

RM87, RM87 sensitive miniature relays

RM87N



RM87N-...-01 (AC) ①



RM87N-...-01 (DC) ①



- 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 ①; with the increased dielectric strength of the contact clearance ② • 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 ②	1 NO
Contact material		AgNi, AgNi/Au hard gold plating, AgSnO ₂	
Rated / max. switching voltage		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 ③
	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		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		600 cycles/hour	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	
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 • contact clearance	5 000 V AC	type of insulation: reinforced
		1 000 V AC	type of clearance: micro-disconnection
		2 000 V AC	contact 1 NO, type of clearance: full-disconnection ②
Contact - coil distance	• clearance • creepage	≥ 10 mm	
		≥ 10 mm	

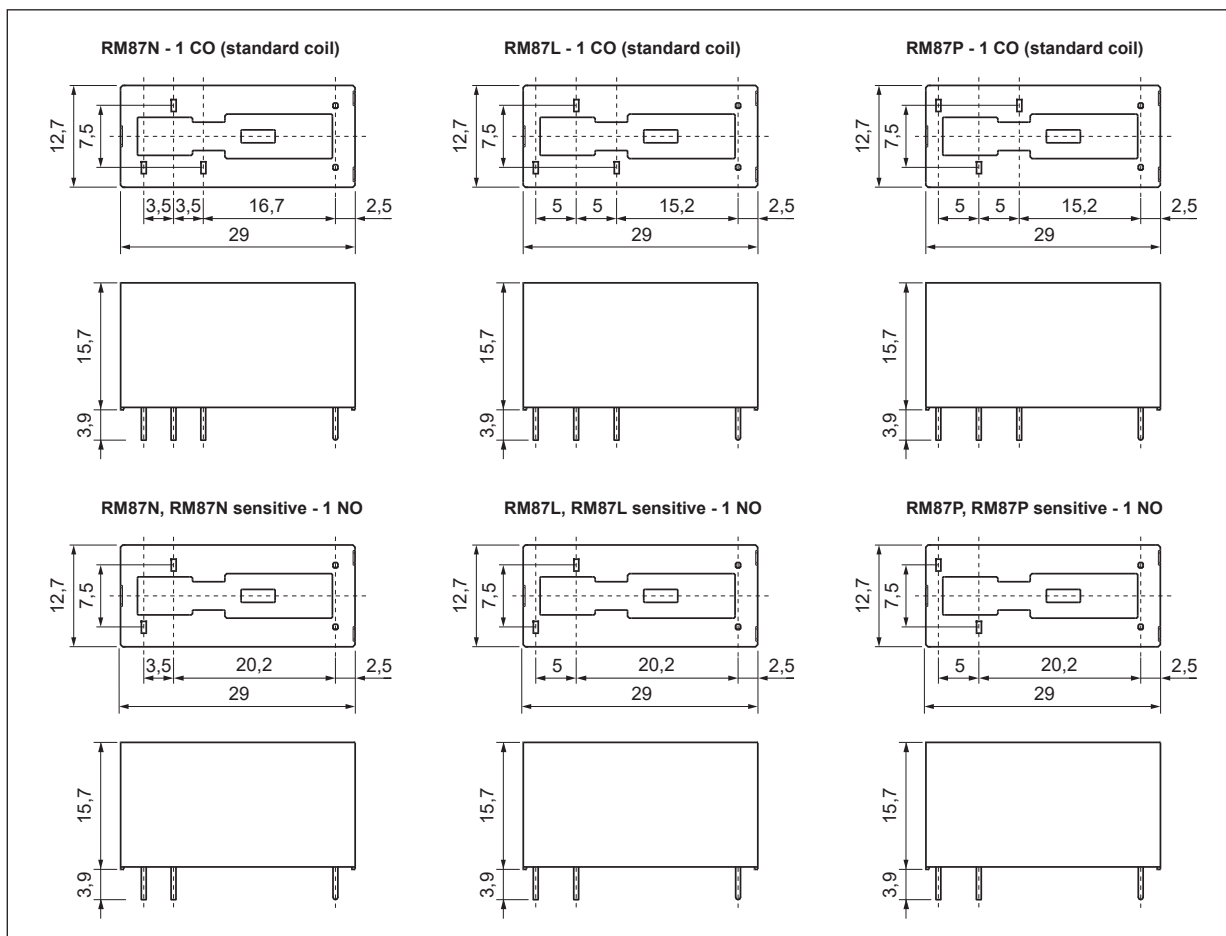
General data

Operating / release time (typical values)		7 ms / 3 ms	
Electrical life (number of cycles)	• resistive AC1	> 10 ⁵ 12 A, 250 V AC	> 1,7 x 10 ⁵ 10 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) / 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 ①
Cover protection category		IP 40 ① or IP 67	EN 60529
Environmental protection		RTII ① 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. ① Special versions - relays in transparent cover (certifications cULus, EAC), only available with IP 40 and RTII, operating temperature -20...+70 °C. See "Ordering codes". ② 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". ③ For single phase motors for 110-120 V AC do not use motors with higher FLA than given for 240 V AC.

RM87, RM87 sensitive miniature relays

Dimensions



Mounting, sockets and accessories for relays

Relays **RM87N** ④, **RM87N sensitive** and **RM87L** ④, **RM87L sensitive**, **RM87P** ④, **RM87P sensitive** are designed for: • direct PCB mounting • plug-in sockets.

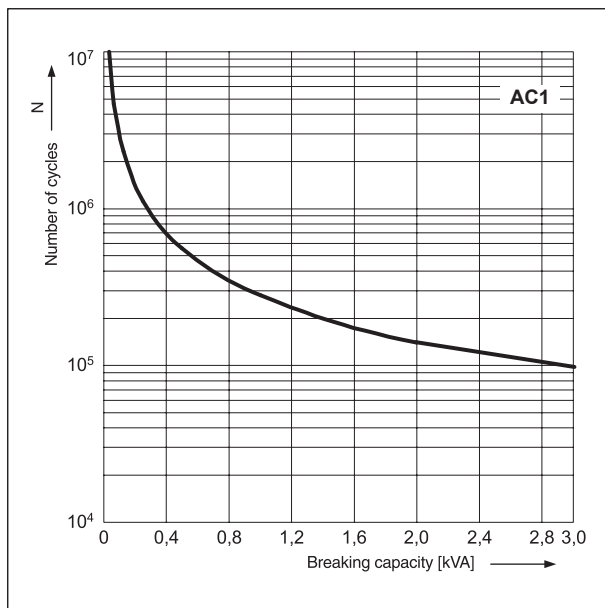
Sockets for RM87N ...	Sockets for RM87L ..., RM87P ...	Accessories			Additional equipment
		Retainer / retractor clips	Spring wire clips	Description plates	
Screw terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)					
GZT92	GZT80	GZT80-0040	GZM80-0041	GZT80-0035	M... ⑤, ZGGZ80 ⑦
GZM92	GZM80	GZT80-0040	GZM80-0041	GZT80-0035	M... ⑤, ZGGZ80 ⑦
GZS92	GZS80	GZS-0040	GZM80-0041	TR	M... ⑤, ZGGZ80 ⑦
–	GZF80	–	GZM80-0041	–	–
Push-in terminals sockets, 35 mm rail mount (acc. to EN 60715) or on panel mounting (one M3 screw)					
–	GZP80 ⑥	GZP80-0400, GZT80-0040	GZM80-0041	MP15	M... ⑤, ZGZP80-8, ZGZP80-2, ZGZP-2 ⑦
Sockets for PCB					
–	PW80	–	MH16-2	–	–
EC 35	EC 50	–	MP16-2 ⑧, MH16-2	–	–
GD35	GD50	–	MP16-2 ⑧, MH16-2, GD-0016	–	–

④ For relays in transparent cover: the distance at least 5 mm between the relays mounted side by side. ⑤ Sockets GZP80: wire connection - see page 9. ⑥ Signalling / protecting modules type M... - see page 13. ⑦ Interconnection strips ZGGZ80, ZGZP... - see page 14-15. ⑧ Plastic clips MP16-2.

RM87, RM87 sensitive miniature relays

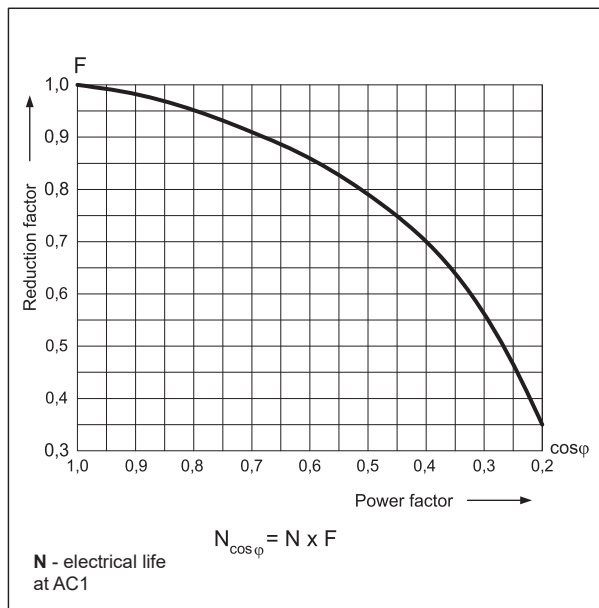
Electrical life at AC resistive load.
Switching frequency: 600 cycles/hour

Fig. 1



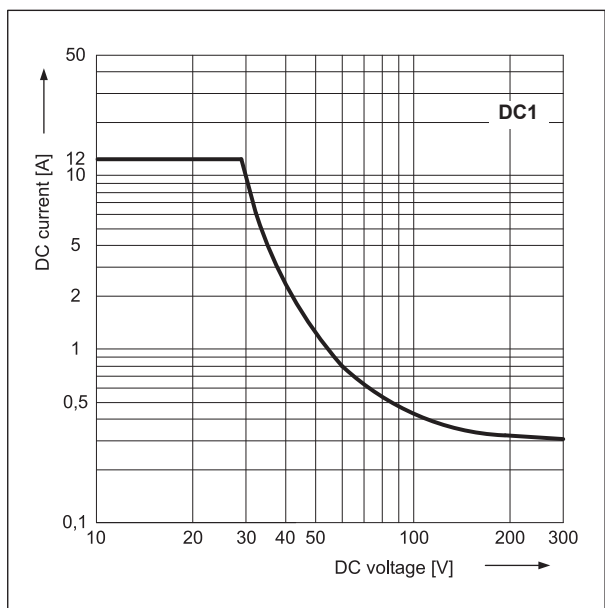
Electrical life reduction factor at AC inductive load

Fig. 2



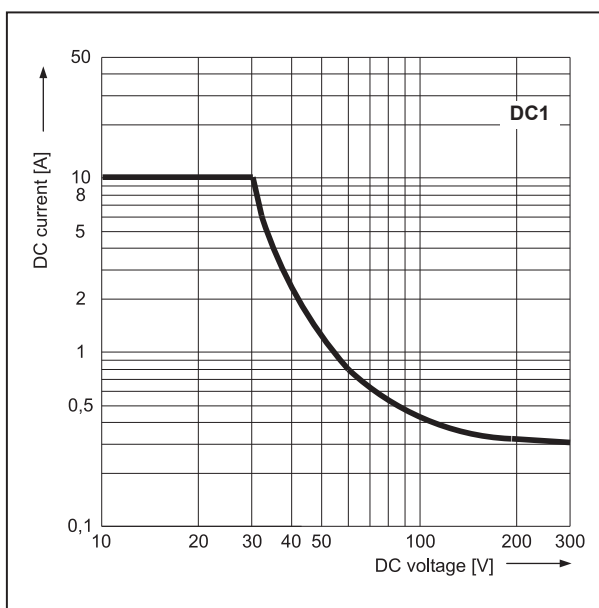
Max. DC resistive load breaking capacity - standard coil

Fig. 3



Max. DC resistive load breaking capacity - sensitive coil

Fig. 4



RM87

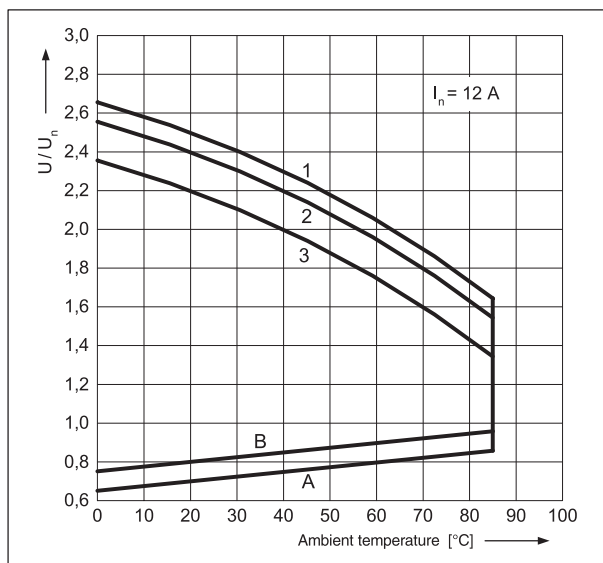
Transparent cover IP 40,
certifications cULus, EAC
(orange colour - AC coils,
blue colour - DC coils)



RM87, RM87 sensitive miniature relays

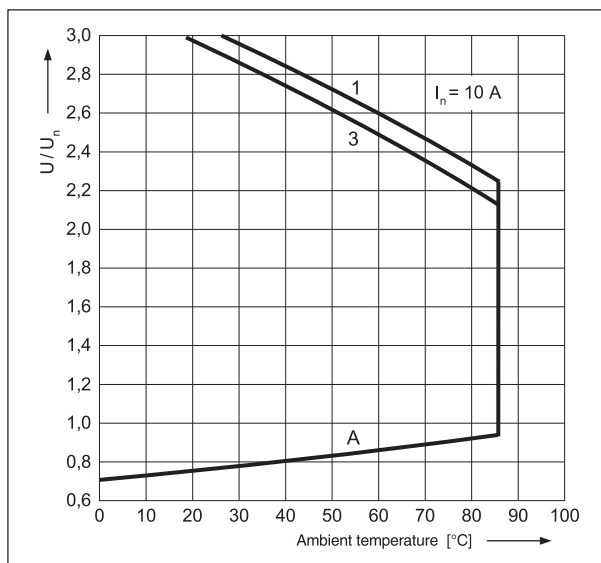
Coil operating range - DC
- standard coil

Fig. 5



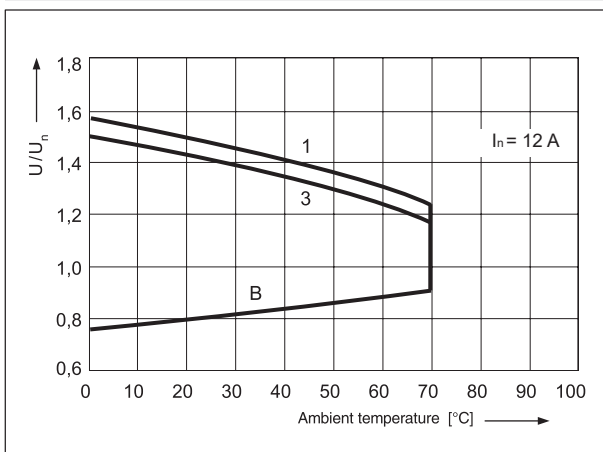
Coil operating range - DC
- sensitive coil

Fig. 6



Coil operating range - AC 50 Hz

Fig. 7



Description of Fig. 5, 6 and 7

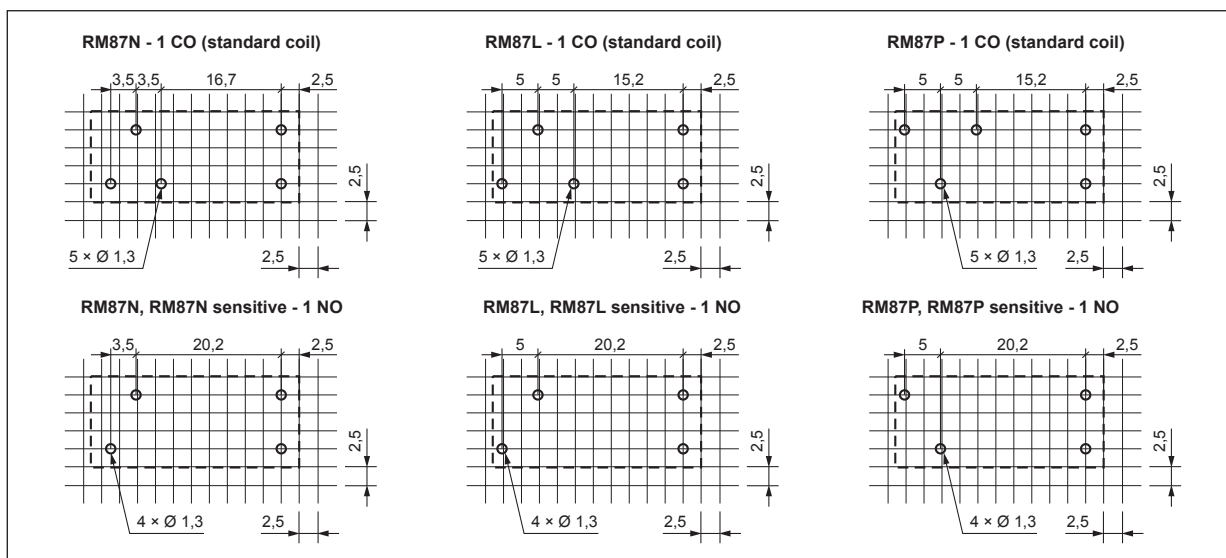
A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).

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)



RM87, RM87 sensitive miniature relays

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)

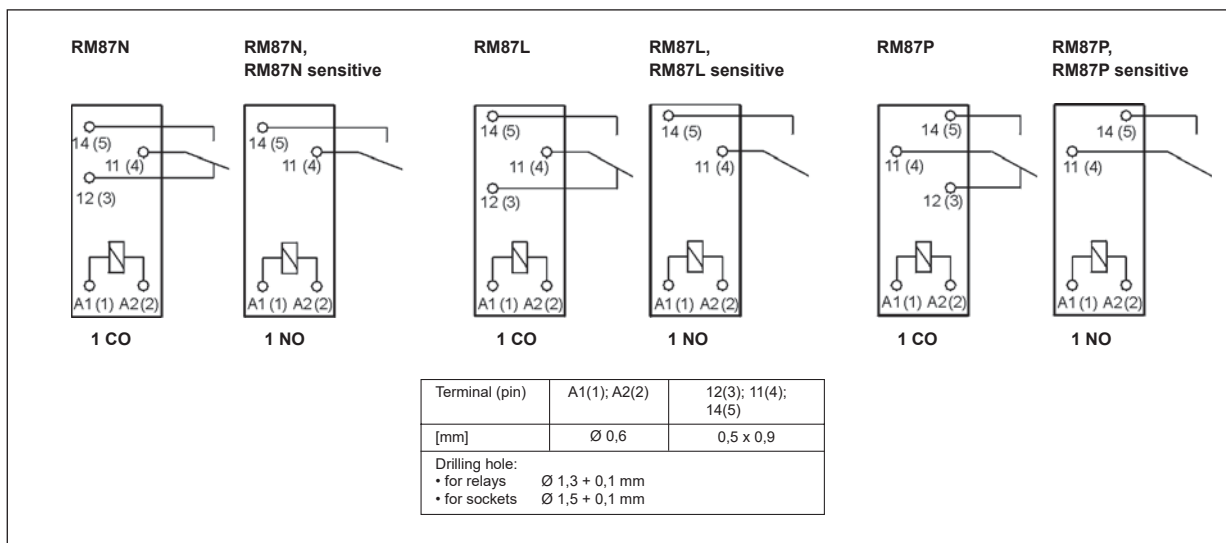
Table 3

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.

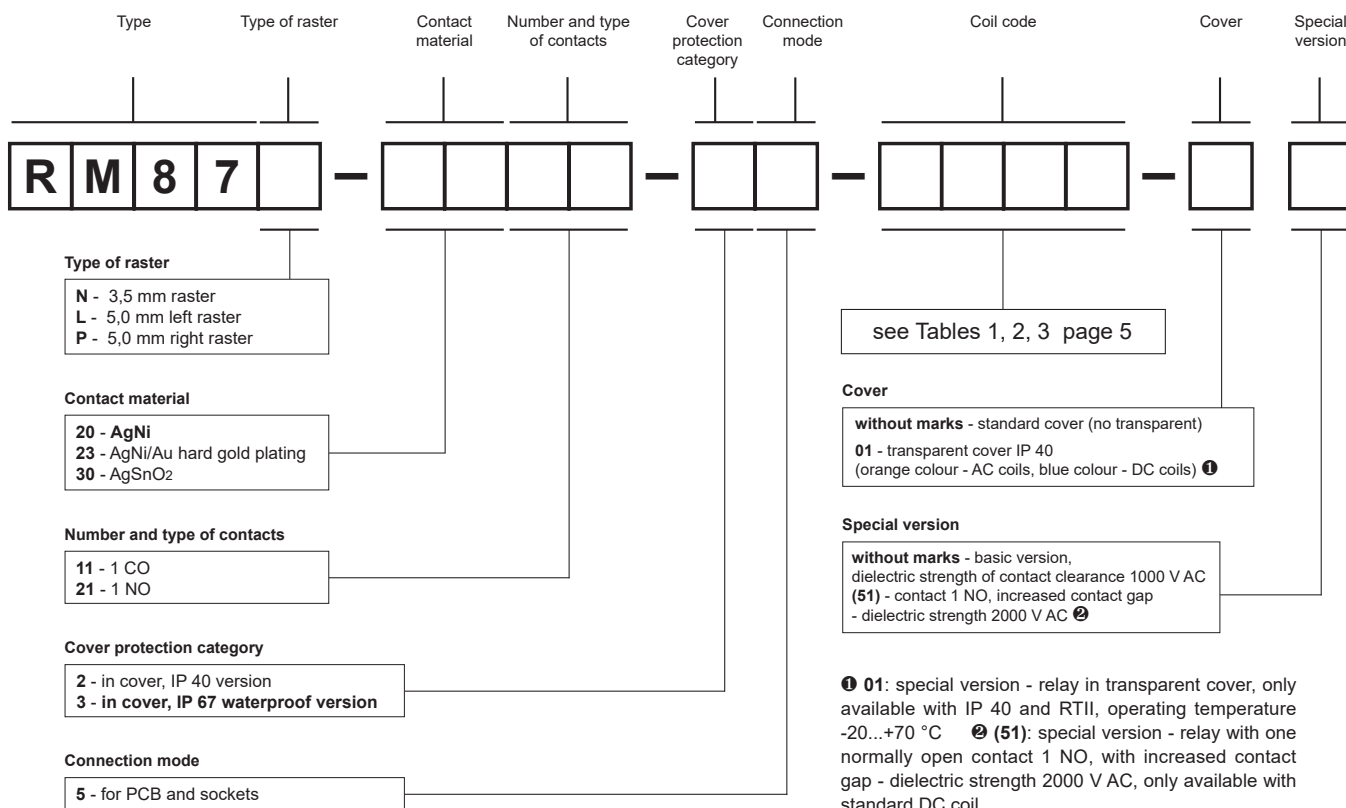
RM87, RM87 sensitive miniature relays

Connection diagrams (pin side view)



Ordering codes

RM87 sensitive - sensitive coil: relays only available with one normally open contact.



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 AgSnO₂, sensitive coil voltage 12 V DC, in standard cover (no transparent) IP 67

Sockets and accessories

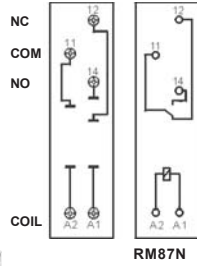
GZT92

For RM87N, RM87N sensitive

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
80 x 15,6 x 61(67) mm ^②
One pole, 3,5 mm pinout
12 A, 300 V AC



Connection diagrams



RM87N

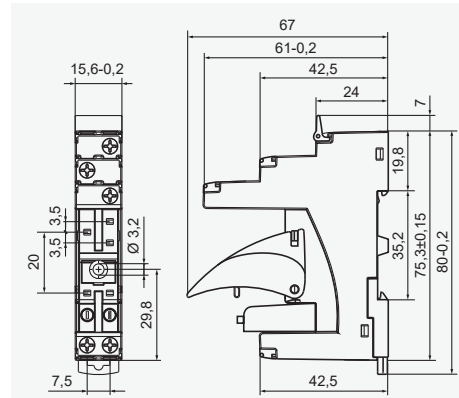
GZT80-0035

Module type M...



GZM80-0041

Dimensions



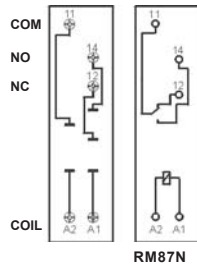
GZM92

For RM87N, RM87N sensitive

Screw terminals
Max. tightening moment
for the terminal: 0,7 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
81,6 x 15,9 x 61(67) mm ^②
One pole, 3,5 mm pinout
12 A, 300 V AC



Connection diagrams



RM87N

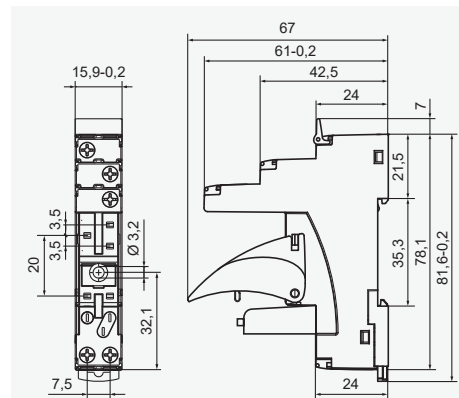
GZT80-0035

Module type M...



GZM80-0041

Dimensions



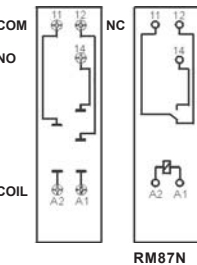
GZS92

For RM87N, RM87N sensitive

Screw terminals
Max. tightening moment
for the terminal: 0,5 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
76,8 x 15,8 x 42,5(57,1) mm ^②
One pole, 3,5 mm pinout
12 A, 300 V AC



Connection diagrams



RM87N

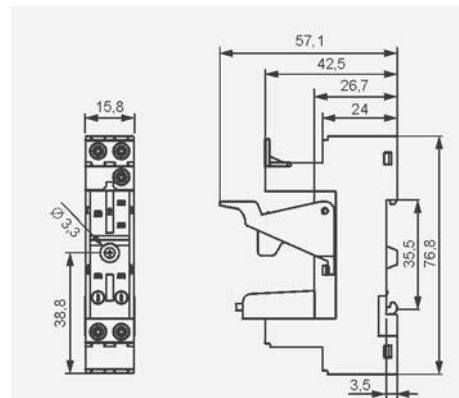
TR

Module type M...



GZM80-0041

Dimensions



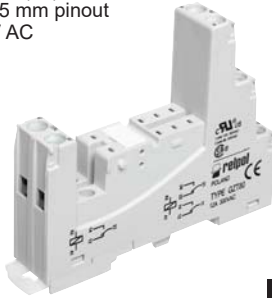
- ① Mounting and sub-assemblies of accessories in the socket - see page 10. Signalling / protecting modules type M... - see page 13.
- ② In the bracket the height of socket with retainer / retractor clip is shown.

Sockets and accessories

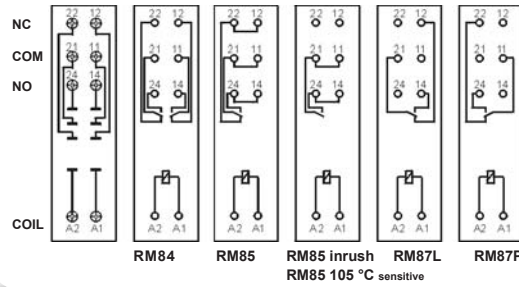
GZT80

For RM84, RM85, RM85 inrush, RM85 105 °C sensitive, RM87L, RM87L sensitive, RM87P, RM87P sensitive

Screw terminals
Max. tightening moment for the terminal: 0,7 Nm
35 mm rail mount acc. to EN 60715 or on panel mounting
80 x 15,6 x 61(67) mm
Two poles, 5 mm pinout
12 A, 300 V AC



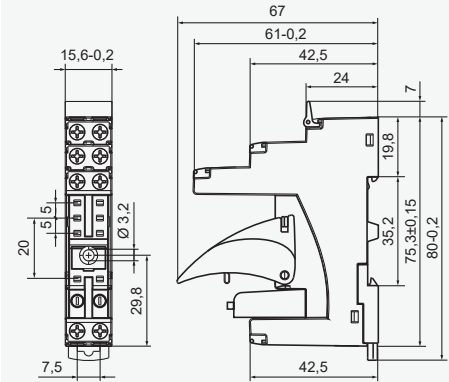
Connection diagrams ④



Accessories ①

ZGGZ80 GZM80-0041

Dimensions



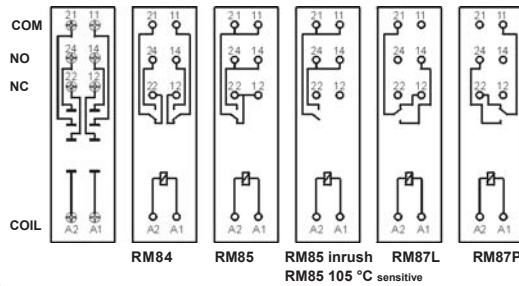
GZM80

For RM84, RM85, RM85 inrush, RM85 105 °C sensitive, RM87L, RM87L sensitive, RM87P, RM87P sensitive

Screw terminals
Max. tightening moment for the terminal: 0,7 Nm
35 mm rail mount acc. to EN 60715 or on panel mounting
81,6 x 15,9 x 61(67) mm
Two poles, 5 mm pinout
12 A, 300 V AC



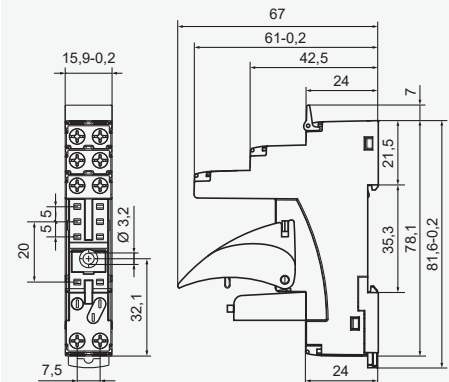
Connection diagrams ④



Accessories ①

ZGGZ80 GZM80-0041

Dimensions



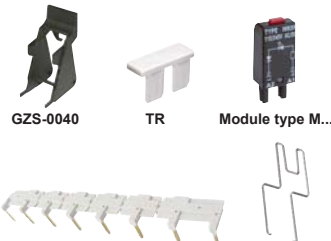
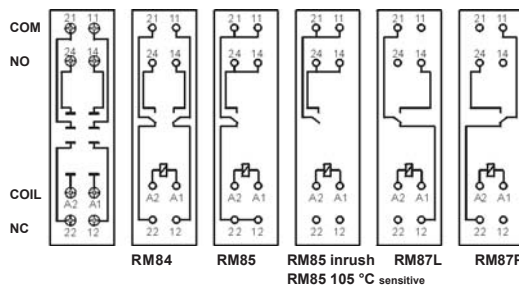
GZS80

For RM84, RM85, RM85 inrush, RM85 105 °C sensitive, RM87L, RM87L sensitive, RM87P, RM87P sensitive

Screw terminals
Max. tightening moment for the terminal: 0,5 Nm
35 mm rail mount acc. to EN 60715 or on panel mounting
76,8 x 15,8 x 42,5(57,1) mm
Two poles, 5 mm pinout
10 A, 300 V AC



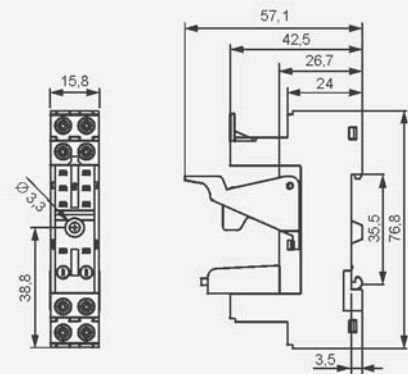
Connection diagrams ④



Accessories ①

ZGGZ80 GZM80-0041

Dimensions



① Mounting and sub-assemblies of accessories in the socket - see page 10. Signalling / protecting modules type M... - see page 13. ② In the bracket the height of socket with retainer / retractor clip is shown. ④ For RM85..., RMP85: loads above 12 A (GZT80, GZM80, GZP80) or 10 A (GZS80, GZF80) require bridging pairs of terminals: 11 with 21, 12 with 22, 14 with 24 - see www.repol.com.pl

Sockets and accessories

GZP80

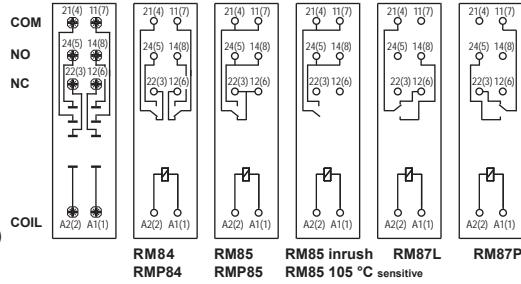
For RM84, RM85,
RM85 inrush,
RM85 105 °C sensitive,
RM87L, RM87L sensitive,
RM87P, RM87P sensitive,
RMP84, RMP85

Push-in terminals
Max. cross section of the cables:
2 x 1,5 mm² (ferrules without
insulation)
2 x 1 mm² (ferrules with insulation)
Stripping length: 8...10 mm

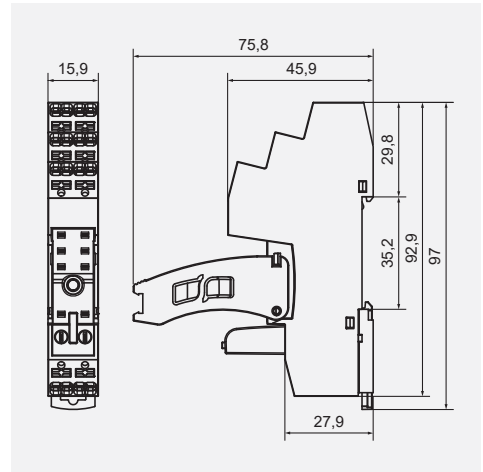
35 mm rail mount
acc. to EN 60715
or on panel mounting
97 x 15,9 x 45,9(75,8) mm
5 mm pinout
One pole
12 A, 300 V AC
Two poles
8 A, 300 V AC



Connection diagrams



Dimensions



The drawings present inserting wire into the Push-in terminal and removing wire using the button releasing a clamp (assembly without tools).

Accessories

Wire connection

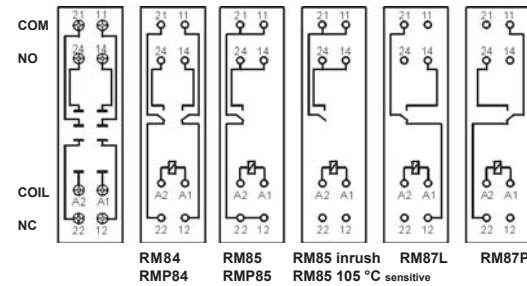
GZF80

For RM84, RM85,
RM85 inrush,
RM85 105 °C sensitive,
RM87L, RM87L sensitive,
RM87P, RM87P sensitive,
RMP84, RMP85

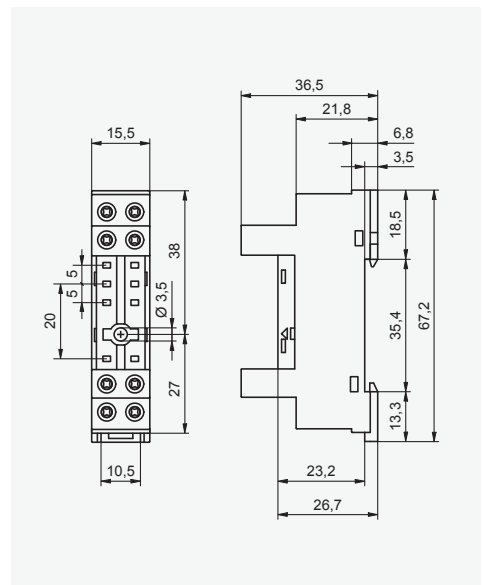
Screw terminals
Max. tightening moment
for the terminal: 0,5 Nm
35 mm rail mount
acc. to EN 60715
or on panel mounting
67,2 x 15,5 x 36,5 mm
Two poles, 5 mm pinout
10 A, 250 V AC



Connection diagrams



Dimensions

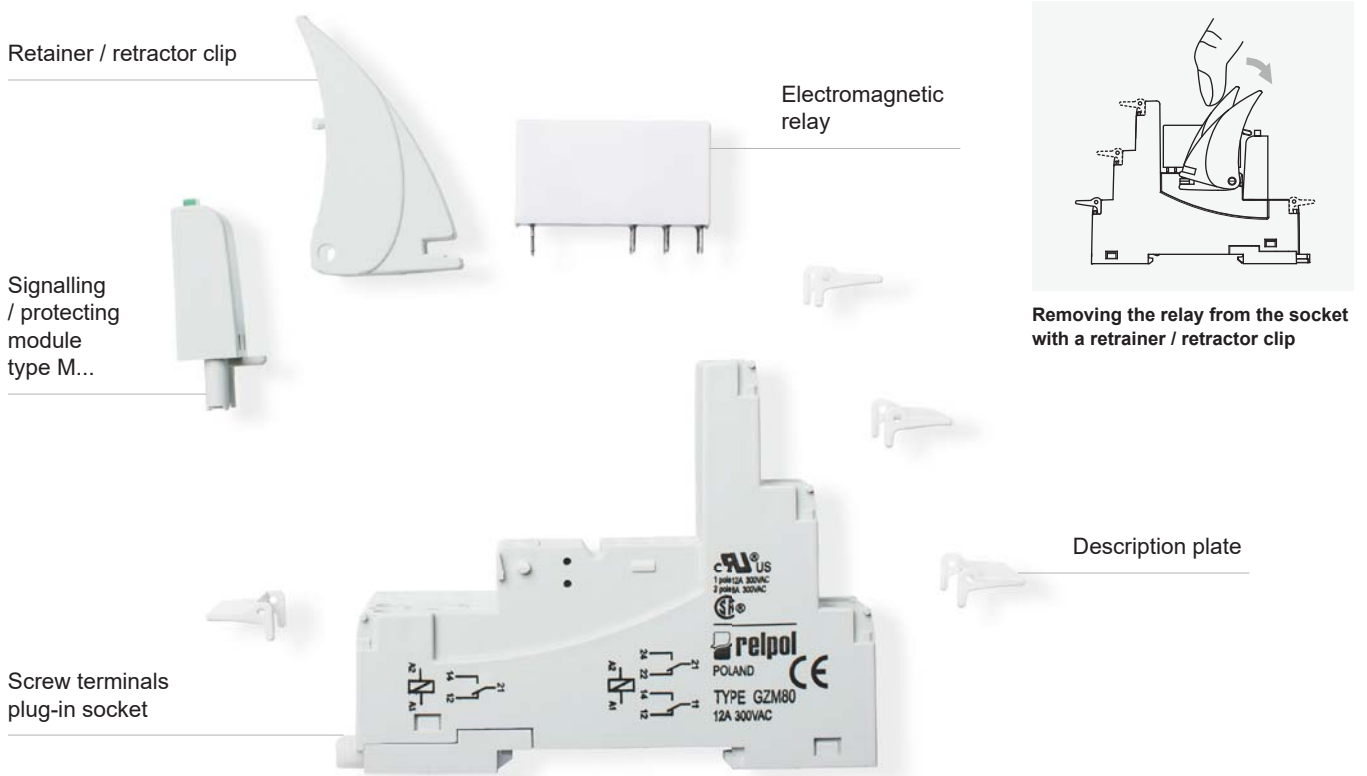


Accessories



① Mounting and sub-assemblies of accessories in the socket - see page 10. Signalling / protecting modules type M... - see page 13. ② In the bracket the height of socket with retainer / retractor clip is shown. ③ For RM85..., RMP85: loads above 12 A (GZT80, GZM80, GZP80) or 10 A (GZS80, GZF80) require bridging pairs of terminals: 11 with 21, 12 with 22, 14 with 24 - see www.repol.com.pl

Mounting and sub-assemblies of the relay and accessories in the socket



PRECAUTIONS:

1. Ensure that the parameters of the product described in its specification provide a safety margin for the appropriate operation of the device or system and never use the product in circumstances which exceed the parameters of the product. 2. Never touch any live parts of the device. 3. Ensure that the product has been connected correctly. An incorrect connection may cause malfunction, excessive heating or risk of fire. 4. In case of any risk of any serious material loss or death or injuries of humans or animals, the devices or systems shall be designed so to equip them with double safety system to guarantee their reliable operation.

Sockets and accessories

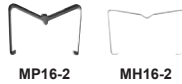
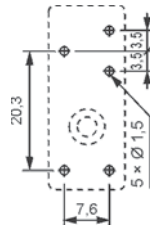
EC 35

For RM87N, RM87N sensitive

For PCB
31,3 x 12,7 x 9 mm
One pole, 3,5 mm pinout
12 A, 300 V AC



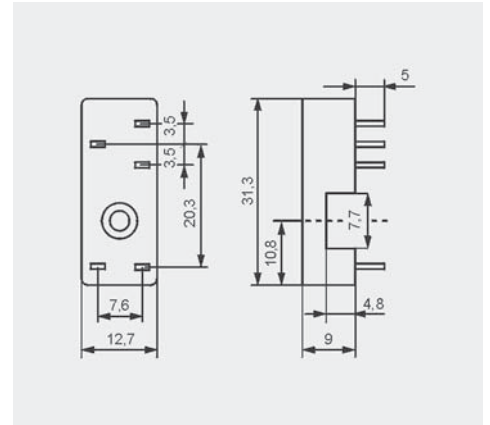
Pinout



Accessories

Dimensions

ERC



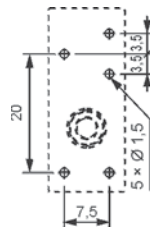
GD35

For RM87N, RM87N sensitive

For PCB
31,5 x 13 x 9 mm
One pole, 3,5 mm pinout
12 A, 300 V AC



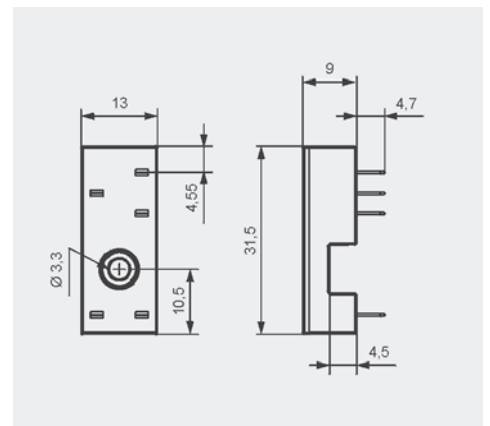
Pinout



Accessories

Dimensions

ERC



Sockets and accessories

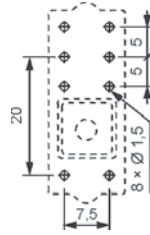
PW80

For RM84, RM85, RM85 inrush,
RM85 105 °C sensitive,
RM87L, RM87L sensitive,
RM87P, RM87P sensitive,
RM83

For PCB
34,6 x 12,9 x 6,6 mm
Two poles, 5 mm pinout
12 A, 250 V AC



Pinout

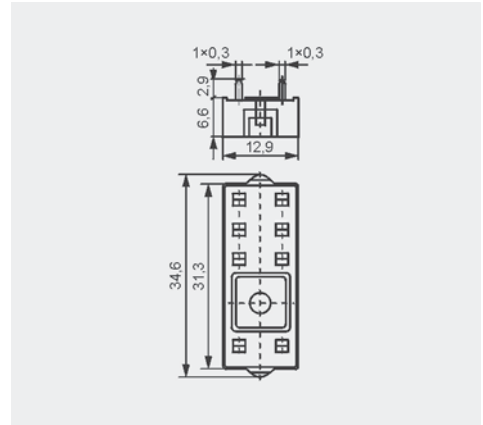


Accessories



Dimensions

ERC



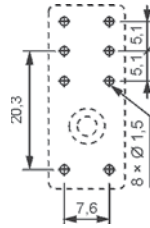
EC 50

For RM84, RM85, RM85 inrush,
RM85 105 °C sensitive,
RM87L, RM87L sensitive,
RM87P, RM87P sensitive,
RM83, RMP84, RMP85

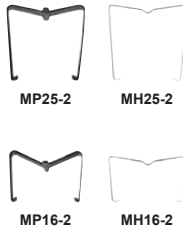
For PCB
31,3 x 12,7 x 9 mm
Two poles, 5 mm pinout
12 A, 250 V AC



Pinout

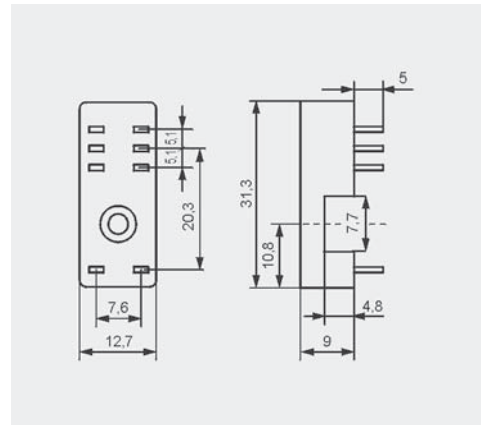


Accessories



Dimensions

ERC



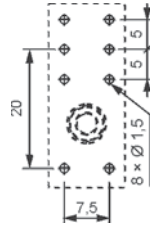
GD50

For RM84, RM85, RM85 inrush,
RM85 105 °C sensitive,
RM87L, RM87L sensitive,
RM87P, RM87P sensitive,
RM83, RMP84, RMP85

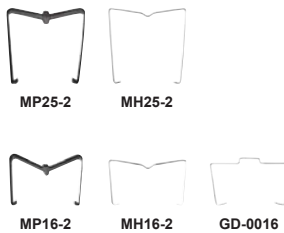
For PCB
31,5 x 13 x 9 mm
Two poles, 5 mm pinout
8 A, 300 V AC



Pinout

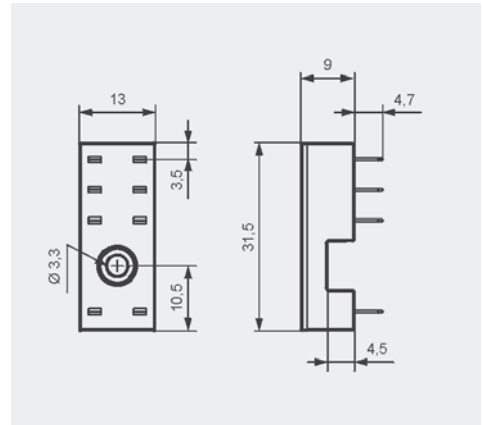


Accessories



Dimensions

ERC



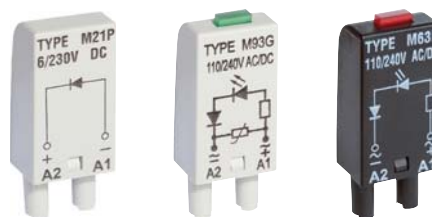
Signalling / protecting modules type M...

For sockets type:

GZT80, GZM80, GZS80, GZP80, GZT92, GZM92, GZS92, ES 32, GZT2, GZM2, GZT3, GZM3, GZT4, GZM4, GZP4

Modules type M... are parallelly connected with relay coil.

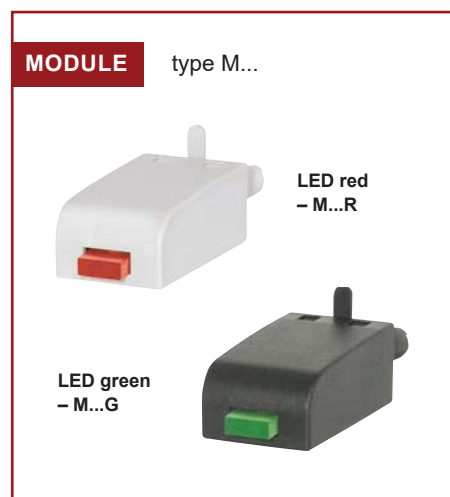
Polarization P: -A1/+A2. Polarization N: +A1/-A2.



Modules type M...	Layout	Voltage	Type of module ① ②
Module D (polarization P) It limits overvoltage on DC coils.		6/230 V DC	M21P
Module D (polarization N) It limits overvoltage on DC coils.		6/230 V DC	M21N
Module LD (polarization P) It limits overvoltage on DC coils. Coil energizing indication.		6/24 V DC 24/60 V DC 110/230 V DC	M31R, M31G M32R, M32G M33R, M33G
Module LD (polarization N) It limits overvoltage on DC coils. Coil energizing indication.		6/24 V DC 24/60 V DC 110/230 V DC	M41R, M41G M42R, M42G M43R, M43G
Module RC It protects against EMC disturbance. It limits overvoltage.		6/24 V AC/DC 24/60 V AC/DC 110/240 V AC/DC	M51 M52 M53
Module L Coil energizing indication.		6/24 V AC/DC 24/60 V AC/DC 110/240 V AC/DC	M61R, M61G M62R, M62G M63R, M63G
Module LV It limits overvoltage on AC and DC coils. Coil energizing indication.		6/24 V AC/DC 24/60 V AC/DC 110/240 V AC/DC	M91R, M91G M92R, M92G M93R, M93G
Module V It limits overvoltage on AC coils. No indication.		6/24 V AC 110/130 V AC 220/240 V AC	M71 M72 M73
Module R It limits harmful voltage on AC coils induced in long lines which causes unwanted making of the relay.		110/240 V AC	M103

① M...R - LED red, M...G - LED green

② When ordering modules indicate their color: gray or black.



Interconnection strips ZGGZ80



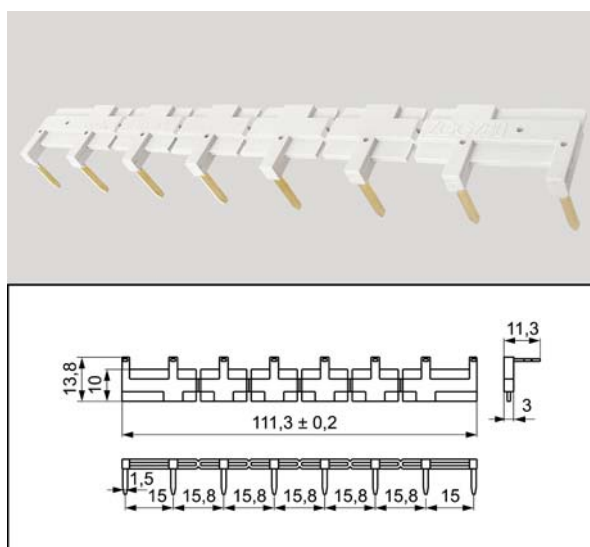
ZGGZ80 for:

Plug-in sockets	Relays for plug-in sockets	Interface relays ③
GZT80	RM84, RM85, RM85 inrush, RM85 105 °C sensitive, RM87L ④, RM87P ④, RM87N ④	PI84-...-TS-... (RM84 + GZT80)
GZM80		PI84-...-MS-... (RM84 + GZM80)
GZS80		PI85-...-TS-... (RM85 + GZT80)
GZT92		(RM85 inrush + GZT80)
GZM92		PI85-...-MS-... (RM85 + GZM80)
GZS92		
ES 32	RM96 1 CO	

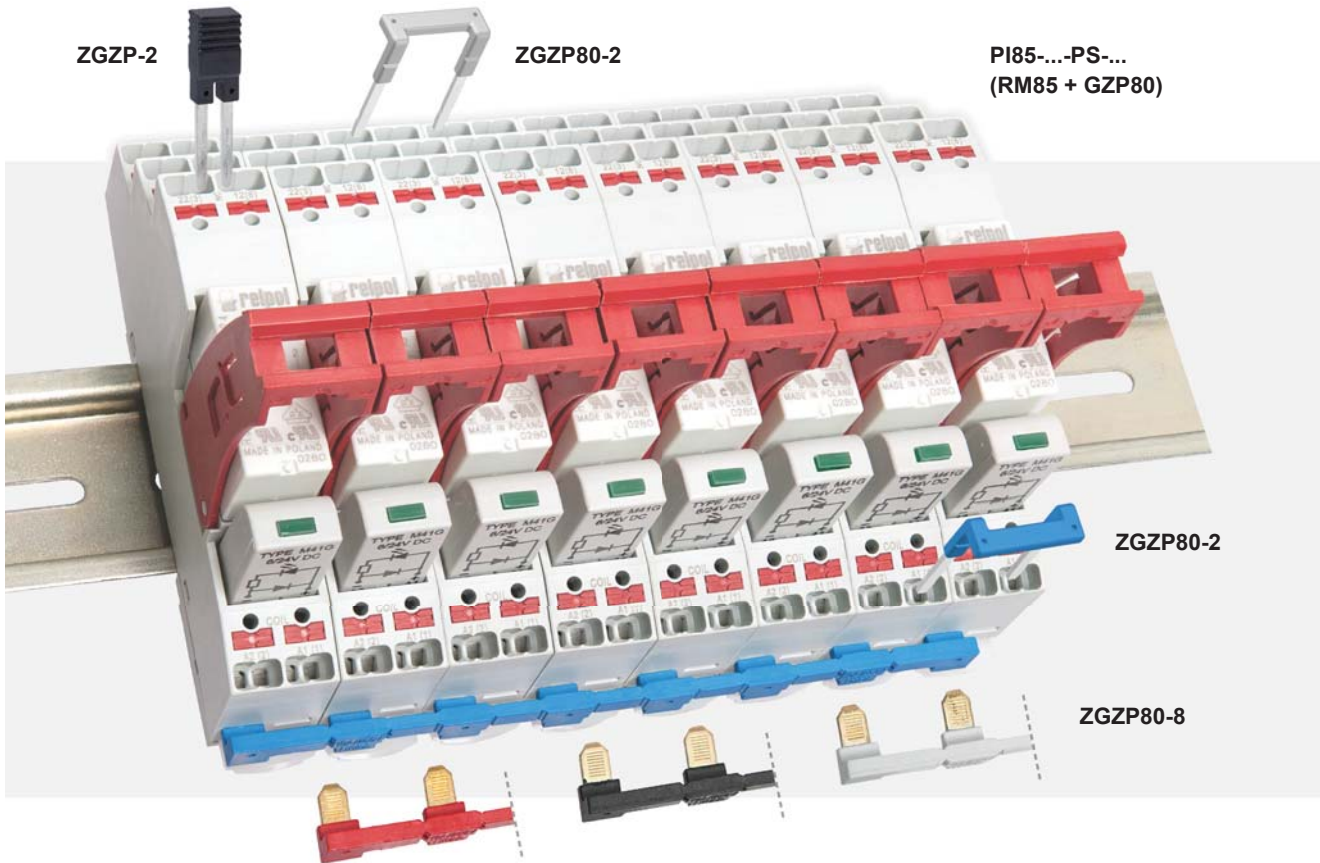
③ Interface relay **PI84 (PI85)** is offered as a **set**: electromagnetic relay **RM84 (RM85)** + plug-in socket **GZT80** or **GZM80** + signalling / protecting module type **M...** + retainer / retractor clip **GZT80-0040** + description plate **GZT80-0035**. ④ Also versions RM87. sensitive

Interconnection strip ZGGZ80

- designed for the co-operation with plug-in sockets of miniature relays and with interface relays PI84 and PI85, which are equipped with screw terminals; sockets and relays are mounted on 35 mm rail mount acc. to EN 60715,
- bridges common input signals (coil terminals A1 or A2) or output signals - see photo at the top,
- maximum permissible current is 10 A / 250 V AC,
- possibility of connection of 8 sockets or relays,
- colours of strips: **ZGGZ80-1** grey, **ZGGZ80-2** black.



Interconnection strips ZGZP...



■ ZGZP... for:

Plug-in sockets	Relays for plug-in sockets	Interface relays ⑤
GZP80	RM84, RM85, RM85 inrush, RM85 105 °C sensitive, RM87L ④, RM87P ④, RMP84, RMP85	PI84-...-PS-... (RM84 + GZP80) PI85-...-PS-... (RM85 + GZP80) PI84P-...-PS-... (RMP84 + GZP80) PI85P-...-PS-... (RMP85 + GZP80)

⑤ Interface relay **PI84** (**PI85**, **PI84P**, **PI85P**) is offered as a **set**: electromagnetic relay **RM84** (**RM85**, **RMP84**, **RMP85**) + plug-in socket **GZP80** + signalling / protecting module type **M...** + retainer / retractor clip **GZP80-0400**.
④ Also versions RM87. sensitive

■ Interconnection strips ZGZP...

- designed for the co-operation with plug-in sockets of miniature relays and with interface relays PI84, PI85, PI84P, PI85P, which are equipped with Push-in terminals; sockets and relays are mounted on 35 mm rail mount acc. to EN 60715,
- strip **ZGZP80-8** bridges common input signals (coil terminals A1 or A2), maximum permissible current is 10 A / 250 V AC, possibility of connection of 8 sockets or relays,



ZGZP80-8 GY grey



ZGZP80-8 BK black



ZGZP80-8 RD red



ZGZP80-8 BE blue

- strip **ZGZP80-2** bridges common input signals (coil terminals A1 or A2) or output signals, possibility of connection of 2+n sockets or relays,



ZGZP80-2 GY grey



ZGZP80-2 BK black



ZGZP80-2 RD red



ZGZP80-2 BE blue

- jumper **ZGZP-2** bridges the neighboring poles of single socket **GZP80**.



ZGZP-2 GY grey



ZGZP-2 BK black



ZGZP-2 RD red



ZGZP-2 BE blue