

Miniature PCB Relays + Faston 250 10 - 16 A



Burners, boilers and furnaces



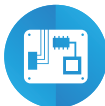
Jacuzzis and hot tubs



Infrared and microwave ovens



Film projectors



Electronic circuit boards



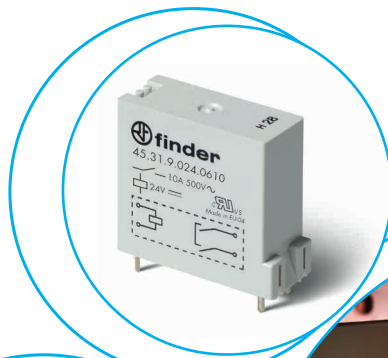
Control and management of electric power



Inverter



Charging Stations



**Relay for +105 °C ambient use
PCB mount - high contact gap for photovoltaic
inverters and charging station
PCB mount**

Type 45.31...0310

- 1 Pole normally open (≥ 3 mm contact gap)
- "Enclosed break device" relay version tested according to **ATEX** EN 60079-1 § 15.5 following «dc» method for group IIB gases

Type 45.31...4310

- Conform to Annex CC EN 61439-7:2018 for ev charging station
- "Enclosed break device" relay version tested according to **ATEX** EN 60079-1 § 15.5 following «dc» method for group IIB gases

Type 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 μ s) isolation, coil-contacts
- Flux proof: RT II

FOR UL RATINGS SEE:

"General technical information" page VIII

For outline drawing see page 7

Contact specification

Contact configuration

45.31-0310



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

45.31-4310

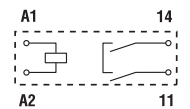


- 1 NO (SPST-NO), ≥ 3 mm gap
- Conform to Annex CC EN 61439-7:2018 for ev charging station
- Max ambient temperature +105 °C
- PCB mounting
- Group IIB gases version

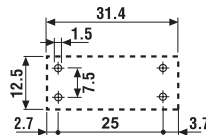
45.31-0610



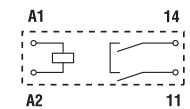
- 1 NO (SPST-NO), ≥ 3.6 mm gap
- Max ambient temperature +105 °C
- PCB mounting



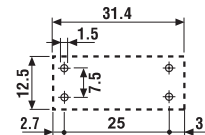
45.31...0310
(1 NO/SPST-NO)



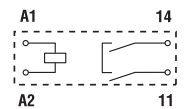
Copper side view



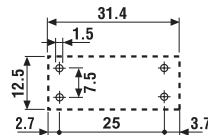
45.31...4310
(1 NO)



Copper side view



45.31...0610
(1 NO/SPST-NO)



Copper side view

1NO (SPST-NO) ≥ 3 mm gap

1NO (SPST-NO) ≥ 3 mm gap

1NO (SPST-NO) ≥ 3.6 mm gap

Rated current/Maximum peak current (@ 105°C) A

16/30

16/80

10/30

Maximum switching current/Maximum peak current (@85°C) A

—

20/80

—

Rated voltage/
Maximum switching voltage V AC

250/400

250/400

500/500

Rated load AC1 VA

4000

4000

5000

Peak current conform to Annex CC EN 61439-7:2018 A

—

230 (70 μ s)

—

Peak current conform to IEC60669-2-1 A2:2015 A

—

120 (600 μ s)

—

LED lamps rating (230 V) W

—

125

—

Rated load AC15 (230 V AC) VA

750

—

750

Single phase motor rating (230 V AC) kW

0.55

—

0.55

Breaking capacity DC1: 24/110/220 V A

16/4/1

16/4/1

10/4/1

Minimum switching load mW (V/mA)

500 (10/5)

500 (10/5)

500 (10/5)

Standard contact material

AgNi

AgSnO₂

AgNi

Coil specification

Nominal voltage (U_N) V AC (50/60 Hz)

—

—

—

V DC

6 - 12 - 24 - 48 - 60

6 - 12 - 24 - 48 - 60

6 - 12 - 24 - 48 - 60

Rated power AC/DC VA (50 Hz)/W

—/0.36

—/0.36

—/0.55

Operating range AC

—

—

—

DC

(0.7...1.2)U_N

(0.7...1.2)U_N

(0.8...1.2)U_N

Holding voltage AC/DC

—/0.4 U_N

—/0.4 U_N

—/0.4 U_N

Must drop-out voltage AC/DC

—/0.1 U_N

—/0.1 U_N

—/0.1 U_N

Technical data

Mechanical life AC/DC cycles

—/10 · 10⁶

—/10 · 10⁶

—/2 · 10⁶

Electrical life at rated load AC1 cycles

30 · 10³

20 · 10³

10 · 10³

Operate/release time ms

12/2

12/2

12/2

Insulation between coil and contacts (1.2/50 μ s) kV

6 (8 mm)

6 (8 mm)

6 (8 mm)

Dielectric strength between open contacts V AC

2500

2500

3000

Ambient temperature range °C

−40...+105

−40...+105

−40...+105

Environmental protection

RT II

RT II

RT II

Approvals (according to type)



Relays for +125 °C ambient use
PCB mount - Faston 250 contact connections

Type 45.71

- 1 Pole normally open or normally closed

Type 45.91

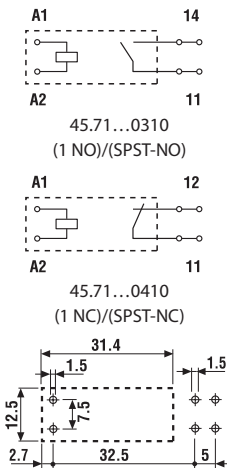
- 1 Pole normally open (≥ 3 mm contact gap)

- 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 μ s) isolation, coil-contacts
- Flux proof: RT II standard, (RT III option)

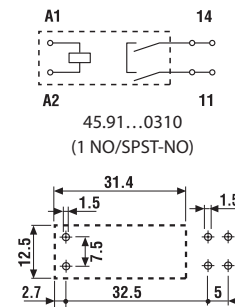


- 1 NO or 1 NC (SPST-NO or SPST-NC)
- Max ambient temperature +125 °C
- PCB mounting + Faston 250

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



Copper side view



Copper side view

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

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: 24/110/220 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		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	—/0.36
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 μ s)	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 0 3	C 1	D 0
Series	Type	No. of poles	A: Contact material	C: Options	D: Special versions
	3 = PCB mount, ≥ 3 mm or ≥ 3.6 mm contact gap 7 = PCB + Faston 250 mount 9 = PCB + Faston 250 mount, ≥ 3 mm	1 = 1 pole, 16 A 1 pole, 10 A (45.31-0610 only)	0 = Standard AgNi for 45.31 and 45.91 1 = Standard AgNi for 45.71 4 = AgSnO ₂ for 45.31	1 = None	0 = Flux proof (RT II) 1 = Wash tight (RT III) 45.71 and 45.91 only
Coil version	7 = Sensitive DC 9 = Standard DC (45.31-0610 only)		B: Contact circuit		
Coil voltage	See coil specifications		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 - 4	3	1	0
	standard DC	0	6	1	0
45.71	sensitive DC	1	3 - 4	1	0 - 1
45.91	sensitive DC	0	3	1	0 - 1

"Enclosed break device" relay version tested according to **ATEX** EN 60079-1 § 15.5 following «dc» method for group IIB gases (according to type)

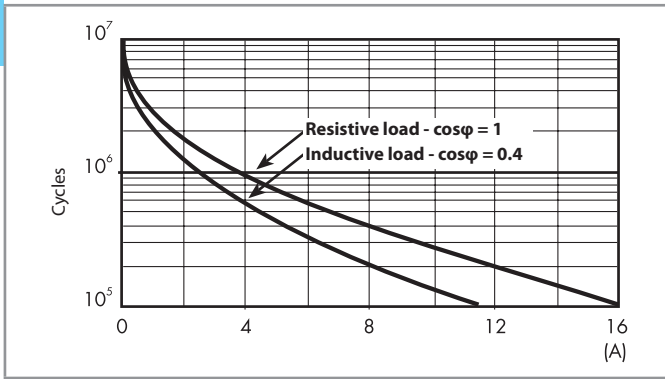
Technical data

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 (according to EN 61180)	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

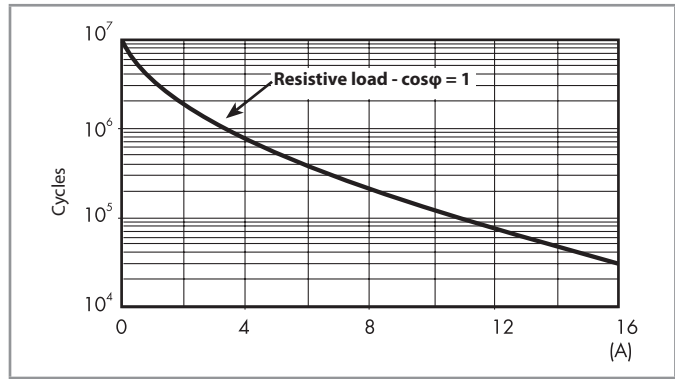
F 45 - Electrical life (AC) v contact current

Type 45.71



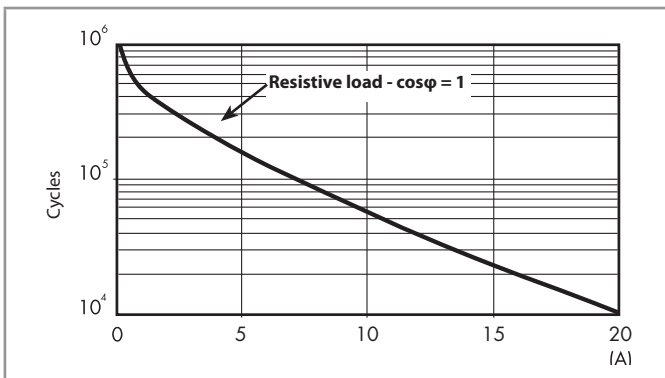
F 45 - Electrical life (AC) v contact current

Type 45.31/45.91

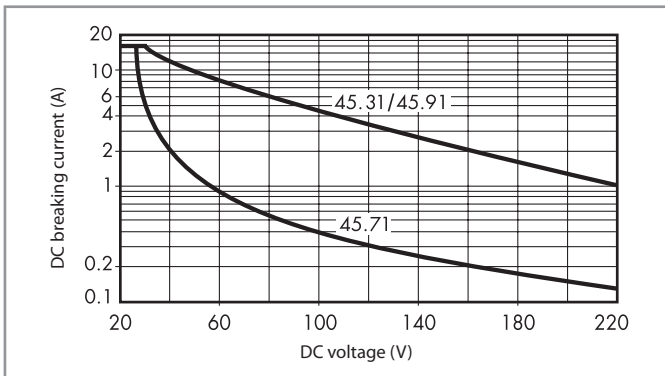


F 45 - Electrical life (AC) v contact current

Type 45.31...4310



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

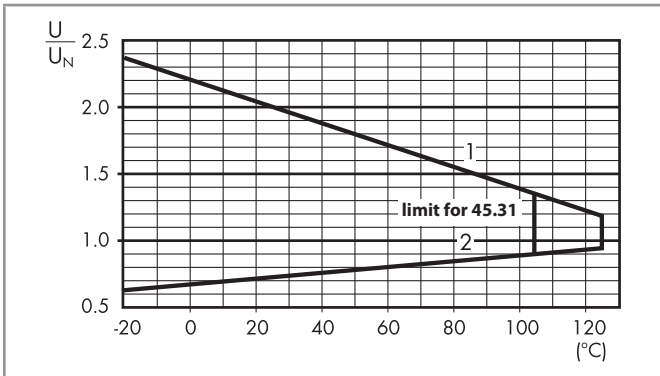
DC coil data - 0.36 W sensitive

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

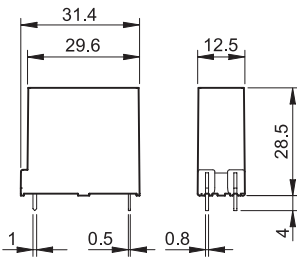
R 45 - DC coil operating range v ambient temperature



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

Outline drawings

Type 45.31



Types 45.71/91

