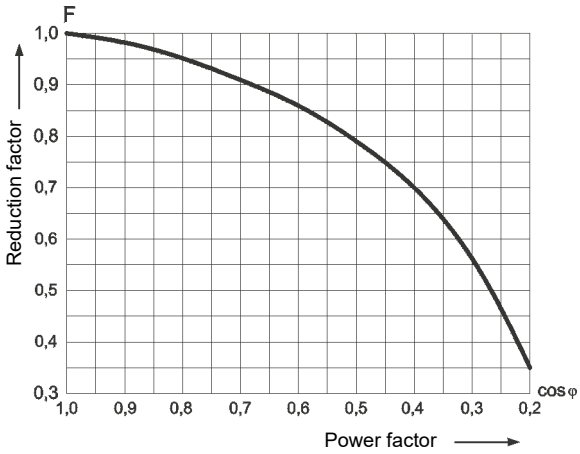
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



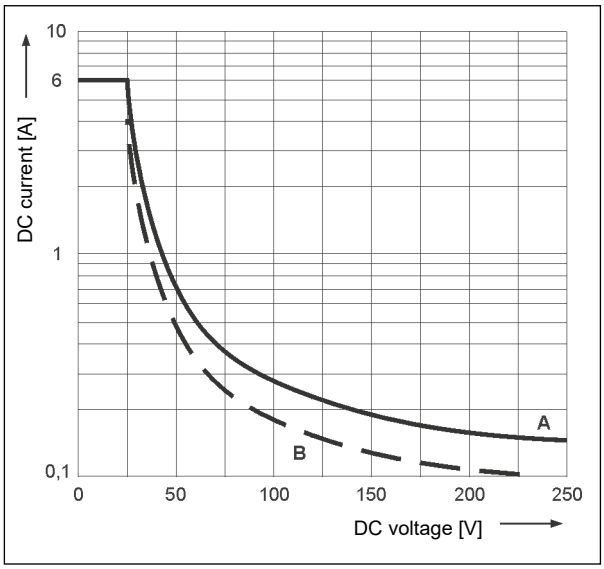
Electrical life reduction factor at AC inductive load Fig. 2



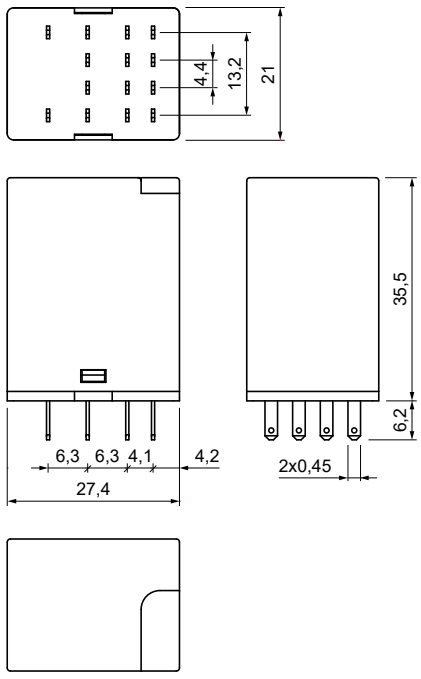
N - electrical life at AC1

$N_{cos\varphi} = N \times F$

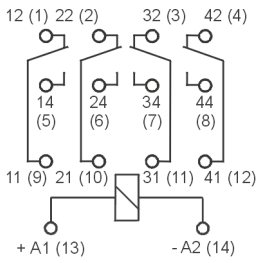
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Dimensions



Connection diagram (pin side view)



4 CO

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.

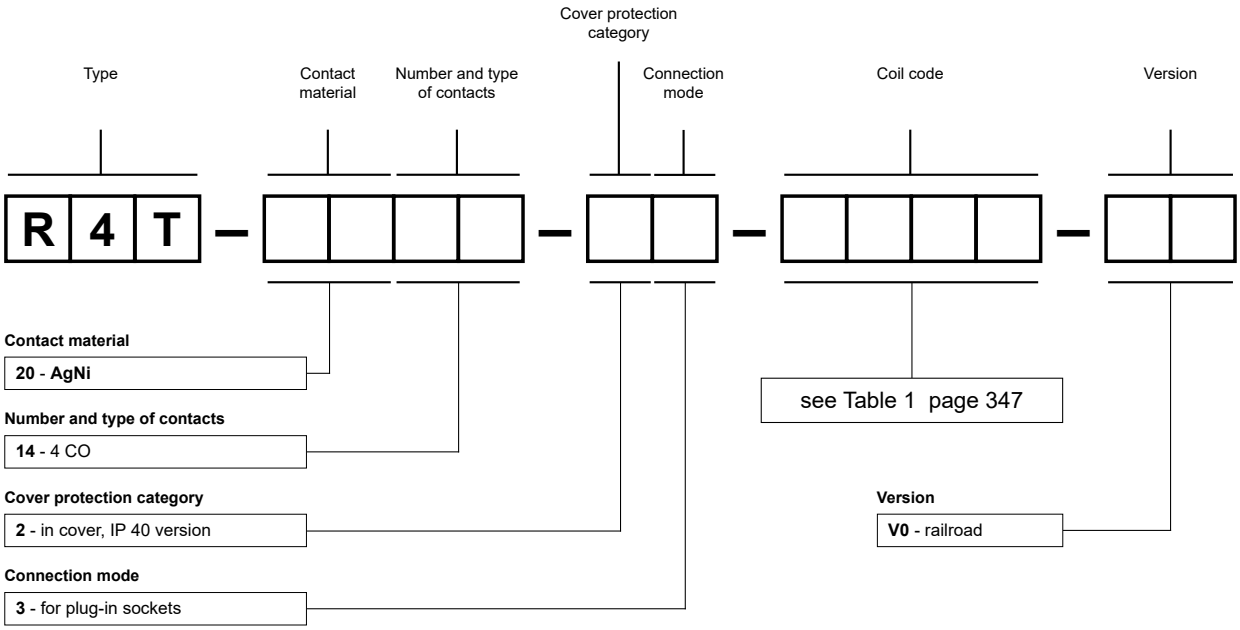
Coil data - DC voltage version

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

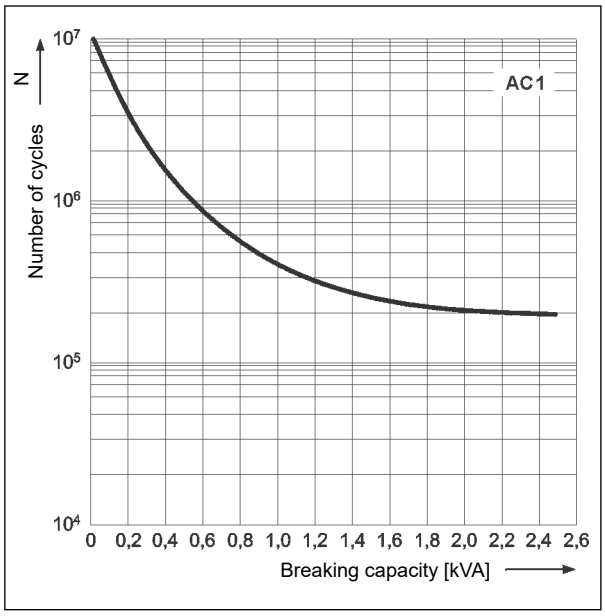
Insulation rated voltage	250 V AC
Rated surge voltage	2 500 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Flammability class	V-0 UL 94, PN-EN 60695-11-10
Dielectric strength	
• between coil and contacts	2 500 V AC type of insulation: basic
• contact clearance	1 500 V AC type of 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

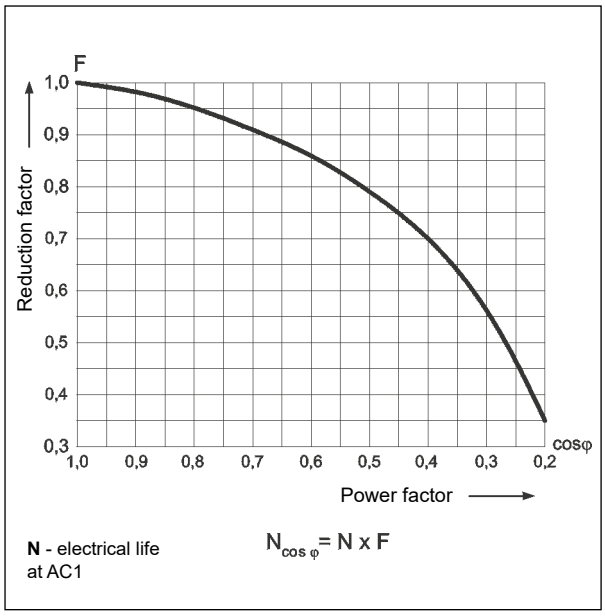
Operating / release time (typical values)		18 ms / 7 ms
Electrical life		
• resistive AC1		> 2 x 10^5 10 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		35 x 35 x 54,4 mm
Weight		83 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• 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.

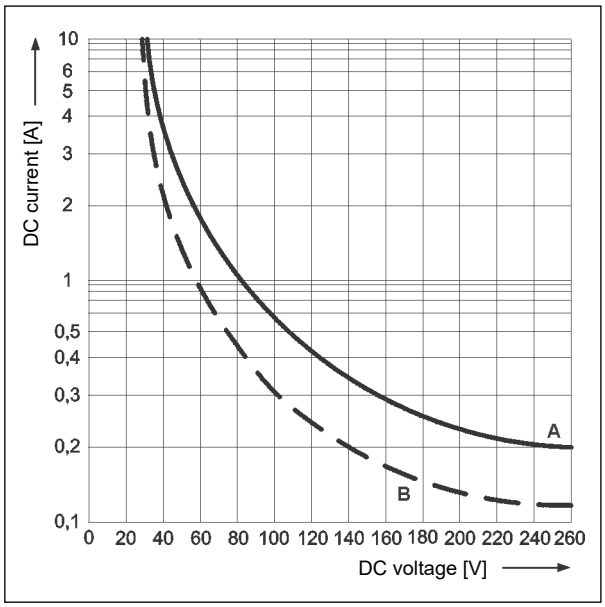
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



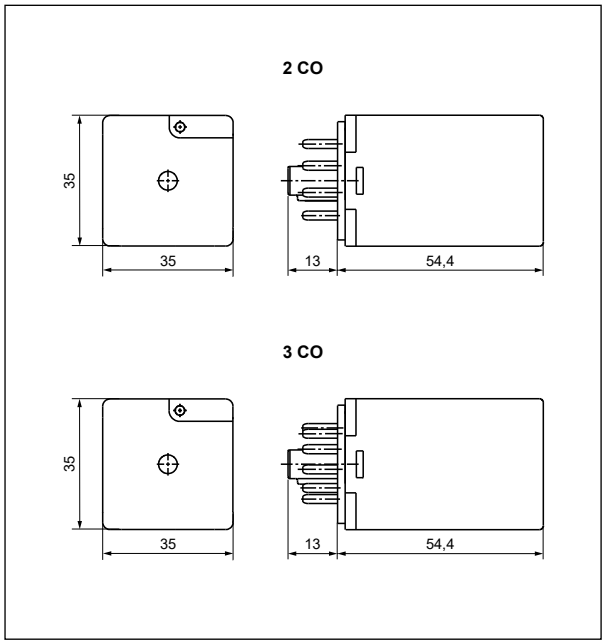
Electrical life reduction factor at AC inductive load Fig. 2



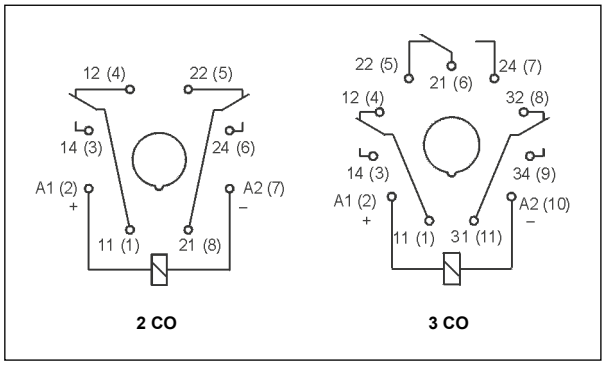
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Dimensions



Connection diagrams (pin side view)



PIR15.T

Relays for railroad industry - interface, contacts 2 CO, 3 CO

← Contents

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

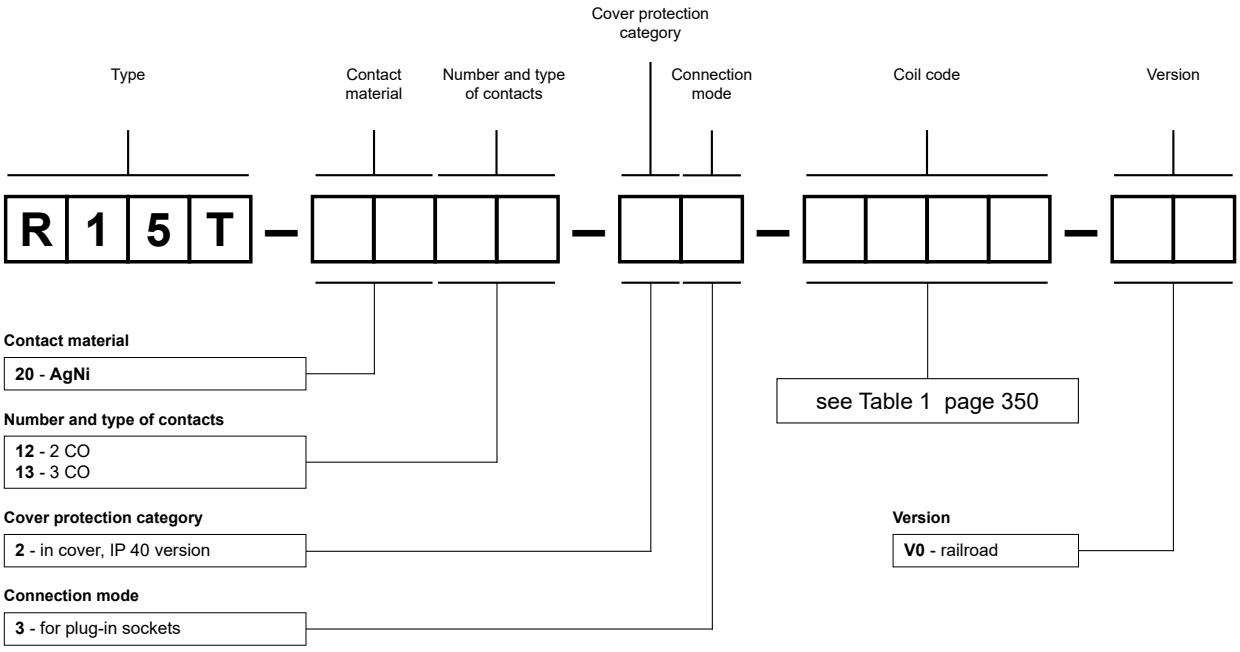
Coil data - DC voltage version

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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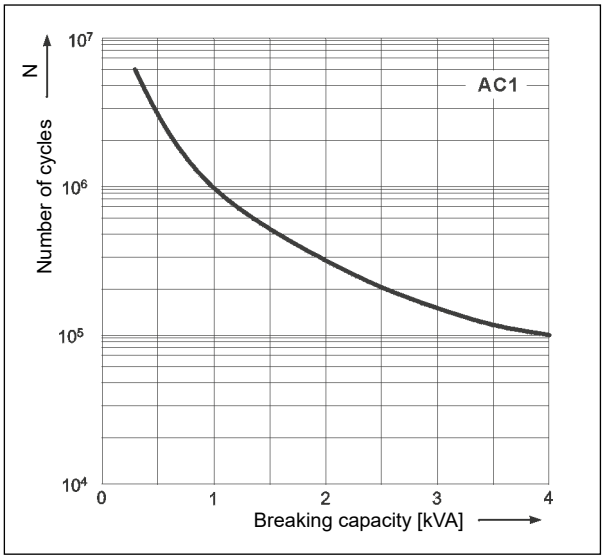
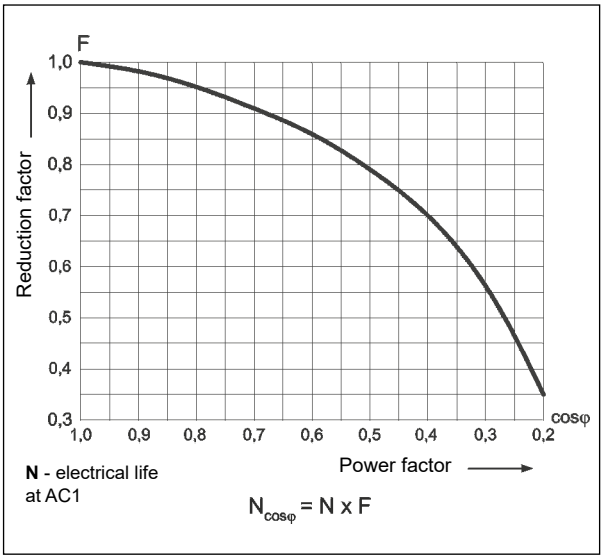
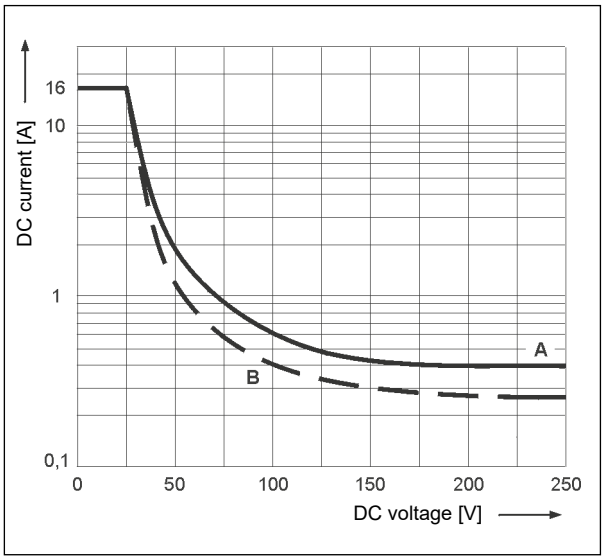
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



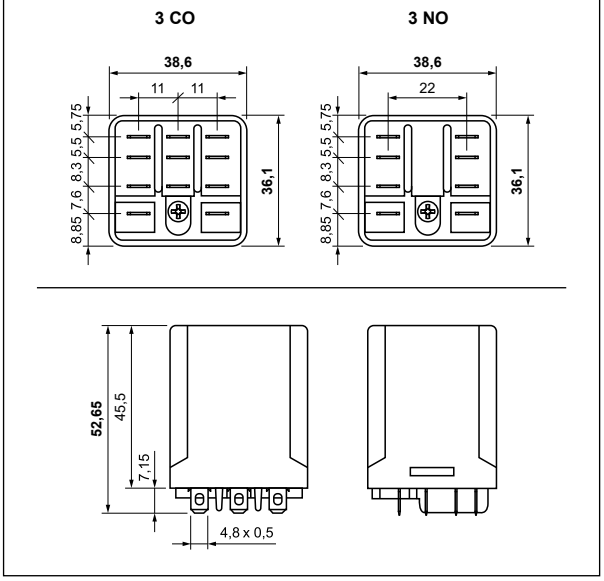
Electrical life reduction factor at AC inductive load Fig. 2



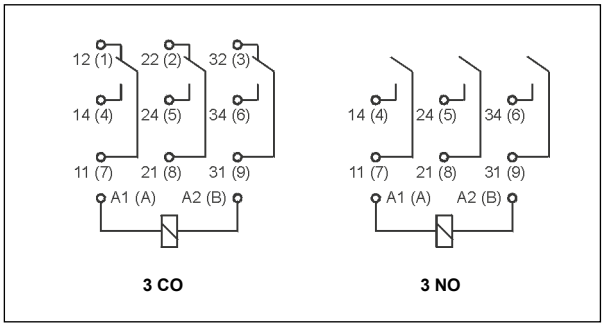
Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



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

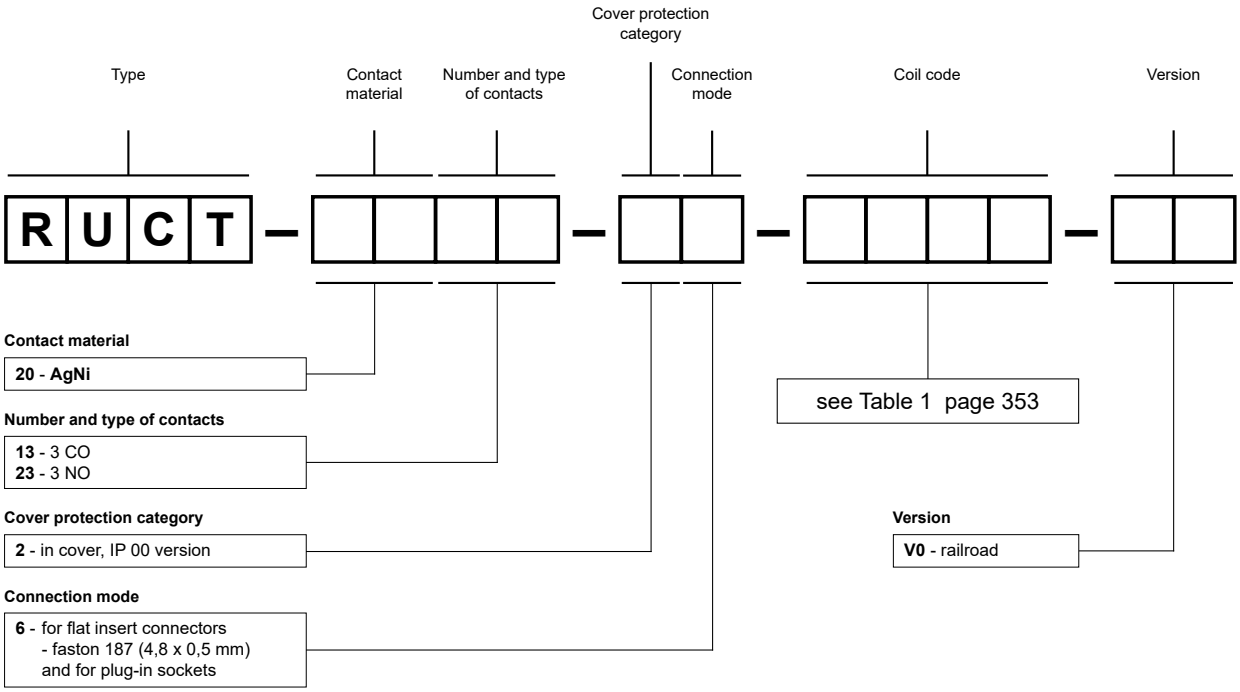
Coil data - DC voltage version

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

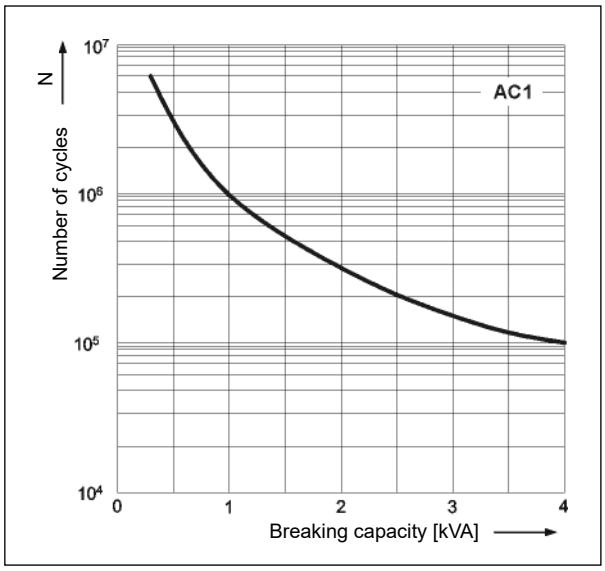
Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Flammability class		V-0 UL 94, PN-EN 60695-11-10
Dielectric strength • between coil and contacts • contact clearance • pole - pole		 2 500 V AC 1 min., type of insulation: 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

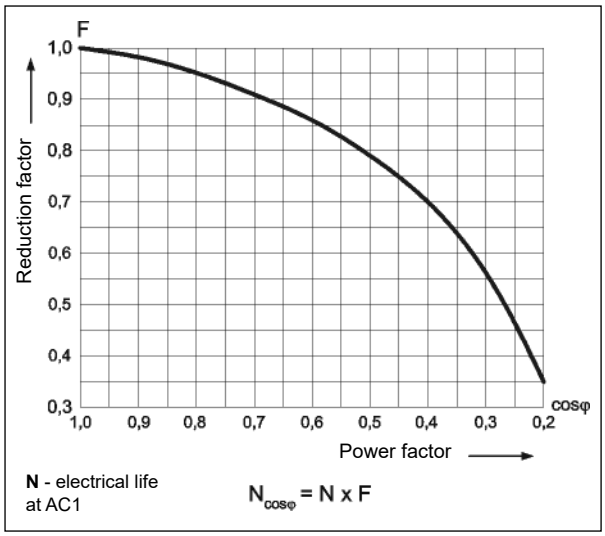
Operating / release time	• typical values • max. values	20 ms / 15 ms 25 ms / 35 ms	
Electrical life • resistive DC1 • DC L/R=40 ms		 > 2 x 10^5 10 A, 220 V DC > 2 x 10^5 2,5 A, 220 V DC	 > 2 x 10^5 3,8 A, 220 V DC > 2 x 10^5 0,4 A, 220 V DC
Mechanical life (cycles)		> 2 x 10^7	
Dimensions (L x W x H)		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.

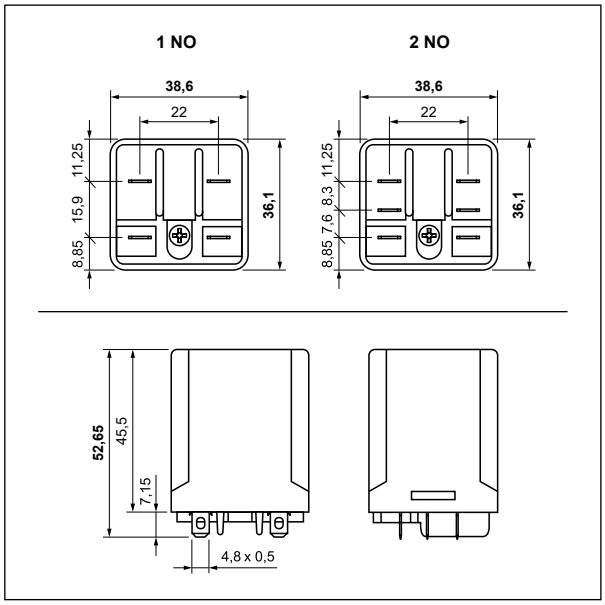
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



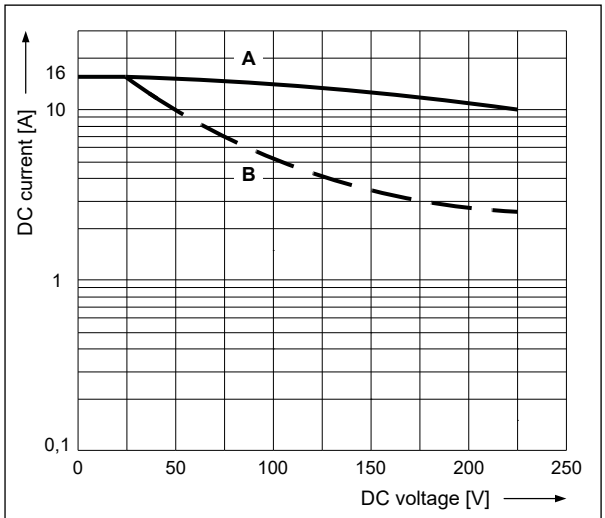
Electrical life reduction factor at AC inductive load Fig. 2



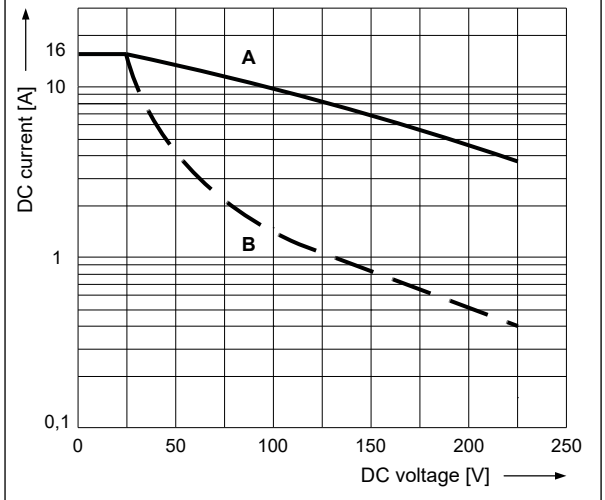
Dimensions



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3

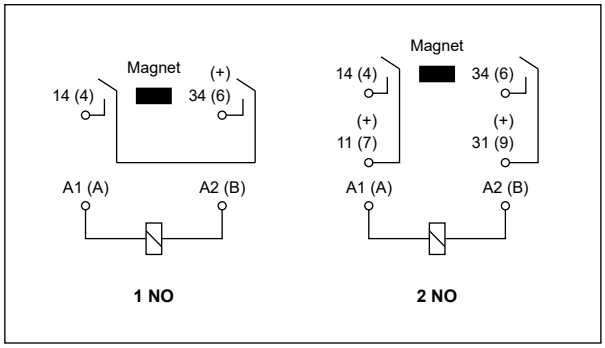


U_n = 24 V DC - version 1 NO (5 mm)



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

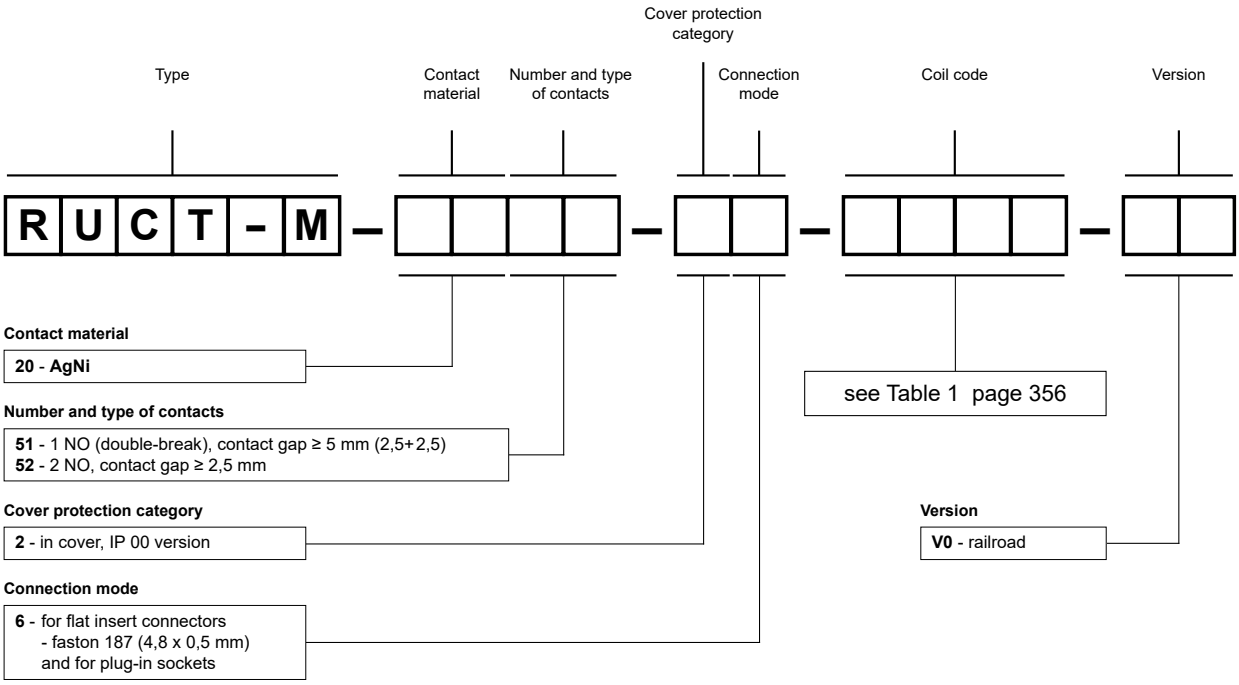
Coil data - DC voltage version

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.

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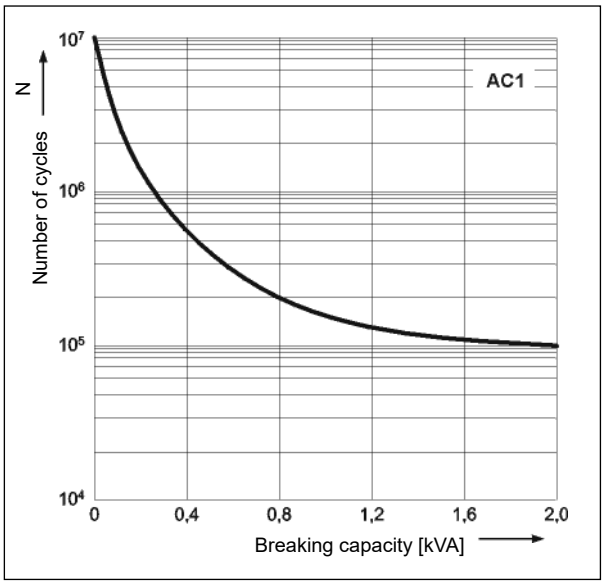
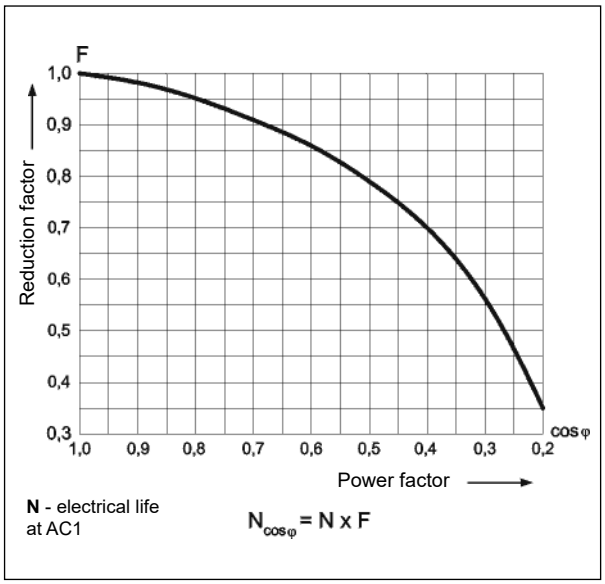
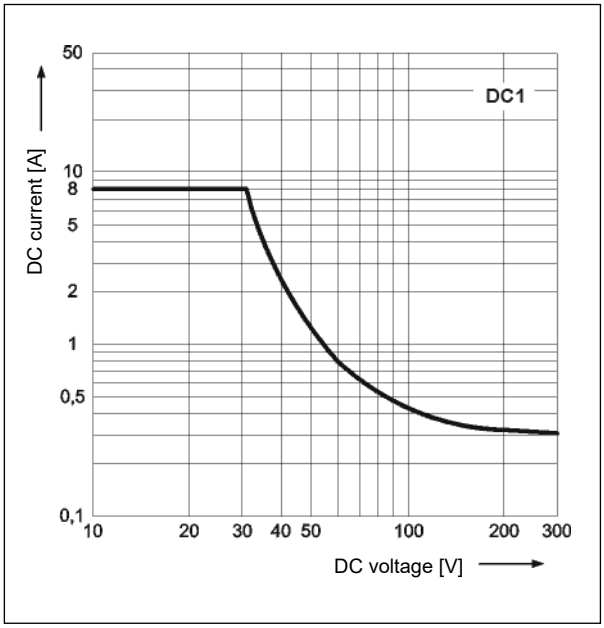
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



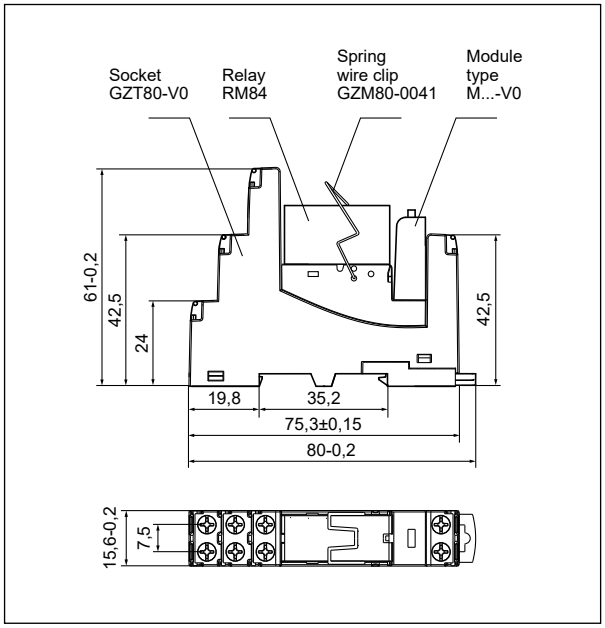
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC resistive load breaking capacity Fig. 3



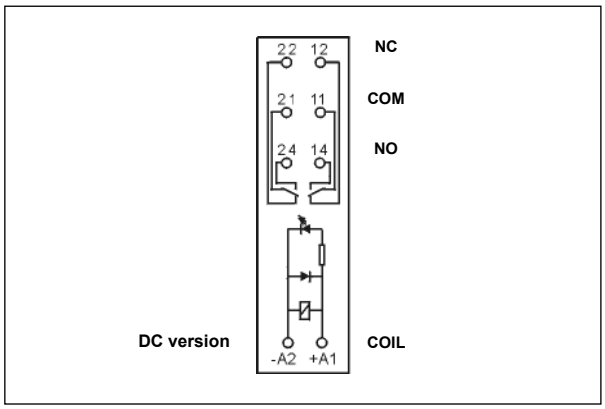
Dimensions



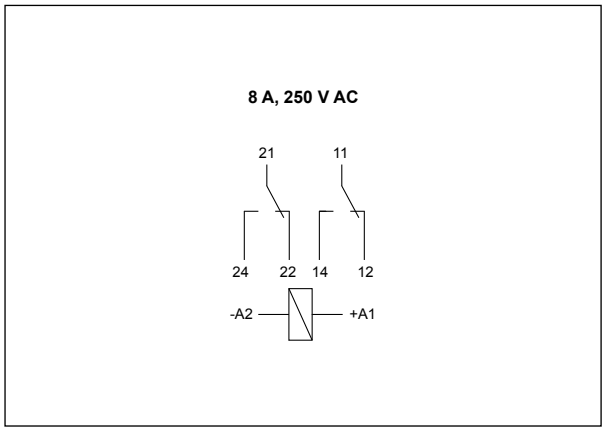
Mounting

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



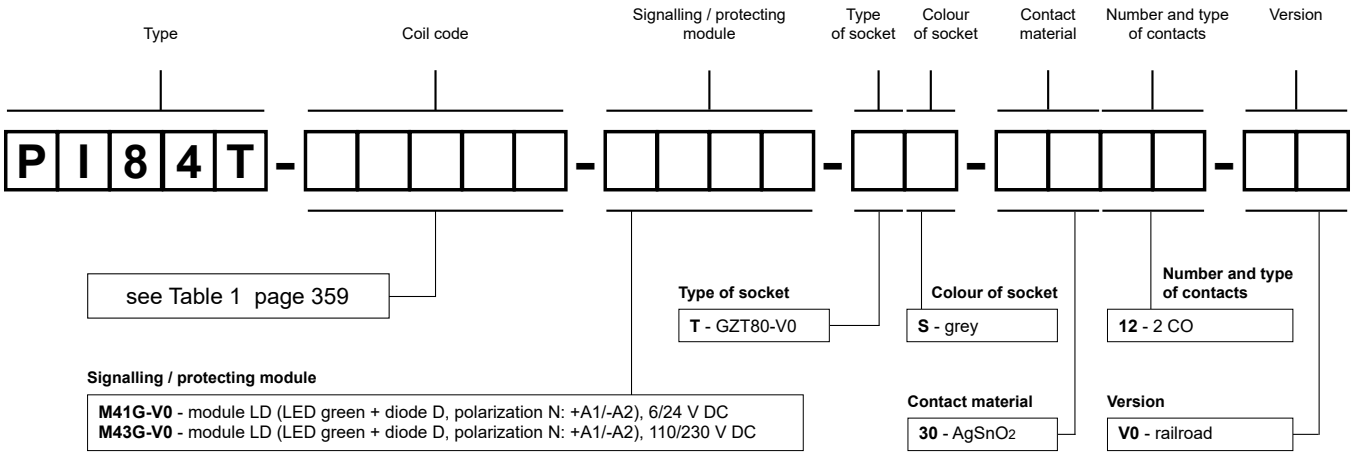
Coil data - DC voltage version

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

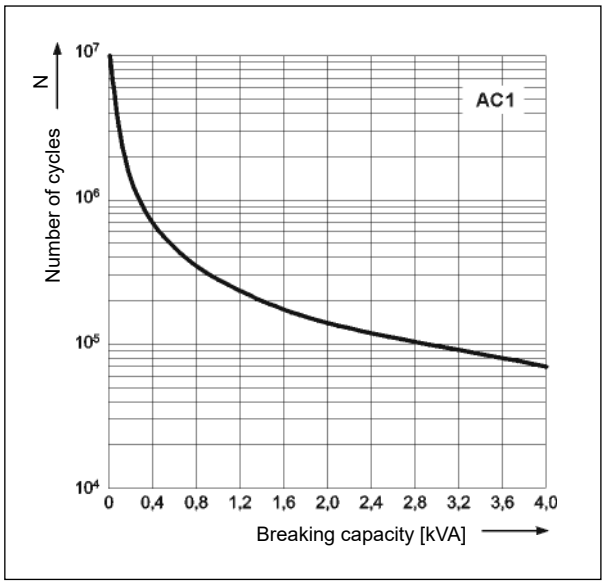
Insulation rated voltage	250 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Flammability class	V-0 UL 94, EN 60695-11-10
Dielectric strength	
• between coil and contacts	5 000 V AC type of insulation: reinforced
• contact clearance	1 000 V AC type of clearance: micro-disconnection
Contact - coil distance	
• clearance	≥ 10 mm
• creepage	≥ 10 mm

General data

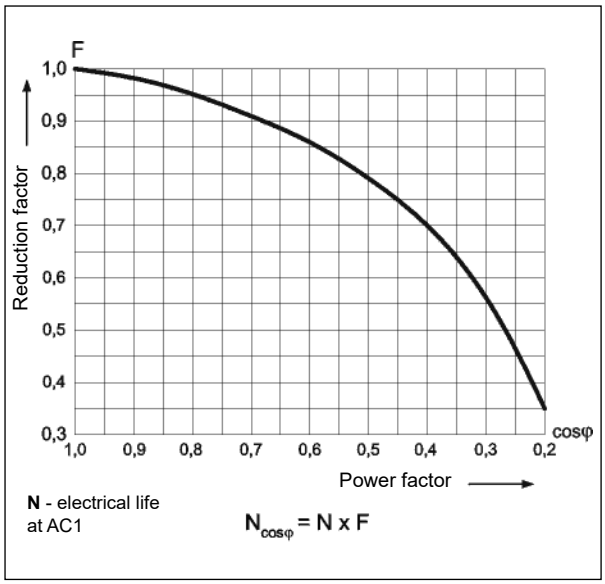
Operating / release time (typical values)		7 ms / 3 ms
Electrical life		
• resistive AC1		> 0,7 x 10^5 16 A, 250 V AC
• cosφ		see Fig. 2
• DC L/R=40 ms		> 10^5 0,12 A, 220 V DC
Mechanical life (cycles)		> 3 x 10^7
Dimensions (L x W x H)		80 x 15,6 x 61 mm
Weight		62 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• 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.

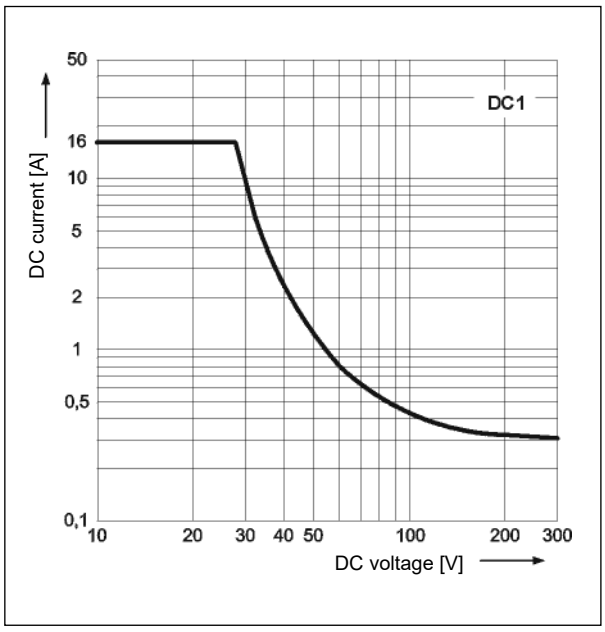
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1



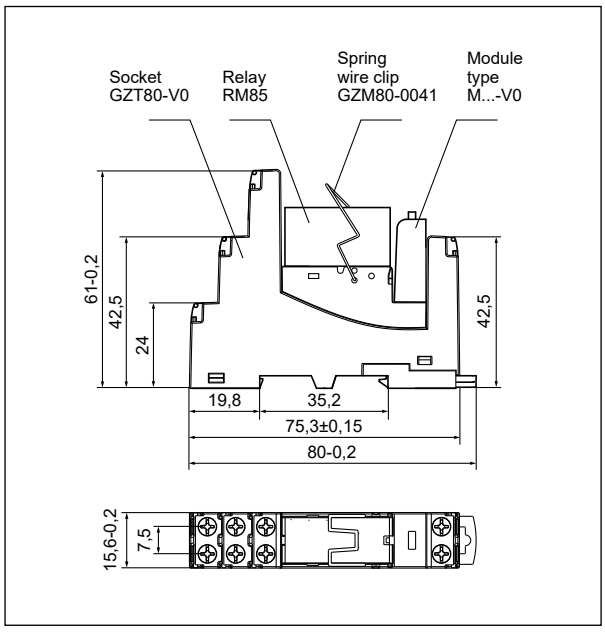
Electrical life reduction factor at AC inductive load Fig. 2



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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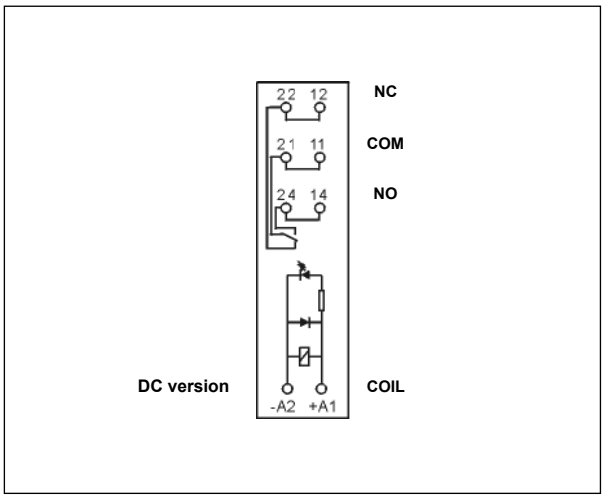
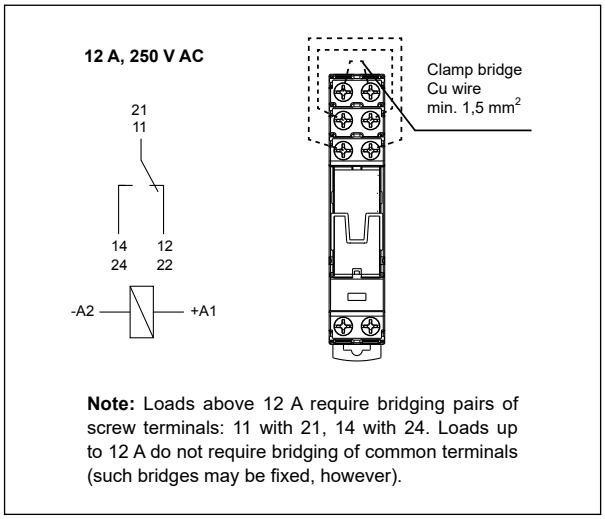
Connection diagram
(screw terminals side view)



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).

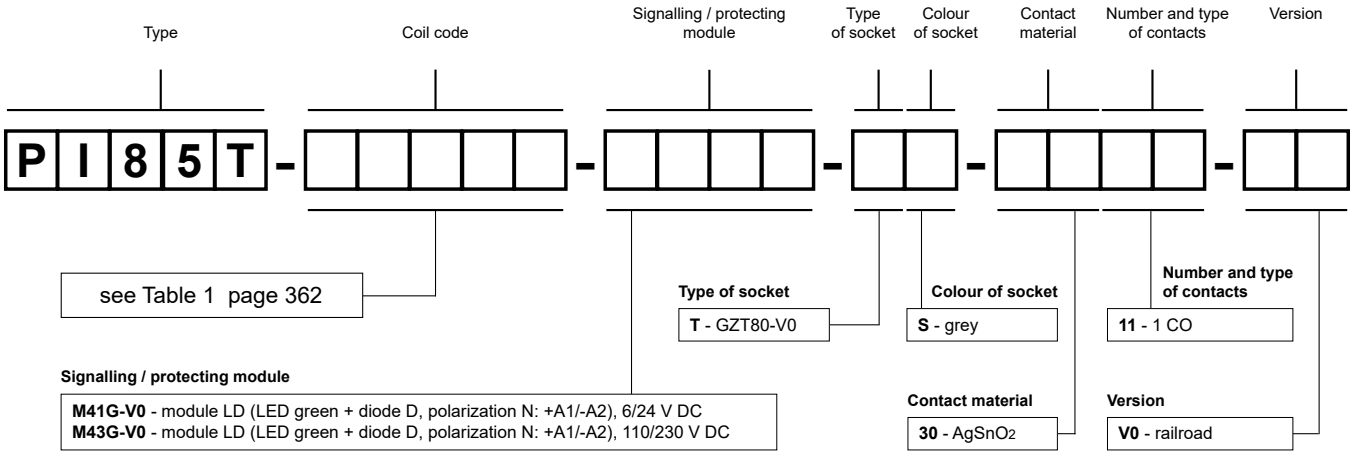
Coil data - DC voltage version

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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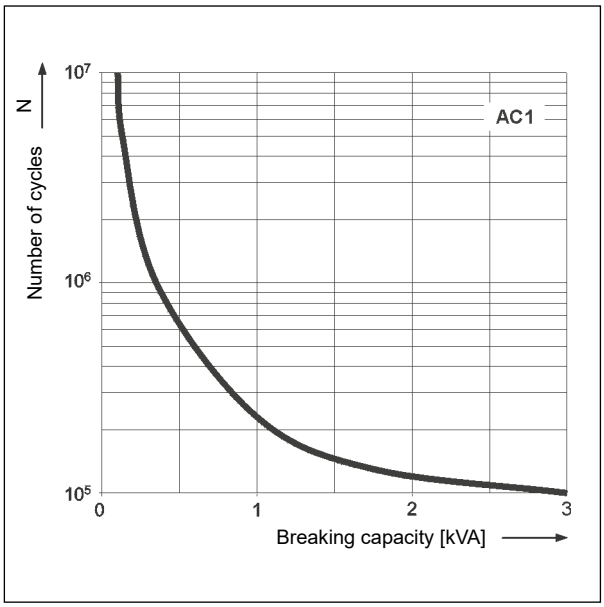
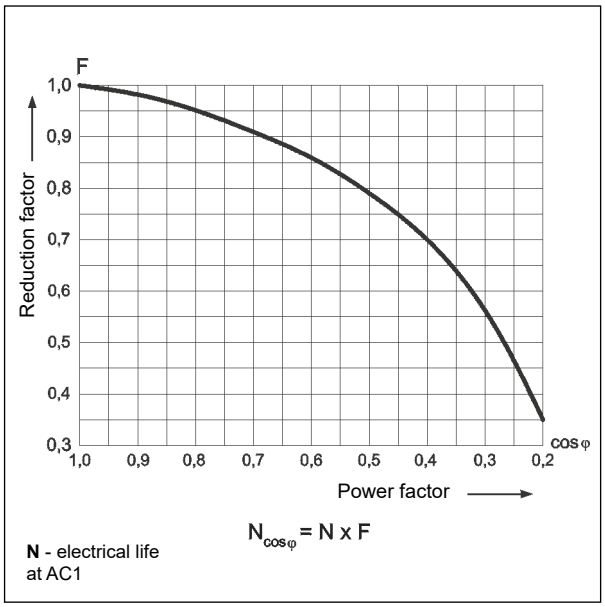
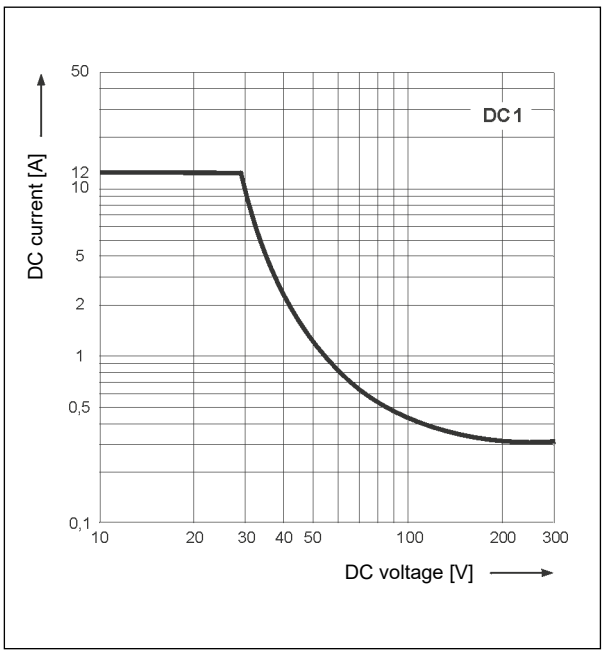
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



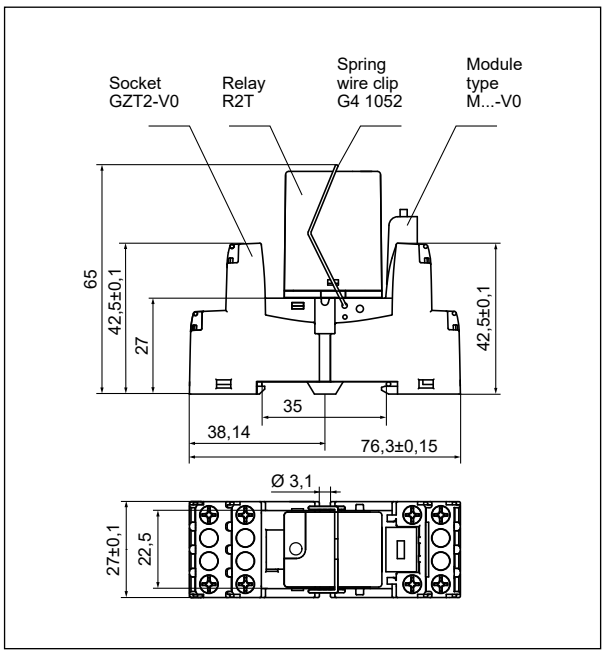
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC resistive load breaking capacity Fig. 3

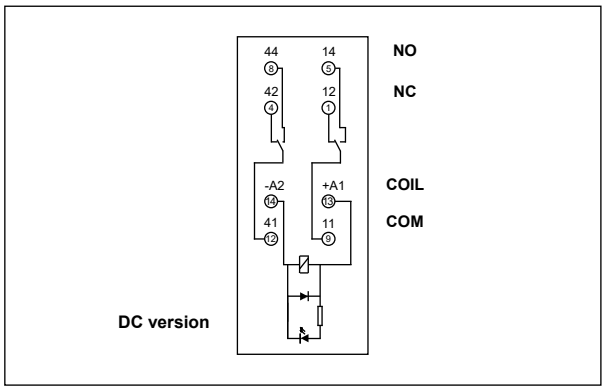


Dimensions



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.

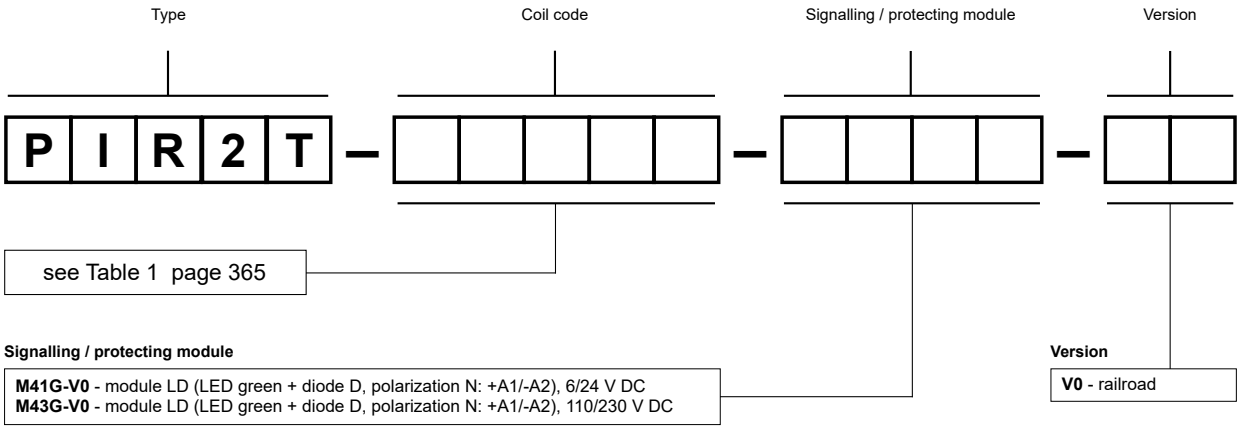
Coil data - DC voltage version

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

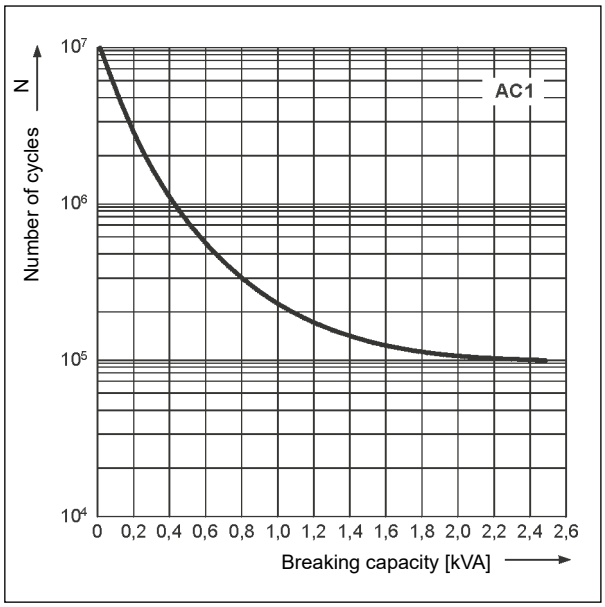
Insulation rated voltage	300 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	2
Flammability class	V-0 UL 94, EN 60695-11-10
Dielectric strength	
• between coil and contacts	2 500 V AC type of insulation: basic
• contact clearance	1 500 V AC type of clearance: micro-disconnection
• pole - pole	2 500 V AC type of insulation: basic
Contact - coil distance	
• clearance	≥ 2,5 mm
• creepage	≥ 4 mm

General data

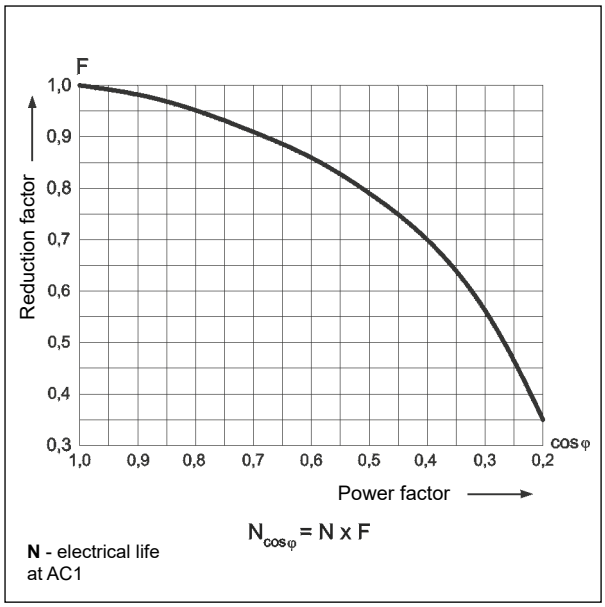
Operating / release time (typical values)		13 ms / 3 ms
Electrical life		
• resistive AC1		> 10^5 10 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		76,3 x 27 x 65 mm
Weight		87 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation and/or icing)	• 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.

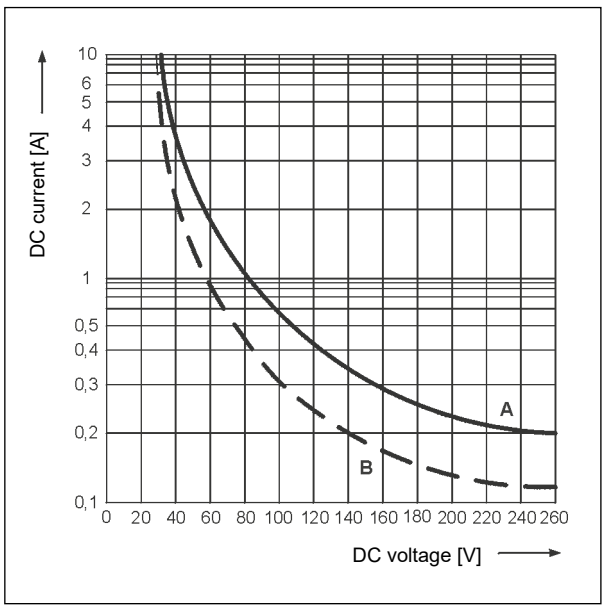
Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1



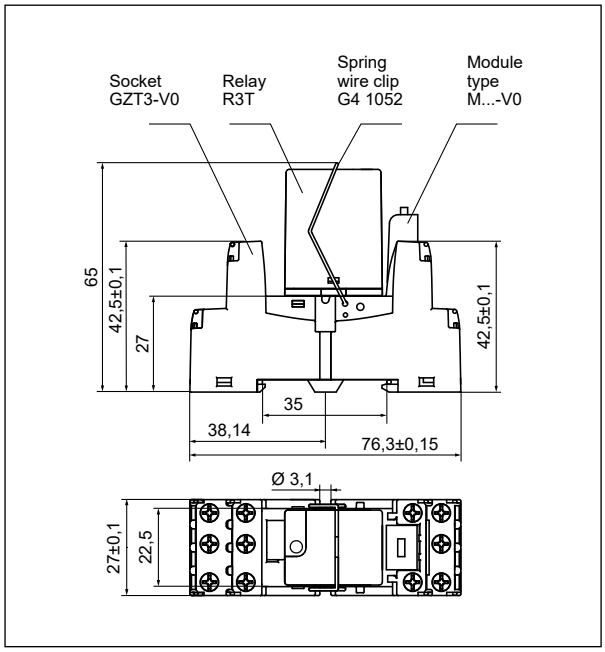
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Dimensions

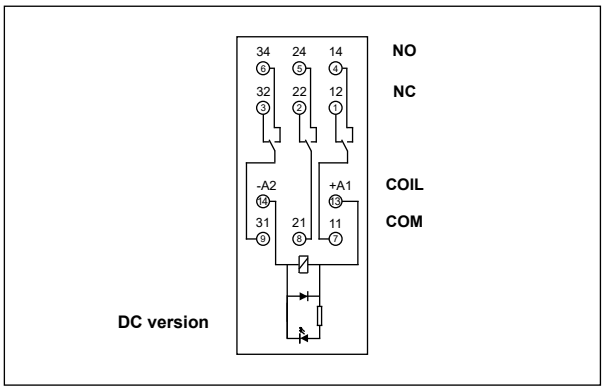


Relays for railroad industry - industrial

R2T R3T R4T

← Contents

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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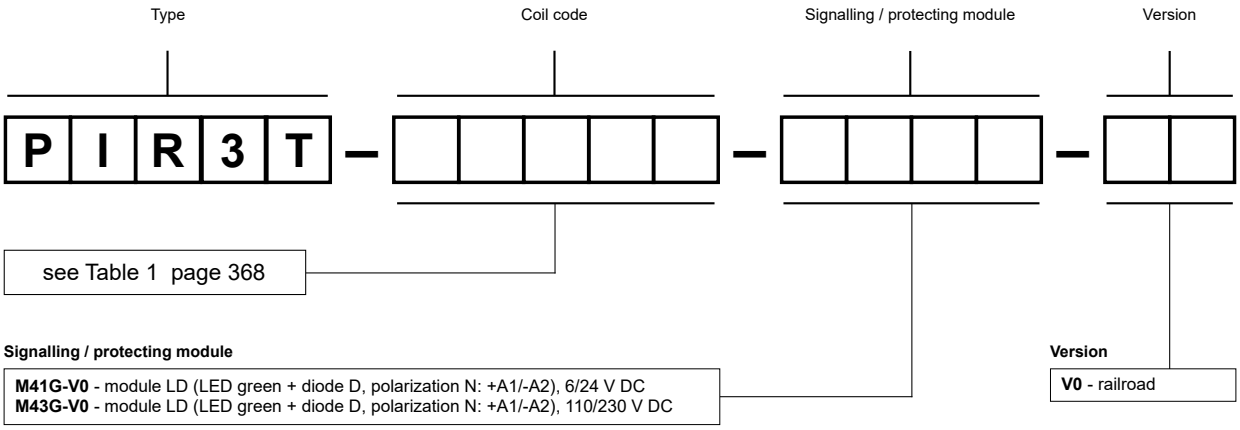
Coil data - DC voltage version

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,

CE EAC CIK

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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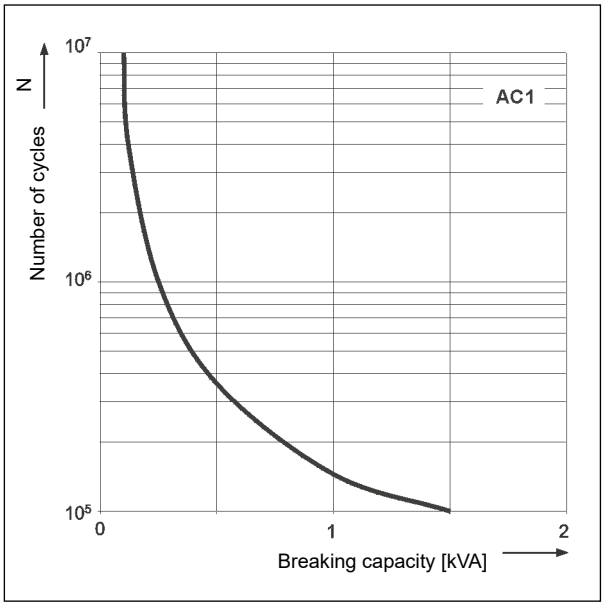
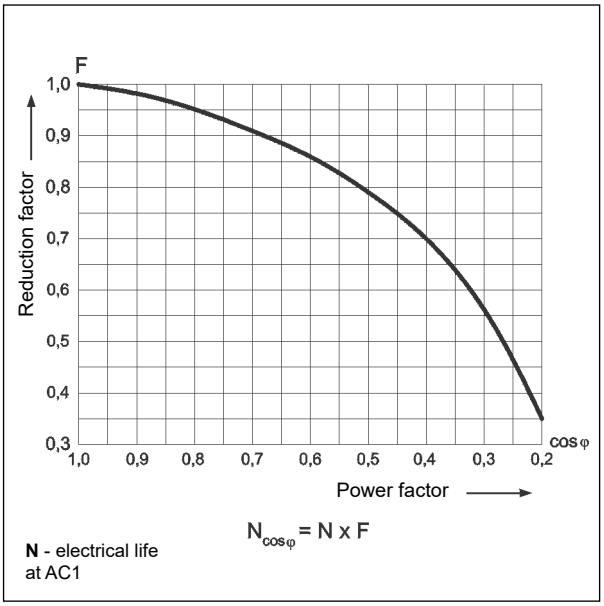
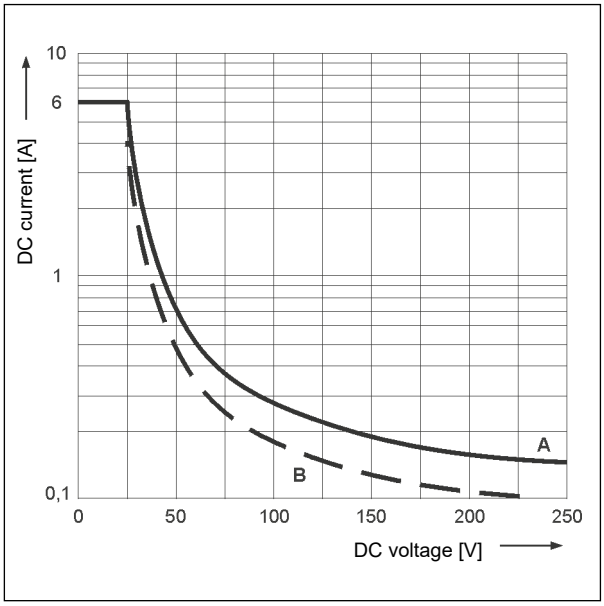
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



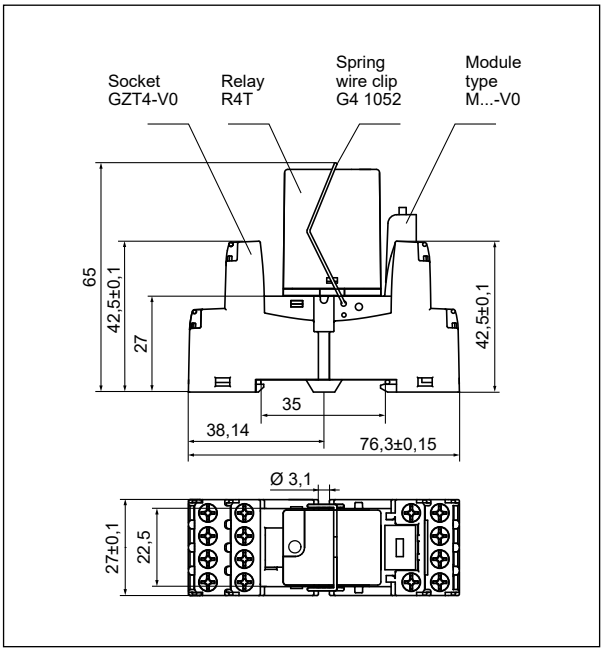
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3

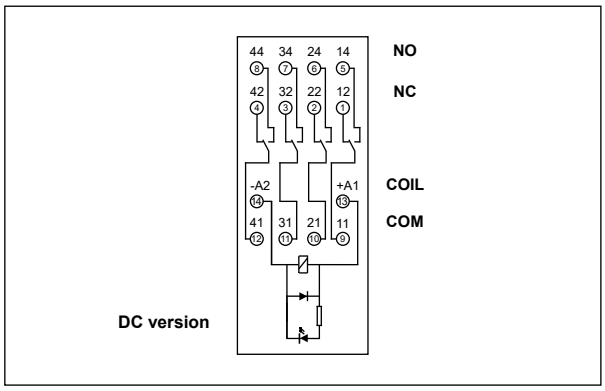


Dimensions



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

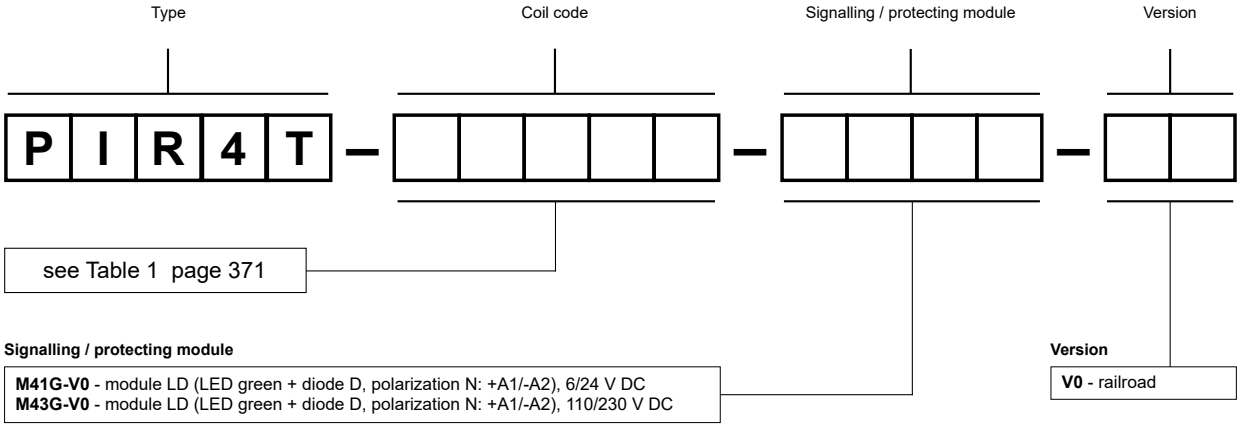
Coil data - DC voltage version

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,

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

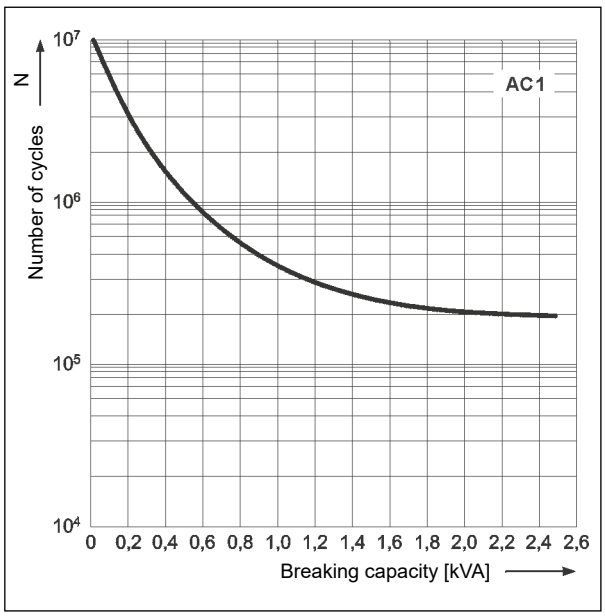
Insulation rated voltage	250 V AC
Rated surge voltage	2 500 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Flammability class	V-0 UL 94, EN 60695-11-10
Dielectric strength	
• between coil and contacts	2 500 V AC type of insulation: basic
• contact clearance	1 500 V AC type of clearance: micro-disconnection
• pole - pole	2 000 V AC type of insulation: basic
Contact - coil distance	
• clearance	≥ 3 mm
• creepage	≥ 4,2 mm

General data

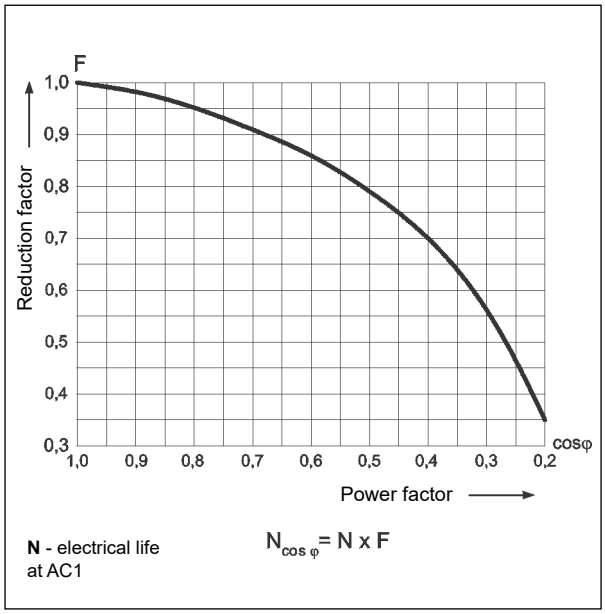
Operating / release time (typical values)		18 ms / 7 ms
Electrical life		
• resistive AC1		> 2 x 10^5 10 A, 250 V AC
• cosφ		see Fig. 2
Mechanical life (cycles)		> 2 x 10^7
Dimensions (L x W x H)		68,2 x 38 x 82 mm
Weight		PIR152T: 150 g PIR153T: 159 g
Ambient temperature	• storage	-40...+85 °C
(non-condensation 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.

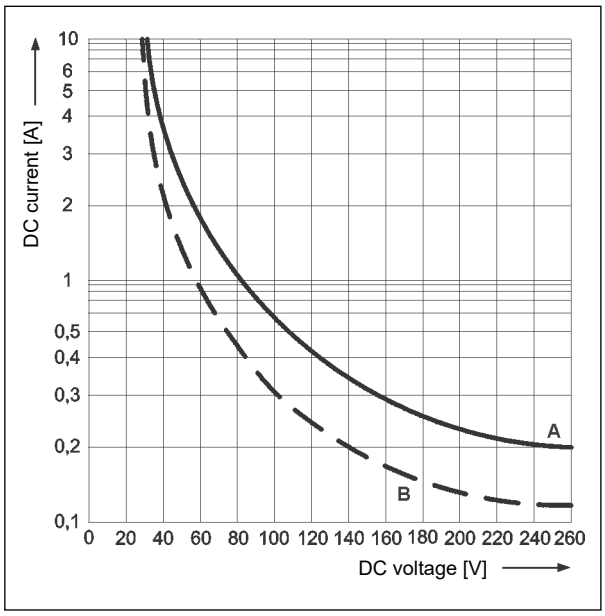
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



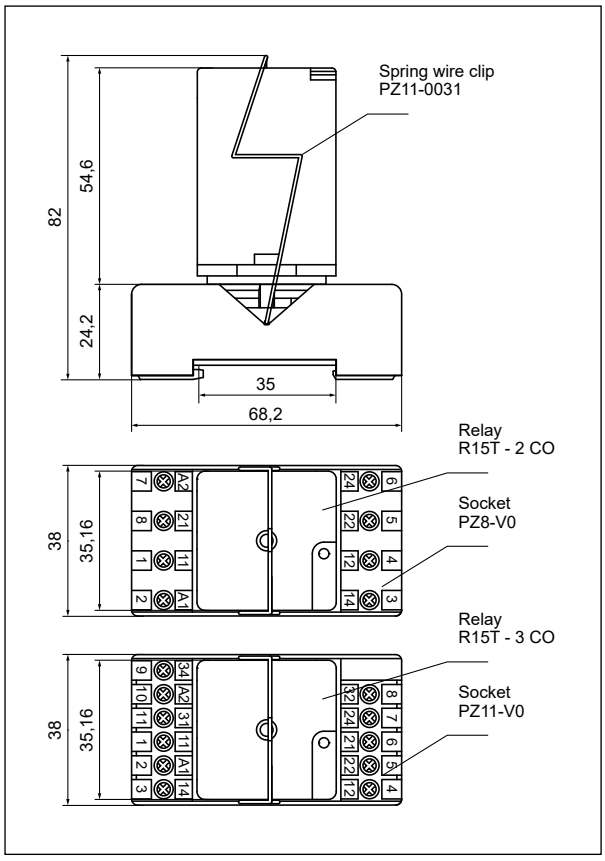
Electrical life reduction factor at AC inductive load Fig. 2



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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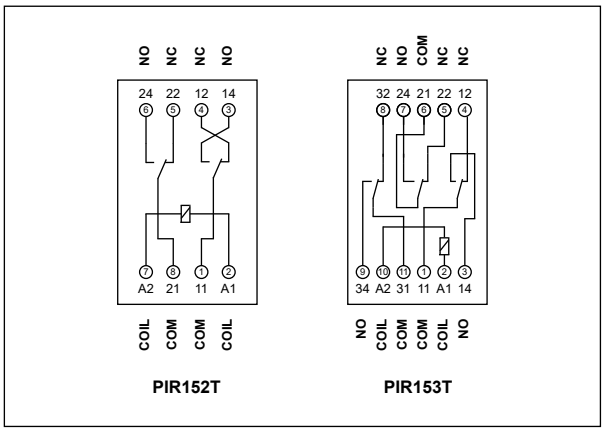
Connection diagrams
(screw terminals side view)



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

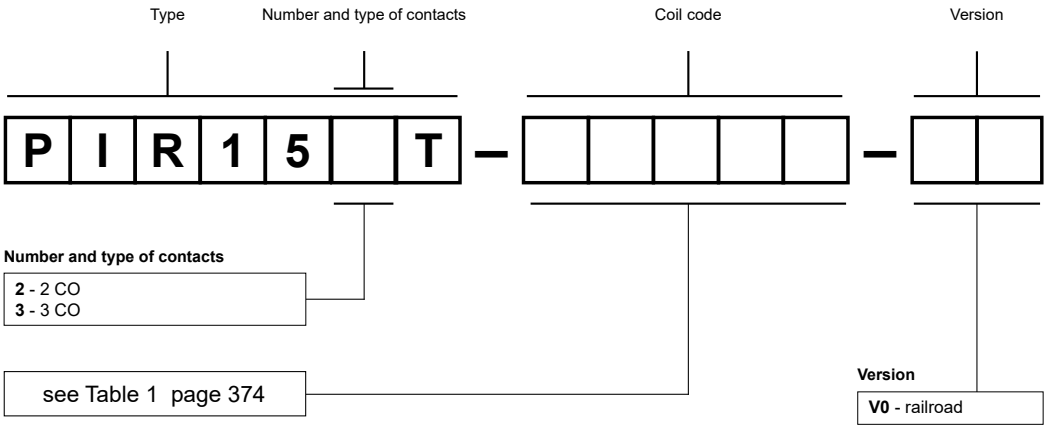
Coil data - DC voltage version

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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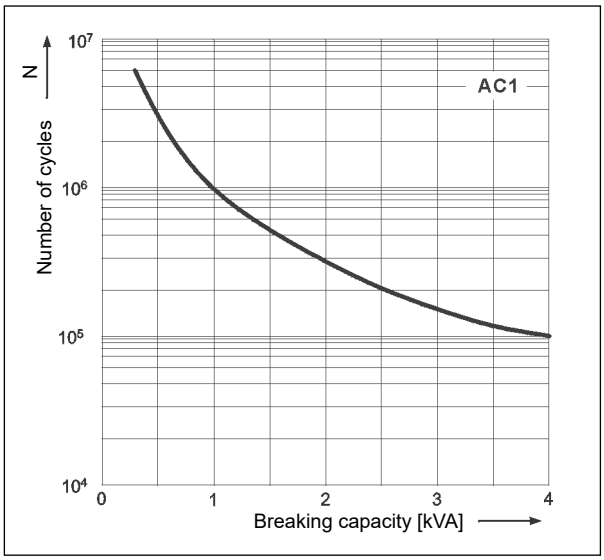
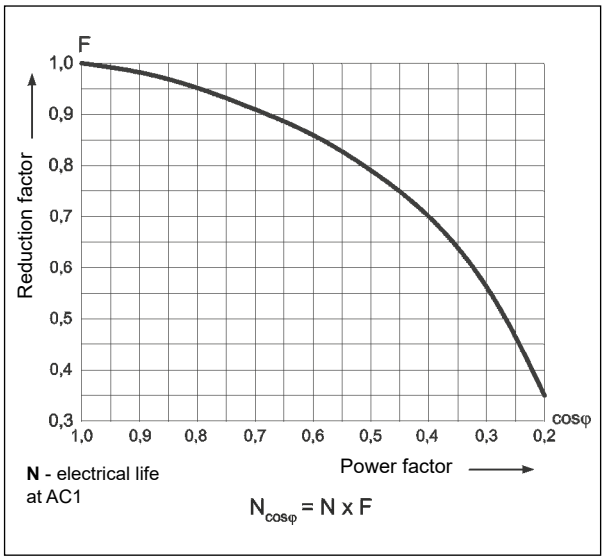
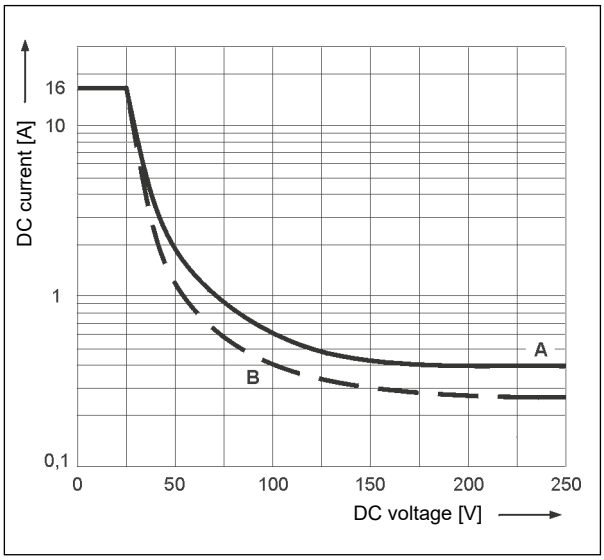
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



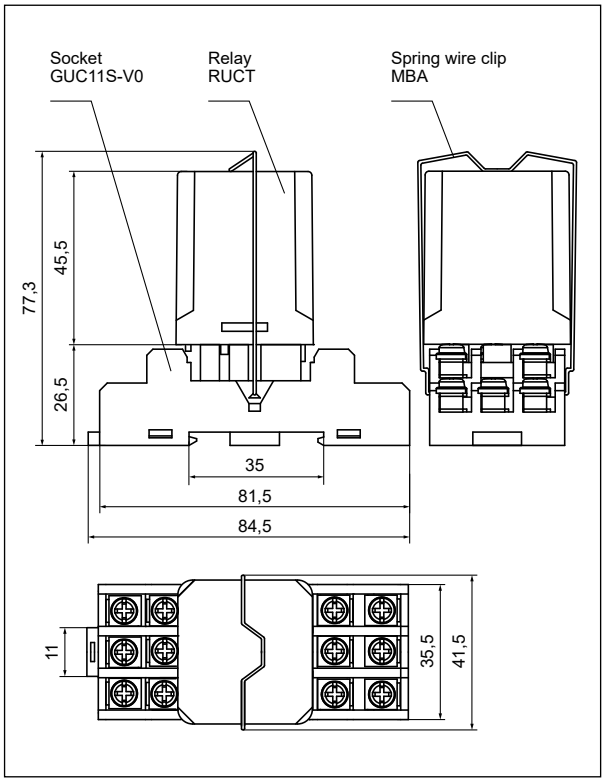
Electrical life reduction factor at AC inductive load Fig. 2



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms Fig. 3



Dimensions

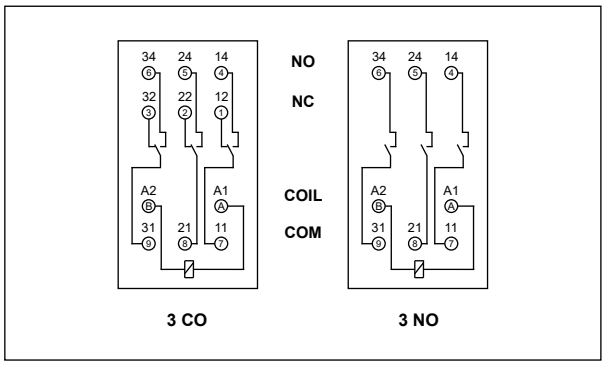


Relays for railroad industry - industrial

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.

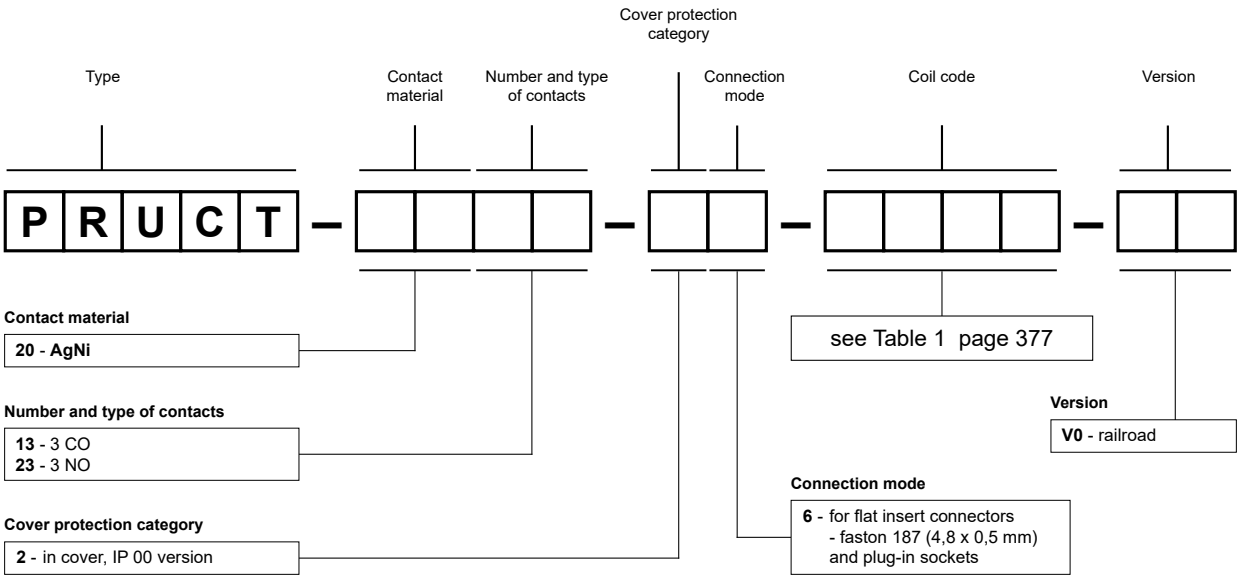
Coil data - DC voltage version

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

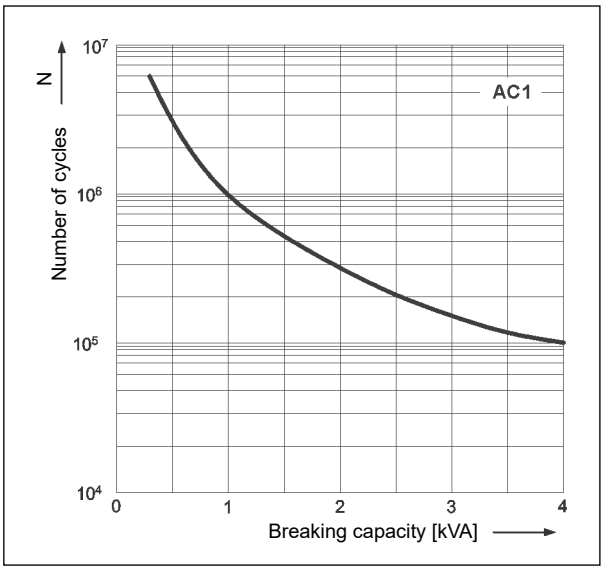
Insulation rated voltage		250 V AC
Rated surge voltage		4 000 V 1,2 / 50 µs
Overvoltage category		III
Insulation pollution degree		3
Flammability class		V-0 UL 94, EN 60695-11-10
Dielectric strength		
• between coil and contacts		2 500 V AC type of insulation: basic
• contact clearance		4 000 V AC contact 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

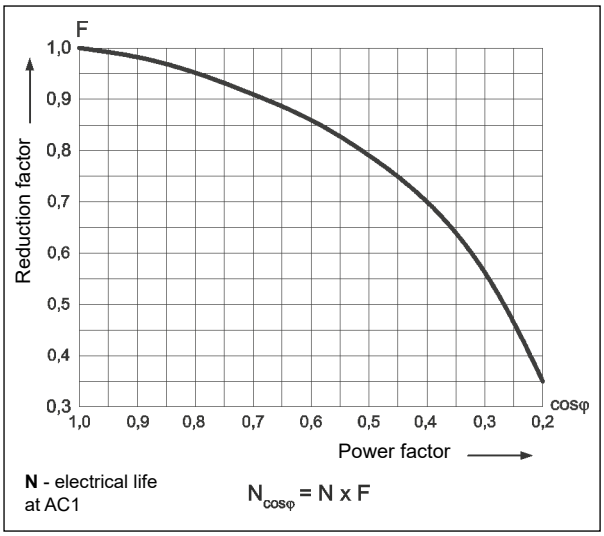
Operating / release time	• typical values	20 ms / 15 ms	
	• max. values	25 ms / 35 ms	
Electrical life			
• resistive DC1		> 2 x 10^5 10 A, 220 V DC	> 2 x 10^5 3,8 A, 220 V DC
• DC L/R=40 ms		> 2 x 10^5 2,5 A, 220 V DC	> 2 x 10^5 0,4 A, 220 V DC
Mechanical life (cycles)		> 2 x 10^7	
Dimensions (L x W 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.

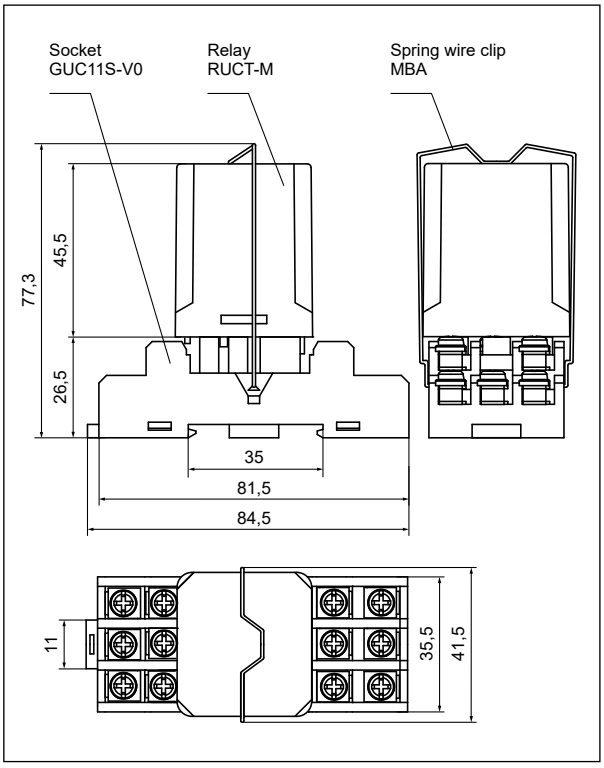
Electrical life at AC resistive load.
Switching frequency: 1 200 cycles/hour Fig. 1



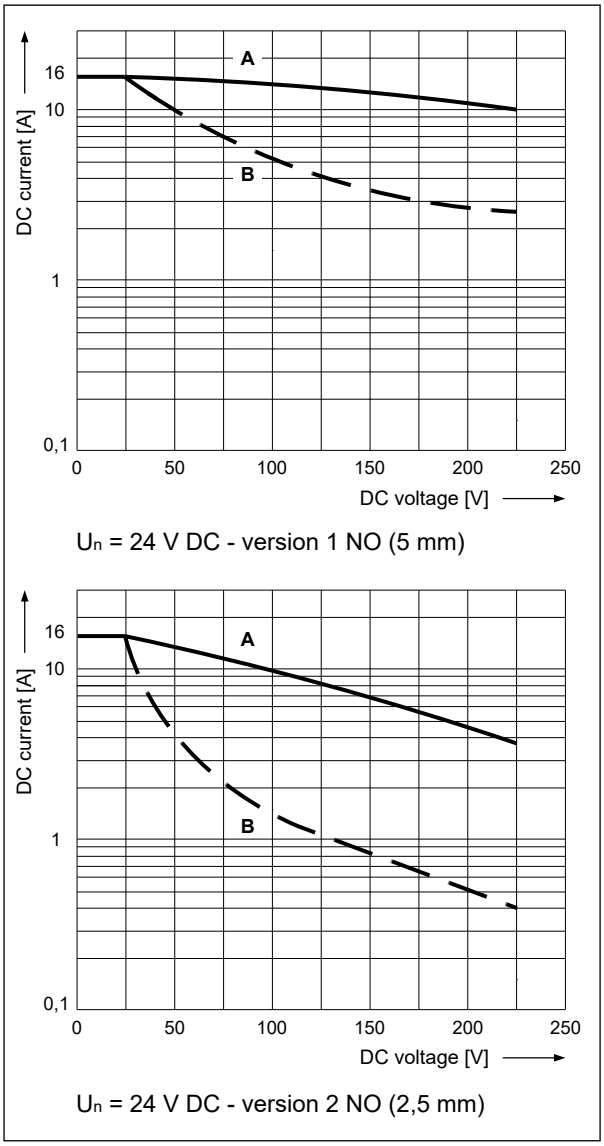
Electrical life reduction factor at AC inductive load Fig. 2



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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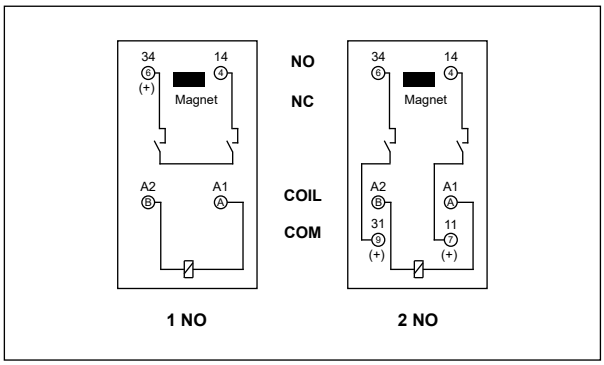
Connection diagrams
(screw terminals side view)



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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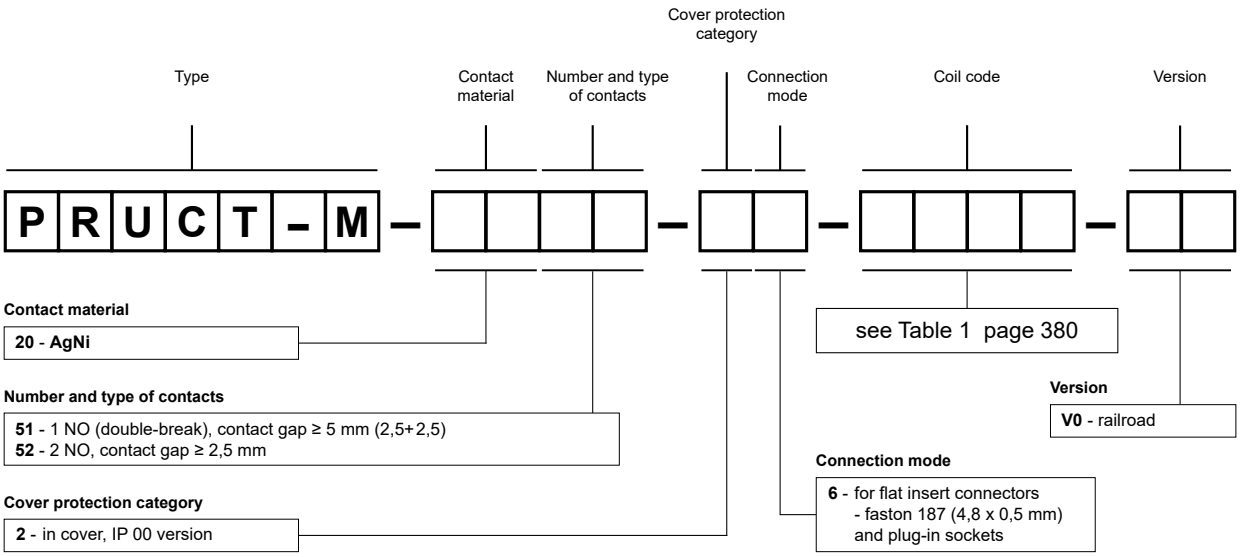
Coil data - DC voltage version

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**