

RM84 / RM85 / RM87

Miniature Electromagnetic Relays



- Miniature dimensions
- 5000 V / 10 mm reinforced insulation
- Available special versions with the increased dielectric strength of the contact clearance
- IP67 flux proof, water proof and sealed cover protection (For IP40 unsealed, contact Altech)
- Cadmium - free contacts
- For PCB and plug-in sockets

| Contact Data | | RM84 | RM85 | RM87 |
|---|-----------------------------|--|--|--|
| No. and type of contacts | | DPDT, DPST (2N0) | SPDT, SPST (1N0) | SPDT, SPST (1N0) |
| Contact material | | AgNi | AgNi | AgNi |
| Rated / max. switching voltage | AC | 250 V / 440 V | 250 V / 440 V | 250 V / 440 V |
| Min. switching voltage | | 5 V | 5 V | 5 V |
| Rated load (capacity) | | 8 A / 250 V AC | 16 A / 250 V AC | 12 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) | 3 A / 120 V; 1.5 A / 240 V (B300) |
| | AC3 | 550 W (single-phase motor) | 750 W (single-phase motor) | 750 W (single-phase motor) |
| | DC1 | 8 A / 24 V DC (see Fig. 3.1) | 16 A / 24 V DC (see Fig. 3.2) | 12 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 | | 12 A | 24 A | 18 A |
| Rated current | | 8 A | 16 A | 12 A |
| Max. breaking capacity | AC1 | 2 000 VA | 4 000 VA | 3 000 VA |
| Min. breaking capacity | | 0.3 W | 0.3 W | 0.3 W |
| Contact resistance | | ≤ 100 mΩ | ≤ 100 mΩ | ≤ 100 mΩ |
| Max. operating frequency | | 600 cycles/hour | 600 cycles/hour | 600 cycles/hour |
| | • at rated load | 72000 cycles/hour | 72000 cycles/hour | 72000 cycles/hour |
| | • no load | | | |
| Coil Data | | | | |
| Rated voltage | 50/60 Hz AC | 12 ... 240 V | 12 ... 240 V | 12 ... 240 V |
| | DC | 3 ... 110 V | 3 ... 110 V | 3 ... 110 V |
| Must release voltage | | AC: ≥ 0.15 U _N ; DC: ≥ 0.1 U _N | AC: ≥ 0.15 U _N ; DC: ≥ 0.1 U _N | AC: ≥ 0.15 U _N ; DC: ≥ 0.1 U _N |
| Operating range of supply voltage | | see page 80 and Fig. 4.1. 5.1 | see page 80 and Fig. 4.2. 5.2 | see page 80 and Fig. 4.3. 5.3 |
| Rated power consumption | AC | 0.75 VA | 0.75 VA | 0.75 VA |
| | DC | 0.4 ... 0.48 W | 0.4 ... 0.48 W | 0.4 ... 0.48 W |
| Insulation | | | | |
| Insulation rated voltage | | 400 V AC | 400 V AC | 400 V AC |
| Rated surge voltage | | 4000 V 1.2 / 50 μs | 4000 V 1.2 / 50 μs | 4000 V 1.2 / 50 μs |
| Overvoltage category | | III | III | III |
| Insulation pollution degree | | 3 | 3 | 3 |
| Dielectric strength | | 5000 V AC type of insulation: reinforced | 5000 V AC type of insulation: reinforced | 5000 V AC type of insulation: reinforced |
| | • between coil and contacts | 1000 V AC type of clearance: micro-disconnection | 1000 V AC type of clearance: micro-disconnection | 1000 V AC type of clearance: micro-disconnection |
| | • contact clearance | 2000 V AC contacts DPST (2N0). type of clearance: full-disconnect | 2000 V AC contacts DPST (2N0). type of clearance: full-disconnect | 2000 V AC contacts SPST (1N0). type of clearance: full-disconnect |
| | • pole - pole | 2500 V AC type of insulation: basic | - | - |
| Contact - coil distance | | ≥ 10 mm | ≥ 10 mm | ≥ 10 mm |
| | • clearance | ≥ 10 mm | ≥ 10 mm | ≥ 10 mm |
| | • creepage | | | |
| General data | | | | |
| Operating / release time (typical values) | | 7 ms / 3 ms | 7 ms / 3 ms | 7 ms / 3 ms |
| Electrical life | | | | |
| | • resistive | > 10 ⁶ ; 8 A. 250 V AC | > 0.7 x 10 ⁶ ; 16 A. 250 V AC | > 10 ⁶ ; 12 A. 250 V AC |
| | • cosφ | see Fig. 2.1 | see Fig. 2.2 | see Fig. 2.3 |
| | • DC L/R=40 ms | > 10 ⁶ ; 0.15 A. 220 V DC | > 10 ⁶ ; 0.15 A. 220 V DC | > 10 ⁶ ; 0.15 A. 220 V DC |
| Mechanical life (cycles) | | > 3 x 10 ⁷ | > 3 x 10 ⁷ | > 3 x 10 ⁷ |
| Dimensions (L x W x H) | | 29 x 12.7 x 15.7 mm | 29 x 12.7 x 15.7 mm | 29 x 12.7 x 15.7 mm |
| Weight | | 14 g | 14 g | 14 g |
| Ambient temperature | | | | |
| | • storage | -40...+85 °C | 40...+85 °C | 40...+85 °C |
| | • operating | AC: -40...+70 °C DC: -40...+85 °C | AC: -40...+70 °C DC: -40...+85 °C | AC: -40...+70 °C DC: -40...+85 °C |
| Cover protection category | | IP 67 PN-EN 60529 | IP 67 PN-EN 60529 | IP 67 PN-EN 60529 |
| Environmental protection | | RTIII PN-EN 116000-3 | RTIII PN-EN 116000-3 | RTIII PN-EN 116000-3 |
| Shock resistance (NO/NC) | | 20 g | 30 g | 30 g |
| Vibration resistance | | 10 g / 5 g 10...150 Hz | 10 g 10...150 Hz | 10 g 10...150 Hz |
| Solder bath temperature | | max. 270 °C | max. 270 °C | max. 270 °C |
| Soldering time | | max. 5 s | max. 5 s | max. 5 s |

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RM84



CONNECTION DIAGRAM



| | | |
|----------------|----------------|---|
| Terminal (pin) | A1(1); A2(2) | 22(3); 21(4); 24(5); 12(6); 11(7); 14(8) |
| [mm] | ∅ 0.6 | 0.5 x 0.9 |
| Drilling hole: | | |
| • for relays | ∅ 1.3 + 0.1 mm | |
| • for sockets | ∅ 1.5 + 0.1 mm | |

DIMENSIONS



LOAD CHARTS

Electrical life at AC resistive load. Switching frequency: 600 cycles/hour Fig. 1.1



Electrical life reduction factor at AC inductive load Fig. 2.1



Max. DC resistive load breaking capacity Fig. 3.1



Coil operating range - DC Fig. 4.1



Coil operating range - AC 50 Hz Fig. 5.1



Description of Fig. 4.1 and 5.1

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

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Miniature Electromagnetic Relays



RM85



CONNECTION DIAGRAM



| 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: | | |
| • for relays | Ø 1.3 + 0.1 mm | |
| • for sockets | Ø 1.5 + 0.1 mm | |

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

DIMENSIONS



LOAD CHARTS

Electrical life at AC resistive load.
Switching frequency: 600 cycles/hour Fig. 1.2



Electrical life reduction factor at AC inductive load Fig. 2.2



Max. DC resistive load breaking capacity Fig. 3.2



Coil operating range - DC Fig. 4.2



Coil operating range - AC 50 Hz Fig. 5.2



Description of Fig. 4.2 and 5.2

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

RM84 / RM85 / RM87

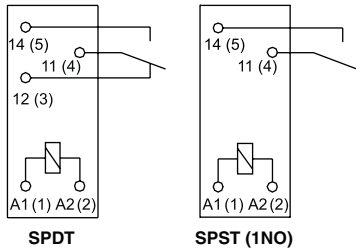
Miniature Electromagnetic Relays



RM87



CONNECTION DIAGRAM



| Terminal (pin) | A1(1); A2(2) | 12(3); 11(4); 14(5) |
|----------------|----------------|---------------------|
| [mm] | Ø 0.6 | 0.5 x 0.9 |
| Drilling hole: | | |
| • for relays | Ø 1.3 + 0.1 mm | |
| • for sockets | Ø 1.5 + 0.1 mm | |

DIMENSIONS

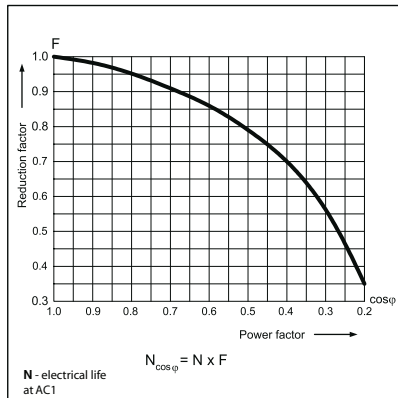


LOAD CHARTS

Electrical life at AC resistive load. Fig. 1.3
Switching frequency: 600 cycles/hour



Electrical life reduction factor at AC inductive load Fig. 2.3



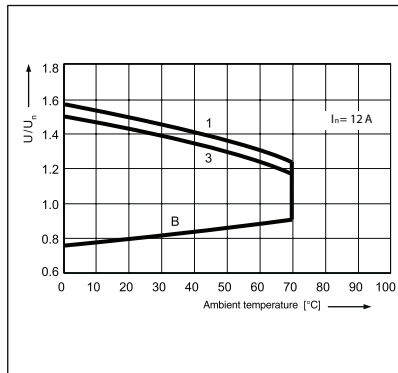
Max. DC resistive load breaking capacity Fig. 3.3
- standard version



Coil operating range - DC Fig. 4.3
- standard version



Coil operating range - AC 50 Hz Fig. 5.3



Description of Fig. 4.3 and 5.3

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

RM84 / RM85 / RM87

Miniature Electromagnetic Relays

R84 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) | max. (at 55°C) |
| ▶ RM84-2012-35-1012 | 12 | DC | 360 | 8.4 | 30.6 |
| ▶ RM84-2012-35-1024 | 24 | DC | 1440 | 16.8 | 61.2 |
| ▶ RM84-2012-35-1110 | 110 | DC | 25200 | 77.0 | 280.0 |
| ▶ RM84-2012-35-5120 | 120 | AC 50/60Hz | 10200 | 96.0 | 144.0 |
| ▶ RM84-2012-35-5230 | 230 | AC 50/60Hz | 38500 | 184.0 | 276.0 |

R84 DPST(2NO) 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) | max. (at 55°C) |
| ▶ RM84-2022-35-1012 | 12 | DC | 360 | 8.4 | 30.6 |
| ▶ RM84-2022-35-1024 | 24 | DC | 1440 | 16.8 | 61.2 |
| ▶ RM84-2022-35-1110 | 110 | DC | 25200 | 77.0 | 280.0 |
| ▶ RM84-2022-35-5120 | 120 | AC 50/60Hz | 10200 | 96.0 | 144.0 |
| ▶ RM84-2022-35-5230 | 230 | AC 50/60Hz | 38500 | 184.0 | 276.0 |

R85 SPDT 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) | max. (at 55°C) |
| ▶ RM85-2011-35-1012 | 12 | DC | 360 | 8.4 | 30.6 |
| ▶ RM85-2011-35-1024 | 24 | DC | 1440 | 16.8 | 61.2 |
| ▶ RM85-2011-35-1110 | 110 | DC | 25200 | 77.0 | 280.0 |
| ▶ RM85-2011-35-5120 | 120 | AC 50/60Hz | 10200 | 96.0 | 144.0 |
| ▶ RM85-2011-35-5230 | 230 | AC 50/60Hz | 38500 | 184.0 | 276.0 |

R85 SPST(1NO) 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) | max. (at 55°C) |
| ▶ RM85-2021-35-1012 | 12 | DC | 360 | 8.4 | 30.6 |
| ▶ RM85-2021-35-1024 | 24 | DC | 1440 | 16.8 | 61.2 |
| ▶ RM85-2021-35-1110 | 110 | DC | 25200 | 77.0 | 280.0 |
| ▶ RM85-2021-35-5120 | 120 | AC 50/60Hz | 10200 | 96.0 | 144.0 |
| ▶ RM85-2021-35-5230 | 230 | AC 50/60Hz | 38500 | 184.0 | 276.0 |

R87 SPDT 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) | max. (at 55°C) |
| ▶ RM87N-2011-35-1012 | 12 | DC | 360 | 8.4 | 30.6 |
| ▶ RM87N-2011-35-1024 | 24 | DC | 1440 | 16.8 | 61.2 |
| ▶ RM87N-2011-35-1110 | 110 | DC | 25200 | 77.0 | 280.0 |
| ▶ RM87N-2011-35-5120 | 120 | AC 50/60Hz | 10200 | 96.0 | 144.0 |
| ▶ RM87N-2011-35-5230 | 230 | AC 50/60Hz | 38500 | 184.0 | 276.0 |

R87 SPST(1NO) 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) | max. (at 55°C) |
| ▶ RM87N-2021-35-1012 | 12 | DC | 360 | 8.4 | 30.6 |
| ▶ RM87N-2021-35-1024 | 24 | DC | 1440 | 16.8 | 61.2 |
| ▶ RM87N-2021-35-1110 | 110 | DC | 25200 | 77.0 | 280.0 |
| ▶ RM87N-2021-35-5120 | 120 | AC 50/60Hz | 10200 | 96.0 | 144.0 |
| ▶ RM87N-2021-35-5230 | 230 | AC 50/60Hz | 38500 | 184.0 | 276.0 |

* waterproof version

▶ **BOLD** - Regular stocked items.

RM84 / RM85 / RM87

Miniature Electromagnetic Relays - Plug-in Sockets and Accessories **Altech**[®]

GZT80 (for RM84 / RM85)

Screw terminals
 Max. tightening moment
 for the terminal: 0.7 Nm
 35 mm rail mount
 acc. to PN-EN 60715
 or on panel mounting
 75.3 x 15.5 x 61(67) mm*
 Two poles, 5 mm pinout
 12 A, 300 V AC



E22891



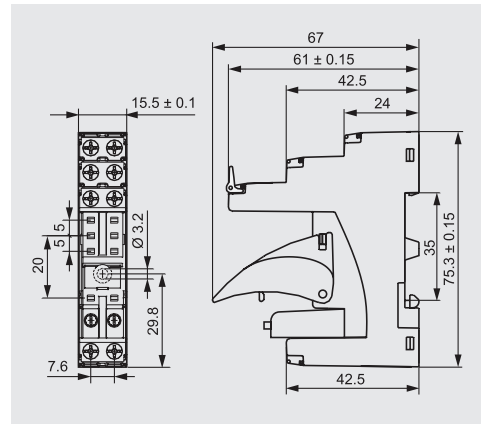
GZT80

CONNECTION DIAGRAM



RM84 RM85

DIMENSIONS



ZGGZ80 (see page 110)



GZT80-0040



GZM80-0041**



GZT80-0035



Module type M... (see page 113)

GZM80 (for RM84 / RM85)

Screw terminals
 Max. tightening moment
 for the terminal: 0.7 Nm
 35 mm rail mount
 acc. to PN-EN 60715
 or on panel mounting
 78.1 x 15.9 x 61(66.5) mm*
 Two poles, 5 mm pinout
 12 A, 300 V AC



E22891



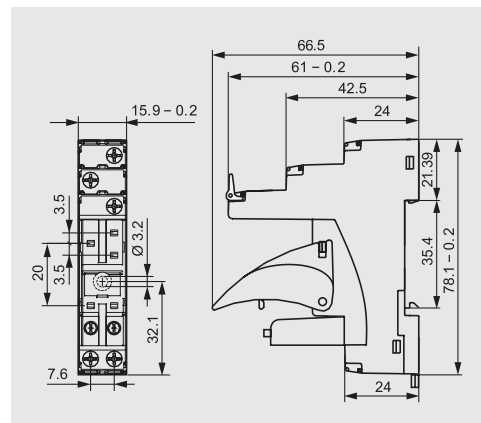
GZM80

CONNECTION DIAGRAM



RM84 RM85

DIMENSIONS



ZGGZ80 (see page 110)



GZT80-0040



GZM80-0041**



GZT80-0035



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.

RM84 / RM85 / RM87

Miniature Electromagnetic Relays - Plug-in Sockets and Accessories

GZT92 (for RM87)

Screw terminals
 Max. tightening moment
 for the terminal: 0.7 Nm
 35 mm rail mount
 acc. to PN-EN 60715
 or on panel mounting
 75.3 x 15.5 x 61(67) mm*
 One pole, 3,5 mm
 12 A, 300 V AC



E22891



GZT92



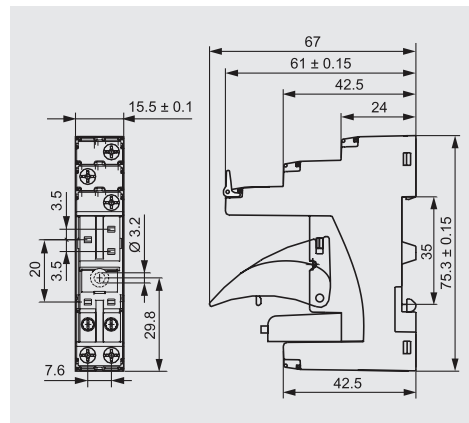
ZGGZ80 (see page 110)

CONNECTION DIAGRAM



RM87

DIMENSIONS



GZT80-0040



GZM80-0041**



GZT80-0035



Module type M... (see page 113)

GZM92 (for RM87)

Screw terminals
 Max. tightening moment
 for the terminal: 0.7 Nm
 35 mm rail mount
 acc. to PN-EN 60715
 or on panel mounting
 78.1 x 15.9 x 61(66.5) mm*
 One pole, 3,5 mm pinout
 12 A, 300 V AC



E22891



GZM92



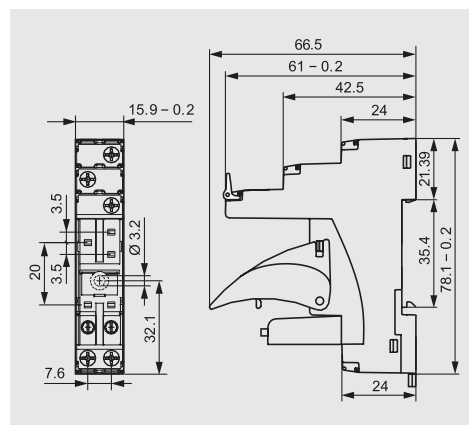
ZGGZ80 (see page 110)

CONNECTION DIAGRAM



RM87

DIMENSIONS



GZT80-0040



GZM80-0041**



GZT80-0035



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.

RM84 / RM85 / RM87

Miniature Electromagnetic Relays - Plug-in Sockets and Accessories **Altech**[®]

GZMB80 (for RM84, RM85)

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
 97 x 16 x 45.2(69) mm*
 Two poles, 5 mm pinout
 10 A, 300 V AC

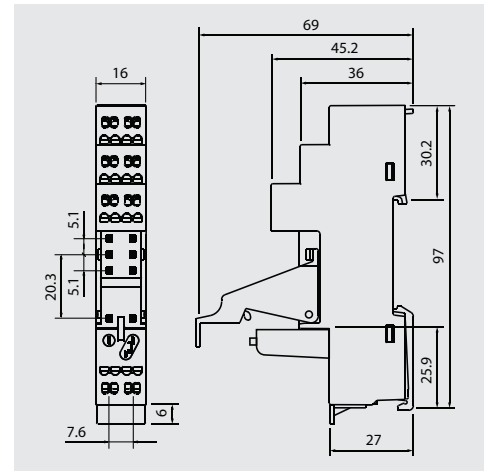


GZMB80

CONNECTION DIAGRAM



DIMENSIONS



GZMB80-0040



GZMB80-0041**



TR



Module type M... (see page 113)

GD50 (for RM84, RM85)

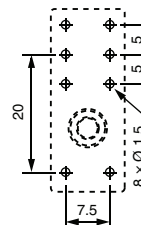
For RM84, RM85

For PCB
 31.5 x 13 x 9 mm
 Two poles, 5 mm pinout
 8 A, 300 V AC

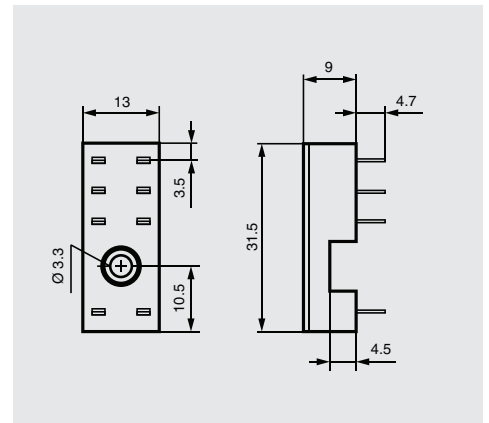


GD50

CONNECTION DIAGRAM



DIMENSIONS



MH16-2

GD35 (for RM87N)

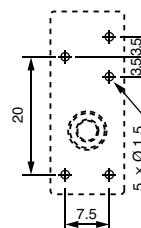
For RM87

For PCB
 31.5 x 13 x 9 mm
 One pole, 3.5 mm pinout
 12 A, 300 V AC

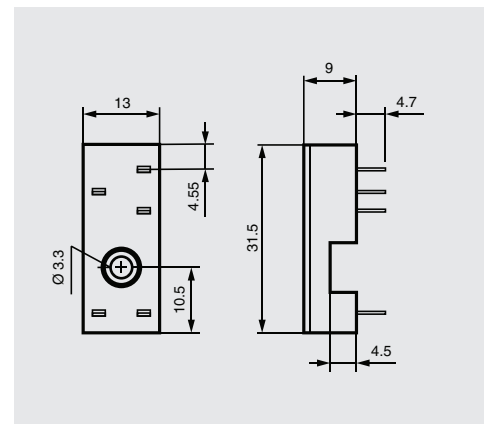


GD35

CONNECTION DIAGRAM



DIMENSIONS



MH16-2

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

All accessories are sold separately.