finder
SWITCH TO THE FUTURE

45
SERIES

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

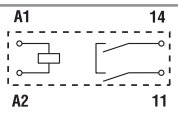
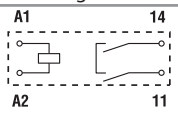
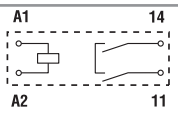
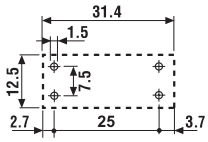
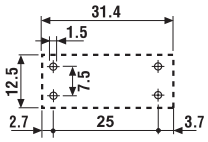
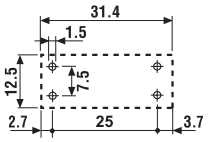
Relay for +105 °C ambient use
PCB mount - high contact gap for photovoltaic inverters and charging station
PCB mount

- **45.31…x310, 1 Pole normally open (≥ 3 mm contact gap)**
- **45.31…4310, Conform to Annex CC EN 61439-7:2018 for ev charging station**
- **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

For UL ratings see: "General technical information" page V

For outline drawing see page 7

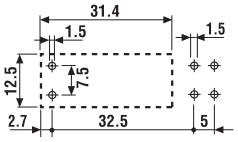
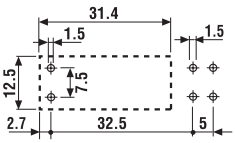
	45.31…x310	NEW **45.31…4310**	**45.31…0610**
			
	• 1 NO (SPST-NO), ≥ 3 mm gap • Max ambient temperature +105 °C • PCB mounting	• 1 NO (SPST-NO), ≥ 3 mm gap • Conform to Annex CC EN 61439-7:2018 for ev charging station • Max ambient temperature +105 °C • PCB mounting	• 1 NO (SPST-NO), ≥ 3.6 mm gap • Max ambient temperature +105 °C • PCB mounting
	 45.31…x310 (1 NO/SPST-NO)	 45.31…4310 (1 NO)	 45.31…0610 (1 NO/SPST-NO)
	 Copper side view	 Copper side view	 Copper side view
Contact specification			
Contact configuration	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 µs)	—
Peak current conform to IEC60669-2-1 A2:2015 A	—	120 (600 µs)	—
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	$AgSnO_2$	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 · 10^6	—/10 · 10^6	—/2 · 10^6
Electrical life at rated load AC1 cycles	30 · 10^3	20 · 10^3	10 · 10^3
Operate/release time ms	12/2	12/2	12/2
Insulation between coil and contacts (1.2/50 µs) 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)	EAC 03 cULus VDE	EAC 15 cULus VDE	EAC 03 cULus VDE

A

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)

	45.71	45.91
		
	• 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
	A1 14 A2 11 45.71…0310 (1 NO)/(SPST-NO) A1 12 A2 11 45.71…0410 (1 NC)/(SPST-NC)  31.4, 1.5, 1.5, 12.5, 7.5, 2.7, 32.5, 5	A1 14 A2 11 45.91…0310 (1 NO/SPST-NO)  31.4, 1.5, 1.5, 12.5, 7.5, 2.7, 32.5, 5
	Copper side view	Copper side view

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: 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		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)		EAC 03 cULus VDE	EAC 15 cULus VDE

Ordering information

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

								A	B	C	D		
4	5	.	7	1	.	7	.	0	1	2	.	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
0 = Standard AgCdO for 45.71, Standard AgNi for 45.31 and 45.91
1 = AgNi
2 = AgCdO
4 = $AgSnO_2$ for 45.31

B: Contact circuit
3 = NO (SPST)
4 = NC (SPST) 45.71 only
6 = NO (SPST), ≥ 3.6 mm

C: Options
1 = None

D: Special versions
0 = Flux proof (RT II)
1 = Wash tight (RT III) 45.71 and 45.91 only

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 - 4	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

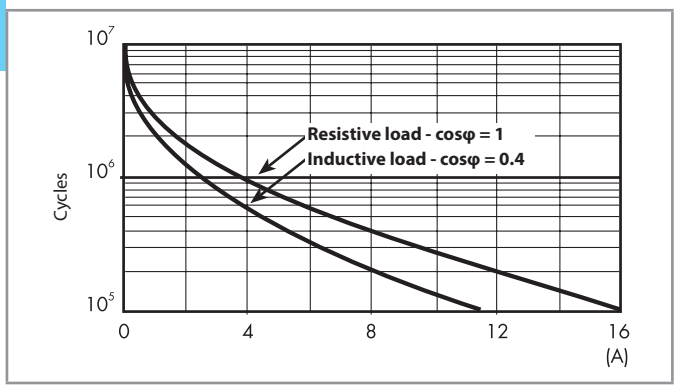
Technical data

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			
Power lost to the environment — with rated current	W	1.8			
Recommended distance between relays mounted on PCB	mm	≥ 5			

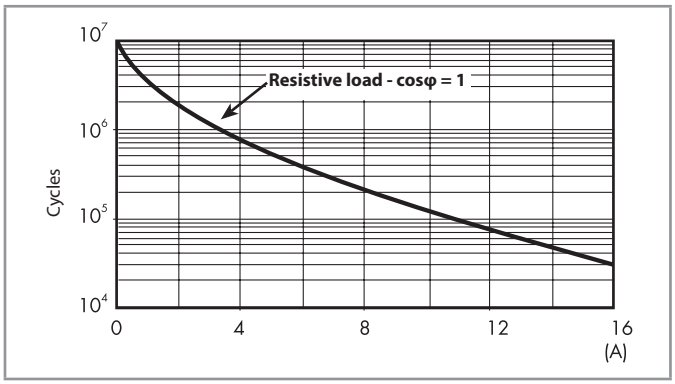
Contact specification

A

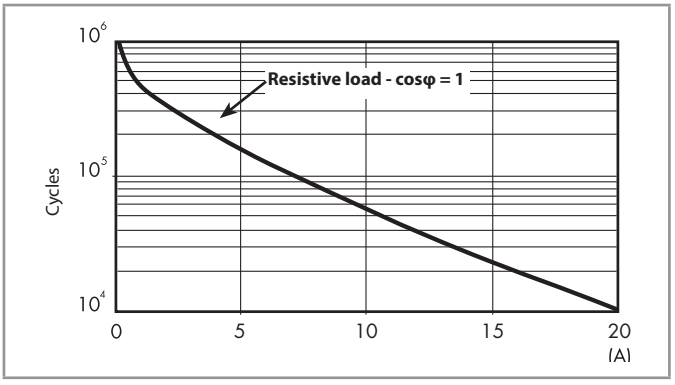
F 45 - Electrical life (AC) v contact current
Type 45.71



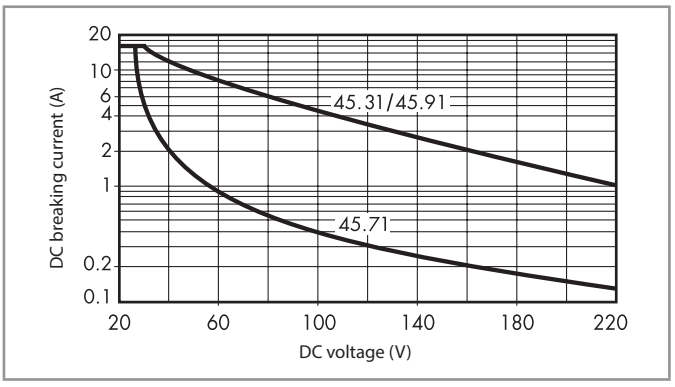
F 45 - Electrical life (AC) v contact current
Type 45.31/45.91



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 ≥ 100 · 10^3 cycles (45.71) and ≥ 30 · 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

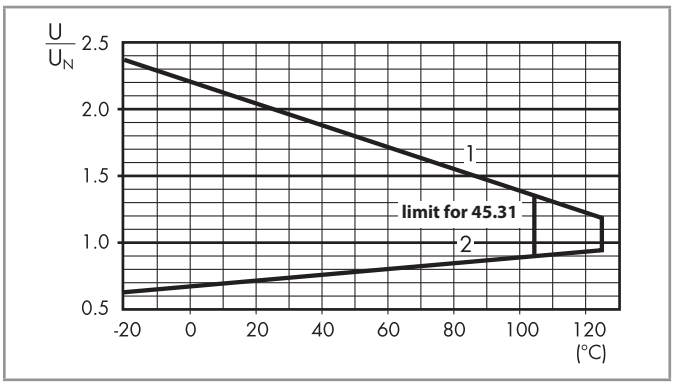
DC coil data - 0.36 W sensitive

Nominal voltage	Coil code	Operating range		Resistance	Rated coil consumption
U_N		U_{min}	U_{max}	R	I at U_N
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	Coil code	Operating range		Resistance	Rated coil consumption
U_N		U_{min}	U_{max}	R	I at U_N
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

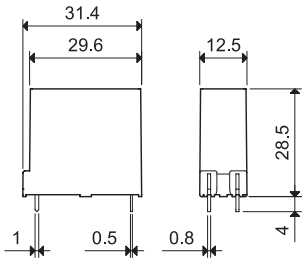
R 45 - DC coil operating range v ambient temperature



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

Outline drawings

Type 45.31



Types 45.71/91