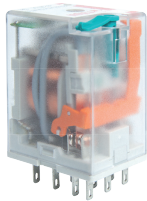






# R3N

## miniature industrial relays



10 A / 250 V AC



- Relays of general application • For plug-in sockets: 35 mm rail mount acc. to PN-EN 60715; on panel mounting • Miniature dimensions • Cadmium - free contacts • AC and DC coils
- WT (mechanical indicator + lockable front test button) - standard features of relays. Relays may be provided with the test buttons (no latching) and plugs - page 10
- Recognitions, certifications, directives: RoHS,    

### Contact data

|                                |      |                                     |
|--------------------------------|------|-------------------------------------|
| Number and type of contacts    |      | 3 CO                                |
| Contact material               |      | <b>AgNi</b> , AgNi/Au 0,2 µm        |
| 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)    |
|                                | AC3  | 370 W (single-phase motor)          |
|                                | DC1  | 10 A / 24 V DC (see Fig. 3)         |
|                                | DC13 | 0,22 A / 120 V 0,1 A / 250 V (R300) |
| 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 ... 240 V                                       |
|                                   | DC          | 5 ... 220 V                                       |
| Must release voltage              |             | AC: ≥ 0,2 U <sub>n</sub> DC: ≥ 0,1 U <sub>n</sub> |
| Operating range of supply voltage |             | see Tables 1, 2                                   |
| Rated power consumption           | AC          | 1,6 VA  |
|                                   | DC          | 0,9 W   |

### Insulation according to PN-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 <sup>5</sup> 10 A, 250 V AC  |
| • cosφ                                    |             | see Fig. 2                        |
| Mechanical life (cycles)                  |             | > 2 x 10 <sup>7</sup>             |
| Dimensions (L x W x H)                    |             | 27,5 x 21,2 x 35,6 mm             |
| Weight                                    |             | 35 g                              |
| Ambient temperature                       | • storage   | -40...+85 °C                      |
|   | • operating | AC: -40...+55 °C DC: -40...+70 °C |
| Cover protection category                 |             | IP 40 PN-EN 60529                 |
| Environmental protection                  |             | RTI PN-EN 116000-3                |
| Shock resistance                          | (NO/NC)     | 10 g / 5 g                        |
| Vibration resistance                      |             | 5 g 10...150 Hz                   |

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

14.07.2014

# R3N

miniature industrial relays

Coil data - DC voltage version

Table 1

| Coil code   | Rated voltage<br>V DC | Coil resistance<br>at 20 °C<br>Ω | Acceptable<br>resistance | Coil operating range<br>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            |
| <b>1024</b> | <b>24</b>             | <b>640</b>                       | <b>± 10%</b>             | <b>19,2</b>                  | <b>26,4</b>     |
| 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           |
| <b>1220</b> | <b>220</b>            | <b>54 000</b>                    | <b>± 10%</b>             | <b>176,0</b>                 | <b>242,0</b>    |

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

Coil data - AC 50/60 Hz voltage version

Table 2

| Coil code   | Rated voltage<br>V AC | Coil resistance<br>at 20 °C<br>Ω | Acceptable<br>resistance | Coil operating range<br>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            |
| <b>5024</b> | <b>24</b>             | <b>158</b>                       | <b>± 10%</b>             | <b>19,2</b>                  | <b>26,4</b>     |
| 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           |
| <b>5230</b> | <b>230</b>            | <b>16 100</b>                    | <b>± 10%</b>             | <b>184,0</b>                 | <b>253,0</b>    |
| 5240        | 240                   | 16 800                           | ± 10%                    | 192,0                        | 264,0           |

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

## NEW TECHNOLOGY

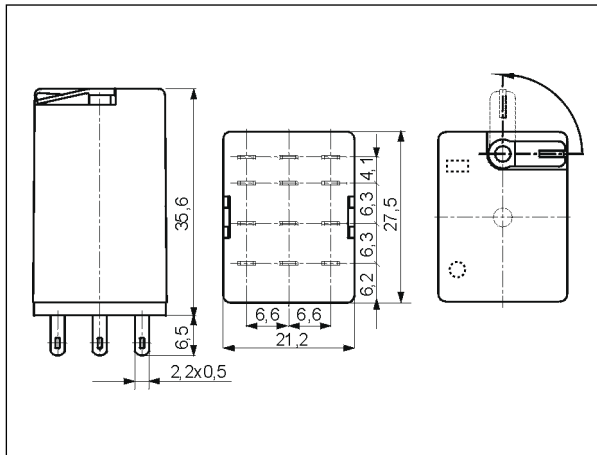
The new R2N, R3N, R4N relays are modernized versions of the R2, R3, R4 relays. The modernization covered the design of the relays and the manufacturing process.



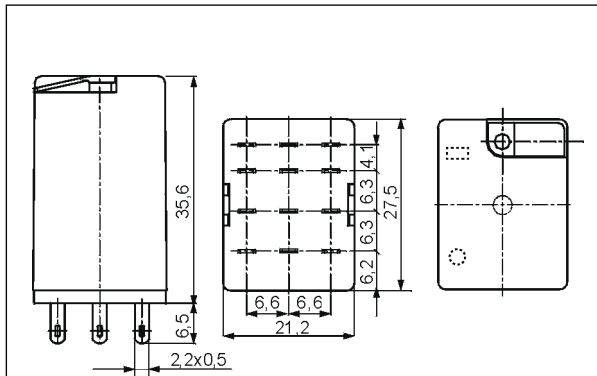
# R3N

## miniature industrial relays

**Dimensions - plug-in version (WT), with lockable front test button type T**

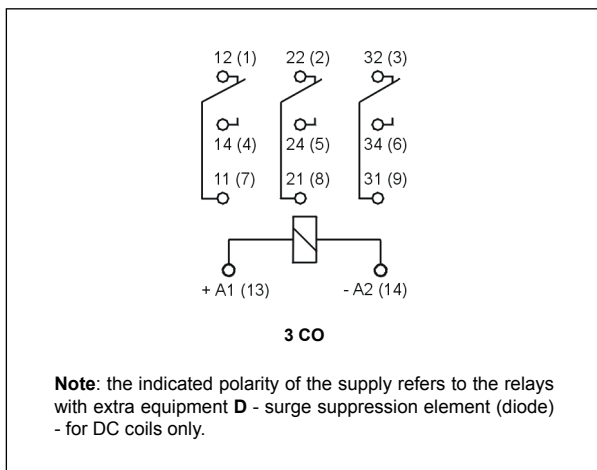


**Dimensions - plug-in version, with test button (no latching) or with plug (no manual operation)**



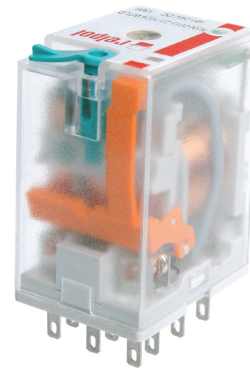
Test buttons R4P-0001 and plugs R4W-0003 need to be ordered separately. They substitute buttons type T. To exchange by Customer themselves. Information on test buttons (no latching) and plugs - page 10.

**Connection diagram (pin side view)**

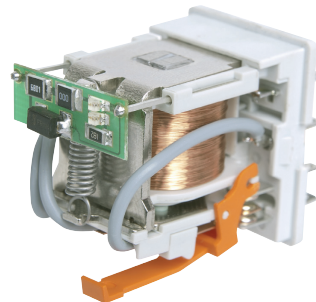


**Design**

**NEW**



**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 features 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.

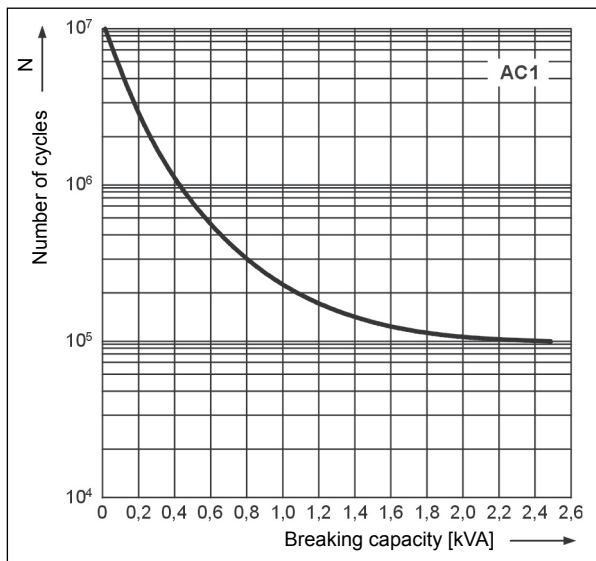


**Improvement of the efficiency of the electromagnet:** an innovational technology of connecting elements has been introduced, which guarantees more reliable operation of the relay.

**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.

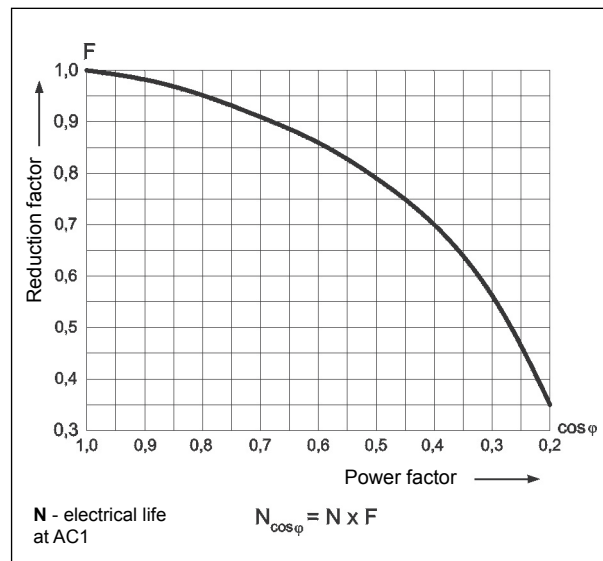
**Electrical life at AC resistive load.**  
Switching frequency: 1 200 cycles/hour

Fig. 1



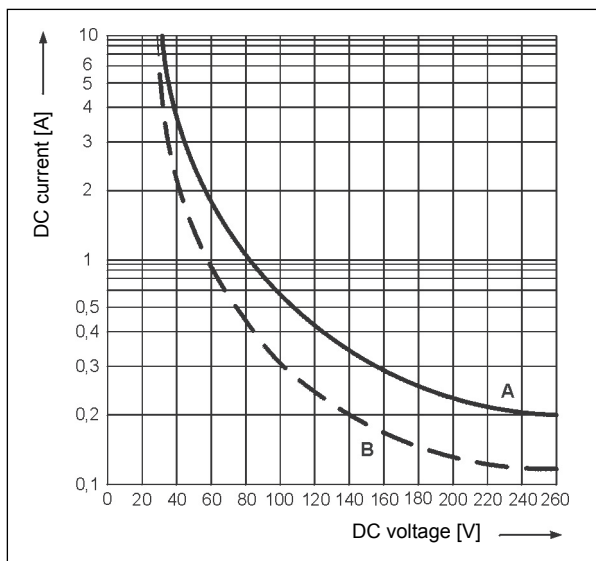
**Electrical life reduction factor at AC inductive load**

Fig. 2



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

Fig. 3



## Mounting

Relays **R3N** are offered in versions for plug-in sockets, with **WT** features 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 separately.

Relays **R3N** are designed for: • screw terminals plug-in sockets **GZT3** ① and **GZM3** ① with clip **GZT4-0040** or **G4 1052**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws. Signalling / protecting modules **type M...** are available with sockets (see page 7).

① Plug-in sockets **GZT3**, **GZM3** may be linked with interconnection strip type **ZGGZ4** (see page 8).

## Contact material selection for different load types

- **AgNi** - for resistive or inductive loads,
- **AgNi/Au 0,2 μm** - Au protects the contact surface during storage.

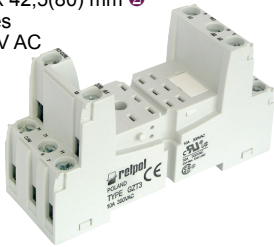


# Plug-in sockets and accessories

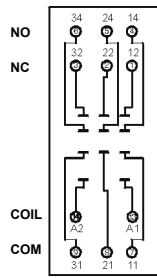
## GZT3

For R3N

Screw terminals  
Max. tightening moment for the terminal: 0,7 Nm  
35 mm rail mount  
acc. to PN-EN 60715  
or on panel mounting  
76,3 x 27 x 42,5(80) mm ②  
Three poles  
10 A, 300 V AC



### Connection diagram



ZGGZ4



GZT4-0040



G4 1052

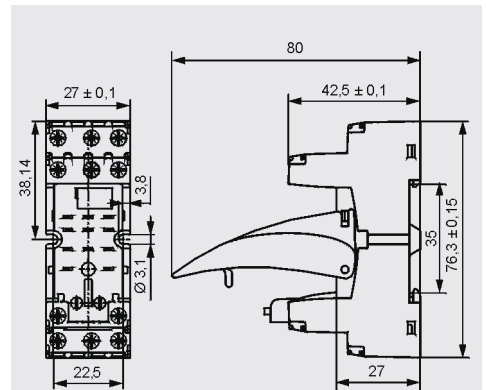


GZT4-0035



Module type M...

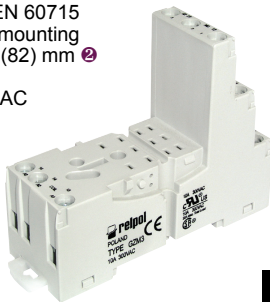
### Dimensions



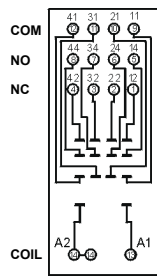
## GZM3

For R3N

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 27 x 61(82) mm ②  
Three poles  
10 A, 300 V AC



### Connection diagram



ZGGZ4



GZT4-0040



G4 1052

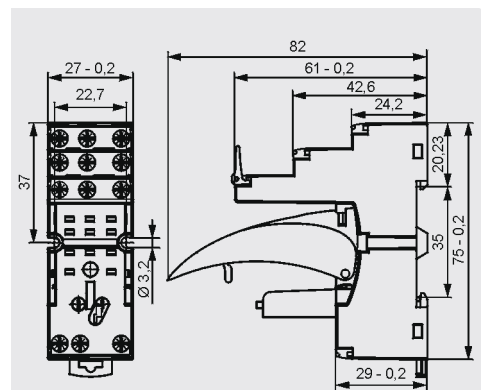


GZT4-0035



Module type M...

### Dimensions



- ① Mounting and sub-assemblies of accessories in the socket - see page 6. Signalling / protecting modules type M... - see page 7.
- 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...

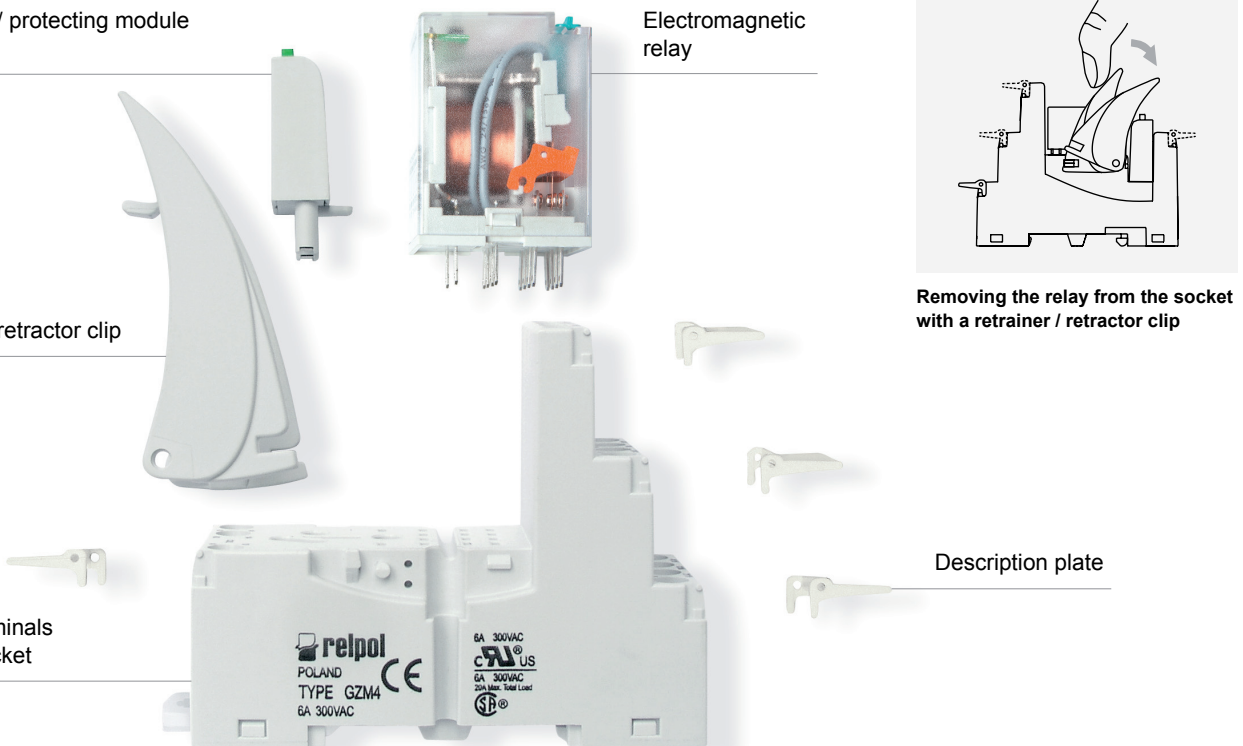
Electromagnetic relay

Retainer / retractor clip

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

Screw terminals plug-in socket

Description plate



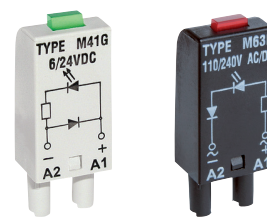
## Signalling / protecting modules type M...

### 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.

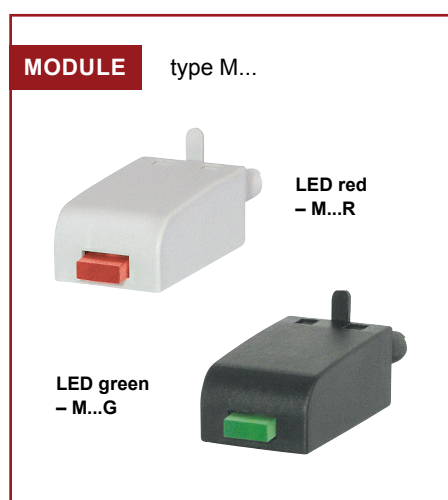
Polarity P: -A1/+A2. Polarity N: +A1/-A2.



| 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.



### 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.

## Interconnection strips ZGGZ4



PIR2-...-00L.  
(R2N + GZM2)

ZGGZ4

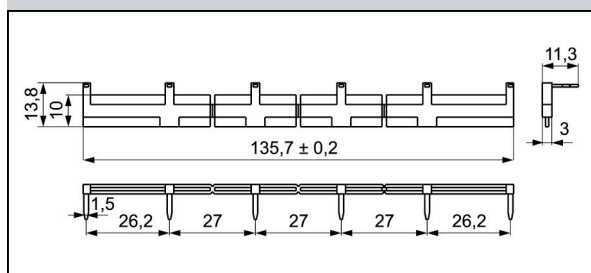
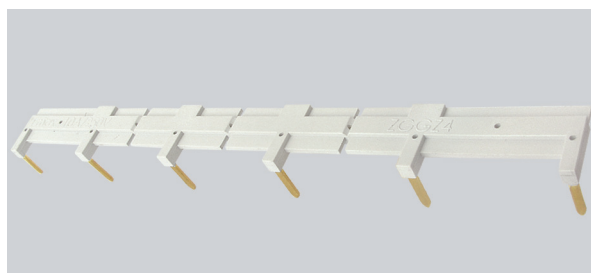
### ZGGZ4 for:

| Plug-in sockets | Relays for plug-in sockets | Interface relays <sup>⑥</sup> |
|-----------------|----------------------------|-------------------------------|
| GZT2            | R2N                        | PIR2-...-00L. (R2N + GZM2)    |
| GZM2            |                            | PIR3-...-00L. (R3N + GZM3)    |
| GZT3            | R3N                        | PIR4-...-00L. (R4N + GZM4)    |
| GZM3            |                            |                               |
| GZT4            | R4N                        |                               |
| GZM4            |                            |                               |

<sup>⑥</sup> Interface relay **PIR2 (PIR3, PIR4)** is offered as a **set**: plug-in socket **GZM2 (GZM3, GZM4)** + miniature industrial relay **R2N (R3N, R4N)** + signalling / protecting module **type M...** + retainer / retractor clip **GZT4-0040** + description plate **GZT4-0035**.



### Interconnection strip ZGGZ4








- designed for the co-operation with plug-in sockets of miniature industrial relays and with interface relays PIR2, PIR3 and PIR4, which are equipped with screw terminals; sockets and relays are mounted on 35 mm rail mount acc. to 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 6 sockets or relays,
- colours of strips: **ZGGZ4-1** grey, **ZGGZ4-2** black.






## Additional features for industrial relays

Industrial relays for plug-in sockets: R2N, R3N, R4N, R15 - 2 CO , R15 - 3 CO  with **WT features as standard** (**W** - mechanical indicator + **T** - lockable front test button). **Detailed information** on additional features of individual relays can be found in the data sheets on the side of "Ordering codes".

| Type  | Description   | For industrial relays  |
|--|---|--|
| <b>W</b>   | mechanical indicator  | R2N, R3N, R4N,<br>(R15 - 2 CO, 3 CO  )                          |
| <b>T</b>   | lockable front test button,<br>orange colour - AC coils,<br>green colour - DC coils | R2N, R3N, R4N,<br>(R15 - 2 CO, 3 CO  )                          |
| <b>L</b>   | light indicator (LED diode),<br>located inside the relay                            | R2N, R3N, R4N, RY2,<br>(R15 - 2 CO, 3 CO, 4 CO  )<br>RUC, RUC-M |
| <b>D</b>   | surge suppression element (diode)<br>- only for DC coils                            | R2N, R3N, R4N, RY2,<br>(R15 - 2 CO, 3 CO, 4 CO  )               |
| <b>V</b>   | surge suppression element (varistor)<br>- only for AC coils                         | (R15 - 2 CO, 3 CO  )  |
| <b>K</b>   | test button without block function  | (R15 - 4 CO  )<br>RUC   |

 Available combinations:

**WT, WTL, WTD, WTL D** - in relays R2N, R3N, R4N for plug-in sockets


**L, D, LD** - in relays RY2 for plug-in sockets

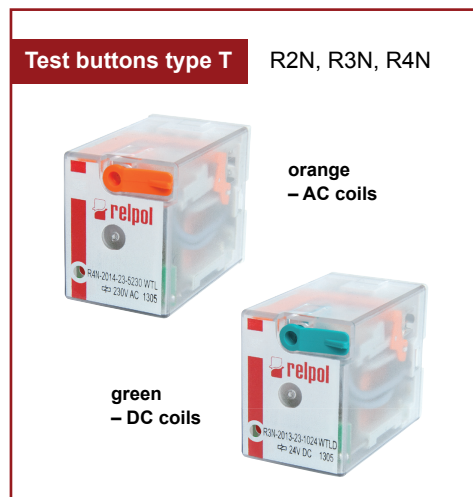
**WT, WTL, WTD, WTL D, WTV, WTL V** - in relays R15 - 2 CO, 3 CO for plug-in sockets

**K, L, D, KL, KD, LD, KLD** - in relays R15 - 4 CO for plug-in sockets

**K, L, KL** - in relays RUC

**L** - in relays RUC-M

 Voltage versions, in covers



## Test buttons (no latching) and plugs

**Test buttons (no latching)** are recommended for R2N...WT, R3N...WT, R4N...WT, R15...WT 2 CO, R15...WT 3 CO relays - **for applications that do not allow permanent contact latching**. By manual operation (pressing the button) relay contacts can get switched for as long time as long the button is pressed. Contacts return to initial position as soon as pressure is released from the button. Those operations can be done while the coil is deenergized.

Button **R4P-0001** or **R15-M404** can be easily inserted by the Customer after removal of button type **T** (see Fig. 2). Button type **T** can be removed with screwdriver as shown on Fig. 1.

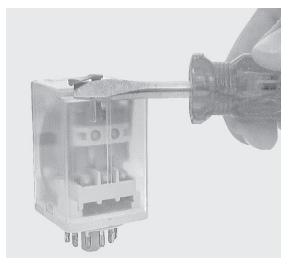


Fig. 1

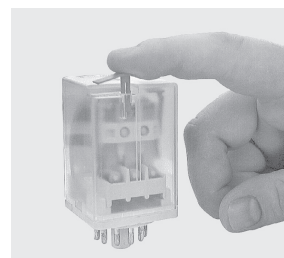
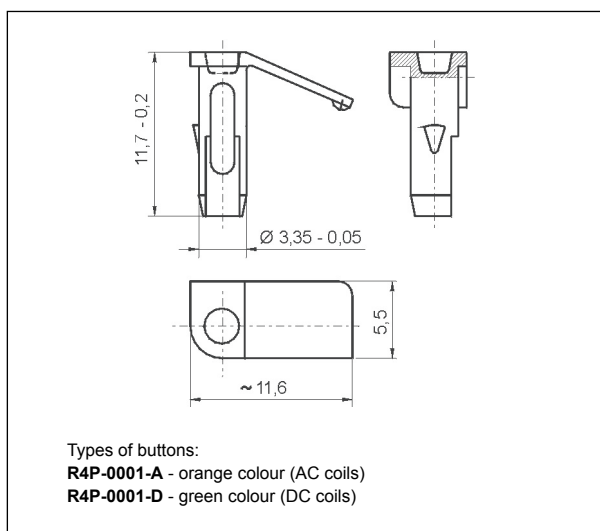
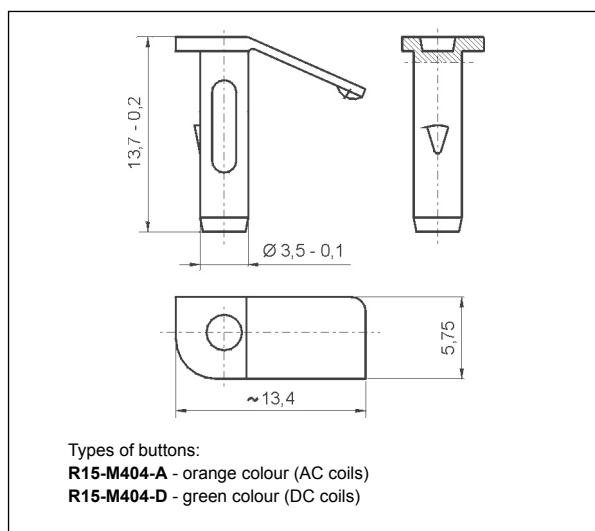


Fig. 2

### Dimensions - test button R4P-0001 for R2N...WT, R3N...WT, R4N...WT

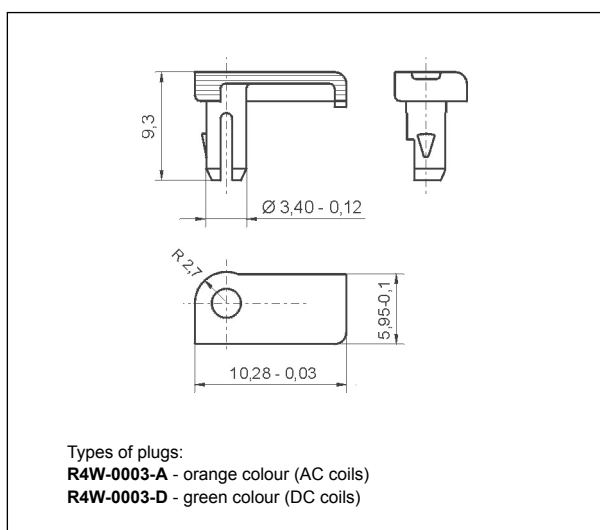


### Dimensions - test button R15-M404 for R15...WT 2 CO, R15...WT 3 CO

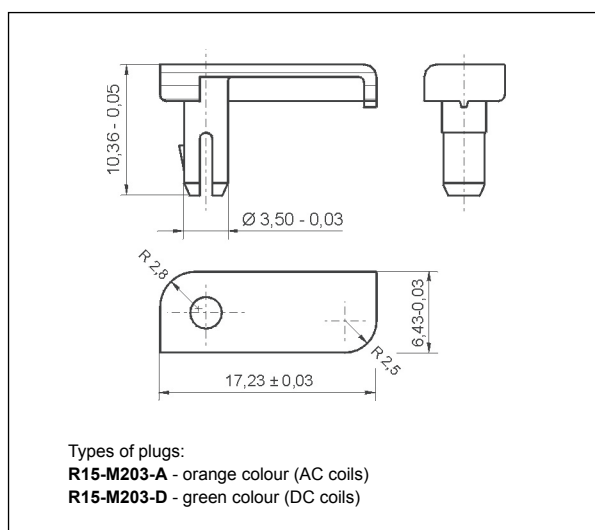


**Plugs R4W-0003** or **R15-M203** can substitute button type **T** if **manual operation (latching and testing) is not allowed**. Changing button type **T** for plug can be done by Customer themselves in the same way as changing button type **T** for button (no latching).

### Dimensions - plug R4W-0003 for R2N...WT, R3N...WT, R4N...WT



### Dimensions - plug R15-M203 for R15...WT 2 CO, R15...WT 3 CO



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