

# RM 96

## miniature relays



- 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
- 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               |                                   | <b>AgSnO<sub>2</sub></b> , AgSnO <sub>2</sub> /Au 3 µm, AgCdO                                                                                                                           |
| Rated / max. switching voltage | AC                                | 250 V / 440 V                                                                                                                                                                           |
| Min. switching voltage         |                                   | 10 V AgSnO <sub>2</sub> , 5 V AgSnO <sub>2</sub> /Au 3 µm, 10 V AgCdO                                                                                                                   |
| Rated load (capacity)          | AC1<br>AC15<br>AC3<br>DC1<br>DC13 | 8 A / 250 V AC<br>3 A / 120 V      1,5 A / 240 V (B300)<br>370 W (single-phase motor; 0,5 HP / 250 V AC UL 508)<br>8 A / 24 V DC (see Fig. 3)<br>0,22 A / 120 V    0,1 A / 250 V (R300) |
| Min. switching current         |                                   | 10 mA AgSnO <sub>2</sub> , 2 mA AgSnO <sub>2</sub> /Au 3 µm, 5 mA AgCdO                                                                                                                 |
| Max. inrush current            |                                   | 15 A                                                                                                                                                                                    |
| Rated current                  |                                   | 8 A                                                                                                                                                                                     |
| Max. breaking capacity         | AC1                               | 2 000 VA                                                                                                                                                                                |
| Min. breaking capacity         |                                   | 1 W AgSnO <sub>2</sub> , 0,05 W AgSnO <sub>2</sub> /Au 3 µm, 0,5 W AgCdO                                                                                                                |
| 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 ... 48 V               |
| Must release voltage              |    | DC: ≥ 0,1 U <sub>n</sub> |
| Operating range of supply voltage |    | see Table 1 and Fig. 4   |
| Rated power consumption           | DC | 0,22...0,3 W             |

### Insulation according to PN-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 <sup>5</sup> 8 A, 250 V AC                               |
| • cosφ                                    |                          | see Fig. 2                                                    |
| Mechanical life (cycles)                  |                          | > 2 x 10 <sup>7</sup>                                         |
| Motor load according to UL 508            |                          | 0,25 HP    120 V AC, single-phase motor                       |
| Dimensions (L x W x H)                    |                          | 1 CO:      30 x 10 x 16,2 mm<br>1 NO, 1 NC: 28 x 10 x 16,2 mm |
| Weight                                    |                          | 11 g                                                          |
| Ambient temperature                       | • storage<br>• operating | -40...+85 °C<br>-40...+80 °C                                  |
| Cover protection category                 |                          | IP 40 or <b>IP 67</b> PN-EN 60529                             |
| Environmental protection                  |                          | RTII      PN-EN 116000-3                                      |
| 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 pertain to the standard versions of the relays.

11.05.2013

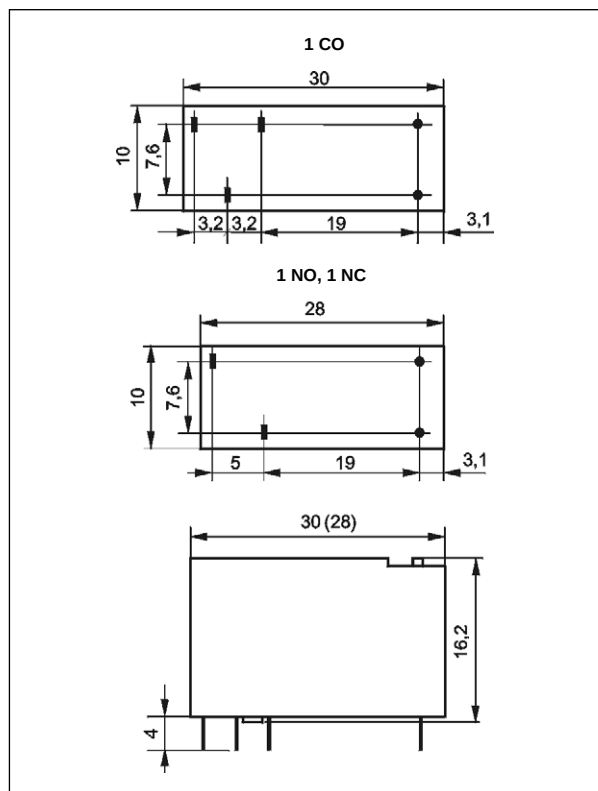
Coil data - DC voltage version

Table 1

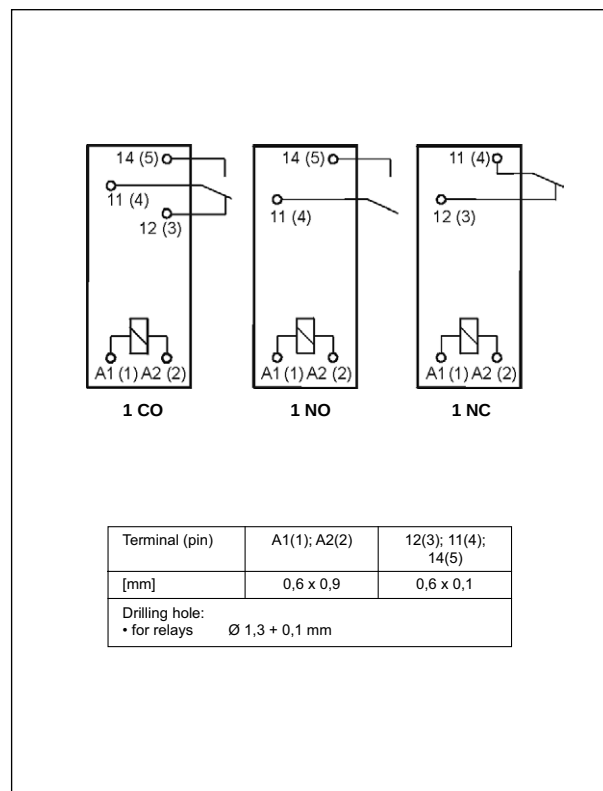
| Coil code   | Rated voltage<br>V DC | Coil resistance<br>at 20 °C<br>$\Omega$ | Acceptable<br>resistance     | Coil operating range<br>V DC |                 |
|-------------|-----------------------|-----------------------------------------|------------------------------|------------------------------|-----------------|
|             |                       |                                         |                              | min. (at 20 °C)              | max. (at 20 °C) |
| 1005        | 5                     | 110                                     | $\pm 10\%$                   | 3,5                          | 12,0            |
| 1006        | 6                     | 160                                     | $\pm 10\%$                   | 4,2                          | 14,5            |
| 1009        | 9                     | 360                                     | $\pm 10\%$                   | 6,3                          | 22,0            |
| <b>1012</b> | <b>12</b>             | <b>660</b>                              | <b><math>\pm 10\%</math></b> | <b>8,4</b>                   | <b>29,5</b>     |
| 1018        | 18                    | 1 500                                   | $\pm 10\%$                   | 12,6                         | 44,0            |
| <b>1024</b> | <b>24</b>             | <b>2 200</b>                            | <b><math>\pm 10\%</math></b> | <b>16,8</b>                  | <b>54,0</b>     |
| 1048        | 48                    | 8 000                                   | $\pm 10\%$                   | 33,6                         | 102,0           |

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

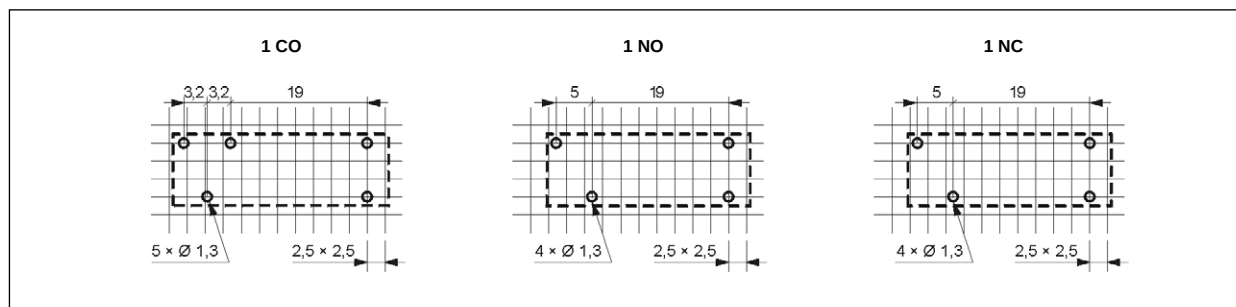
## Dimensions



## Connection diagrams (pin side view)

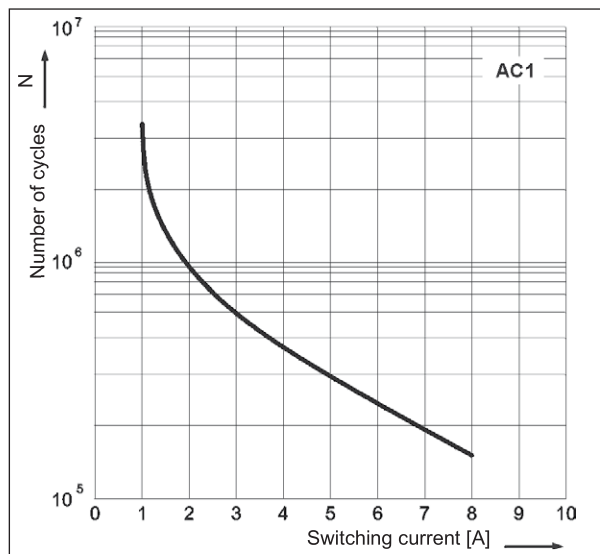


## Pinout (solder side view)



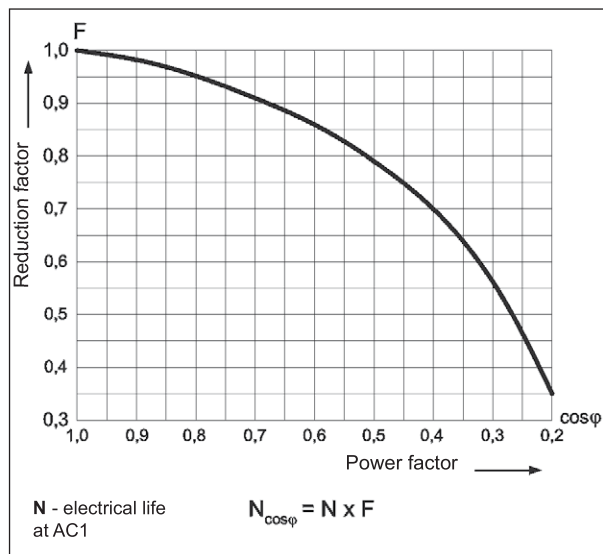
**Electrical life at AC resistive current.**  
 $U_n = 230 \text{ V AC}$  - version 1NO

Fig. 1



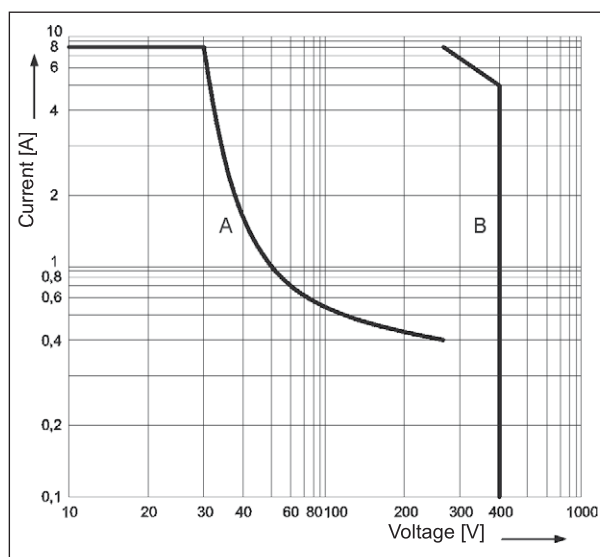
**Electrical life reduction factor at AC inductive load**

Fig. 2



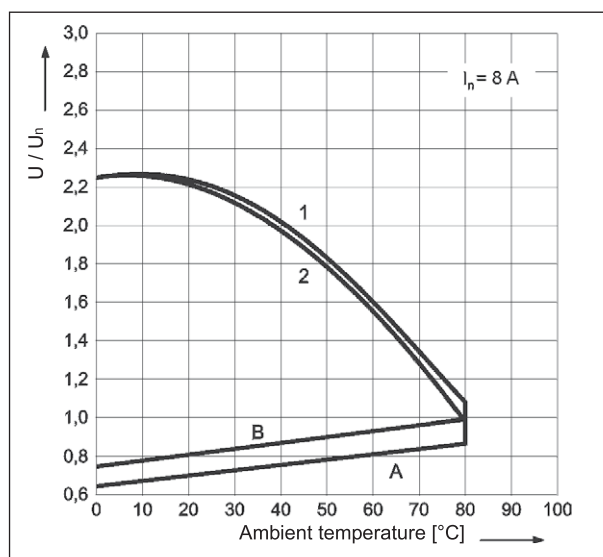
**Max. breaking capacity**  
**A - resistive load DC1**  
**B - resistive load AC1**

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

## ES 32

Screw terminals  
 plug-in socket  
 for RM96 1 CO  
 - see page 5.



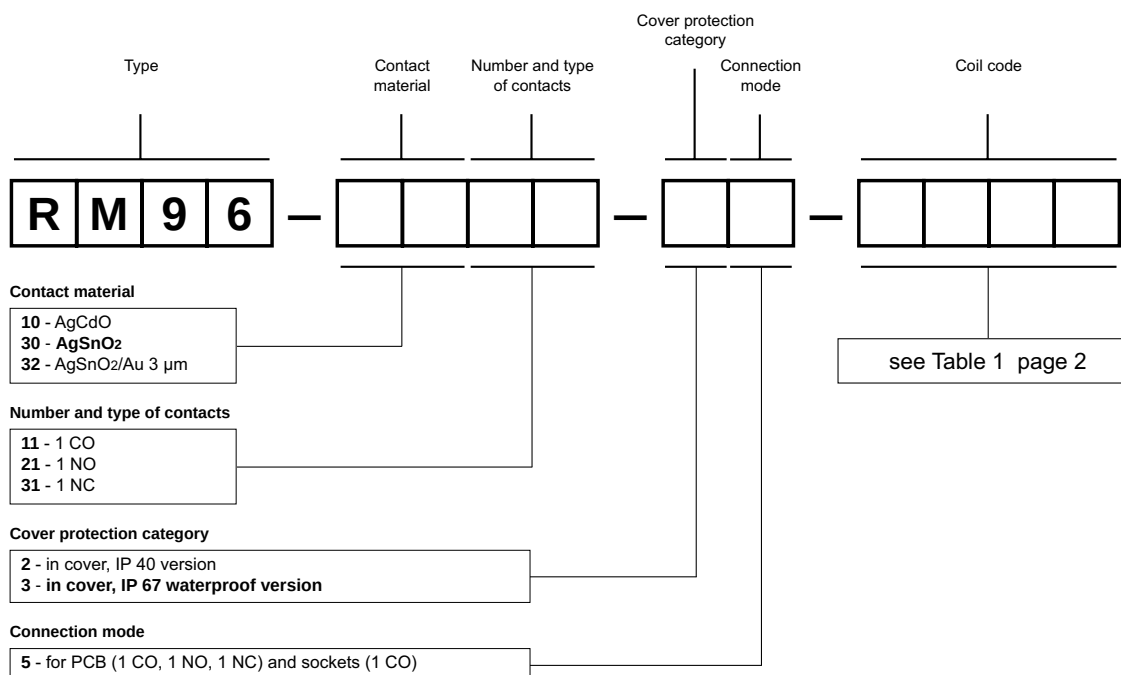
## Mounting

Relays **RM96 1 CO** (one changeover contact) are designed for: • direct PCB mounting • screw terminals plug-in sockets **ES 32** ① with clip **MS 16** or **GZM80-0041**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with one M3 screw. Signalling / protecting modules **type M...** are available with sockets (see page 6).

Relays **RM96 1 NO** (one normally open contact) and **RM96 1 NC** (one normally closed contact) are designed for direct PCB mounting.

① Plug-in sockets **ES 32** may be linked with interconnection strip type **ZGGZ80** (see page 7).

## Ordering codes



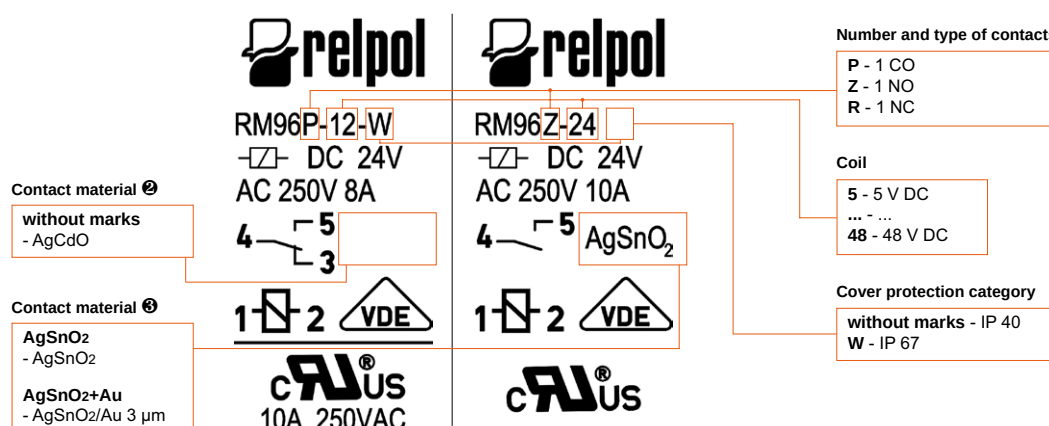
Examples of ordering codes:

**RM96-1011-35-1012** relay **RM96**, for PCB and sockets, one changeover contact, contact material AgCdO, coil voltage 12 V DC, in cover IP 67

**RM96-3021-25-1024** relay **RM96**, for PCB, one normally open contact, contact material AgSnO<sub>2</sub>, coil voltage 24 V DC, in cover IP 40

## Print on relay cover

Type marking on relays cover **RM96** do not match the ordering codes (examples of marking for **RM96-1011-35-1012** ② and **RM96-3021-25-1024** ③).



## Plug-in sockets and accessories

### ES 32

For RM96 1 CO

Screw terminals

Max. tightening moment

for the terminal: 0,7 Nm

35 mm rail mount

acc. to PN-EN 60715 or on panel

mounting

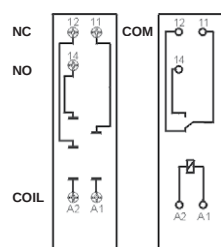
75 x 15,5 x 42,5(59) mm ②

One pole, 3,2 mm pinout

12 A, 300 V AC



### Connection diagrams



MS 16

GZMB80-0040



TR



Module type M...



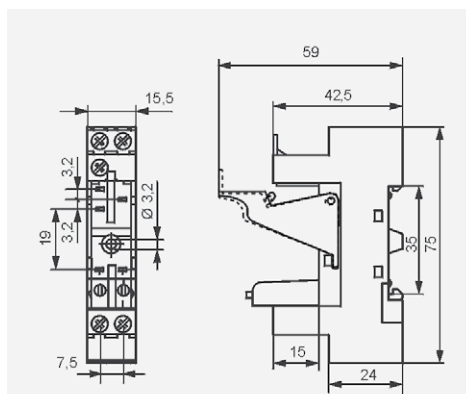
ZGGZ80



GZM80-0041

### Accessories ①

### Dimensions



① Mounting and sub-assemblies of accessories in the socket - see page 5. Signalling / protecting modules type M... - see page 6.

② In the bracket the height of socket with retainer / retractor clip is shown.

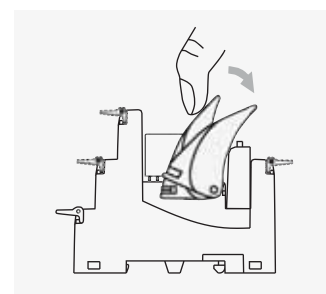
## Mounting and sub-assemblies of the relay and accessories in the socket

Signalling / protecting module  
type M...

Electromagnetic  
relay

Retainer / retractor clip

Screw terminals  
plug-in socket



Removing the relay from the socket  
with a retractor / retractor clip

Description plate

### 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.

11.05.2013

## Signalling / protecting modules type M...

### For sockets type:

GZT80, GZM80, GZS80, GZMB80, GZT92, GZM92, GZS92, ES 32,  
GZT2, GZM2, GZMB2, GZT3, GZM3, GZT4, GZM4, GZMB4

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

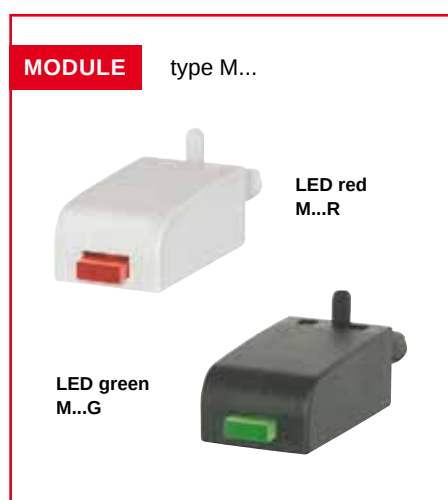
Polarity P: -A1/+A2. Polarity N: +A1/-A2.



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



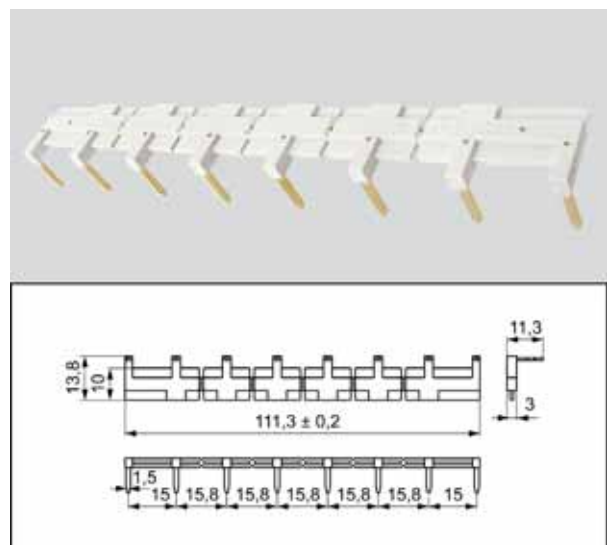
### ZGGZ80 for:

| Plug-in sockets | Relays for plug-in sockets                                                        | Interface relays ①           |
|-----------------|-----------------------------------------------------------------------------------|------------------------------|
| GZT80           | RM84, RM85, RM85 inrush,<br>RM85 105 °C sensitive,<br>RM87L ②, RM87P ②<br>RM87N ② | PI84-...-M..G (GZT80 + RM84) |
| GZM80           |                                                                                   | PI84-...-00L. (GZM80 + RM84) |
| GZS80           |                                                                                   | PI85-...-M..G (GZT80 + RM85) |
| GZT92           |                                                                                   | PI85-...-00L. (GZM80 + RM85) |
| GZM92           |                                                                                   |                              |
| GZS92           | RM96 1 CO                                                                         |                              |
| ES 32           |                                                                                   |                              |

① Interface relay **PI84 (PI85)** is offered as a **set**: plug-in socket **GZT80** or **GZM80** + miniature relay **RM84 (RM85)** + signalling / protecting module **type M...** + retainer / retractor clip **GZT80-0040** + description plate **GZT80-0035**. ② 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 PN-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.



11.05.2013