

Relays for railway applications 8 - 16 A



Exterior light control



Driver's control console



Pantograph management



Door control



Doors opening/
closing



Internal light
management



Message
panels
infotainment



Plug-in power relays

Type 46.52T

- 2 pole 8 A

Type 46.61T

- 1 pole 16 A

- Complies with EN 45545-2:2020 (protection against fire of materials), EN 61373 (resistance against random vibrations and shock, Category 1, Class B), EN 50155 (resistance to temperature and humidity, OT4/ST1 class)
- AC coils or DC coils with extended range
- Cadmium Free contacts (standard version)
- Contact material options
- 97 series sockets
- Coil EMC suppression modules
- Accessories (Sockets and Timer modules)

* Short term (10 min) +85°C

For outline drawing see page 5

Contact specification

Contact configuration		2 CO (DPDT)	1 CO (SPDT)
Rated current/Maximum peak current	A	8/15	16/80
Rated voltage/ Maximum switching voltage	V AC	250/400	250/400
Rated load AC1	VA	2000	4000
Rated load AC15 (230 V AC)	VA	350	750
Single phase motor rating (230 V AC)	kW	0.37	0.55
Breaking capacity DC1: 24/110/220 V	A	6/0.5/0.15	12/0.5/0.25
Minimum switching load	mW (V/mA)	300 (5/5)	300 (10/5)
Standard contact material		AgNi	AgSnO ₂

Coil specification

Nominal voltage (U _N)	V AC (50/60 Hz)	230	230
	V DC	24 - 72 - 110	24 - 72 - 110
Rated power	VA/W	1.2/0.5	1.2/0.5
Operating range	AC	(0.80...1.1)U _N	(0.80...1.1)U _N
	DC	(0.70...1.25)U _N	(0.70...1.25)U _N
Holding voltage		0.4 U _N	0.4 U _N
Must drop-out voltage		0.1 U _N	0.1 U _N

Technical data

Mechanical life DC	cycles	10 · 10 ⁶	10 · 10 ⁶
Electrical life at rated load AC1	cycles	100 · 10 ³	100 · 10 ³
Operate/release time	ms	10/3	15/5
Insulation between coil and contacts (1.2/50 µs)	kV	6 (8 mm)	6 (8 mm)
Dielectric strength between open contacts	V AC	1000	1000
Ambient temperature range	°C	-40...+70*	-40...+70*
Environmental protection		RT II	RT II

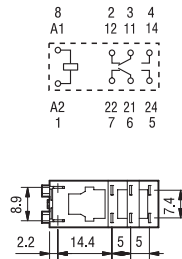
Approvals (according to type)



46.52T



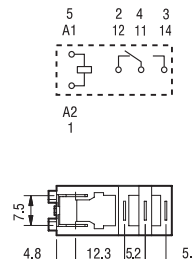
- 2 Pole CO, 8 A
- Plug-in



46.61T



- 1 Pole CO, 16 A
- Plug-in



Ordering information

Example: 46 series plug-in relay, 2 poles, 24 V DC coil, AgNi contacts.

A

4 6 . 5 2 . 9 . 0 2 4 . 0 0 0 0 T

Series
Type

5 = Spade/blade solder terminal
(2.5 x 0.5)mm
6 = Spade/blade terminal
Faston 187 (4.8 x 0.5)mm

No. of poles

1 = 1 pole, 16 A
2 = 2 poles, 8 A

Coil version

9 = DC
8 = AC (50/60 Hz)

Coil voltage

024 = 24 V
072 = 72 V
110 = 110 V
230 = 230 V

A: Contact material

0 = AgNi
4 = AgSnO₂ (46.61T only)
5 = AgNi + Au

B: Contact circuit

0 = CO (nPDT)

D: Special versions

0 = Standard

C: Options

0 = None

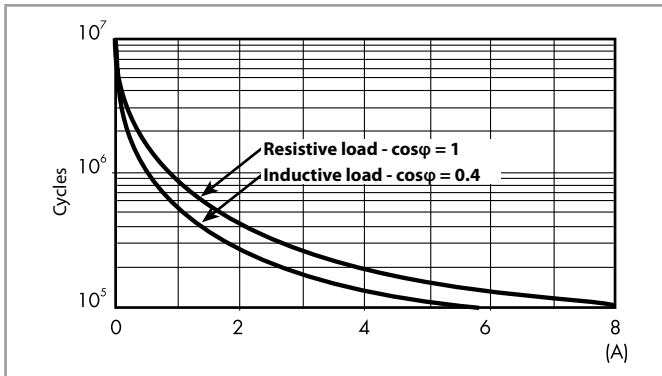
Technical data

Insulation according to EN 61810-1

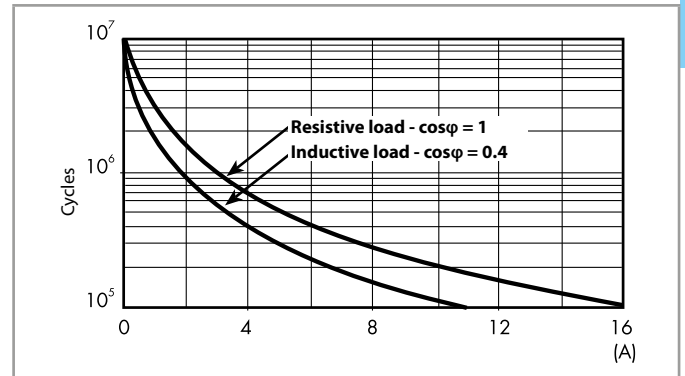
		46.61T		46.52T	
Nominal voltage of supply system	V AC	230/400		230/400	
Rated insulation voltage	V AC	250	400	250	400
Pollution degree		3	2	3	2
Insulation between coil and contact set					
Type of Insulation		Reinforced (8 mm)		Reinforced (8 mm)	
Overvoltage category		III		III	
Rated impulse voltage	kV (1.2/50 µs)	6		6	
Dielectric strength	V AC	4000		4000	
Insulation between adjacent contacts					
Type of insulation		—		Basic	
Overvoltage category		—		III	
Rated impulse voltage	kV (1.2/50 µs)	—		4	
Dielectric strength	V AC	—		2000	
Insulation between open contacts					
Type of disconnection		Micro-disconnection		Micro-disconnection	
Dielectric strength	V AC/kV (1.2/50 µs)	1000/1.5		1000/1.5	
Insulation between coil terminals					
Rated impulse voltage (surge) differential mode (according to EN 50121)	kV (1.2/50 µs)	2			
Other data					
Bounce time: NO/NC	ms	2/6		1/4	
Vibration resistance: NO/NC		According to EN 61373			
Shock resistance		According to EN 61373			
Power lost to the environment	without contact current	W	0.6	0.6	
	with rated current	W	1.6	2	

Contact specification

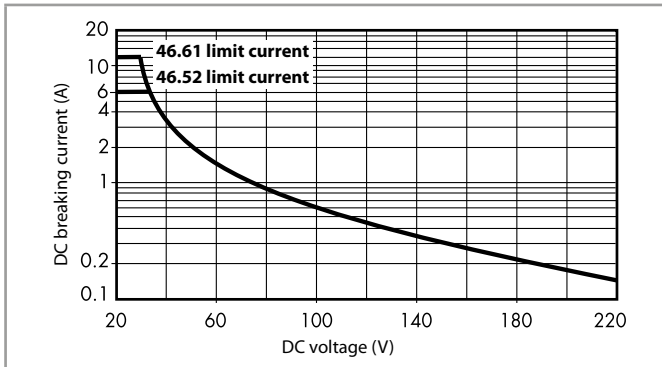
F 46 - Electrical life (AC) v contact current
Type 46.52T



F 46 - Electrical life (AC) v contact current
Type 46.61T



H 46 - Maximum DC1 breaking capacity



- When switching a resistive load (DC1) having voltage and current values under the curve, an electrical life of $\geq 100 \cdot 10^3$ 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

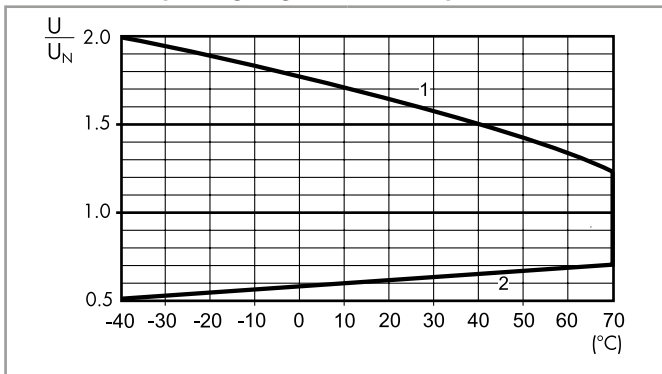
DC coil data

Nominal voltage U_N V	Coil code	Operating range		Resistance R Ω	Rated coil consumption I at U_N mA
		U_{min} V	U_{max} V		
24	9.024	16.8	30	1200	20
72	9.072	50.4	90	3400	7
110	9.110	77	137.5	23500	4.7

AC coil data

Nominal voltage U_N V	Coil code	Operating range		Resistance R Ω	Rated coil consumption I at U_N mA
		U_{min} V	U_{max} V		
230	8.230	184	253	28000	5

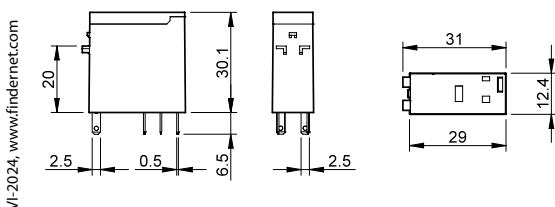
R 46T - DC coil operating range v ambient temperature



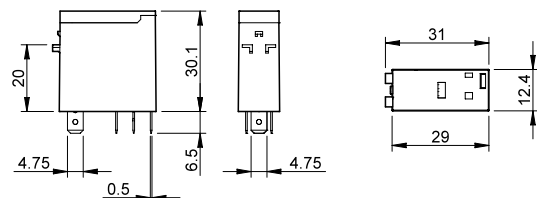
- 1 - Max. permitted coil voltage.
2 - Min. pick-up voltage with coil at ambient temperature.

Outline drawings

Type 46.52T



Type 46.61T



A



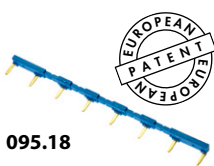
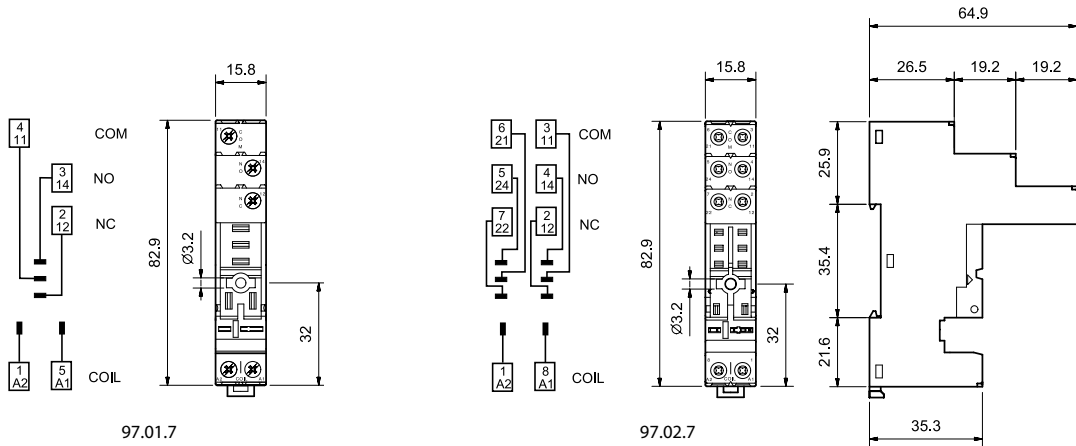
97.01.7

Approvals
(according to type):



Screw terminal socket panel or 35 mm rail (EN 60715) mount	97.01.7 SMA*	97.02.7 SMA*
For relay type	46.61T	46.52T
Accessories		
Metal retaining clip (supplied with socket - packaging code SMA)		097.71T
Identification tag		095.00.4
8-way jumper link		095.18
Modules (see table below)		99.02
Timer modules (see table below)		86.30T
Technical data		
Rated values	16 A - 250 V AC	8 A - 250 V AC
Dielectric strength	6 kV (1.2/50 μs) between coil and contacts	
Protection category	IP 20	
Ambient temperature	°C -40...+70	
Screw torque	Nm	0.8
Wire strip length	mm	8
Max. wire size for 97.01.7 and 97.02.7 socket	solid wire	stranded wire
	mm ²	1 x 6 / 2 x 2.5
	AWG	1 x 10 / 2 x 14

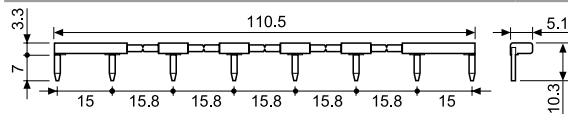
* Complies with **EN 45545-2:2020** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, **OT4/ST1** class)



095.18



8-way jumper link	095.18
Rated values	10 A - 250 V



86.30

86 series timer modules	86.30.0.024.0000T
(12...24)V AC/DC; Bi-function: AI, DI; (0.05 s...100 h)	

Approvals (according to type):

AI: ON-delay
DI: Interval



99.02

99.02 coil indication and EMC suppression modules		
Diode (+A1, standard polarity)	(6...220)V DC	99.02.3.000.00
LED + Diode (+A1, standard polarity)	(6...24)V DC	99.02.9.024.99
LED + Diode (+A1, standard polarity)	(28...72)V DC	99.02.9.060.99
LED + Diode (+A1, standard polarity)	(110...220)V DC	99.02.9.220.99
LED + Varistor	(6...24)V DC/AC	99.02.0.024.98
LED + Varistor	(28...72)V DC/AC	99.02.0.060.98
LED + Varistor	(110...240)V DC/AC	99.02.0.230.98

Approvals (according to type):

DC Modules with non-standard polarity (+A2) on request.



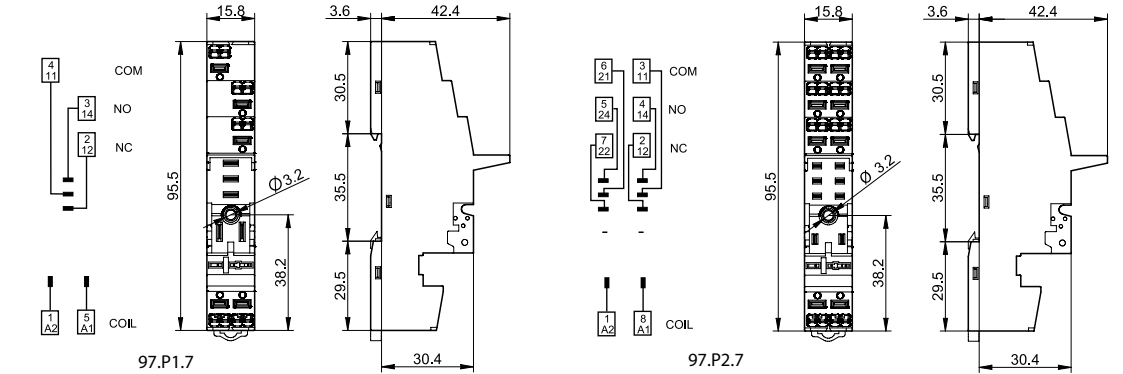
97.P1.7

Approvals
(according to type):



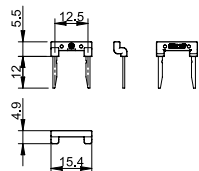
Push-in terminal socket panel or 35 mm rail (EN 60715) mount		97.P1.7 SMA*	97.P2.7 SMA*
For relay type		46.61T	46.52T
Accessories			
Metal retaining clip (supplied with socket - packaging code SMA)			097.71T
2-way jumper link			097.52
2-way jumper link			097.42
Modules (see table below)			99.02
Timer modules (see table below)			86.30T
Technical data			
Rated values		10 A - 250 V AC	8 A - 250 V AC
Dielectric strength		6 kV (1.2/50 μs) between coil and contacts	
Protection category		IP 20	
Ambient temperature		°C -40...+70	
Wire strip length		mm 8	
Min. wire size for 97.P1.7 and 97.P2.7 socket		solid wire	stranded wire
		mm ² 0.5	0.5
		AWG 21	21
Max. wire size for 97.P1.7 and 97.P2.7 sockets		solid wire	stranded wire
		mm ² 2 x 1.5 / 1 x 2.5	2 x 1.5 / 1 x 2.5
		AWG 2 x 18 / 1 x 14	2 x 18 / 1 x 14

* Complies with EN 45545-2:2020 (protection against fire of materials), EN 61373 (resistance against random vibrations and shock, Category 1, Class B), EN 50155 (resistance to temperature and humidity, OT4/ST1 class)



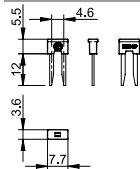
097.52

2-way jumper link for 97.P1.7 and 97.P2.7 sockets	097.52
Rated values	10 A - 250 V



097.42

2-way jumper link for 97.P1.7 and 97.P2.7 sockets	097.42
Rated values	10 A - 250 V



86.30

86 series timer modules	86.30.0.024.0000T
(12...24)V AC/DC; Bi-function: AI, DI; (0.05 s...100 h)	

Approvals (according to type):

AI: ON-delay
DI: Interval



99.02

99.02 coil indication and EMC suppression modules		
Diode (+A1, standard polarity)	(6...220)V DC	99.02.3.000.00
LED + Diode (+A1, standard polarity)	(6...24)V DC	99.02.9.024.99
LED + Diode (+A1, standard polarity)	(28...72)V DC	99.02.9.060.99
LED + Diode (+A1, standard polarity)	(110...220)V DC	99.02.9.220.99
LED + Varistor	(6...24)V DC/AC	99.02.0.024.98
LED + Varistor	(28...72)V DC/AC	99.02.0.060.98
LED + Varistor	(110...240)V DC/AC	99.02.0.230.98

Approvals (according to type):

DC Modules with non-standard polarity (+A2) on request.

A



97.12.7

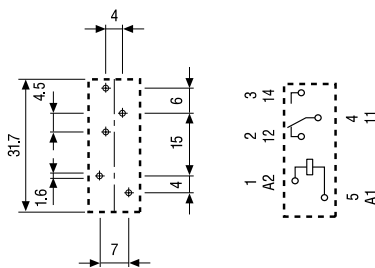
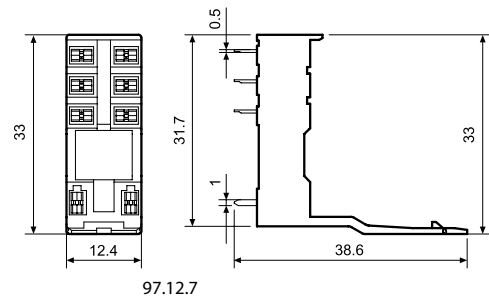
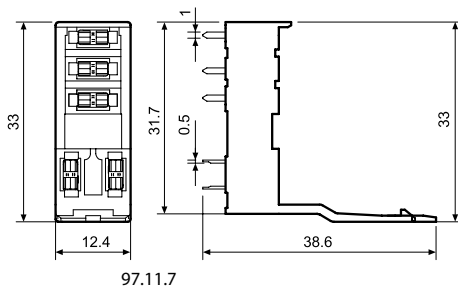
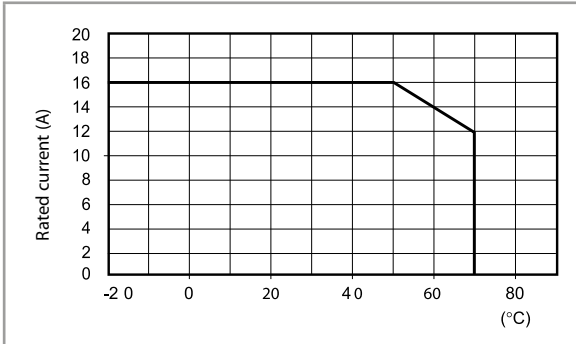
Approvals
(according to type):



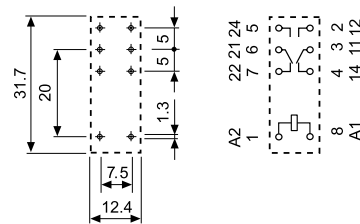
PCB socket	97.11.7*	97.12.7*
For relay type	46.61T	46.52T
Technical data		
Rated values	12 A - 250 V (see diagram L97)	8 A - 250 V
Dielectric strength	6 kV (1.2/50 μs) between coil and contacts	
Protection category	IP 20	
Ambient temperature	°C -40...+70	

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L 97 - Rated current v ambient temperature
(for 46.61T relay/97.11.7 socket combination)



Copper side view



Copper side view

Packaging codes

How to code and identify retaining clip and packaging options for sockets.

Example:



A Standard packaging

SM Metal retaining clip