

**Printed circuit mount - 3 mm contact gap**  
**50 A Power relay for photovoltaic inverters**

- 2 and 3 pole versions (NO, double break contacts)
- Contact gap  $\geq 3$  mm (according to VDE 0126-1-1, EN 62109-1, EN 62109-2)
- DC coils, with only 170 mW holding power
- Reinforced insulation between coil and contacts
- 1.5 mm gap between PCB and relay base
- Suitable for use at ambient temperatures up to 85 °C (with energy-saving coil energization) or 70 °C (with standard coil energization)
- Meets the EN 60335-1 requirements of resistance to heat and fire (GWIT 775 °C and GWFI 850 °C)
- Cadmium free contact materials:
  - AgNi version (for applications where lower contact resistance is needed)
  - AgSnO<sub>2</sub> version (for applications where higher inrush current values are expected)

**NEW 67.22-x300**

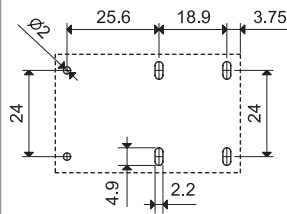
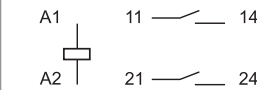


- 2 NO
- Contact gap  $\geq 3$  mm
- PCB mount

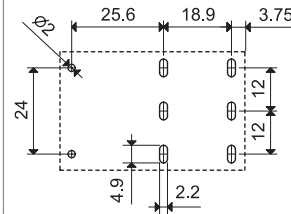
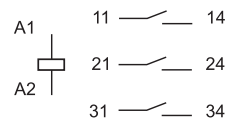
**NEW 67.23-x300**



- 3 NO
- Contact gap  $\geq 3$  mm
- PCB mount



Copper side view



Copper side view

For outline drawing see page 6

**Contact specification**

|   |           |                    |                    |
|---|-----------|--------------------|--------------------|
| Contact configuration                             |           | 2 NO (DPST-NO)     | 3 NO (3PST-NO)     |
| Contact gap                                       | mm        | $\geq 3$           | $\geq 3$           |
| Rated current/<br>Maximum peak current (for 5 ms) | A         | 50/150             | 50/150             |
| Rated voltage/<br>Maximum switching voltage       | V AC      | 400/690            | 400/690            |
| Rated load AC1/AC7a (per pole)                    | VA        | 20000              | 20000              |
| Rated load AC15 (per pole @ 230 V AC)             | VA        | 2300               | 2300               |
| Single-phase motor rating (230 V AC)              | kW        | 2.2                | 2.2                |
| Three-phase motor rating (480 V AC)               | kW        | —                  | 11                 |
| Breaking capacity DC1: 24/110/220 V               | A         | 50/4/1             | 50/4/1             |
| Minimum switching load                            | mW (V/mA) | 1000 (10/10)       | 1000 (10/10)       |
| Standard contact material                         |           | AgSnO <sub>2</sub> | AgSnO <sub>2</sub> |

**Coil specification**

|                                   |      |                                     |                              |
|-----------------------------------|------|-------------------------------------|------------------------------|
| Nominal voltage (U <sub>N</sub> ) | V DC | 5 - 6 - 8 - 12 - 24 - 48 - 60 - 110 |                              |
| Rated power                       | W    | 1.7                                 | 1.7                          |
| Operating range (-40...+70)°C     | DC   | (0.90 ... 1.1)U <sub>N</sub>        | (0.90 ... 1.1)U <sub>N</sub> |
| Energy-saving mode (-40...+85)°C  |      |                                     |                              |
| Operating range for 1 s           |      | (0.95...2.5)U <sub>N</sub>          | (0.95...2.5)U <sub>N</sub>   |
| Holding voltage range             | DC   | (0.32...0.65)U <sub>N</sub>         | (0.32...0.65)U <sub>N</sub>  |
| Minimum holding power             | W    | 0.17                                | 0.17                         |
| Must drop-out voltage             | DC   | 0.05 U <sub>N</sub>                 | 0.05 U <sub>N</sub>          |

**Technical data**

|  |        |                       |                       |
|--|--------|-----------------------|-----------------------|
| Mechanical life                                | cycles | 1 · 10 <sup>6</sup>   | 1 · 10 <sup>6</sup>   |
| Electrical life at rated load AC7a             | cycles | 30 · 10 <sup>3</sup>  | 30 · 10 <sup>3</sup>  |
| Operate/release time                           | ms     | 25/5                  | 25/5                  |
| Ambient temperature range (energy-saving mode) | °C     | -40...+70 (-40...+85) | -40...+70 (-40...+85) |
| Environmental protection                       |        | RT II                 | RT II                 |

**Approvals** (according to type)



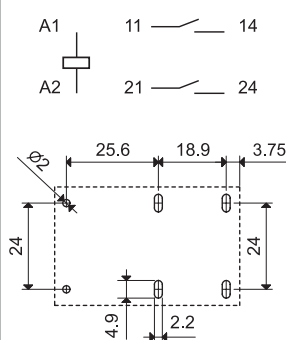
**Printed circuit mount - 5.2 mm contact gap  
50 A Power relay for photovoltaic inverters**

- 2 and 3 pole versions (NO double break contacts)
- Contact gap  $\geq 5.2$  mm (according to VDE 0126-1-1, EN 62109-1, EN 62109-2)
- Suitable for inverters with DC input up to 1500 V and AC output up to 690 V, installations up to 4000 m above sea level
- DC coils, with only 170 mW holding power
- Reinforced insulation between coil and contacts
- 1.5 mm gap between PCB and relay base
- Suitable for use at ambient temperatures up to 85 °C (with energy-saving coil energization) or 60 °C (with standard coil energization)
- Meets the EN 60335-1 requirements of resistance to heat and fire (GWIT 775 °C and GWFI 850 °C)
- Cadmium free contact materials:
  - AgNi version (for applications where lower contact resistance is needed)
  - AgSnO<sub>2</sub> version (for applications where higher inrush current values are expected)

A

**NEW 67.22-x500**

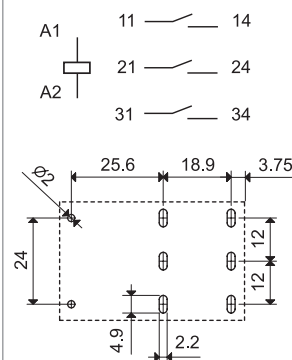

- 2 NO
- Contact gap  $\geq 5.2$  mm
- PCB mount



Copper side view

**NEW 67.23-x500**


- 3 NO
- Contact gap  $\geq 5.2$  mm
- PCB mount



Copper side view

For outline drawing see page 6

**Contact specification**

| Contact configuration                             |           | 2 NO (DPST-NO)     | 3 NO (3PST-NO)     |
|---|-----------|--------------------|--------------------|
| Contact gap                                       | mm        | $\geq 5.2$         | $\geq 5.2$         |
| Rated current/<br>Maximum peak current (for 5 ms) | A         | 50/150             | 50/150             |
| Rated voltage/<br>Maximum switching voltage       | V AC      | 400/690            | 400/690            |
| Rated load AC1/AC7a (per pole)                    | VA        | 20000              | 20000              |
| Rated load AC15 (per pole @ 230 V AC)             | VA        | 2300               | 2300               |
| Single-phase motor rating (230 V AC)              | kW        | 2.2                | 2.2                |
| Three-phase motor rating (480 V AC)               | kW        | —                  | 11                 |
| Breaking capacity DC1: 24/110/220                 | A         | 50/7/2             | 50/7/2             |
| Minimum switching load                            | mW (V/mA) | 1000 (10/10)       | 1000 (10/10)       |
| Standard contact material                         |           | AgSnO <sub>2</sub> | AgSnO <sub>2</sub> |

**Coil specification**

|                                   |      |                                     |                              |
|-----------------------------------|------|-------------------------------------|------------------------------|
| Nominal voltage (U <sub>N</sub> ) | V DC | 5 - 6 - 8 - 12 - 24 - 48 - 60 - 110 |                              |
| Rated power                       | W    | 2.7                                 | 2.7                          |
| Operating range (-40...+60)°C     | DC   | (0.90 ... 1.1)U <sub>N</sub>        | (0.90 ... 1.1)U <sub>N</sub> |
| Energy-saving mode (-40...+85)°C  |      |                                     |                              |
| Operating range for 1 s           |      | (0.95...2.5)U <sub>N</sub>          | (0.95...2.5)U <sub>N</sub>   |
| Holding voltage range             | DC   | (0.25...0.5)U <sub>N</sub>          | (0.25...0.5)U <sub>N</sub>   |
| Minimum holding power             | W    | 0.17                                | 0.17                         |
| Must drop-out voltage             | DC   | 0.05 U <sub>N</sub>                 | 0.05 U <sub>N</sub>          |

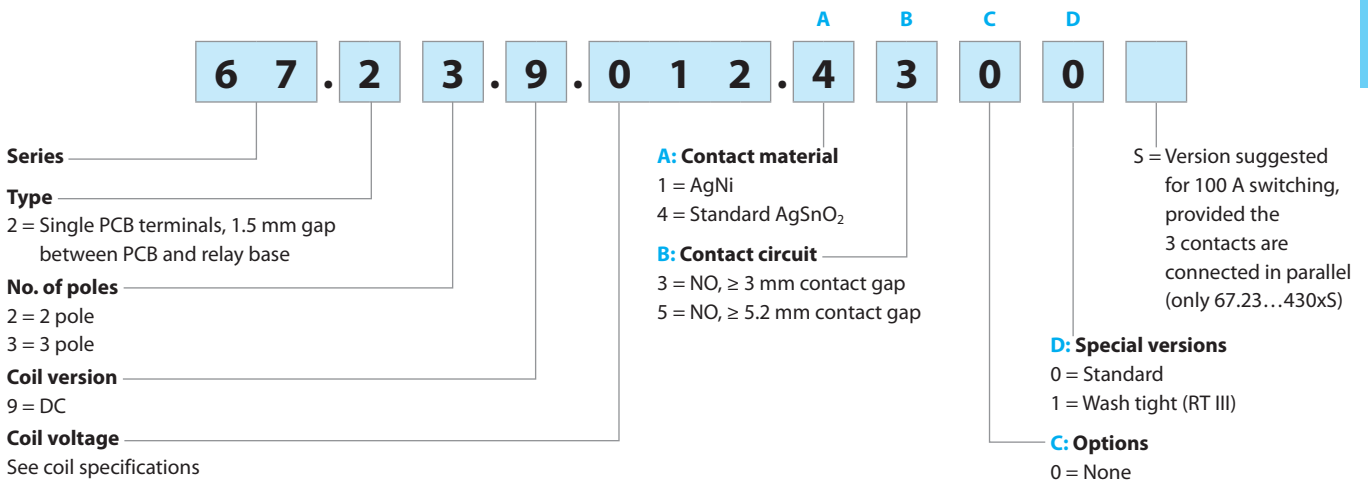
**Technical data**

|   |        |                       |                       |
|---|--------|-----------------------|-----------------------|
| Mechanical life                                   | cycles | 1 · 10 <sup>6</sup>   | 1 · 10 <sup>6</sup>   |
| Electrical life at rated load AC7a                | cycles | 30 · 10 <sup>3</sup>  | 30 · 10 <sup>3</sup>  |
| Operate/release time                              | ms     | 30/4                  | 30/4                  |
| Ambient temperature range<br>(energy-saving mode) | °C     | -40...+60 (-40...+85) | -40...+60 (-40...+85) |
| Environmental protection                          |        | RT II                 | RT II                 |

**Approvals** (according to type)


## Ordering information

Example: 67 series solar relay, single PCB terminals, 2 pole NO, ≥ 3 mm contact gap.



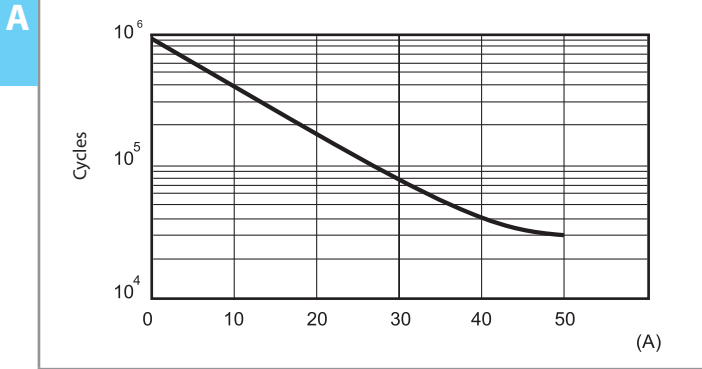
## Technical data

| Insulation according to EN 61810-1                 |                         |                                     |                                   |                    |
|--|-------------------------|-------------------------------------|-----------------------------------|--------------------|
| Nominal voltage of supply system                   | V AC                    | 400/690 3-phase                     | 400 1-phase                       | 230/400            |
| Rated insulation voltage                           | V AC                    | 630                                 | 400                               | 400                |
| Pollution degree                                   |                         | 3                                   |                                   |                    |
| Insulation between coil and contact set            |                         |                                     |                                   |                    |
| Type of Insulation                                 |                         | Reinforced                          |                                   |                    |
| Overvoltage category                               |                         | III                                 |                                   |                    |
| Rated impulse voltage                              | kV (1.2/50 μs)          | 6                                   |                                   |                    |
| Dielectric strength                                | V AC                    | 4000                                |                                   |                    |
| Insulation between adjacent contacts               |                         |                                     |                                   |                    |
| Type of Insulation                                 |                         | Basic                               |                                   |                    |
| Overvoltage category                               |                         | III                                 |                                   |                    |
| Rated impulse voltage                              | kV (1.2/50)μs           | 6                                   |                                   |                    |
| Dielectric strength                                | V AC                    | 2500                                |                                   |                    |
| Insulation between open contacts                   |                         |                                     |                                   |                    |
| Type of disconnection                              |                         | Micro-disconnection*                |                                   | Full-disconnection |
| Overvoltage category                               |                         | —                                   |                                   | III                |
| Rated impulse voltage                              | kV (1.2/50)μs           | —                                   |                                   | 4                  |
| Dielectric strength                                | V AC                    | 2500 (67.xx-x300)/3000 (67.xx-x500) |                                   |                    |
| Conducted disturbance immunity                     |                         |                                     |                                   |                    |
| Burst (5...50)ns, 5 kHz, on A1 - A2                |                         | EN 61000-4-4                        | level 4 (4 kV)                    |                    |
| Surge (1.2/50 μs) on A1 - A2 (differential mode)   |                         | EN 61000-4-5                        | level 4 (4 kV)                    |                    |
| Other data   |                         |                                     |                                   |                    |
| Bounce time: NO                                    | ms                      | 2                                   |                                   |                    |
| Vibration resistance (10...150)Hz: NO              | g                       | 15                                  |                                   |                    |
| Shock resistance                                   | g                       | 35                                  |                                   |                    |
| Power lost to the environment                      | without contact current | W                                   | 1.7 (67.xx-x300)/2.7 (67.xx-x500) |                    |
|  | with rated current      | W                                   | 8.5 (67.xx-x300)/9.5 (67.xx-x500) |                    |
| Recommended distance between relays mounted on PCB | mm                      | ≥ 20                                |                                   |                    |
| Short circuit protection                           |                         |                                     |                                   |                    |
| Rated conditional short circuit current            | kA                      | 5                                   |                                   |                    |
| Back-up fuse for motor load                        | A                       | 30 (delayed type)                   |                                   |                    |

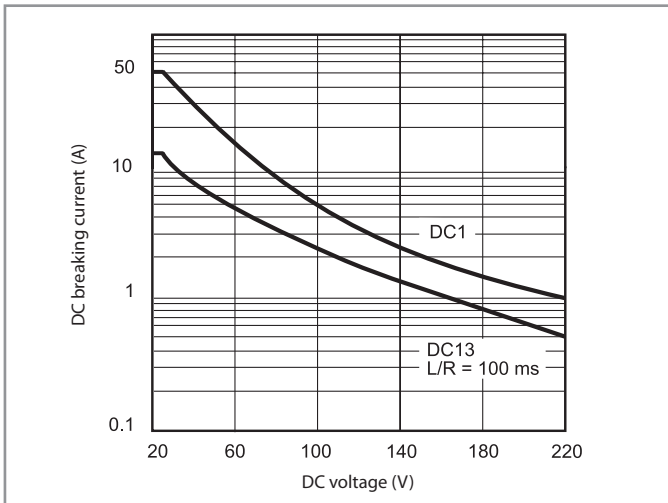
\* with overvoltage category II: Full-disconnection

## Contact specification

F 67 - Electrical life vs contact current (AC1/AC7a load)

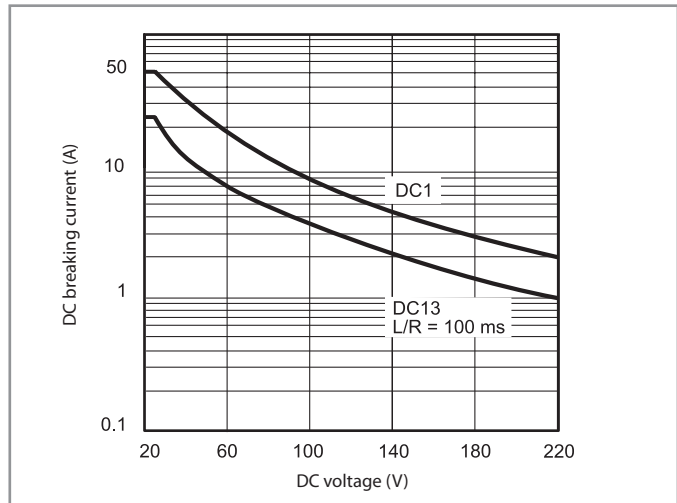


H 67 - Maximum DC breaking capacity (67.xx-x300)



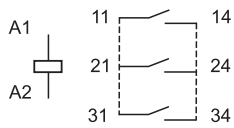
When switching a resistive (DC1) or inductive (DC13) load having voltage and current values under the corresponding curve, an electrical life of > 30000 cycles can be expected.

H 67 - Maximum DC breaking capacity (67.xx-x500)



When switching a resistive (DC1) or inductive (DC13) load having voltage and current values under the corresponding curve, an electrical life of > 30000 cycles can be expected.

## Connection of contacts in parallel



Connecting in parallel the contacts, with appropriate dimensioning of tracks on PC board, allow the relays to carry and switch loads up to 100 A:  
 - 100 A, with 67.23...4300S version  
 - 80 A, with 67.23...1300 version

**Coil specifications**

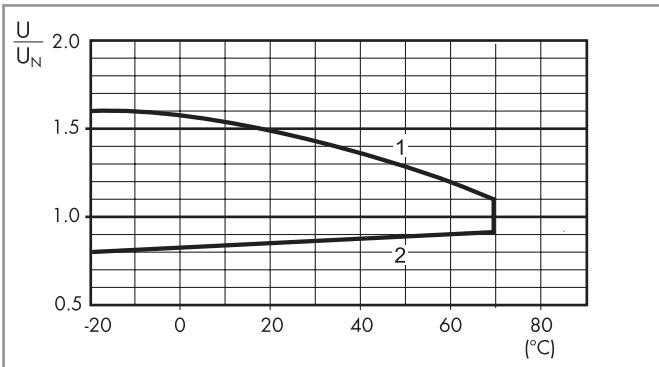
**DC coil data, 67.xx-x300**

| Nominal voltage<br>$U_N$ | Coil code | Operating range (@ 70 °C max) |           | Holding voltage<br>$U_h$ | Resistance<br>$R$ | Rated coil consumption<br>I at $U_N$<br>$I_N$ |
|--------------------------|-----------|-------------------------------|-----------|--------------------------|-------------------|---|
|                          |           | $U_{min}$                     | $U_{max}$ |                          |                   |   |
| V                        |           | V                             | V         | V                        | $\Omega$          | mA  |
| 5                        | 9.005     | 4.5                           | 5.5       | 1.6                      | 14.7              | 340   |
| 6                        | 9.006     | 5.4                           | 6.6       | 1.9                      | 21.5              | 279   |
| 8                        | 9.008     | 7.2                           | 8.8       | 2.6                      | 37.6              | 213   |
| 12                       | 9.012     | 10.8                          | 13.2      | 3.8                      | 85                | 141   |
| 24                       | 9.024     | 21.6                          | 26.4      | 7.7                      | 340               | 71  |
| 48                       | 9.048     | 43.2                          | 52.8      | 15.4                     | 1355              | 35  |
| 60                       | 9.060     | 54                            | 66        | 19.2                     | 2120              | 28  |
| 110                      | 9.110     | 99                            | 121       | 35.2                     | 7120              | 15  |

**DC coil data, 67.xx-x500**

| Nominal voltage<br>$U_N$ | Coil code | Operating range (@ 60 °C max) |           | Holding voltage<br>$U_h$ | Resistance<br>$R$ | Rated coil consumption<br>I at $U_N$<br>$I_N$ |
|--------------------------|-----------|-------------------------------|-----------|--------------------------|-------------------|---|
|                          |           | $U_{min}$                     | $U_{max}$ |                          |                   |   |
| V                        |           | V                             | V         | V                        | $\Omega$          | mA  |
| 5                        | 9.005     | 4.5                           | 5.5       | 1.25                     | 9.3               | 538   |
| 6                        | 9.006     | 5.4                           | 6.6       | 1.5                      | 13.5              | 444   |
| 8                        | 9.008     | 7.2                           | 8.8       | 2                        | 23.7              | 338   |
| 12                       | 9.012     | 10.8                          | 13.2      | 3                        | 53.5              | 224   |
| 24                       | 9.024     | 21.6                          | 26.4      | 6                        | 213               | 113   |
| 48                       | 9.048     | 43.2                          | 52.8      | 12                       | 855               | 56  |
| 60                       | 9.060     | 54                            | 66        | 15                       | 1335              | 45  |
| 110                      | 9.110     | 99                            | 121       | 27.5                     | 4500              | 24  |

**R 67 - Operating range v ambient temperature, 67.xx-x300**  
with standard (continuous) coil energization (-40...+70)°C



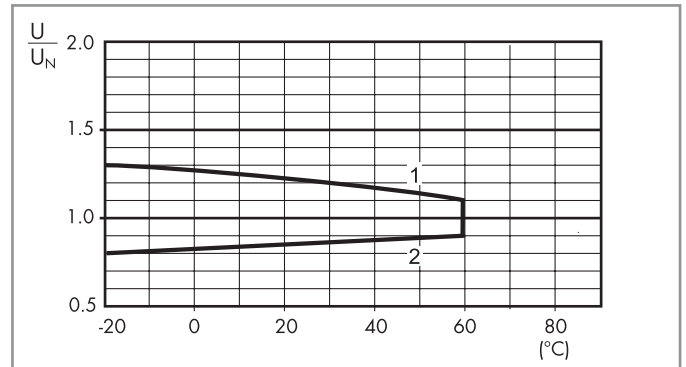
- 1 - Max. permitted coil voltage.
- 2 - Min. pick-up voltage with coil at ambient temperature.

**Energy saving mode**

In some applications, such as photovoltaic inverters, it may be necessary to minimize the overall relay power dissipation and to permit use at higher ambient temperature levels (up to 85 °C). This can be achieved by initially applying a coil voltage within the Energy saving mode Operating range (see diagram to the right) and then rapidly (< 1 s) reducing the coil voltage to a level within the Holding voltage range. The lower the Holding voltage, the lower is the continuous power dissipation of the coil (0.17 W minimum).

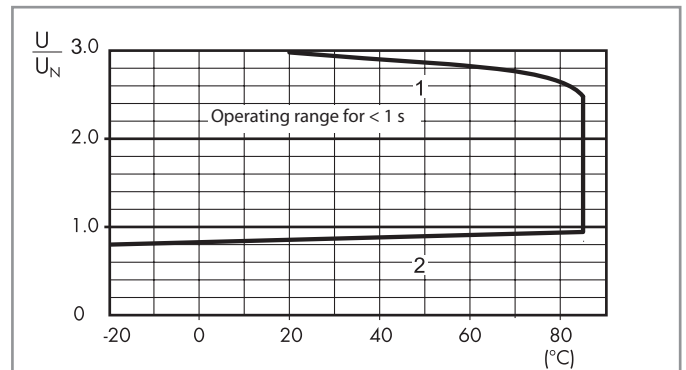
Coil voltages as high as 2.5  $U_N$  may be used, when necessary, to reduce the contact operate time.

**R 67 - Operating range v ambient temperature, 67.xx-x500**  
with standard (continuous) coil energization (-40...+60)°C



- 1 - Max. permitted coil voltage.
- 2 - Min. pick-up voltage with coil at ambient temperature.

**R 67 - Operating range v ambient temperature, 67.xx-x300/x500**  
in energy saving mode (-40...+85)°C

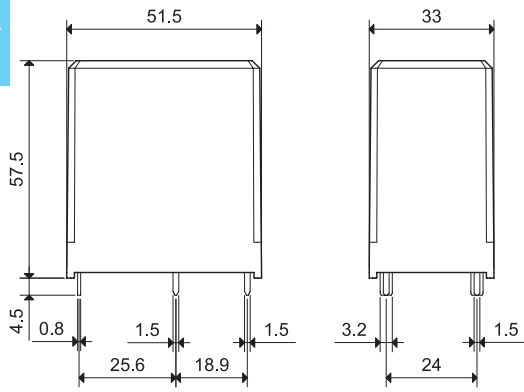


- 1 - Max. permitted coil voltage.
- 2 - Min. pick-up voltage with coil at ambient temperature.

Outline drawings

A

Type 67.22



Type 67.23

