# R2, R3, R4
## Industrial Electromagnetic Relays

E105728

- Compact size
- Relays of general application
- Cadmium - free contacts
- AC and DC coils
- For plug-in sockets, 35 mm rail mount or on panel mounting *
- 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 (see page 115)
- AUCOTEAM GmbH Berlin - railway standards.

| Contact Data | | R2 | R3 | R4 |
|---|---|---|---|---|
| **Number and type of contacts** | | **DPDT** | **3PDT** | **4PDT** |
| Contact material | | AgNi** | AgNi** | AgNi** |
| Rated / max. switching voltage | AC | 250 V / 440 V | 250 V / 440 V | 250 V / 250 V |
| Min. switching voltage | | 10 V | 10 V | 10 V |
| Rated load (capacity) | AC1 | 12 A / 250 V AC | 10 A / 250 V AC | 6 A / 250 V AC |
| | AC15 | 3 A / 120 V; 1.5 A / 240 V (B300) | 3 A / 120 V; 1.5 A / 240 V (B300) | 1.5 A / 120 V; 0.75 A / 240 V (C300) |
| | AC3 | 370 W (single-phase motor) | 370 W (single-phase motor) | 125 W (single-phase motor) |
| | DC1 | 12 A / 24 V DC (see Fig. 3.1) | 10 A / 24 V DC (see Fig. 3.2) | 6 A / 24 V DC (see Fig. 3.3) |
| | DC13 | 0.22 A / 120 V; 0.1 A / 250 V (R300) | 0.22 A / 120 V; 0.1 A / 250 V (R300) | 0.22 A / 120 V; 0.1 A / 250 V (R300) |
| Min. switching current | | 5 mA | 5 mA | 5 mA |
| Max. inrush current | | 24 A | 20 A | 12A |
| **Rated current** | | **12 A** | **10 A** | **6A** |
| Max. breaking capacity | AC1 | 3000 VA | 2500 VA | 1500 VA |
| Min. breaking capacity | | 0.3 W | 0.3 W | 0.3 W |
| Contact resistance | | ≤ 100 mΩ | ≤ 100 mΩ | ≤ 100 mΩ |
| Max. operating frequency | | | | |
| • at rated load | AC1 | 1200 cycles/hour | 1200 cycles/hour | 1200 cycles/hour |
| • no load | | 18000 cycles/hour | 18000 cycles/hour | 18000 cycles/hour |
| **Coil Data** | | | | |
| Rated voltage | 50/60 Hz AC | 6 ... 240 V | 6 ... 240 V | 6 ... 240 V |
| | DC | 5 ... 220 V | 5 ... 220 V | 5 ... 220 V |
| Must release voltage | | AC: ≥ 0.2 $U_n$; DC: ≥ 0.1 $U_n$ | AC: ≥ 0.2 $U_n$; DC: ≥ 0.1 $U_n$ | AC: ≥ 0.2 $U_n$; DC: ≥ 0.1 $U_n$ |
| Operating range of supply voltage | | see page 54 | see page 54 | see page 54 |
| Rated power consumption | AC | 1.6 VA | 1.6 VA | 1.6 VA |
| | DC | 0.9 W | 0.9 W | 0.9 W |
| **Insulation** | | | | |
| Insulation rated voltage | | 250 V AC | 250 V AC | 250 V AC |
| Rated surge voltage | | 4000 V 1.2 / 50 µs | with AC coils: 2500 V 1.2 / 50 µs<br>with DC coils: 4000 V 1.2 / 50 µs | 2500 V 1.2 / 50 µs |
| Overvoltage category | | III | III | II |
| Insulation pollution degree | | 3 | 3 | 2 |
| Dielectric strength | | | | |
| • between coil and contacts | | 2500 V AC type of insulation: basic | 2500 V AC type of insulation: basic | 2500 V AC type of insulation: basic |
| • contact clearance | | 1500 V AC type of clearance: micro-disco. | 1500 V AC type of clearance: micro-disco. | 1500 V AC type of clearance: micro-disco. |
| • pole - pole | | 2500 V AC type of insulation: basic | 2500 V AC type of insulation: basic | 2500 V AC type of insulation: basic |
| Contact - coil distance | | | | |
| • clearance | | ≥ 2.5 mm | ≥ 2.5 mm | ≥ 1.6 mm |
| • creepage | | ≥ 4 mm | ≥ 4 mm | ≥ 3.2 mm |
| **General data** | | | | |
| Operating / release time (typical) | | AC: 10 ms / 8 ms; DC: 13 ms / 3 ms | AC: 10 ms / 8 ms; DC: 13 ms / 3 ms | AC: 10 ms / 8 ms; DC: 13 ms / 3 ms |
| Electrical life | | | | |
| • resistive | AC1 | > $10^5$; 12 A. 250 V AC | > $10^5$; 10 A. 250 V AC | > $10^5$; 6 A. 250 V AC |
| • cosφ | | see Fig. 2.1 | see Fig. 2.2 | see Fig. 2.3 |
| Mechanical life (cycles) | | > 2 x $10^7$ | > 2 x $10^7$ | > 2 x $10^7$ |
| Dimensions (L x W x H) | | 27.5 x 21.2 x 35.6 mm | 27.5 x 21.2 x 35.6 mm | 27.5 x 21.2 x 35.6 mm |
| Weight | | 35 g | 35 g | 35 g |
| Ambient temperature | | | | |
| • storage | | -40...+85 °C | -40...+85 °C | -40...+85 °C |
| • operating | | AC: -40...+55 °C; DC: -40...+70 °C | AC: -40...+55 °C; DC: -40...+70 °C | AC: -40...+55 °C; DC: -40...+70 °C |
| Cover protection category | | IP 40 PN-EN 60529 | IP 40 PN-EN 60529 | IP 40 PN-EN 60529 |
| Environmental protection | | RTI PN-EN 116000-3 | RTI PN-EN 116000-3 | RTI PN-EN 116000-3 |
| Shock resistance | (NO/NC) | 10 g / 5 g | 10 g / 5 g | 10 g / 5 g |
| Vibration resistance | | 5 g 10...150 Hz | 5 g 10...150 Hz | 5 g 10...150 Hz |
| Solder bath temperature | | max. 270 °C | – | max. 270 °C |
| Soldering time | | max. 5 s | – | max. 5 s |

* PCB or threaded bolt versions contact Altech Corp.

** Other contact materials (eg. gold plated) available, contact Altech Corp.

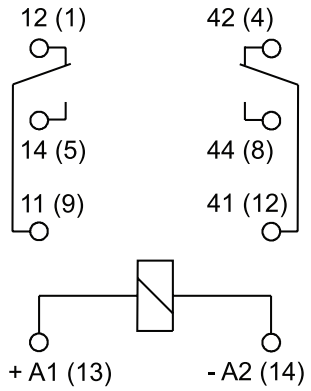


DATA SUBJECT TO CHANGE WITHOUT NOTICE

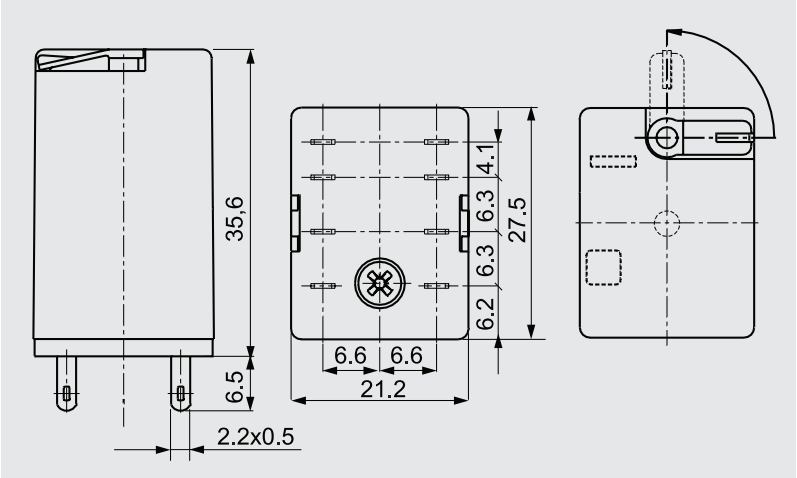
## R2 (DPDT)

E105728

### CONNECTION DIAGRAM

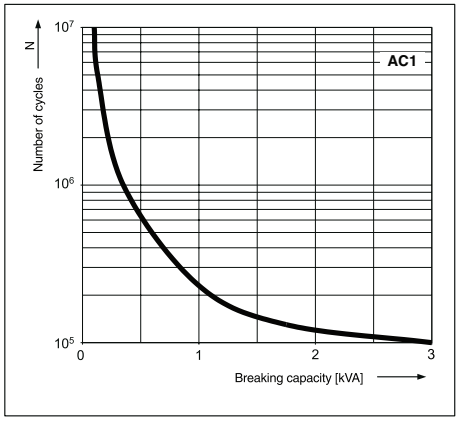



### DIMENSIONS

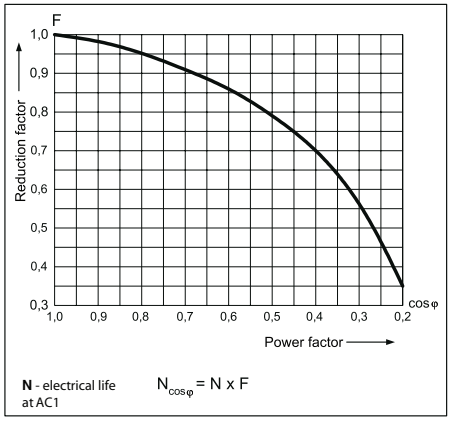



### LOAD CHARTS

**Electrical life at AC resistive load. Switching frequency: 1200 cycles/hour** Fig. 1.1



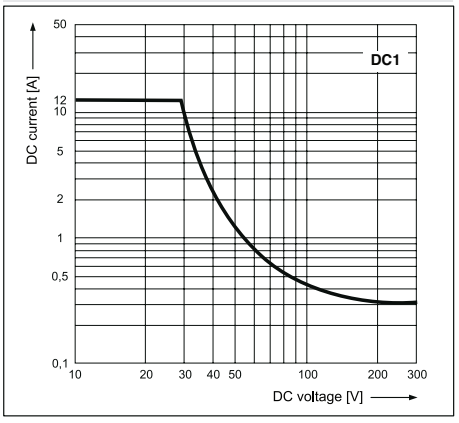

**Electrical life reduction factor at AC inductive load** Fig. 2.1




**N** - electrical life at AC1

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

**Max. DC resistive load breaking capacity** Fig. 3.1







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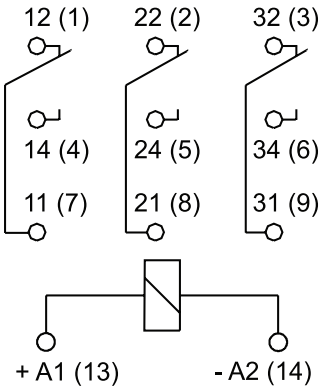
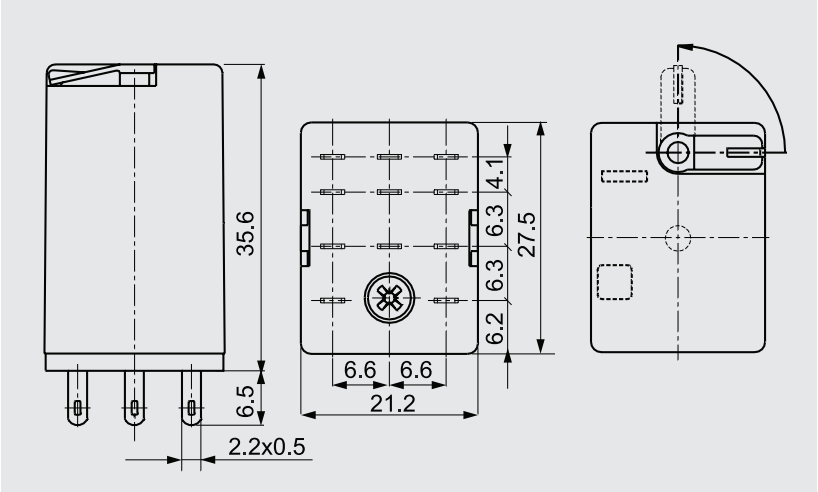
## R3 (3PDT)

E105728

### CONNECTION DIAGRAM

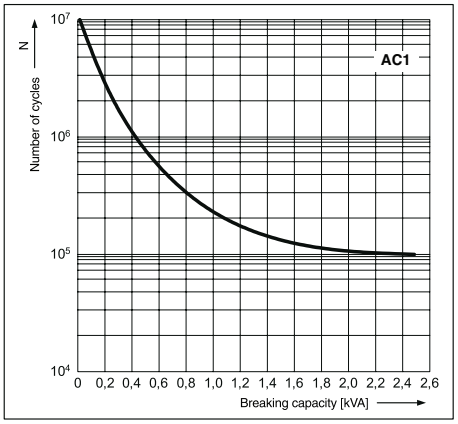



### DIMENSIONS

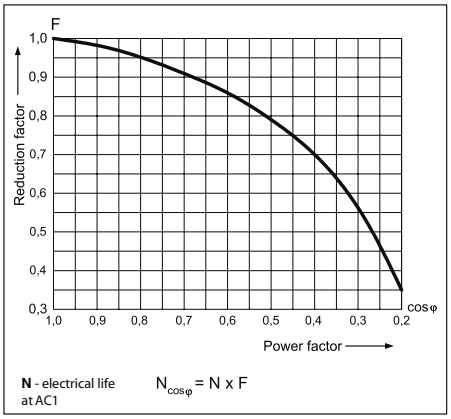



### LOAD CHARTS

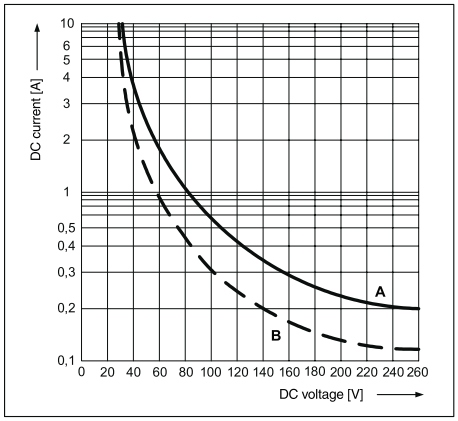
**Electrical life at AC resistive load. Switching frequency: 1200 cycles/hour** — Fig. 1.2




**Electrical life reduction factor at AC inductive load** — Fig. 2.2




**Max. DC breaking capacity**
**A - resistive load DC1**
**B - inductive load L/R = 40 ms** — Fig. 3.2







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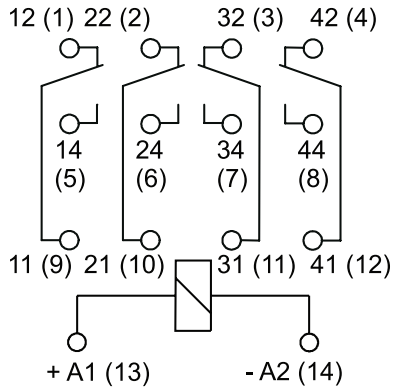
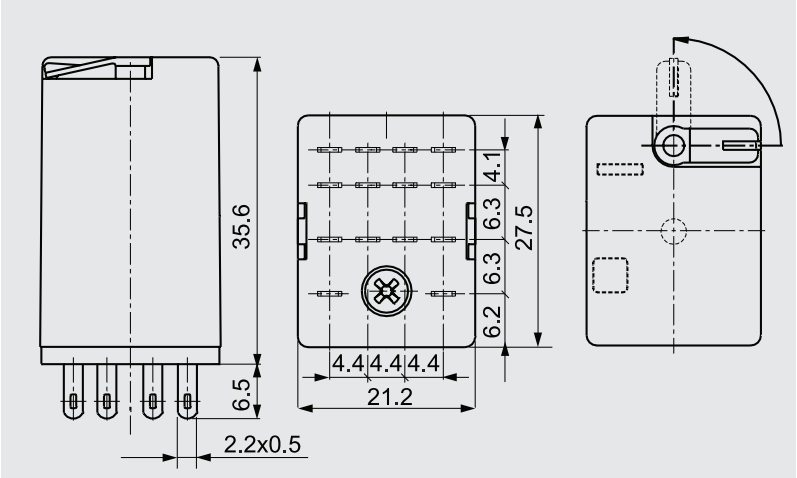
## R4 (4PDT)

E105728

### CONNECTION DIAGRAM

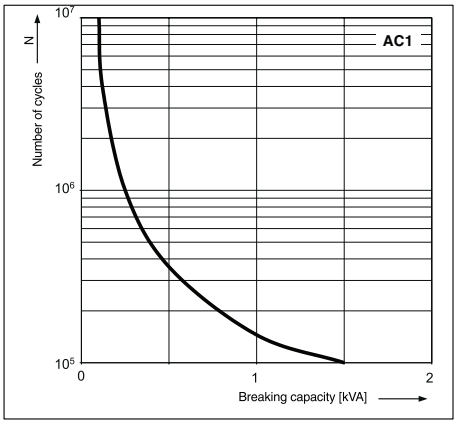



### DIMENSIONS

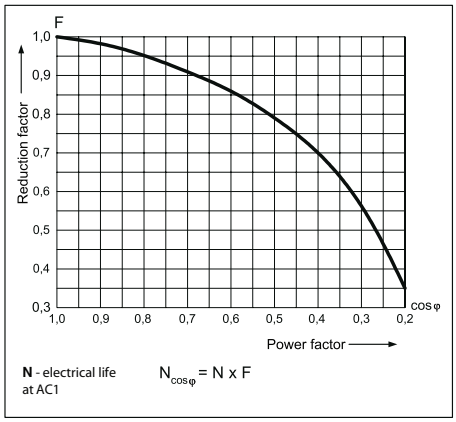



### LOAD CHARTS

**Electrical life at AC resistive load. Switching frequency: 1200 cycles/hour** — Fig. 3.1



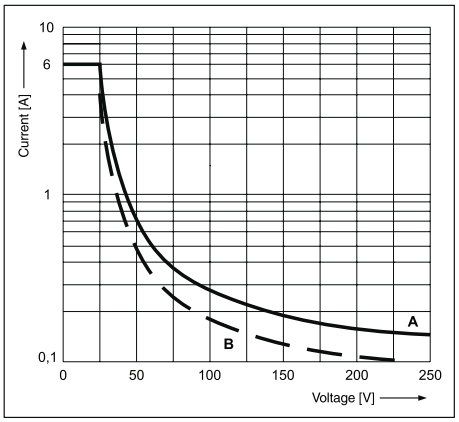

**Electrical life reduction factor at AC inductive load** — Fig. 2.3




**N** - electrical life at AC1

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

**Max. DC breaking capacity**
**A - resistive load DC1**
**B - inductive load L/R = 40 ms** — Fig. 3.3







DATA SUBJECT TO CHANGE WITHOUT NOTICE

# R2, R3, R4
## Industrial Electromagnetic Relays

### R2 DPDT AC 50/60Hz & DC coil

| Part Number | Coil Voltage (V) | Coil Type | Coil resistance at 20 °C in Ω | Coil operating range min. (at 20°C) | Coil operating range max. (at 55°C) | Options* WT | Options* WTL |
|---|---|---|---|---|---|---|---|
| R2N-2012-23-1012-WT | 12 | DC | 160 | 9.6 | 13.2 | x | |
| ► **R2N-2012-23-1012-WTL** | 12 | DC | 160 | 9.6 | 13.2 | | x |
| ► **R2N-2012-23-1024-WT** | 24 | DC | 640 | 19.2 | 26.4 | x | |
| ► **R2N-2012-23-1024-WTL** | 24 | DC | 640 | 19.2 | 26.4 | | x |
| R2N-2012-23-1110-WT | 110 | DC | 13600 | 88.0 | 121.0 | x | |
| R2N-2012-23-1110-WTL | 110 | DC | 13600 | 88.0 | 121.0 | | x |
| R2N-2012-23-5024-WT | 24 | AC 50/60Hz | 158.0 | 19.2 | 26.4 | x | |
| ► **R2N-2012-23-5024-WTL** | 24 | AC 50/60Hz | 158.0 | 19.2 | 26.4 | | x |
| ► **R2N-2012-23-5120-WT** | 120 | AC 50/60Hz | 3770 | 96.0 | 132.0 | x | |
| ► **R2N-2012-23-5120-WTL** | 120 | AC 50/60Hz | 3770 | 96.0 | 132.0 | | x |
| R2N-2012-23-5230-WT | 230 | AC 50/60Hz | 16100 | 184.0 | 253.0 | x | |
| ► **R2N-2012-23-5230-WTL** | 230 | AC 50/60Hz | 16100 | 184.0 | 253.0 | | x |

### R3 DPDT AC 50/60Hz & DC coil

| Part Number | Coil Voltage (V) | Coil Type | Coil resistance at 20 °C in Ω | Coil operating range min. (at 20°C) | Coil operating range max. (at 55°C) | Options* WT | Options* WTL |
|---|---|---|---|---|---|---|---|
| R3N-2013-23-1012-WT | 12 | DC | 160 | 9.6 | 13.2 | x | |
| ► **R3N-2013-23-1012-WTL** | 12 | DC | 160 | 9.6 | 13.2 | | x |
| R3N-2013-23-1024-WT | 24 | DC | 640 | 19.2 | 26.4 | x | |
| ► **R3N-2013-23-1024-WTL** | 24 | DC | 640 | 19.2 | 26.4 | | x |
| R3N-2013-23-1110-WT | 110 | DC | 13600 | 88.0 | 121.0 | x | |
| R3N-2013-23-1110-WTL | 110 | DC | 13600 | 88.0 | 121.0 | | x |
| R3N-2013-23-5024-WT | 24 | AC 50/60Hz | 158.0 | 19.2 | 26.4 | x | |
| R3N-2013-23-5024-WTL | 24 | AC 50/60Hz | 158.0 | 19.2 | 26.4 | | x |
| ► **R3N-2013-23-5120-WT** | 120 | AC 50/60Hz | 3770 | 96.0 | 132.0 | x | |
| ► **R3N-2013-23-5120-WTL** | 120 | AC 50/60Hz | 3770 | 96.0 | 132.0 | | x |
| R3N-2013-23-5230-WT | 230 | AC 50/60Hz | 16100 | 184.0 | 253.0 | x | |
| R3N-2013-23-5230-WTL | 230 | AC 50/60Hz | 16100 | 184.0 | 253.0 | | x |

### R4 DPDT AC 50/60Hz & DC coil

| Part Number | Coil Voltage (V) | Coil Type | Coil resistance at 20 °C in Ω | Coil operating range min. (at 20°C) | Coil operating range max. (at 55°C) | Options* WT | Options* WTL |
|---|---|---|---|---|---|---|---|
| R4N-2014-23-1012-WT | 12 | DC | 160 | 9.6 | 13.2 | x | |
| ► **R4N-2014-23-1012-WTL** | 12 | DC | 160 | 9.6 | 13.2 | | x |
| ► **R4N-2014-23-1024-WT** | 24 | DC | 640 | 19.2 | 26.4 | x | |
| ► **R4N-2014-23-1024-WTL** | 24 | DC | 640 | 19.2 | 26.4 | | x |
| R4N-2014-23-1110-WT | 110 | DC | 13600 | 88.0 | 121.0 | x | |
| ► **R4N-2014-23-1110-WTL** | 110 | DC | 13600 | 88.0 | 121.0 | | x |
| R4N-2014-23-5024-WT | 24 | AC 50/60Hz | 158.0 | 19.2 | 26.4 | x | |
| ► **R4N-2014-23-5024-WTL** | 24 | AC 50/60Hz | 158.0 | 19.2 | 26.4 | | x |
| ► **R4N-2014-23-5120-WT** | 120 | AC 50/60Hz | 3770 | 96.0 | 132.0 | x | |
| ► **R4N-2014-23-5120-WTL** | 120 | AC 50/60Hz | 3770 | 96.0 | 132.0 | | x |
| R4N-2014-23-5230-WT | 230 | AC 50/60Hz | 16100 | 184.0 | 253.0 | x | |
| ► **R4N-2014-23-5230-WTL** | 230 | AC 50/60Hz | 16100 | 184.0 | 253.0 | | x |

**WT** = with mechanical indicator + lockable front test button
**WTL** = with mechanical indicator + lockable front test button + light indicator (LED)
* other options available upon request

► **BOLD - Regular stocked items.**



DATA SUBJECT TO CHANGE WITHOUT NOTICE

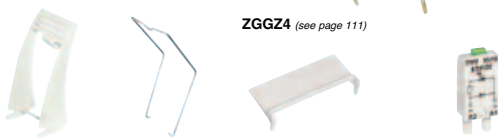
## GZT2 (for R2)

Screw terminals
Max. tightening moment
for the terminal: 0.7 Nm
35 mm rail mount
acc. to PN-EN 60715
or on panel mounting
76,3 x 27 x 42.5(80) mm*
Two poles
12 A, 300 V AC

E22891

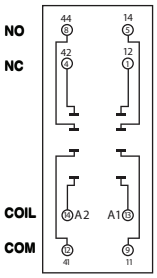
GZT2

ZGGZ4 *(see page 111)*

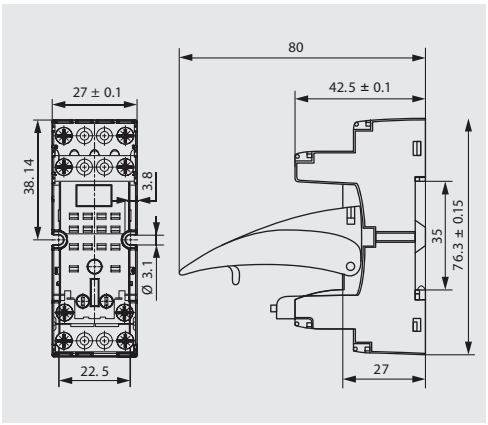


GZT4-0040 | G4 1052** | GZT4-0035 | Module type M... *(see page 113)*

**CONNECTION DIAGRAM**




**DIMENSIONS**



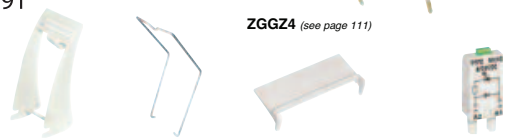

## GZM2 (for R2)

Screw terminals
Max. tightening moment
for the terminal: 0.7 Nm
35 mm rail mount
acc. to PN-EN 60715
or on panel mounting
75 x 27 x 61(82) mm*
Two poles
12 A, 300 V AC

E22891

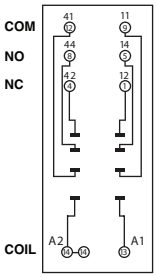
GZM2

ZGGZ4 *(see page 111)*

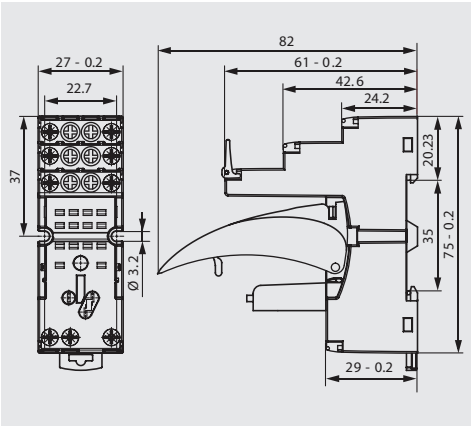


GZT4-0040 | G4 1052** | GZT4-0035 | Module type M... *(see page 113)*

**CONNECTION DIAGRAM**




**DIMENSIONS**



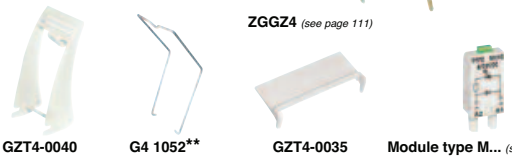

## GZT3 (for R3)

Screw terminals
Max. tightening moment
for the terminal: 0.7 Nm
35 mm rail mount
acc. to PN-EN 60715
or on panel mounting
76,3 x 27 x 42.5(80) mm*
Three poles
10 A, 300 V AC

E22891

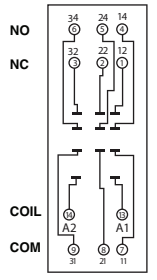
GZT3

ZGGZ4 *(see page 111)*

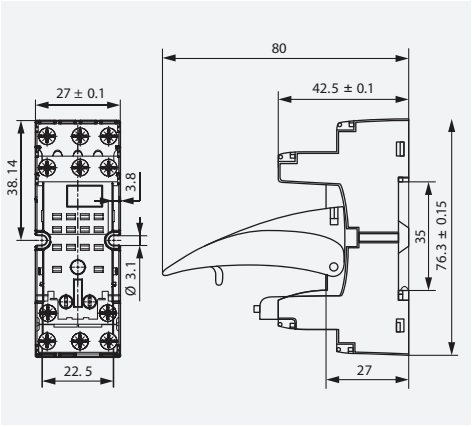


GZT4-0040 | G4 1052** | GZT4-0035 | Module type M... *(see page 113)*

**CONNECTION DIAGRAM**




**DIMENSIONS**




* In parenthesis is the height of the socket with plastic retainer clip. ** For lower profile application.

All accessories are sold separately.




DATA SUBJECT TO CHANGE WITHOUT NOTICE

### GZM3 (for R3)

Screw terminals
Max. tightening moment
for the terminal: 0.7 Nm
35 mm rail mount
acc. to PN-EN 60715
or on panel mounting
75 x 27 x 61(82) mm*
Three poles
10 A, 300 V AC

E22891

GZT2

ZGGZ4 *(see page 111)*



GZT4-0040

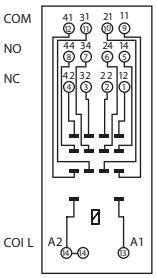
G4 1052**



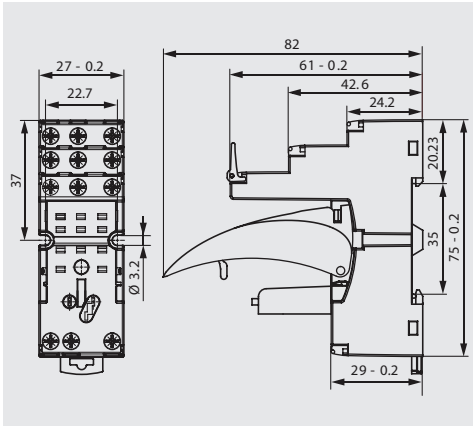
GZT4-0035

Module type M... *(see page 113)*

**CONNECTION DIAGRAM**




**DIMENSIONS**




### GZT4 (for R4)

Screw terminals
Max. tightening moment
for the terminal: 0.7 Nm
35 mm rail mount
acc. to PN-EN 60715
or on panel mounting
76,3 x 27 x 42.5(80) mm *
Four poles
6 A, 300 V AC

E22891

GZM2

ZGGZ4 *(see page 111)*



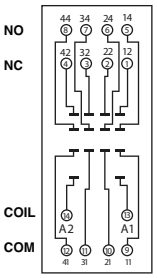
GZT4-0040

G4 1052**

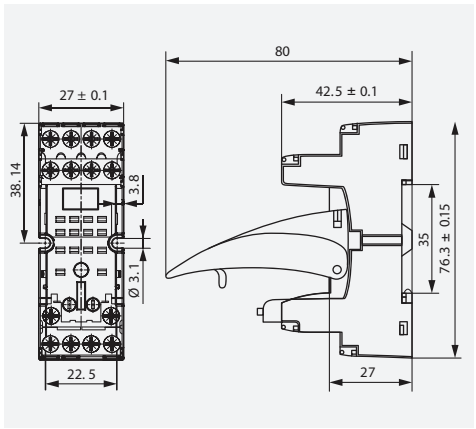
GZT4-0035

Module type M... *(see page 113)*

**CONNECTION DIAGRAM**




**DIMENSIONS**




### GZM4 (for R4)

Screw terminals
Max. tightening moment
for the terminal: 0.7 Nm
35 mm rail mount
acc. to PN-EN 60715
or on panel mounting
75 x 27 x 61(82) mm*
Four poles
6 A, 300 V AC

E22891

GZT3

ZGGZ4 *(see page 111)*



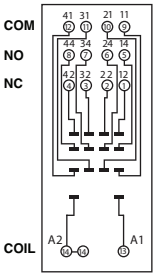
GZT4-0040

G4 1052**

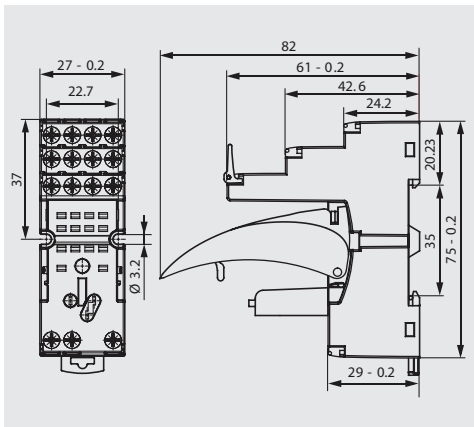
GZT4-0035

Module type M... *(see page 113)*

**CONNECTION DIAGRAM**




**DIMENSIONS**




* In parenthesis is the height of the socket with plastic retainer clip. ** For lower profile application.

All accessories are sold separately.

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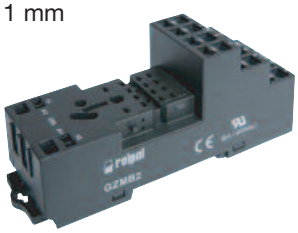
## GZMB2 (for R2)

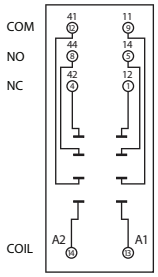
Spring terminals
Max. cross section of the cables:
1 x 0,2...1,5 mm2
(1 x 24...16 AWG)
Stripping length deinsulation: 9...11 mm
35 mm rail mount
acc. to PN-EN 60715
95 x 31 x 42.5(80) mm*
Two poles
10 A, 300 V AC

E22891

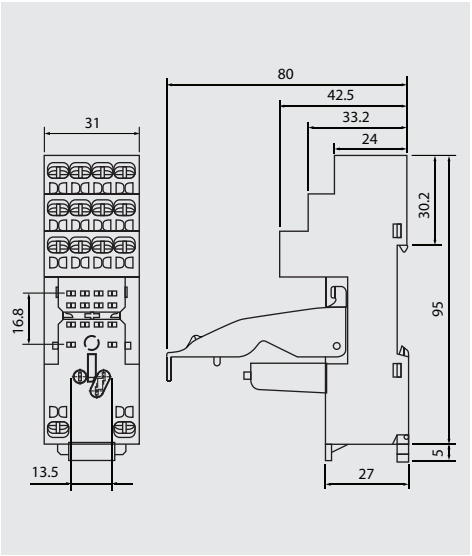


GZMB2

**CONNECTION DIAGRAM**




**DIMENSIONS**



GZMB4-0040

G4 1052**

TR

Module type M... *(see page 113)*

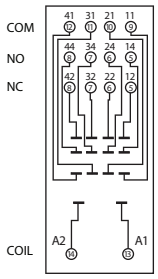
## GZMB4 (for R4)

Spring terminals
Max. cross section of the cables:
1 x 0,2...1,5 mm2
(1 x 24...16 AWG)
Stripping length deinsulation:
9...11 mm
35 mm rail mount
acc. to PN-EN 60715
95 x 31 x 42.5(80) mm*
Four poles
10 A, 300 V AC

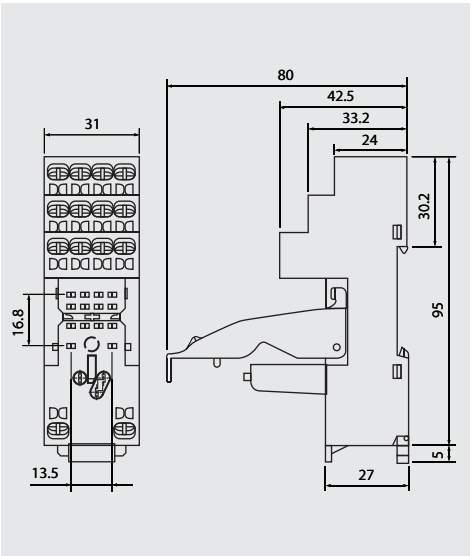
E22891

GZMB4

**CONNECTION DIAGRAM**




**DIMENSIONS**



GZMB4-0040

G4 1052**

TR

Module type M... *(see page 113)*

* In parenthesis is the height of the socket with plastic retainer clip. ** For lower profile application.

All accessories are sold separately.




DATA SUBJECT TO CHANGE WITHOUT NOTICE