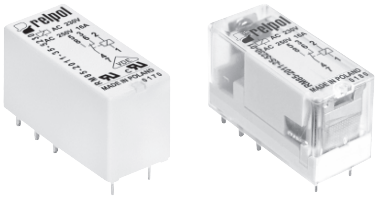
RM85 RM85-...-01 ❶



NEW product

- Cadmium - free contacts • Height 15,7 mm
- 5000 V / 10 mm reinforced insulation
- For PCB and plug-in sockets
- Accessories: sockets and modules • AC and DC coils
- Available special versions: with transparent cover ❶; with the increased dielectric strength of the contact clearance ❷
- Compliance with standard PN-EN 60335-1
- Recognitions, certifications, directives: RoHS,

## Contact data

| | | |
|---|---|---|
| Number and type of contacts | | 1 C/O, 1 NO ❷ |
| Contact material | | **AgNi**, AgNi/Au 5 µm, $AgSnO_2$ |
| Rated / max. switching voltage | AC | 250 V / 440 V |
| Min. switching voltage | | 5 V AgNi, 5 V AgNi/Au 5 µm, 10 V $AgSnO_2$ |
| Rated load (capacity) | AC1 | 16 A / 250 V AC |
| | AC15 | 3 A / 120 V 1,5 A / 240 V (B300) |
| | AC3 | 750 W (single-phase motor) |
| | DC1 | 16 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, 2 mA AgNi/Au 5 µm, 10 mA $AgSnO_2$ |
| Max. inrush current | | 30 A $AgSnO_2$ |
| Rated current | | 16 A |
| Max. breaking capacity | AC1 | 4 000 VA |
| Min. breaking capacity | | 0,3 W AgNi, 0,05 W AgNi/Au 5 µm, 1 W $AgSnO_2$ |
| Contact resistance | | ≤ 100 mΩ |
| Max. operating frequency | | |
| • at rated load | AC1 | 600 cycles/hour |
| • no load | | 72 000 cycles/hour |

## Coil data

| | | |
|---|---|---|
| Rated voltage | 50/60 Hz AC | 12 ... 240 V |
| | DC | 3 ... 110 V |
| Must release voltage | | AC: ≥ 0,15 $U_n$ DC: ≥ 0,1 $U_n$ |
| Operating range of supply voltage | | see Tables 1, 2 and Fig. 4, 5 |
| Rated power consumption | AC | 0,75 VA |
| | DC | 0,4 ... 0,48 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 | 1 000 V AC type of clearance: micro-disconnection |
| | | 2 000 V AC contact 1 NO, type of clearance: full-disconnection ❷ |
| Contact - coil distance | • clearance | ≥ 10 mm |
| | • creepage | ≥ 10 mm |

## General data

| | | |
|---|---|---|
| Operating / release time (typical values) | | 7 ms / 3 ms |
| Electrical life (number of cycles) | | |
| • resistive AC1 | | > 0,7 x $10^5$ 16 A, 250 V AC |
| | | > $10^4$ 20 A, 250 V AC, 85 °C (RM85-3021-25-1...) |
| • cos$\phi$ | | see Fig. 2 |
| • DC L/R=40 ms | | > $10^5$ 0,15 A, 220 V DC |
| Mechanical life (cycles) | | > 3 x $10^7$ |
| Dimensions (L x W x H) | | 29 x 12,7 x 15,7 mm |
| Weight | | 14 g |
| Ambient temperature | • storage | -40...+85 °C |
| | • operating | AC: -40...+70 °C DC: -40...+85 °C |
| Cover protection category | | IP 40 or **IP 67** PN-EN 60529 |
| Environmental protection | | RTII or **RTIII** PN-EN 116000-3 |
| Shock resistance | | 30 g |
| Vibration resistance | | 10 g 10...150 Hz |
| Solder bath temperature | | max. 270 °C |
| Soldering time | | max. 5 s |

The data in bold type pertain to the standard versions of the relays. ❶ Available special version: relays in transparent cover - see "Ordering codes"
❷ Available special version with contact 1 NO: relays with increased contact gap, dielectric strength 2000 V AC - see "Ordering codes"

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

| Coil code | Rated voltage V DC | Coil resistance at 20 °C Ω | Acceptable resistance | Coil operating range V DC | |
|---|---|---|---|---|---|
| | | | | min. (at 20 °C) | max. (at 20 °C) |
| 1003 | 3 | 22 | ± 10% | 2,1 | 7,6 |
| 1005 | 5 | 60 | ± 10% | 3,5 | 12,7 |
| 1006 | 6 | 90 | ± 10% | 4,2 | 15,3 |
| 1009 | 9 | 200 | ± 10% | 6,3 | 22,9 |
| **1012** | **12** | **360** | **± 10%** | **8,4** | **30,6** |
| 1018 | 18 | 710 | ± 10% | 12,6 | 45,9 |
| **1024** | **24** | **1 440** | **± 10%** | **16,8** | **61,2** |
| 1036 | 36 | 3 140 | ± 10% | 25,2 | 91,8 |
| 1048 | 48 | 5 700 | ± 10% | 33,6 | 122,4 |
| 1060 | 60 | 7 500 | ± 10% | 42,0 | 153,0 |
| 1110 | 110 | 25 200 | ± 10% | 77,0 | 280,0 |

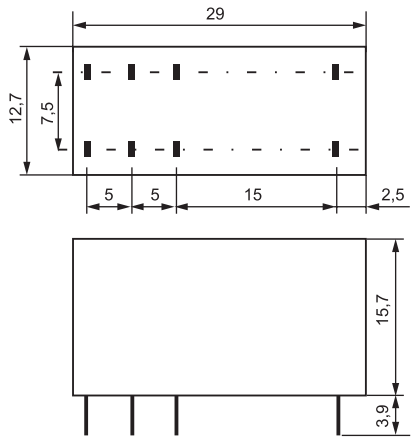
The data in bold type pertain to the standard versions of the relays.

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

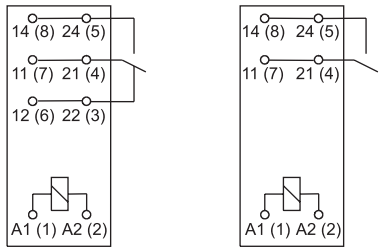
| Coil code | Rated voltage V AC | Coil resistance at 20 °C Ω | Acceptable resistance | Coil operating range V AC 50 Hz | |
|---|---|---|---|---|---|
| | | | | min. (at 20 °C) | max. (at 20 °C) |
| 5012 | 12 | 100 | ± 10% | 9,6 | 13,2 |
| **5024** | **24** | **400** | **± 10%** | **19,2** | **28,8** |
| 5048 | 48 | 1 550 | ± 10% | 38,4 | 57,6 |
| 5060 | 60 | 2 600 | ± 10% | 48,0 | 72,0 |
| 5110 | 110 | 8 900 | ± 10% | 88,0 | 132,0 |
| 5115 | 115 | 9 600 | ± 10% | 92,0 | 138,0 |
| 5120 | 120 | 10 200 | ± 10% | 96,0 | 144,0 |
| 5220 | 220 | 35 500 | ± 10% | 176,0 | 264,0 |
| **5230** | **230** | **38 500** | **± 10%** | **184,0** | **276,0** |
| 5240 | 240 | 42 500 | ± 15% | 192,0 | 288,0 |

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

## Dimensions




## Connection diagrams (pin side view)

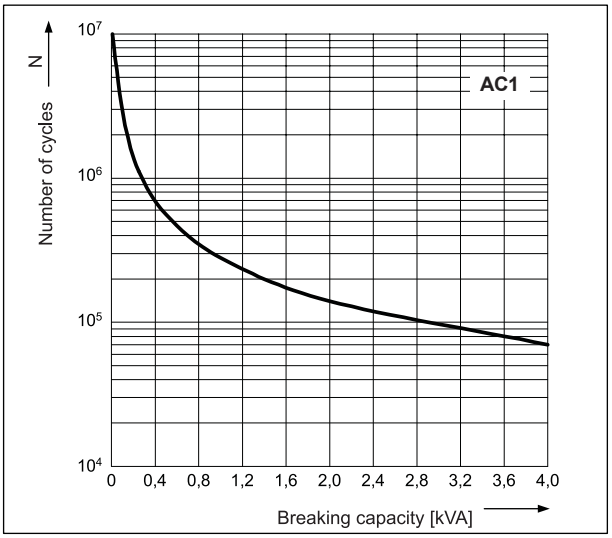



**1 C/O** **1 NO**

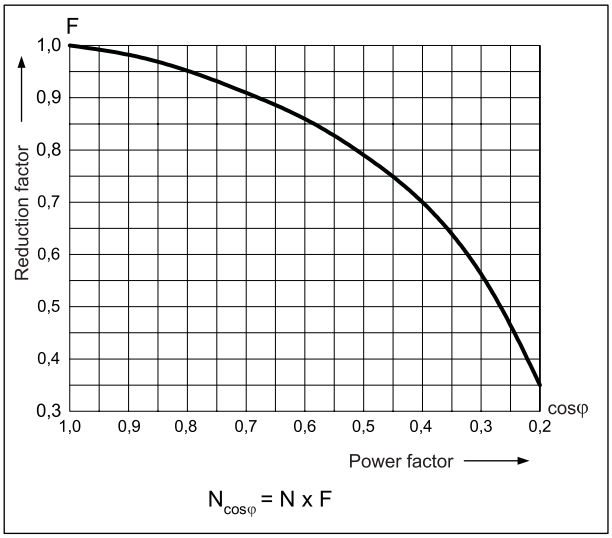
| Terminal (pin) | A1(1); A2(2) | 22(3); 21(4); 24(5); 12(6); 11(7); 14(8) |
|---|---|---|
| [mm] | Ø 0,6 | 0,5 x 0,9 |
| Drilling hole:<br>• for relays<br>• for sockets | <br>Ø 1,3 + 0,1 mm<br>Ø 1,5 + 0,1 mm | |

**RM85** terminals are doubled for each contact.
Both terminals are to be used while connecting to load.

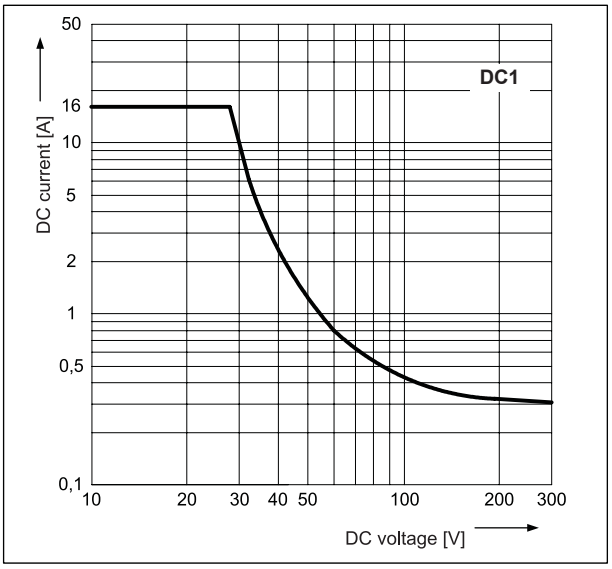
**Electrical life at AC resistive load. Switching frequency: 600 cycles/hour** Fig. 1



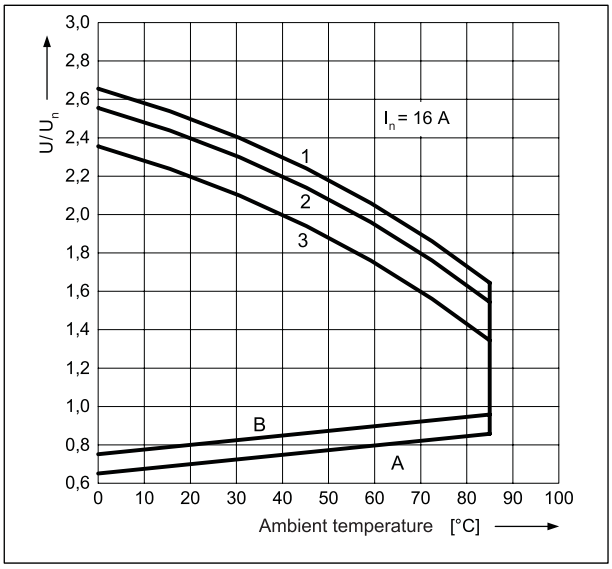

**Electrical life reduction factor at AC inductive load** Fig. 2



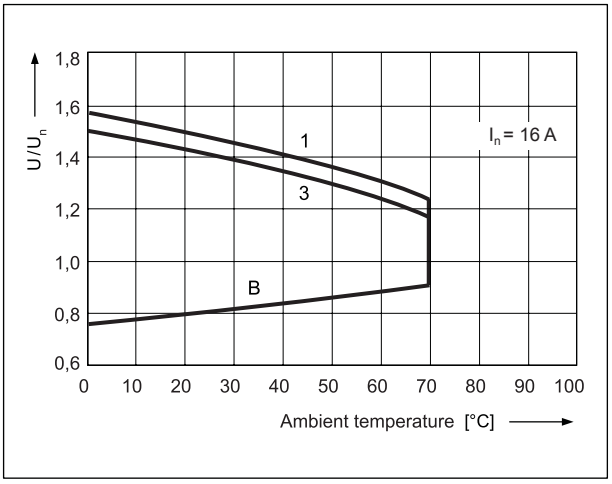

**Max. DC resistive load breaking capacity** Fig. 3




**Coil operating range - DC** Fig. 4



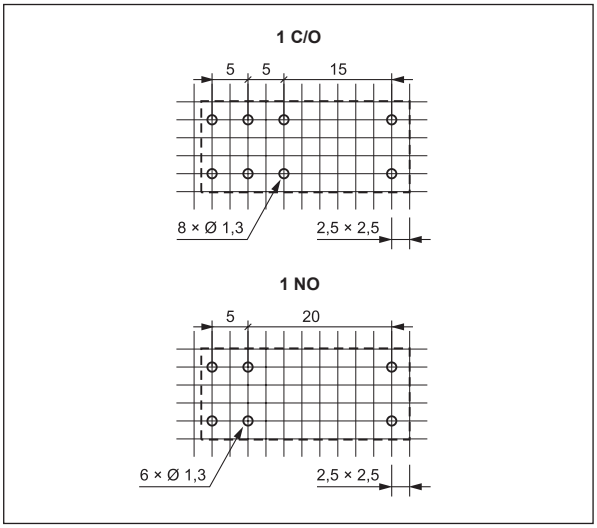

**Coil operating range - AC 50 Hz** Fig. 5




**Description of Fig. 4 and 5**

**A** - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
**B** - relations between make voltage and ambient temperature after initial coil heating up with 1,1 $U_n$, at continues load of $I_n$ on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
**1, 2, 3** - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
**1** - no load
**2** - 50% of rated load
**3** - rated load

## Pinout (solder side view)

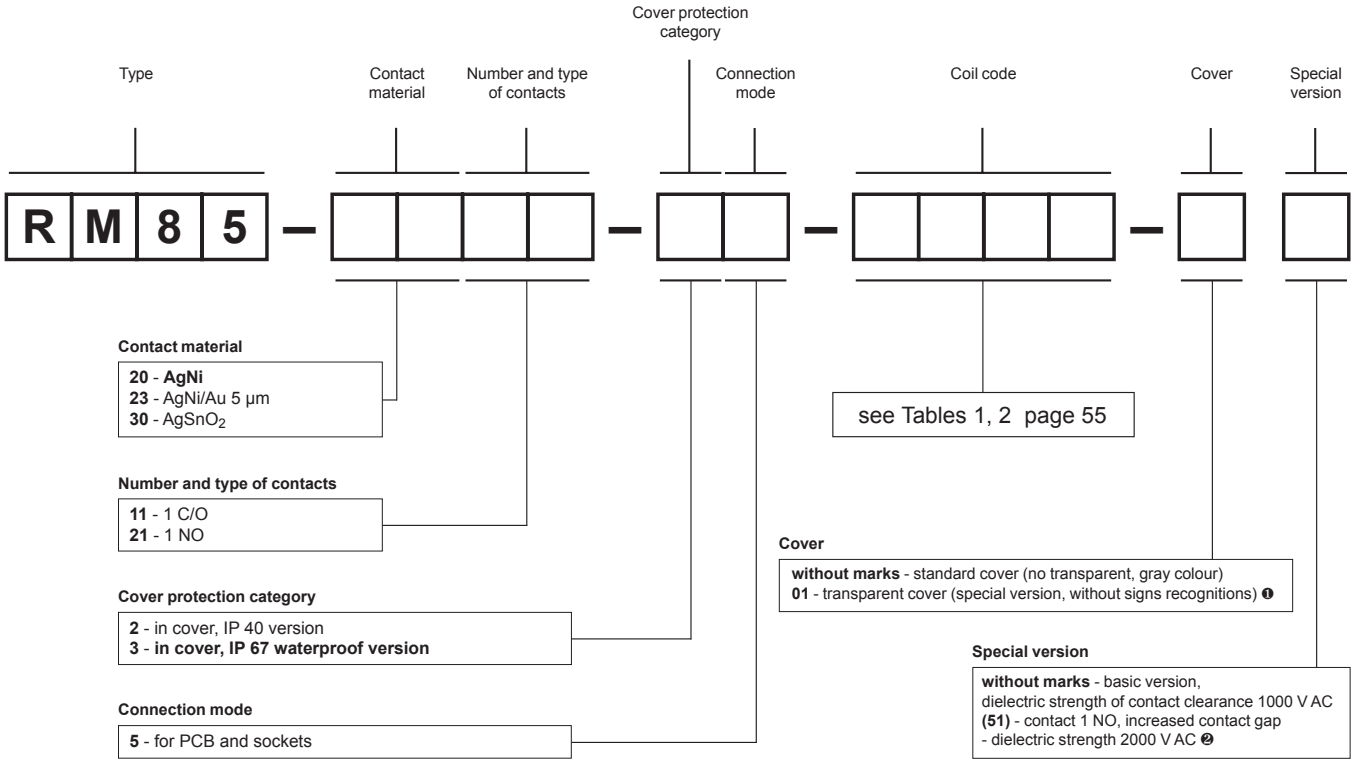



## Mounting

Relays **RM85** are designed for: • direct PCB mounting • screw terminals plug-in sockets **GZT80** ❸ and **GZM80** ❸ with clip **GZT80-0040** or **GZM80-0041**; plug-in sockets **GZS80** ❸ with clip **GZS-0040** or **GZM80-0041**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with one M3 screw. Signalling / protecting modules **type M...** are available with sockets (see page 250) • plug-in sockets for PCB mounting **EC50** with clip **MP16-2**, MH16-2; plug-in sockets **PW80** with clip **MH16-2**; plug-in sockets **GD50** with clip **MP16-2**, GD-0016, MH16-2.

❸ Plug-in sockets **GZT80**, **GZM80** and **GZS80** may be linked with interconnection strip type **ZGGZ80** (see page 261).

## Ordering codes




Examples of ordering code:

| | |
|---|---|
| **RM85-3011-25-5024** | relay **RM85**, contact material $AgSnO_2$, with one changeover contact, in standard cover (no transparent, gray colour) IP 40, for PCB and sockets, voltage version 24 V AC 50/60 Hz |
| **RM85-2011-25-1012-01** | relay **RM85**, contact material AgNi, with one changeover contact, in transparent cover (special version, without signs recognitions) ❶ IP 40, for PCB and sockets, voltage version 12 V DC |
| **RM85-2321-35-1024 (51)** | relay **RM85**, contact material AgNi/Au 5 µm, with one normally open contact, special version ❷ with increased contact gap, in standard cover (no transparent, gray colour) IP 67, for PCB and sockets, voltage version 24 V DC |

# RM85 for high voltage switching
## miniature relays

- **for high voltage switching**
- Cadmium - free contacts
- Height 15,7 mm
- 5000 V / 10 mm reinforced insulation
- For PCB
- DC coils
- Compliance with standard PN-EN 60335-1
- Recognitions, certifications, directives: RoHS,

| | | |
|---|---|---|
| **Contact data** | | |
| Number and type of contacts | | 1 NO |
| Contact material | | **$AgSnO_2$** |
| Rated / max. switching voltage | AC | 250 V / 480 V |
| Min. switching voltage | | 10 V |
| Rated load (capacity) | AC1 | 5 A / 480 V AC |
| | AC15 | 3 A / 120 V 1,5 A / 240 V (B300) |
| | AC3 | 750 W (single-phase motor) |
| | DC1 | 16 A / 24 V DC |
| | DC13 | 0,22 A / 120 V 0,1 A / 250 V (R300) |
| Min. switching current | | 10 mA |
| Max. inrush current | | 30 A |
| Rated current | | 16 A / 250 V AC |
| Max. breaking capacity | AC1 | 2 400 VA |
| Min. breaking capacity | | 1 W |
| Contact resistance | | ≤ 100 mΩ 100 mA, 24 V |
| Max. operating frequency | | |
| • at rated load | AC1 | 360 cycles/hour |
| • no load | | 3 600 cycles/hour |
| **Coil data** | | |
| Rated voltage | D C | 3 ... 110 V |
| Must release voltage | | ≥ 0,1 $U_n$ |
| Operating range of supply voltage | | see Table 1 |
| Rated power consumption | D C | 0,4 ... 0,48 W |
| **Insulation** according to PN-EN 60664-1 | | |
| Insulation rated voltage | | 480 V AC |
| Rated surge voltage | | 4 000 V 1,2 / 50 µs |
| Overvoltage category | | III |
| Insulation pollution degree | | 2 |
| Dielectric strength | | |
| • between coil and contacts | | 5 000 V AC type of insulation: reinforced |
| • contact clearance | | 1 500 V AC type of clearance: micro-disconnection |
| Contact - coil distance | | |
| • clearance | | ≥ 10 mm |
| • creepage | | ≥ 10 mm |
| **General data** | | |
| Operating / release time (typical values) | | 7 ms / 3 ms |
| Electrical life (number of cycles) | | |
| • at resistive load | AC1 | > 4 x $10^4$ 5 A, 480 V AC |
| Mechanical life | 3 600 cycles/hour | > 3 x $10^7$ |
| Load according to UL 508 | | Heavy Pilot Duty 480 V AC, 15 A make / 1,5 A break |
| Dimensions (L x W x H) | | 29 x 12,7 x 15,7 mm |
| Weight | | 14 g |
| Ambient temperature | • storage | -40...+85 °C |
| | • operating | -40...+85 °C |
| Cover protection category | | IP 40 or **IP 67** PN-EN 60529 |
| Environmental protection | | RTII PN-EN 116000-3 |
| Shock resistance | | 30 g |
| Vibration resistance | | 10 g 10...150 Hz |
| Solder bath temperature | | max. 270 °C |
| Soldering time | | max. 5 s |

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

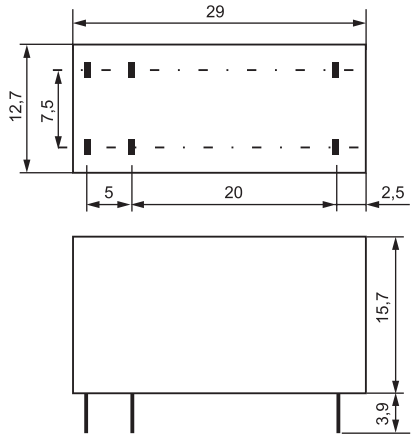
## **Coil data** - DC voltage version

Table 1

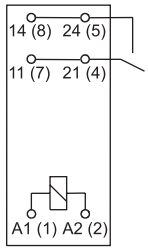
| Coil code | Rated voltage V DC | Coil resistance at 20 °C Ω | Acceptable resistance | Coil operating range V DC | |
|---|---|---|---|---|---|
| | | | | min. (at 20 °C) | max. (at 20 °C) |
| 1003 | 3 | 22 | ± 10% | 2,1 | 7,6 |
| 1005 | 5 | 60 | ± 10% | 3,5 | 12,7 |
| 1006 | 6 | 90 | ± 10% | 4,2 | 15,3 |
| 1009 | 9 | 200 | ± 10% | 6,3 | 22,9 |
| **1012** | **12** | **360** | **± 10%** | **8,4** | 30,6 |
| 1018 | 18 | 710 | ± 10% | 12,6 | 45,9 |
| **1024** | **24** | **1 440** | **± 10%** | **16,8** | 61,2 |
| 1036 | 36 | 3 140 | ± 10% | 25,2 | 91,8 |
| 1048 | 48 | 5 700 | ± 10% | 33,6 | 122,4 |
| 1060 | 60 | 7 500 | ± 10% | 42,0 | 153,0 |
| 1110 | 110 | 25 200 | ± 10% | 77,0 | 280,0 |

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

## Dimensions




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

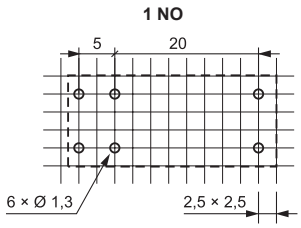



**1 NO**

| Terminal (pin) | A1(1); A2(2) | 21(4); 24(5); 11(7); 14(8) |
|---|---|---|
| [mm] | Ø 0,6 | 0,5 x 0,9 |
| Drilling hole: • for relays | Ø 1,3 + 0,1 mm | |

**RM85**
terminals are doubled for each contact.
Both terminals are to be used while connecting to load.

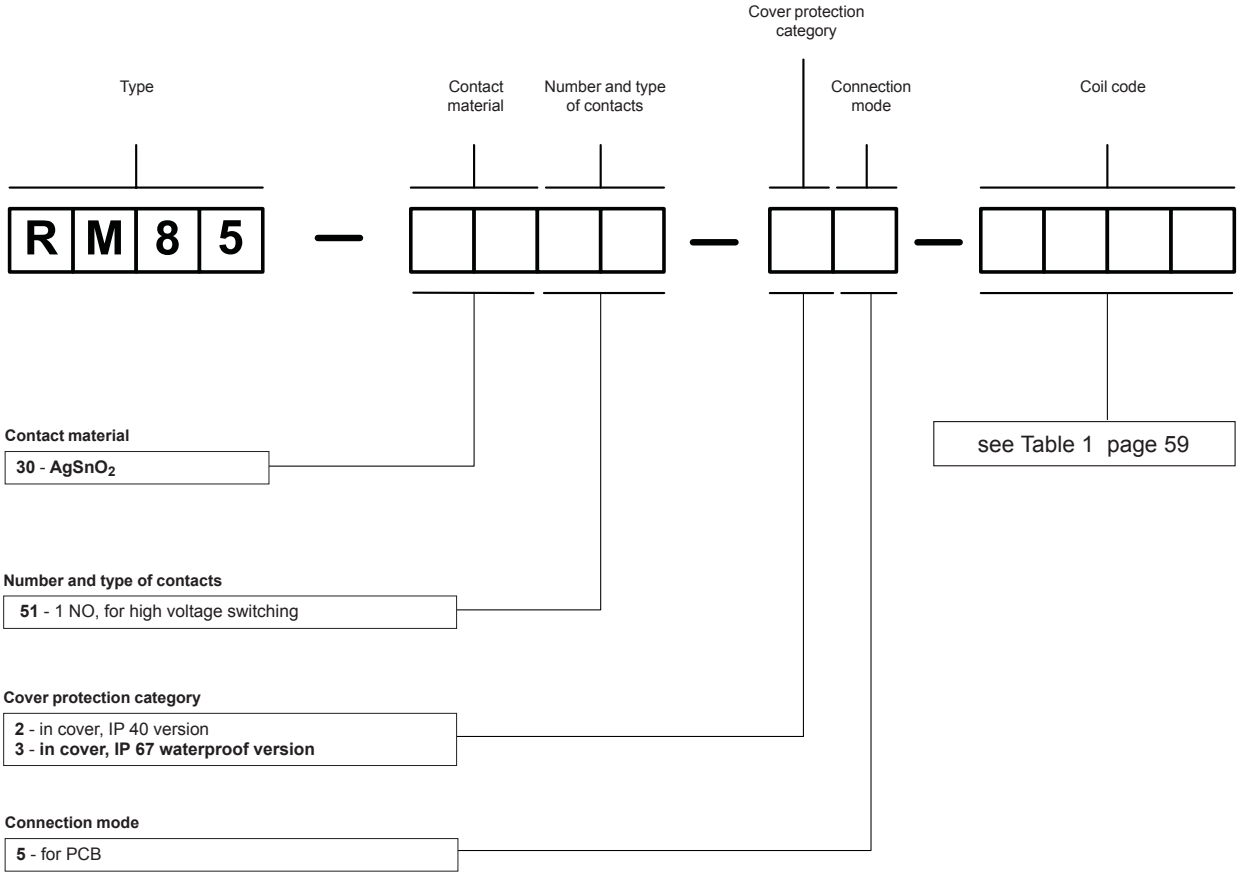
## **Pinout** (solder side view)




## Mounting

Relays **RM85 for high voltage switching for direct** PCB mounting. for high voltage switching

## Ordering codes




Example of ordering code:

**RM85-3051-35-1012** relay **RM85**, contact material $AgSnO_2$, with one normally open contact, for high voltage switching, in cover IP 67, for PCB, voltage version 12 V DC

- Cadmium - free contacts • Height 15,7 mm • **Resistance to inrush current 80 A (20 ms)** • 5000 V / 10 mm reinforced insulation
- For PCB and plug-in sockets
- Accessories: sockets and modules • DC coils
- Applications: for motor operation control, lighting, electromagnetic valves, and many other applications
- Compliance with standard PN-EN 60335-1
- Recognitions, certifications, directives: RoHS,

## Contact data

| | | |
|---|---|---|
| Number and type of contacts | | 1 NO |
| Contact material | | **$AgSnO_2$** |
| Rated / max. switching voltage | AC | 250 V / 440 V |
| Min. switching voltage | | 10 V |
| Rated load (capacity) | AC1 | 16 A / 250 V AC |
| | AC15 | 3 A / 120 V 1,5 A / 240 V (B300) |
| | AC3 | 750 W (single-phase motor) |
| | DC1 | 16 A / 24 V DC (see Fig. 2) |
| | DC13 | 0,22 A / 120 V 0,1 A / 250 V (R300) |
| Min. switching current | | 10 mA |
| Max. inrush current | | 80 A 20 ms |
| Rated current | | 16 A |
| Max. breaking capacity | AC1 | 4 000 VA |
| Min. breaking capacity | | 1 W |
| Contact resistance | | ≤ 100 mΩ |
| Max. operating frequency | | |
| • at rated load | AC1 | 600 cycles/hour |
| • no load | | 72 000 cycles/hour |

## Coil data

| | | |
|---|---|---|
| Rated voltage | DC | 3 ... 110 V |
| Must release voltage | | DC: ≥ 0,1 $U_n$ |
| Operating range of supply voltage | | see Table 1 and Fig. 3 |
| Rated power consumption | DC | 0,4 ... 0,48 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 | 1 000 V AC type of clearance: micro-disconnection |
| Contact - coil distance | |
| • clearance | ≥ 10 mm |
| • creepage | ≥ 10 mm |

## General data

| | | |
|---|---|---|
| Operating / release time (typical values) | | 8 ms / 3 ms |
| Electrical life (number of cycles) | | |
| • resistive AC1 | 600 cycles/hour | > $10^5$ 16 A, 250 V AC |
| • cos$\phi$ | | see Fig. 1 |
| • resistive DC1 | 600 cycles/hour | > $10^5$ 16 A, 24 V DC |
| • inductive AC3, I = 3,5 A | | > 2,5 x $10^5$ |
| • at incandescent lamp load, 1000 W | | > 0,9 x $10^5$ |
| Mechanical life (cycles) | | > 3 x $10^7$ |
| Dimensions (L x W x H) | | 29 x 12,7 x 15,7 mm |
| Weight | | 14 g |
| Ambient temperature | • storage | -40...+85 °C |
| | • operating | -40...+85 °C |
| Cover protection category | | IP 40 PN-EN 60529 |
| Environmental protection | | RTII PN-EN 116000-3 |
| Shock resistance | | 30 g |
| Vibration resistance | | 10 g 10...150 Hz |
| Solder bath temperature | | max. 270 °C |
| Soldering time | | max. 5 s |

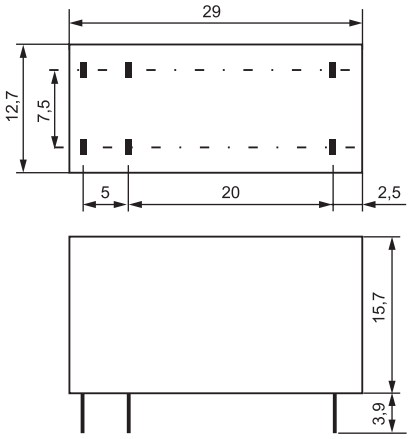
The data in bold type pertain to the standard versions of the relays.

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

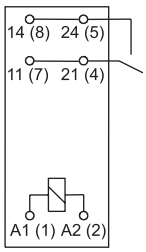
| Coil code | Rated voltage V DC | Coil resistance at 20 °C Ω | Acceptable resistance | Coil operating range V DC | |
|---|---|---|---|---|---|
| | | | | min. (at 20 °C) | max. (at 20 °C) |
| 1003 | 3 | 22 | ± 10% | 2,1 | 7,6 |
| 1005 | 5 | 60 | ± 10% | 3,5 | 12,7 |
| 1006 | 6 | 90 | ± 10% | 4,2 | 15,3 |
| 1009 | 9 | 200 | ± 10% | 6,3 | 22,9 |
| **1012** | **12** | **360** | **± 10%** | **8,4** | **30,6** |
| 1018 | 18 | 710 | ± 10% | 12,6 | 45,9 |
| **1024** | **24** | **1 440** | **± 10%** | **16,8** | **61,2** |
| 1036 | 36 | 3 140 | ± 10% | 25,2 | 91,8 |
| 1048 | 48 | 5 700 | ± 10% | 33,6 | 122,4 |
| 1060 | 60 | 7 500 | ± 10% | 42,0 | 153,0 |
| 1110 | 110 | 25 200 | ± 10% | 77,0 | 280,0 |

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

## Dimensions




## Connection diagram (pin side view)

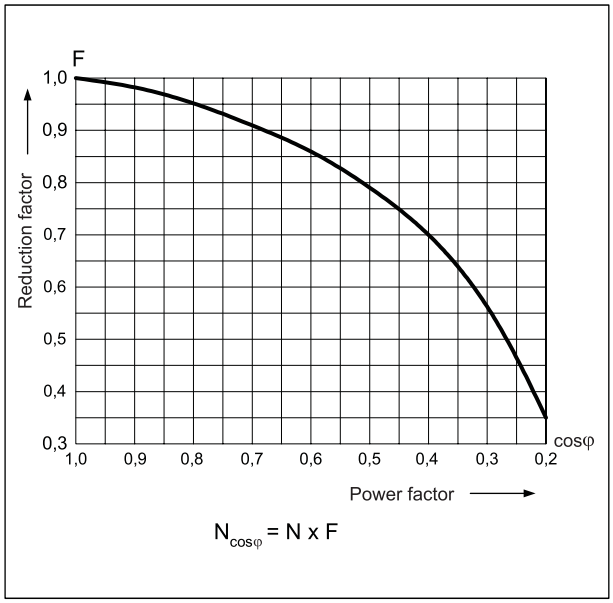



**1 NO**

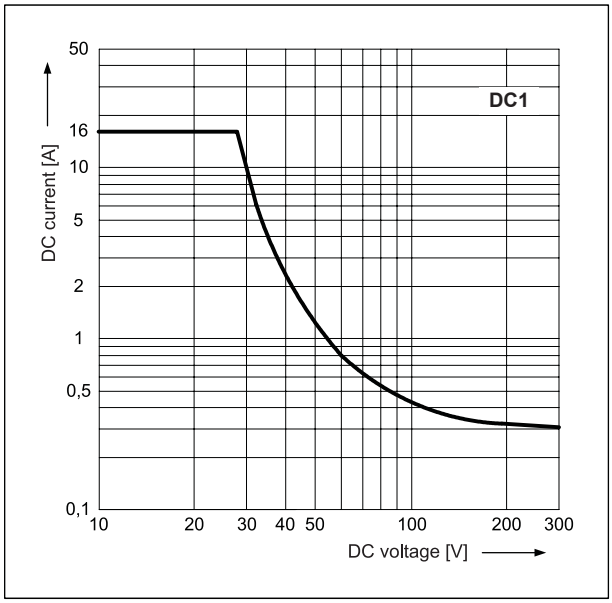
| Terminal (pin) | A1(1); A2(2) | 21(4); 24(5); 11(7); 14(8) |
|---|---|---|
| [mm] | Ø 0,6 | 0,5 x 0,9 |
| Drilling hole:<br>• for relays<br>• for sockets | <br>Ø 1,3 + 0,1 mm<br>Ø 1,5 + 0,1 mm | |

**RM85 inrush** terminals are doubled for each contact.
Both terminals are to be used while connecting to load.

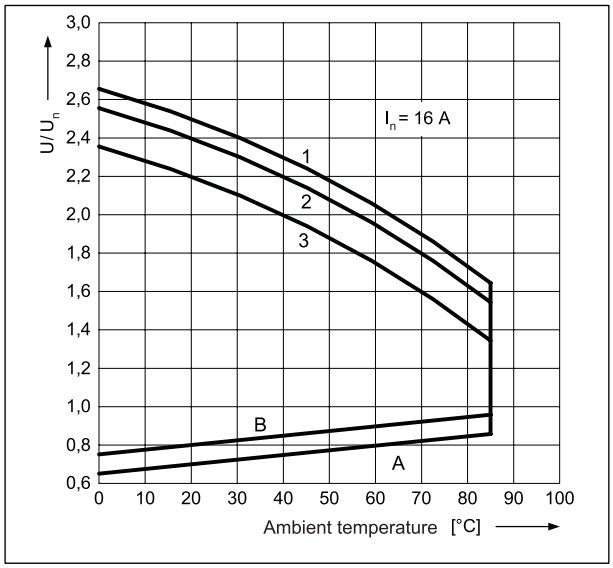
**Electrical life reduction factor at AC inductive load** Fig. 1




**Max. DC resistive load breaking capacity** Fig. 2



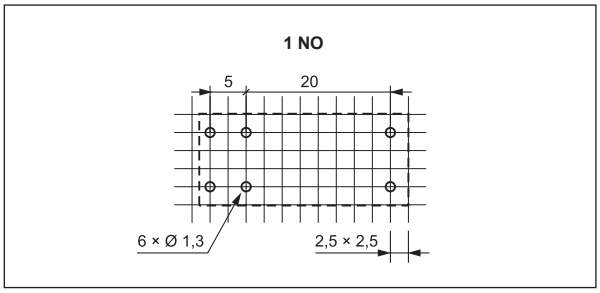

**Coil operating range - DC** Fig. 3




**Description of Fig. 3**

**A** - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
**B** - relations between make voltage and ambient temperature after initial coil heating up with 1,1 $U_n$, at continues load of $I_n$ on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
**1, 2, 3** - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
**1** - no load
**2** - 50% of rated load
**3** - rated load

## Pinout (solder side view)

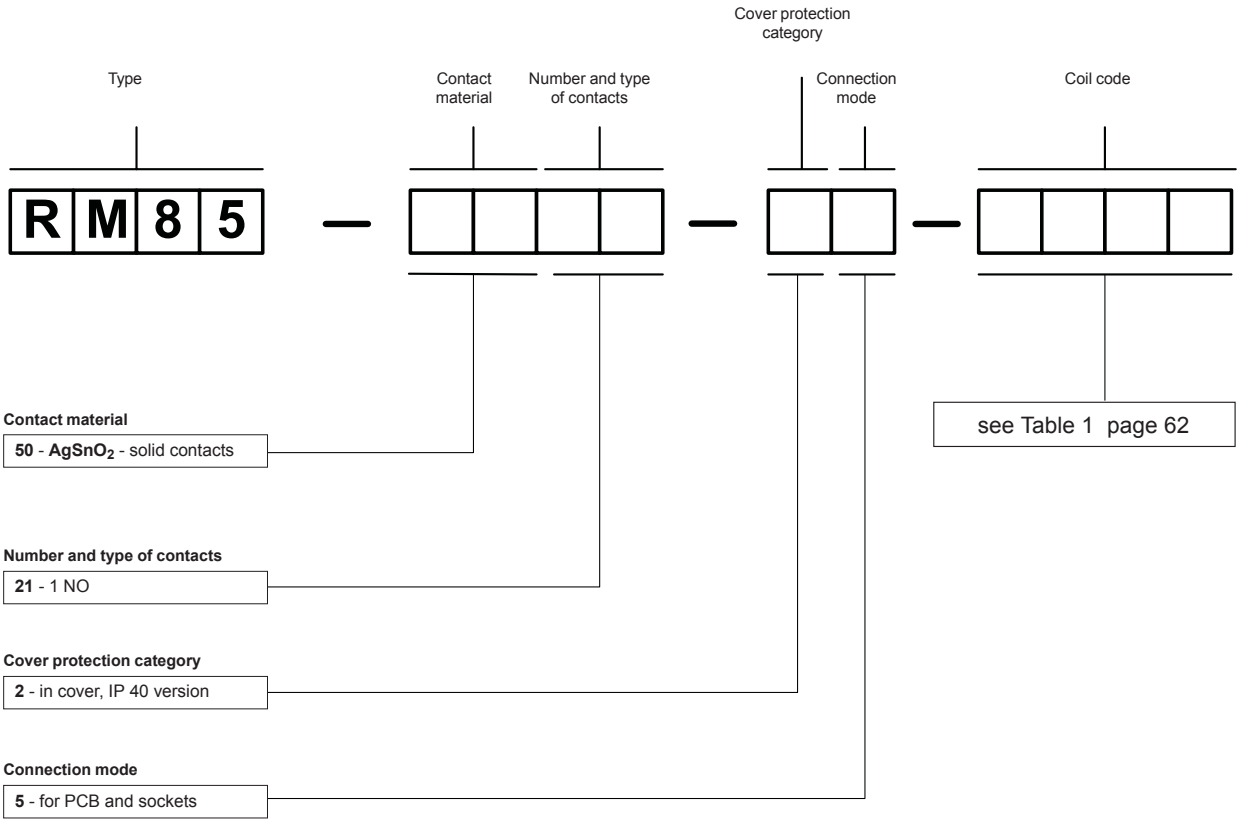



## Mounting

Relays **RM85 inrush** are designed for: • direct PCB mounting • screw terminals plug-in sockets **GZT80** ❶ and **GZM80** ❶ with clip **GZT80-0040** or **GZM80-0041**; plug-in sockets **GZS80** ❶ with clip **GZS-0040** or **GZM80-0041**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with one M3 screw. Signalling / protecting modules **type M...** are available with sockets (see page 250) • plug-in sockets for PCB mounting **EC50** with clip **MP16-2**, MH16-2; plug-in sockets **PW80** with clip **MH16-2**; plug-in sockets **GD50** with clip **MP16-2**, GD-0016, MH16-2.

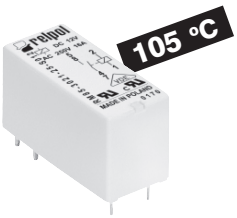
❶ Plug-in sockets **GZT80**, **GZM80** and **GZS80** may be linked with interconnection strip type **ZGGZ80** (see page 261).

## Ordering codes




Example of ordering code:

**RM85-5021-25-1012** relay **RM85 inrush**, contact material $AgSnO_2$ - solid contacts, with one normally open contact, in cover IP 40, for PCB and sockets, voltage version 12 V DC




- For PCB and plug-in sockets
- Accessories: sockets and modules
- DC coils - sensitive
- Ambient temperature up to 105 °C
- Applications: in household equipment, in temperature controlers
- Compliance with standard PN-EN 60335-1
- Recognitions, certifications, directives: RoHS,

## Contact data

| | | |
|---|---|---|
| Number and type of contacts | | 1 NO |
| Contact material | | AgNi, AgNi/Au 5 µm, **$AgSnO_2$** |
| Rated / max. switching voltage | AC | 250 V / 440 V |
| Min. switching voltage | | 5 V AgNi, 5 V AgNi/Au 5 µm, 10 V $AgSnO_2$ |
| Rated load (capacity) | AC1 | 16 A / 250 V AC |
| | AC15 | 3 A / 120 V 1,5 A / 240 V (B300) |
| | AC3 | 750 W (single-phase motor) |
| | DC1 | 16 A / 24 V DC (see Fig. 2) |
| | DC13 | 0,22 A / 120 V 0,1 A / 250 V (R300) |
| Min. switching current | | 5 mA AgNi, 2 mA AgNi/Au 5 µm, 10 mA $AgSnO_2$ |
| Max. inrush current | | 30 A $AgSnO_2$ |
| Rated current | | 16 A |
| Max. breaking capacity | AC1 | 4 000 VA |
| Min. breaking capacity | | 0,3 W AgNi, 0,05 W AgNi/Au 5 µm, 1 W $AgSnO_2$ |
| Contact resistance | | ≤ 100 mΩ |
| Max. operating frequency | | |
| • at rated load | AC1 | 600 cycles/hour |
| • no load | | 72 000 cycles/hour |

## Coil data

| | | |
|---|---|---|
| Rated voltage | DC | 5 ... 48 V |
| Must release voltage | | DC: ≥ 0,1 $U_n$ |
| Operating range of supply voltage | | see Table 1 and Fig. 3 |
| Rated power consumption | DC | 0,25 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 | | 1 000 V AC type of clearance: micro-disconnection |
| Contact - coil distance | | |
| • clearance | | ≥ 10 mm |
| • creepage | | ≥ 10 mm |

## General data

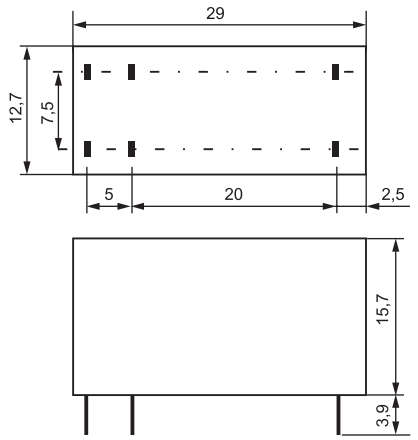
| | | |
|---|---|---|
| Operating / release time (typical values) | | 8 ms / 3 ms |
| Electrical life (number of cycles) | • resistive AC1 | > $10^5$ 16 A, 230 V AC, 70 °C |
| | | > 2 x $10^4$ 16 A, 230 V AC, 105 °C |
| | | > 1,7 x $10^5$ 10 A, 230 V AC, 105 °C |
| | | > 2,8 x $10^5$ 8 A, 230 V AC, 105 °C |
| | | > 3,2 x $10^5$ 6 A, 230 V AC, 105 °C |
| | • cos$\phi$ | see Fig. 1 |
| | • DC L/R=40 ms | > $10^5$ 0,15 A, 220 V DC |
| Mechanical life (cycles) | | > 3 x $10^7$ |
| Dimensions (L x W x H) | | 29 x 12,7 x 15,7 mm |
| Weight | | 14 g |
| Ambient temperature | • storage | -40...+105 °C |
| | • operating | -40...+105 °C |
| Cover protection category | | IP 40 PN-EN 60529 |
| Environmental protection | | RTII PN-EN 116000-3 |
| Shock resistance | | 30 g |
| Vibration resistance | | 10 g 10...150 Hz |
| Solder bath temperature | | max. 270 °C |
| Soldering time | | max. 5 s |

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

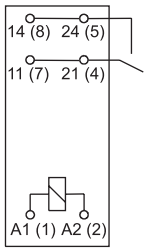
**Coil data** - DC voltage version, sensitive version — Table 1

| Coil code | Rated voltage V DC | Coil resistance at 20 °C Ω | Acceptable resistance | Coil operating range V DC | |
|---|---|---|---|---|---|
| | | | | min. (at 20 °C) | max. (at 20 °C) |
| S005 | 5 | 102 | ± 10% | 3,75 | 15,0 |
| S006 | 6 | 144 | ± 10% | 4,50 | 18,0 |
| S009 | 9 | 330 | ± 10% | 6,75 | 27,0 |
| S010 | 10 | 380 | ± 10% | 7,50 | 30,0 |
| S012 | 12 | 580 | ± 10% | 9,00 | 36,0 |
| S018 | 18 | 1 300 | ± 10% | 13,50 | 54,0 |
| S024 | 24 | 2 300 | ± 10% | 18,00 | 72,0 |
| S048 | 48 | 9 340 | ± 10% | 36,00 | 144,0 |

**Dimensions**




**Connection diagram** (pin side view)

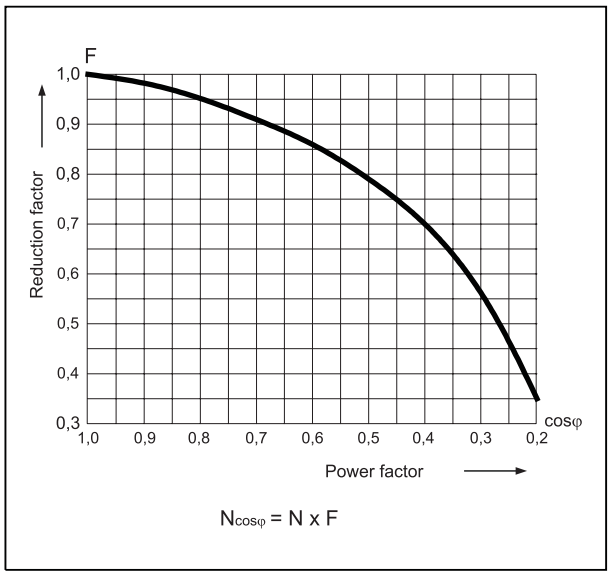



**1 NO**

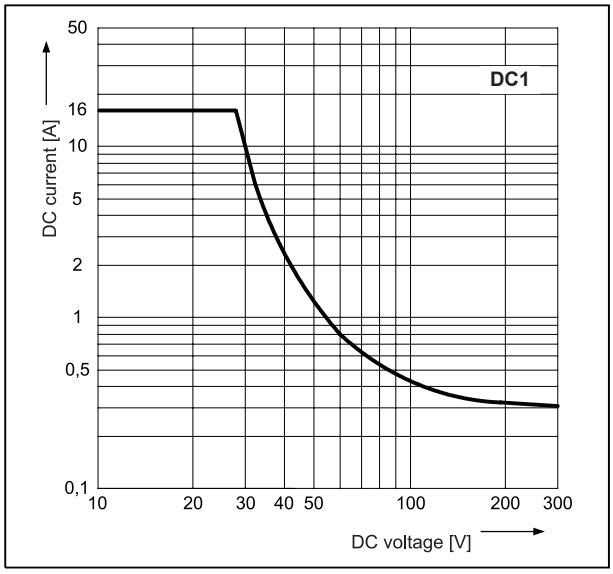
| Terminal (pin) | A1(1); A2(2) | 21(4); 24(5); 11(7); 14(8) |
|---|---|---|
| [mm] | Ø 0,6 | 0,5 x 0,9 |
| Drilling hole:<br>• for relays<br>• for sockets | <br>Ø 1,3 + 0,1 mm<br>Ø 1,5 + 0,1 mm | |

**RM85 105 °C sensitive** terminals are doubled for each contact. Both terminals are to be used while connecting to load.

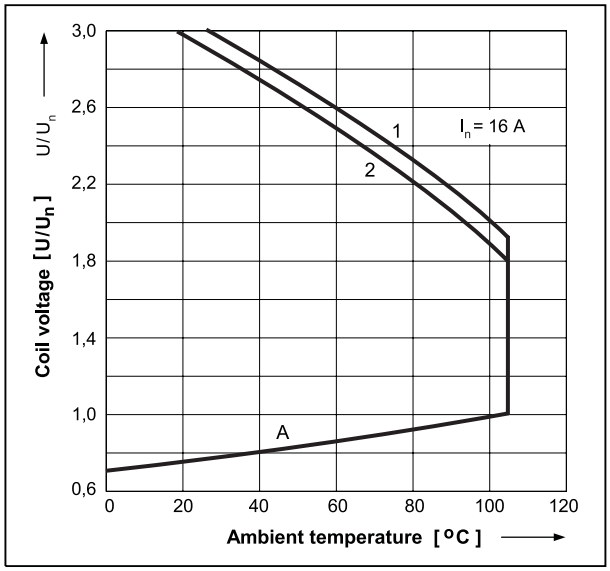
**Electrical life reduction factor at AC inductive load** Fig. 1




**Max. DC resistive load breaking capacity** Fig. 2



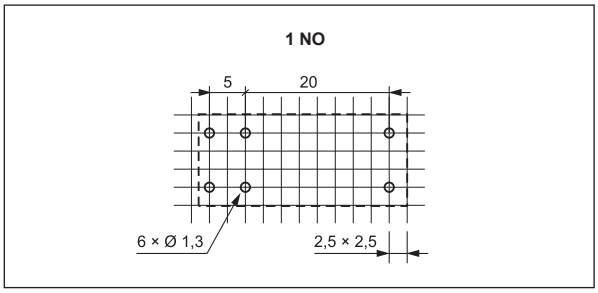

**Coil operating range - DC** Fig. 3




**Description of Fig. 3**

**A** - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
**1, 2** - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
**1** - no load
**2** - rated load

## Pinout (solder side view)

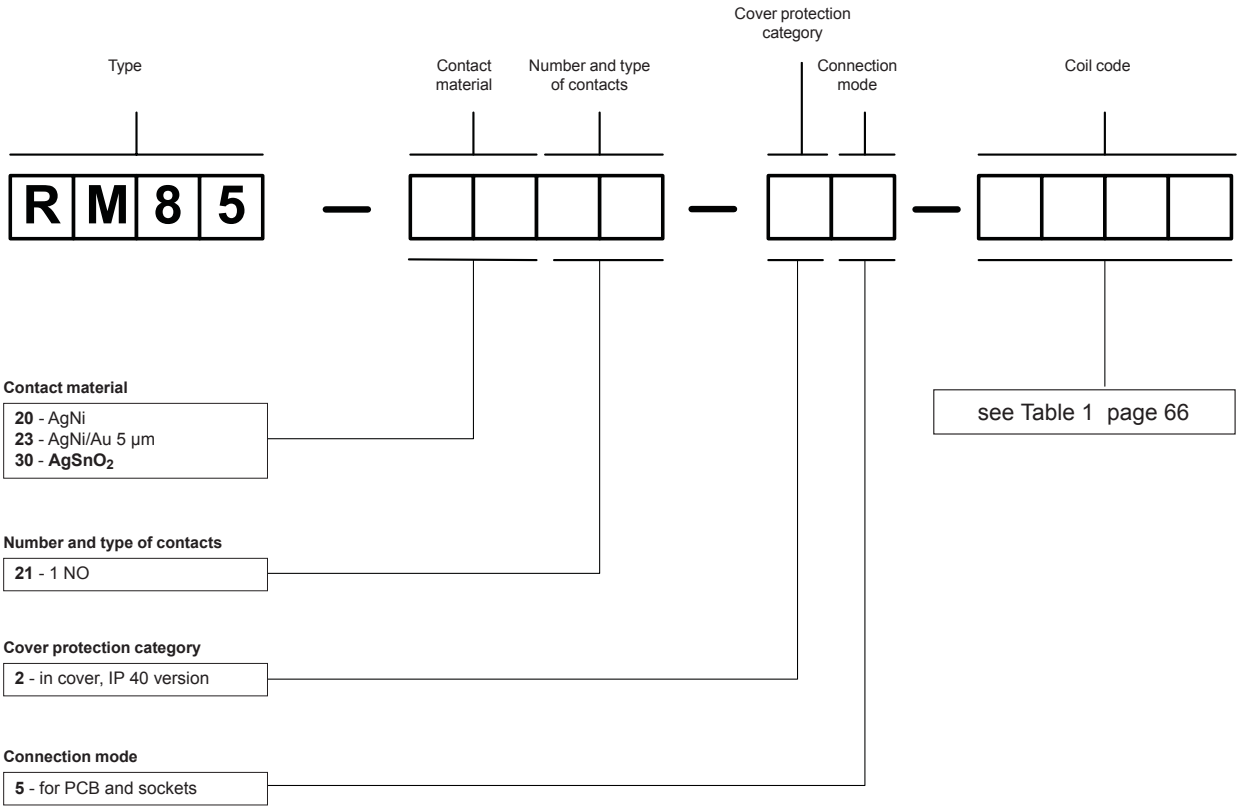



## Mounting

Relays **RM85 105 ºC sensitive** are designed for: • direct PCB mounting • screw terminals plug-in sockets **GZT80** ❶ and **GZM80** ❶ with clip **GZT80-0040** or **GZM80-0041**; plug-in sockets **GZS80** ❶ with clip **GZS-0040** or **GZM80-0041**, 35 mm rail mount acc. to PN-EN 60715 or on panel mounting with one M3 screw. Signalling / protecting modules **type M...** are available with sockets (see page 250) • plug-in sockets for PCB mounting **EC50** with clip **MP16-2**, MH16-2; plug-in sockets **PW80** with clip **MH16-2**; plug-in sockets **GD50** with clip **MP16-2**, GD-0016, MH16-2.

❶ Plug-in sockets **GZT80**, **GZM80** and **GZS80** may be linked with interconnection strip type **ZGGZ80** (see page 261).

## Ordering codes




Examples of ordering code:

**RM85-3021-25-S012** relay **RM85 105 ºC sensitive**, contact material $AgSnO_2$, with one normally open contact, in cover IP 40, for PCB and sockets, sensitive voltage version 12 V DC

**RM85-2321-25-S005** relay **RM85 105 ºC sensitive**, contact material AgNi/Au 5 µm, with one normally open contact, in cover IP 40, for PCB and sockets, sensitive voltage version 5 V DC

- Cadmium - free contacts
- Height 15,7 mm
- 5000 V / 10 mm reinforced insulation
- **For surface mounting SMT**
- AC and DC coils
- Compliance with standard PN-EN 60335-1
- Recognitions, certifications, directives: RoHS,

## Contact data

| | | |
|---|---|---|
| Number and type of contacts | | 1 C/O |
| Contact material | | **AgNi**, AgNi/Au 5 µm, $AgSnO_2$ |
| Rated / max. switching voltage | AC | 250 V / 440 V |
| Min. switching voltage | | 5 V AgNi, 5 V AgNi/Au 5 µm, 10 V $AgSnO_2$ |
| Rated load (capacity) | AC1 | 16 A / 250 V AC |
| | AC15 | 3 A / 120 V 1,5 A / 240 V (B300) |
| | AC3 | 750 W (single-phase motor) |
| | DC1 | 16 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, 2 mA AgNi/Au 5 µm, 10 mA $AgSnO_2$ |
| Max. inrush current | | 30 A $AgSnO_2$ |
| Rated current | | 16 A |
| Max. breaking capacity | AC1 | 4 000 VA |
| Min. breaking capacity | | 0,3 W AgNi, 0,05 W AgNi/Au 5 µm, 1 W $AgSnO_2$ |
| Contact resistance | | ≤ 100 mΩ |
| Max. operating frequency | | |
| • at rated load | AC1 | 600 cycles/hour |
| • no load | | 72 000 cycles/hour |

## Coil data

| | | |
|---|---|---|
| Rated voltage | 50/60 Hz AC | 12 ... 240 V |
| | DC | 3 ... 110 V |
| Must release voltage | | AC: ≥ 0,15 $U_n$ DC: ≥ 0,1 $U_n$ |
| Operating range of supply voltage | | see Tables 1, 2 and Fig. 4, 5 |
| Rated power consumption | AC | 0,75 VA |
| | DC | 0,4 ... 0,48 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 | 1 000 V AC type of clearance: micro-disconnection |
| Contact - coil distance | |
| • clearance | ≥ 10 mm |
| • creepage | ≥ 10 mm |

## General data

| | |
|---|---|
| Operating / release time (typical values) | 7 ms / 3 ms |
| Electrical life (number of cycles) | |
| • resistive AC1 | > 0,7 x $10^5$ 16 A, 250 V AC |
| • cos$\phi$ | see Fig. 2 |
| • DC L/R=40 ms | > $10^5$ 0,15 A, 220 V DC |
| Mechanical life (cycles) | > 3 x $10^7$ |
| Dimensions (L x W x H) | 29 x 12,7 x 15,7 (17,7) mm |
| Weight | 14 g |
| Ambient temperature • storage | -40...+85 °C |
| • operating | AC: -40...+70 °C DC: -40...+85 °C |
| Cover protection category | IP 40 PN-EN 60529 |
| Environmental protection | RTII PN-EN 116000-3 |
| Shock resistance | 30 g |
| Vibration resistance | 10 g 10...150 Hz |
| Solder bath temperature | max. 270 °C |
| Soldering time | max. 5 s |

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

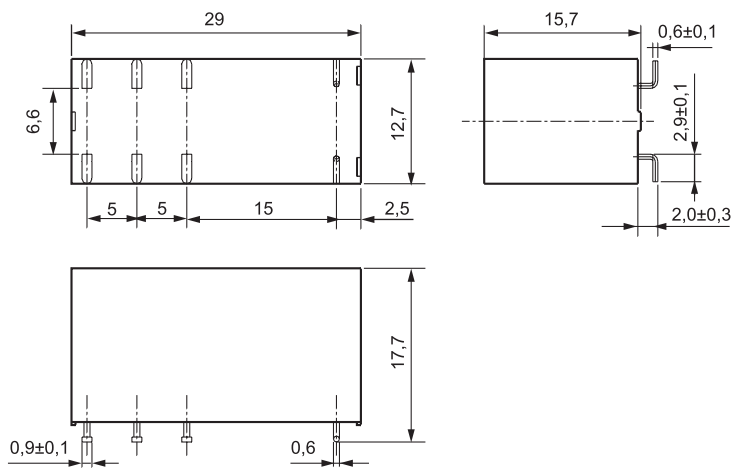
**Coil data** - DC voltage version — Table 1

| Coil code | Rated voltage V DC | Coil resistance at 20 °C Ω | Acceptable resistance | Coil operating range V DC | |
|---|---|---|---|---|---|
| | | | | min. (at 20 °C) | max. (at 20 °C) |
| 1003 | 3 | 22 | ± 10% | 2,1 | 7,6 |
| 1005 | 5 | 60 | ± 10% | 3,5 | 12,7 |
| 1006 | 6 | 90 | ± 10% | 4,2 | 15,3 |
| 1009 | 9 | 200 | ± 10% | 6,3 | 22,9 |
| 1012 | 12 | 360 | ± 10% | 8,4 | 30,6 |
| 1018 | 18 | 710 | ± 10% | 12,6 | 45,9 |
| 1024 | 24 | 1 440 | ± 10% | 16,8 | 61,2 |
| 1036 | 36 | 3 140 | ± 10% | 25,2 | 91,8 |
| 1048 | 48 | 5 700 | ± 10% | 33,6 | 122,4 |
| 1060 | 60 | 7 500 | ± 10% | 42,0 | 153,0 |
| 1110 | 110 | 25 200 | ± 10% | 77,0 | 280,0 |

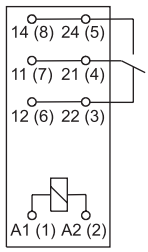
**Coil data** - AC 50/60 Hz voltage version — Table 2

| Coil code | Rated voltage V AC | Coil resistance at 20 °C Ω | Acceptable resistance | Coil operating range V AC 50 Hz | |
|---|---|---|---|---|---|
| | | | | min. (at 20 °C) | max. (at 20 °C) |
| 5012 | 12 | 100 | ± 10% | 9,6 | 13,2 |
| 5024 | 24 | 400 | ± 10% | 19,2 | 28,8 |
| 5048 | 48 | 1 550 | ± 10% | 38,4 | 57,6 |
| 5060 | 60 | 2 600 | ± 10% | 48,0 | 72,0 |
| 5110 | 110 | 8 900 | ± 10% | 88,0 | 132,0 |
| 5115 | 115 | 9 600 | ± 10% | 92,0 | 138,0 |
| 5120 | 120 | 10 200 | ± 10% | 96,0 | 144,0 |
| 5220 | 220 | 35 500 | ± 10% | 176,0 | 264,0 |
| 5230 | 230 | 38 500 | ± 10% | 184,0 | 276,0 |
| 5240 | 240 | 42 500 | ± 15% | 192,0 | 288,0 |

**Dimensions**




**Connection diagram**
(pin side view)

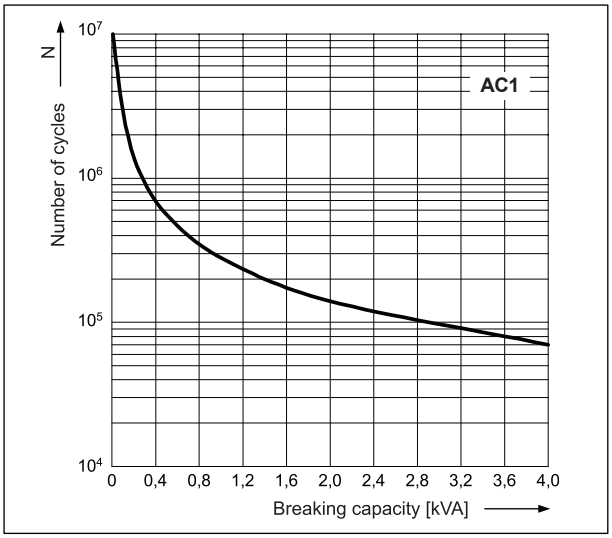



**1 C/O**

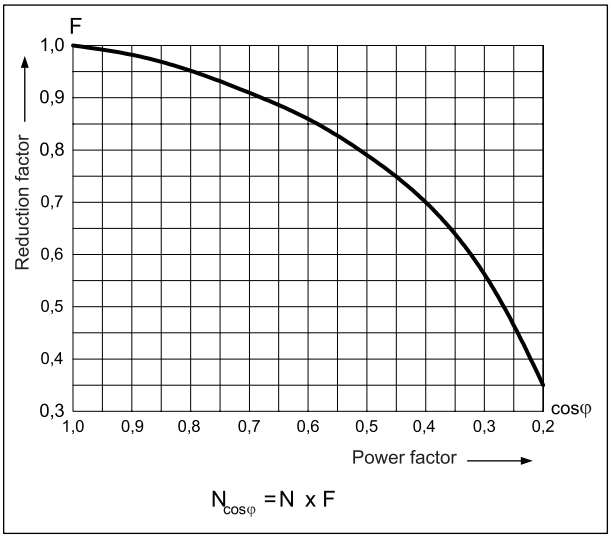
| Terminal (pin) | A1(1); A2(2) | 22(3); 21(4); 24(5); 12(6); 11(7); 14(8) |
|---|---|---|
| [mm] | Ø 0,6 | 0,5 x 0,9 |

**RM85 SMT** terminals are doubled for each contact. Both terminals are to be used while connecting to load.

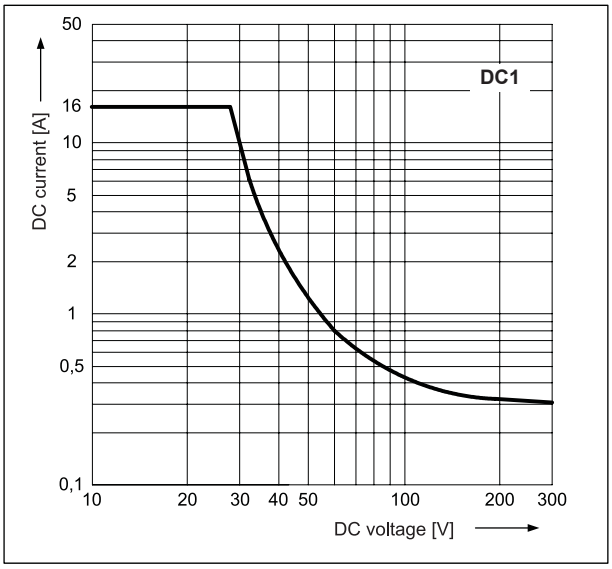
**Electrical life at AC resistive load. Switching frequency: 600 cycles/hour** Fig. 1



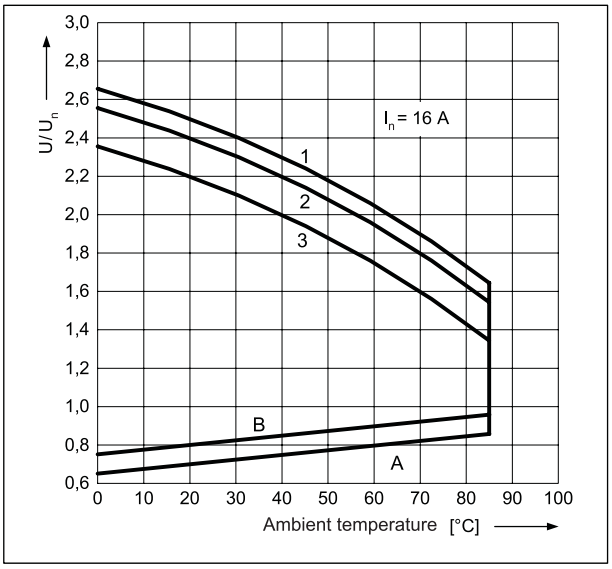

**Electrical life reduction factor at AC inductive load** Fig. 2



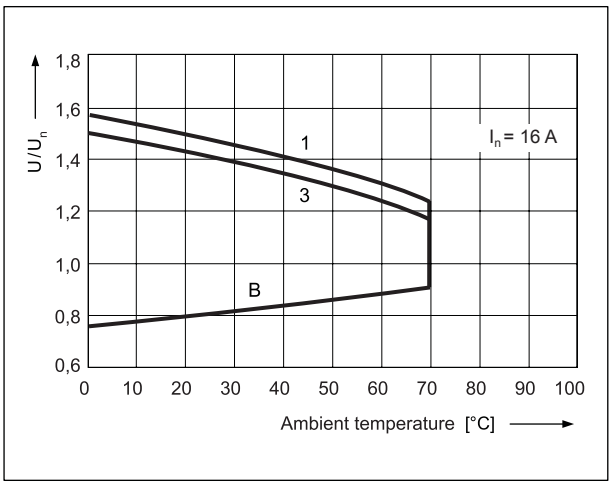

**Max. DC resistive load breaking capacity** Fig. 3




**Coil operating range - DC** Fig. 4



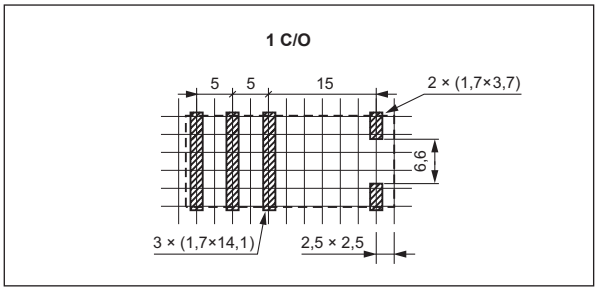

**Coil operating range - AC 50 Hz** Fig. 5




**Description of Fig. 4 and 5**

**A** - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
**B** - relations between make voltage and ambient temperature after initial coil heating up with 1,1 $U_n$, at continues load of $I_n$ on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
**1, 2, 3** - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
**1** - no load
**2** - 50% of rated load
**3** - rated load

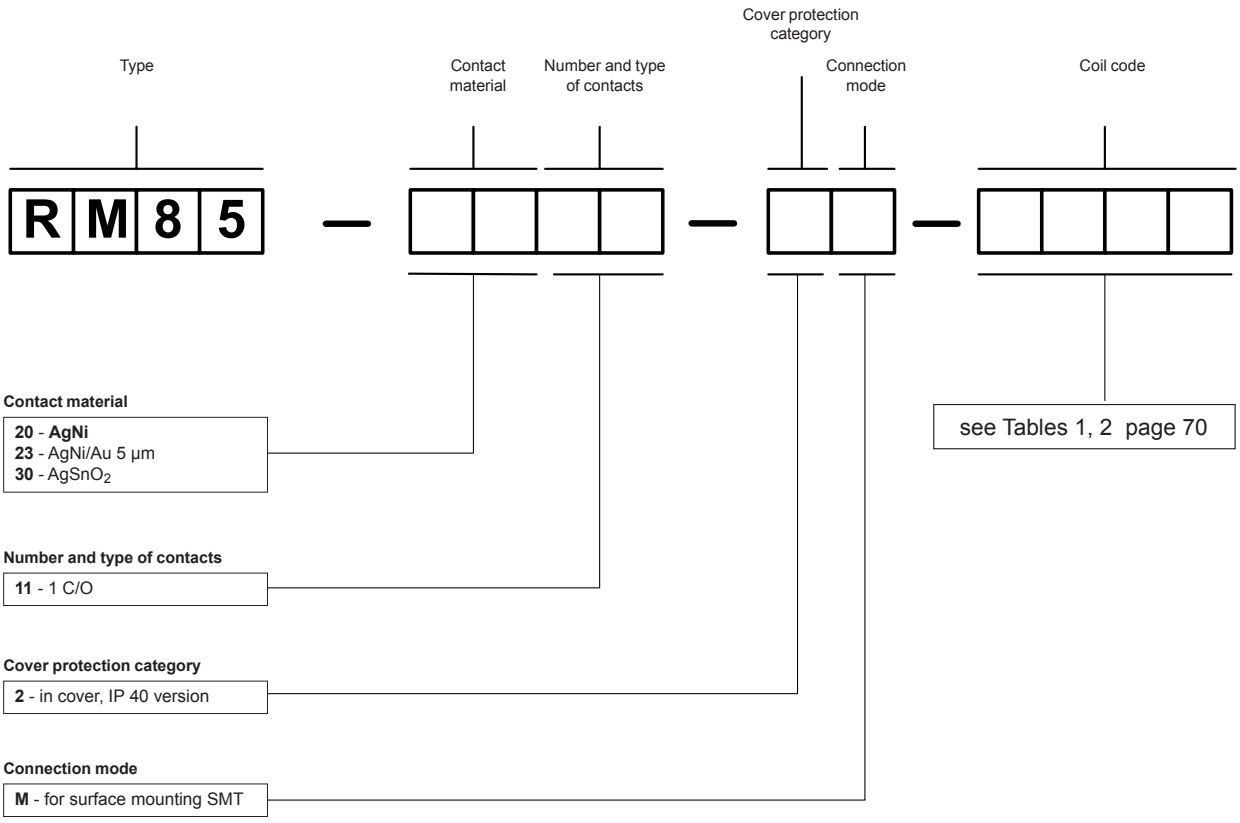
## Soldering areas (solder side view)




## Mounting

Relays **RM85 SMT** are designed for surface mounting SMT.

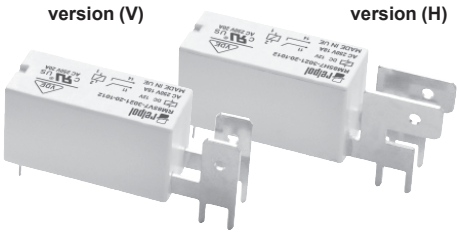
## Ordering codes




Example of ordering code:

**RM85-2011-2M-1012** relay **RM85 SMT**, contact material AgNi, with one changeover contact, in cover IP 40, for surface mounting SMT, voltage version 12 V DC

version (V) version (H)



• Cadmium - free contacts • Height 15,7 mm • 5000 V / 10 mm reinforced insulation • **Coil terminals for PCB, contacts terminals for PCB and flat insert connectors - faston 250 (6,3 x 0,8 mm), faston arrangement: vertical version (V) and horizontal version (H)** • DC coils - sensitive • Ambient temperature up to 105 °C • Applications: for control of operation of heating elements and motors of household equipment and catering industry devices, for control of electromagnetic valves, in many other applications • Compliance with standard PN-EN 60335-1
• Recognitions, certifications, directives: RoHS,

## Contact data

| | | |
|---|---|---|
| Number and type of contacts | | 1 NO |
| Contact material | | **$AgSnO_2$** |
| Rated / max. switching voltage | AC | 250 V / 440 V |
| Min. switching voltage | | 10 V |
| Rated load (capacity) | AC1 | 20 A / 250 V AC |
| | AC15 | 3 A / 120 V 1,5 A / 240 V (B300) |
| | AC3 | 750 W (single-phase motor) |
| | DC1 | 20 A / 24 V DC |
| | DC13 | 0,22 A / 120 V 0,1 A / 250 V (R300) |
| Min. switching current | | 10 mA |
| Max. inrush current | | 30 A |
| Rated current | | 20 A |
| Max. breaking capacity | AC1 | 5 000 VA |
| Min. breaking capacity | | 1 W |
| Contact resistance | | ≤ 100 mΩ 100 mA, 24 V |
| Max. operating frequency | | |
| • at rated load | AC1 | 600 cycles/hour |
| • no load | | 72 000 cycles/hour |

## Coil data

| | | |
|---|---|---|
| Rated voltage | DC | 5 ... 48 V |
| Must release voltage | | DC: ≥ 0,1 $U_n$ |
| Operating range of supply voltage | | see Table 1 |
| Rated power consumption | DC | 0,25 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 | 1 000 V AC type of clearance: micro-disconnection |
| Contact - coil distance | |
| • clearance | ≥ 10 mm |
| • creepage | ≥ 10 mm |

## General data

| | |
|---|---|
| Operating / release time (typical values) | 8 ms / 3 ms |
| Electrical life (number of cycles) | |
| • resistive AC1 | > 2 x $10^4$ 20 A, 250 V AC, 85 °C |
| | > 1,5 x $10^5$ 10 A, 250 V AC, 105 °C |
| • cos$\phi$ | see Fig. 1 |
| Mechanical life (cycles) | > 3 x $10^7$ |
| Dimensions (L x W x H) | vertical version (V): 40,5 x 12,7 x 15,7 mm |
| | horizontal version (H): 44,5 x 12,7 x 15,7 mm |
| Weight | 16 g |
| Ambient temperature • storage | -40...+105 ºC |
| • operating | -40...+105 ºC |
| Cover protection category | IP 40 PN-EN 60529 |
| Environmental protection | RTII PN-EN 116000-3 |
| Shock resistance | 30 g |
| Vibration resistance | 10 g 10...150 Hz |
| Solder bath temperature | max. 270 ºC |
| Soldering time | max. 5 s |

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

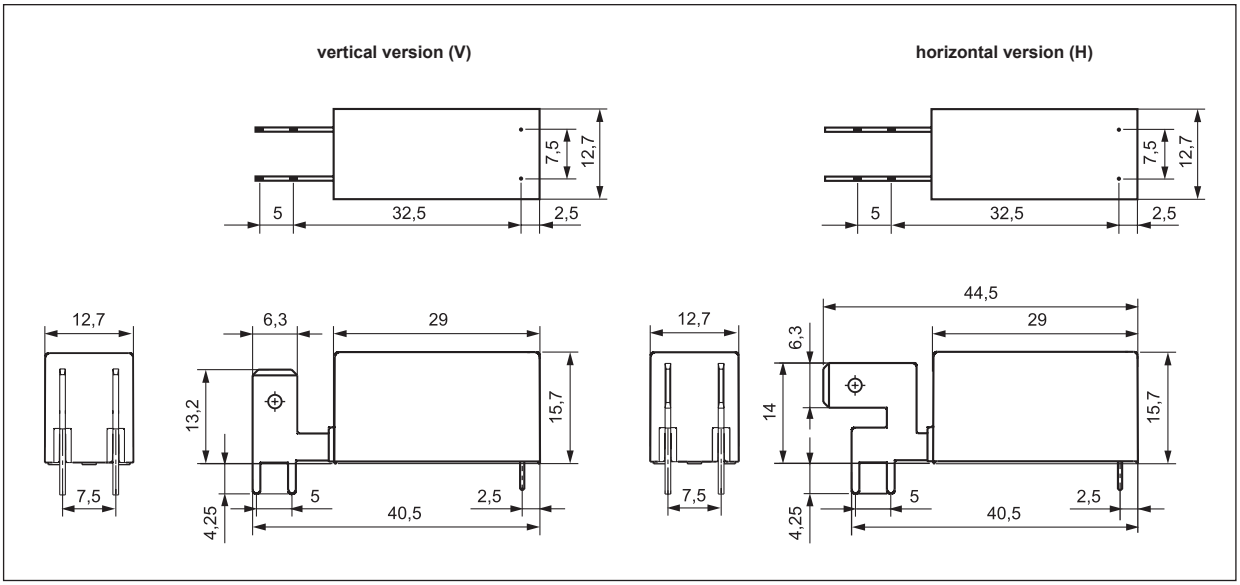
## **Coil data** - DC voltage version, sensitive version

Table 1

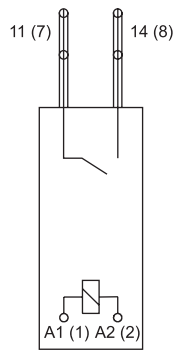
| Coil code | Rated voltage V DC | Coil resistance at 20 °C Ω | Acceptable resistance | Coil operating range V DC | |
|---|---|---|---|---|---|
| | | | | min. (at 20 °C) | max. (at 20 °C) |
| S005 | 5 | 102 | ± 10% | 3,75 | 15,0 |
| S006 | 6 | 144 | ± 10% | 4,50 | 18,0 |
| S009 | 9 | 330 | ± 10% | 6,75 | 27,0 |
| S010 | 10 | 380 | ± 10% | 7,50 | 30,0 |
| **S012** | **12** | **580** | **± 10%** | **9,00** | **36,0** |
| S018 | 18 | 1 300 | ± 10% | 13,50 | 54,0 |
| **S024** | **24** | **2 300** | **± 10%** | **18,00** | **72,0** |
| S048 | 48 | 9 340 | ± 10% | 36,00 | 144,0 |

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

## Dimensions




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

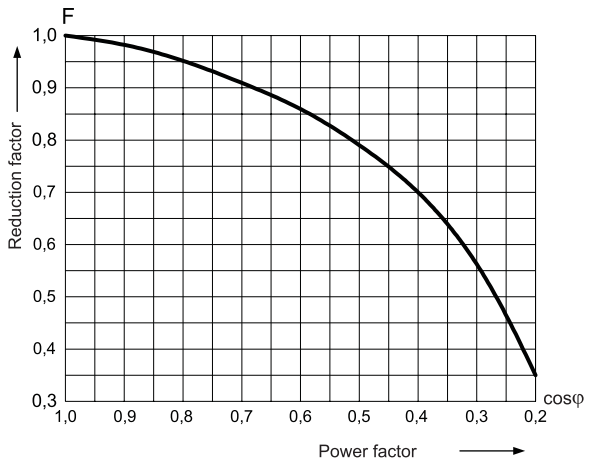



**1 NO**

| Terminal (pin) | A1(1); A2(2) | 11(7); 14(8) |
|---|---|---|
| [mm] | Ø 0,6 | 1,2 x 0,8<br>faston 6,3 x 0,8 |
| Drilling hole:<br>• for relays | Ø 1,3 + 0,1 mm | |

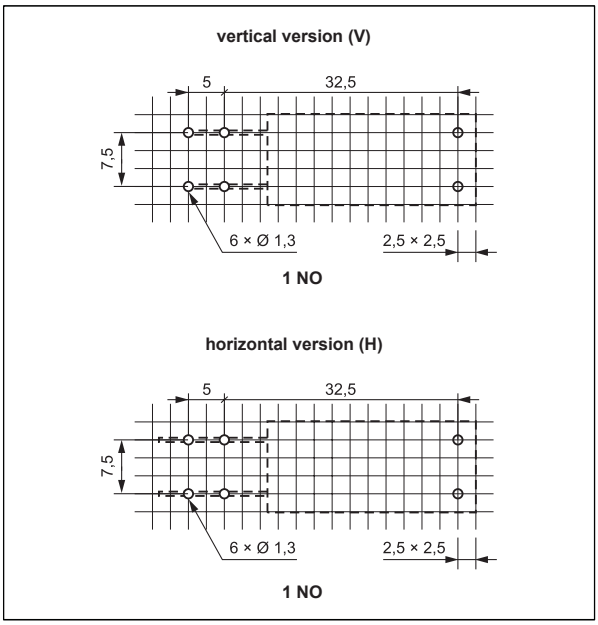
## **Electrical life reduction factor at AC inductive load**

Fig.1




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

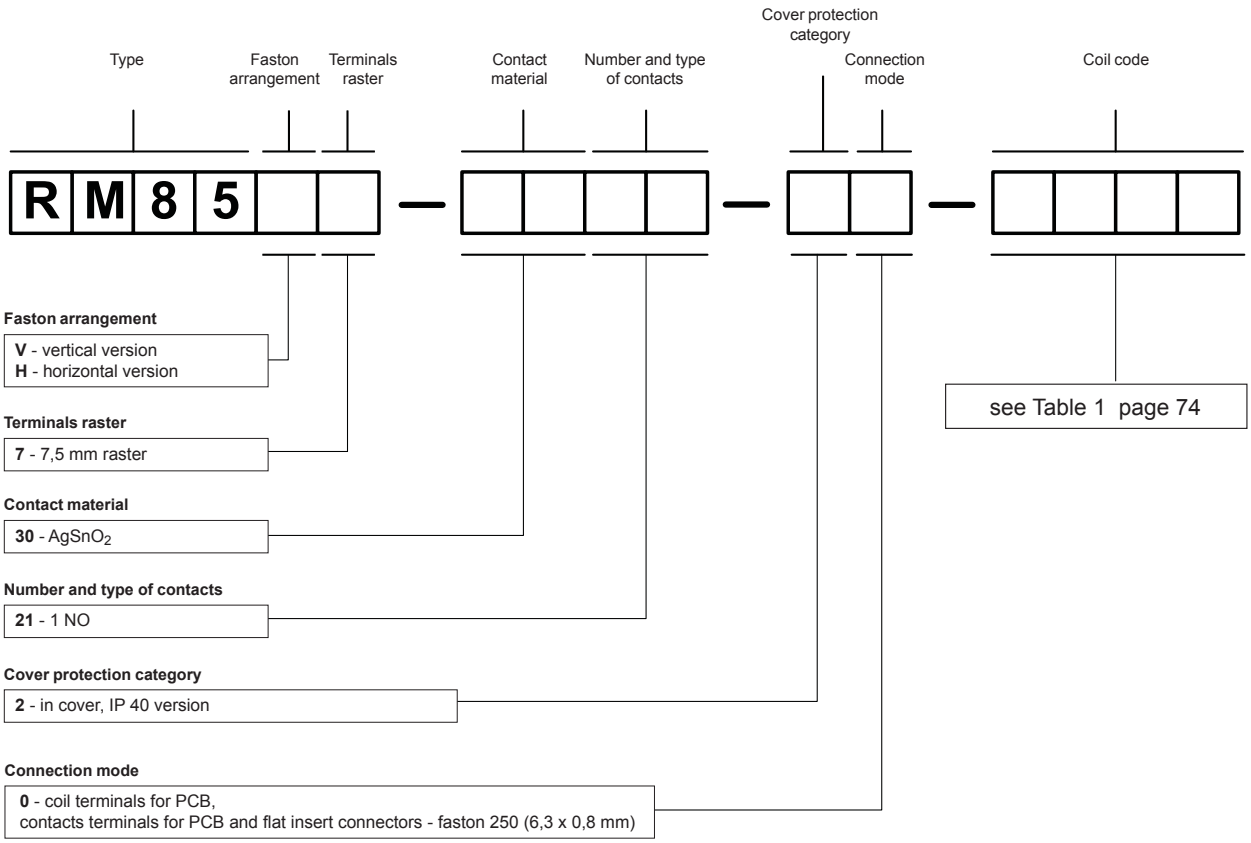
## Pinout (solder side view)




## Mounting

Relays **RM85 faston** are designed for: • direct PCB mounting • connection of load with flat insert connectors - faston 250 (6,3 x 0,8 mm).

## Ordering codes




Example of ordering code:

**RM85V7-3021-20-S012** relay **RM85 faston**, vertical version, 7,5 mm terminals raster, contact material $AgSnO_2$, with one normally open contact, in cover IP 40, coil terminals for PCB, contacts terminals for PCB and flat insert connectors - faston 250 (6,3 x 0,8 mm), sensitive voltage version 12 V DC