



**R A I L W A Y
A P P L I C A T I O N S
2 0 1 3**

FINDER's 10,000 different products, represent one of the most extensive product lines available on the market. They are the result of specialization across a variety of relay types: step relays, light dependent relays, miniature and sub-miniature p.c.b relays, plug-in general purpose and power relays, relay interface modules, timers, relay and powertimers, relay sockets and accessories.

FINDER has the widest range of quality approvals of any relay manufacturer.

Our four factories use machines which have been designed and built in-house by our own team of technicians, who are experts in their own right in production techniques and industrial automation.



Finder "milestones"

1949 Turin: Piero Giordanino patented step relay (Italy)

1954 Finder founded by Piero Giordanino

1965 Almese (TO): manufacturing facility opened

1966 Launch of 60 Series industrial relay range

1974 Sanfront (CN): manufacturing facility opened

1981 Dedicated toolmaking and automation facility opened

1991 St. Jean de Maurienne, France: manufacturing facility opened

1993 Launch of electronic timer range

1996 Introduction of first fully-automated production line for new generation p.c.b. relay

2001 Acquisition of Eichhoff Reles SL, Valencia (Spain)

2002 In-house manufacture of pcb's starts

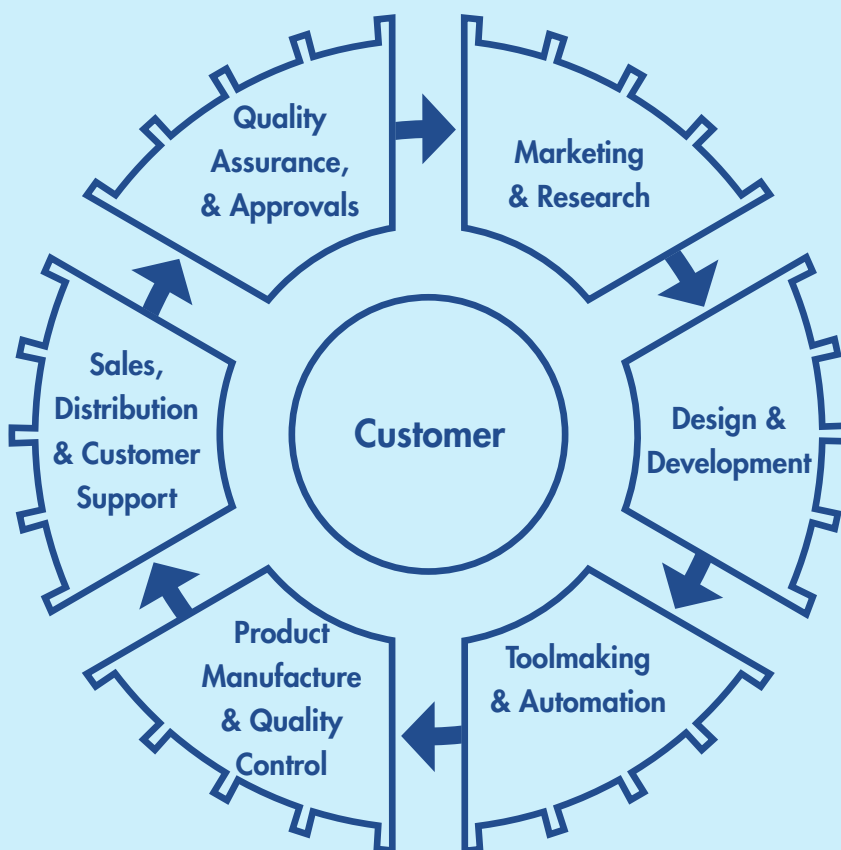
2003 Trebur Astheim, Germany: logistics centre to service central Europe

2006 Almese (TO): logistics centre

2009 Finder's 55 year anniversary



TOTAL IN-HOUSE CAPABILITY





Relays used for railway rolling stock are subject to increasingly higher technical demands – such as the need for wider operating ranges; higher resistance to shock and vibration; operation over a wider range of temperature and humidity ; and above all, the fire resistance properties of the relay's constituent parts.

Fire and smoke characteristics of the materials

The relays and their sockets and accessories are manufactured using specific insulating materials, which satisfy the requirements of fire protection prescribed by the standard **UNI CEI 11170-3** for Risk levels LR1 to LR4:

- conformity to reaction to fire test (Single flame source test according to **ISO 11925-2**)
- smoke class F2 (or better) according to **NF F 16-101** (calculated from Opacity according to **NF X 10-702-2 + NF X 10-702-1** and from Toxicity according to **NF X 70-100-1 + NF X 70-100-2**).

Mechanical and climatic characteristics

The resistance against random vibrations and shock of the relays and their sockets and accessories is in compliance with the prescription of **EN 61373** standard for Category 1, **Class B** products.

Their resistance to temperature and humidity is in compliance with the prescription of **EN 50155** standard, **TX class**.

















- Signal control
- Control Board
- Traffic management



- Air Conditioning
- Door control systems
- Train Light Control



	Rated current	Function & Features	Sockets
 46 Series Page 1	8 A	2 CO Relays for railway <ul style="list-style-type: none"> - Plug-in mounting - DC coils with extended range - Complies with UNI CEI 11170-3 (protection against fire of materials), EN 61373 (resistance against random vibrations and shock, Category 1, Class B), EN 50155 (resistance to temperature and humidity, TX class) - 97 and 96 series sockets - Coil EMC suppression modules 	 Type 97.02 Type 97.52 Page 4,5
 56 Series Page 1	12 A	2 CO 4 CO	 Type 96.02 Type 96.04 Page 6
 86 Series Page 7	—	Multi-functions Bi-functions	 Type 96.02 Type 96.04 Type 97.02 Type 97.52 Page 10...12
 72 Series Page 13	6 A	Phase rotation Phase loss	Monitoring relay <ul style="list-style-type: none"> - 17.5mm wide - Universal voltage monitoring (208...480VAC)
 75 Series Page 15	6 A	Relay module with forcibly guided contacts	Relay module with forcibly guided contacts <ul style="list-style-type: none"> - Extended operating range (0.7...1.25) U_N - For safety applications, with class A forcibly guided contact relays (EN 50205) - For railway applications; materials compliant with fire and smoke characteristics (UNI 11170-3); mechanical and climatic characteristics compliant with EN 61373 and EN 50155 - Coil status visual indication with LED - 35 mm rail (EN 60715) mount
 80 Series Page 20	16 A	Multi-functions Mono-functions	Modular timers <ul style="list-style-type: none"> - 17.5mm wide - Six time scale from 0.1s to 24h - Multi-voltage - High input /output isolation - 1 pole - Relay output, 16A
 81 Series Page 25	16 A	Multi-function and multi-voltage timer	Modular timers <ul style="list-style-type: none"> - 17.5 mm wide - Seven functions (4 with supply start and 3 with signal start with Reset function) - Six time ranges from 0.1s to 10h - 1 pole - Relay output, 16A
 11 Series Page 28	16 A	Light dependent relay	Modular Light dependent relay <ul style="list-style-type: none"> - 1 contact NO - Sensitivity adjustment from 1 to 100 lux - 17.5 mm wide - 24 V AC/DC - 35 mm rail (EN 60715) mount
 13 Series Page 32	16 A	Electronic step relay	Electronic step relay <ul style="list-style-type: none"> - 1 contact - Longer mechanical and electrical life - Suitable for SELV applications according to IEC 364

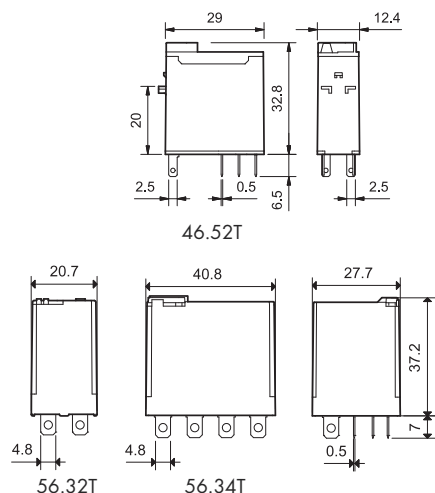
Features

Plug-in power relays:

8 A, 2 pole

12 A, 2 and 4 pole

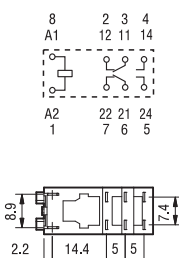
- Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)
- DC coils with extended range
- Cadmium Free contacts (standard version)
- Contact material options
- 97 and 96 series sockets
- Coil EMC suppression modules
- Accessories (Sockets and Timer modules)



46.52T



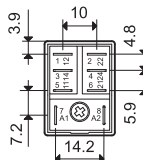
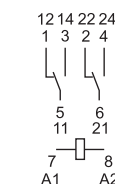
- 2 Pole CO, 8A
- Plug-in



56.32T



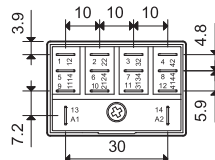
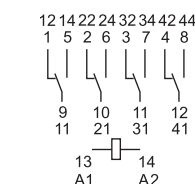
- 2 Pole CO, 12 A
- Plug-in/Faston 187



56.34T



- 4 Pole CO, 12 A
- Plug-in/Faston 187



Contact specification

Contact configuration	2 CO (DPDT)	2 CO (DPDT)	4 CO (4PDT)
Rated current/Maximum peak current A	8/15	12/20	12/20
Rated voltage/Maximum switching voltage V AC	250/400	250/400	250/400
Rated load AC1 VA	2,000	3,000	3,000
Rated load AC15 (230 V AC) VA	350	700	700
Single phase motor rating (230 V AC) kW	0.37	0.55	0.55
Breaking capacity DC1: 30/110/220 V A	6/0.5/0.15	12/0.5/0.25	12/0.5/0.25
Minimum switching load mW (V/mA)	300 (5/5)	500 (10/5)	500 (10/5)
Standard contact material	AgNi	AgNi	AgNi

Coil specification

Nominal voltage (U _N) V AC (50/60 Hz)	—	—	—
V DC	24 - 72 - 110	24 - 72 - 110	24 - 72 - 110
Rated power W	0.5	1	1.3
Operating range @ 23 °C AC	—	—	—
DC	(0.70...1.6) U _N	(0.70...1.6) U _N	(0.70...1.6) U _N
Holding voltage	0.4 U _N	0.6 U _N	0.6 U _N
Must drop-out voltage	0.1 U _N	0.1 U _N	0.1 U _N

Technical data

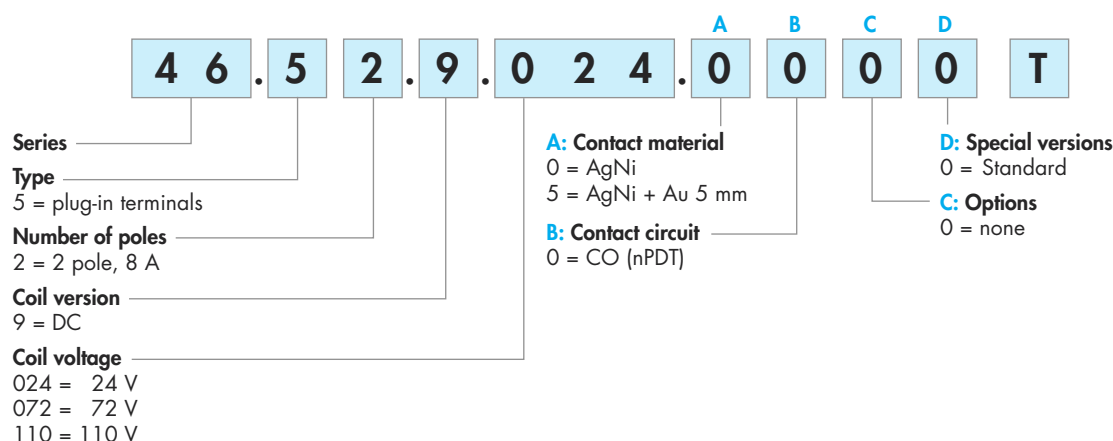
Mechanical life DC cycles	10 · 10 ⁶	10 · 10 ⁶	10 · 10 ⁶
Electrical life at rated load AC1 cycles	100 · 10 ³	100 · 10 ³	100 · 10 ³
Operate/release time ms	10/3	8/8	8/8
Insulation between coil and contacts (1.2/50 μs) kV	6 (8 mm)	4	4
Dielectric strength between open contacts V AC	1,000	1,000	1,000
Ambient temperature range °C	-40...+70	-40...+70	-40...+70
Environmental protection	RT II	RT I	RT I

Approvals (according to type)

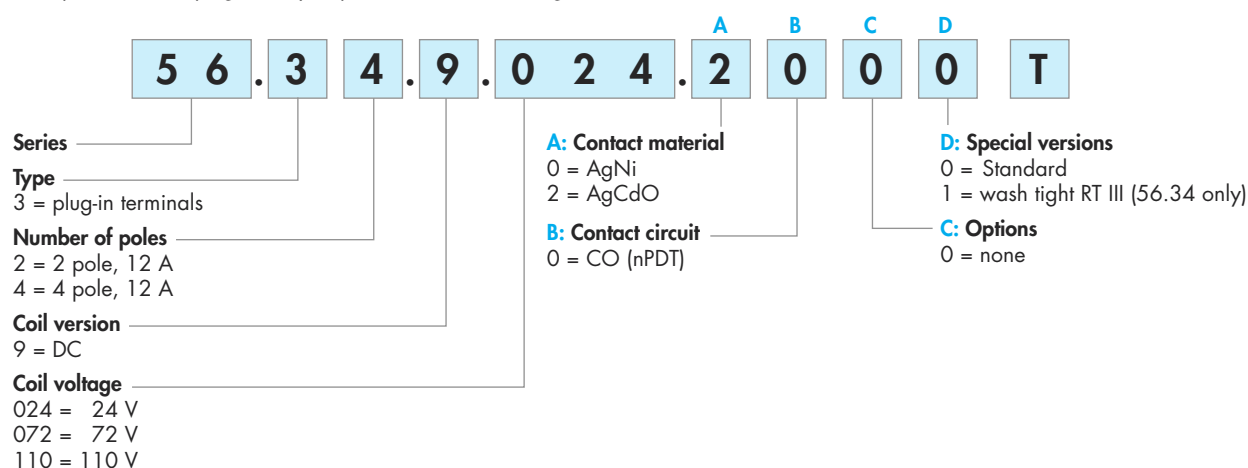


Ordering information

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



Example: 56 series plug-in relay, 4 poles, 24 V DC coil, AgCdO contacts.

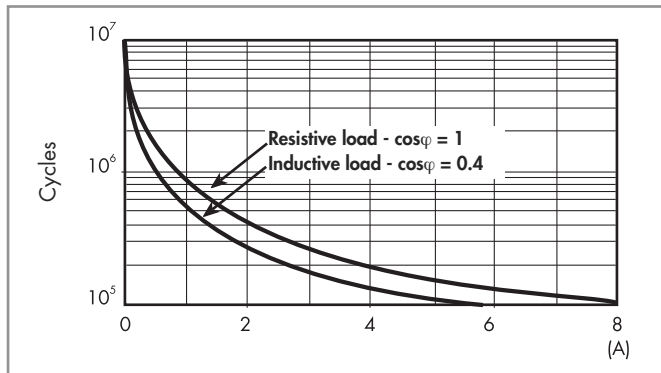


Technical data

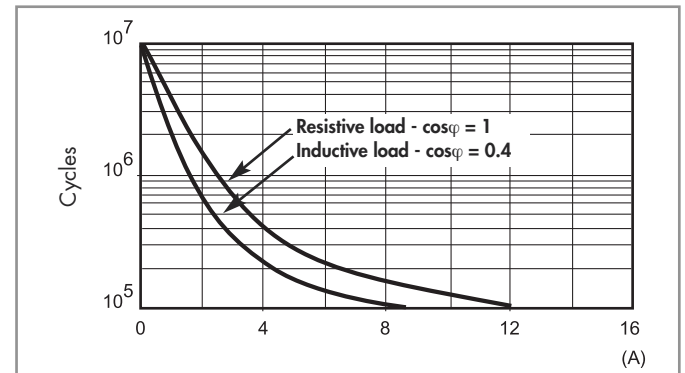
Insulation according to EN 61810-1		46.52T		56.32T/34T	
Nominal voltage of supply system	V AC	230/400		230/400	
Rated insulation voltage	V AC	250	400	250	400
Pollution degree		3	2	3	2
Insulation between coil and contact set					
Type of insulation		Reinforced (8 mm)		Basic	
Overvoltage category		III		III	
Rated impulse voltage	kV (1.2/50 µs)	6		4	
Dielectric strength	V AC	4,000		2,500	
Insulation between adjacent contacts					
Type of insulation		Basic		Basic	
Overvoltage category		III		III	
Rated impulse voltage	kV (1.2/50 µs)	4		4	
Dielectric strength	V AC	2,000		2,500	
Insulation between open contacts					
Type of disconnection		Micro-disconnection		Micro-disconnection	
Dielectric strength	V AC/(1.2/50 µs)	1,000/1.5		1,000/1.5	
Conducted disturbance immunity					
Burst (5...50)ns, 5 kHz, on A1 - A2	EN 61000-4-4	level 4 (4 kV)		level 4 (4 kV)	
Surge (1.2/50 µs) on A1 - A2 (differential mode)	EN 61000-4-5	level 3 (2 kV)		level 4 (4 kV)	
Other data					
Bounce time: NO/NC	ms	1/4		1/3	
Power lost to the environment	without contact current	W	0.6	1 (56.32) / 1.3 (56.34)	
	with rated current	W	2	3.8 (56.32) / 6.9 (56.34)	

Contact specification

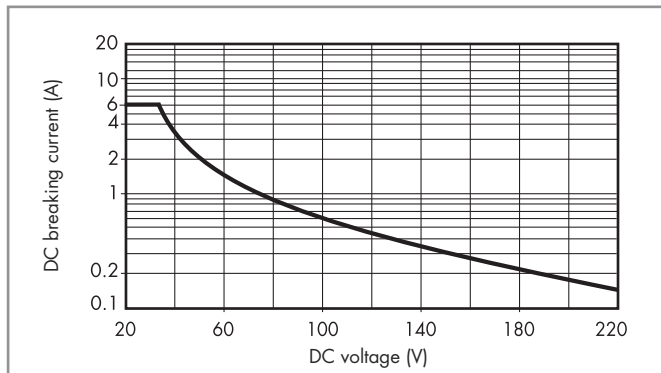
F 46 - Electrical life (AC) v contact current - Type 46.52T



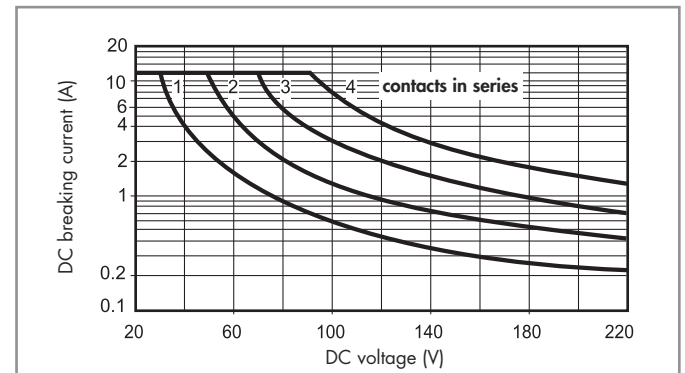
F 56 - Electrical life (AC) v contact current - Type 56.32T and 56.34T



H 46 - Maximum DC1 breaking capacity - Type 46.52T



H 56 - Maximum DC1 breaking capacity - Type 56.32T and 56.34T



- 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, 2 CO - Type 46.52T @ 23 °C

Nominal voltage U_N	Coil code	Operating range		Resistance R	Rated coil consumption I at U_N
V		U_{min} V	U_{max} V	Ω	mA
24	9.024	16.8	38	1,200	20
72	9.072	50.4	115	3,400	7
110	9.110	77	176	23,500	4.7

DC coil data, 2 CO - Type 56.32T @ 23 °C

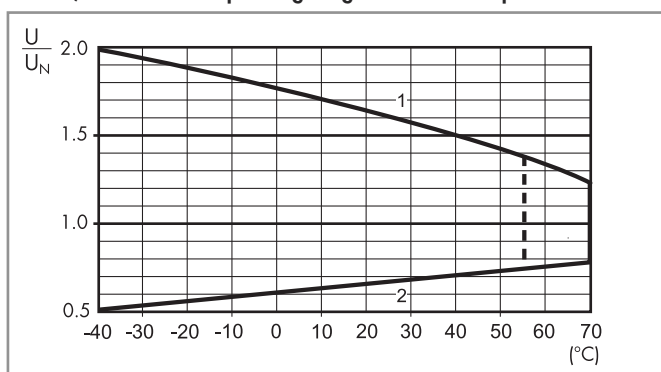
Nominal voltage U_N	Coil code	Operating range		Resistance R	Rated coil consumption I at U_N
V		U_{min} V	U_{max} V	Ω	mA
24	9.024	16.8	38	600	40
72	9.072	50.4	115	5,100	14
110	9.110	77	176	12,500	8.8

Other types of coil version are available on request.

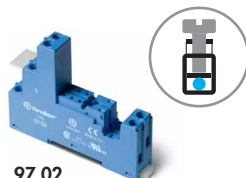
DC coil data, 4 CO - Type 56.34T @ 23 °C

Nominal voltage U_N	Coil code	Operating range		Resistance R	Rated coil consumption I at U_N
V		U_{min} V	U_{max} V	Ω	mA
24	9.024	16.8	38	490	49
72	9.072	50.4	115	4,000	18
110	9.110	77	176	10,400	10.5

RT 46T / 56T - DC coil operating range v ambient temperature



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

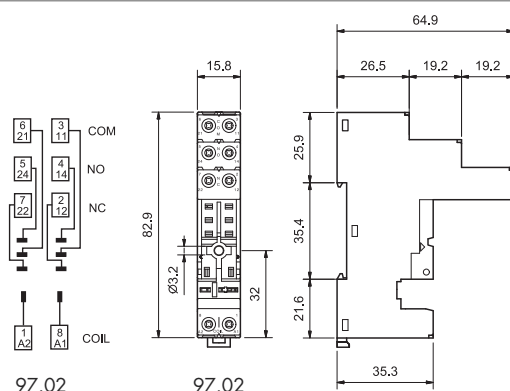


97.02

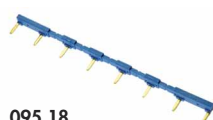
Approvals
(according to type):



Screw terminal socket panel or 35 mm rail (EN 60715) mount		97.02 SMA*
For relay type		46.52T
Accessories		
Metal retaining clip (supplied with socket - packaging code SMA)		097.71
8-way jumper link		095.18
Modules (see table below)		99.02T
Timer modules (see table below)		86.30T
Technical data		
Rated current		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 97.02 socket		solid wire
		mm ² 1x6 / 2x2.5
		AWG 1x10 / 2x14
		stranded wire
		mm ² 1x4 / 2x2.5
		AWG 1x12 / 2x14

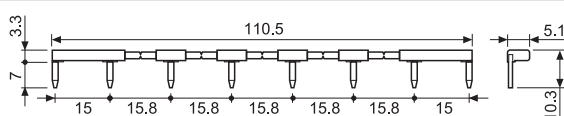


* Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)



095.18

8-way jumper link for 97.02 socket	095.18
Rated values	10 A - 250 V



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

Approvals (according to type):

AI: ON-delay
DI: Interval

86.30T



99.02 coil indication and EMC suppression modules for 97.02 socket		
Diode (+A1, standard polarity)	(6...220)V DC	99.02.3.000.00T
LED + Diode (+A1, standard polarity)	(6...24)V DC	99.02.9.024.99T
LED + Varistor	(6...24)V DC/AC	99.02.0.024.98T

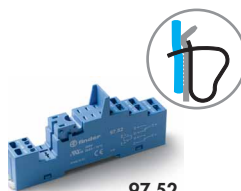
99.02T

Approvals
(according to type):



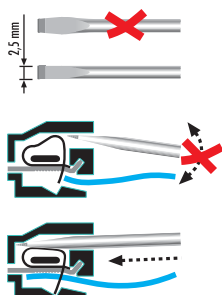
DC Modules with
non-standard polarity
(+A2) on request.





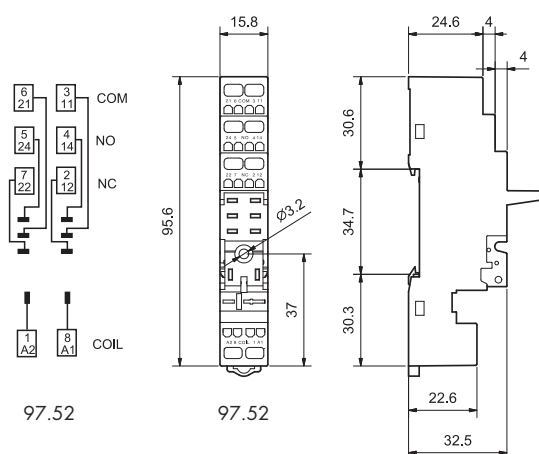
97.52

Approvals
(according to type):



Screwless terminal socket panel or 35 mm rail (EN 60715) mount		97.52 SMA*	
For relay type		46.52T	
Accessories			
Metal retaining clip (supplied with socket - packaging code SMA)		097.71	
Modules (see table below)		99.02T	
Timer modules (see table below)		86.30T	
Technical data			
Rated current		8 A - 250 V AC	
Dielectric strength		6 kV (1.2/50 µs) between coil and contacts	
Protection category		IP 20	
Ambient temperature		°C -25...+70	
Wire strip length		mm 8	
Max. wire size for 97.52 socket		solid wire	stranded wire
	mm²	2x(0.2...1.5)	2x(0.2...1.5)
	AWG	2x(24...18)	2x(24...18)

* Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)



97.52

97.52

86 series timer module		
(12...24)V AC/DC; Bi-function: AI, DI; (0.05s...100h)	86.30.0.024.0000T	
Approvals (according to type):		
	AI: ON-delay DI: Interval	



86.30T

99.02 coil indication and EMC suppression modules for 97.52 socket		
Diode (+A1, standard polarity)	(6...220)V DC	99.02.3.000.00T
LED + Diode (+A1, standard polarity)	(6...24)V DC	99.02.9.024.99T
LED + Varistor	(6...24)V DC/AC	99.02.0.024.98T

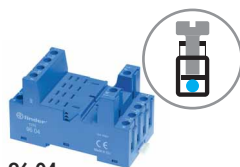


99.02T

Approvals
(according to type):



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



96.04

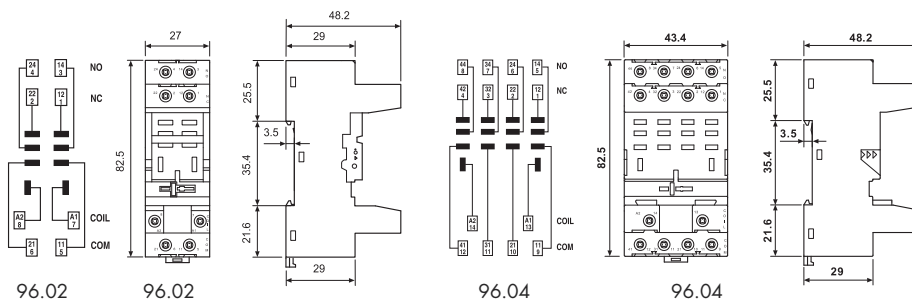
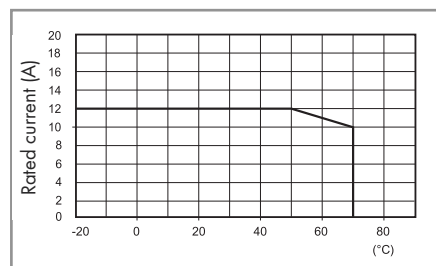
Approvals
(according to type):



Screw terminal (Box clamp) socket panel or 35 mm (EN 60715) rail mount	96.02 SMA*	96.04 SMA*
For relay type	56.32T	56.34T
Accessories		
Metal retaining clip (supplied with socket - packaging code SMA)	094.71	096.71
Modules (see table below)	99.02T	
Timer modules (see table below)	86.00T, 86.30T	
Technical data		
Rated values	12 A - 250 V	
Dielectric strength	2 kV AC	
Grado di protezione	IP 20	
Protection category	°C -40...+70 (see diagram L96)	
Screw torque	Nm	0.8
Wire strip length	mm	8
Max. wire size for 96.02 and 96.04 socket	solid wire	stranded wire
	mm ²	1x6 / 2x2.5
	AWG	1x10 / 2x14

* Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)

L 96 - Rated current vs ambient temperature



86.00T



86.30T

86 series timer modules

Multi-voltage: (12...240)V AC/DC;	
Multi-functions: AI, DI, SW, BE, CE, DE, EE, FE; (0.05 s...100 h)	86.00.0.240.0000T
(12...24)V AC/DC; Bi-function: AI, DI; (0.05 s...100 h)	86.30.0.024.0000T

Approvals (according to type):

AI: ON-delay
DI: Interval
SW: Symmetrical flasher (starting pulse on)
BE: Off-delay with control signal
CE: On- and off-delay with control signal
DE: Interval with control signal on
EE: Interval with control signal off
FE: Interval with control signal on and off



99.02T

Approvals
(according to type):



99.02 coil indication and EMC suppression modules for 96.02 and 96.04 socket

Diode (+A1, standard polarity)	(6...220)V DC	99.02.3.000.00T
LED + Diode (+A1, standard polarity)	(6...24)V DC	99.02.9.024.99T
LED + Varistor	(6...24)V DC/AC	99.02.0.024.98T

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

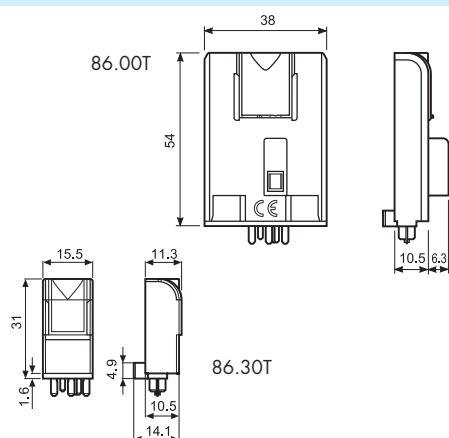
Features

Timer modules for use in conjunction with relay & socket.

86.00T - Multi-function & multi-voltage timer module

86.30T - Bi-function & multi-voltage timer module

- Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)
- Timer module type 86.00T for 96 series sockets and type 86.30T for 96, 97 series sockets
- Wide supply voltage range:
12...240 V AC/DC (86.00)
12...24 V AC/DC (86.30)
- LED indicator

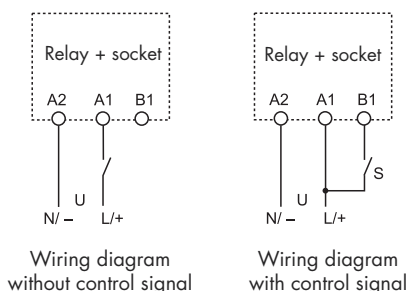


86.00T



- Time scale: from 0.05s to 100h
- Multi-function
- Plug-in for use with 96.04 sockets

AI: On-delay
DI: Interval
SW: Symmetrical flasher (starting pulse on)
BE: Off-delay with control signal
CE: On- and off-delay with control signal
DE: Interval with control signal on
EE: Interval with control signal off
FE: Interval with control signal on and off

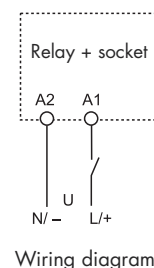


86.30T



- Time scale: from 0.05s to 100h
- Bi-function
- Plug-in for use with 96.02, 96.04, 97.02 and 97.52 sockets

AI: On-delay
DI: Interval



Contact specification

Contact configuration

Rated current/Maximum peak current A

Rated voltage/Maximum switching voltage V AC

Rated load AC1 VA

Rated load AC15 (230 V AC) VA

Single phase motor rating (230 V AC) kW

Breaking capacity DC1: 30/110/220 V A

Minimum switching load mW (V/mA)

Standard contact material

Supply specification

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

V DC

Rated power AC/DC W

Operating range V AC (50/60 Hz)

DC

Technical data

Specified time range

Repeatability %

Recovery time ms

Minimum control impulse ms

Setting accuracy full range %

Electrical life at rated load in AC1 cycles

Ambient temperature range °C

Protection category

Approvals (according to type)

See 56 series relays

See 46, 56 series relays

(0.05...1)s, (0.5...10)s, (5...100)s, (0.5...10)min, (5...100)min, (0.5...10)h, (5...100)h

± 1 ± 1

≤ 50 ≤ 50

50 —

± 5 ± 5

See 56 series relays See 46, 56 series relays

–20...+50 –20...+50

IP 20 IP 20

Ordering information

Example: 86 series multi-function timer module, (12...240)V AC/DC supply voltage.

8 6 . 0 0 . 0 . 2 4 0 . 0 0 0 0 T

Series _____
Type _____
 0 = Multi-function timer (AI, DI, SW, BE, CE, DE, EE, FE)
 3 = Bi-function timer (AI, DI)
No. of poles _____
 See 46, 56 series relays
 Poles for chosen relay/socket combination -
 according to chart below

Supply voltage
 024 = (12...24)V AC/DC (86.30 only)
 240 = (12...240)V AC/DC (86.00 only)
Supply version
 0 = AC (50/60 Hz)/DC

Combinations

Number of poles	Relay type	Socket type	Timer module
2	46.52T	97.02/97.52	86.30T
2	56.32T	96.02	86.30T
4	56.34T	96.04	86.00T/86.30T

Technical data

EMC specifications				
Type of test		Reference standard	86.00T	86.30T
Electrostatic discharge	contact discharge	EN 61000-4-2	4 kV	n.a.
	air discharge	EN 61000-4-2	8 kV	8 kV
Radio-frequency electromagnetic field (80 ÷ 1,000 MHz)		EN 61000-4-3	10 V/m	10 V/m
Fast transients (burst) (5-50 ns, 5 kHz) on Supply terminals		EN 61000-4-4	4 kV	2 kV
Surges (1.2/50 µs) on Supply terminals	common mode	EN 61000-4-5	4 kV	2 kV
	differential mode	EN 61000-4-5	4 kV	1 kV
Radio-frequency common mode (0.15 ÷ 80 MHz) on Supply terminals		EN 61000-4-6	10 V	10 V
Radiated and conducted emission		EN 55022	class B	class B
Other data		86.00T	86.30T	
Current absorption on control signal (B1)		mA	1	—
Power lost to the environment	without contact current	W	0.1 (12 V) - 1 (230 V)	0.2
	with rated current		See 56 series relays	See 46, 56 series relays


Time scales

1 2 3 	1 2 3 	1 2 3 	1 2 3 	1 2 3 	1 2 3 	1 2 3
(0.05...1)s	(0.5...10)s	(5...100)s	(0.5...10)min	(5...100)min	(0.5...10)h	(5...100)h

NOTE: Time scales and functions must be set before energising the timer.

To achieve the minimum time setting of 0.05 seconds it is necessary to use one of the functions with control signal. When setting very short times it may be necessary to take into account the operate time of the relay used.

Functions

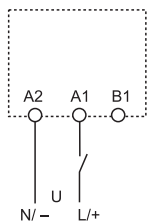
U = Supply voltage
S = Control signal
 = Output contact

LED Type 86.00T	LED Type 86.30T	Supply voltage	NO output contact
		OFF	Open
		ON	Open
		ON	Open (timing in progress)
		ON	Closed

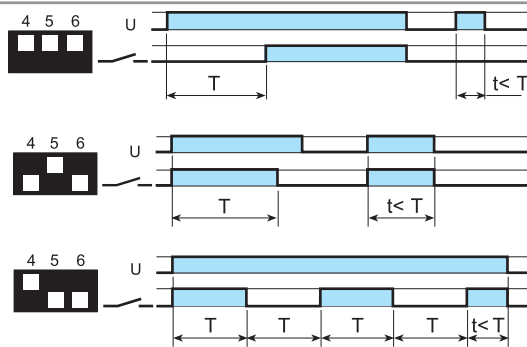
Without control signal = Start via contact in supply line (A1).
 With control signal = Start via contact into control terminal (B1).

Wiring diagram

Without control signal



Type 86.00T



(AI) On-delay.

Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs when power is removed.

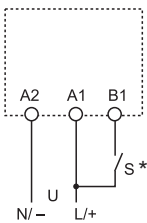
(DI) Interval.

Apply power to timer. Output contacts transfer immediately. After the preset time has elapsed, contacts reset.

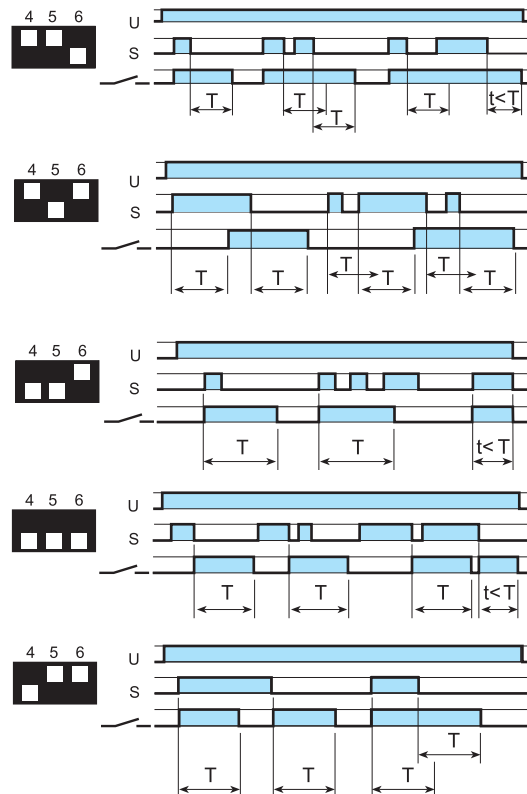
(SW) Symmetrical flasher (starting pulse on).

Apply power to timer. Output contacts transfer immediately and cycle between ON and OFF for as long as power is applied. The ratio is 1:1 (time on = time off).

With control signal



* With DC supply, positive polarity has to be connected to B1 terminal (according to EN 60204-1). Switch S should be exclusively used to provide the control signal to terminal B1. (Do not connect any other load at this point).



(BE) Off-delay with control signal.

Power is permanently applied to the timer. The output contacts transfer immediately on closure of the control signal (S). Opening the control signal initiates the preset delay, after which time the output contacts reset.

(CE) On- and off-delay with control signal.

Power is permanently applied to the timer. Closing the control signal (S) initiates the preset delay, after which time the output contacts transfer. Opening the control signal initiates the same preset delay, after which time the output contacts reset.

(DE) Interval with control signal on.

Power is permanently applied to the timer. On momentary or maintained closure of control signal (S), the output contacts transfer, and remain so for the duration of the preset delay, after which they reset.

(EE) Interval with control signal off.

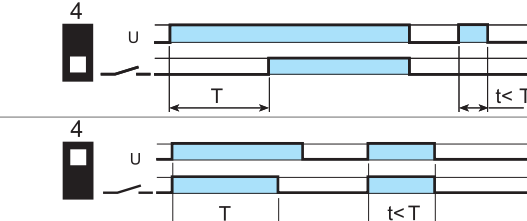
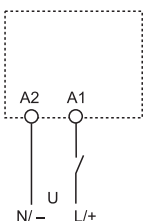
Power is permanently applied to the timer. On opening of the control signal (S) the output contacts transfer, and remain so for the duration of the preset delay, after which they reset.

(FE) Interval with control signal on and off.

Power is permanently applied to the timer. Both the opening and closing of the control signal (S) initiates the transfer of the output contacts. In both instances the contacts reset after the delay period has elapsed.

Wiring diagram

Type 86.30T

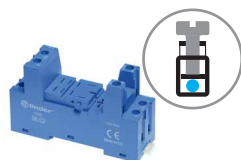


(AI) On-delay.

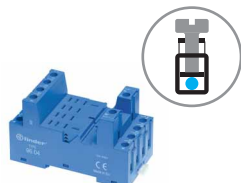
Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs when power is removed.

(DI) Interval.

Apply power to timer. Output contacts transfer immediately. After the preset time has elapsed, contacts reset.



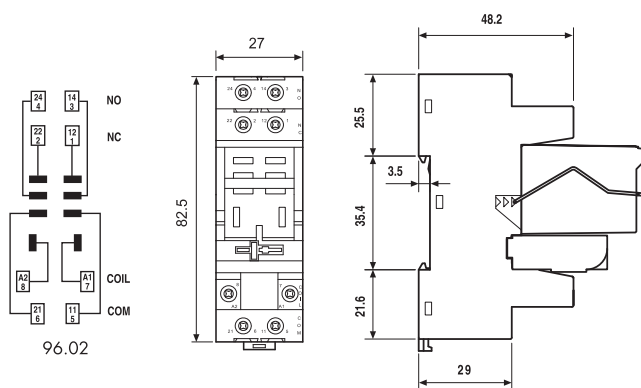
96.02
Approvals
(according to type):



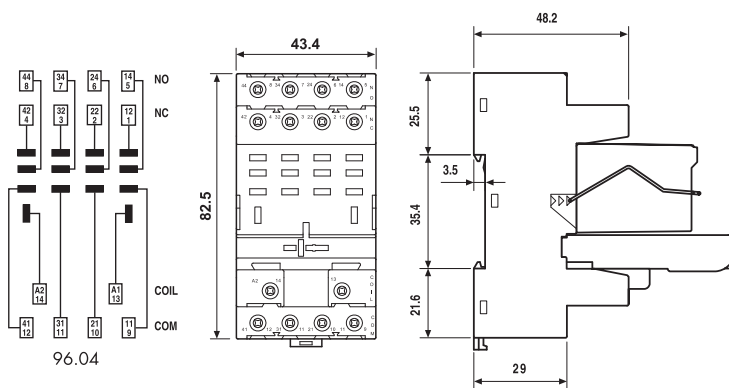
96.04
Approvals
(according to type):



Screw terminal (Box clamp) socket		96.02 SMA*	96.04 SMA*
panel or 35 mm rail (EN 60715) mount			
For relay type		56.32T	56.34T
Accessories			
Metal retaining clip (supplied with socket - packaging code SMA)		094.71	096.71
6-way jumper link		094.06	—
Identification tag		095.00.4	090.00.2
Timer modules		86.30T	86.00T, 86.30T
Technical data			
Rated values		12 A - 250 V	
Dielectric strength		2 kV AC	
Protection category		IP 20	
Ambient temperature		°C -40...+70	
Screw torque		Nm	0.8
Wire strip length		mm	8
Max. wire size for 96.02/04 sockets		solid wire	stranded wire
		mm ²	1x6 / 2x2.5
		AWG	1x10 / 2x14



96.02 96.02 + 56.32T + 094.71 + 86.30T



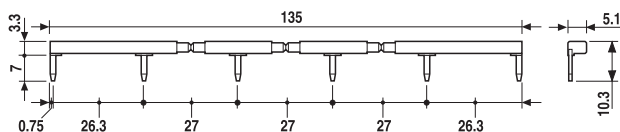
96.04 96.04 + 56.34T + 096.71 + 86.00T / 86.30T

* Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)



094.06

6-way jumper link for 96.02 socket	094.06
Rated values	10 A - 250 V



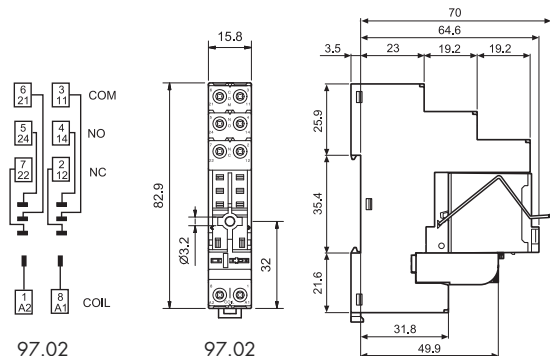


97.02

Approvals
(according to type):

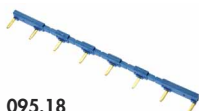


Screw terminal socket		97.02 SMA*	
panel or 35 mm rail (EN 60715) mount			
For relay type		46.52T	
Accessories			
Metal retaining clip (supplied with socket - packaging code SMA)		097.71	
8-way jumper link		095.18	
Identification tag		095.00.4	
Timer modules		86.30T	
Technical data			
Rated current		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 97.02 sockets		solid wire	stranded wire
		mm ²	1x6 / 2x2.5
		AWG	1x10 / 2x14



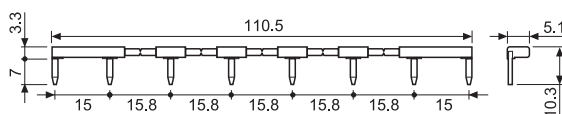
97.02 + 46.52T + 097.71 + 86.30T

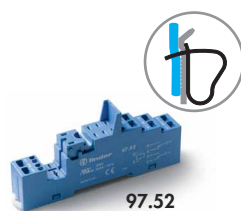
* Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)



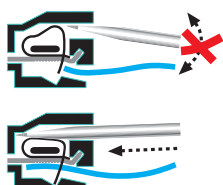
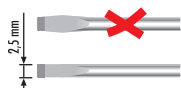
095.18

8-way jumper link for 97.02 sockets	095.18
Rated values	10 A - 250 V

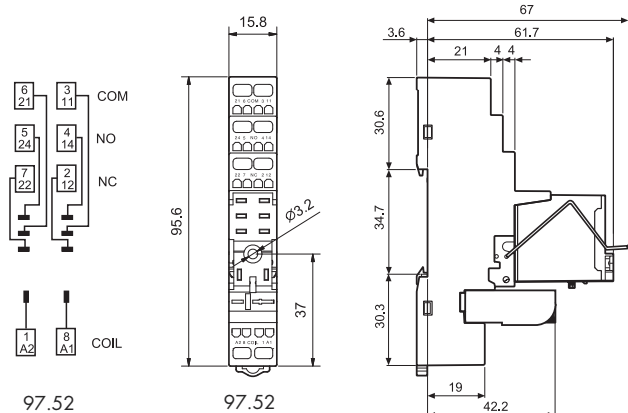




Approvals
(according to type):



Screwless terminal socket		97.52 SMA*	
panel or 35 mm rail (EN 60715) mount			
For relay type		46.52T	
Accessories			
Metal retaining clip (supplied with socket - packaging code SMA)		097.71	
Timer modules		86.30T	
Technical data			
Rated current		8 A - 250 V AC	
Dielectric strength		6 kV (1.2/50 µs) between coil and contacts	
Protection category		IP 20	
Ambient temperature		°C -25...+70	
Wire strip length		mm 8	
Max. wire size for 97.52 sockets		solid wire	stranded wire
		mm ² 2x(0.2...1.5)	2x(0.2...1.5)
		AWG 2x(24...18)	2x(24...18)



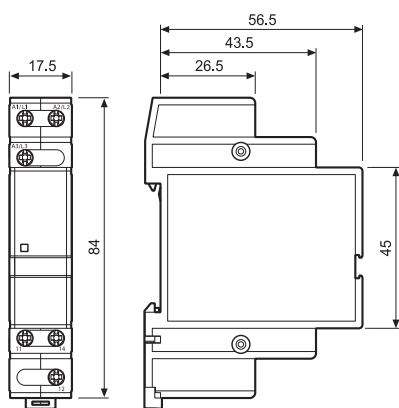
* Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)

97.52 + 46.52T + 097.71 + 86.30T

Features

3 Phase - Rotation and phase loss monitoring relay

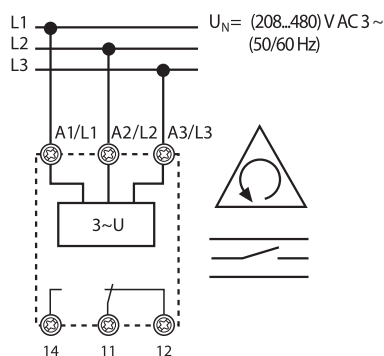
- Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)
- Universal voltage monitoring (U_N from 208 V to 480 V, 50/60 Hz)
- Phase loss monitoring, under phase regeneration
- Positive safety logic - make contact opens if the relay detects an error
- Small size (17.5 mm wide)
- 35 mm rail (EN 60715) mount
- European patent pending for the fully innovative principle at the root of the 3 phase monitoring and error survey system



72.31T



- Phase rotation monitoring
- Phase loss monitoring



Contact specification

Contact configuration	1 CO (SPDT)
Rated current/Maximum peak current A	6/15
Rated voltage/Maximum switching voltage V AC	250/400
Rated load AC1 VA	1,500
Rated load AC15 (230 V AC) VA	250
Single phase motor rating (230 V AC) kW	0.185
Breaking capacity DC1: 30/110/220 V A	3/0.35/0.2
Minimum switching load mW(V/mA)	500 (10/5)
Standard contact material	AgCdO

Supply specification

Nominal system voltage (U_N) V AC 3 ~	208...480
Frequency Hz	50/60
Rated power VA 50 Hz/ W	8/1
Operating range V AC 3 ~	170...500

Technical data

Electrical life at rated load AC1 cycles	$100 \cdot 10^3$
Switch-off/reaction time s	<0.5/<0.5
Ambient temperature °C	-20...+50
Protection category	IP20

Approvals (according to type)



Ordering information

Monitoring relays

Example: 3 phase line monitoring relay, phase rotation and loss monitoring

7 2 . 3 1 . 8 . 4 0 0 . 0 0 0 0 T

Series
Type
 3 = 3 phase AC line monitoring
No. of poles
 1 = 1 CO

Supply voltage
 400 = (208...480)V AC 3~
Supply version
 8 = AC (50/60 Hz)




Technical data

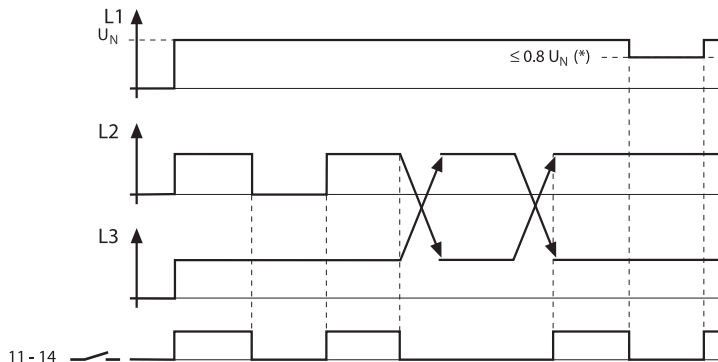
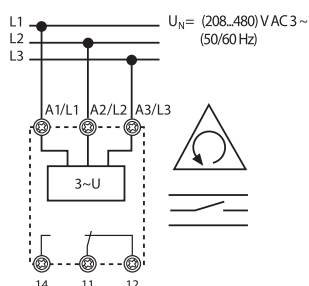
Insulation			
Insulation	between supply and contacts	Dielectric strength	Impulse (1.2/50 µs)
	between open contacts	3,000 V	5 kV
		1,000 V	1.5 kV
EMC specifications			
Type of test		Reference standard	
Electrostatic discharge	contact discharge	EN 61000-4-2	4 kV
	air discharge	EN 61000-4-2	8 kV
Fast transients (burst) (5-50ns, 5kHz) on A1, A2, A3		EN 61000-4-4	2 kV
Surge (1.2/50 µs)	differential mode	EN 61000-4-5	4 kV
Other data			
Start up time (NO contact closure after energising)		s	< 2
Regeneration level (Maximum)			≤ 80% of average of other 2 phase
Power lost to the environment	without contact current	W	1
	with rated current	W	1.4
Screw torque		Nm	0.8
Max. wire size		solid cable	stranded cable
		mm ²	1x6 / 2x4
		AWG	1x12 / 2x14

Functions

L1, L2, L3 = Supply voltage

 = Contact 11- 14

LED status		Supply voltage	NO output contact	Contacts	
				Open	Closed
	Supply voltage OFF	OFF	Open	11 - 14	11 - 12
	- Incorrect phase rotation - Phase loss	ON			
	Normal operation	ON	Closed	11 - 12	11 - 14



Switch off
 - Incorrect phase rotation
 - Phase loss

Output contact (11 - 14)
 - Closed, if monitored system healthy

(*) Phase loss monitoring possible under regeneration up to 80% of the average of the other 2 phases

Features

Relay module with forcibly guided contacts

7S.12 with 2 pole (1 NO + 1 NC)

7S.14 with 4 pole (2 NO + 2 NC and 3 NO + 1 NC)

7S.16 with 6 pole (4 NO + 2 NC)

- For safety applications, with class A forcibly guided contact relays (EN 50205)
- For functional reliability in machinery and plant engineering according to EN 13849-1
- For railway applications; materials compliant with fire and smoke characteristics (UNI 11170-3); mechanical and climatic characteristics compliant with EN 61373 and EN 50155
- Extended operating range (0.7...1.25) U_N
- Coil status visual indication with LED
- 35 mm rail (EN 60715) mount

Screwless terminal



* Single contact current ≤ 6 A,
total NO contacts current ≤ 12 A

For outline drawing see page 19

7S.12.....5110



• 2 pole (1 NO + 1 NC)

7S.14.....0220/0310



• 4 pole (2 NO + 2 NC and 3 NO + 1 NC)

7S.16.....0420

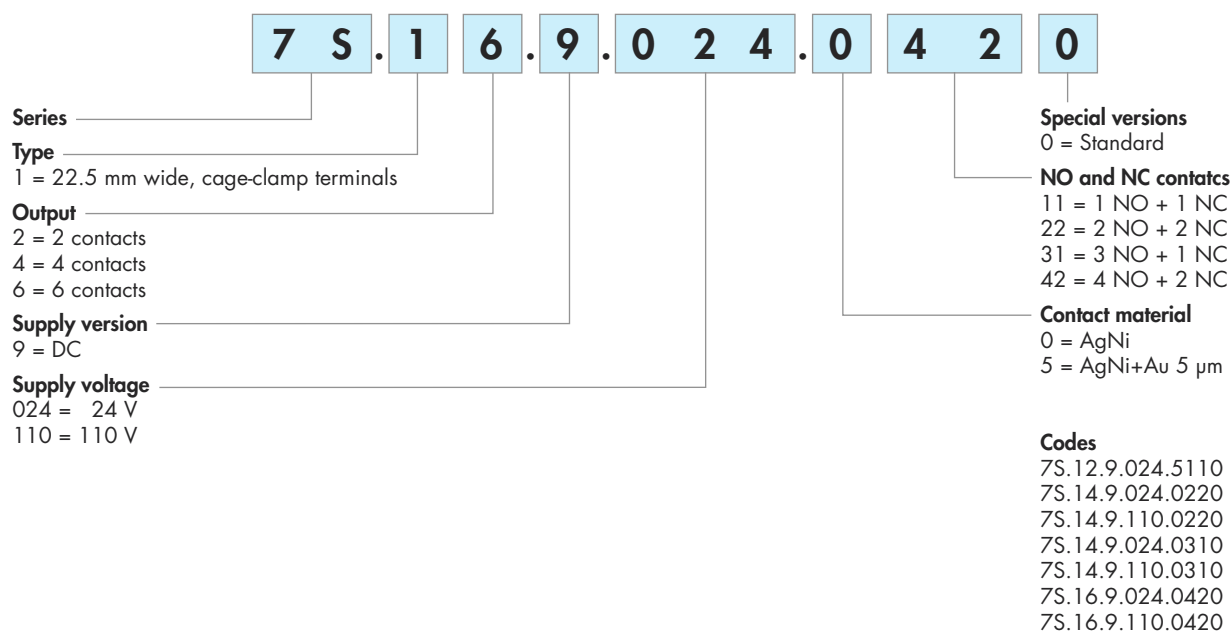


• 6 pole (4 NO + 2 NC)

Contact specification			
Contact configuration	1 NO + 1 NC	2 NO + 2 NC, 3 NO + 1 NC	4 NO + 2 NC
Rated current / Max. peak current A	6/15	6*/12	6*/12
Rated switching voltage V AC (50/60 Hz)	250	250	250
Rated load AC1 VA	1,500	1,500	1,500
Rated load AC15 (230 V AC) VA	700	500	500
Breaking capacity DC1: 30/110/220 V A	6/0.6/0.2	6/0.6/0.3	6/0.6/0.3
Breaking capacity DC13: 24 V A	1	1	1
Minimum switching load mW (V/mA)	60 (5/5)	60 (5/5)	60 (5/5)
Standard contact material	AgNi + Au (5 μ m)	AgNi with notched crown	AgNi with notched crown
Coil specification			
Nominal voltage (U_N) V DC	24	24 - 110	24 - 110
Rated power W	0.8	0.8	0.8
Operating range DC	(0.7...1.25) U_N	(0.7...1.25) U_N	(0.7...1.25) U_N
Holding voltage DC	0.45 U_N	0.55 U_N	0.55 U_N
Must drop-out voltage DC	0.12 U_N	0.12 U_N	0.12 U_N
Technical data			
Mechanical life cycles	10 · 10 ⁶	10 · 10 ⁶	10 · 10 ⁶
Electrical life at rated load AC1 cycles	100 · 10 ³	100 · 10 ³	100 · 10 ³
Operate / release time ms	7/11	12/10	12/10
Insulation between coil and contacts (1.2/50 μ s) kV	6	6 (4 against 13-14)	6 (4 against 13-14)
Dielectric strength between open contacts V AC	1,500	1,500	1,500
Ambient temperature °C	-40....+60	-40....+60	-40....+60
Protection category	IP 20	IP 20	IP 20
Approvals (according to type)	CE		

Ordering information

Example: 7S series Relay module with forcibly guided contacts, 6 contact (4 NO + 2 NC) 6 A, supply voltage 24 V DC.



Technical data

Insulation according to EN 61810-1				
Nominal voltage of supply system	V AC	230/400		
Rated insulation voltage	V AC	250		
Pollution degree		2		
Insulation between coil and contact set				
Type of Insulation		Reinforced *	Basic *	Reinforced *
Overvoltage category		III	III	II
Rated impulse voltage	kV (1.2/50 µs)	6	4	4
Dielectric strength	V AC	4,000	2,500	2,500
Insulation between adjacent contacts				
Type of Insulation		Reinforced *	Basic*	Reinforced *
Overvoltage category		III	III	II
Rated impulse voltage	kV (1.2/50 µs)	6	4	4
Dielectric strength	V AC	4,000	2,500	2,500
Insulation between open contacts				
Type of disconnection		Micro-disconnection		
Dielectric strength	V AC / kV (1.2/50 µs)	1,500 / 2.5		

* Tables below indicate, for each 7S type, those contacts (R) meeting Reinforced Insulation Overvoltage category III, those contacts (R2) meeting Reinforced Insulation Overvoltage category II, and those contacts (B) meeting Basic Insulation Overvoltage category III.

EMC specifications				Reference standard	
Burst (5/50 ns)	on supply terminals			EN 61000-4-4	4 kV
Surge (1.2/50 µs)	on supply terminals	differential mode		EN 61000-4-5	1.5 kV
Terminals				solid cable	stranded cable
Max. wire size		mm ²		1 x 1.5	1 x 1.5
		AWG		1 x 14	1 x 16
Wire strip length		mm		9	
Other data				7S.12	7S.14
Bounce time: NO/NC		ms		2/8	1/20
Vibration resistance (10...200) Hz: NO/NC		g		10/5	15/4
Shock resistance: NO/NC		g		20/6	25/13
Power lost to the environment	without contact current	W		0.8	0.8
	with rated current	W		1.4	2.3

Type of insulation between coil and contacts and between adjacent contacts

Code		
Type of Insulation		Overvoltage category
R	Reinforced	III
B	Basic	III
R2	Reinforced	II

7S.12....5110			
	Coil	13-14	21-22
Coil	—	R	R
13-14		—	B/R2
21-22			—

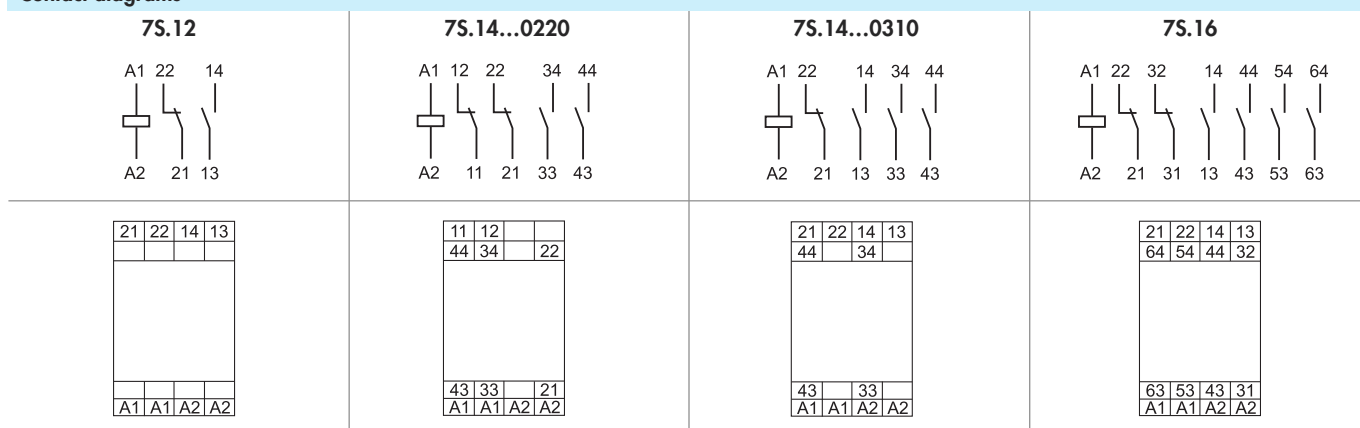
7S.14....0310					
	Coil	13-14	21-22	33-34	43-44
Coil	—	B	R	R	R
13-14		—	B	R	R
21-22			—	R	R
33-34				—	B/R2
43-44					—

7S.16....0420							
	Coil	13-14	21-22	31-32	43-44	53-54	63-64
Coil	—	B	R	R	R	R	R
13-14		—	B	R	R	R	R
21-22			—	R	R	R	R
31-32				—	B/R2	R	R
43-44					—	B/R2	R
53-54						—	B/R2
63-64							—

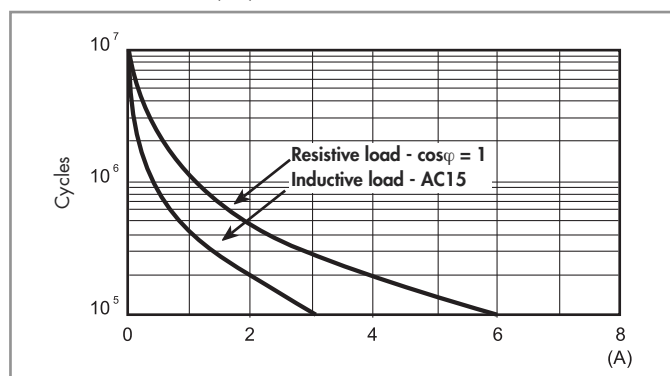
7S.14....0220					
	Coil	11-12	21-22	33-34	43-44
Coil	—	R	R	R	R
11-12		—	R	R	R
21-22			—	R	R
33-34				—	B/R2
43-44					—

Contact specifications

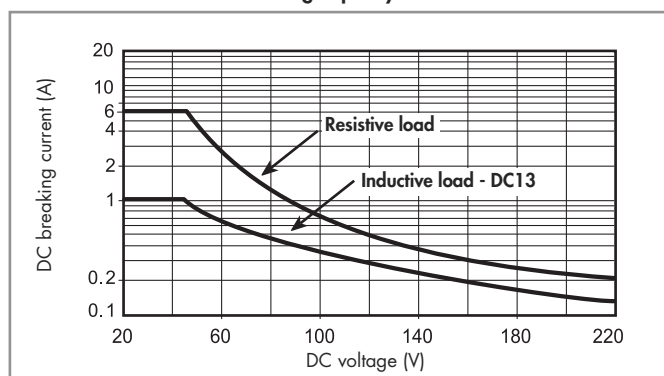
Contact diagrams



F 7S12 - Electrical life (AC) v contact current - 7S.12

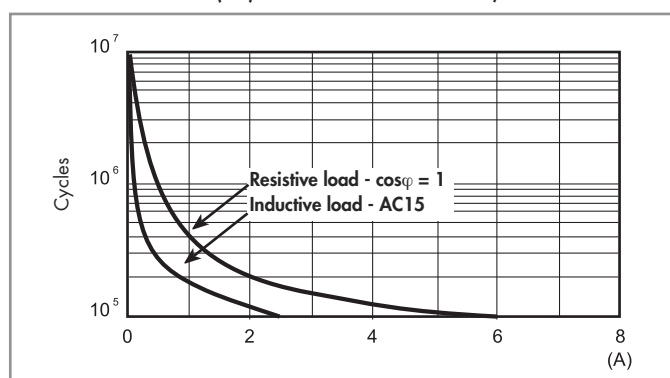


H 7S12 - Maximum DC breaking capacity - 7S.12

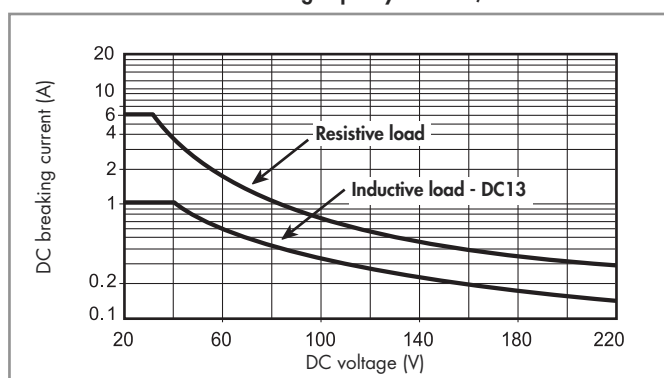


- When switching a load having voltage and current values under the curve, an electrical life of $\geq 100 \cdot 10^3$ can be expected.

F 7S16 - Electrical life (AC) v contact current - 7S.14 / 7S.16



H 7S16 - Maximum DC breaking capacity - 7S.14 / 7S.16



- When switching a load having voltage and current values under the curve, an electrical life of $\geq 100 \cdot 10^3$ can be expected.

Coil specifications

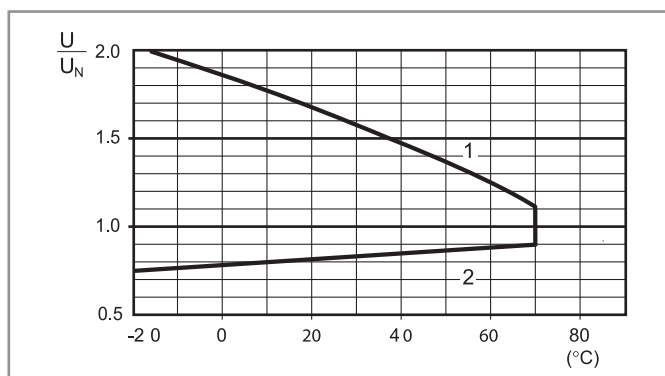
Coil data - 7S.12

Nominal voltage	Coil code	Operating range		Must drop-out voltage	Rated input current at U_N	Rated power at U_N
U_N		U_{min}	U_{max}	U_r	I_N	W
V		V	V	V	mA	
24	9.024	16.8	30	2.9	33	0.8

Coil data - 7S.14 / 7S.16

Nominal voltage	Coil code	Operating range		Must drop-out voltage	Rated input current at U_N	Rated power at U_N
U_N		U_{min}	U_{max}	U_r	I_N	W
V		V	V	V	mA	
24	9.024	16.8	30	2.9	33	0.8
110	9.110	77	138	13.2	7.5	0.8

R 7S - DC coil operating range v ambient temperature - 7S.12 / 7S.14 / 7S.16

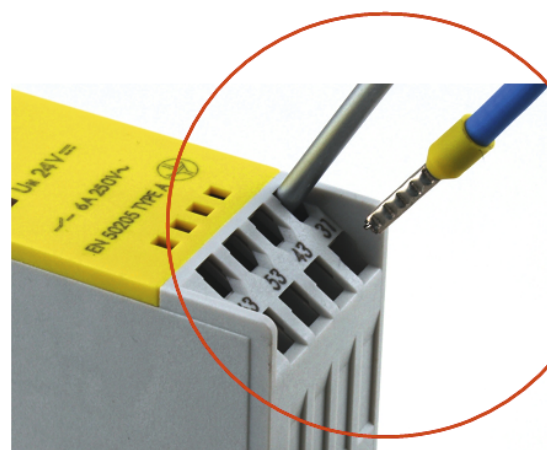
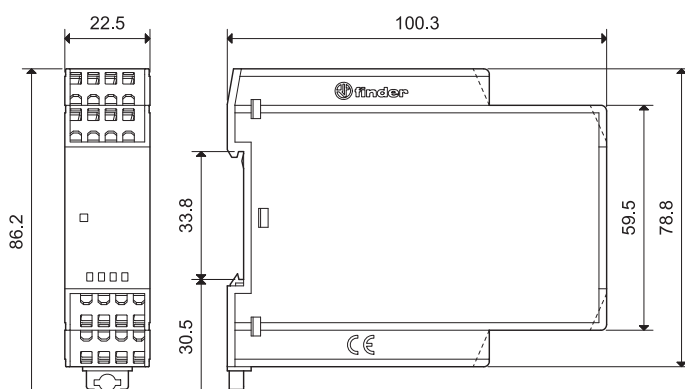


1 - Max. permitted coil voltage.

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

Outline drawings

7S
Screwless terminal



Accessories



Sheet of marker tags, plastic, 72 tags, 6x12 mm

060.72

060.72

Features

Multi-function and mono-function timer range

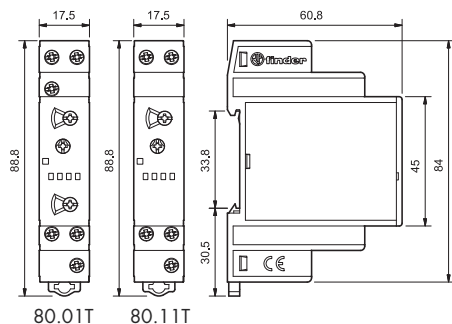
80.01T - Multi-function & multi-voltage

80.11T - ON delay, multi-voltage

- Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)
- 17.5 mm wide
- Six time scales from 0.1 s to 24 h
- High input/output isolation
- 35 mm rail (EN 60715) mount
- "Blade + cross" - both flat blade and cross head screw drivers can be used to adjust the range and function selectors, the timing trimmer, and to disengage the rail mounting clip
- New multi-voltage versions with "PWM clever" technology



80.01T / 80.11T
Screw terminal

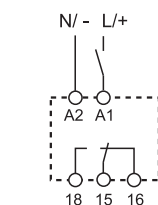


80.01T

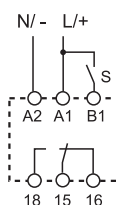


- Multi-voltage
- Multi-function

AI: On-delay
DI: Interval
SW: Symmetrical flasher (starting pulse on)
BE: Off-delay with control signal
CE: On- and off-delay with control signal
DE: Interval with control signal on



Wiring diagram
(without control signal)



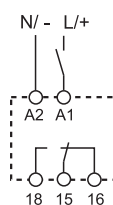
Wiring diagram
(with control signal)

80.11T



- Multi-voltage
- Mono-function

AI: On-delay



Wiring diagram
(without control signal)

Contact specification			
Contact configuration		1 CO (SPDT)	1 CO (SPDT)
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	4,000	4,000
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	16/0.3/0.12	16/0.3/0.12
Minimum switching load	mW (V/mA)	500 (10/5)	500 (10/5)
Standard contact material		AgCdO	AgCdO
Supply specification			
Nominal voltage (U _N)	V AC (50/60 Hz)	12...240	24...240
	V DC	12...240	24...240
Rated power AC/DC	VA (50 Hz)/W	< 1.8 / < 1	< 1.8 / < 1
Operating range	V AC	(10.8...265)	(16.8...265)
	V DC	(10.8...265)	(16.8...265)
Technical data			
Specified time range		(0.1...2)s, (1...20)s, (0.1...2)min, (1...20)min, (0.1...2)h, (1...24)h	
Repeatability	%	± 1	± 1
Recovery time	ms	≤ 50	≤ 50
Minimum control impulse	ms	50	—
Setting accuracy-full range	%	± 5	± 5
Electrical life at rated load in AC1	cycles	100·10 ³	100·10 ³
Ambient temperature range	°C	-10...+50	-10...+50
Protection category		IP 20	IP 20
Approvals (according to type)			

Features

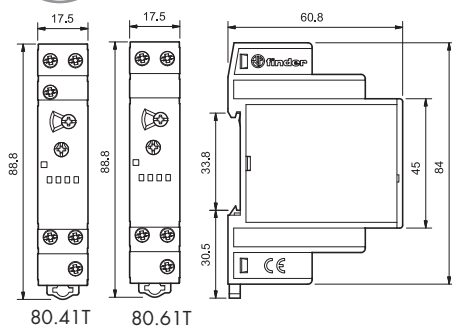
Mono-function timer range

80.41T - Off-delay with control signal, multi-voltage
80.61T - Power off-delay (True off-delay), multi-voltage

- Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)
- 17.5 mm wide
- Six time scales from 0.1 s to 24 h (type 80.41T)
- Four time scales from 0.1 s to 3 min (type 80.61T)
- High input/output isolation
- 35 mm rail (EN 60715) mount
- "Blade + cross" - both flat blade and cross head screw drivers can be used to adjust the range and function selectors, the timing trimmer, and to disengage the rail mounting clip (type 80.41T)
- New multi-voltage versions with "PWM clever" technology
- Rotary range selector, and timing trimmer (80.61T)



80.41T / 80.61T
Screw terminal

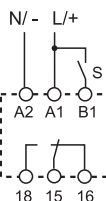


80.41T



- Multi-voltage
- Mono-function

BE: Off-delay with control signal



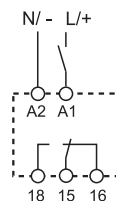
Wiring diagram
(with control signal)

80.61T



- Multi-voltage
- Mono-function

BI: Power off-delay (True off-delay)



Wiring diagram
(without control signal)

Contact specification

Contact configuration	1 CO (SPDT)	1 CO (SPDT)
Rated current/Maximum peak current	A	16/30
Rated voltage/Maximum switching voltage V AC	250/400	250/400
Rated load AC1	VA	4,000
Rated load AC15 (230 V AC)	VA	750
Single phase motor rating (230 V AC)	kW	0.55
Breaking capacity DC1: 30/110/220 V	A	16/0.3/0.12
Minimum switching load	mW (V/mA)	500 (10/5)
Standard contact material	AgCdO	AgNi

Supply specification

Nominal voltage (U _N)	V AC (50/60 Hz)	24...240	24...240
	V DC	24...240	24...220
Rated power AC/DC	VA (50 Hz)/W	< 1.8 / < 1	< 0.6 / < 0.6
Operating range	V AC	16.8...265	16.8...265
	V DC	16.8...265	16.8...242

Technical data

Specified time range	(0.1...2)s, (1...20)s, (0.1...2)min, (1...20)min, (0.1...2)h, (1...24)h	(0.05...2)s, (1...16)s, (8...70)s, (50...180)s
Repeatability	%	± 1
Recovery time	ms	≤ 50
Minimum control impulse	ms	50
Setting accuracy-full range	%	± 5
Electrical life at rated load in AC1	cycles	100·10 ³
Ambient temperature range	°C	-10...+50
Protection category	IP 20	IP 20

Approvals (according to type)



Ordering information

Example: 80 series, modular timers, 1 CO (SPDT) - 16 A, supply rated at (12...240)V AC/DC.

8 0 . 0 1 . 0 . 2 4 0 . 0 0 0 0 T

Series

Type

0 = Multi-function timer (AI, DI, SW, BE, CE, DE);
1 CO 16 A - 250 V AC
1 = Monofunction timer (AI);
1 CO 16 A - 250 V AC
4 = Monofunction timer (BE);
1 CO 16 A - 250 V AC
6 = Monofunction timer (BI);
1 CO 8 A - 250 V AC

Versions

0 = Standard

Supply voltage

240 = (12 ... 240)V AC/DC (80.01)

240 = (24 ... 240)V AC/DC (80.11, 80.41, 80.61)

Supply version

0 = AC (50/60 Hz)/DC

No. of poles

1 = 1 CO (SPDT)

Technical data

Insulation

Dielectric strength			80.01T/11T/41T	80.61T
	between input and output circuit	V AC	4,000	2,500
	between open contacts	V AC	1,000	1,000
Insulation (1.2/50 µs) between input and output			kV	6
				4

EMC specifications

Type of test		Reference standard	
Electrostatic discharge	contact discharge	EN 61000-4-2	4 kV
	air discharge	EN 61000-4-2	8 kV
Radio-frequency electromagnetic field (80 ÷ 1,000 MHz)		EN 61000-4-3	10 V/m
Fast transients (burst) (5-50 ns, 5 kHz) on Supply terminals		EN 61000-4-4	4 kV
Surges (1.2/50 µs) on Supply terminals	common mode	EN 61000-4-5	4 kV
	differential mode	EN 61000-4-5	4 kV
	on control signal (B1) common mode	EN 61000-4-5	4 kV
	differential mode	EN 61000-4-5	4 kV
Radio-frequency common mode (0.15 ÷ 80 MHz) on Supply terminals		EN 61000-4-6	10 V
Radiated and conducted emission		EN 55022	class A

Other data





Current absorption on control signal (B1)			< 1 mA
Power lost to the environment	without contact current	W	1.4
	with rated current	W	3.2
Screw torque		Nm	0.8
Max. wire size	solid cable		stranded cable
	mm ²	1x6 / 2x4	1x4 / 2x2.5
	AWG	1x10 / 2x12	1x12 / 2x14

Functions

U = Supply voltage

S = Control signal

 = Output contact

LED*	Supply voltage	NO output contact	Contacts	
			Open	Closed
	OFF	Open	15 - 18	15 - 16
	ON	Open	15 - 18	15 - 16
	ON	Open (Timing in Progress)	15 - 18	15 - 16
	ON	Closed	15 - 16	15 - 18

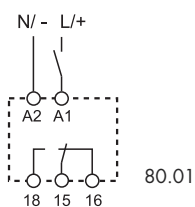
* The LED on type 80.61T is illuminated only when the supply voltage is applied to the timer; during the timing period the LED is not illuminated.

Wiring diagram

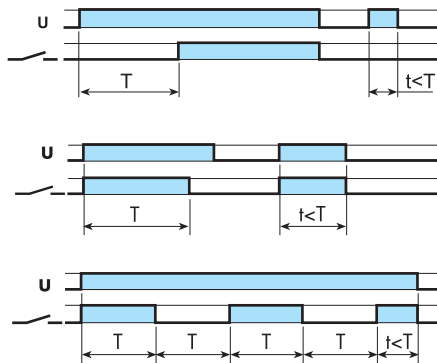
Without control signal = Start via contact in supply line (A1).

With control signal = Start via contact into control terminal (B1).

Without control signal



Type 80.01T



(AI) On-delay.

Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs when power is removed.

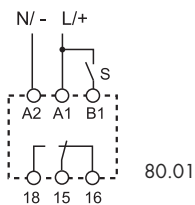
(DI) Interval.

Apply power to timer. Output contacts transfer immediately. After the preset time has elapsed, contacts reset.

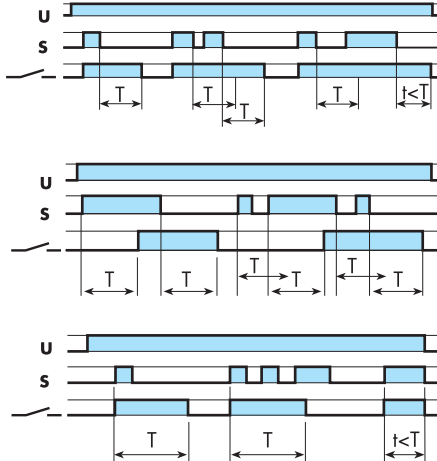
(SW) Symmetrical flasher (starting pulse on).

Apply power to timer. Output contacts transfer immediately and cycle between ON and OFF for as long as power is applied. The ratio is 1:1 (time on = time off).

With control signal



80.01T



(BE) Off-delay with control signal.

Power is permanently applied to the timer. The output contacts transfer immediately on closure of the control signal (S). Opening the control signal initiates the preset delay, after which time the output contacts reset.

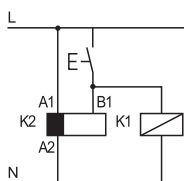
(CE) On- and off-delay with control signal.

Power is permanently applied to the timer. Closing the control signal (S) initiates the preset delay, after which time the output contacts transfer. Opening the control signal initiates the same preset delay, after which time the output contacts reset.

(DE) Interval with control signal on.

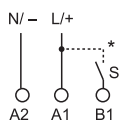
Power is permanently applied to the timer. On momentary or maintained closure of control signal (S), the output contacts transfer, and remain so for the duration of the preset delay, after which they reset.

NOTE: The function must be set before energising the timer.



- Possible to control an external load, such as another relay coil or timer, connected to the control signal terminal B1.

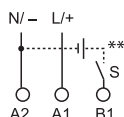
* With DC supply, positive polarity has to be connected to B1 terminal (according to EN 60204-1).



** A voltage other than the supply voltage can be applied to the control signal (B1), example:

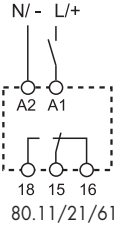
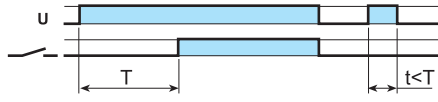
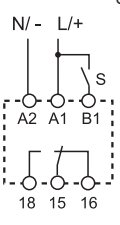
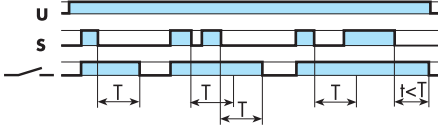
A1 - A2 = 230 V AC

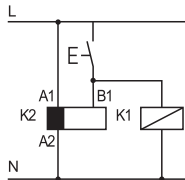
B1 - A2 = 12 V DC



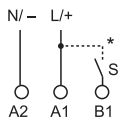
Functions

Wiring diagram

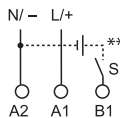
<p>Without control signal</p>  <p>80.11/21/61</p>	<p>Type 80.11T</p>		<p>(AI) On-delay. Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs when power is removed.</p>
<p>With control signal</p> 	<p>80.41T</p>		<p>(BE) Off-delay with control signal. Power is permanently applied to the timer. The output contacts transfer immediately on closure of the control signal (S). Opening the control signal initiates the preset delay, after which time the output contacts reset.</p>



- Possible to control an external load, such as another relay coil or timer, connected to the control signal terminal B1.



- * With DC supply, positive polarity has to be connected to B1 terminal (according to EN 60204-1).



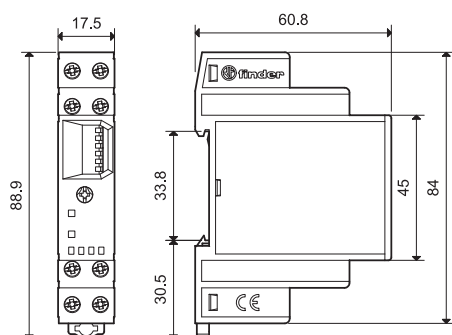
- ** A voltage other than the supply voltage can be applied to the control signal (B1), example:
A1 - A2 = 230 V AC
B1 - A2 = 12 V DC

Features

Multi-function and multi-voltage timer

- Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)
- One module 17.5 mm wide housing
- Seven functions (4 with supply start and 3 with control signal)
- Additional Reset function
- Six time ranges from 0.1s to 10h
- 35 mm rail (EN 60715) mounting

81.01T
Screw terminal

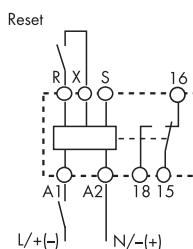


81.01T

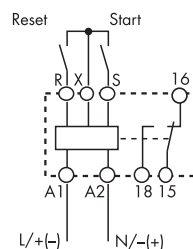


- Multi-voltage (DC non polarized)
- Multi-function
- 35 mm rail (EN 60715) mounting

AI: On-delay
DI: Interval
SW: Symmetrical flasher (starting pulse on)
SP: Symmetrical flasher (starting pulse off)
BE: Off-delay with control signal
DE: Interval with control signal on
EEb: Interval with control signal off



Wiring diagram
without control signal



Wiring diagram
with control signal

Contact specification

Contact configuration	1 CO (SPDT)
Rated current/Maximum peak current	A 16/30
Rated voltage/Maximum switching voltage V AC	250/400
Rated load AC1	VA 4,000
Rated load AC15 (230 V AC)	VA 750
Single phase motor rating (230 V AC)	kW 0.55
Breaking capacity DC1: 30/110/220 V	A 16/0.3/0.12
Minimum switching load	mW (V/mA) 500 (10/5)
Standard contact material	AgCdO

Supply specification

Nominal voltage (U _N)	V AC (50/60 Hz)	12...230
	V DC	12...230 (non polarized)
Rated power AC/DC	VA (50 Hz)/W	< 2 / < 2
Operating range	V AC	10.8...250
	V DC	10.8...250

Technical data

Specified time range	(0.1...1)s, (1...10)s, (10...60)s, (1...10)min, (10...60)min, (1...10)h
Repeatability	% ± 1
Recovery time	ms ≤ 50
Minimum control impulse	ms 50
Setting accuracy-full range	% ± 5
Electrical life at rated load in AC1	cycles 100·10 ³
Ambient temperature range	°C -10...+50
Protection category	IP 20

Approvals (according to type)



Ordering information

Example: 81 series, multi function timer; 1 CO 16 A - 250 V AC, supply rated at (12...230)V AC/DC.

8 1 . 0 1 . 0 . 2 3 0 . 0 0 0 0 T

Series _____
Type _____
 0 = Multi-function (AI, DI, SW, SP, BE, DE, EEb)
No. of poles _____
 1 = 1 CO (SPDT)

Supply voltage
 230 = (12 ... 230)V AC/DC
Supply version
 0 = AC (50/60 Hz)/DC

Technical data

EMC specifications

Type of test		Reference standard	
Electrostatic discharge	contact discharge	EN 61000-4-2	4 kV
	air discharge	EN 61000-4-2	8 kV
Radio-frequency electromagnetic field (80 ÷ 1,000 MHz)		EN 61000-4-3	10 V/m
Fast transients (burst) (5-50 ns, 5 kHz) on Supply terminals		EN 61000-4-4	4 kV
Surges (1.2/50 µs) on Supply terminals	common mode	EN 61000-4-5	4 kV
	differential mode	EN 61000-4-5	4 kV
Radio-frequency common mode (0.15 ÷ 80 MHz) on Supply terminals		EN 61000-4-6	10 V
Radiated and conducted emission		EN 55022	class A

Other data


Current absorption on control signal (B1)		< 1 mA (S-X)	< 1 mA (R-X)
Voltage potential on the input terminal R - X and S -X		Not galvanic separation from the supply voltage on A1 - A2	
Power lost to the environment	without contact current	W	1.3
	with rated current	W	3.2
Screw torque		Nm	0.8
Max. wire size	solid cable		stranded cable
	mm²		1x4 / 2x2.5
	AWG		1x12 / 2x14


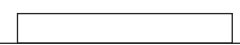

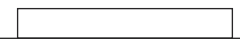


Time range setting

(0.1...1)s	(1...10)s	(10...60)s	(1...10)min	(10...60)min	(1...10)h
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6

NOTE: time range and function must be set before energising the timer.

Functions

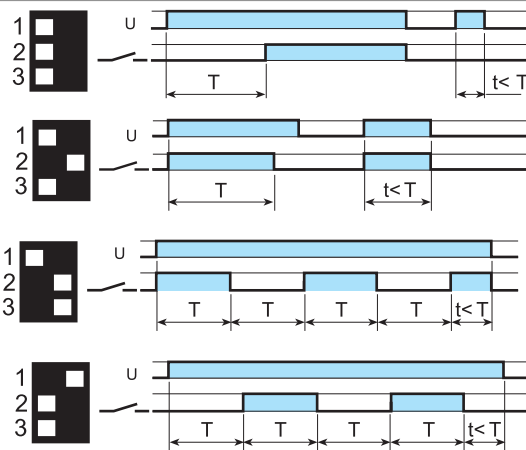
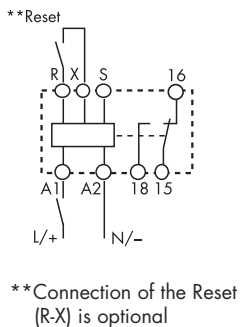
- U** = Supply voltage
S = Control signal
R = Reset
 = Output contact

LED (green)	LED (red)	Supply voltage	NO output contact	Contacts	
				Open	Closed
		OFF	Open	15 - 18	15 - 16
		ON	Open	15 - 18	15 - 16
		ON	Closed	15 - 16	15 - 18

Without control signal = Start via contact in supply line (A1).
 With control signal = Start via contact into control terminal (B1).

Wiring diagram

Without control signal



(AI) On-delay.

Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs when power is removed.

(DI) Interval.

Apply power to timer. Output contacts transfer immediately. After the preset time has elapsed, contacts reset.

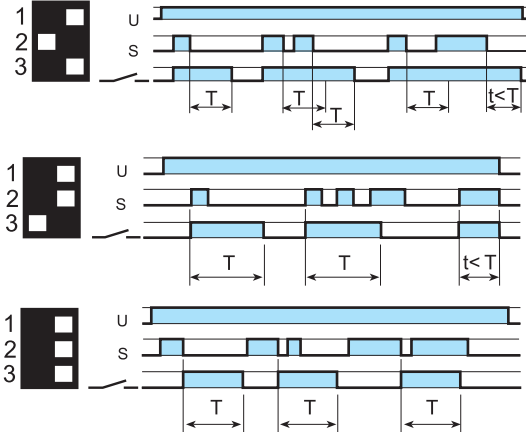
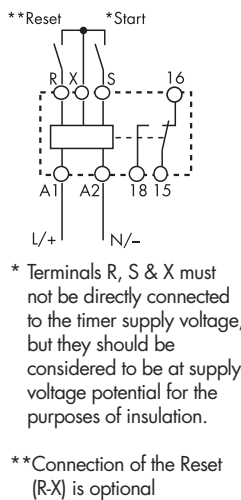
(SW) Symmetrical flasher (starting pulse on).

Apply power to timer. Output contacts transfer immediately and cycle between ON and OFF for as long as power is applied. The ratio is 1:1 (time on = time off).

(SP) Symmetrical flasher (starting pulse off).

Apply power to timer. First transfer of contact occurs after preset time has elapsed. The timer now cycles between OFF and ON as long as power is applied. The ratio is 1:1 (time on = time off).

With control signal



(BE) Off-delay with control signal.

Power is permanently applied to the timer. The output contacts transfer immediately on closure of the control signal (S). Opening the control signal initiates the preset delay, after which time the output contacts reset.

(DE) Interval with control signal on.

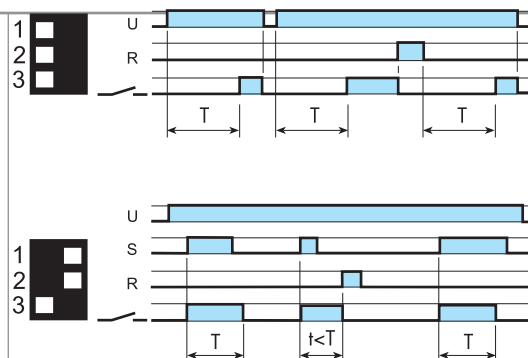
Power is permanently applied to the timer. On momentary or maintained closure of control signal (S), the output contacts transfer, and remain so for the duration of the preset delay, after which they reset.

(EEb) Interval with control signal off.

Power is permanently applied to the timer. On opening of the Signal Switch (S) the output contacts transfer, and remain so for the duration of the preset delay, after which they reset.

RESET function (R)

For each and every function and time range, the timer is immediately reset when the reset switch is closed.



Example:

On-delay function (without control signal).
Closing the external reset switch immediately resets the timer. Opening the reset switch re-initiates the timing function.

Example:

Interval with control signal on function.
Closing the external reset switch terminates the interval time and resets the timer. To re-start, it is necessary to open the reset switch, before closing the control signal contact.

Features

Relays for automatic control of lighting according to ambient light level - with separate light sensor

11.31 - 1 NO 16 A output contact

- Sensitivity adjustment from 1 to 100 lux
- One module, 17.5mm wide
- Low energy consumption
- 24 V DC/AC version
- For the first 3 working cycles the delay time (On and Off) is reduced to zero in order to aid installation
- LED status indication
- SELV separation between contact and supply circuit
- Double insulation between supply and light sensor
- 35 mm rail (EN 60715) mount
- Cadmium free contact material
- Cadmium free light sensor (IC photo diode)

11.31



- 1 pole
- 17.5 mm wide

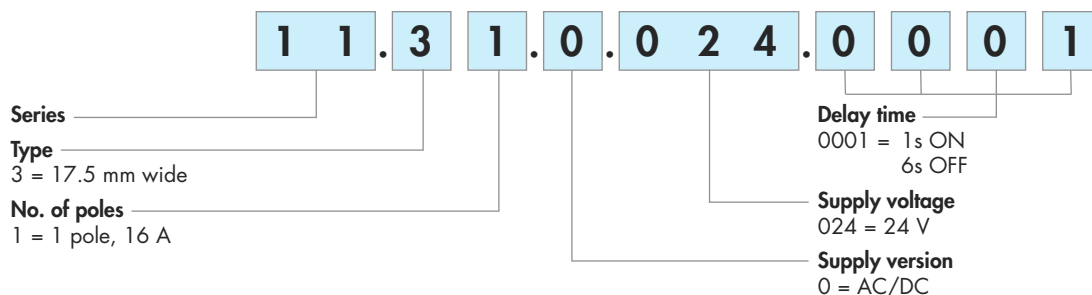


For outline drawing see page 30

Contact specification		
Contact configuration		1 NO (SPST-NO)
Rated current/Maximum peak current (I_N/I_{max}) A		16 / 30 (120 – 5 ms)
Rated voltage/Maximum switching voltage (U_N/U_{max}) V AC		250 / 400
Rated load AC1	VA	4,000
Rated load AC15 (230 V AC)	VA	750
Nominal lamp rating (230 V): incandescent W		2,000
compensated fluorescent W		750
uncompensated fluorescent W		1,000
halogen W		2,000
Minimum switching load	mW (V/mA)	1,000 (10 / 10)
Standard contact material		AgSnO ₂
Supply specification		
Nominal voltage (U_N)	V AC (50/60 Hz)	24
	DC	24
Rated power	VA (50 Hz)/W	2.5
Operating range	V AC (50 Hz)	16.8...28.8
	DC	16.8...32
Technical data		
Electrical life at rated load in AC1	cycles	100 · 10 ³
Threshold setting:	Standard range lx	1...100
	High range lx	—
Hysteresis (switching Off/On ratio)		1.25
Delay time: switching On / Off	s	1 / 6
Ambient temperature range	°C	-20...+50
Protection category: light dependent relay/light sensor		IP 20 / IP 54
Approvals (according to type)		

Ordering information

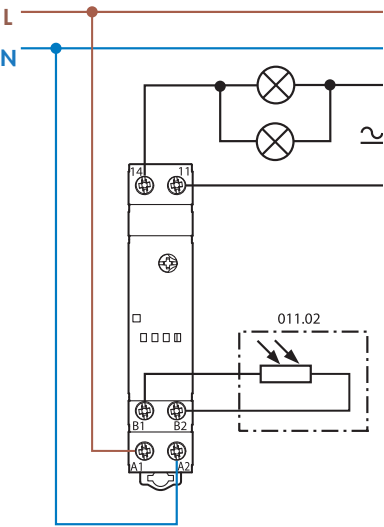
Example: 11 series light dependent relay with time switch, 1 NO (SPST-NO) 16 A contact, 24 V AC/DC supply.









Technical data

Insulation		Dielectric strength	Impulse (1.2/50 µs)
	between supply and contacts	4,000 V AC	6 kV
	between supply and light sensor	2,000 V AC	4 kV
	between open contacts	1,000 V AC	1.5 kV
EMC specifications			
Type of test		Reference standard	
Electrostatic discharge	contact discharge	EN 61000-4-2	4 kV
	air discharge	EN 61000-4-2	8 kV
Radiated electromagnetic field (80 ... 1,000 MHz)		EN 61000-4-3	10 V/m
Fast transients (burst 5/50 ns, 5 and 100 kHz)	on supply terminals	EN 61000-4-4	3 kV
	on light sensor connection	EN 61000-4-4	3 kV
Voltage pulses on supply terminals (surge 1.2/50 µs)	common mode	EN 61000-4-5	4 kV
	differential mode	EN 61000-4-5	3 kV
Radiofrequency common mode voltage (0.15...80 MHz)	on supply terminals	EN 61000-4-6	10 V
	on light sensor	EN 61000-4-6	3 V
Voltage dips	70 % U _N , 40 % U _N	EN 61000-4-11	10 cycles
Short interruptions		EN 61000-4-11	10 cycles
Radio frequency conducted emissions	0.15...30 MHz	EN 55014	class B
Radiated emissions	30...1,000 MHz	EN 55014	class B
Terminals			
Screw torque		0.8 Nm	
Max. wire size	solid cable	1 x 6 / 2 x 4 mm ²	1 x 10 / 2 x 12 AWG
	stranded cable	1 x 4 / 2 x 2.5 mm ²	1 x 12 / 2 x 14 AWG
Wire strip length		9 mm	
Other data			
Cable grip of light sensor		7.5 ... 9 mm	
Maximum cable length relay to light sensor		50 m (2 x 1.5 mm ²)	
Preset threshold		10 lx	
Power lost to the environment	in stand-by	0.3 W	
	without contact current	0.9 W	
	with rated current	1.7 W	

Wiring diagrams

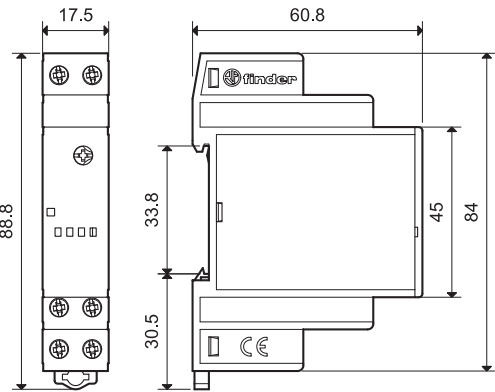


LED functions

LED	Supply voltage	NO output contact 11.31
	OFF	Open
	ON	Open
	ON	Open (timing to close in progress)
	ON	Closed
	ON	Closed (timing to open in progress)
	ON	—

Outline drawings

11.31
Screw terminal



Accessories

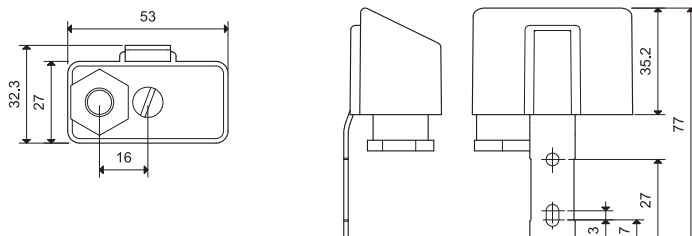


011.02

Light sensor (supplied with light dependent relay)

011.02

- Ambient temperature range: $-40...+70\text{ }^{\circ}\text{C}$
- Cadmium free
- Non polarized
- Double insulated with respect to light dependent relay supply
- Not compatible with old 11.01 and 11.71 light dependent relay (to be used with 011.00 photosensor)



011.03

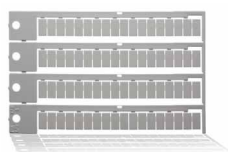
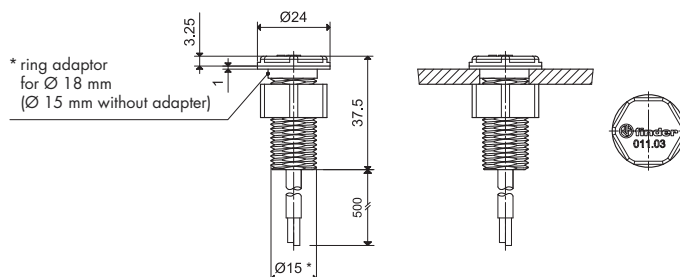
Flush-mounted light sensor (protection category: IP66/67)

011.03

- Ambient temperature range: $-40...+70\text{ }^{\circ}\text{C}$
- Cadmium free
- Non polarized
- Double insulated with respect to light dependent relay supply
- Not compatible with old 11.01 and 11.71 light dependent relay
- Supplied with light dependent relay (packaging code POA)

Connection cable

Material		PVC, flame retardant
Conductor size	mm ²	0.5
Cable length	mm	500
Cable diameter	mm	5.0
Working voltage	V	300/500
Test voltage, cable	kV	2.5
Max. temperature	$^{\circ}\text{C}$	+90



060.72

Sheet of marker tags, plastic, 72 tags, 6x12 mm

060.72

Features

Quiet operating electronic step/
monostable relay

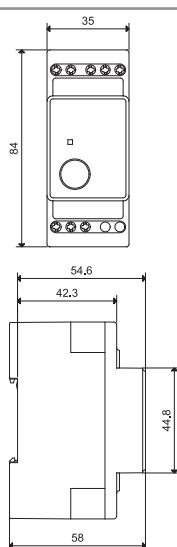
1 Pole output contact

- Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)
- Selectable Step or Monostable operation
- Control input can be continuously applied
- Longer mechanical and electrical life, and much quieter than electromechanical step relays
- Suitable for SELV applications according to IEC 364
- Supply 24 V AC/DC
- 35 mm rail (EN 60715) mount
- Cadmium free contact material

13.01T



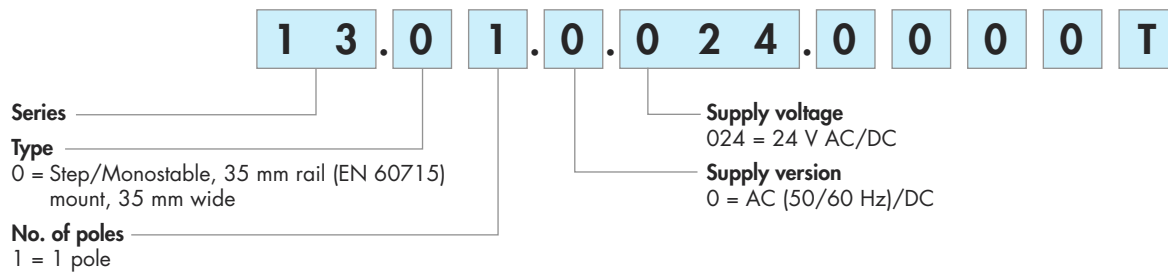
- Step or monostable relay
- 35 mm rail (EN 60715) mount



Contact specification		
Contact configuration		1 CO (SPDT)
Rated current/Maximum peak current	A	16/30 (120 A - 5 ms)
Rated voltage/Maximum switching voltage V AC		250/400
Rated load AC1	VA	4,000
Rated load AC15 (230 V AC)	VA	750
Nominal lamp rating: incandescent (230 V)	W	2,000
compensated fluorescent (230 V)	W	750
uncompensated fluorescent (230 V)	W	1,000
halogen (230 V)	W	2,000
Minimum switching load	mW (V/mA)	1,000 (10/10)
Standard contact material		AgSnO ₂
Supply specification		
Nominal voltage (U _N)	V AC (50/60 Hz)	24
	V DC	24
Rated power AC/DC	V AC (50 Hz)/W	2.5/2.5
Operating range	AC (50 Hz)	(19.2...26.2) V
	DC	(16.8...33.6) V
Technical data		
Electrical life at rated load in AC1	cycles	100 · 10 ³
Maximum impulse duration		continuous
Dielectric strength between: open contacts	V AC	1,000
supply - contacts	V AC	4,000
Ambient temperature range	°C	-10...+60
Protection category		IP 20
Approvals (according to type)		CE PG

Ordering information

Example: 13 series, electronic step/monostable relay, 35 mm rail (EN 60715) mount, 1 CO (SPDT) 16 A contact, 24 V AC/DC supply.



Technical data

Insulation			
Dielectric strength			
between control circuit and contacts	V AC	4,000	
between supply and contacts	V AC	4,000	
between open contacts	V AC	1,000	
Other data			
Power lost to the environment			
without contact current	W	2.2	
without rated current	W	3.5	
Max cable lenght for push-button connection	m	100	
Terminals			
Max. wire size		solid cable	stranded cable
	mm ²	1x6 / 2x4	1x6 / 2x2.5
	AWG	1x10 / 2x12	1x10 / 2x14
Screw torque	Nm	0.8	

Functions



Monostable

On closure of a switch between terminals (B2-B3) the output contact will close, and remain so, until the switch opens.



Bistable

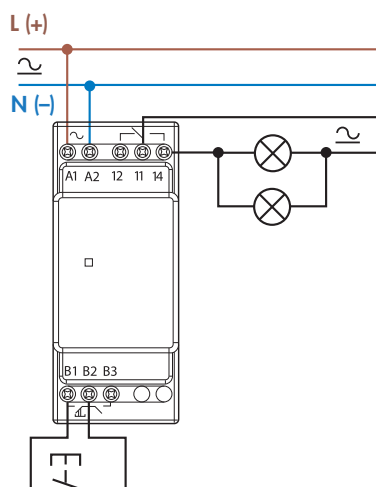
After every impulse (B1-B2), the output contact changes state - alternately switching from open to closed and vice versa.

Wiring diagrams

Type 13.01T

Step wiring diagram

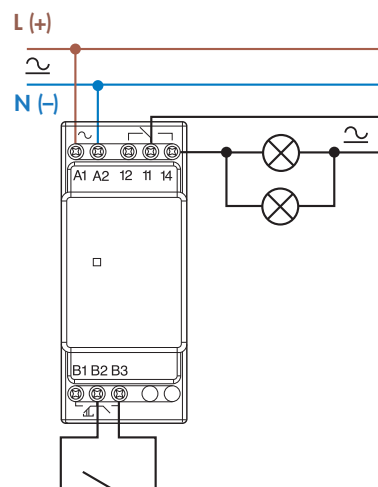
Red LED indication:
Continuous = relay ON



Type 13.01T

Monostable wiring diagram

Red LED indication:
Continuous = relay ON



深圳市创威联合科技有限公司

ShenZhen Ceratich Union Tech. Co.,Ltd

地址: 深圳市罗湖区泥岗西路鸿颖大厦2404室

Add: Rm 2404 ,Hongying Building ,Luohu direct Nigang West Road ,ShenZhen,China

电话(TEL): 0086-755-81025509 82489221

传真(Fax): 0086-755- 82489223

WWW.CREATICH.COM
