






DM87N sensitive

- 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 - standard (DM87N, DM87L, DM87P), DC coils - sensitive (DM87N sensitive)**
- Recyclable packing
- Recognitions, certificates, directives: RoHS,   

### Contacts

|                              |       |  |
|------------------------------|-------|--|
| Contact number & arrangement |       | 1C/O, 1NO  |
| Contact material             |       | <b>AgNi</b> , AgNi/Au 5 um, AgSnO <sub>2</sub>                                     |
| Max. switching voltage       | AC/DC | 400 V / 300 V  |
| Min. switching voltage       |       | 5 V AgNi, 5 V AgNi/Au 5 um, 10 V AgSnO <sub>2</sub>                                |
| Rated load                   | AC1   | 12 A / 250 V AC standard version 10 A / 250 V AC sensitive version                 |
|                              | DC1   | 12 A / 24 V DC standard version 10 A / 24 V DC sensitive version                   |
| Min. switching current       |       | 5 mA AgNi, 2 mA AgNi/Au 5 um, 10 mA AgSnO <sub>2</sub>                             |
| Max. inrush current          |       | 25 A AgSnO <sub>2</sub> standard version 20 A AgSnO <sub>2</sub> sensitive version |
| Rated current                |       | 12 A standard version 10 A sensitive version                                       |
| Max. breaking capacity       | AC1   | 3 000 VA standard version 2 500 VA sensitive version                               |
| Min. breaking capacity       |       | 0.3 W AgNi, 0.05 W AgNi/Au 5 um, 1 W AgSnO <sub>2</sub>                            |
| Resistance                   |       | ≤ 100 mΩ   |
| Max. operating frequency     | AC1   | • at rated load 600 cycles/hour  |
|                              |       | • no load 72 000 cycles/hour   |

### Coil

|                                   |             |  |
|-----------------------------------|-------------|--|
| Rated voltage                     | 50/60 Hz AC | 12...240 V standard version                            |
|                                   | DC          | 3...110 V standard version 5...48 V sensitive version  |
| Must release voltage              |             | AC: ≥ 0.15 U <sub>n</sub> DC: ≥ 0.1 U <sub>n</sub>     |
| Operating range of supply voltage |             | see Tables 1, 3 and Fig. 5, 7 standard version         |
|                                   |             | see Table 2 and Fig. 6 sensitive version               |
| Rated power consumption           | AC          | 0,75 VA standard version                               |
|                                   | DC          | 0.4...0.48 W standard version 0.25 W sensitive version |

### Insulation

|                             |                                |            |
|-----------------------------|--------------------------------|------------|
| Insulation category         | C250 / B400                    |            |
| Insulation rated voltage    | 400 V AC                       |            |
| Rated surge voltage         | 4 000 V AC                     |            |
| Overtoltage category        | III IEC 61810-5 (PN-IEC 664-1) |            |
| Insulation pollution degree | 3                              |            |
| Dielectric strength         | • coil - contact               | 5 000 V AC |
|                             | • contact - contact            | 1 000 V AC |
| Contact - coil distance     | • clearance                    | ≥ 10 mm    |
|                             | • creepage                     | ≥ 10 mm    |

### General data

|                                |                       |   |
|--------------------------------|-----------------------|---|
| Operating time (typical value) | 7 ms                  |   |
| Release time (typical value)   | 3 ms                  |   |
| Electrical life                | • resistive AC1       | > 10 <sup>5</sup> 12 A, 250 V AC standard version<br>> 1,7 x 10 <sup>5</sup> 10 A, 250 V AC sensitive version |
|                                | • cos φ               | see Fig. 2  |
|                                | • L/R=40 ms           | > 10 <sup>5</sup> 0,15 A, 220 V DC  |
| Mechanical life (cycles)       | > 3 x 10 <sup>7</sup> |   |
| 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        |   |
| Environmental protection       | RTII IEC 61810-7      |   |
| Shock resistance               | 30 g                  |   |
| Vibration resistance           | 10 g 10...150 Hz      |   |
| Solder bath temperature        | max. 270 °C           |   |
| Soldering time                 | max. 5 s              |   |

Standard contact materials are marked with bold type.

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

| Coil code   | Rated voltage<br>V DC | Coil resistance<br>±10% at 20 °C<br>Ω | Coil operating range at 20 °C<br>V DC |             |
|-------------|-----------------------|---------------------------------------|---------------------------------------|-------------|
|             |                       |                                       | min.                                  | max.        |
| 1003        | 3                     | 22                                    | 2.1                                   | 7.6         |
| 1005        | 5                     | 60                                    | 3.5                                   | 12.7        |
| 1006        | 6                     | 90                                    | 4.2                                   | 15.3        |
| 1009        | 9                     | 200                                   | 6.3                                   | 22.9        |
| 1012        | 12                    | 360                                   | 8.4                                   | 30.6        |
| 1018        | 18                    | 710                                   | 12.6                                  | 45.9        |
| <b>1024</b> | <b>24</b>             | <b>1 440</b>                          | <b>16.8</b>                           | <b>61.2</b> |
| 1036        | 36                    | 3 140                                 | 25.2                                  | 91.8        |
| 1048        | 48                    | 5 700                                 | 33.6                                  | 122.4       |
| 1060        | 60                    | 7 500                                 | 42.0                                  | 153.0       |
| 1110        | 110                   | 25 200                                | 77.0                                  | 280.0       |

Standard coil rated voltages marked with bold type.

**Coil data - sensitive DC voltage version (only for DM87N)** Table 2

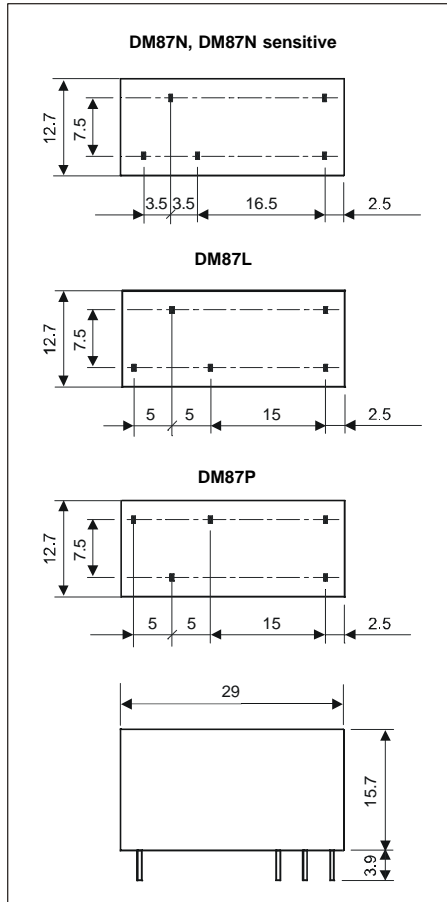
| Coil code | Rated voltage<br>V DC | Coil resistance<br>±10% at 20 °C<br>Ω | Coil operating range at 20 °C<br>V DC |       |
|-----------|-----------------------|---------------------------------------|---------------------------------------|-------|
|           |                       |                                       | min.                                  | max.  |
| S005      | 5                     | 102                                   | 3.75                                  | 15.0  |
| S006      | 6                     | 144                                   | 4.50                                  | 18.0  |
| S009      | 9                     | 330                                   | 6.75                                  | 27.0  |
| S010      | 10                    | 400                                   | 7.50                                  | 30.0  |
| S012      | 12                    | 580                                   | 9.00                                  | 36.0  |
| S018      | 18                    | 1 300                                 | 13.50                                 | 54.0  |
| S024      | 24                    | 2 300                                 | 18.00                                 | 72.0  |
| S048      | 48                    | 9 340                                 | 36.00                                 | 144.0 |

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

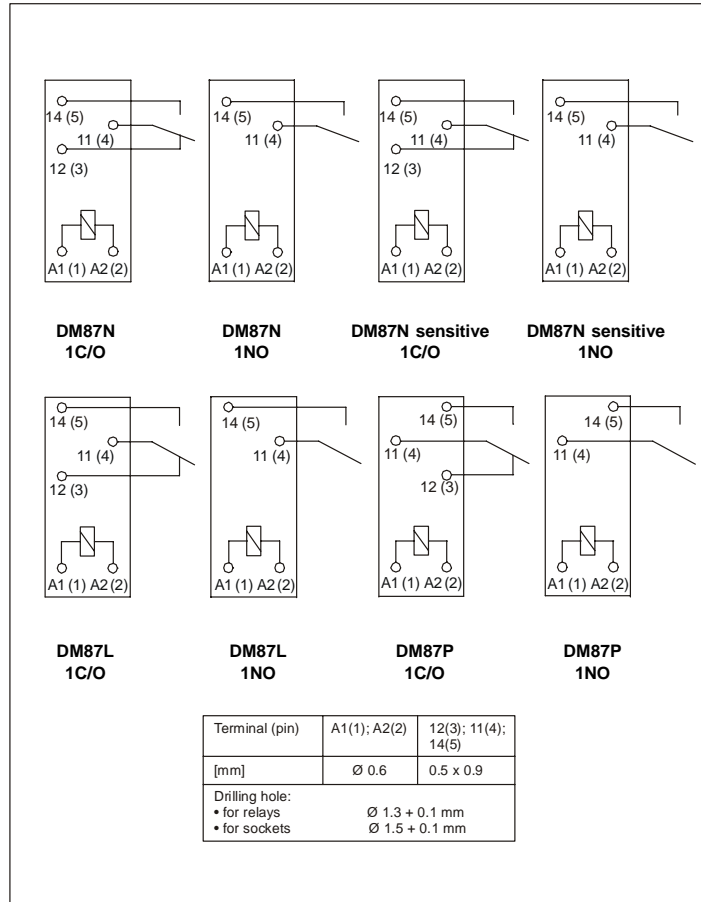
| Coil code   | Rated voltage<br>V AC | Coil resistance<br>at 20 °C<br>Ω | Acceptable<br>resistance | Coil operating range at 20 °C<br>V AC - 50 Hz |              |
|-------------|-----------------------|----------------------------------|--------------------------|---|--------------|
|             |                       |                                  |                          | min.  | max.         |
| 5012        | 12                    | 100                              | ±10%                     | 9.6   | 13.2         |
| <b>5024</b> | <b>24</b>             | <b>400</b>                       | <b>±10%</b>              | <b>19.2</b>                                   | <b>28.8</b>  |
| 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        |
| <b>5230</b> | <b>230</b>            | <b>38 500</b>                    | <b>±10%</b>              | <b>184.0</b>                                  | <b>276.0</b> |
| 5240        | 240                   | 42 500                           | ±15%                     | 192.0   | 288.0        |

Standard coil rated voltages marked with bold type.

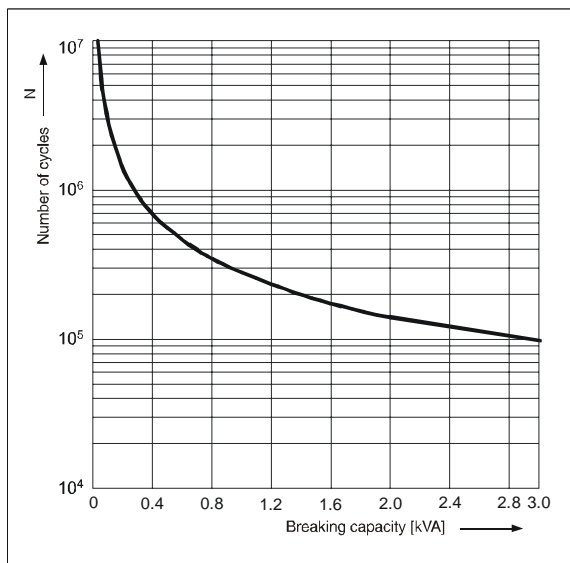
### Dimensions



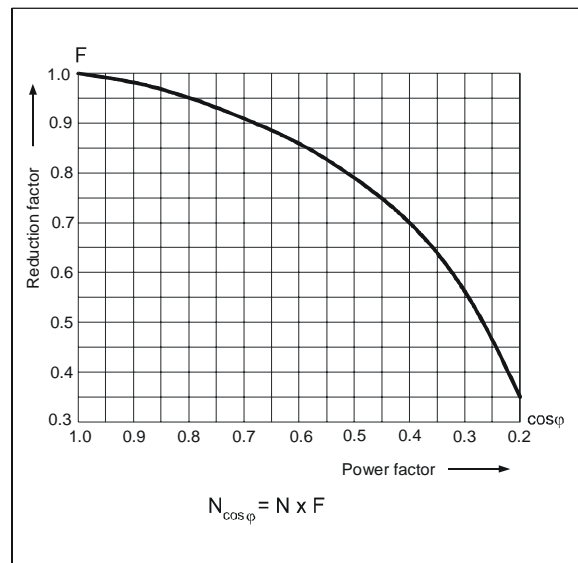
### Connections diagram (pin side view)



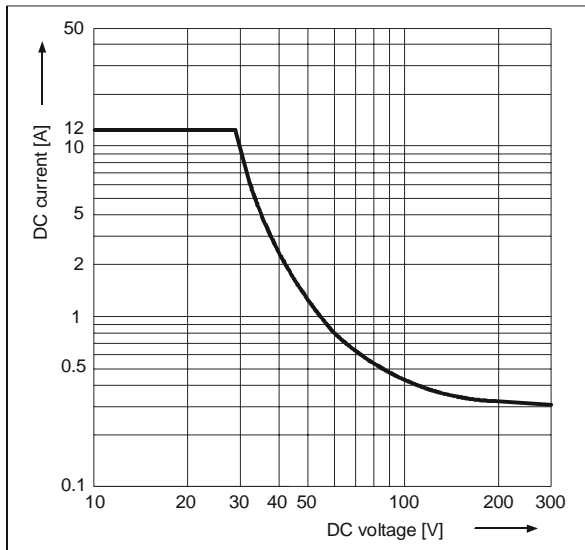
**Electrical life at AC resistive load. Maximum switching frequency at rated load** Fig. 1



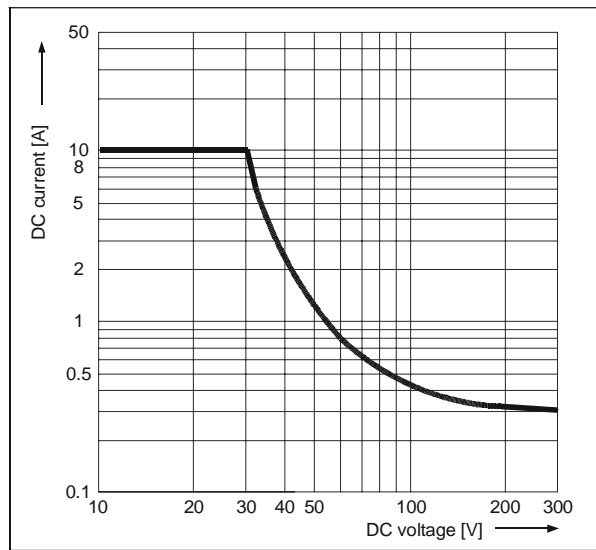
**Electrical life reduction factor at AC inductive load** Fig. 2



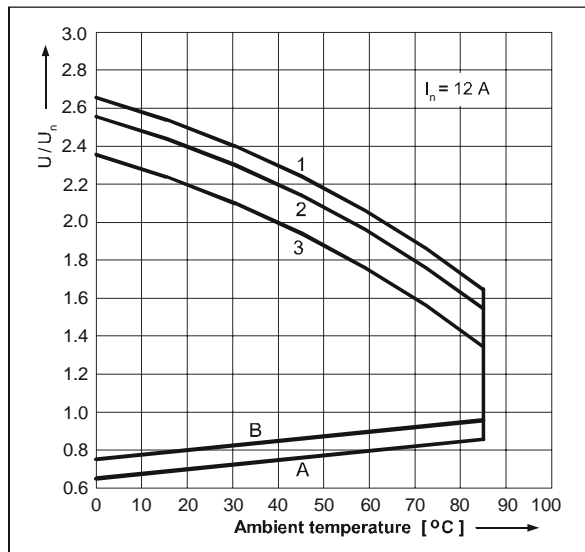
**Max. DC resistive load breaking capacity - standard version** Fig. 3



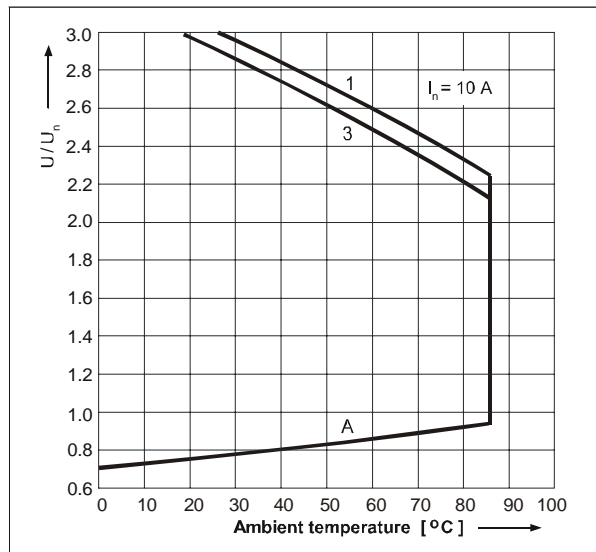
**Max. DC resistive load breaking capacity - sensitive version** Fig. 4



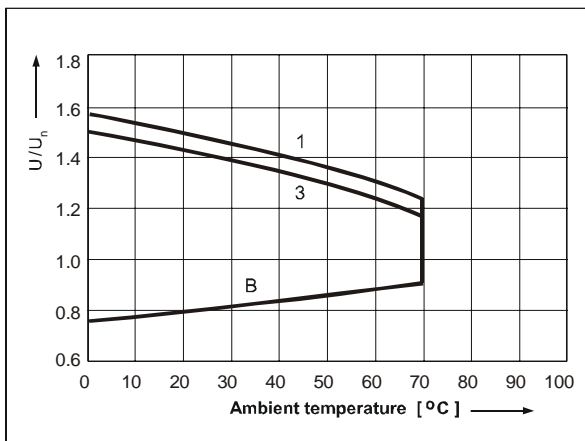
**Coil operating range - DC - standard version** Fig. 5



**Coil operating range - DC - sensitive version** Fig. 6



**Coil operating range - AC 50 Hz** Fig. 7



**Description of Fig. 5, 6 and 7**

**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

