## Industrial relays

**Miniature industrial relays**



**Industrial relays of small dimensions**



Industrial relays are applied mainly in industrial and power automation systems, in signaling and protection systems, in other control and electric drives systems.

The basic features of industrial relays are:
- contact number: from 1 to 4,
- rated contact switching currents up to 30 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 PCB, plug-in sockets, 35 mm rails, screw-terminals of plug-in sockets and via flat connecting inserts.

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.

R2, R3 and R4 relays are the basis for the interface relays of PIR2, PIR3 and PIR4 types which are described in the section of "Interface relays".

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

**12 A / 250 V AC**

• Miniature dimensions • Cadmium - free contacts • AC and DC coils • For plug-in sockets, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting • For PCB and soldering connections - option • Relays of general application • WT (mechanical indicator + lockable front test button) - standard features of relays for plug-in sockets. Relays may be provided with the test buttons (no latching) and plugs - page 251 • Recognitions, certifications, directives: RoHS, AUCOTEAM GmbH Berlin - railway standards,

## Contact data

| | | |
|---|---|---|
| Number and type of contacts | | 2 C/O |
| Contact material | | **AgNi**, AgNi/Au 0,2 µm, AgNi/Au 5 µm |
| Rated / max. switching voltage | AC | 250 V / 440 V |
| Min. switching voltage | | 5 V |
| Rated load (capacity) | AC1 | 12 A / 250 V AC ❶ 10 A / 250 V AC ❷ |
| | AC15 | 3 A / 120 V 1,5 A / 240 V (B300) |
| | AC3 | 370 W (single-phase motor) |
| | DC1 | 12 A / 24 V DC (see Fig. 3) ❶ 10 A / 24 V DC ❷ |
| | DC13 | 0,22 A / 120 V 0,1 A / 250 V (R300) |
| Min. switching current | | 5 mA AgNi, 5 mA AgNi/Au 0,2 µm, 2 mA AgNi/Au 5 µm |
| Max. inrush current | | 24 A |
| Rated current | | 12 A ❶ 10 A ❷ |
| Max. breaking capacity | AC1 | 3 000 VA ❶ 2 500 VA ❷ |
| Min. breaking capacity | | 0,3 W AgNi, 0,3 W AgNi/Au 0,2 µm, 0,1 W AgNi/Au 5 µm |
| 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 $U_n$ 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 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 | 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 |
| • cos$\phi$ | | see Fig. 2 |
| Mechanical life (cycles) | | ≥ 2 x $10^7$ |
| Dimensions (L x W x H) | | 27,5 x 21,2 x 35,6 mm ❶ 27,5 x 21,1 x 33,5 mm ❷ 27,5 x 21,2 x 33 mm ❸ |
| 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 |
| Solder bath temperature | | max. 270 °C |
| Soldering time | | max. 5 s |

The data in bold type pertain to the standard versions of the relays.
❶ For plug-in sockets version: standard (WT) ❷ For PCB version ❸ For version with threaded bolt

**Coil data** - DC voltage version

Table 1

| Coil code | Rated voltage V DC | Coil resistance (±10%) at 20 °C Ω | Coil operating range V DC | |
|---|---|---|---|---|
| | | | min. (at 20 °C) | max. (at 55 °C) |
| 1005 | 5 | 28 | 4,0 | 5,5 |
| 1006 | 6 | 40 | 4,8 | 6,6 |
| 1012 | 12 | 160 | 9,6 | 13,2 |
| **1024** | **24** | **640** | **19,2** | **26,4** |
| 1048 | 48 | 2 600 | 38,4 | 52,8 |
| 1060 | 60 | 4 000 | 48,0 | 66,0 |
| 1080 | 80 | 7 100 | 64,0 | 88,0 |
| 1110 | 110 | 13 600 | 88,0 | 121,0 |
| 1125 | 125 | 16 000 | 100,0 | 137,5 |
| **1220** | **220** | **54 000** | **176,0** | **242,0** |

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

**Coil data** - AC 50/60 Hz voltage version

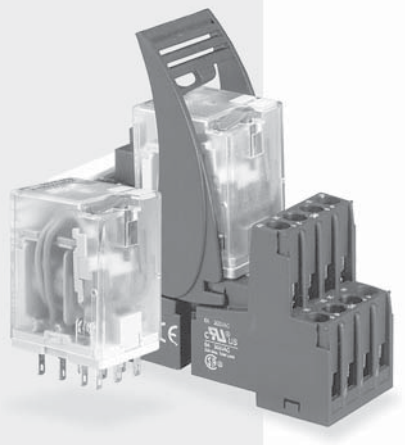
Table 2

| Coil code | Rated voltage V AC | Coil resistance (±10%) at 20 °C Ω | Coil operating range V AC | |
|---|---|---|---|---|
| | | | min. (at 20 °C) | max. (at 55 °C) |
| 5006 | 6 | 9,8 | 4,8 | 6,6 |
| 5012 | 12 | 39,5 | 9,6 | 13,2 |
| **5024** | **24** | **158,0** | **19,2** | **26,4** |
| 5042 | 42 | 470,0 | 33,6 | 46,2 |
| 5048 | 48 | 640,0 | 38,4 | 52,8 |
| 5060 | 60 | 930,0 | 48,0 | 66,0 |
| 5080 | 80 | 1 720,0 | 64,0 | 88,0 |
| 5110 | 110 | 3 450,0 | 88,0 | 121,0 |
| 5115 | 115 | 3 610,0 | 92,0 | 127,0 |
| 5120 | 120 | 3 770,0 | 96,0 | 132,0 |
| 5127 | 127 | 4 000,0 | 101,6 | 139,0 |
| 5220 | 220 | 15 400,0 | 176,0 | 242,0 |
| **5230** | **230** | **16 100,0** | **184,0** | **253,0** |
| 5240 | 240 | 16 800,0 | 192,0 | 264,0 |

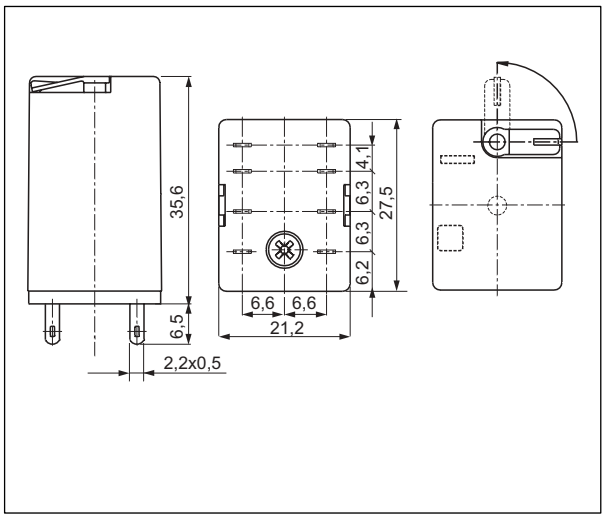
The data in bold type pertain to the standard versions of the relays.

**EUROPRODUCT 2002**
for electromagnetic relays
**R2...WT**, **R3...WT**, **R4...WT**
with sockets **GZT2**, **GZT3**, **GZT4**

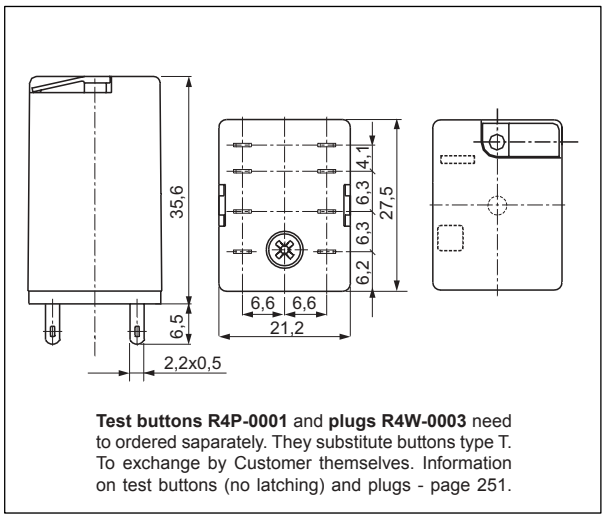
**ELECTROPRODUCT 2003**
for electromagnetic relays
**R2**, **R3**, **R4**

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

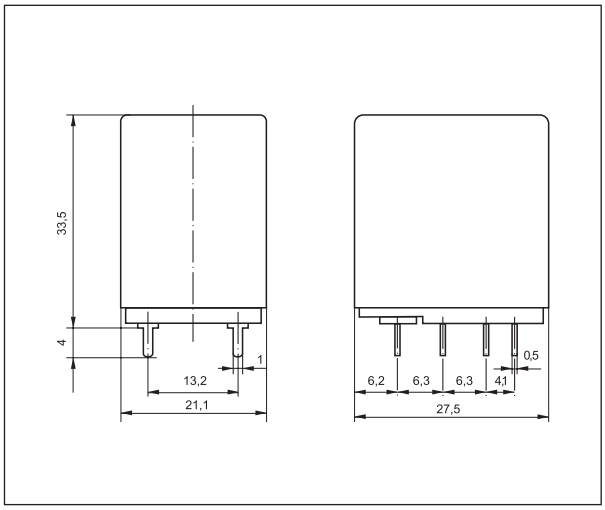



**Dimensions** - plug-in version, with test button (no latching) or with plug (no manual operation)

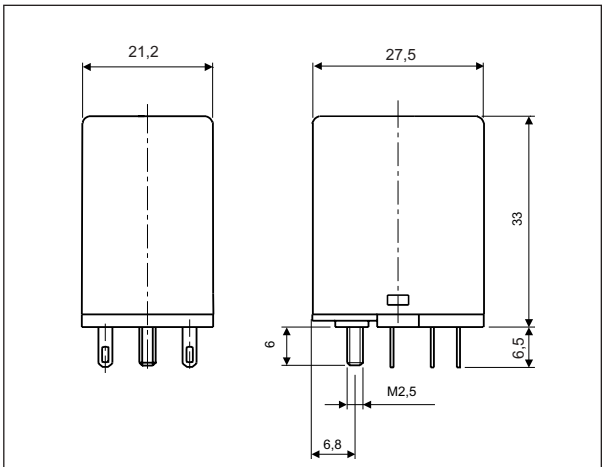



**Test buttons R4P-0001** and **plugs R4W-0003** need to ordered saparately. They substitute buttons type T. To exchange by Customer themselves. Information on test buttons (no latching) and plugs - page 251.

**Dimensions** - PCB version (without WT)



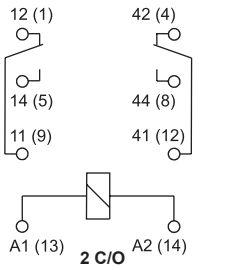

**Dimensions** - version with threaded bolt




## Mounting

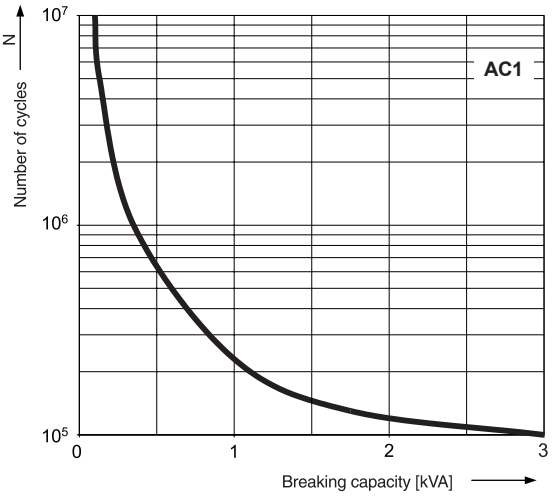
**Relays R2 are offered in versions**: • standard WT (mechanical indicator + lockable front test button), for plug-in sockets. **In standard version of relays (WT) is possibility self-exchange of button type T for test button R4P-0001 (no latching) or plug R4W-0003 (no manual operation). Test buttons (no latching) and plugs need to ordered saparately** • for PCB (without WT) • with threaded bolt.

**Connection diagram** (pin side view)

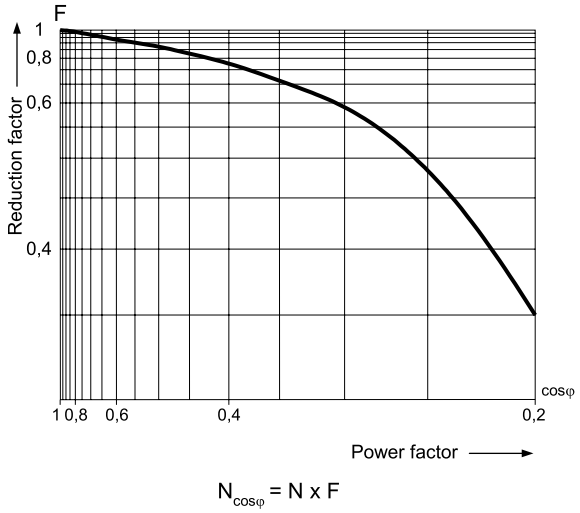



| |
|---|
| Relay terminals for PCB<br>0,5 x 1 mm |
| Drilling hole:<br>• for relays Ø 1,3 + 0,1 mm<br>• for sockets Ø 1,5 + 0,1 mm |

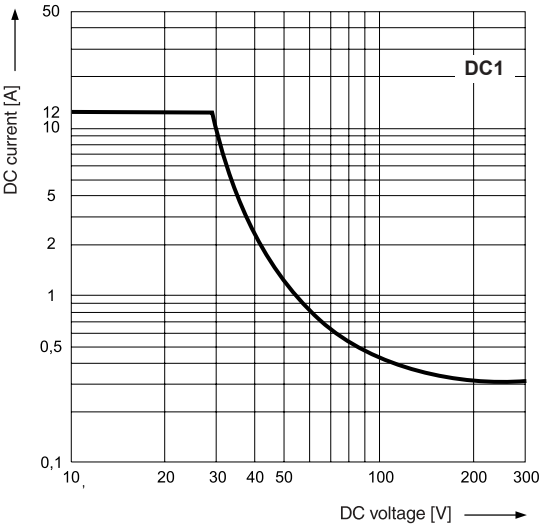
**Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour** Fig. 1




**Electrical life reduction factor at AC inductive load** Fig. 2




**Max. DC resistive load breaking capacity** Fig. 3




## Mounting

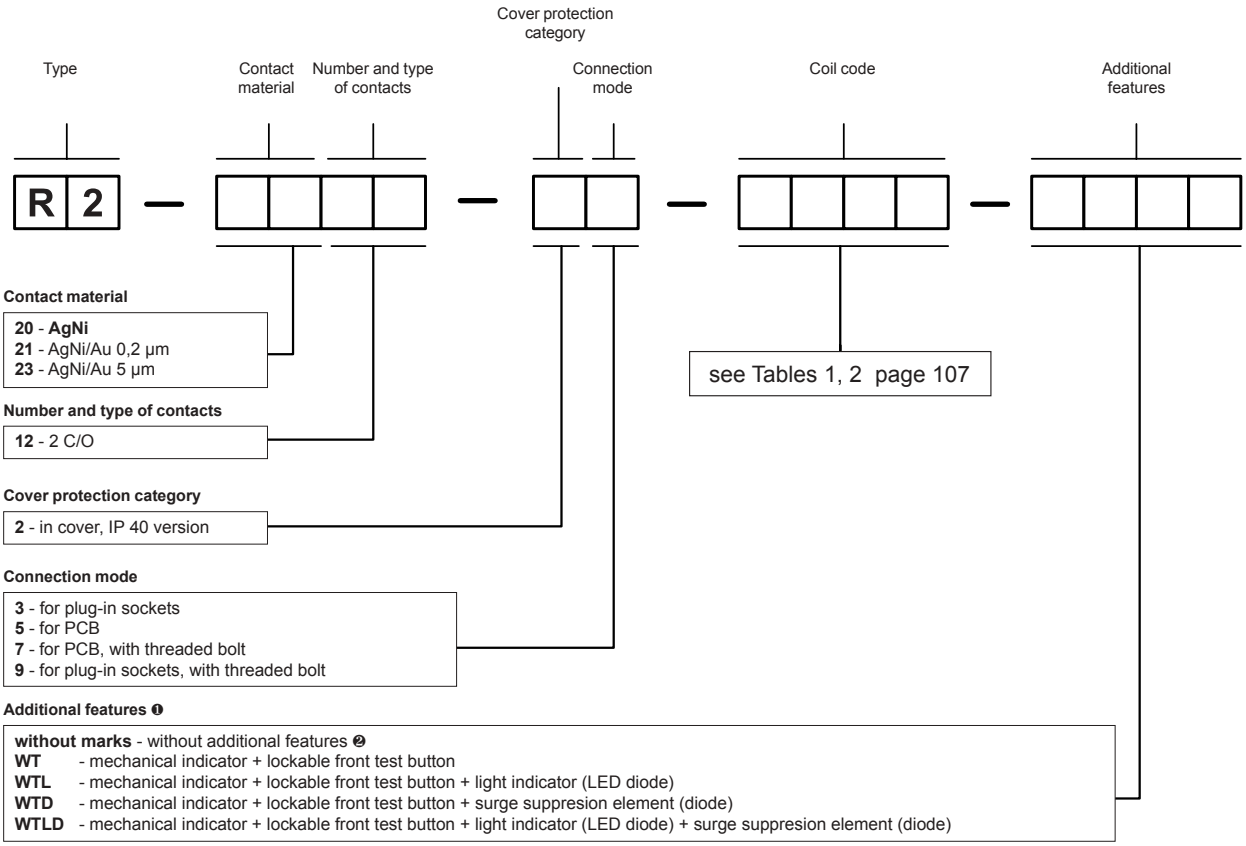
Relays **R2** are designed for: • screw terminals plug-in sockets **GZT2** ❶ and **GZM2** ❶ with clip **GZT4-0040** or **G4 1052**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws. Signalling / protecting modules **type M...** are available with sockets (see page 250) • plug-in sockets for PCB mounting **SU4/2D** with clip **G4 1053** (WT) or **G4 1050** (without WT) • solder terminals sockets **SU4/2L** with clip **G4 1053** (WT) or **G4 1050** (without WT) and spring clamp **G4 1040** • solder terminals sockets **G4/2** with clip **G4 1053** (WT) or **G4 1050** (without WT) • direct PCB mounting.

❶ Plug-in sockets **GZT2** and **GZM2** may be linked with interconnection strip type **ZGGZ4** (see page 262).

## Contact material selection for different load types

- **AgNi** - for resistive or inductive loads,
- **AgNi/Au 0,2 µm** - contact surface protection against oxidation during storage,
- **AgNi/Au 5 µm** - for small resistive loads in control circuits.

## Ordering codes




❶ **WT** - standard features of relays for plug-in sockets. **WTD, WTLD** - only for DC coils
❷ Refer relays for PCB and with threaded bolt

**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 251.

- 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:**
For relays with DC coils and additional features inclusive: **D** - surge suppresion element (diode) and **L** - light indicator (LED diode) coil supply polarization is fixed. Terminal A1 (13) "+"; terminal A2 (14) "-". Supply polarization is marked on relay cover. Colour of lockable front test button type T represents type of coil supply current: orange - AC coil, green - DC coil.

Examples of ordering codes:

**R2-2012-23-1024-WT** relay **R2**, contact material AgNi, with two changeover contacts, in cover IP 40, for plug-in sockets, voltage version 24 V DC, with mechanical indicator and lockable front test button

**R2-2012-25-1024** relay **R2**, contact material AgNi, with two changeover contacts, in cover IP 40, for PCB, voltage version 24 V DC

**10 A / 250 V AC**

• Miniature dimensions • Cadmium - free contacts • AC and DC coils • For plug-in sockets, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting • Relays of general application • WT (mechanical indicator + lockable front test button) - standard features of relays for plug-in sockets. Relays may be provided with the test buttons (no latching) and plugs - page 251 • Recognitions, certifications, directives: RoHS, AUCOTEAM GmbH Berlin - railway standards,

## Contact data

| | | |
|---|---|---|
| Number and type of contacts | | 3 C/O |
| Contact material | | **AgNi**, AgNi/Au 0,2 µm, AgNi/Au 5 µm |
| 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) |
| | 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 AgNi, 5 mA AgNi/Au 0,2 µm, 2 mA AgNi/Au 5 µm |
| 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 0,2 µm, 0,1 W AgNi/Au 5 µm |
| 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 $U_n$ 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 PN-EN 60664-1

| | |
|---|---|
| Insulation rated voltage | 250 V AC |
| Rated surge voltage | with AC coils: 2 500 V 1,2 / 50 µs |
| | with DC coils: 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 | | ≥ $10^5$ 10 A, 250 V AC |
| • cos$\phi$ | | see Fig. 2 |
| Mechanical life (cycles) | | ≥ 2 x $10^7$ |
| Dimensions (L x W x H) | | 27,5 x 21,2 x 35,6 mm ❶ 27,5 x 21,2 x 33 mm ❷ |
| 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 |
| Solder bath temperature | | max. 270 °C |
| Soldering time | | max. 5 s |

The data in bold type pertain to the standard versions of the relays. ❶ For plug-in sockets version: standard (WT) ❷ For version with threaded bolt

**Coil data** - DC voltage version

Table 1

| Coil code | Rated voltage V DC | Coil resistance (±10%) at 20 °C Ω | Coil operating range V DC | |
|---|---|---|---|---|
| | | | min. (at 20 °C) | max. (at 55 °C) |
| 1005 | 5 | 28 | 4,0 | 5,5 |
| 1006 | 6 | 40 | 4,8 | 6,6 |
| 1012 | 12 | 160 | 9,6 | 13,2 |
| **1024** | **24** | **640** | **19,2** | **26,4** |
| 1048 | 48 | 2 600 | 38,4 | 52,8 |
| 1060 | 60 | 4 000 | 48,0 | 66,0 |
| 1080 | 80 | 7 100 | 64,0 | 88,0 |
| 1110 | 110 | 13 600 | 88,0 | 121,0 |
| 1125 | 125 | 16 000 | 100,0 | 137,5 |
| **1220** | **220** | **54 000** | **176,0** | **242,0** |

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

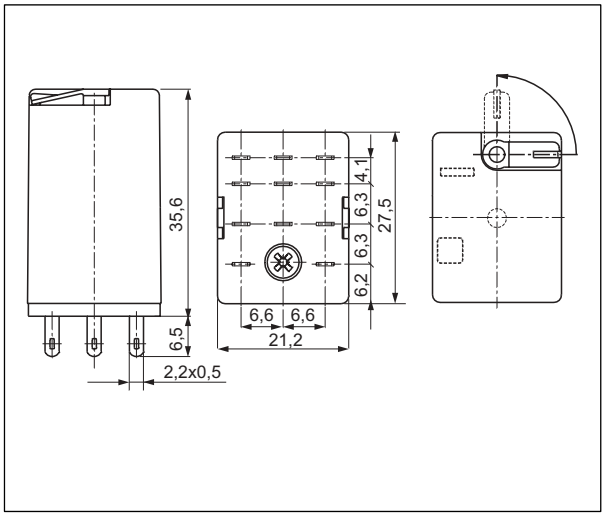
**Coil data** - AC 50/60 Hz voltage version

Table 2

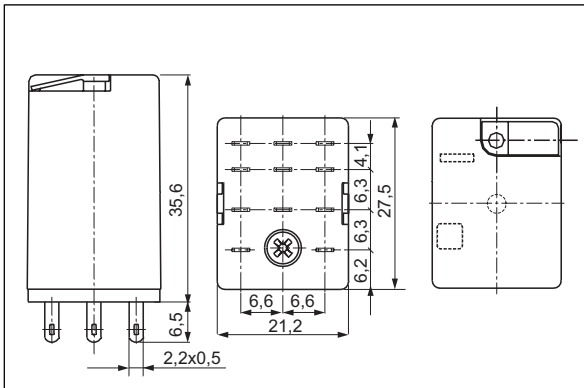
| Coil code | Rated voltage V AC | Coil resistance (±10%) at 20 °C Ω | Coil operating range V AC | |
|---|---|---|---|---|
| | | | min. (at 20 °C) | max. (at 55 °C) |
| 5006 | 6 | 9,8 | 4,8 | 6,6 |
| 5012 | 12 | 39,5 | 9,6 | 13,2 |
| **5024** | **24** | **158,0** | **19,2** | **26,4** |
| 5042 | 42 | 470,0 | 33,6 | 46,2 |
| 5048 | 48 | 640,0 | 38,4 | 52,8 |
| 5060 | 60 | 930,0 | 48,0 | 66,0 |
| 5080 | 80 | 1 720,0 | 64,0 | 88,0 |
| 5110 | 110 | 3 450,0 | 88,0 | 121,0 |
| 5115 | 115 | 3 610,0 | 92,0 | 127,0 |
| 5120 | 120 | 3 770,0 | 96,0 | 132,0 |
| 5127 | 127 | 4 000,0 | 101,6 | 139,0 |
| 5220 | 220 | 15 400,0 | 176,0 | 242,0 |
| **5230** | **230** | **16 100,0** | **184,0** | **253,0** |
| 5240 | 240 | 16 800,0 | 192,0 | 264,0 |

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

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

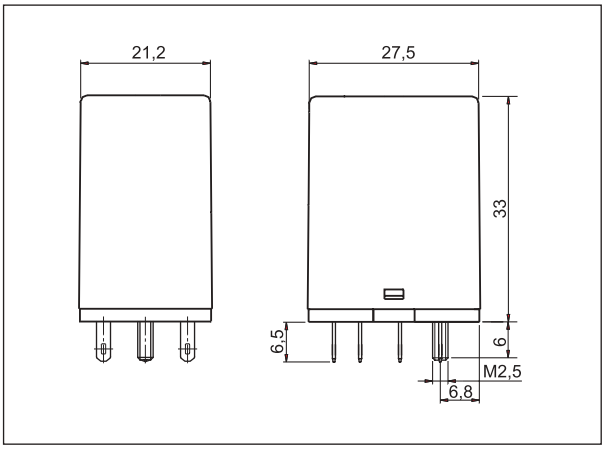



**Dimensions** - plug-in version, with test button (no latching) or with plug (no manual operation)

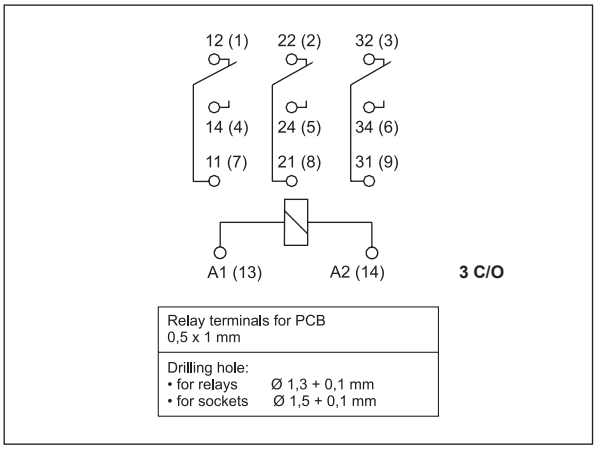



**Test buttons R4P-0001** and **plugs R4W-0003** need to ordered saparately. They substitute buttons type T. To exchange by Customer themselves. Information on test buttons (no latching) and plugs - page 251.

## **Dimensions -** version with threaded bolt

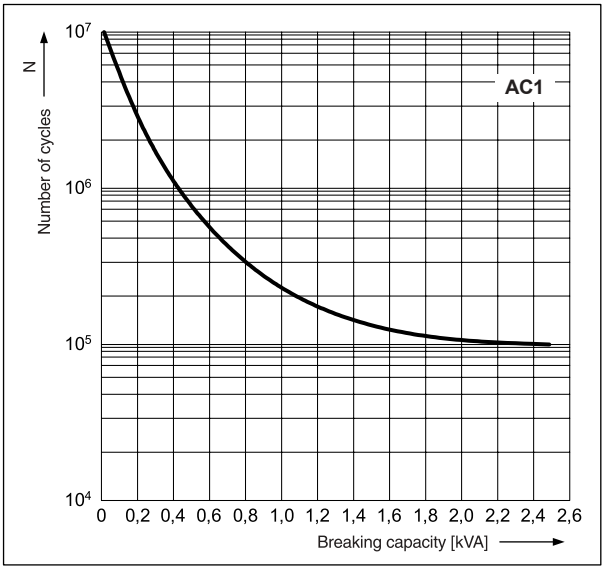



## **Connection diagram** (pin side view)



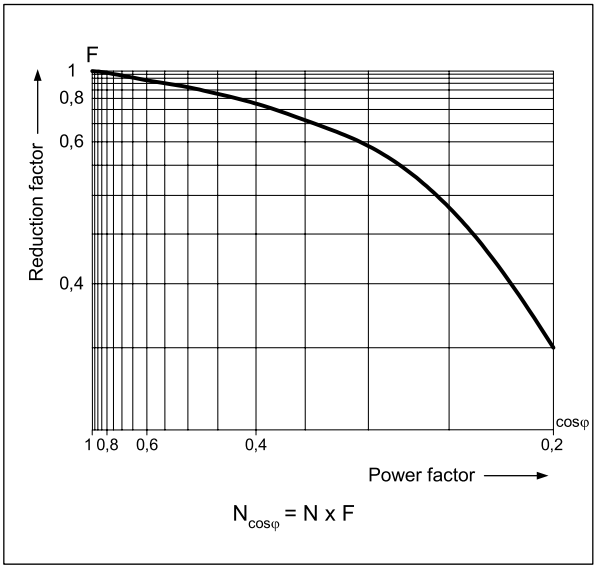

## **Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour**

Fig. 1



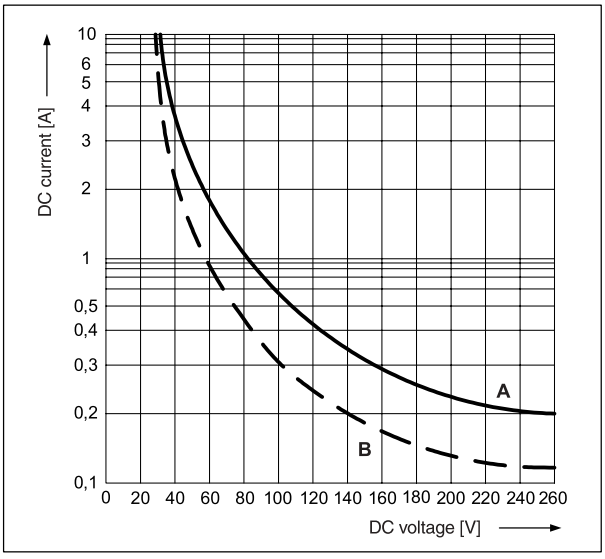

## **Electrical life reduction factor at AC inductive load**

Fig. 2




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

Fig. 3




## **Mounting**

**Relays R3 are offered in versions**: • standard WT (mechanical indicator + lockable front test button), for plug-in sockets. **In standard version of relays (WT) is possibility self-exchange of button type T for test button R4P-0001 (no latching) or plug R4W-0003 (no manual operation). Test buttons (no latching) and plugs need to ordered saparately** • with threaded bolt.

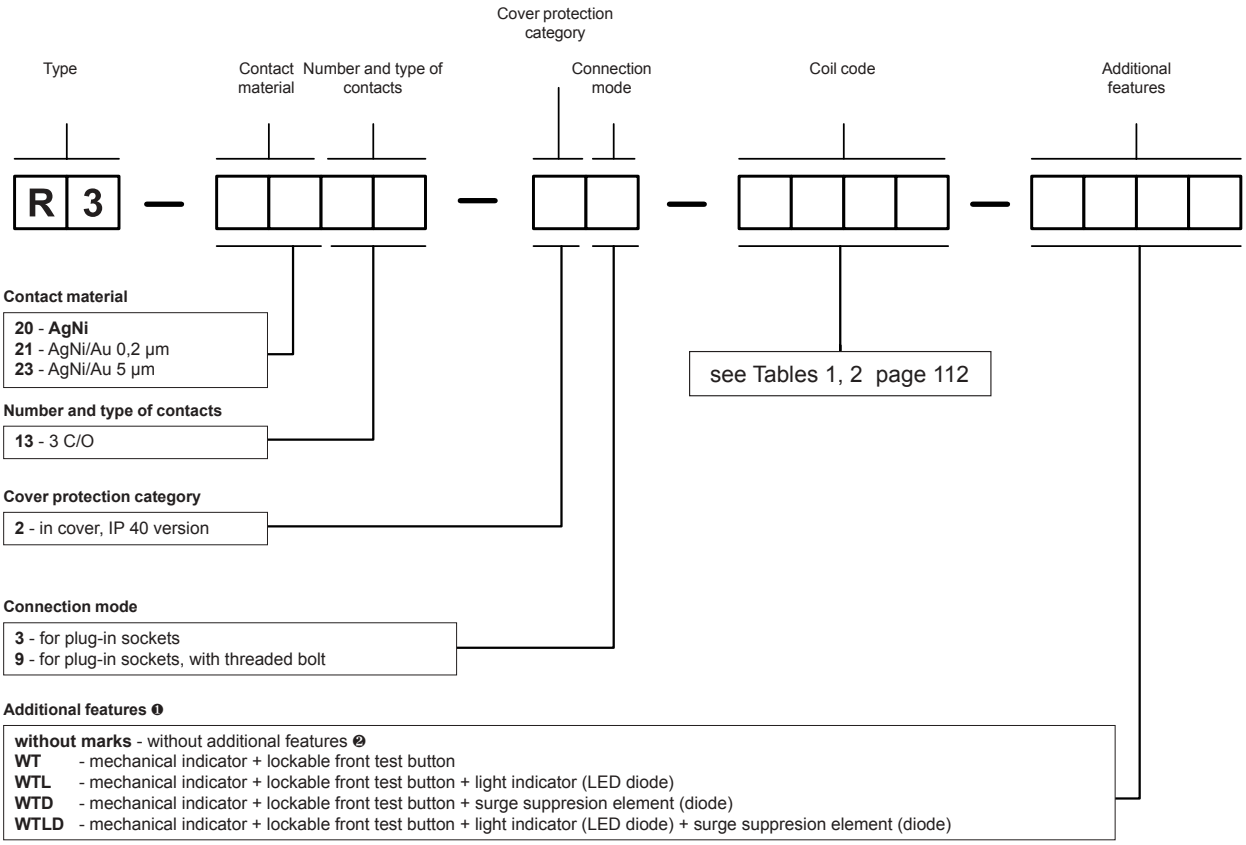
Relays **R3** are designed for: • screw terminals plug-in sockets **GZT3** ❶ and **GZM3** ❶ with clip **GZT4-0040** or **G4 1052**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws. Signalling / protecting modules **type M...** are available with sockets (see page 250).

❶ Plug-in sockets **GZT3** and **GZM3** may be linked with interconnection strip type **ZGGZ4** (see page 262).

## Contact material selection for different load types

- **AgNi** - for resistive or inductive loads,
- **AgNi/Au 0,2 µm** - contact surface protection against oxidation during storage,
- **AgNi/Au 5 µm** - for small resistive loads in control circuits.

## Ordering codes




❶ **WT** - standard features of relays for plug-in sockets. **WTD, WTLD** - only for DC coils
❷ Refer relays with threaded bolt

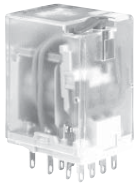
**Test buttons (no latching) and plugs** need to ordered saparately. They substitute buttons type T. To exchange by Customer themselves.
Information on test buttons (no latching) and plugs - page 251.

- 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:**
For relays with DC coils and additional features inclusive: **D** - surge suppresion element (diode) and **L** - light indicator (LED diode) coil supply polarization is fixed. Terminal A1 (13) ”+”; terminal A2 (14) ”-”. Supply polarization is marked on relay cover. Colour of lockable front test button type T represents type of coil supply current: orange - AC coil, green - DC coil.

Example of ordering code:

**R3-2013-23-1024-WT** relay **R3**, contact material AgNi, with three changeover contacts, in cover IP 40, for plug-in sockets, voltage version 24 V DC, with mechanical indicator and lockable front test button



**6 A / 250 V AC**

• Miniature dimensions • Cadmium - free contacts • AC and DC coils • For plug-in sockets, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting • For PCB and for soldering connections - option • Relays of general application • WT (mechanical indicator + lockable front test button) - standard features of relays for plug-in sockets. Relays may be provided with the test buttons (no latching) and plugs - page 251 • **Have obtained LR Type Approval Certificate (Lloyd's Register) - R4...WT** • Recognitions, certifications, directives: RoHS, AUCOTEAM GmbH Berlin - railway standards,

## Contact data

| | | |
|---|---|---|
| Number and type of contacts | | 4 C/O |
| Contact material | | **AgNi**, AgNi/Au 0,2 µm, AgNi/Au 5 µm |
| Rated / max. switching voltage | AC | 250 V / 250 V |
| Min. switching voltage | | 5 V |
| Rated load (capacity) | AC1 | 6 A / 250 V AC |
| | AC15 | 1,5 A / 120 V 0,75 A / 240 V (C300) |
| | AC3 | 125 W (single-phase motor) |
| | DC1 | 6 A / 24 V DC (see Fig. 3) |
| | DC13 | 0,22 A / 120 V 0,1 A / 250 V (R300) |
| Min. switching current | | 5 mA AgNi, 5 mA AgNi/Au 0,2 µm, 2 mA AgNi/Au 5 µm |
| Max. inrush current | | 12 A |
| Rated current | | 6 A |
| Max. breaking capacity | AC1 | 1 500 VA |
| Min. breaking capacity | | 0,3 W AgNi, 0,3 W AgNi/Au 0,2 µm, 0,1 W AgNi/Au 5 µm |
| 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 $U_n$ 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 PN-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 | | ≥ $10^5$ 6 A, 250 V AC |
| • cos$\phi$ | | see Fig. 2 |
| Mechanical life (cycles) | | ≥ 2 x $10^7$ |
| Dimensions (L x W x H) | | 27,5 x 21,2 x 35,6 mm ❶ 27,5 x 21,1 x 33,5 mm ❷ 27,5 x 21,2 x 33 mm ❸ |
| 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 |
| Solder bath temperature | | max. 270 °C |
| Soldering time | | max. 5 s |

The data in bold type pertain to the standard versions of the relays.
❶ For plug-in sockets version: standard (WT) ❷ For PCB version ❸ For version with threaded bolt

**Coil data -** DC voltage version Table 1

| Coil code | Rated voltage V DC | Coil resistance (±10%) at 20 °C Ω | Coil operating range V DC | |
|---|---|---|---|---|
| | | | min. (at 20 °C) | max. (at 55 °C) |
| 1005 | 5 | 28 | 4,0 | 5,5 |
| 1006 | 6 | 40 | 4,8 | 6,6 |
| **1012** | **12** | **160** | **9,6** | **13,2** |
| **1024** | **24** | **640** | **19,2** | **26,4** |
| 1048 | 48 | 2 600 | 38,4 | 52,8 |
| 1060 | 60 | 4 000 | 48,0 | 66,0 |
| 1080 | 80 | 7 100 | 64,0 | 88,0 |
| 1110 | 110 | 13 600 | 88,0 | 121,0 |
| 1125 | 125 | 16 000 | 100,0 | 137,5 |
| **1220** | **220** | **54 000** | **176,0** | **242,0** |

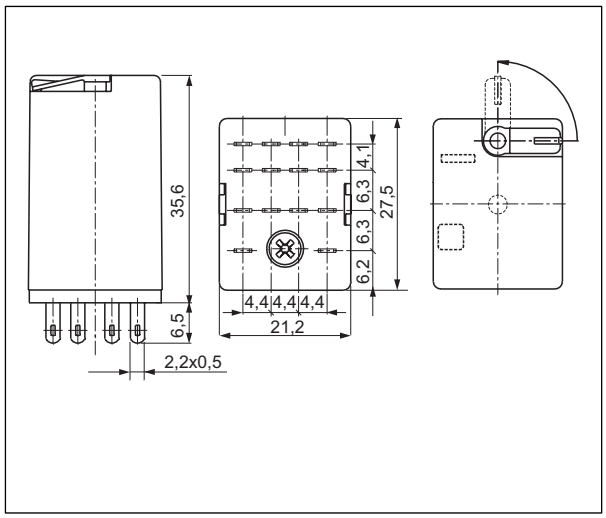
The data in bold type pertain to the standard versions of the relays.

**Coil data -** AC 50/60 Hz voltage version Table 2

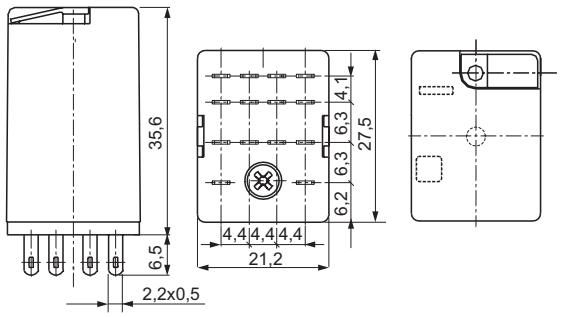
| Coil code | Rated voltage V AC | Coil resistance (±10%) at 20 °C Ω | Coil operating range V AC | |
|---|---|---|---|---|
| | | | min. (at 20 °C) | max. (at 55 °C) |
| 5006 | 6 | 9,8 | 4,8 | 6,6 |
| 5012 | 12 | 39,5 | 9,6 | 13,2 |
| **5024** | **24** | **158,0** | **19,2** | **26,4** |
| 5042 | 42 | 470,0 | 33,6 | 46,2 |
| 5048 | 48 | 640,0 | 38,4 | 52,8 |
| 5060 | 60 | 930,0 | 48,0 | 66,0 |
| 5080 | 80 | 1 720,0 | 64,0 | 88,0 |
| 5110 | 110 | 3 450,0 | 88,0 | 121,0 |
| 5115 | 115 | 3 610,0 | 92,0 | 127,0 |
| 5120 | 120 | 3 770,0 | 96,0 | 132,0 |
| 5127 | 127 | 4 000,0 | 101,6 | 139,0 |
| 5220 | 220 | 15 400,0 | 176,0 | 242,0 |
| **5230** | **230** | **16 100,0** | **184,0** | **253,0** |
| 5240 | 240 | 16 800,0 | 192,0 | 264,0 |

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

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

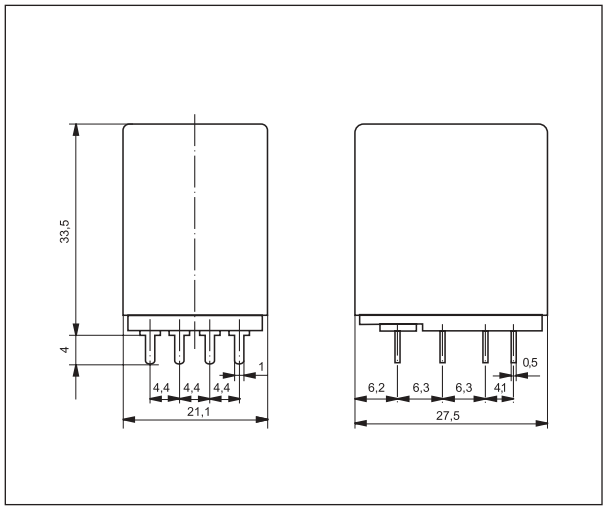



**Dimensions** - plug-in version, with test button (no latching) or with plug (no manual operation)

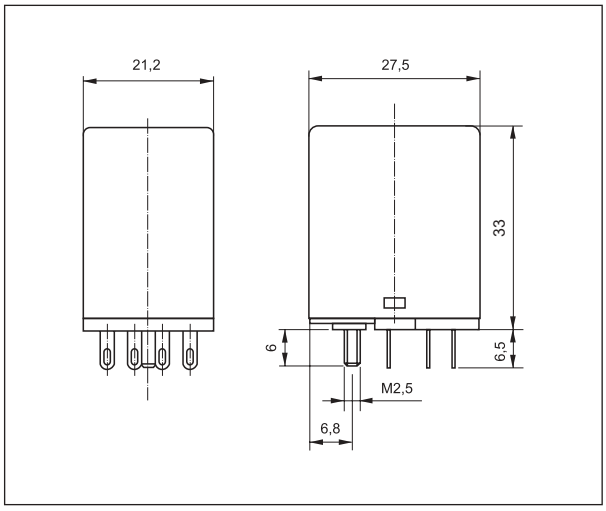



**Test buttons R4P-0001** and **plugs R4W-0003** need to ordered saparately. They substitute buttons type T. To exchange by Customer themselves. Information on test buttons (no latching) and plugs - page 251.

**Dimensions** - PCB version (without WT)



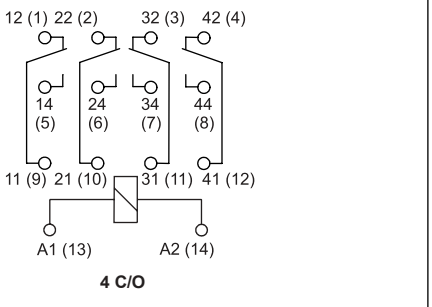

**Dimensions** - version with threaded bolt




## Mounting

**Relays R4 are offered in versions**: • standard WT (mechanical indicator + lockable front test button), for plug-in sockets. **In standard version of relays (WT) is possibility self-exchange of button type T for test button R4P-0001 (no latching) or plug R4W-0003 (no manual operation). Test buttons (no latching) and plugs need to ordered saparately** • for PCB (without WT) • with threaded bolt.

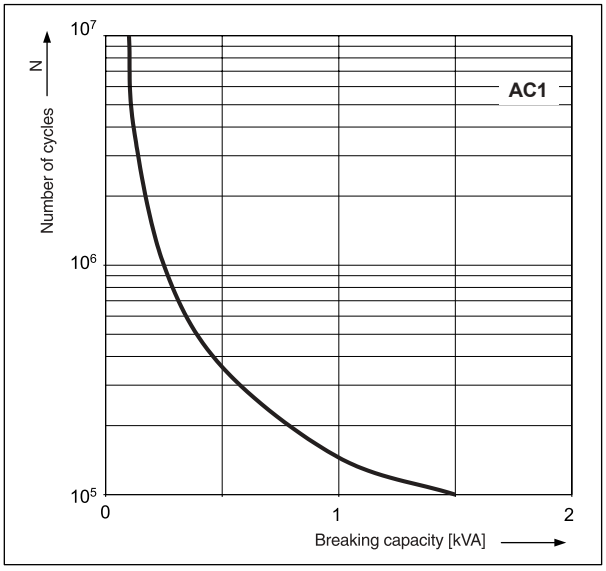
**Connection diagram** (pin side view)



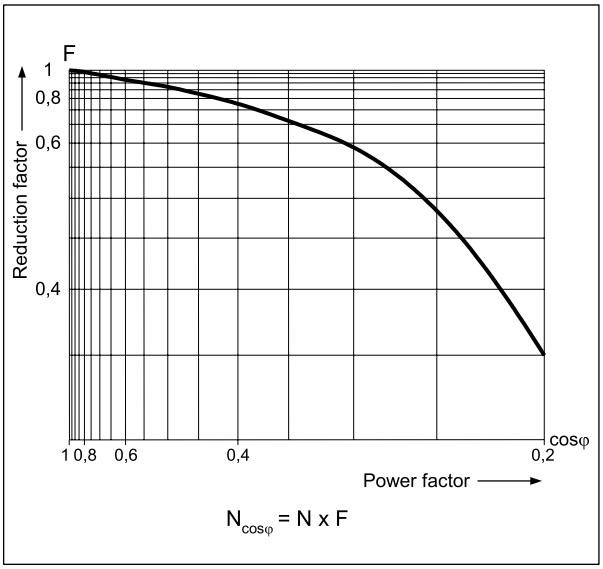

**4 C/O**

| Relay terminals for PCB 0,5 x 1 mm |
|---|
| Drilling hole:<br>• for relays Ø 1,3 + 0,1 mm<br>• for sockets Ø 1,5 + 0,1 mm |

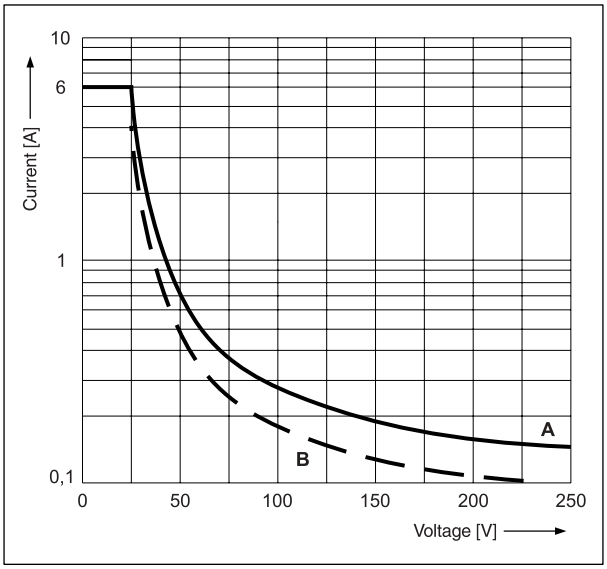
**Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour** Fig. 1




**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

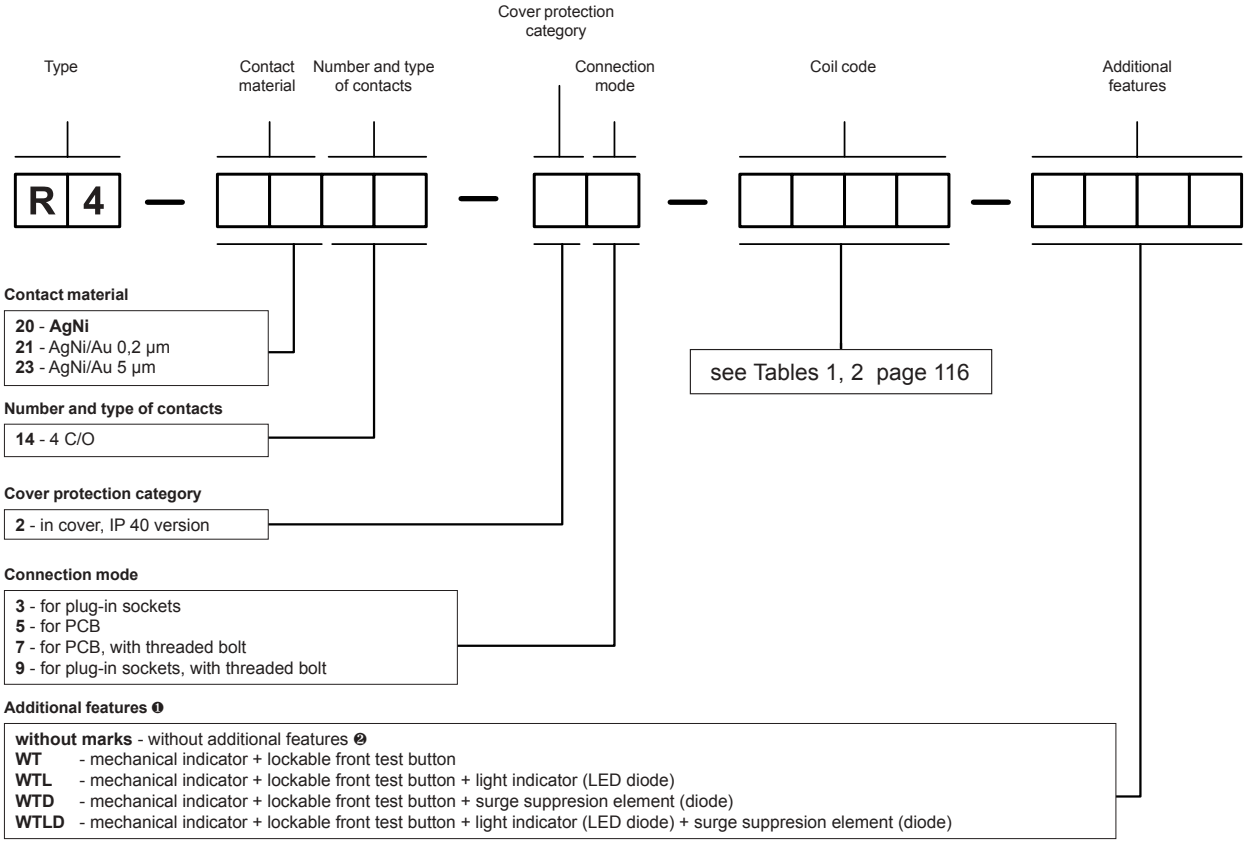
Relays **R4** are designed for: • screw terminals plug-in sockets **GZT4** ❶ and **GZM4** ❶ with clip **GZT4-0040** or **G4 1052**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws. Signalling / protecting modules **type M...** are available with sockets (see page 250) • screw terminals plug-in sockets **GZ4** with clip **G4 1052** or plug-in sockets **GS4** with clip **GS4-0036**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws • plug-in sockets for PCB mounting **SU4D** with clip **G4 1053** (WT) or **G4 1050** (without WT) • solder terminals sockets **SU4L** with clip **G4 1053** (WT) or **G4 1050** (without WT) and spring clamp **G4 1040** • solder terminals sockets **G4** with clip **G4 1053** (WT) or **G4 1050** (without WT) • direct PCB mounting.

❶ Plug-in sockets **GZT4** and **GZM4** may be linked with interconnection strip type **ZGGZ4** (see page 262).

## Contact material selection for different load types

- **AgNi** - for resistive or inductive loads,
- **AgNi/Au 0,2 µm** - contact surface protection against oxidation during storage,
- **AgNi/Au 5 µm** - for small resistive loads in control circuits.

## Ordering codes




❶ **WT** - standard features of relays for plug-in sockets. **WTD, WTLD** - only for DC coils
❷ Refer relays for PCB and with threaded bolt

**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 251.

- 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:**
For relays with DC coils and additional features inclusive: **D** - surge suppresion element (diode) and **L** - light indicator (LED diode) coil supply polarization is fixed. Terminal A1 (13) ”+”; terminal A2 (14) ”-”. Supply polarization is marked on relay cover. Colour of lockable front test button type T represents type of coil supply current: orange - AC coil, green - DC coil.

Example of ordering code:

**R4-2014-23-5230-WTL** relay **R4**, contact material AgNi, with four changeover contacts, in cover IP 40, for plug-in sockets, voltage version 230 V AC 50/60 Hz, with mechanical indicator and lockable front test button and light indicator (LED diode)

# RY2
## miniature industrial relays

- Relays of general application
- For plug-in sockets, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting
- Flat insert connectors - faston 4,8 x 0,5 mm
- Recognitions, certifications, directives: RoHS,

## Contact data

| | | |
|---|---|---|
| Number and type of contacts | | 2 C/O |
| Contact material | | **AgNi**, AgCdO |
| Rated / max. switching voltage | AC | 250 V / 440 V |
| Min. switching voltage | | 5 V AgNi, 10 V AgCdO |
| Rated load | AC1 | 12 A / 250 V AC |
| | DC1 | 12 A / 30 V DC |
| Min. switching current | | 5 mA AgNi, 10 mA AgCdO |
| Max. inrush current | | 20 A |
| Rated current | | 12 A |
| Max. breaking capacity | AC1 | 3 000 VA |
| Min. breaking capacity | | 0,3 W AgNi, 1 W AgCdO |
| 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 $U_n$ 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 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 | 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 |
| • cos$\phi$ | | 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 |
| | • operating | -40...+55 °C |
| Cover protection category | | IP 40 PN-EN 60529 |
| Shock resistance | | 10 g |
| Vibration resistance | | 5 g 15...150 Hz |

The data in bold type pertain to the standard versions of the relays.
❶ For plug-in sockets version: standard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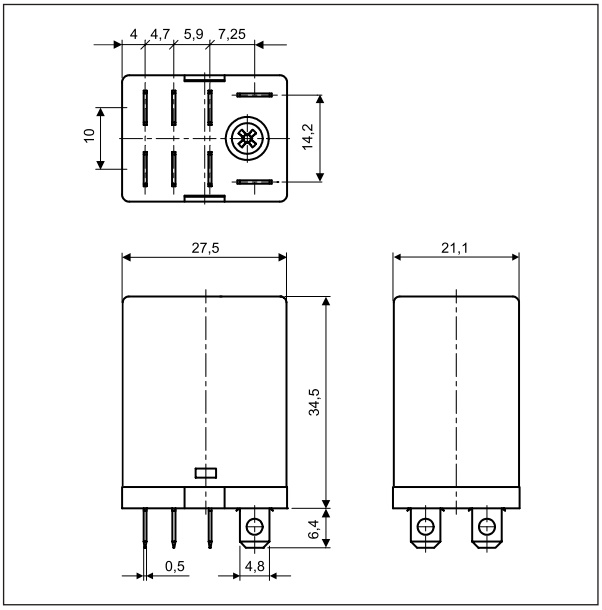
**Coil data** - DC voltage version Table 1

| Coil code | Rated voltage V DC | Coil resistance ±10% at 20 °C Ω | Coil operating range V DC | |
|---|---|---|---|---|
| | | | min. (at 20°C) | max. (at 55°C) |
| 1005 | 5 | 28 | 4,0 | 5,5 |
| 1006 | 6 | 40 | 4,8 | 6,6 |
| 1012 | 12 | 160 | 9,6 | 13,2 |
| 1024 | 24 | 640 | 19,2 | 26,4 |
| 1048 | 48 | 2 600 | 38,4 | 52,8 |
| 1060 | 60 | 4 000 | 48,0 | 66,0 |
| 1080 | 80 | 7 100 | 64,0 | 88,0 |
| 1110 | 110 | 13 600 | 88,0 | 121,0 |
| 1125 | 125 | 16 000 | 100,0 | 137,5 |
| 1220 | 220 | 54 000 | 176,0 | 242,0 |

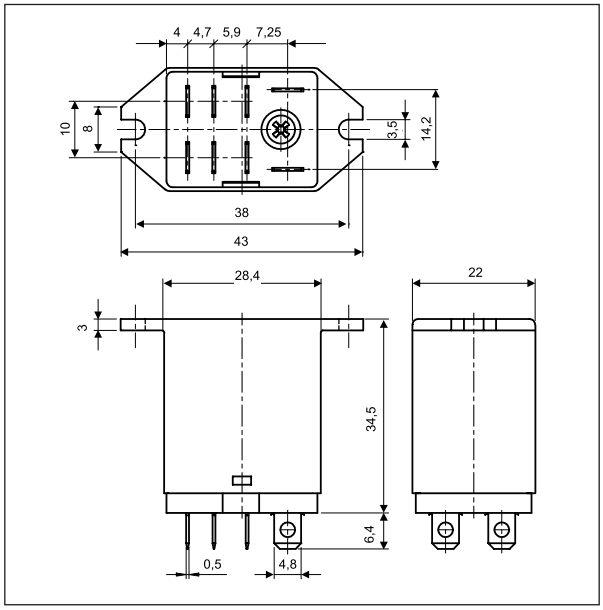
**Coil data** - AC 50/60 Hz voltage version Table 2

| Coil code | Rated voltage V AC | Coil resistance ±10% at 20 °C Ω | Coil operating range V AC | |
|---|---|---|---|---|
| | | | min. (at 20°C) | max. (at 55°C) |
| 5006 | 6 | 9,8 | 4,8 | 6,6 |
| 5012 | 12 | 39,5 | 9,6 | 13,2 |
| 5024 | 24 | 158,0 | 19,2 | 26,4 |
| 5042 | 42 | 470,0 | 33,6 | 46,2 |
| 5048 | 48 | 640,0 | 38,4 | 52,8 |
| 5060 | 60 | 930,0 | 48,0 | 66,0 |
| 5080 | 80 | 1 720,0 | 64,0 | 88,0 |
| 5110 | 110 | 3 450,0 | 88,0 | 121,0 |
| 5120 | 120 | 3 770,0 | 96,0 | 132,0 |
| 5127 | 127 | 4 000,0 | 101,6 | 139,7 |
| 5220 | 220 | 15 400,0 | 176,0 | 242,0 |
| 5230 | 230 | 16 100,0 | 184,0 | 253,0 |
| 5240 | 240 | 16 800,0 | 192,0 | 264,0 |

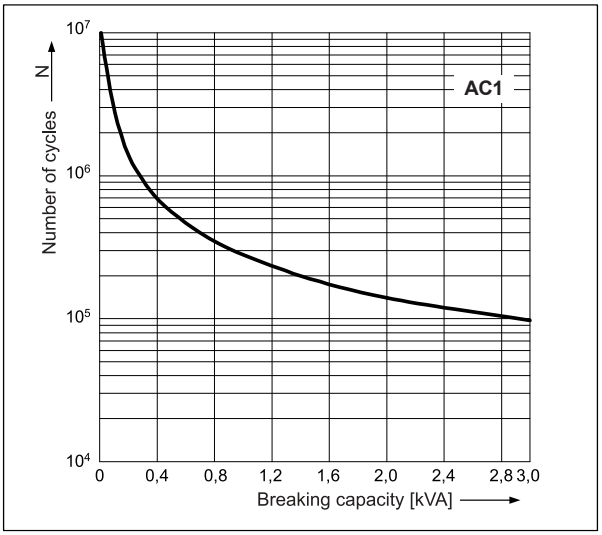
## **Dimensions -** plug-in version (standard)



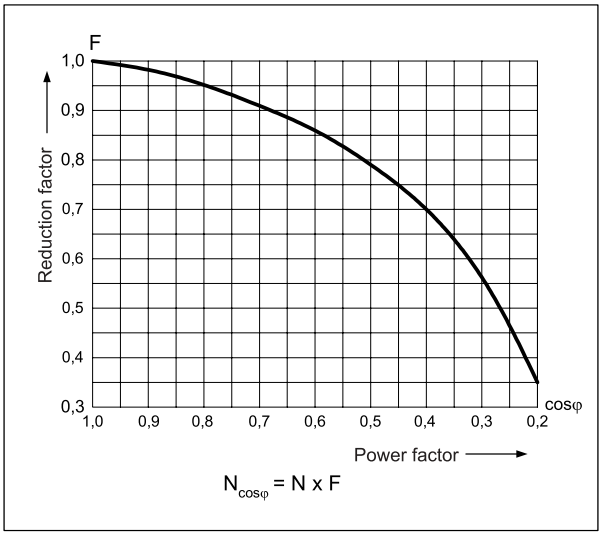

## **Dimensions -** version with mounting flange in the upper wall of the cover



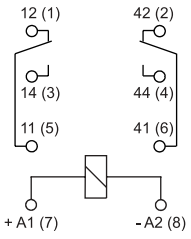

## **Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour** Fig. 1




## **Electrical life reduction factor at AC inductive load** Fig. 2




## **Connection diagram** (pin side view)



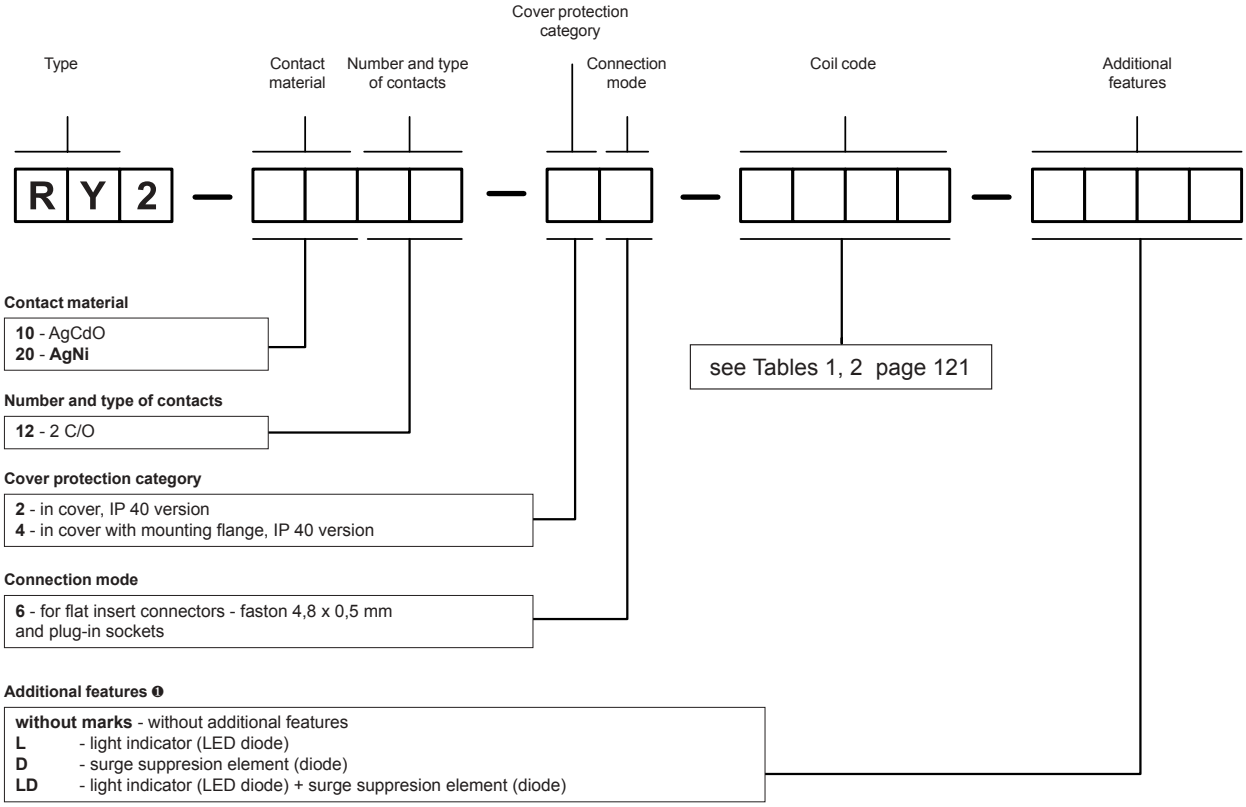

**2 C/O**

**Note**: marks "+" and "-" refer to versions with DC coils, with surge suppresion element (diode) and light indicator (LED diode).

## Mounting

**Relays RY2 are offered in versions**: • standard, for plug-in sockets • with mounting flange in the upper wall of the cover.
Relays **RY2** are designed for: • screw terminals plug-in sockets **GZY2** with clip **GZY 2000** and spring clamp **GZ2 1111**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws • flat insert connectors - faston 4,8 x 0,5 mm.

## Ordering codes




❶ **D, LD** - only for DC coils

Examples of ordering codes:

**RY2-2012-26-1024** relay **RY2**, contact material AgNi, with two changeover contacts, in cover IP 40, for flat insert connectors - faston 4,8 x 0,5 mm and plug-in sockets, voltage version 24 V DC

**RY2-2012-26-5230-L** relay **RY2**, contact material AgNi, with two changeover contacts, in cover IP 40, for flat insert connectors - faston 4,8 x 0,5 mm and plug-in sockets, voltage version 230 V AC 50/60 Hz, with light indicator (LED diode)

- Relays of general application
- For plug-in sockets, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting
- For PCB and for soldering connections
- AC and DC coils
- Recognitions, certifications, directives: RoHS,

## Contact data

| | | |
|---|---|---|
| Number and type of contacts | | 2 C/O |
| Contact material | | **AgNi**, AgNi/Au 0,2 µm, $AgSnO_2$ |
| Rated / max. switching voltage | AC | 250 V / 250 V |
| Min. switching voltage | | 5 V AgNi, 5 V AgNi/Au 0,2 µm, 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 0,2 µm, 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 0,2 µm, 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 ... 240 V |
| | DC | 6 ... 110 V |
| Must release voltage | | ≥ 0,05 $U_n$ |
| Operating range of supply voltage | | see Tables 1, 2 |
| Rated power consumption | AC | 1,2 VA |
| | DC | 0,9 W |

## Insulation according to PN-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 |
| • cos$\phi$ | | 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 |
| | • operating | -40...+55 °C |
| Cover protection category | | IP 40 PN-EN 60529 |
| 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 pertain to the standard versions of the relays.
**Note**: relays with AgNi contacts can be used up to 5 A at resistive and inductive load.

**Coil data -** DC voltage version Table 1

| Coil code | Rated voltage V DC | Coil resistance ±10% at 20 °C Ω | Coil operating range V DC | |
|---|---|---|---|---|
| | | | min. (at 20°C) | max. (at 55°C) |
| 1006 | 6 | 47 | 4,8 | 6,6 |
| **1012** | **12** | **188** | **9,6** | **13,2** |
| **1024** | **24** | **750** | **19,2** | **26,4** |
| 1048 | 48 | 2 660 | 38,4 | 52,8 |
| 1060 | 60 | 4 000 | 48,0 | 66,0 |
| 1080 | 80 | 7 100 | 64,0 | 88,0 |
| 1110 | 110 | 13 480 | 88,0 | 121,0 |

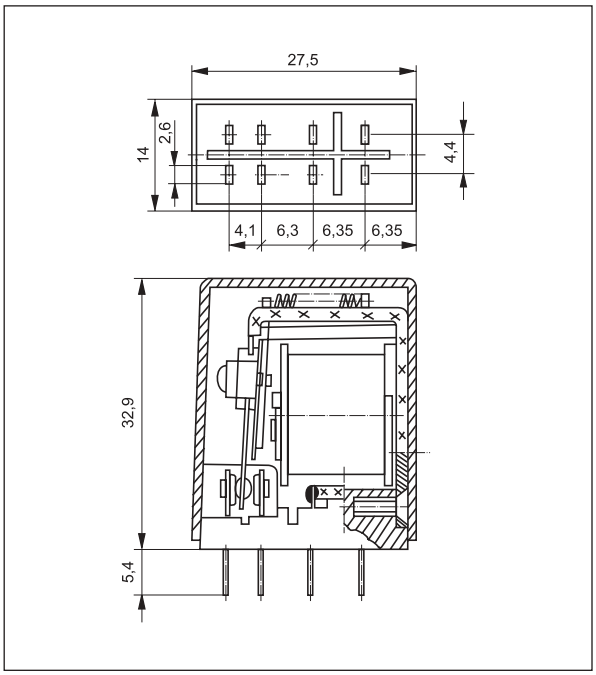
The data in bold type pertain to the standard versions of the relays.

**Coil data -** AC 50/60 Hz voltage version Table 2

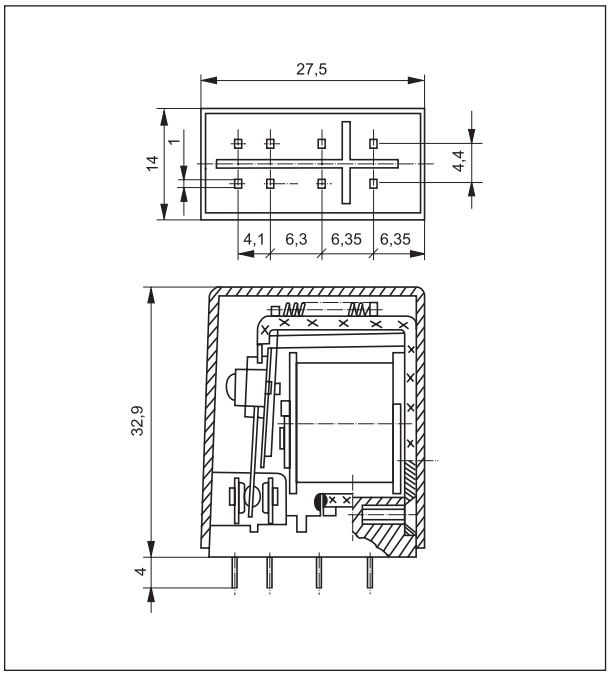
| Coil code | Rated voltage V AC | Coil resistance ±10% at 20 °C Ω | Coil operating range V AC | |
|---|---|---|---|---|
| | | | min. (at 20°C) | max. (at 55°C) |
| 5006 | 6 | 16 | 4,8 | 6,6 |
| 5012 | 12 | 68 | 9,6 | 13,2 |
| **5024** | **24** | **270** | **19,2** | **26,4** |
| 5050 | 50 | 1 150 | 40,0 | 55,0 |
| 5100 | 100 | 5 590 | 80,0 | 110,0 |
| 5110 | 110 | 5 670 | 88,0 | 121,0 |
| 5115 | 115 | 5 990 | 92,0 | 126,0 |
| 5120 | 120 | 6 390 | 96,0 | 132,0 |
| 5220 | 220 | 21 470 | 176,0 | 242,0 |
| **5230** | **230** | **21 470** | **184,0** | **253,0** |
| 5240 | 240 | 25 390 | 192,0 | 264,0 |

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

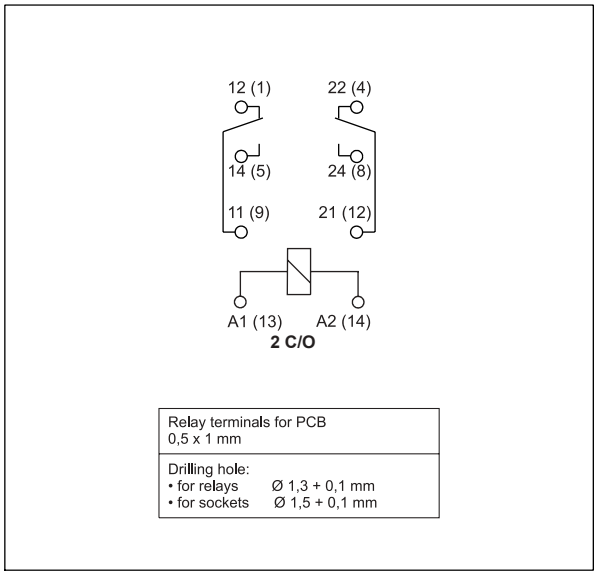
**Dimensions -** plug-in version



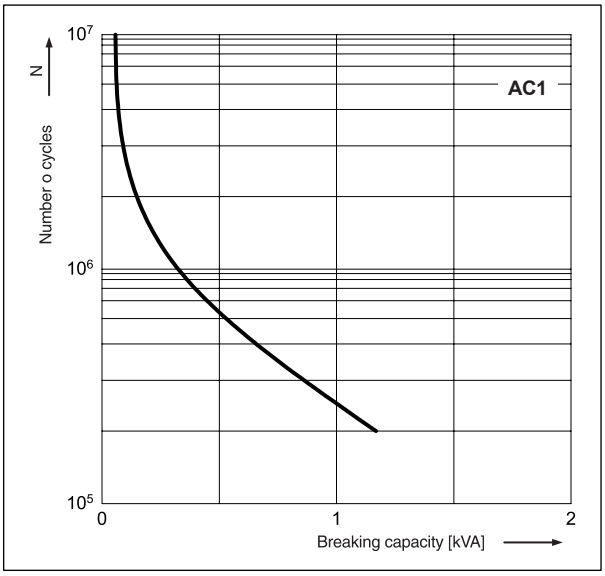

**Dimensions -** PCB version



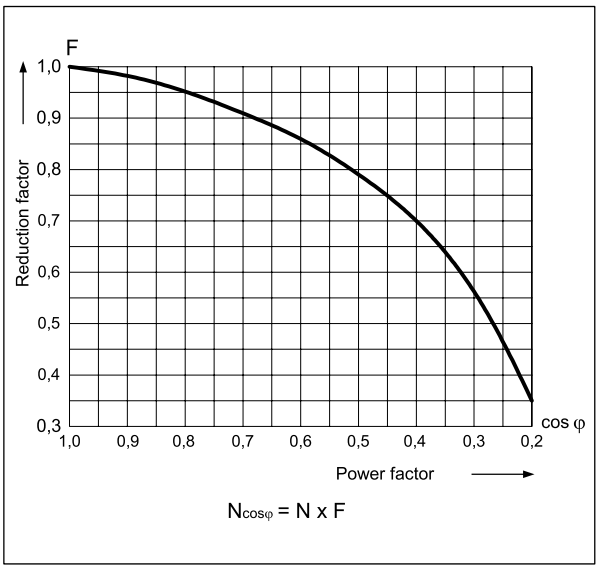
**Connection diagram** (pin side view)



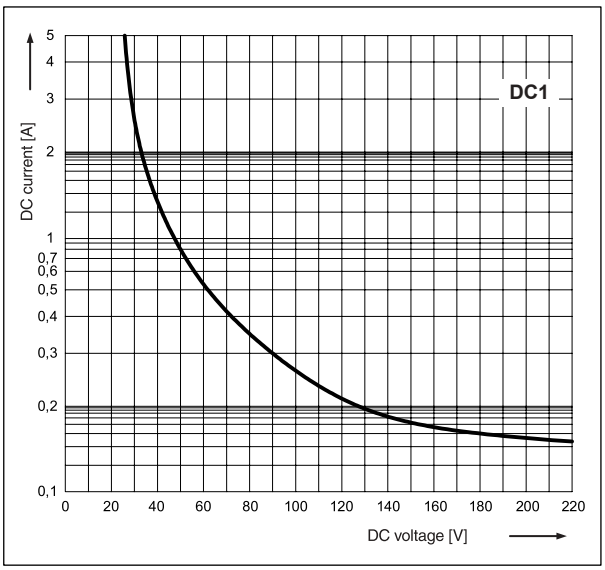

**Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour** Fig. 1




**Electrical life reduction factor at AC inductive load** Fig. 2




**Max. DC resistive load breaking capacity** Fig. 3



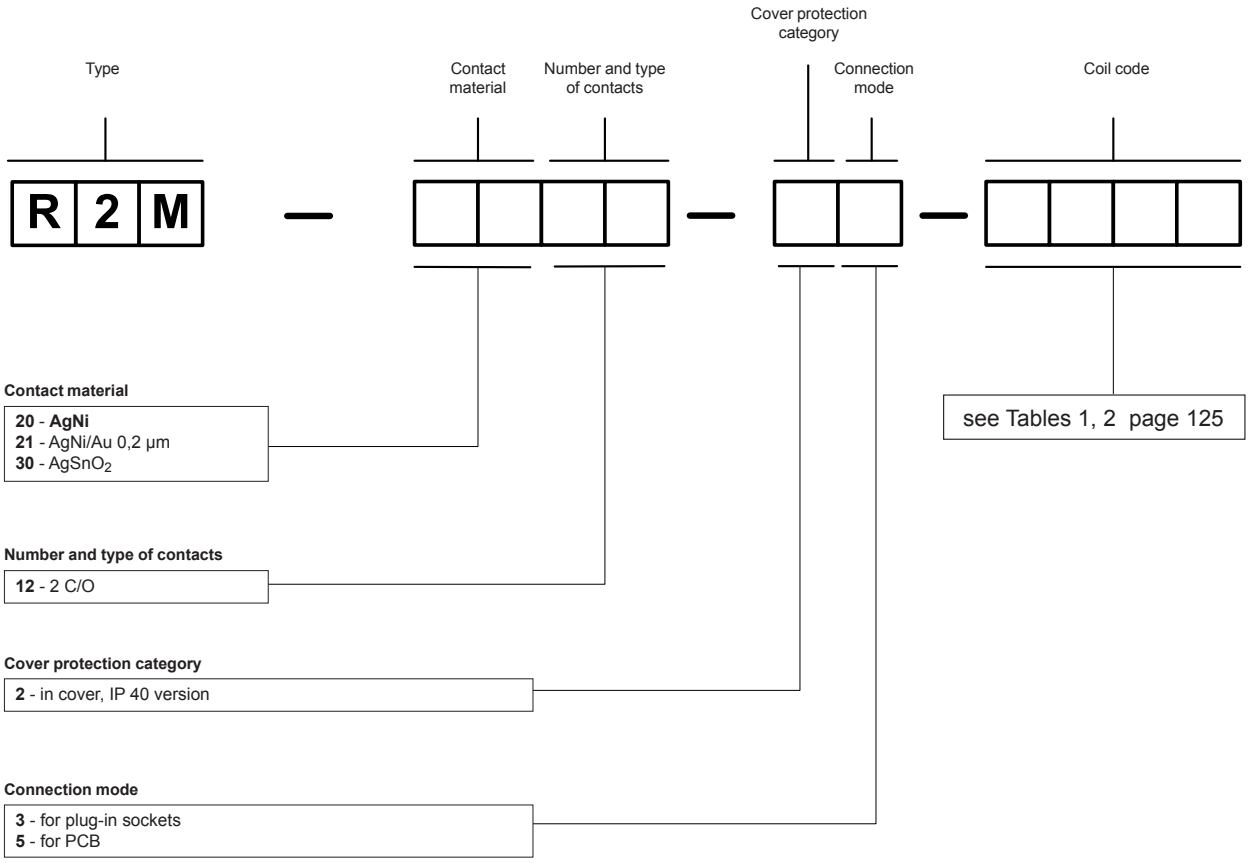

## Mounting

Relays **R2M** are designed for: • screw terminals plug-in sockets **GZ2** with clip **GZ2 1060** and spring clamp **GZ2 1111**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws • plug-in sockets for PCB mounting **S2M** with clip **G4 1050** • solder terminals sockets **G2M** with clip **G4 1050** and spring clamp **G2M 1020** • direct PCB mounting.

## Contact material selection for different load types

- **AgNi** - for resistive or inductive loads,
- **AgNi/Au 0,2 µm** - contact surface protection against oxidation during storage,
- **$AgSnO_2$** - for capacitive loads or incandescent lamp loads.

## Ordering codes



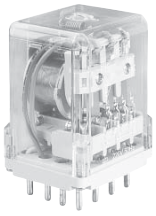

Examples of ordering codes:

**R2M-2012-23-5230** relay **R2M**, contact material AgNi, with two changeover contacts, in cover IP 40, for plug-in sockets, voltage version 230 V AC 50/60 Hz

**R2M-2012-25-1024** relay **R2M**, contact material AgNi, with two changeover contacts, in cover IP 40, for PCB, voltage version 24 V DC


R15 2 C/O


R15 3 C/O


R15 4 C/O

• Relays of general application • For plug-in sockets, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting • Cadmium - free contacts - R15 2 C/O, R15 3 C/O relays • WT (mechanical indicator + lockable front test button) - standard features of R15 2 C/O, R15 3 C/O relays in cover, for plug-in sockets. Relays may be provided with the test buttons (no latching) and plugs - page 251 • **Have obtained LR Type Approval Certificate (Lloyd's Register) - R15...WT 2 C/O, R15...WT 3 C/O** • Recognitions, certifications, directives: RoHS, AUCOTEAM GmbH Berlin - railway standards,

## Contact data

| | | | |
|---|---|---|---|
| Number and type of contacts | | 2 C/O, 3 C/O, 4 C/O | |
| Contact material | | 2 C/O, 3 C/O: **AgNi**, AgNi/Au 0,2 µm, AgNi/Au 5 µm<br>4 C/O: **AgCdO**, AgCdO/Au 0,2 µm, AgCdO/Au 5 µm | |
| Rated / max. switching voltage | AC | 2 C/O, 3 C/O: 250 V / 440 V | 4 C/O: 250 V / 250 V |
| Min. switching voltage | | 2 C/O, 3 C/O: 5 V AgNi, 5 V AgNi/Au 0,2 µm, 5 V AgNi/Au 5 µm<br>4 C/O: 10 V AgCdO, 10 V AgCdO/Au 0,2 µm, 5 V AgCdO/Au 5 µm | |
| Rated load (capacity) | AC1 | 10 A / 250 V AC | 10 A / 277 V AC UL 508 |
| | AC15 | 3 A / 120 V | 1,5 A / 240 V (B300) |
| | AC3 | 370 W (single-phase motor, 1/2 HP / 240 V AC UL 508) | |
| | DC1 | 10 A / 24 V DC (see Fig. 3) | |
| | DC13 | 0,22 A / 120 V | 0,1 A / 250 V (R300) |
| Min. switching current | | 2 C/O, 3 C/O: 5 mA AgNi, 5 mA AgNi/Au 0,2 µm, 2 mA AgNi/Au 5 µm<br>4 C/O: 10 mA AgCdO, 10 mA AgCdO/Au 0,2 µm, 2 mA AgCdO/Au 5 µm | |
| Max. inrush current | | 20 A | |
| Rated current | | 10 A | |
| Max. breaking capacity | AC1 | 2 500 VA | |
| Min. breaking capacity | | 2 C/O, 3 C/O: 0,3 W AgNi, 0,3 W AgNi/Au 0,2 µm, 0,05 W AgNi/Au 5 µm<br>4 C/O: 0,5 W AgCdO, 0,5 W AgCdO/Au 0,2 µm, 0,05 W AgCdO/Au 5 µm | |
| 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 | AC | 2 C/O, 3 C/O: 6 ... 240 V 50/60 Hz | 4 C/O: 6 ... 240 V 50 Hz, 60 Hz |
| | DC | 6 ... 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, 4 | |
| Rated power consumption | | AC: 2,8 VA 50 Hz 2,5 VA 60 Hz | DC: 1,5 W |

## Insulation according to PN-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 | | 2 C/O, 3 C/O, 4 C/O: ≥ 3 mm | |
| • creepage | | 2 C/O, 3 C/O: ≥ 4,2 mm | 4 C/O: ≥ 3,2 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 | |
| | • cos$\phi$ | see Fig. 2 | |
| Mechanical life (cycles) | | ≥ 2 x $10^7$ | |
| Dimensions (L x W x H) | | 2 C/O, 3 C/O: 35 x 35 x 54,4 mm | 4 C/O: 35 x 42,5 x 54,5 mm |
| Weight | | 2 C/O, 3 C/O: 83 g | 4 C/O: 95 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 | | 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 pertain to the standard versions of the relays.

**Coil data** - DC voltage version

Table 1

| Coil code | Rated voltage $U_n$ V DC | Coil resistance ±10% at 20 °C Ω | Coil operating range V DC | |
|---|---|---|---|---|
| | | | min. (at 20 °C) | max. (at 55 °C) |
| 1006 | 6 | 28 | 4,8 | 6,6 |
| **1012** | **12** | **110** | **9,6** | **13,2** |
| **1024** | **24** | **430** | **19,2** | **26,4** |
| 1048 | 48 | 1 750 | 38,4 | 52,8 |
| 1060 | 60 | 2 700 | 48,0 | 66,0 |
| 1110 | 110 | 9 200 | 88,0 | 121,0 |
| 1120 | 120 | 11 000 | 96,0 | 132,0 |
| **1220** | **220** | **37 000** | **176,0** | **242,0** |

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

**Coil data** - AC 50/60 Hz voltage version (standard for R15 2 C/O, R15 3 C/O)

Table 2

| Coil code | Rated voltage $U_n$ V AC | Coil resistance ±15% at 20 °C Ω | Coil operating range V AC | |
|---|---|---|---|---|
| | | | min. (at 20 °C) | max. (at 55 °C) |
| 5006 | 6 | 4,3 | 4,8 | 6,6 |
| 5012 | 12 | 18,5 | 9,6 | 13,2 |
| **5024** | **24** | **75,0** | **19,2** | **26,4** |
| 5048 | 48 | 305,0 | 38,4 | 52,8 |
| 5060 | 60 | 475,0 | 48,0 | 66,0 |
| 5115 | 115 | 1 840,0 | 92,0 | 126,5 |
| 5120 | 120 | 1 910,0 | 96,0 | 132,0 |
| 5220 | 220 | 6 980,0 | 176,0 | 242,0 |
| **5230** | **230** | **7 080,0** | **184,0** | **253,0** |
| 5240 | 240 | 7 760,0 | 192,0 | 264,0 |

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

**Coil data** - AC 50 Hz voltage version (standard for R15 4 C/O)

Table 3

| Coil code | Rated voltage $U_n$ V AC | Coil resistance ±15% at 20 °C Ω | Coil operating range V AC | |
|---|---|---|---|---|
| | | | min. (at 20 °C) | max. (at 55 °C) |
| 3006 | 6 | 4,8 | 4,8 | 6,6 |
| 3012 | 12 | 20,0 | 9,6 | 13,2 |
| 3024 | 24 | 72,0 | 19,2 | 26,4 |
| 3048 | 48 | 360,0 | 38,4 | 52,8 |
| 3060 | 60 | 520,0 | 48,0 | 66,0 |
| 3115 | 115 | 2 100,0 | 92,0 | 126,5 |
| 3120 | 120 | 2 300,0 | 96,0 | 132,0 |
| 3220 | 220 | 7 000,0 | 176,0 | 242,0 |
| 3230 | 230 | 7 900,0 | 184,0 | 253,0 |
| 3240 | 240 | 8 300,0 | 192,0 | 264,0 |

**Coil data** - AC 60 Hz voltage version (special for R15 4 C/O) Table 4

| Coil code | Rated voltage $U_n$ V AC | Coil resistance ±15% at 20 °C Ω | Coil operating range V AC | |
|---|---|---|---|---|
| | | | min. (at 20 °C) | max. (at 55 °C) |
| 6006 | 6 | 4,8 | 4,8 | 6,6 |
| 6012 | 12 | 17,0 | 9,6 | 13,2 |
| 6024 | 24 | 65,0 | 19,2 | 26,4 |
| 6048 | 48 | 310,0 | 38,4 | 52,8 |
| 6060 | 60 | 490,0 | 48,0 | 66,0 |
| 6110 | 110 | 1 760,0 | 88,0 | 121,0 |
| 6120 | 120 | 2 000,0 | 96,0 | 132,0 |
| 6220 | 220 | 6 900,0 | 176,0 | 242,0 |
| 6230 | 230 | 7 000,0 | 184,0 | 253,0 |
| 6240 | 240 | 7 100,0 | 192,0 | 264,0 |

## Mounting

**Relays R15 2 C/O and R15 3 C/O are offered in version**: • standard WT (mechanical indicator + lockable front test button), for plug-in sockets. **In standard version of relays (WT) is possibility self-exchange of button type T for test button R15-M404 (no latching) or plug R15-M203 (no manual operation). Test buttons (no latching) and plugs need to ordered saparately**.

Relays **R15 2 C/O** are designed for: • screw terminals plug-in sockets **PZ8** with clip **PZ11 0031**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws • screw terminals plug-in sockets **GZU8** with clip **GZU 1052**, 35 mm rail mount acc. to PN-EN 60715 • screw terminals plug-in sockets **GZ8** with clip **GZ 1050**, on panel mounting with two M3 screws • screw terminals plug-in sockets **GZS8**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws • screw terminals plug-in sockets **GZP8** with clip **GZP-0054**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws • solder terminals sockets **GOP8** with clip **R159 1051** and spring clamp **R15 5922** • direct PCB mounting.

Relays **R15 3 C/O** are designed for: • screw terminals plug-in sockets **PS11** and **PZ11** with clip **PZ11 0031**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws • screw terminals plug-in sockets **GZU11** with clip **GZU 1052**, 35 mm rail mount acc. to PN-EN 60715 • screw terminals plug-in sockets **GZ11** with clip **GZ 1050**, on panel mounting with two M3 screws • screw terminals plug-in sockets **GZS11**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws • screw terminals plug-in sockets **GZP11** with clip **GZP-0054**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws • solder terminals sockets **GOP11** with clip **R159 1051** and spring clamp **R15 5922** • direct PCB mounting.

**Relays R15 4 C/O are offered in version** • in cover, for plug-in sockets.

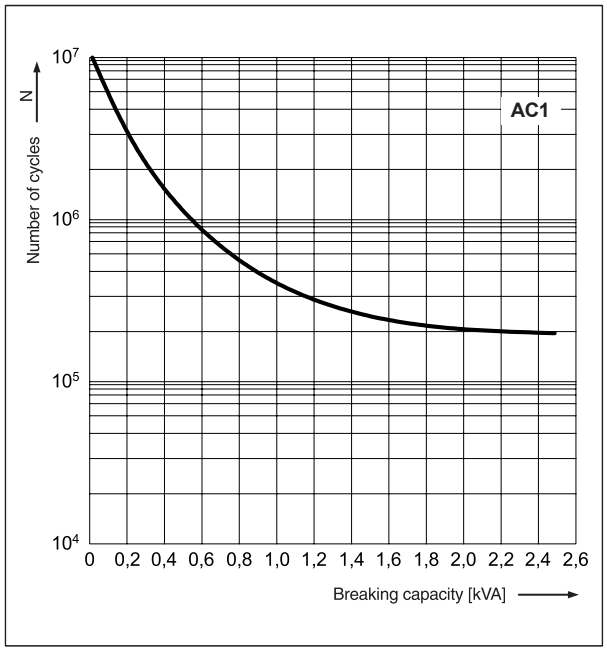
Relays **R15 4 C/O** are designed for: • screw terminals plug-in sockets **GZ14U** with clip **GZ14 0737**, 35 mm rail mount acc. to PN-EN 60715 • screw terminals plug-in sockets **GZ14** with clip **GZ14 0737**, on panel mounting with two M3 screws • screw terminals plug-in sockets **GZ14Z** with clip **GZ14 0737**, on panel mounting with two M3 screws • solder terminals sockets **GOP14** with clip **R15 0736** and spring clamp **R15 5922**.

NEW product

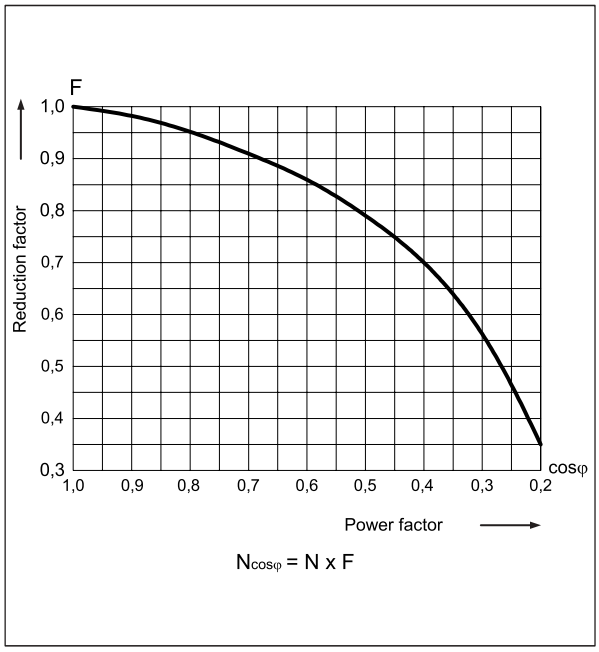
**GZ14Z**

Screw terminals
plug-in socket for R15 4 C/O
**to be mounted behind the assembly panel**
- see page 248.

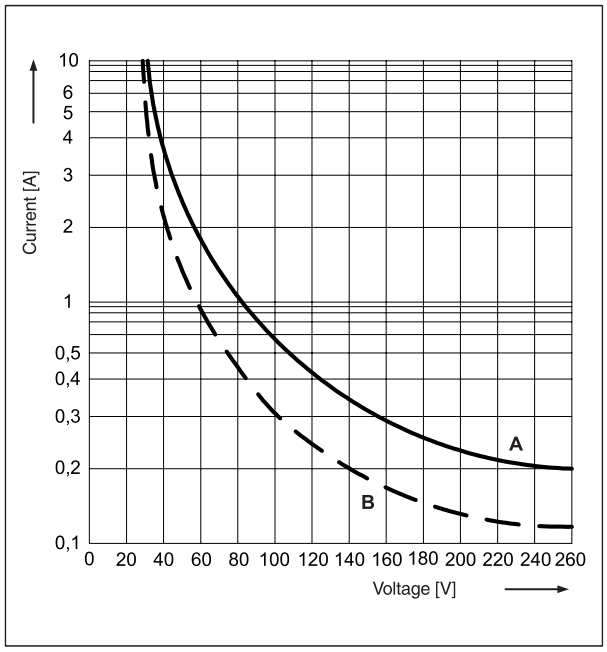
**Electrical life at AC resistive load.**
**Switching frequency: 1 200 cycles/hour** Fig. 1




**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



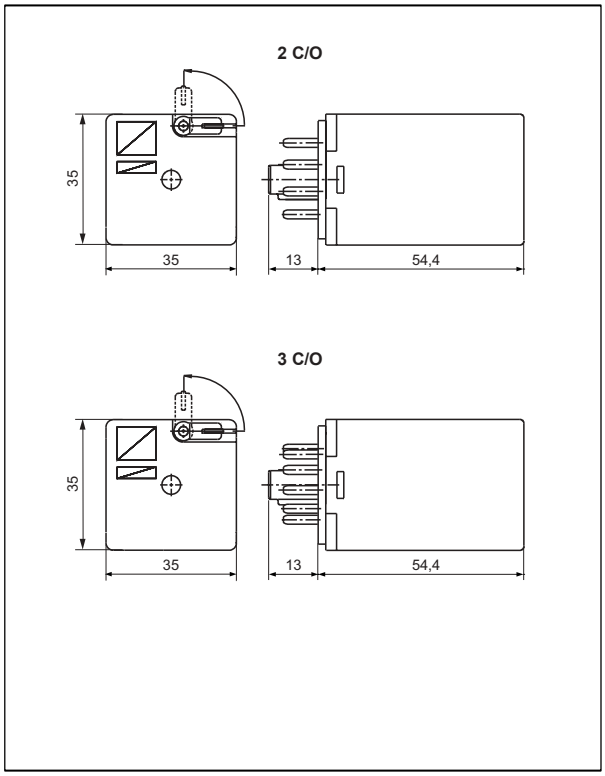
## R15 2 C/O, R15 3 C/O in cover, for plug-in sockets

R15 2 C/O

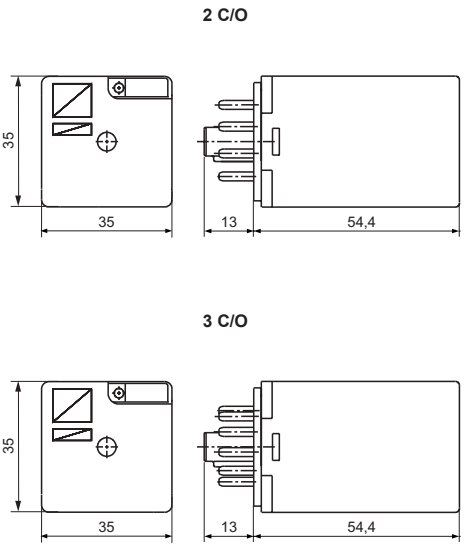
R15 3 C/O

- WT (mechanical indicator + lockable front test button) - standard features of R15 2 C/O, R15 3 C/O relays in cover, for plug-in sockets. Relays may be provided with the test buttons (no latching) and plugs - page 251
- **Have obtained LR Type Approval Certificate (Lloyd's Register) - R15...WT 2 C/O, R15...WT 3 C/O**
- Recognitions, certifications, directives: RoHS, AUCOTEAM GmbH Berlin - railway standards,

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

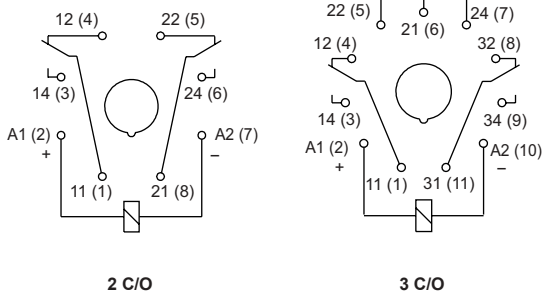



### **Dimensions** - plug-in version, with test button (no latching) or with plug (no manual operation)




**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 251.

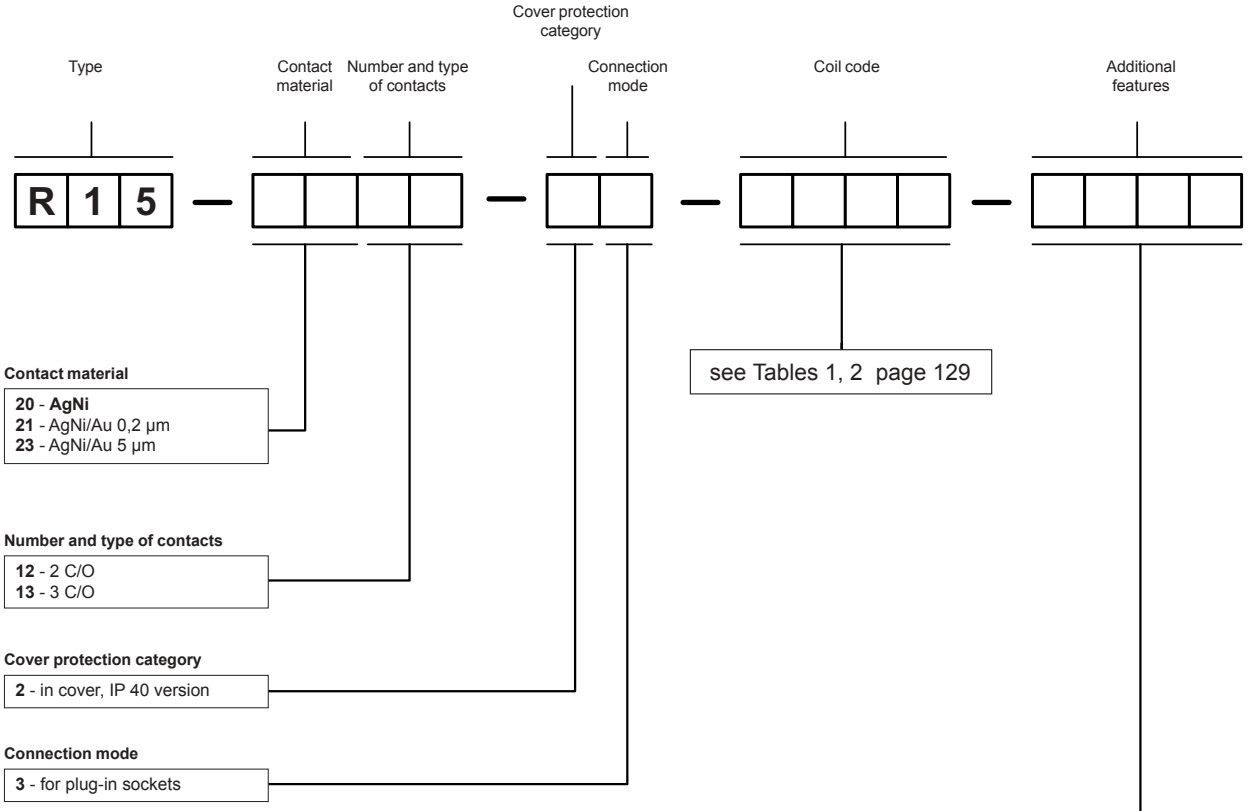
### **Connection diagrams** (pin side view)




**Note**: marks "+" and "-" refer to versions with DC coils, with surge suppresion element (diode).

## R15 2 C/O, R15 3 C/O in cover, for plug-in sockets

### Ordering codes




**Contact material**

**20** - **AgNi**
**21** - AgNi/Au 0,2 µm
**23** - AgNi/Au 5 µm

**Number and type of contacts**

**12** - 2 C/O
**13** - 3 C/O

**Cover protection category**

**2** - in cover, IP 40 version

**Connection mode**

**3** - for plug-in sockets

**Additional features** ❶

| | |
|---|---|
| **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 suppresion element (diode) |
| **WTLD** | - mechanical indicator + lockable front test button + light indicator (LED diode) + surge suppresion element (diode) |
| **WTV** | - mechanical indicator + lockable front test button + surge suppresion element (varistor) |
| **WTLV** | - mechanical indicator + lockable front test button + light indicator (LED diode) + surge suppresion element (varistor) |

❶ **WT** - standard features of relays for plug-in sockets. **WTD, WTLD** - only for DC coils, **WTV, WTLV** - only for AC 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 251.

- 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)

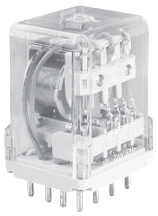
**Note:**
Colour of lockable front test button type T represents type of coil supply current: orange - AC coil, green - DC coil.

Examples of ordering codes:

**R15-2012-23-1024-WT** relay **R15**, contact material AgNi, with two changeover contacts, in cover IP 40, for plug-in sockets, voltage version 24 V DC, with mechanical indicator and lockable front test button

**R15-2013-23-5230-WTL** relay **R15**, contact material AgNi, with three changeover contacts, in cover IP 40, for plug-in sockets, voltage version 230 V AC 50/60 Hz, with mechanical indicator and lockable front test button and light indicator (LED diode)

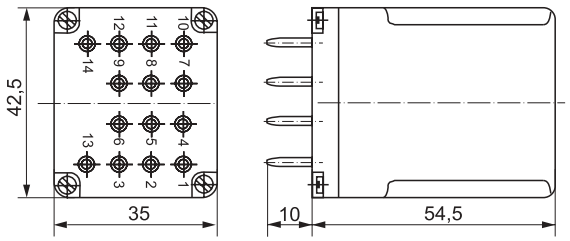
## R15 4 C/O in cover, for plug-in sockets



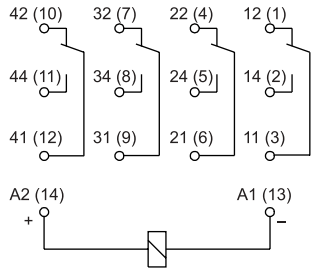
R15 4 C/O

• Recognitions, certifications, directives: RoHS,

### Dimensions



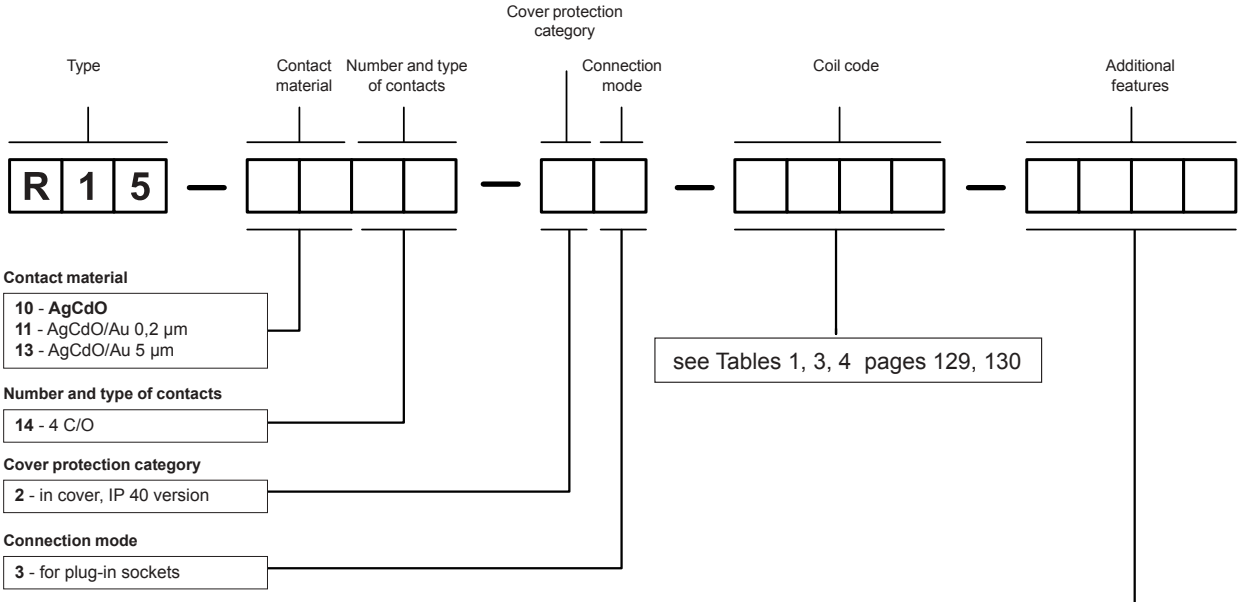

### Connection diagram (pin side view)




4 C/O

**Note**: marks "+" and "-" refer to versions with DC coils, with surge suppresion element (diode) and light indicator (LED diode).

### Ordering codes




**Contact material**

**10** - **AgCdO**
**11** - AgCdO/Au 0,2 µm
**13** - AgCdO/Au 5 µm

**Number and type of contacts**

**14** - 4 C/O

**Cover protection category**

**2** - in cover, IP 40 version

**Connection mode**

**3** - for plug-in sockets

see Tables 1, 3, 4 pages 129, 130

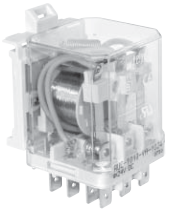
**Additional features** ❶

**without marks** - without additional features
**K** - test button without block function
**L** - light indicator (LED diode)
**D** - surge suppresion element (diode)
**KL** - test button without block function + light indicator (LED diode)
**KD** - test button without block function + surge suppresion element (diode)
**LD** - light indicator (LED diode) + surge suppresion element (diode)
**KLD** - test button without block function + light indicator (LED diode) + surge suppresion element (diode)

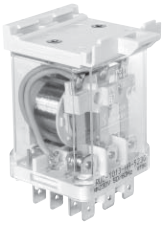
❶ **D, KD, LD, KLD** - only for DC coils
**Note**: for R15 4 C/O relays 50/60 Hz coils are not offered, show coil according with Table 3 or 4, pages 129, 130.

Example of ordering code:

**R15-1014-23-3230-K** relay **R15**, contact material AgCdO, with four changeover contacts, in cover IP 40, for plug-in sockets, voltage version 230 V AC 50 Hz, with test button without block function



with adaptor (V)



with adaptor (H)

NEW product

• Power relays of general application • AC and DC coils • Mounting: in sockets; 35 mm rail mount acc. to PN-EN 60715; on panel; PCB • Versions: faston 187 (4,8 x 0,5 mm); faston 250 (6,3 x 0,8 mm) • 3 mm contact gap (option - only in versions with normally open contacts) • Additional features: 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; etc.

• Recognitions, certifications, directives: RoHS,

## Contact data

| | | | |
|---|---|---|---|
| Number and type of contacts | | 2 C/O, 3 C/O, 2 NO, 3 NO | 2 NO, 3 NO with contact gap ≥ 3 mm |
| Contact material | | **AgCdO**, AgNi | |
| Rated / max. switching voltage | AC | 400 V / 440 V | 230 V / 250 V ❶ |
| Min. switching voltage | | 5 V AgNi, 10 V AgCdO | |
| 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 | |
| Min. switching current | | 5 mA AgNi, 10 mA AgCdO | |
| 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 AgCdO | |
| 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 | AC | 6 ... 240 V 50/60 Hz | 400 V 50 Hz ❶ |
| | DC | 6 ... 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, 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 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 | 2 500 V AC | type of insulation: basic |
| • contact clearance | 1 500 V AC | type of clearance: micro-disconnection |
| | 2 500 V AC | with contact gap ≥ 3 mm, type of clearance: full-disconnection |
| • pole - pole | 2 500 V AC | type of insulation: basic |
| Contact - coil distance • clearance | ≥ 5 mm | |
| • creepage | ≥ 8 mm | |

## 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 |
| • cos$\phi$ | see Fig. 2 | |
| Mechanical life (cycles) | ≥ $10^7$ | |
| Motor load according to UL 508 | 2 C/O: 1/3 HP 120 V AC, single-phase motor | 1/2 HP 240 V AC, single-phase motor |
| | 3 C/O: 1/3 HP 120 V AC, single-phase motor | 1/2 HP 240 V AC, single-phase motor |
| | 3 C/O: 1/2 HP 240 V AC, three-phase motor | |
| Dimensions (L x W x H) | RUC faston 4,8 x 0,5 ❷ | RUC faston 6,3 x 0,8 ❸ |
| Weight | 80 g ❹ | 85 g ❺ |
| Ambient temperature • storage | -40...+85 °C | |
| • operating | AC: -40...+55 °C 3 C/O, 3 NO / 16 A | (+70 °C 2 C/O, 2 NO / 16 A) |
| | DC: -40...+55 °C 3 C/O, 3 NO / 16 A | (+70 °C 3 C/O, 3 NO / 10 A; 2 C/O, 2 NO / 16 A) |
| Cover protection category | IP 00 | PN-EN 60529 |
| Shock / vibration resistance | 10 g / 5 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. ❶ For RUC faston 4,8 x 0,5 with GUC11 socket, max. switching voltages and coil voltages of relays are limited to 250 V AC/DC. ❷ For plug-in sockets version: 36,1 x 38,6 x 45,5 mm. For version: with (V) adaptor: 58,75 x 38,6 x 45,9 mm; with (H) adaptor: 46,8 x 38,6 x 62,45 mm. For version with mounting flange: 66,3 x 38,6 x 36,1 mm. For PCB version: 36,1 x 38,6 x 52,5 mm. ❸ For version: with (V) adaptor: 62,4 x 38,6 x 45,9 mm; with (H) adaptor: 46,8 x 38,6 x 66,1 mm. For version with mounting flange: 66,3 x 38,6 x 36,1 mm. ❹ Weight of plug-in sockets version and PCB version (RUC faston 4,8 x 0,5). ❺ Weight of version with (V) or (H) adaptor, and version with mounting flange.

**Coil data** - DC voltage version Table 1

| Coil code | Rated voltage V DC | Coil resistance ±10% at 20°C Ω | Coil operating range V DC | |
|---|---|---|---|---|
| | | | min. (at 20°C) | max. (at 55°C) |
| 1006 | 6 | 28 | 4,8 | 6,6 |
| **1012** | **12** | **110** | **9,6** | **13,2** |
| 1024 | 24 | 430 | 19,2 | 26,4 |
| 1042 | 42 | 1 340 | 33,6 | 46,2 |
| 1048 | 48 | 1 750 | 38,4 | 52,8 |
| 1060 | 60 | 2 700 | 48,0 | 66,0 |
| 1110 | 110 | 9 200 | 88,0 | 121,0 |
| 1120 | 120 | 11 000 | 96,0 | 132,0 |
| 1220 | 220 | 37 000 | 176,0 | 242,0 |

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

**Coil data** - DC voltage version, reinforced Table 2

| Coil code ❶ | Rated voltage V DC | Coil resistance ±10% at 20°C Ω | Coil operating range V DC | |
|---|---|---|---|---|
| | | | min. (at 20°C) | max. (at 55°C) |
| W012 | 12 | 85 | 9,6 | 13,2 |
| W024 | 24 | 345 | 19,2 | 26,4 |
| W048 | 48 | 1 370 | 38,4 | 52,8 |
| W110 | 110 | 7 300 | 88,0 | 121,0 |
| W220 | 220 | 30 000 | 176,0 | 242,0 |

❶ For version with contact gap ≥ 3 mm.

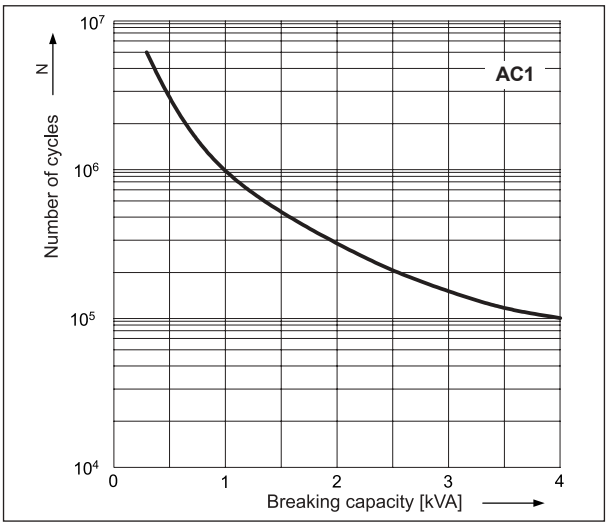
**Coil data** - AC 50/60 Hz voltage version Table 3

| Coil code | Rated voltage V AC | Coil resistance ±10% at 20°C Ω | Coil operating range V AC | |
|---|---|---|---|---|
| | | | min. (at 20°C) | max. (at 55°C) |
| 5006 | 6 | 4,3 | 4,8 | 6,6 |
| 5012 | 12 | 18,5 | 9,6 | 13,2 |
| 5024 | 24 | 75,0 | 19,2 | 26,4 |
| 5115 | 115 | 1 840,0 | 92,0 | 126,5 |
| 5120 | 120 | 1 910,0 | 96,0 | 132,0 |
| 5220 | 220 | 6 980,0 | 176,0 | 242,0 |
| 5230 | 230 | 7 080,0 | 184,0 | 253,0 |
| 5240 | 240 | 7 760,0 | 192,0 | 264,0 |

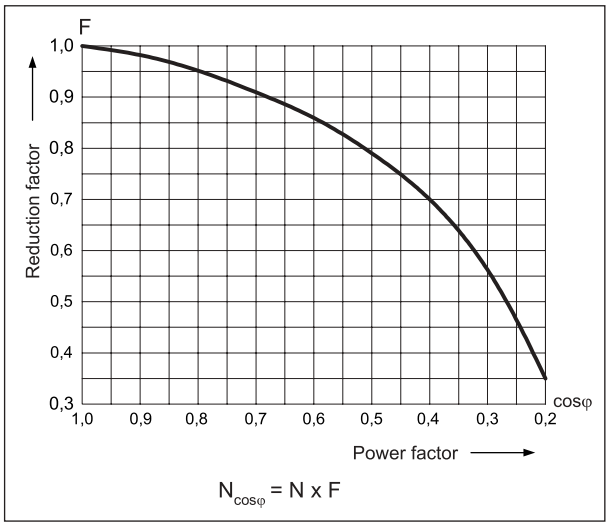
**Coil data** - AC 50 Hz voltage version Table 4

| Coil code | Rated voltage V AC | Coil resistance ±10% at 20°C Ω | Coil operating range V AC | |
|---|---|---|---|---|
| | | | min. (at 20°C) | max. (at 55°C) |
| 3400 | 400 | 21 500 | 320,0 | 440,0 |

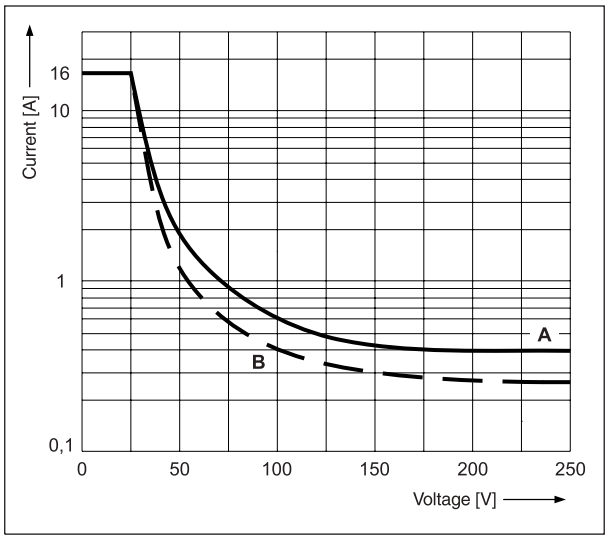
**Electrical life at AC resistive load.**
**Switching frequency: 1 200 cycles/hour** Fig. 1



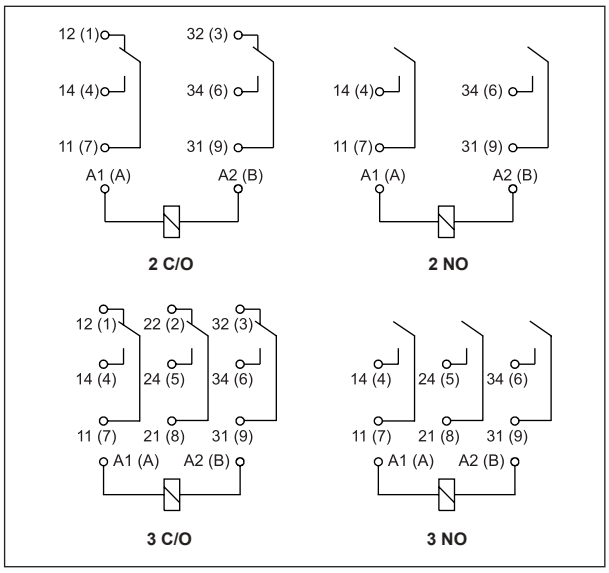

**Electrical life reduction factor**
**at AC inductive load** Fig. 2



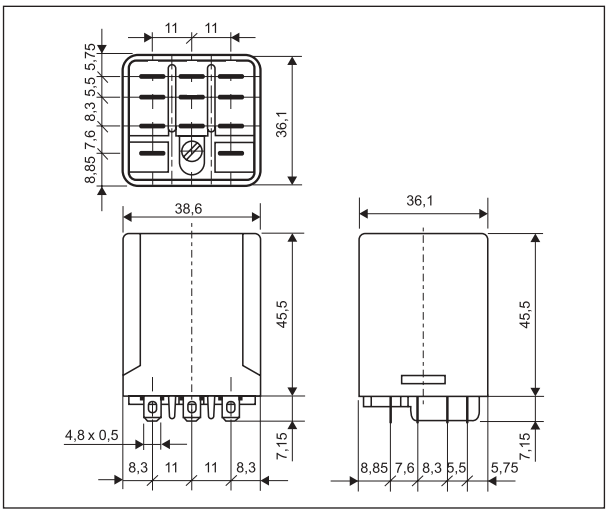

**Max. DC breaking capacity**
**A - resistive load DC1**
**B - inductive load L/R = 40 ms** Fig. 3



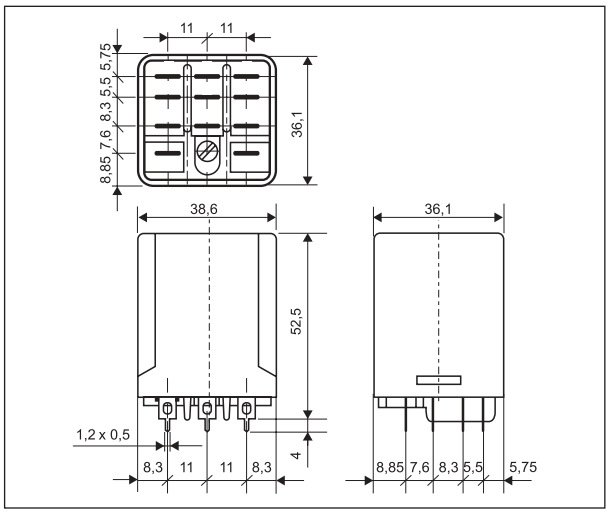

**Connection diagrams** (pin side view)



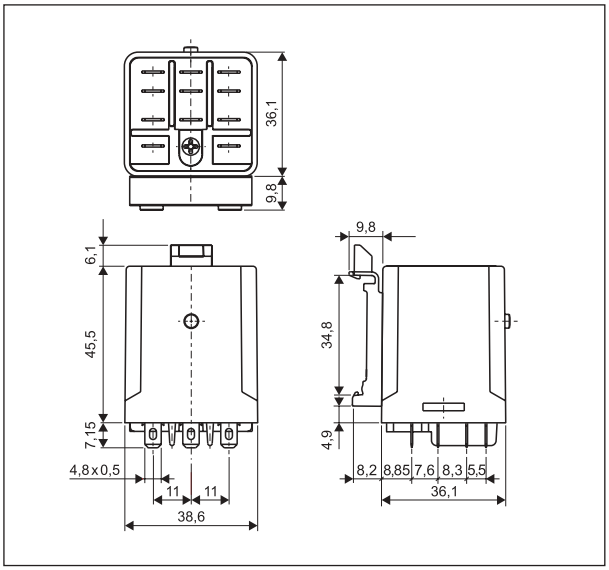

**Dimensions -** RUC faston 4,8 x 0,5
**-** plug-in version (standard)



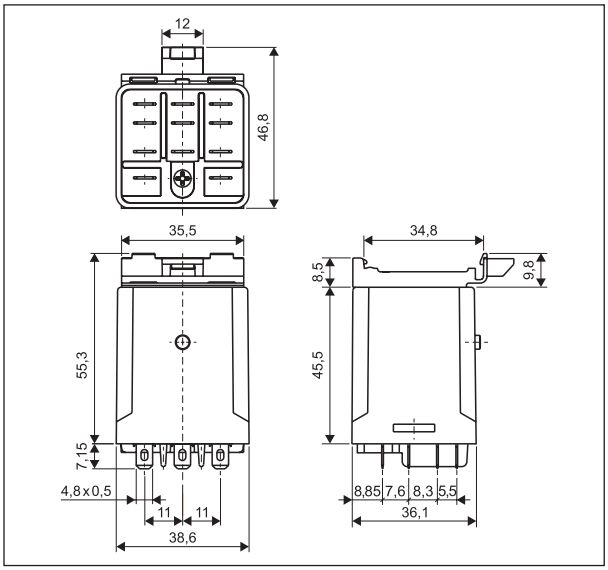

**Dimensions -** RUC faston 4,8 x 0,5
**-** PCB version



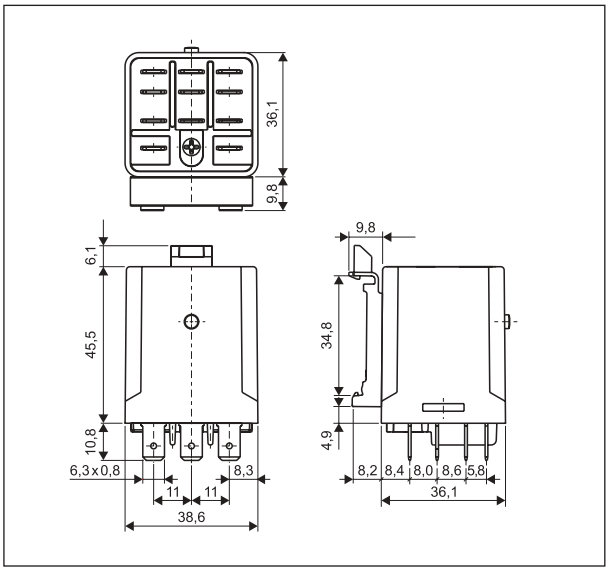
**Dimensions -** RUC faston 4,8 x 0,5
**-** version with vertical adaptor (V)



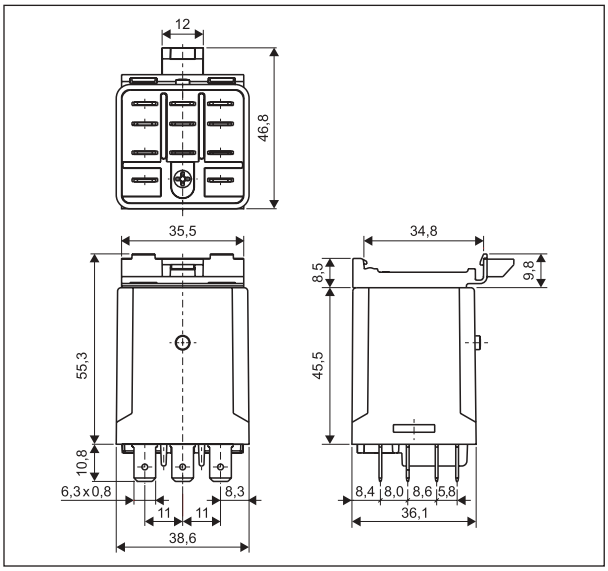

**Dimensions -** RUC faston 4,8 x 0,5
**-** version with horizontal adaptor (H)



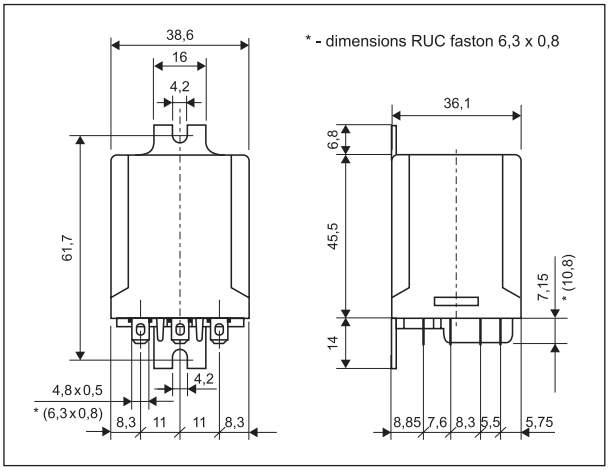

**Dimensions -** RUC faston 6,3 x 0,8
**-** version with vertical adaptor (V)




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




**Dimensions -** RUC faston 4,8 x 0,5 (faston 6,3 x 0,8)
**-** version with mounting flange in the wall of the cover



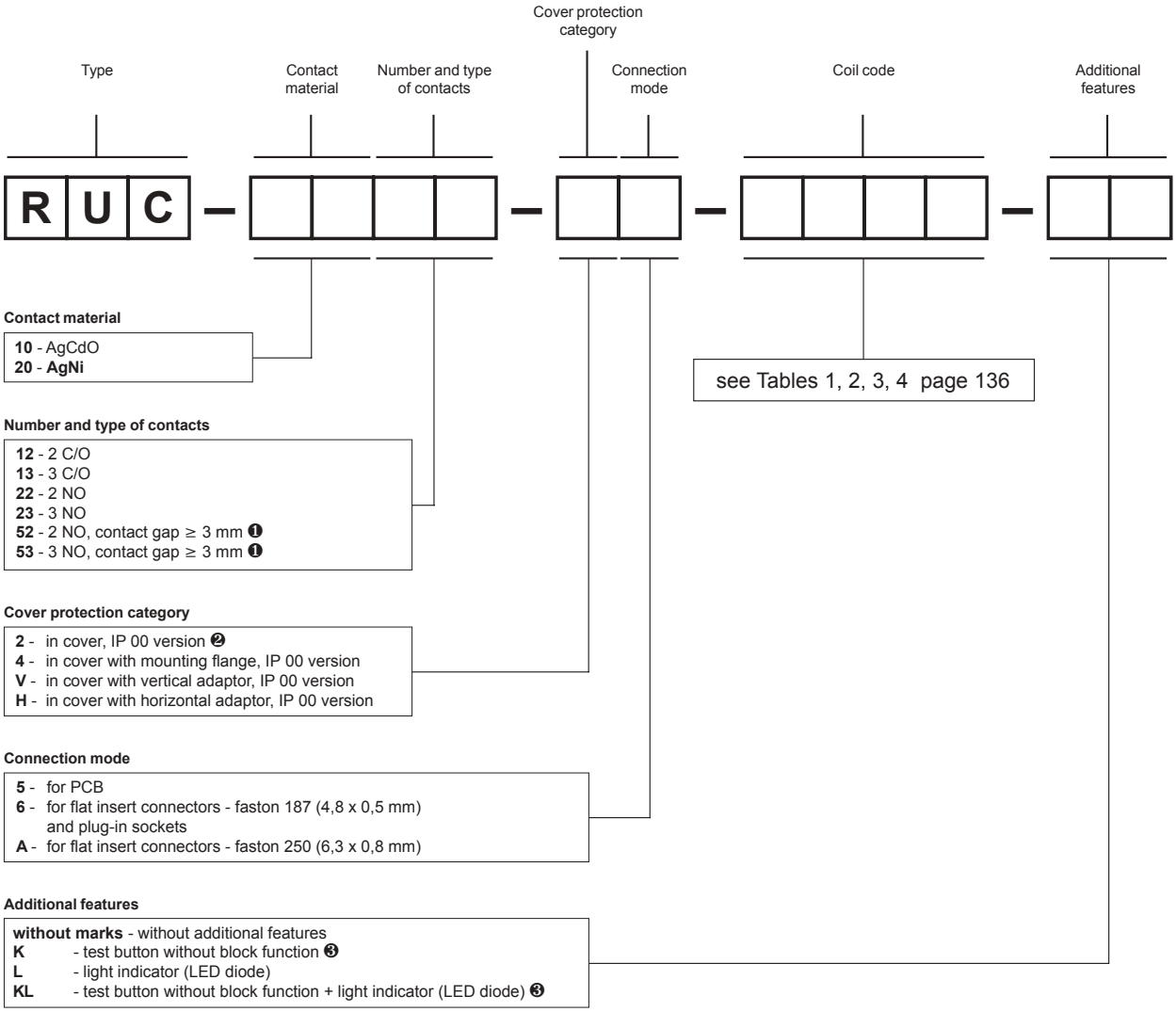

**Mounting**

**Relays RUC are offered in versions**: • standard, for screw terminals plug-in sockets **GUC11** ❶ with clip **MBA**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws • with mounting flange in the wall of the cover, on panel mounting, 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 PN-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 ❻.

❻ Relays are not available with (V) or (H) adaptor, and cover with mounting flange.

❶ For RUC faston 4,8 x 0,5 with GUC11 socket, max. switching voltages and coil voltages of relays are limited to 250 V AC/DC.

## Ordering codes




❶ For versions with reinforced DC coils: W012, W024, W048, W110, W220 and with AC coils.
❷ Only for version RUC faston 4,8 x 0,5.
❸ Additional features is not available in versions of relays with contact gap ≥ 3 mm.

Examples of ordering codes:

**RUC-2053-26-W024** relay **RUC**, faston 187 (4,8 x 0,5 mm), contact material AgNi, with three normally open contacts, with contact gap ≥ 3 mm, in cover IP 00, for plug-in sockets GUC11, voltage version 24 V DC - reinforced coil

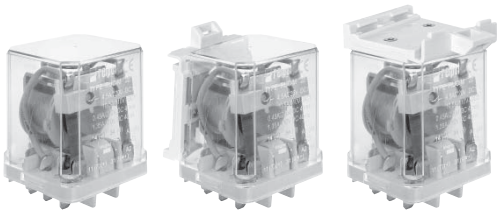
**RUC-2013-V6-3400-KL** relay **RUC**, faston 187 (4,8 x 0,5 mm), contact material AgNi, with three changeover contacts, in cover IP 00, with vertical adaptor (V), for flat insert connectors, voltage version 400 V AC 50 Hz, with test button without block function and light indicator (LED diode)

**RUC-2052-HA-W220-L** relay **RUC**, faston 250 (6,3 x 0,8 mm), contact material AgNi, with two normally open contacts, with contact gap ≥ 3 mm, in cover IP 00, with horizontal adaptor (H), for flat insert connectors, voltage version 220 V DC - reinforced coil, with light indicator (LED diode)

**RUC-1022-25-5024** relay **RUC**, contact material AgCdO, with two normally open contacts, in cover IP 00, for PCB, voltage version 24 V AC 50/60 Hz

# RUC-M

## industrial relays for DC loads



NEW product

with adaptor (V) with adaptor (H)

**• Magnetic blow-out relays for high DC load with the contact plate with permanent magnet whose magnetic field blows out the electric arc between the contacts** • AC and DC coils • Mounting: in sockets; 35 mm rail mount acc. to PN-EN 60715; on panel; PCB • Version: faston 187 (4,8 x 0,5 mm) • Contact gap: 3 mm (version 2 NO); 6 mm (version 1 NO) • Additional features: 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; etc. • Recognitions, certifications, directives: RoHS,

### Contact data

| | | | |
|---|---|---|---|
| Number and type of contacts | | 1 NO (double-break) | 2 NO |
| Contact material | | **AgCdO** | |
| Rated / max. switching voltage | | 250 V DC, AC / 350 V DC; 440 V AC ❶ | |
| Min. switching voltage | | 10 V | |
| Rated load (capacity) | DC1 | 16 A / 24 V DC; 14 A / 110 V DC<br>12 A / 220 V DC | 16 A / 24 V DC; 10,5 A / 110 V DC<br>4,5 A / 220 V DC |
| | DC L/R=40 ms | 16 A / 24 V DC; 5,4 A / 110 V DC<br>3 A / 220 V DC | 16 A / 24 V DC; 1,35 A / 110 V DC<br>0,45 A / 220 V DC |
| | AC1 | 16 A / 250 V AC | 16 A / 250 V AC |
| Min. switching current | | 10 mA | |
| Max. inrush current | | 40 A 20 ms | |
| Rated current | | 16 A | |
| Min. breaking capacity | | 1 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 | AC | 12 ... 240 V 50/60 Hz | |
| | DC | 12 ... 220 V | |
| 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 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 | 2 500 V AC type of insulation: reinforced |
| | • contact clearance | 4 000 V AC 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 | |
| Electrical life | | | |
| • resistive DC1 | | ≥ 2 x $10^5$ 12 A, 220 V DC | ≥ 2 x $10^5$ 4,5 A, 220 V DC |
| • DC L/R=40 ms | | ≥ 2 x $10^5$ 3 A, 220 V DC | ≥ 2 x $10^5$ 0,45 A, 220 V DC |
| Mechanical life (cycles) | | ≥ 2 x $10^7$ | |
| Dimensions (L x W x H) | | 36,1 x 38,6 x 45,5 mm ❷ | |
| Weight | | 80 g ❸ | 85 g ❹ |
| Ambient temperature | • storage | -40...+85 °C | |
| | • operating | -40...+70 °C | |
| Cover protection category | | IP 00 PN-EN 60529 | |
| 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 pertain to the standard versions of the relays.
❶ For RUC-M with GUC11 socket, max. switching voltages and coil voltages of relays are limited to 250 V AC/DC.
❷ For plug-in sockets version. For version: with (V) adaptor: 58,75 x 38,6 x 45,9 mm; with (H) adaptor: 46,8 x 38,6 x 62,45 mm.
For version with mounting flange: 66,3 x 38,6 x 36,1 mm. For PCB version: 36,1 x 38,6 x 52,5 mm.
❸ Weight of plug-in sockets version and PCB version. ❹ Weight of version with (V) or (H) adaptor, and version with mounting flange.

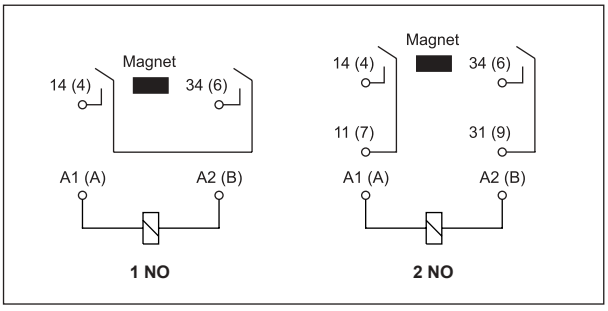
**Coil data** - DC voltage version, reinforced Table 1

| Coil code | Rated voltage V DC | Coil resistance ±10% at 20°C Ω | Coil operating range V DC | |
|---|---|---|---|---|
| | | | min. (at 20°C) | max. (at 55°C) |
| W012 | 12 | 85 | 9,6 | 13,2 |
| W024 | 24 | 345 | 19,2 | 26,4 |
| W048 | 48 | 1 370 | 38,4 | 52,8 |
| W110 | 110 | 7 300 | 88,0 | 121,0 |
| W220 | 220 | 30 000 | 176,0 | 242,0 |

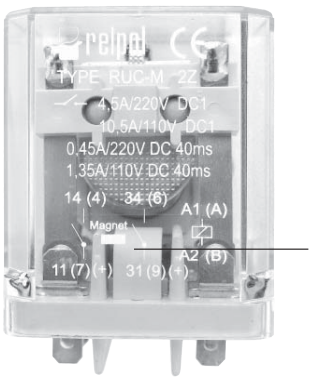
**Coil data** - AC 50/60 Hz voltage version Table 2

| Coil code | Rated voltage V AC | Coil resistance ±10% at 20°C Ω | Coil operating range V AC | |
|---|---|---|---|---|
| | | | min. (at 20°C) | max. (at 55°C) |
| 5012 | 12 | 18,5 | 9,6 | 13,2 |
| 5024 | 24 | 75,0 | 19,2 | 26,4 |
| 5115 | 115 | 1 840,0 | 92,0 | 126,5 |
| 5120 | 120 | 1 910,0 | 96,0 | 132,0 |
| 5230 | 230 | 7 080,0 | 184,0 | 253,0 |
| 5240 | 240 | 7 760,0 | 192,0 | 264,0 |

## Connection diagrams (pin side view)

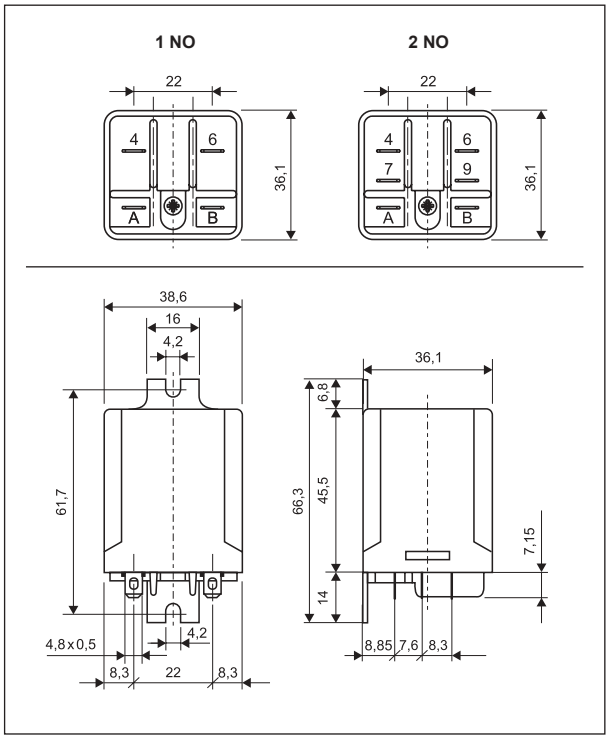



## Design

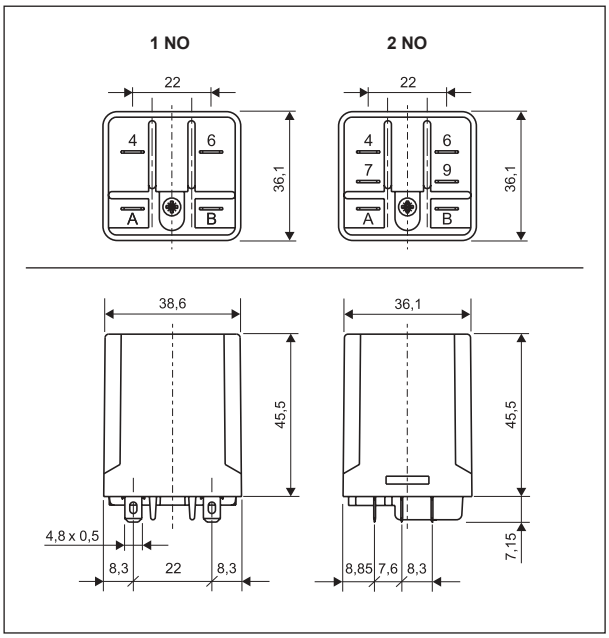



Permanent magnet fixed in the contact plate to perform the function of the so-called "magnetic blow-out". Its magnetic field is directed to the contact set and blows out the electric arc which appears at switching off the DC load.

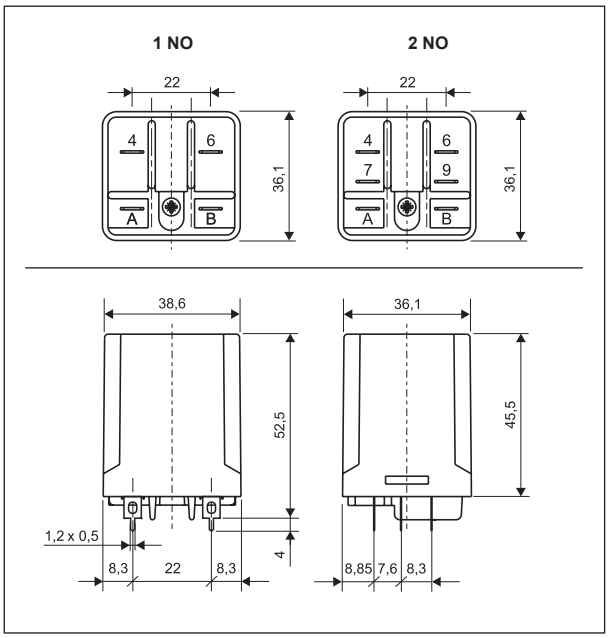
## Dimensions - version with mounting flange in the wall of the cover



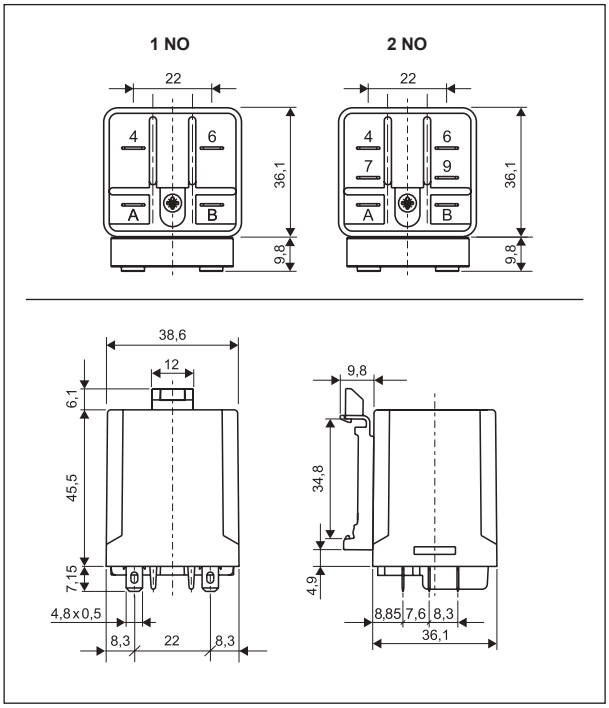
## **Dimensions -** plug-in version (standard)



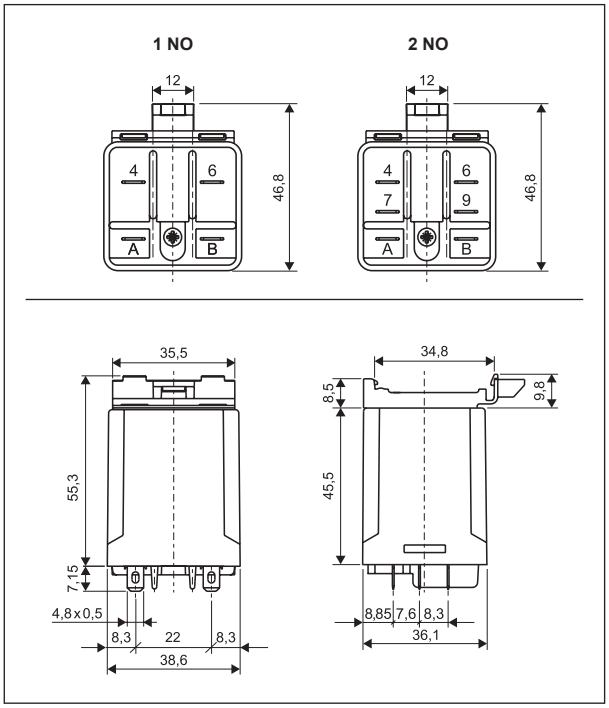

## **Dimensions -** PCB version




## **Dimensions -** version with vertical adaptor (V)




## **Dimensions -** version with horizontal adaptor (H)

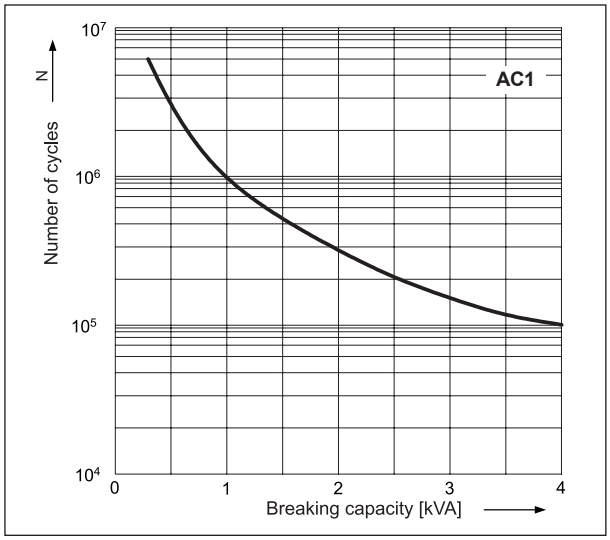



## Mounting

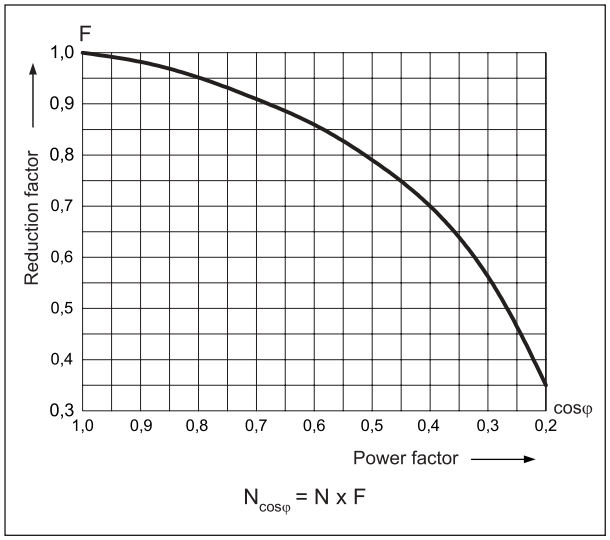
**Relays RUC-M are offered in versions**: • standard, for screw terminals plug-in sockets **GUC11** ❶ with clip **MBA**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with two M3 screws • with mounting flange in the wall of the cover, on panel mounting, flat insert connectors - faston 187 (4,8 x 0,5 mm) • with vertical (V) or horizontal (H) adaptors for direct mounting on 35 mm rail mount acc. to PN-EN 60715, flat insert connectors - faston 187 (4,8 x 0,5 mm) • for direct PCB mounting ❺.

❺ Relays are not available with (V) or (H) adaptor, and cover with mounting flange.
❶ For RUC-M with GUC11 socket, max. switching voltages and coil voltages of relays are limited to 250 V AC/DC.

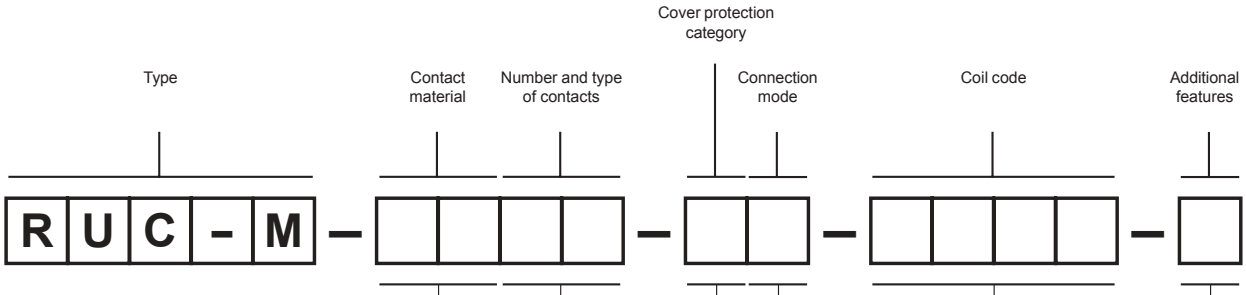
**Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour** Fig. 1




**Electrical life reduction factor at AC inductive load** Fig. 2




## Ordering codes




**Contact material**

**10** - **AgCdO**

**Number and type of contacts**

**51** - 1 NO (double-break), contact gap ≥ 6 mm (3+3)
**52** - 2 NO, contact gap ≥ 3 mm

see Tables 1, 2 page 141

**Cover protection category**

**2** - in cover, IP 00 version
**4** - in cover with mounting flange, IP 00 version
**V** - in cover with vertical adaptor, IP 00 version
**H** - in cover with horizontal adaptor, IP 00 version

**Connection mode**

**5** - for PCB
**6** - for flat insert connectors - faston 187 (4,8 x 0,5 mm) and plug-in sockets

**Additional features**

**without marks** - without additional features
**L** - light indicator (LED diode)

Examples of ordering codes:

**RUC-M-1051-26-W024** relay **RUC-M**, faston 187 (4,8 x 0,5 mm), contact material AgCdO, with one normally open contact (double-break), with contact gap ≥ 6 mm (3+3), in cover IP 00, for plug-in sockets GUC11, voltage version 24 V DC - reinforced coil

**RUC-M-1052-V6-5230-L** relay **RUC-M**, faston 187 (4,8 x 0,5 mm), contact material AgCdO, with two normally open contacts, with contact gap ≥ 3 mm, in cover IP 00, with vertical adaptor (V), for flat insert connectors, voltage version 230 V AC 50/60 Hz, with light indicator (LED diode)

**RUC-M-1051-25-5024** relay **RUC-M**, contact material AgCdO, with one normally open contact (double-break), with contact gap ≥ 6 mm (3+3), in cover IP 00, for PCB, voltage version 24 V AC 50/60 Hz

- Power relays of general application • AC and DC coils
- High breaking capacity: AC1 - 10 kVA; AC3 - 6 kVA
- 35 mm rail mount acc. to PN-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; etc.
- Recognitions, certifications, directives: RoHS,

## Contact data

| | | |
|---|---|---|
| Number and type of contacts | | 2 NO |
| Contact material | | **AgCdO** |
| Rated / max. switching voltage | AC | 400 V / 440 V |
| Min. switching voltage | | 10 V |
| Rated load (capacity) | AC1 | 25 A / 400 V AC |
| | AC3 | 15 A / 400 V AC |
| | DC1 | 25 A / 24 V DC (see Fig. 3) |
| | DC13 | 0,30 A / 120 V 0,15 A / 250 V (R300) |
| Min. switching current | | 10 mA |
| Max. inrush current | | 40 A |
| Rated current | | 25 A |
| Max. breaking capacity | AC1 | 10 000 VA |
| | AC3 | 6 000 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 ... 400 V |
| | DC | 12 ... 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 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 | 5 000 V AC type of insulation: reinforced |
| • contact clearance | 1 500 V AC type of clearance: full-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 |
| • cos$\phi$ | | see Fig. 2 |
| Mechanical life (cycles) | | ≥ $10^6$ |
| Dimensions (L x W x H) | | 26 x 49 x 72 mm |
| Weight | | 130 g |
| Ambient temperature | • storage | -25...+85 °C |
| | • operating | -25...+85 °C |
| Cover protection category | | IP 20 PN-EN 60529 |
| Shock resistance | | 10 g |
| Vibration resistance | | 5 g 10...150 Hz |

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

**Coil data** - DC voltage version

Table 1

| Coil code | Rated voltage V DC | Coil resistance ±10% at 20 °C Ω | Coil operating range V DC | |
|---|---|---|---|---|
| | | | min. (at 20°C) | max. (at 55°C) |
| 1012 | 12 | 85 | 9,6 | 13,2 |
| **1024** | **24** | **340** | **19,2** | **26,4** |
| 1048 | 48 | 1 350 | 38,4 | 52,8 |
| 1110 | 110 | 7 600 | 88,0 | 121,0 |
| 1220 | 220 | 30 000 | 176,0 | 242,0 |

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

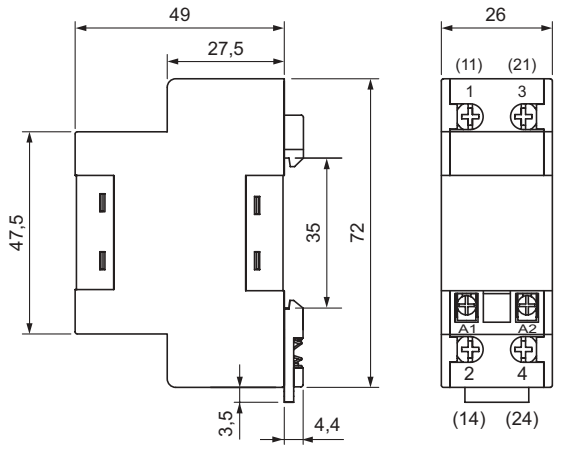
**Coil data** - AC 50 Hz voltage version

Table 2

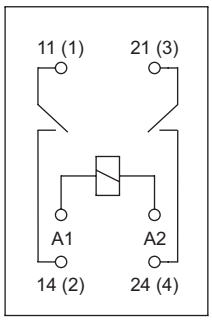
| Coil code | Rated voltage V AC | Coil resistance ±10% at 20 °C Ω | Coil operating range V AC | |
|---|---|---|---|---|
| | | | min. (at 20°C) | max. (at 55°C) |
| 3012 | 12 | 17 | 8,4 | 13,2 |
| **3024** | **24** | **76** | **16,8** | **26,4** |
| 3110 | 110 | 1 600 | 77,0 | 121,0 |
| **3230** | **230** | **6 800** | **161,0** | **253,0** |
| 3400 | 400 | 18 600 | 280,0 | 440,0 |

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

**Dimensions**



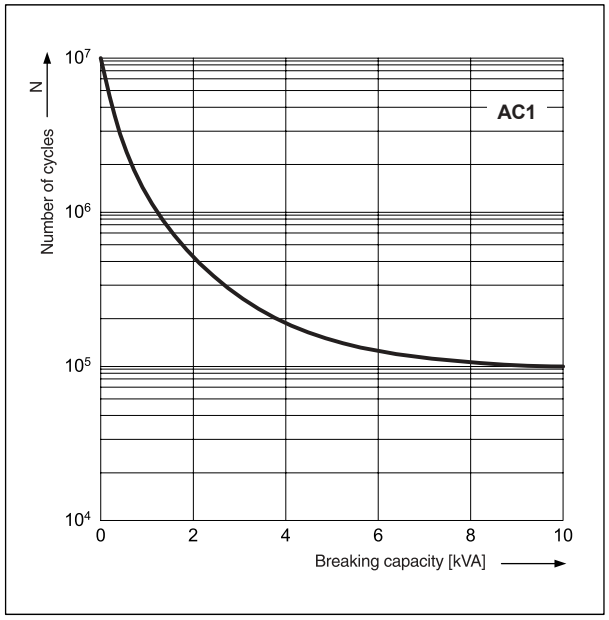

**Connection diagram**
(screw terminals side view)




**2 NO**

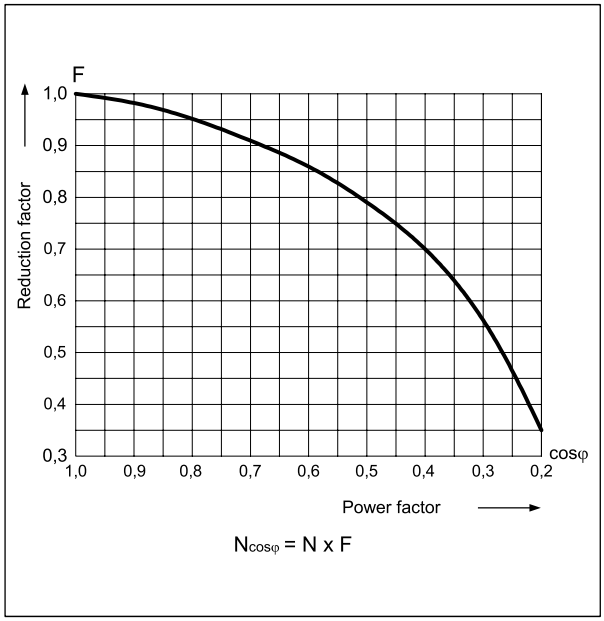
**Electrical life at AC resistive load.**
**Switching frequency: 600 cycles/hour**

Fig. 1



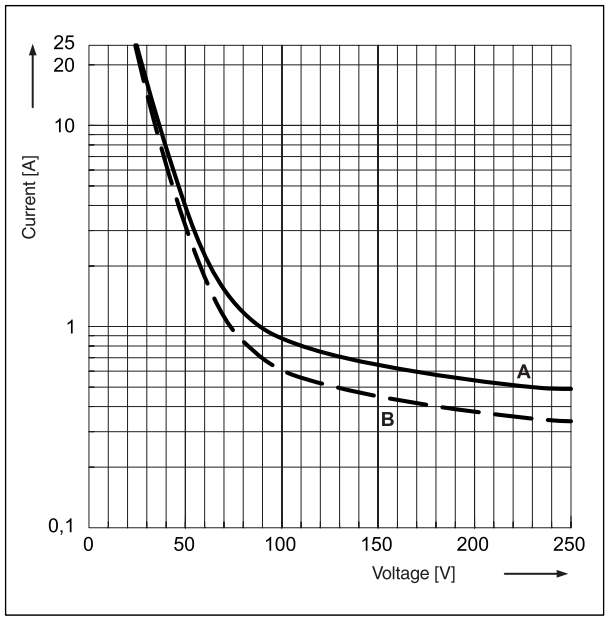

**Electrical life reduction factor at AC inductive load**

Fig. 2




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

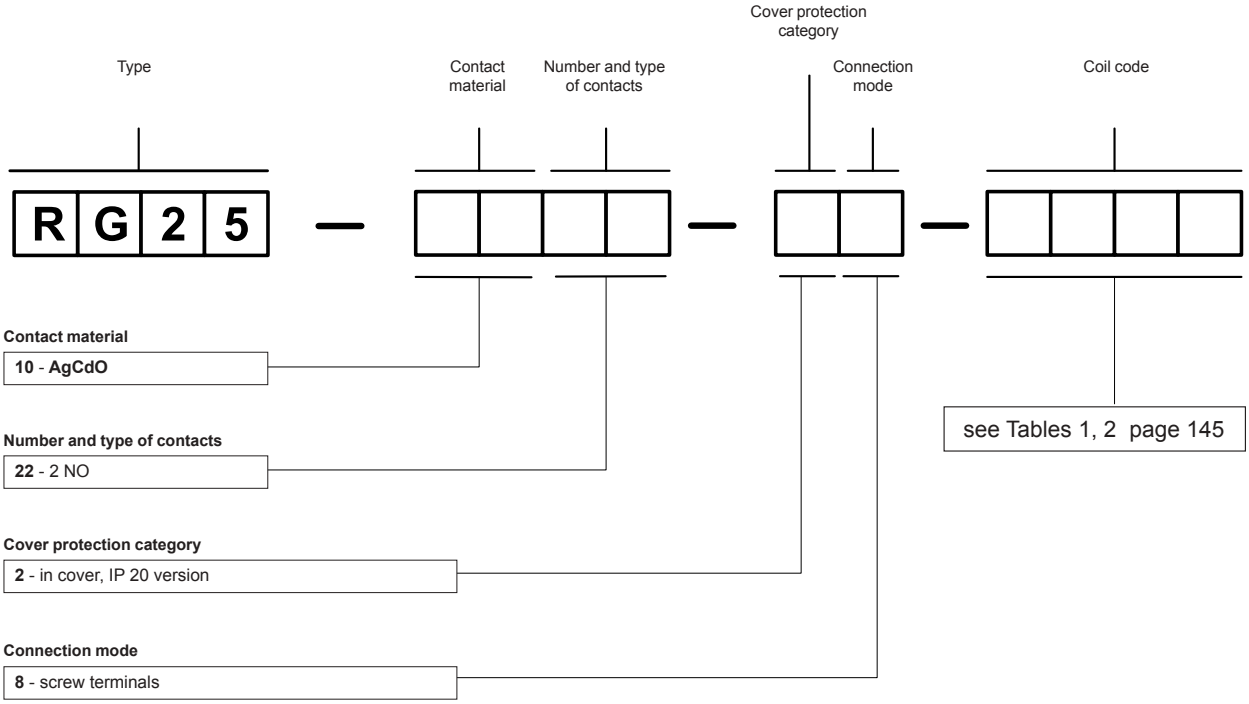
Fig. 3



## Mounting

Relays **RG25** are designed for direct mounting on 35 mm rail mount acc. to PN-EN 60715. Operational position - screw terminals of coil downwards. Maximum size of wires 2 x 2,5 mm$^2$ (2 x 14 AWG). Rated cross-sectional area of conductors 2 x 1,5 mm$^2$ (2 x 16 AWG). Maximum screw torque: 0,7 Nm.

## Ordering codes




Example of ordering code:

**RG25-1022-28-3230** relay **RG25**, contact material AgCdO, with two normally open contacts, in cover IP 20, screw terminals, voltage version 230 V AC 50 Hz

# R20

## industrial relays of small dimensions


- High switching capacity up to 30 A
- "Bridge" type contacts which open the circuit with double break
- Flat insert connectors - faston 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, 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 | |
| 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 ... 230 V | |
| | DC | 12 ... 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...2,5 VA | |
| | DC | 1,9 W | |

### Insulation according to PN-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 | $10^5$ | 1 NO: 30 A, 250 V AC — 2 NO: 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 | • operating | -25...+75 °C | |
| Cover protection category | | IP 50 ❶ | PN-EN 60529 |
| Shock resistance | | 10 g | |
| Vibration resistance | | 1,5 mm DA (constant amplitude) | 10...55 Hz |

The data in bold type pertain to the standard versions of the relays.
❶ In cover with mounting flange.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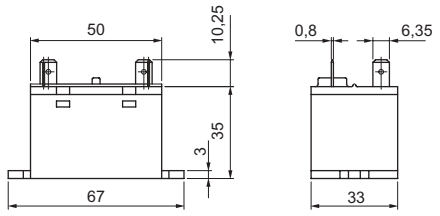
**Coil data** - DC voltage version — Table 1

| Coil code | Rated voltage V DC | Coil resistance ± 10% at 20°C Ω | Coil operating range at 20°C V DC | | Power consumption W |
|---|---|---|---|---|---|
| | | | min. | max. | |
| 1012 | 12 | 75,8 | 9,0 | 13,2 | 1,9 |
| 1024 | 24 | 303,0 | 18,0 | 26,4 | 1,9 |
| 1110 | 110 | 6 400,0 | 82,5 | 121,0 | 1,9 |

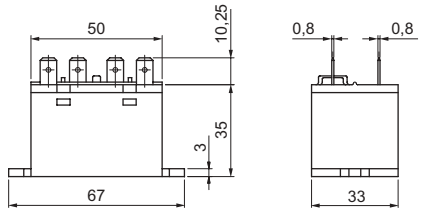
**Coil Data** - AC 50/60 Hz voltage version — Table 2

| Coil code | Rated voltage V AC | Coil resistance ± 10% at 20°C Ω | Coil operating range at 20°C V AC | | Power consumption VA |
|---|---|---|---|---|---|
| | | | min. | max. | |
| 5024 | 24 | 338 | 18,0 | 26,4 | 1,7 |
| 5048 | 48 | | 36,0 | 52,8 | 1,7 |
| 5115 | 115 | 5 260 | 86,3 | 126,5 | 2,5 |
| 5230 | 230 | 21 000 | 172,5 | 253,0 | 2,5 |

**Dimensions**

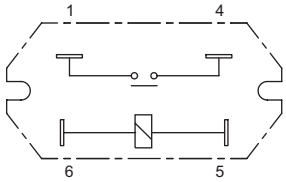



**1 NO**

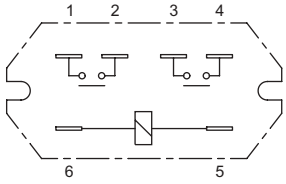



**2 NO**

**Connection diagrams** (pin side view)

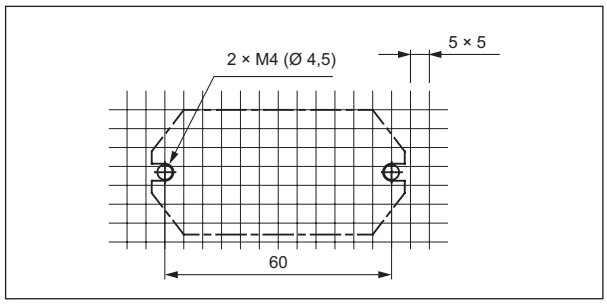



**1 NO**




**2 NO**

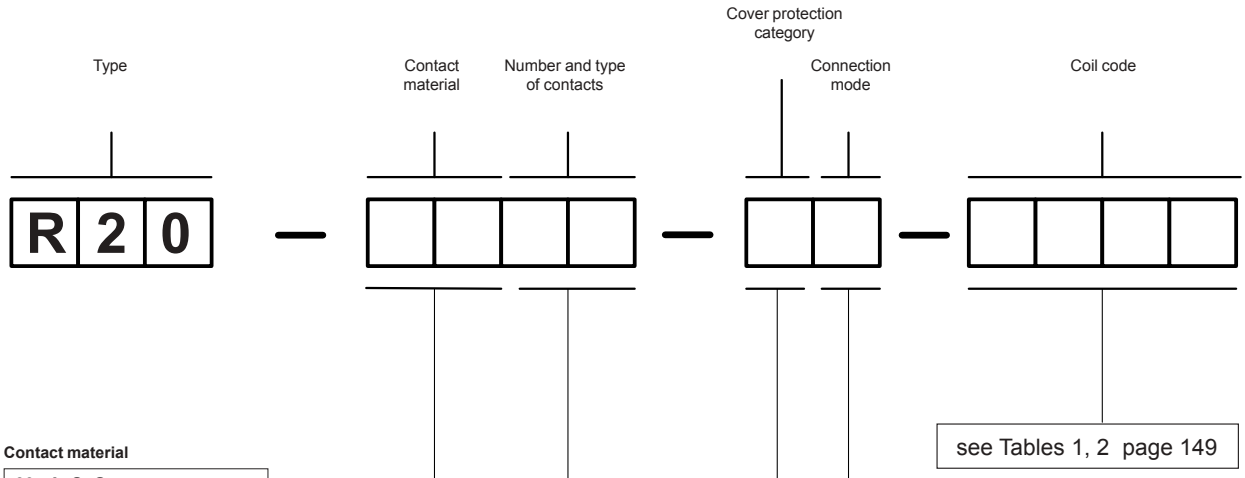
## Pinout




## Mounting

Relays **R20** are designed for flat insert connectors - faston 6,3 x 0,8 mm. Relays are on panel mounting with two M4 screws.

## Ordering codes




**Contact material**

**30** - **$AgSnO_2$**

**Number and type of contacts**

**21** - 1 NO
**22** - 2 NO

**Cover protection category**

**9** - in cover with mounting flange, IP 50 version

**Connection mode**

**6** - for flat insert connectors - faston 6,3 x 0,8 mm

Example of ordering code:

**R20-3021-96-1012** relay **R20**, contact material $AgSnO_2$, with one normally open contact, in cover with mounting flange IP 50, for flat insert connectors - faston 6,3 x 0,8 mm, voltage version 12 V DC

NEW product

- High switching capacity up to 30 A
- For PCB
- Available also with sealed cover (standard with no sealing)
- Applications: internal applications, heating systems, ventilation, automotive electric systems, other electric applications
- Recognitions, certifications, directives: RoHS,

## Contact data

| | | | |
|---|---|---|---|
| Number and type of contacts | | 1 C/O, 1 NO | |
| Contact material | | **$AgSnO_2$** | |
| Rated / max. switching voltage | AC | 240 V / 250 V | |
| Min. switching voltage | | 10 V | |
| Rated load | AC1 | 1 C/O: 20 A / 10 A (NO/NC) / 240 V AC | 1 NO: 30 A / 240 V AC |
| | DC1 | 1 C/O: 20 A / 10 A (NO/NC) / 30 V DC | 1 NO: 30 A / 30 V DC |
| Min. switching current | | 10 mA | 10 mA |
| Rated current | | 1 C/O: 20 A / 10 A (NO/NC) | 1 NO: 30 A |
| Max. breaking capacity | AC1 | 1 C/O: 4 800 VA | 1 NO: 7 200 VA |
| | AC3 | 0,5 HP 240 V AC | 0,5 HP 240 V AC |
| Min. breaking capacity | | 0,1 W | |
| Contact resistance | | ≤ 100 mΩ | |

## Coil data

| | | |
|---|---|---|
| Rated voltage | DC | 12 ... 24 V |
| Must release voltage | | DC: ≥ 0,05 $U_n$ |
| Operating range of supply voltage | | see Table 1 |
| Must operate voltage | | ≤ 0,8 $U_n$ |
| Rated power consumption | DC | 1,0 W |

## Insulation according to PN-EN 60664-1

| | |
|---|---|
| Insulation rated voltage | 250 V AC |
| Overvoltage category | II |
| Flammability degree | V-0 UL94 |
| Insulation resistance | > 100 MΩ 500 V DC, 60 s |
| Dielectric strength | |
| • between coil and contacts | 1 500 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 C/O: 20 A / 10 A (NO/NC), 240 V AC | 1 NO: 30 A, 240 V AC |
| Mechanical life (cycles) | | > $10^7$ | |
| Dimensions (L x W x H) | | 32,2 x 27,5 x 20,5 mm | |
| Weight | | 22 g | |
| Ambient temperature | • operating | -30...+55 °C | |
| Cover protection category | | IP 64 PN-EN 60529 | |
| Shock resistance | | 5 g | |
| Vibration resistance | | 1,5 mm DA (constant amplitude) 10...55 Hz | |

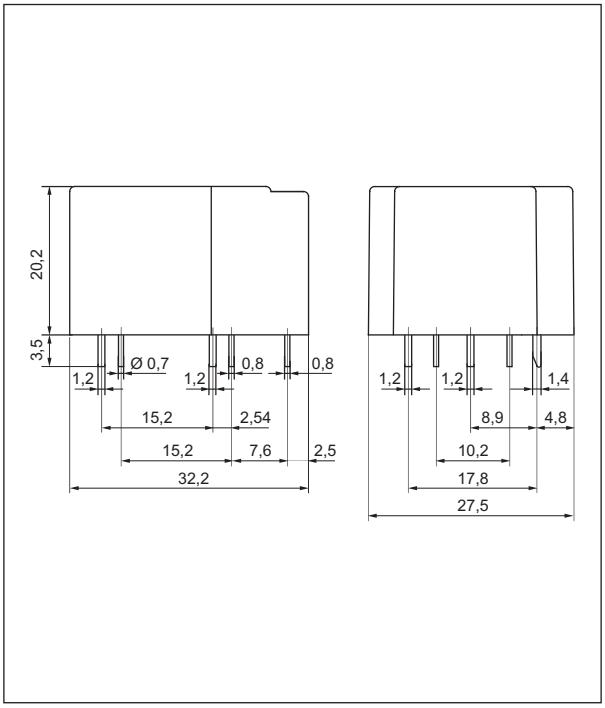
The data in bold type pertain to the standard versions of the relays.

**Coil data** - DC voltage version

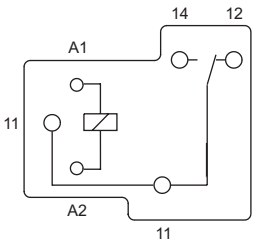
Table 1

| Coil code | Rated voltage V DC | Coil resistance ± 10% at 20°C Ω | Coil operating range at 20°C V DC | | Power consumption W |
|---|---|---|---|---|---|
| | | | min. | max. | |
| 1012 | 12 | 155 | 9,6 | 18 | 1,0 |
| 1024 | 24 | 660 | 19,2 | 36 | 1,0 |

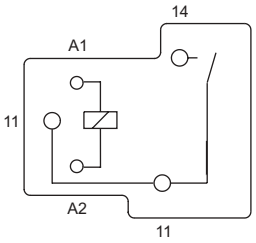
**Dimensions**




**Connection diagrams** (pin side view)



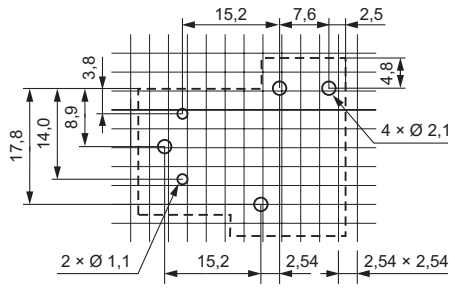

**1 C/O**



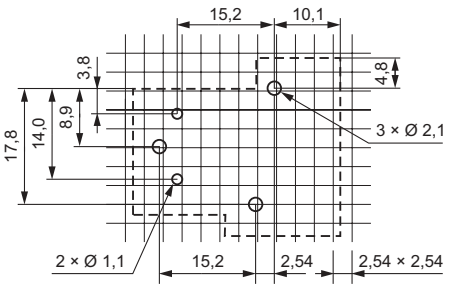

**1 NO**

**Pinout** (solder side view)

**1 C/O**



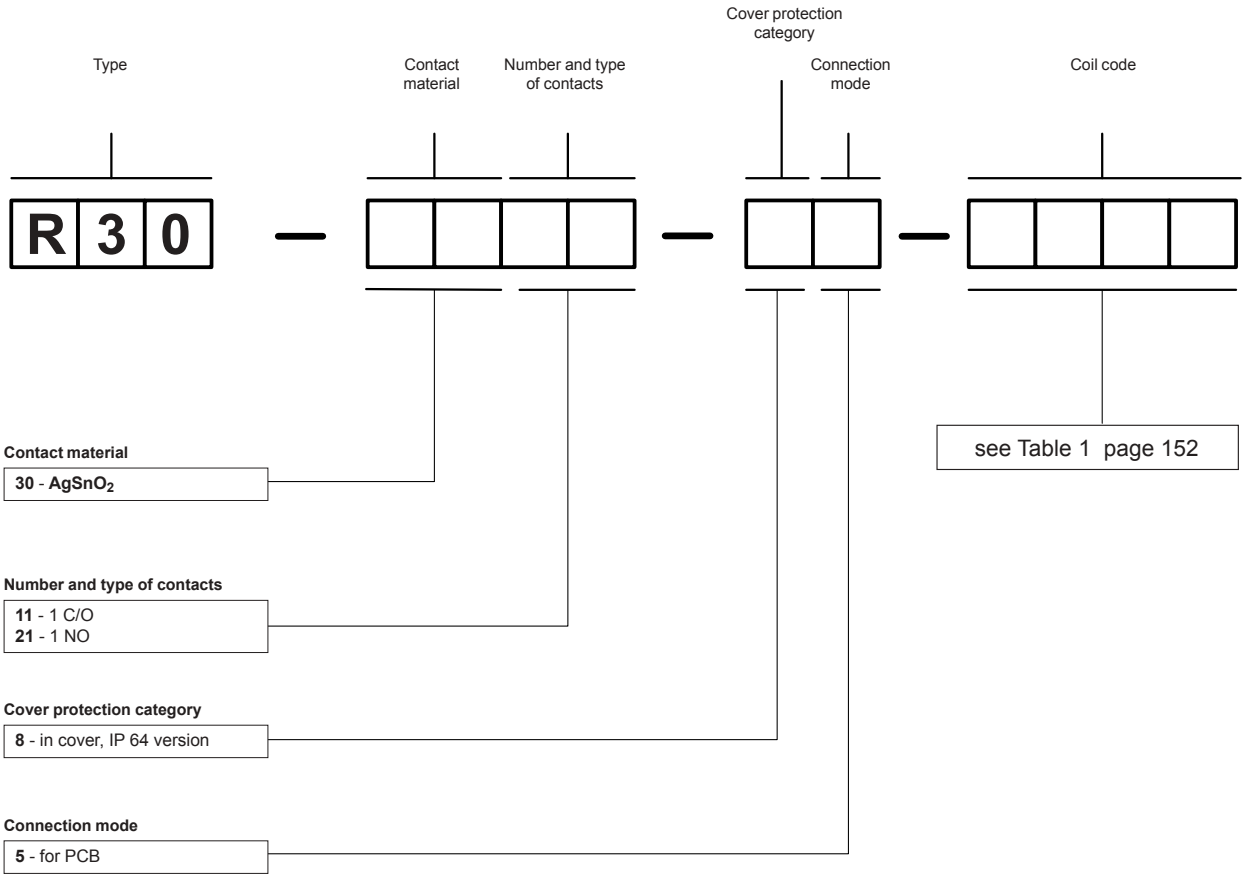

**1 NO**



## Mounting

Relays **R30** are designed for direct PCB mounting.

## Ordering codes




Examples of ordering codes:

**R30-3011-85-1012** relay **R30**, contact material $AgSnO_2$, with one changeover contact, in cover IP 64, for PCB, voltage version 12 V DC

**R30-3021-85-1024** relay **R30**, contact material $AgSnO_2$, with one normally open contact, in cover IP 64, for PCB, voltage version 24 V DC


RS35


RS50

NEW product

- **Relays for power control in solar systems generating energy**
- Max. switching current: 35 A (version RS35); 50 A (version RS50)
- 5000 V / 10 mm reinforced insulation
- Contact gap > 1,75 mm • Holding power 0,1 W
- For PCB • DC coils • Reinforced insulation, acc. PN-EN 60730-1 (VDE 0631, part 1); PN-EN 60335-1 (VDE 0700, part 1)
- Recognitions, certifications, directives: RoHS,

## Contact data

| | | | |
|---|---|---|---|
| Number and type of contacts | | 2 NO | |
| Contact material | | **$AgSnO_2$** | |
| Rated / max. switching voltage | AC | 250 V / 440 V | |
| Min. switching voltage | | 10 V | |
| Rated load | AC1 | RS35: 35 A / 250 V AC | RS50: 48 A / 250 V AC |
| | DC1 | RS35: 35 A / 24 V DC | RS50: 48 A / 24 V DC |
| Min. switching current | | 10 mA | |
| Rated current | | RS35: 35 A | RS50: 50 A |
| Max. breaking capacity | AC1 | RS35: 8 750 VA | RS50: 12 500 VA |
| | DC1 | RS35: 90 W 0,3 A / 300 V | RS50: 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 | 5 ... 110 V |
| Must release voltage | | DC: ≥ 0,05 $U_n$ |
| Operating range of supply voltage | | see Table 1 |
| Rated power consumption | DC | 0,48 W |
| Power consumption at pickup voltage | | 0,3 W |
| Max. continuous dissipation | | 1,9 W at 20 °C |

## 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 | 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

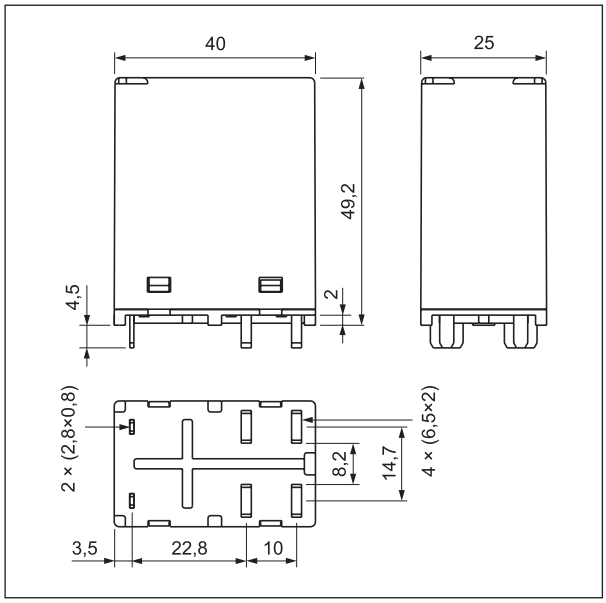
| | | | |
|---|---|---|---|
| Operating / release time (typical values) | | 30 ms / 5 ms | |
| Electrical life | | | |
| • resistive AC1 | | $5 \times 10^4$ 35 A, 250 V AC, 20 °C | $5 \times 10^4$ 50 A, 250 V AC, 20 °C |
| • AC7a | | $3 \times 10^4$ 35 A, 250 V AC, 20 °C | $3 \times 10^4$ 50 A, 250 V AC, 20 °C |
| 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 | |
| | • operating | -40...+85 °C | |
| Cover protection category | | IP 40 PN-EN 60529 | |
| Environmental protection | | RTI PN-EN 116000-3 | |
| 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 pertain to the standard versions of the relays.

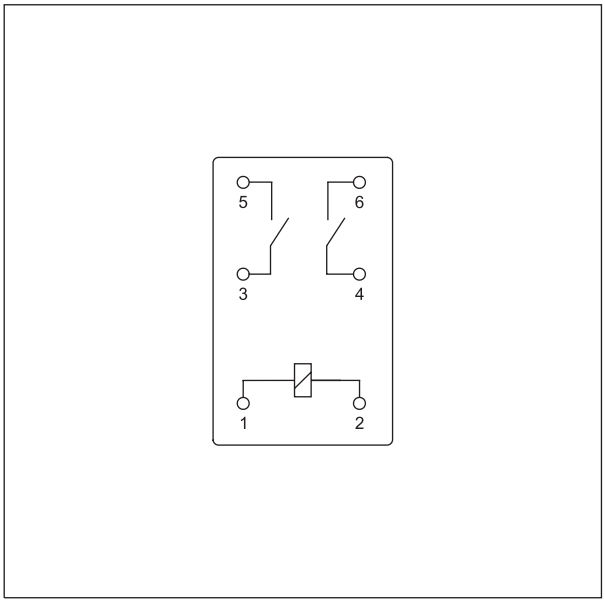
**Coil data** - DC voltage version Table 1

| Coil code | Rated voltage V DC | Coil resistance ±10% at 20°C Ω | Coil operating range V DC | |
|---|---|---|---|---|
| | | | min. (at 20°C) | max. (at 55°C) |
| 1005 | 5 | 50 | 3,75 | 10 |
| 1009 | 9 | 170 | 6,75 | 18 |
| 1012 | 12 | 300 | 9,00 | 24 |
| 1018 | 18 | 675 | 13,50 | 36 |
| 1024 | 24 | 1 200 | 18,00 | 48 |
| 1100 | 110 | 25 000 | 82,50 | 220 |

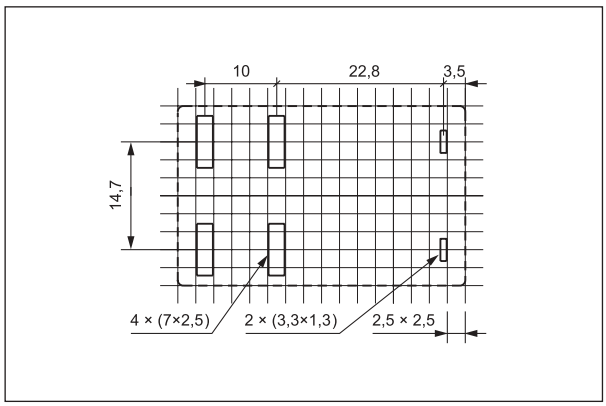
**Dimensions**




**Connection diagram** (pin side view)



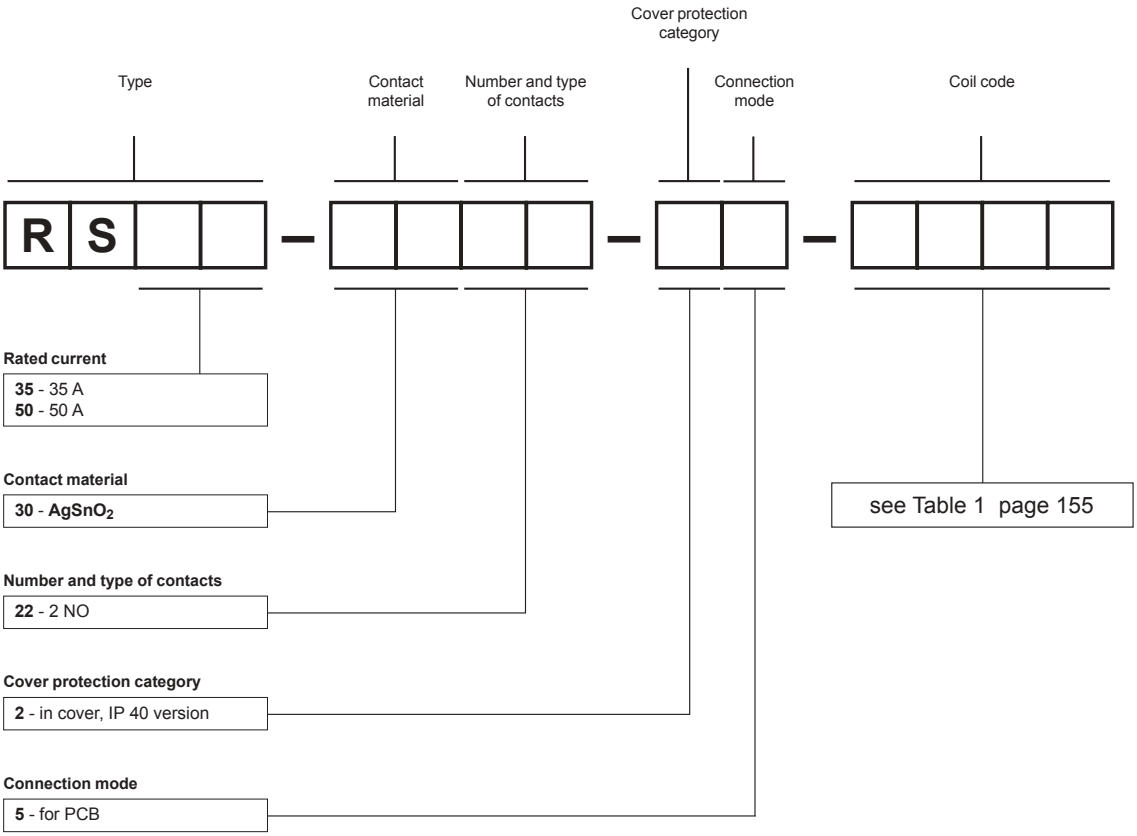

**Pinout** (solder side view)



## Mounting

Relays **RS35**, **RS50** are designed for direct PCB mounting.

## Ordering codes




Examples of ordering code:

**RS35-3022-25-1005** relay **RS35**, rated current 35 A, contact material $AgSnO_2$, with two normally open contacts, in cover IP 40, for PCB, voltage version 5 V DC

**RS50-3022-25-1110** relay **RS35**, rated current 50 A, contact material $AgSnO_2$, with two normally open contacts, in cover IP 40, for PCB, voltage version 110 V DC