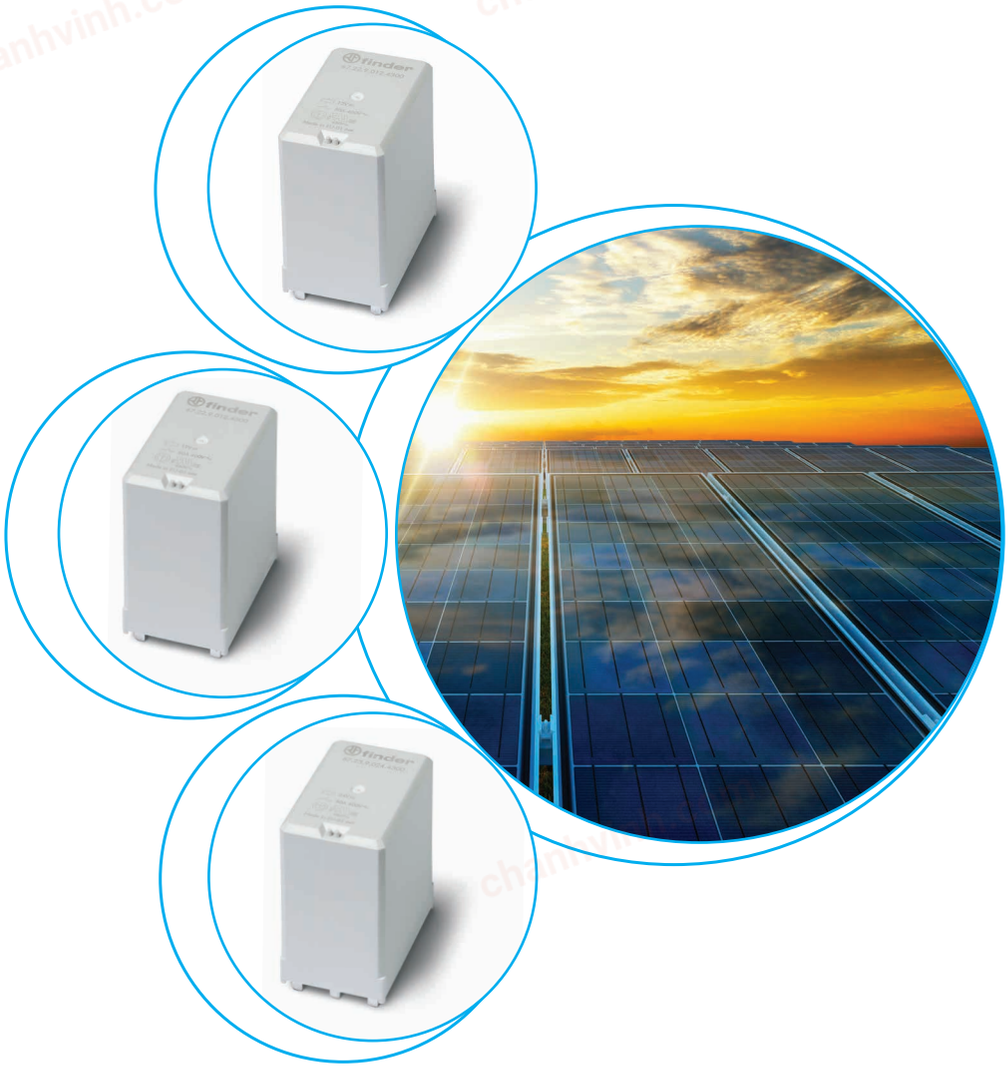
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SWITCH TO THE FUTURE

67
SERIES

# High Power relay 50 A

- Power generators
- Back-up generators
- Pump control
- Disabled lift
- Inverter



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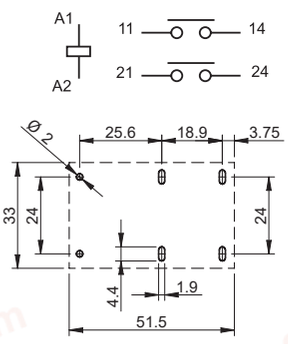
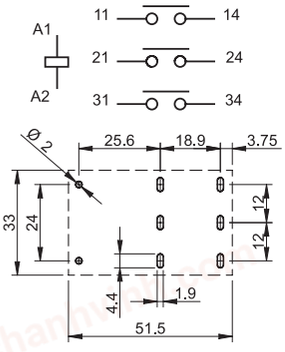


**Printed circuit mount - 3 mm contact gap**
**50 A Power relay for photovoltaic inverters**

**Type 67.22-x300**
- 2 NO

**Type 67.23-x300**
- 3 NO

- Contact gap ≥ 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)
  - $AgSnO_2$ version (for applications where higher inrush current values are expected)

| | 67.22-x300 | 67.23-x300 |
|---|---|---|
| |  |  |
| | • 2 NO<br>• Contact gap ≥ 3 mm<br>• PCB mount | • 3 NO<br>• Contact gap ≥ 3 mm<br>• PCB mount |
| |  |  |
| For outline drawing see page 8 | Copper side view | Copper side view |
| **Contact specification** | | |
| Contact configuration | 2 NO (DPST-NO) | 3 NO (3PST-NO) |
| Contact gap mm | ≥ 3 | ≥ 3 |
| Rated current/ Maximum peak current (for 5 ms) A | 50/150 | 50/150 |
| Rated voltage/ 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 | $AgSnO_2$ | $AgSnO_2$ |
| **Coil specification** | | |
| Nominal voltage ($U_N$) V DC | 5 - 6 - 8 - 12 - 24 - 48 | |
| Rated power W | 1.7 | 1.7 |
| Operating range (–40…+70)°C DC | (0.90 …1.1)$U_N$ | (0.90 …1.1)$U_N$ |
| Energy-saving mode (–40…+85)°C | | |
| Operating range for 1 s | (0.95…2.5)$U_N$ | (0.95…2.5)$U_N$ |
| Holding voltage range DC | (0.32…0.65)$U_N$ | (0.32…0.65)$U_N$ |
| Minimum holding power W | 0.17 | 0.17 |
| Must drop-out voltage DC | 0.05 $U_N$ | 0.05 $U_N$ |
| **Technical data** | | |
| Mechanical life cycles | $1 \cdot 10^6$ | $1 \cdot 10^6$ |
| Electrical life at rated load AC7a cycles | $30 \cdot 10^3$ | $30 \cdot 10^3$ |
| 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) | EAC cULus 03 | |

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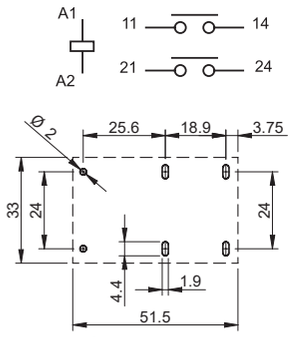
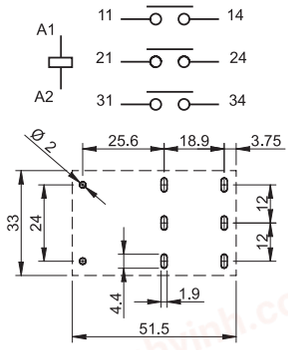
# 67 SERIES
# High Power relay 50 A

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

**Type 67.22-x500**
- 2 NO

**Type 67.23-x500**
- 3 NO

- Contact gap ≥ 5.2 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 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)
  - $AgSnO_2$ version (for applications where higher inrush current values are expected)

| | **67.22-x500** | **67.23-x500** |
|---|---|---|
| |  |  |
| | • 2 NO<br>• Contact gap ≥ 5.2 mm<br>• PCB mount | • 3 NO<br>• Contact gap ≥ 5.2 mm<br>• PCB mount |
| |  |  |
| For outline drawing see page 8 | Copper side view | Copper side view |
| **Contact specification** | | |
| Contact configuration | 2 NO (DPST-NO) | 3 NO (3PST-NO) |
| Contact gap mm | ≥ 5.2 | ≥ 5.2 |
| Rated current/ Maximum peak current (for 5 ms) A | 50/150 | 50/150 |
| Rated voltage/ 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 | $AgSnO_2$ | $AgSnO_2$ |
| **Coil specification** | | |
| Nominal voltage ($U_N$) V DC | 5 - 6 - 8 - 12 - 24 - 48 | |
| Rated power W | 2.7 | 2.7 |
| Operating range (–40…+60)°C DC | (0.90 …1.1)$U_N$ | (0.90 …1.1)$U_N$ |
| Energy-saving mode (–40…+85)°C | | |
| Operating range for 1 s | (0.95…2.5)$U_N$ | (0.95…2.5)$U_N$ |
| Holding voltage range DC | (0.25…0.5)$U_N$ | (0.25…0.5)$U_N$ |
| Minimum holding power W | 0.17 | 0.17 |
| Must drop-out voltage DC | 0.05 $U_N$ | 0.05 $U_N$ |
| **Technical data** | | |
| Mechanical life cycles | $1 \cdot 10^6$ | $1 \cdot 10^6$ |
| Electrical life at rated load AC7a cycles | $30 \cdot 10^3$ | $30 \cdot 10^3$ |
| Operate/release time ms | 30/4 | 30/4 |
| Ambient temperature range (energy-saving mode) °C | –40…+60 (–40…+85) | –40…+60 (–40…+85) |
| Environmental protection | RT II | RT II |
| **Approvals** (according to type) | EAC cULus | |



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## Ordering information

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

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | A | B | C | D | | |
| 6 | 7 | . | 2 | 3 | . | 9 | . | 0 | 1 | 2 | . | 4 | 3 | 0 | 0 | |

**Series**

**Type**
2 = Single PCB terminals, 1.5 mm gap between PCB and relay base

**No. of poles**
2 = 2 pole
3 = 3 pole

**Coil version**
9 = DC

**Coil voltage**
See coil specifications

**A: Contact material**
1 = AgNi
4 = Standard $AgSnO_2$

**B: Contact circuit**
3 = NO, ≥ 3 mm contact gap
5 = NO, ≥ 5.2 mm contact gap

**D: Special versions**
0 = Standard
1 = Wash tight (RT III)

**C: Options**
0 = None

S = Version suggested for 100 A switching, provided the 3 contacts are connected in parallel (only 67.23…430xS)

## 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) | | |
| **Insulation between coil terminals** | | | | | |
| Rated impulse voltage (surge) differential mode (according to EN 61000-4-5) | | kV (1.2/50 µs) | 4 | | |
| **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

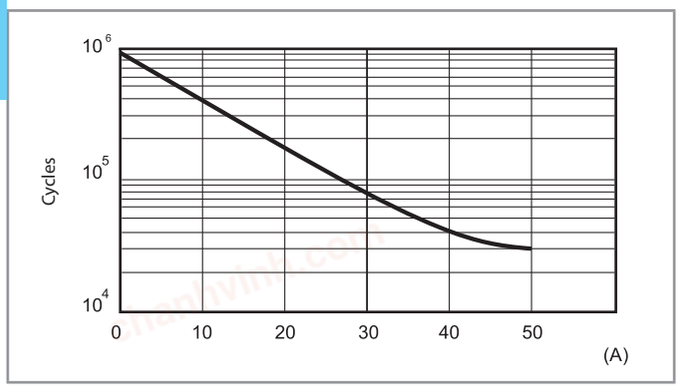
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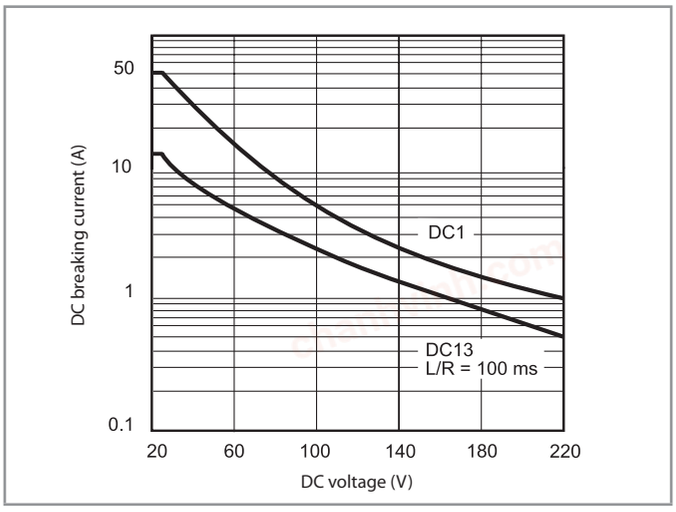
## Contact specification

A

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

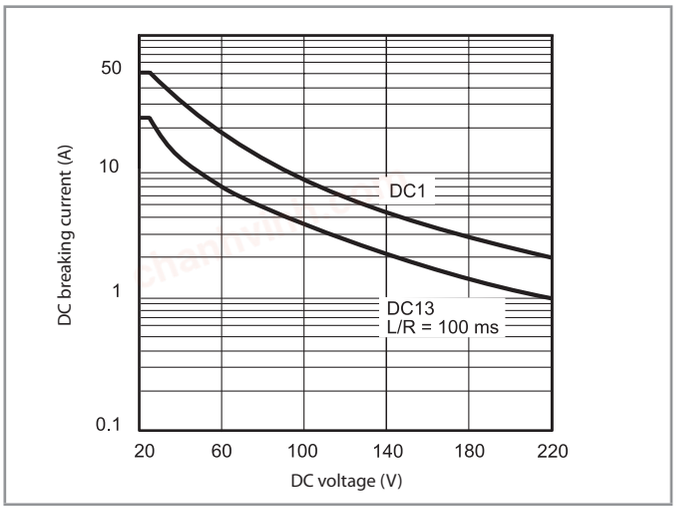



**H 67-1 - Maximum DC breaking capacity (67.xx-x300)**



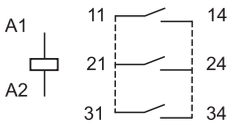

When switching a resistive (DC1) or inductive (DC13) load having voltage and current values under the corresponding curve, an electrical life of > 30000 cycles can be expected.

**H 67-2 - 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

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## Coil specifications

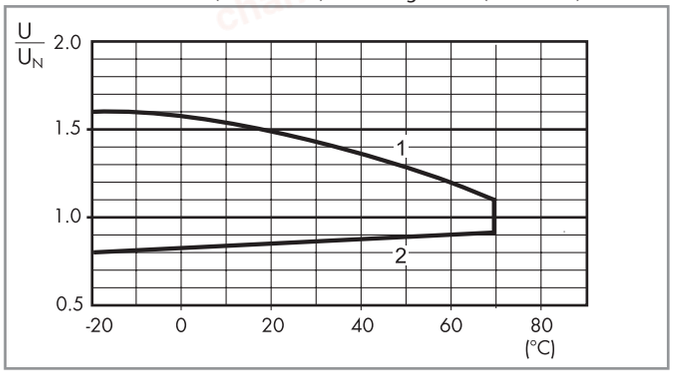
**DC coil data, 67.xx-x300**

| Nominal voltage $U_N$ | Coil code | Operating range (@ 70 °C max) $U_{min}$ | $U_{max}$ | Holding voltage $U_h$ | Resistance R | Rated coil consumption I at $U_N$ $I_N$ |
|---|---|---|---|---|---|---|
| V | | V | V | V | Ω | 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 |

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

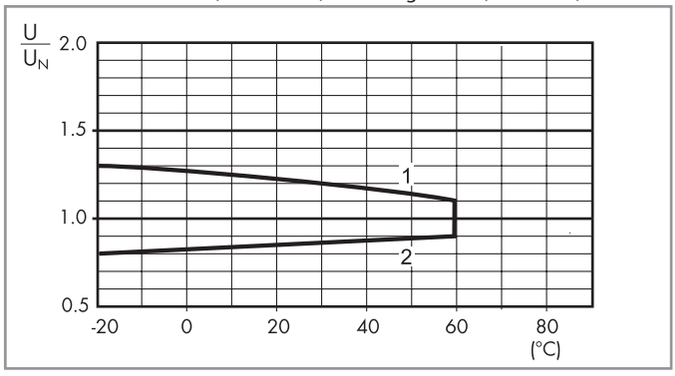
| Nominal voltage $U_N$ | Coil code | Operating range (@ 60 °C max) $U_{min}$ | $U_{max}$ | Holding voltage $U_h$ | Resistance R | Rated coil consumption I at $U_N$ $I_N$ |
|---|---|---|---|---|---|---|
| V | | V | V | V | Ω | mA |
| 5 | **9**.005 | 4.5 | 5.5 | 1.25 | 9.3 | 538 |
| 6 | **9**.006 | 5.4 | 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 |

**R 67-1 - 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.

**R 67-2 - Operating range v ambient temperature, 67.xx-x500**
with standard (continuous) coil energization (–40…+60)°C

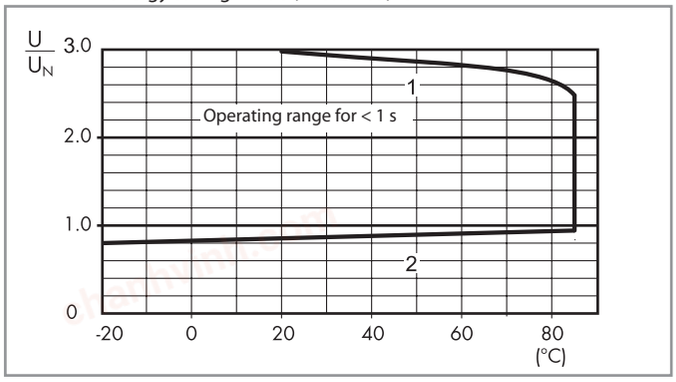



**1 -** Max. permitted coil voltage.
**2 -** Min. pick-up voltage with coil at ambient temperature.

**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 67-3 - 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.

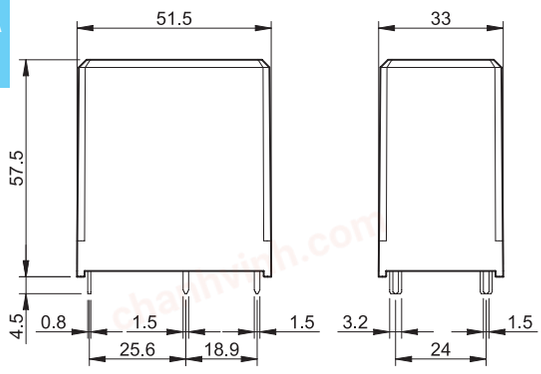
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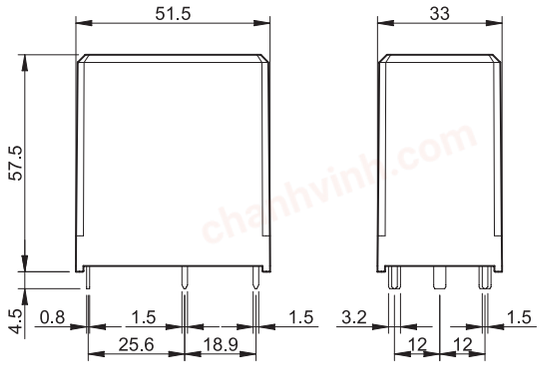
## Outline drawings

A

Type 67.22




Type 67.23




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