



finder[®]
SWITCH TO THE FUTURE

45
SERIES

Miniature PCB Relays 10 - 16 A



Burners, boilers
and furnaces



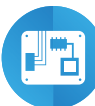
Film projectors



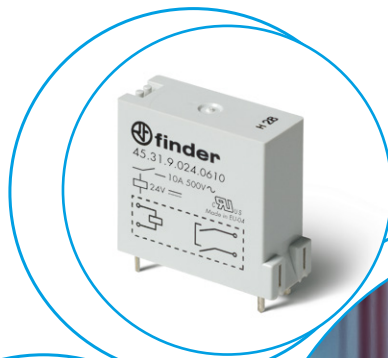
Infrared and
microwave
ovens



Jacuzzis and
hot tubs



Electronic
circuit boards



Relay for +105 °C ambient use
PCB mount - high contact gap

- **45.31...x310, 1 Pole normally open**
(≥ 3 mm contact gap)
- **45.31...0610, 1 Pole normally open**
(≥ 3.6 mm contact gap)

- Contact gap ≥ 3 mm or ≥ 3.6 mm according to EN 60730-1
- Sensitive DC coil - 360 mW (45.31...x310 type)
- Cadmium Free contact material
- Reinforced insulation between coil and contacts according to EN 60335-1, EN 50178, EN 60204 with safe separation and 8 mm clearance and creepage distance
- 6 kV (1.2/50 μs) isolation, coil-contacts
- Flux proof: RT II

45.31...x310

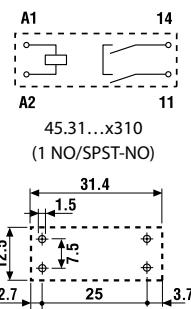


- 1 NO (SPST-NO), ≥ 3 mm gap
- Max ambient temperature +105 °C
- PCB mounting

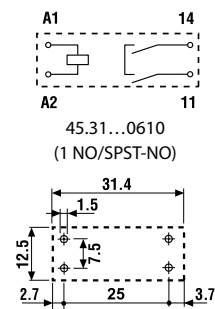
45.31...0610



- 1 NO (SPST-NO), ≥ 3.6 mm gap
- Max ambient temperature +105 °C
- PCB mounting



Copper side view



Copper side view

FOR UL RATINGS SEE:
"General technical information" page V

For outline drawing see page 7

| Contact specification | | | 45.31...x310 (1 NO/SPST-NO) | 45.31...0610 (1 NO/SPST-NO) |
|--|-----------------|--|--------------------------------|--------------------------------|
| Contact configuration | | | 1NO (SPST-NO) ≥ 3 mm gap | 1NO (SPST-NO) ≥ 3.6 mm gap |
| Rated current/Maximum peak current | A | | 16/30 | 10/30 |
| Rated voltage/ Maximum switching voltage | V AC | | 250/400 | 500/500 |
| Rated load AC1 | VA | | 4000 | 5000 |
| Rated load AC15 (230 V AC) | VA | | 750 | 750 |
| Single phase motor rating (230 V AC) | kW | | 0.55 | 0.55 |
| Breaking capacity DC1: 30/110/220 V | A | | 16/4/1 | 10/4/1 |
| Minimum switching load | mW (V/mA) | | 500 (10/5) | 500 (10/5) |
| Standard contact material | | | AgNi | AgNi |
| Coil specification | | | | |
| Nominal voltage (U _N) | V AC (50/60 Hz) | | — | — |
| | V DC | | 6 - 12 - 24 - 48 - 60 | 6 - 12 - 24 - 48 - 60 |
| Rated power AC/DC | VA (50 Hz)/W | | —/0.36 | —/0.55 |
| Operating range | AC | | — | — |
| | DC | | (0.7...1.2)U _N | (0.8...1.2)U _N |
| Holding voltage | AC/DC | | —/0.4 U _N | —/0.4 U _N |
| Must drop-out voltage | AC/DC | | —/0.1 U _N | —/0.1 U _N |
| Technical data | | | | |
| Mechanical life AC/DC | cycles | | —/10 · 10 ⁶ | —/2 · 10 ⁶ |
| Electrical life at rated load AC1 | cycles | | 30 · 10 ³ | 10 · 10 ³ |
| Operate/release time | ms | | 12/2 | 12/2 |
| Insulation between coil and contacts (1.2/50 μs) | kV | | 6 (8 mm) | 6 (8 mm) |
| Dielectric strength between open contacts | V AC | | 2500 | 3000 |
| Ambient temperature range | °C | | −40...+105 | −40...+105 |
| Environmental protection | | | RT II | RT II |
| Approvals (according to type) | | | | |

Relays for +125 °C ambient use

PCB mount - Faston 250 contact connections

- 45.71, 1 Pole normally open or normally closed

- 45.91, 1 Pole normally open (≥ 3 mm contact gap)

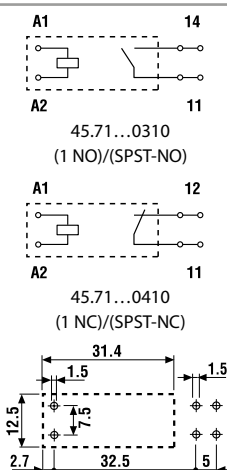
- Contact gap ≥ 3 mm according to EN 60730-1 (45.91 type)
- Sensitive DC coil - 360 mW
- Cadmium Free option available
- Reinforced insulation between coil and contacts according to EN 60335-1, EN 50178, EN 60204 with safe separation and 8 mm clearance and creepage distance
- 6 kV (1.2/50 μs) isolation, coil-contacts
- Flux proof: RT II standard, (RT III option)

A

45.71



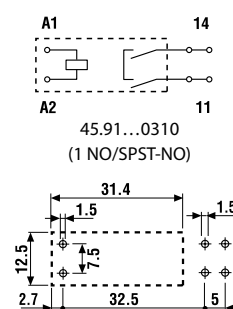
- 1 NO or 1 NC (SPST-NO or SPST-NC)
- Max ambient temperature +125 °C
- PCB mounting + Faston 250



45.91



- 1 NO (SPST-NO), ≥ 3 mm gap
- Max ambient temperature +125 °C
- PCB mounting + Faston 250



FOR UL RATINGS SEE:

"General technical information" page V

For outline drawing see page 7

Contact specification

| | | | |
|---|-----------|---------------------------------|--------------------------|
| Contact configuration | | 1NO or 1NC (SPST-NO or SPST-NC) | 1NO (SPST-NO) ≥ 3 mm gap |
| Rated current/Maximum peak current | A | 16/30 | 16/30 |
| Rated voltage/ Maximum switching voltage | V AC | 250/400 | 250/400 |
| Rated load AC1 | VA | 4000 | 4000 |
| Rated load AC15 (230 V AC) | VA | 750 | 750 |
| Single phase motor rating (230 V AC) | kW | 0.55 | 0.55 |
| Breaking capacity DC1: 30/110/220 V | A | 16/0.3/0.13 | 16/4/1 |
| Minimum switching load | mW (V/mA) | 500 (10/5) | 500 (10/5) |
| Standard contact material | | AgCdO | AgNi |

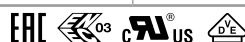
Coil specification

| | | | |
|-----------------------------------|-----------------|---------------------------|---------------------------|
| Nominal voltage (U _N) | V AC (50/60 Hz) | — | — |
| | V DC | 6 - 12 - 24 - 48 - 60 | 6 - 12 - 24 - 48 - 60 |
| Rated power AC/DC | VA (50 Hz)/W | —/0.36 | —/0.36 |
| Operating range | AC | — | — |
| | DC | (0.7...1.2)U _N | (0.7...1.2)U _N |
| Holding voltage | AC/DC | —/0.4 U _N | —/0.4 U _N |
| Must drop-out voltage | AC/DC | —/0.1 U _N | —/0.1 U _N |

Technical data

| | | | |
|--|--------|------------------------|------------------------|
| Mechanical life AC/DC | cycles | —/10 · 10 ⁶ | —/10 · 10 ⁶ |
| Electrical life at rated load AC1 | cycles | 100 · 10 ³ | 30 · 10 ³ |
| Operate/release time | ms | 10/2 | 12/2 |
| Insulation between coil and contacts (1.2/50 μs) | kV | 6 (8 mm) | 6 (8 mm) |
| Dielectric strength between open contacts | V AC | 1000 | 2500 |
| Ambient temperature range | °C | −40...+125 | −40...+125 |
| Environmental protection | | RT II | RT II |

Approvals (according to type)



Ordering information

Example: 45 series for PCB relay + Faston 250, 1 NO (SPST-NO), 12 V DC coil.

| | | | | | | | |
|---------------------|---|----------------|----------------|--|----------|----------|--|
| | 4 5 . 7 | 1 . 7 . | 0 1 2 . | A | B | C | D |
| | 0 | 3 | 1 | 0 | 3 | 1 | 0 |
| Series | | | | | | | |
| Type | 3 = PCB mount, ≥ 3 mm or ≥ 3.6 mm contact gap 7 = PCB + Faston 250 mount 9 = PCB + Faston 250 mount, ≥ 3 mm | | | | | | |
| No. of poles | 1 = 1 pole, 16 A | | | | | | |
| Coil version | 7 = Sensitive DC 9 = Standard DC (45.31...0610 only) | | | | | | |
| Coil voltage | See coil specifications | | | | | | |
| | | | | A: Contact material | | | D: Special versions |
| | | | | 0 = Standard AgCdO for 45.71, Standard AgNi for 45.31 and 45.91 | | | 0 = Flux proof (RT II) 1 = Wash tight (RT III) 45.71 and 45.91 only |
| | | | | 1 = AgNi 2 = AgCdO | | | C: Options |
| | | | | B: Contact circuit | | | 1 = None |
| | | | | 3 = NO (SPST) 4 = NC (SPST) 45.71 only 6 = NO (SPST), ≥ 3.6 mm | | | |

Selecting features and options: only combinations in the same row are possible.

| Type | Coil version | A | B | C | D |
|-------|--------------|-------|-------|---|-------|
| 45.31 | sensitive DC | 0 - 2 | 3 | 1 | 0 |
| | standard DC | 0 | 6 | 1 | 0 |
| 45.71 | sensitive DC | 0 - 1 | 3 - 4 | 1 | 0 - 1 |
| 45.91 | sensitive DC | 0 - 2 | 3 | 1 | 0 - 1 |

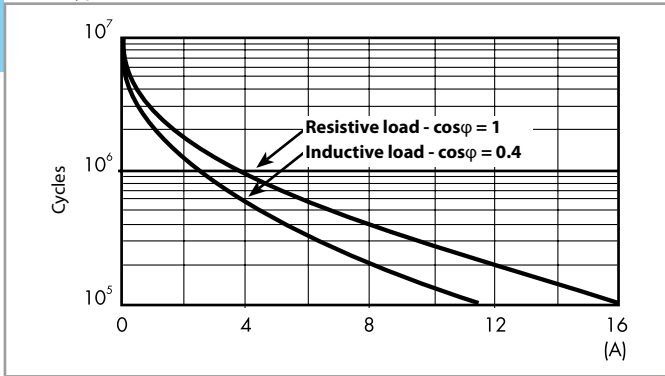
Technical data

| Insulation according to EN 61810-1 | | 45.71 | | 45.31 / 45.91 | |
|---|-------------------------|---------------------|-----|--------------------|-----|
| Nominal voltage of supply system | V AC | 230/400 | | 230/400 | |
| Rated insulation voltage | V AC | 250 | 400 | 250 | 400 |
| Pollution degree | | 3 | 2 | 3 | 2 |
| Insulation between coil and contact set | | | | | |
| Type of insulation | | Reinforced (8 mm) | | Reinforced (8 mm) | |
| Overvoltage category | | III | | III | |
| Rated impulse voltage | kV (1.2/50 μs) | 6 | | 6 | |
| Dielectric strength | V AC | 4000 | | 4000 | |
| 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/kV (1.2/50 μs) | 1000/1.5 | | 2500/4 | |
| Insulation between coil terminals | | | | | |
| Rated impulse voltage (surge) differential mode (according to EN 61000-4-5) | kV (1.2/50 μs) | 2 | | | |
| Other data | | 45.71 | | 45.31 / 45.91 | |
| Bounce time: NO/NC | ms | 3/3 | | 2/— | |
| Vibration resistance (10...150)Hz: NO/NC | g | 20/10 | | 20/— | |
| Shock resistance | g | 20 | | | |
| Power lost to the environment | without contact current | W | 0.4 | | |
| | with rated current | W | 1.8 | | |
| Recommended distance between relays mounted on PCB | mm | ≥ 5 | | | |

Contact specification

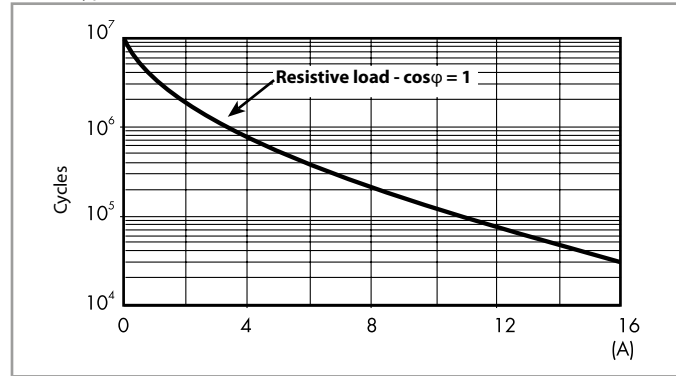
F 45 - Electrical life (AC) v contact current

Type 45.71

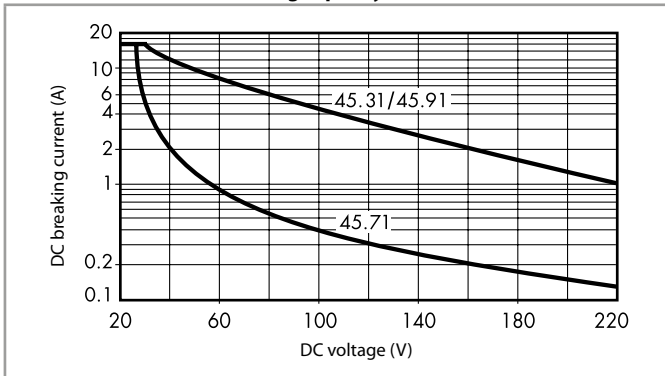


F 45 - Electrical life (AC) v contact current

Type 45.31/45.91



H 45 - Maximum DC1 breaking capacity



- When switching a resistive load (DC1) having voltage and current values under the curve, an electrical life of $\geq 100 \cdot 10^3$ cycles (45.71) and $\geq 30 \cdot 10^3$ cycles (45.31, 45.91) can be expected.
- In the case of DC13 loads, the connection of a diode in parallel with the load will permit a similar electrical life as for a DC1 load. Note: the release time for the load will be increased.

Coil specifications

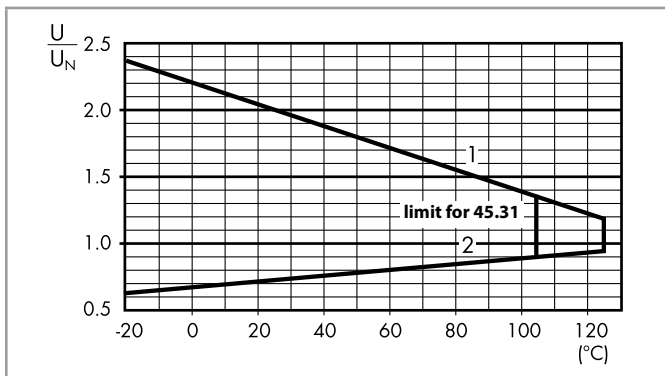
DC coil data - 0.36 W sensitive

| Nominal voltage U_N | Coil code | Operating range | | Resistance R | Rated coil consumption I at U_N |
|--------------------------|-----------|-----------------|-----------|-------------------|--|
| | | U_{min} | U_{max} | | |
| V | | V | V | Ω | mA |
| 6 | 7.006 | 4.2 | 7.2 | 100 | 60 |
| 12 | 7.012 | 8.4 | 14.4 | 400 | 30 |
| 24 | 7.024 | 16.8 | 28.8 | 1600 | 15 |
| 48 | 7.048 | 33.6 | 57.6 | 6400 | 7.5 |
| 60 | 7.060 | 42 | 72 | 10000 | 6 |

DC coil data - 0.55 W standard

| Nominal voltage U_N | Coil code | Operating range | | Resistance R | Rated coil consumption I at U_N |
|--------------------------|-----------|-----------------|-----------|-------------------|--|
| | | U_{min} | U_{max} | | |
| V | | V | V | Ω | mA |
| 6 | 9.006 | 4.2 | 7.2 | 72 | 83 |
| 12 | 9.012 | 8.4 | 14.4 | 300 | 40 |
| 24 | 9.024 | 16.8 | 28.8 | 1150 | 21 |
| 48 | 9.048 | 33.6 | 57.6 | 4400 | 11 |
| 60 | 9.060 | 42 | 72 | 7200 | 8.3 |

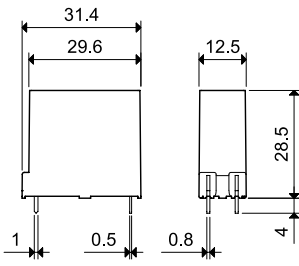
R 45 - DC coil operating range v ambient temperature



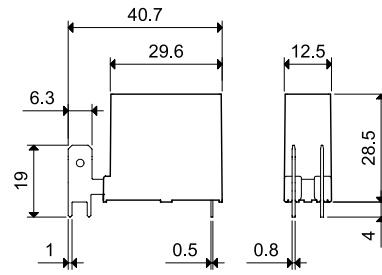
- 1 - Max. permitted coil voltage.
- 2 - Min. pick-up voltage with coil at ambient temperature.

Outline drawings

Type 45.31



Types 45.71/91



A

