finder®

The power in relays and timers since 1954

RAILWAY APPLICATIONS 2012

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 "milestones"

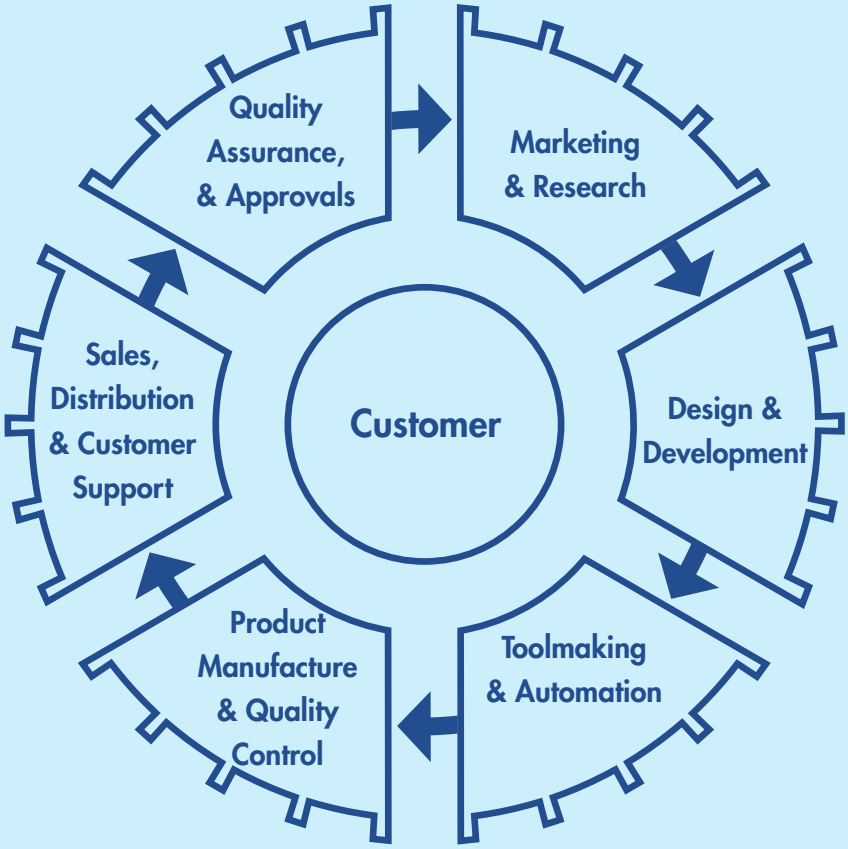
1949 Turin: Piero Giordanino patented step relay (Italy)
1954 Finder founded by Piero Giordanino
1965 Almese (TO): manufacturing facility opened
1966 Launch of 60 Series industrial relay range
1974 Sanfront (CN): manufacturing facility opened
1981 Dedicated toolmaking and automation facility opened
1991 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

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.

ISO 9001:2008 ISO 14001:2004

TOTAL IN-HOUSE CAPABILITY



RoHS compliance

finder

SALES NETWORK

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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

RoHS compliance

finder®

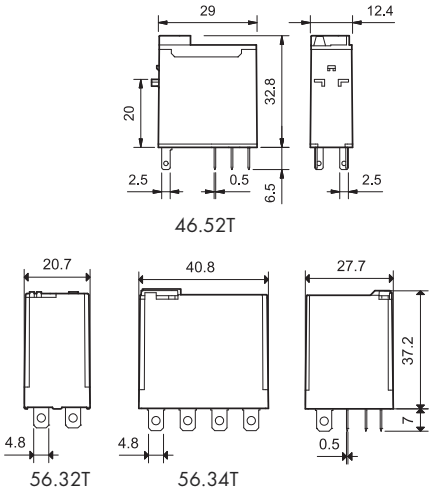
The power in relays and timers since 1954

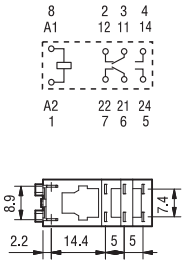
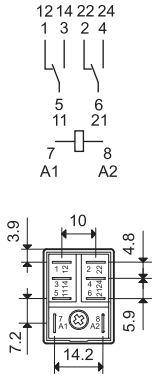
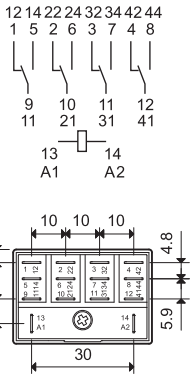
	Rated current	Function & Features		Sockets
 **46 Series** Page 1	8 A	2 CO	**Relays for railway** - Plug-in mounting - DC coils with extended range - Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class 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	**Timer modules** - Multi-voltage - Time scale from 0.05s to 100h - Wide supply range in AC or DC coils - Timer for 96, 97 series sockets	 **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** - 17.5mm wide - Universal voltage monitoring (208...480VAC)	
 **7S Series** Page 15	6 A	NEW Relay module with forcibly guided contacts	**Relay module with forcibly guided contacts** - 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** - 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** - 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	
 **13 Series** Page 28	16 A	Electronic step relay	**Electronic step relay** - 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

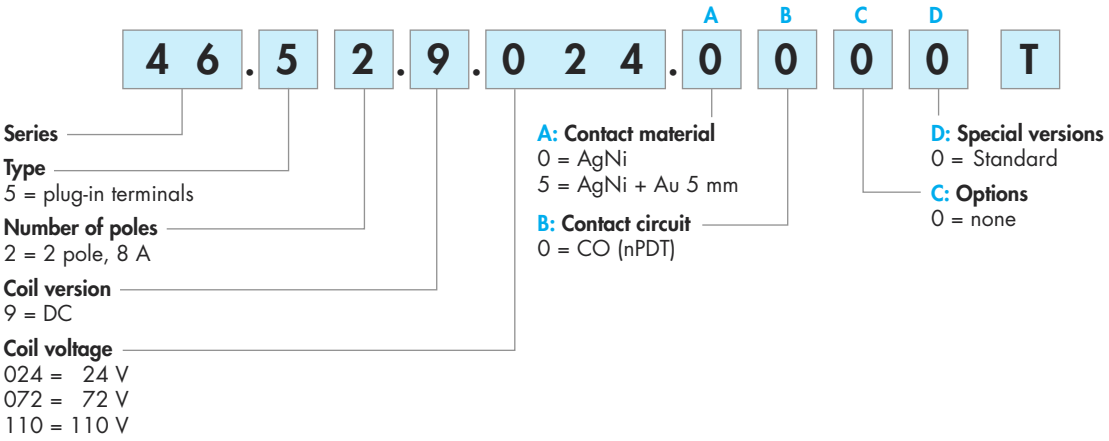
- Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)
- DC coils with extended range
- Cadmium Free contacts (standard version)
- Contact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



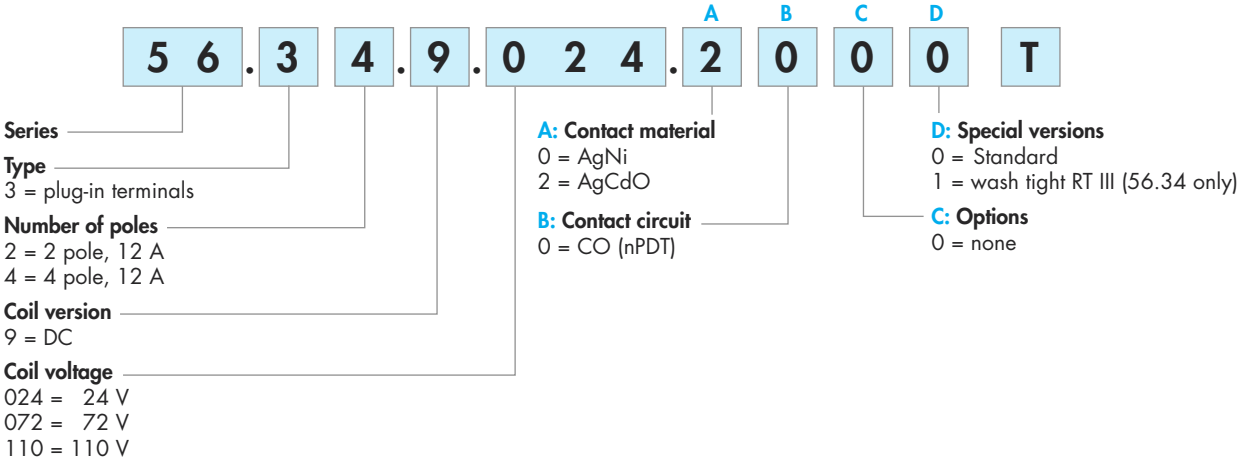
	46.52T	56.32T	56.34T
			
	• 2 Pole CO, 8A • Plug-in	• 2 Pole CO, 12 A • Plug-in/Faston 187	• 4 Pole CO, 12 A • Plug-in/Faston 187
			
Contact specification			
Contact configuration	2 CO (DPDT)	2 CO (DPDT)	4 CO (4PDT)
Rated current/Maximum peak current A	8/15	12/20	12/20
Rated voltage/Maximum switching 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	$10 \cdot 10^6$	$10 \cdot 10^6$	$10 \cdot 10^6$
Electrical life at rated load AC1 cycles	$100 \cdot 10^3$	$100 \cdot 10^3$	$100 \cdot 10^3$
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)	CE	CE	CE

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.

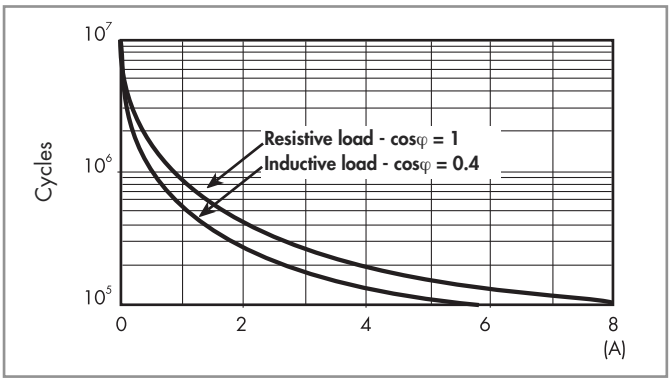


Technical data

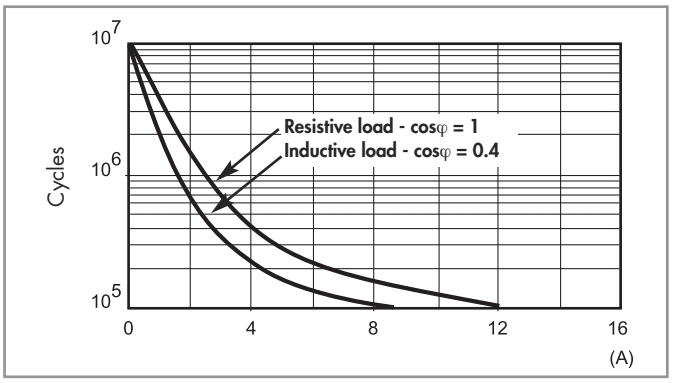
Insulation according to EN 61810-1			**46.52T**		**56.32T/34T**	
Nominal voltage of supply system		V AC	230/400		230/400	
Rated insulation voltage		V AC	250	400	250	400
Pollution degree			3	2	3	2
Insulation between coil and contact set						
Type of insulation			Reinforced (8 mm)		Basic	
Overvoltage 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

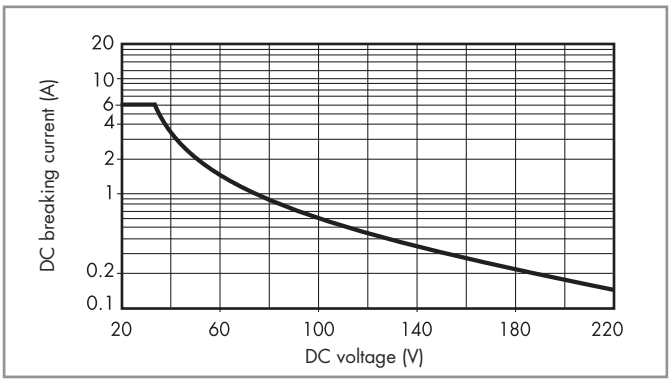
F 46 - Electrical life (AC) v contact current - Type 46.52T



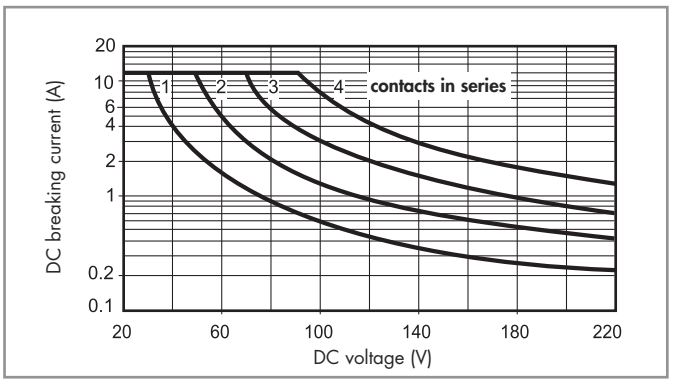
F 56 - Electrical life (AC) v contact current - Type 56.32T and 56.34T



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 ≥ $100 \cdot 10^3$ 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 U_{min}	Operating range U_{max}	Resistance R	Rated coil consumption I at U_N
V		V	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

Other types of coil version are available on request.

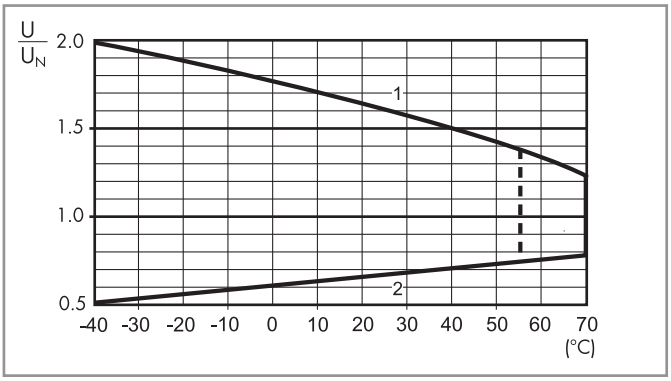
DC coil data, 2 CO - Type 56.32T @ 23 °C

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

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

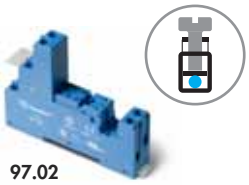
Nominal voltage U_N	Coil code	Operating range U_{min}	Operating range U_{max}	Resistance R	Rated coil consumption I at U_N
V		V	V	Ω	mA
24	**9**.024	16.8	38	490	49
72	**9**.072	50.4	115	4,000	18
110	**9**.110	77	176	10,400	10.5

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.

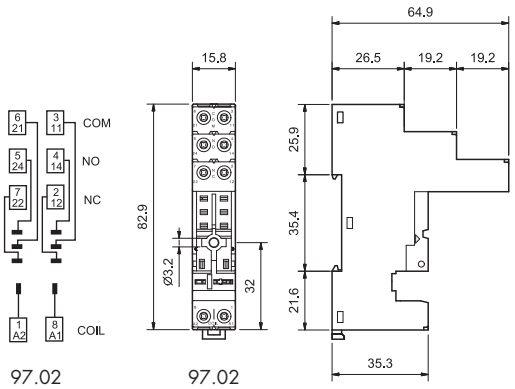
97 Series - Sockets and accessories for 46 series relays



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	stranded wire
	mm^2	1x6 / 2x2.5	1x4 / 2x2.5
	AWG	1x10 / 2x14	1x12 / 2x14

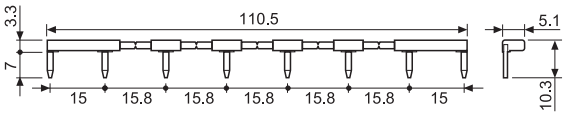


97.02 97.02

* 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



86.30T

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

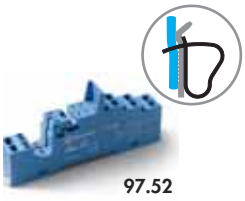
99.02T

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

Approvals (according to type):

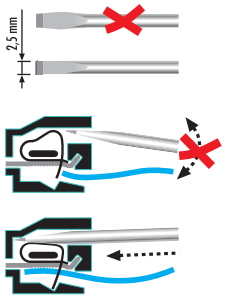
DC Modules with non-standard polarity (+A2) on request.

97 Series - Sockets and accessories for 46 series relays

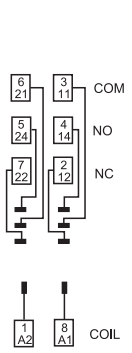


97.52

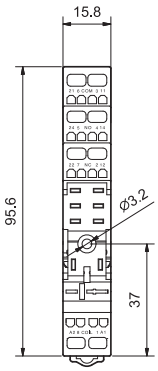
Approvals (according to type):



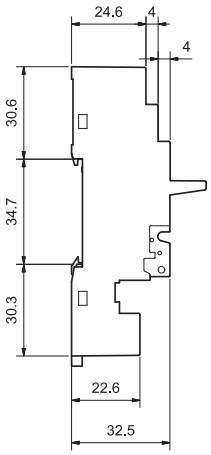
Screwless terminal socket panel or 35 mm rail (EN 60715) mount		**97.52 SMA***	
For relay type		46.52T	
Accessories			
Metal retaining clip (supplied with socket - packaging code SMA)		097.71	
Modules (see table below)		99.02T	
Timer modules (see table below)		86.30T	
Technical data			
Rated current		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)



97.52



97.52



* 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)

86.30T

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

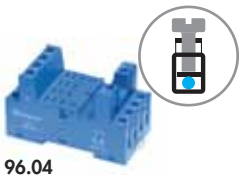
99.02T

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

Approvals (according to type):

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

96 Series - Sockets and accessories for 56 series relays



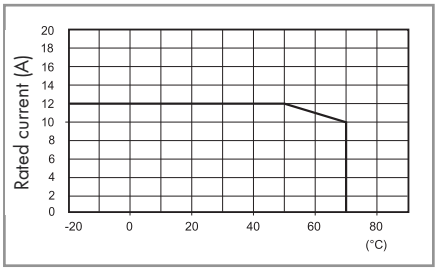
96.04

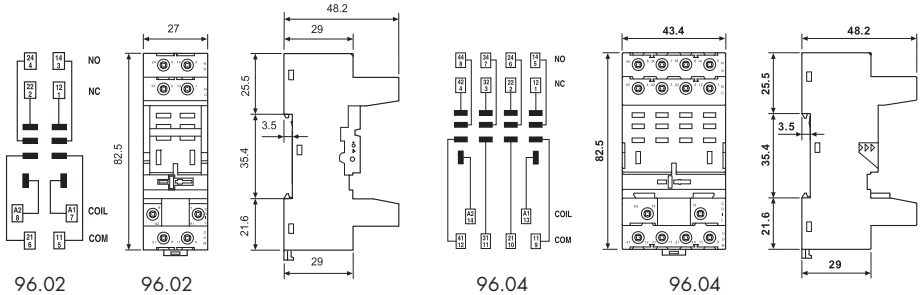
Approvals (according to type):

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	1x4 / 2x2.5
	AWG	1x10 / 2x14	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)

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

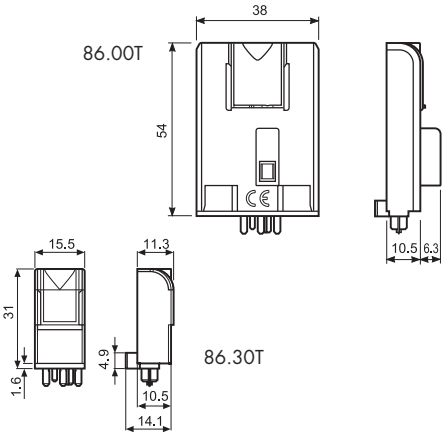
DC Modules with non-standard polarity (+A2) on request.

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

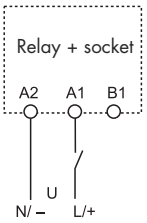
- Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)
- Timer module type 86.00T for 96 series sockets and type 86.30T for 96, 97 series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



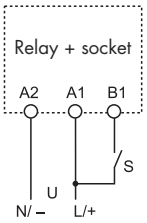
86.00T

- 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



Wiring diagram without control signal

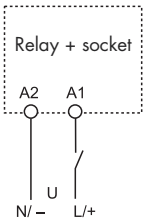


Wiring diagram with control signal

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



Wiring diagram

Contact specification				
Contact configuration		See 56 series relays	See 46, 56 series relays	
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)	12...240	12...24	–
	V DC	12...240	12...24	–
Rated power AC/DC	W	1.2	0.15	
Operating range	V AC (50/60 Hz)	10.2...265	9.6...36	–
	DC	10.2...265	9.6...36	–
Technical data				
Specified time range		(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		
Repeatability	%	± 1	± 1	
Recovery time	ms	≤ 50	≤ 50	
Minimun control impulse	ms	50	–	
Setting accuracy full range	%	± 5	± 5	
Electrical life at rated load in AC1	cycles	See 56 series relays	See 46, 56 series relays	
Ambient temperature range	°C	–20...+50	–20...+50	
Protection category		IP 20	IP 20	
Approvals (according to type)		CE EAC cULus		

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

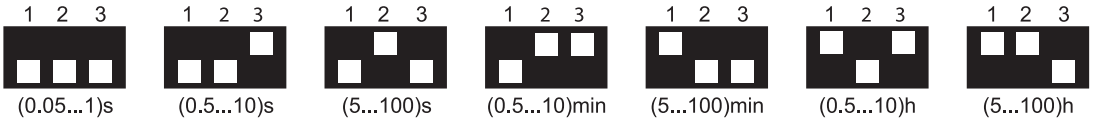
Combinations

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



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

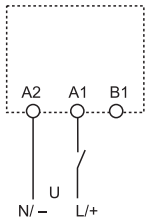
U = Supply voltage
S = Control signal
= Output contact

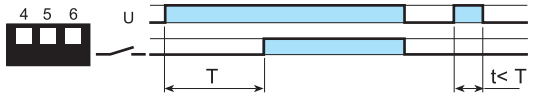
LED Type 86.00T	LED Type 86.30T	Supply voltage	NO output contact
		OFF	Open
		ON	Open
		ON	Open (timing in progress)
		ON	Closed

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

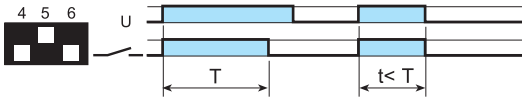
Wiring diagram — Type 86.00T

Without control signal

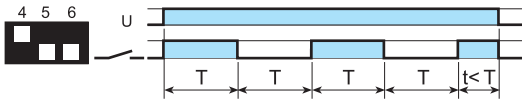




(AI) On-delay.
Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs when power is removed.

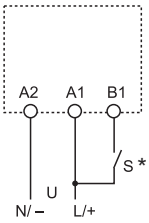


(DI) Interval.
Apply power to timer. Output contacts transfer immediately. After the preset time has elapsed, contacts reset.

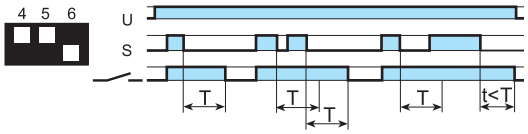


(SW) Symmetrical flasher (starting pulse on).
Apply power to timer. Output contacts transfer immediately and cycle between ON and OFF for as long as power is applied. The ratio is 1:1 (time on = time off).

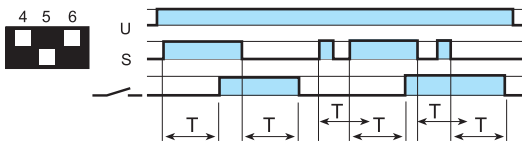
With control signal



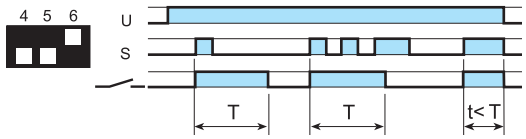
* With DC supply, positive polarity has to be conneted to B1 terminal (according to EN 60204-1). Switch S should be exclusively used to provide the control signal to terminal B1. (Do not connect any other load at this point).



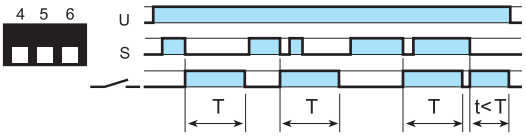
(BE) Off-delay with control signal.
Power is permenently applied to the timer.
The output contacts transfer immediately on closure of the control signal (S). Opening the control signal initiates the preset delay, after which time the output contacts reset.



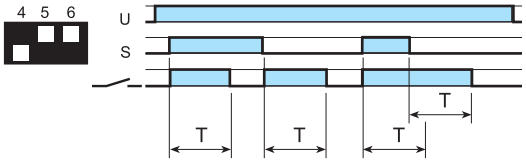
(CE) On- and off-delay with control signal.
Power is permenently applied to the timer.
Closing the control signal (S) initiates the preset delay, after which time the output contacts transfer. Opening the control signal initiates the same preset delay, after which time the output contacts reset.



(DE) Interval with control signal on.
Power is permenently 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.

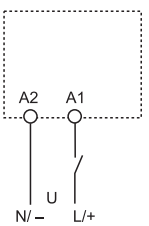


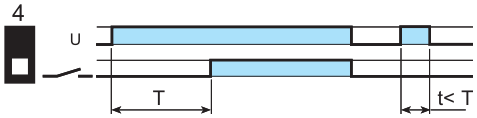
(EE) Interval with control signal off.
Power is permenently applied to the timer.
On opening of the control signal (S) the output contacts transfer, and remain so for the duration of the preset delay, after which they reset.



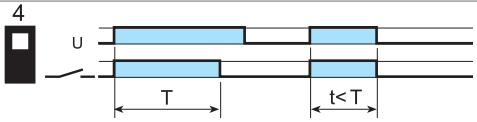
(FE) Interval with control signal on and off.
Power is permenently applied to the timer.
Both the opening and closing of the control signal (S) initiates the transfer of the output contacts. In both instances the contacts reset after the delay period has elapsed.

Wiring diagram — Type 86.30T

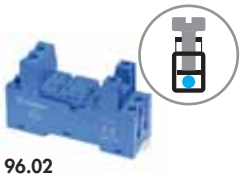




(AI) On-delay.
Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs when power is removed.



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



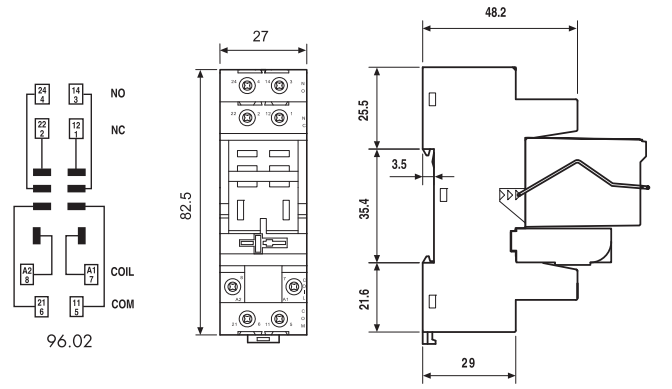
96.02

Approvals (according to type):

96.04

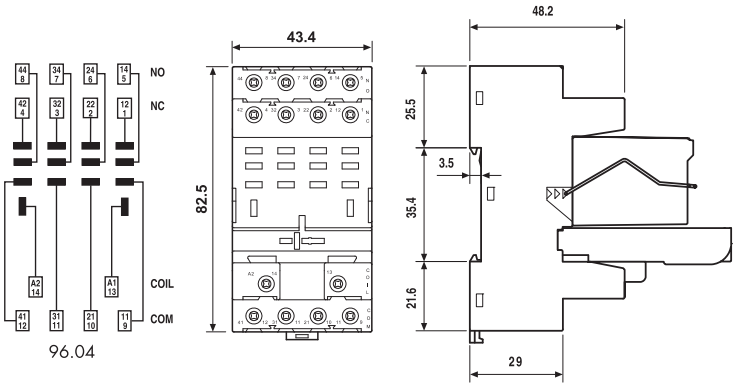
Approvals (according to type):

Screw terminal (Box clamp) socket panel or 35 mm rail (EN 60715) 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
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	1x4 / 2x2.5
	AWG	1x10 / 2x14	1x12 / 2x14



96.02 96.02 + 56.32T + 094.71 + 86.30T

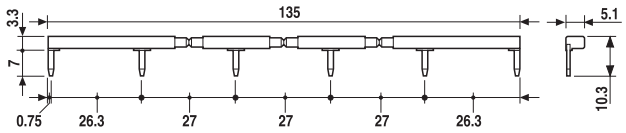
* Complies with **UNI CEI 11170-3** (protection against fire of materials), **EN 61373** (resistance against random vibrations and shock, Category 1, Class B), **EN 50155** (resistance to temperature and humidity, TX class)

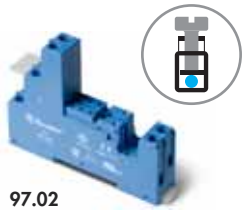


96.04 96.04 + 56.34T + 096.71 + 86.00T / 86.30T

094.06

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

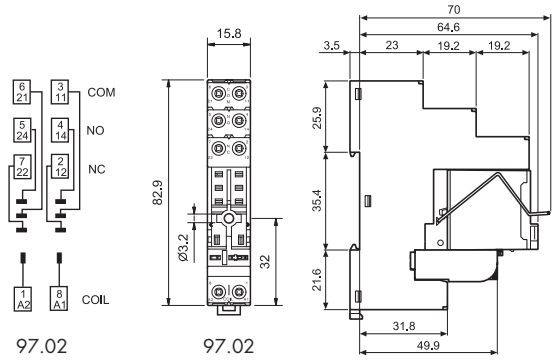




97.02

Approvals (according to type):

Screw terminal socket 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	
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
	mm²	1x6 / 2x2.5	1x4 / 2x2.5
	AWG	1x10 / 2x14	1x12 / 2x14



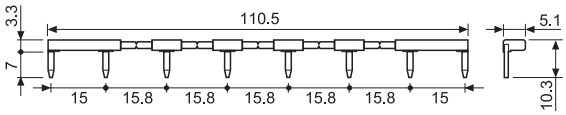
97.02 97.02

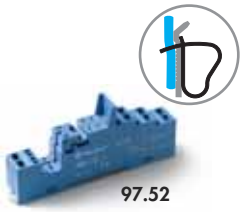
97.02 + 46.52T + 097.71 + 86.30T

* 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

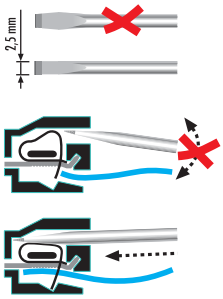
8-way jumper link for 97.02 sockets	095.18
Rated values	10 A - 250 V

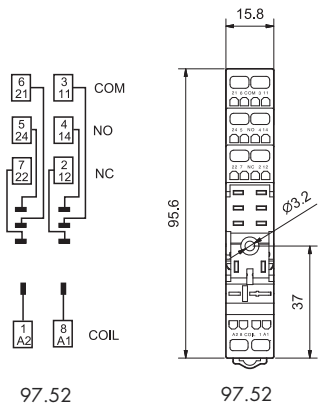




Approvals (according to type):

Screwless terminal socket 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	
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
	mm²	2x(0.2...1.5)	2x(0.2...1.5)
	AWG	2x(24...18)	2x(24...18)





97.52 97.52

* 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

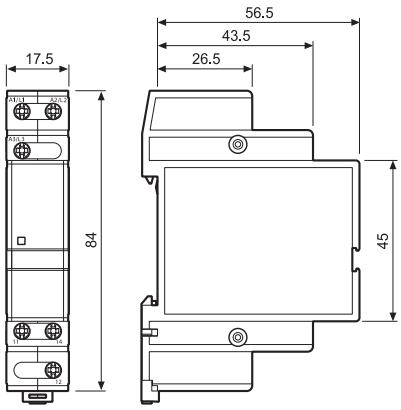
Features

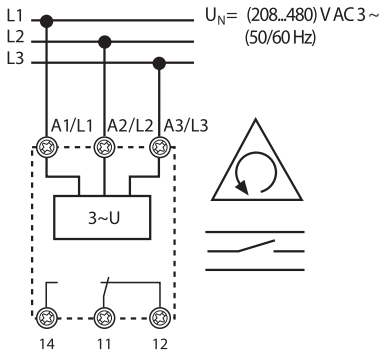
3 Phase - Rotation and phase loss monitoring relay

- 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)		CE EAC cULus

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 version
8 = AC (50/60 Hz)

Supply voltage
400 = (208...480)V AC 3~

Technical data

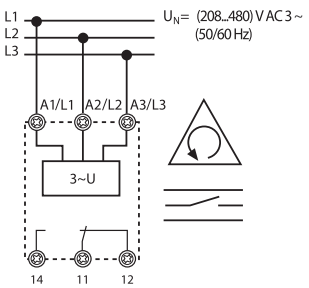
Insulation				
Insulation			Dielectric strength	Impulse (1.2/50 µs)
	between supply and contacts		3,000 V	5 kV
	between open contacts		1,000 V	1.5 kV
EMC specifications				
Type of test			**Reference standard**	
Electrostatic discharge	contact discharge		EN 61000-4-2	4 kV
	air discharge		EN 61000-4-2	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
		mm²	1x6 / 2x4	1x4 / 2x2.5
		AWG	1x10 / 2x12	1x12 / 2x14

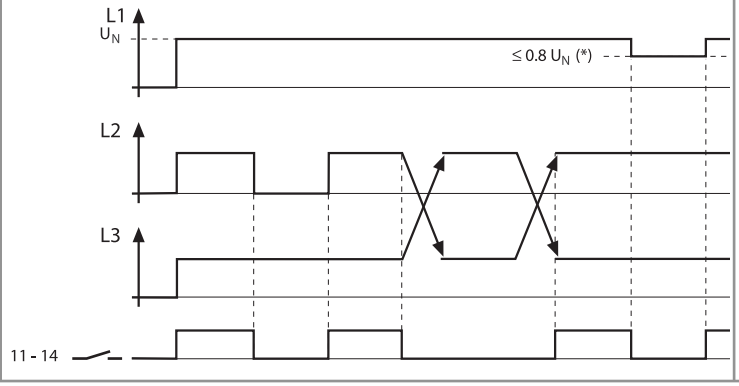
Functions

L1, L2, L3 = Supply voltage

= Contact 11- 14

LED status		Supply voltage	NO output contact	Contacts Open	Contacts 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 (1NO + 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

NEW 7S.12.....5110	NEW 7S.14.....0220/0310	NEW 7S.16.....0420
		
• 2 pole (1 NO + 1 NC)	• 4 pole (2 NO + 2 NC and 3 NO + 1 NC)	• 6 pole (4 NO + 2 NC)

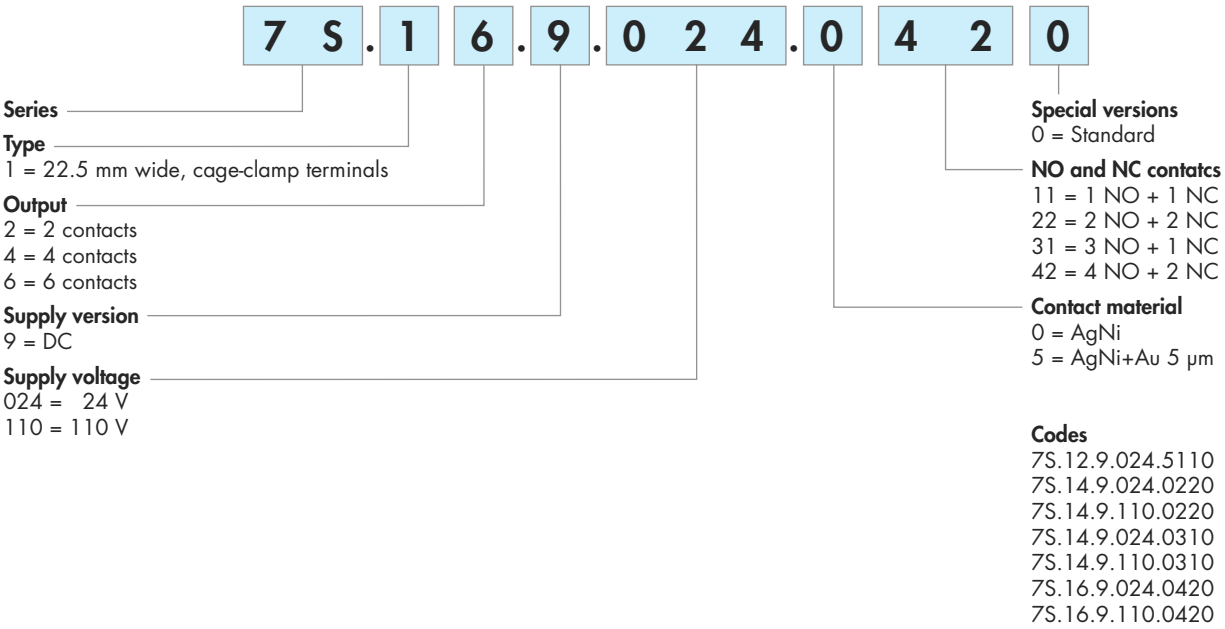
* Single contact current ≤ 6 A, total NO contacts current ≤ 12 A

For outline drawing see page 19

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 µm)	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	$10 \cdot 10^6$	$10 \cdot 10^6$	$10 \cdot 10^6$
Electrical life at rated load AC1	cycles	$100 \cdot 10^3$	$100 \cdot 10^3$	$100 \cdot 10^3$
Operate / release time	ms	7/11	12/10	12/10
Insulation between coil and contacts (1.2/50 µs)	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.



Codes

7S.12.9.024.5110
7S.14.9.024.0220
7S.14.9.110.0220
7S.14.9.024.0310
7S.14.9.110.0310
7S.16.9.024.0420
7S.16.9.110.0420

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**	**7S.16**
Bounce time: NO/NC		ms	2/8	1/20	1/20
Vibration resistance (10...200) Hz: NO/NC		g	10/5	15/4	15/4
Shock resistance: NO/NC		g	20/6	25/13	25/13
Power lost to the environment	without contact current	W	0.8	0.8	0.8
	with rated current	W	1.4	2.3	2.8

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			—

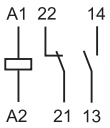
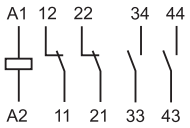
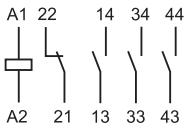
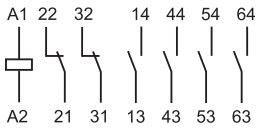
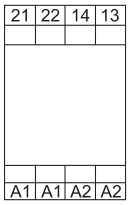
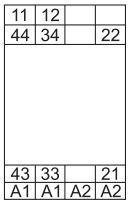
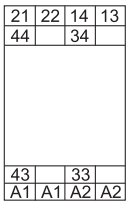
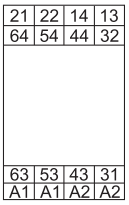
7S.14....0310					
	Coil	13-14	21-22	33-34	43-44
Coil	—	B	R	R	R
13-14		—	B	R	R
21-22			—	R	R
33-34				—	B/R2
43-44					—

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							—

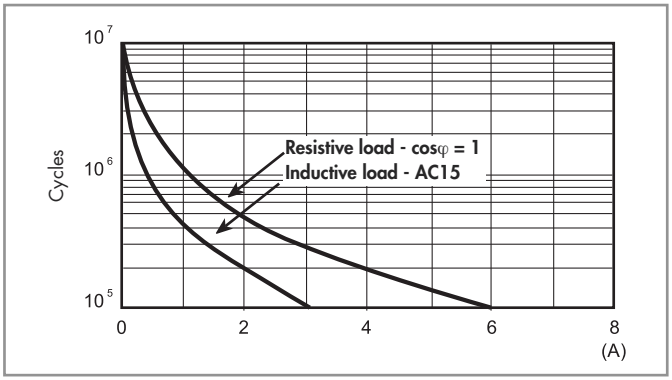
7S.14....0220					
	Coil	11-12	21-22	33-34	43-44
Coil	—	R	R	R	R
11-12		—	R	R	R
21-22			—	R	R
33-34				—	B/R2
43-44					—

Contact specifications

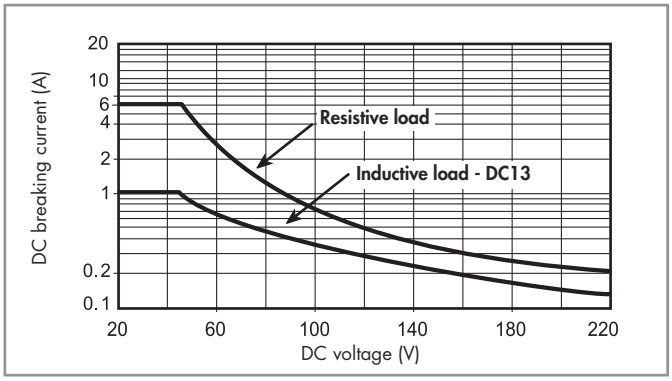
Contact diagrams

7S.12	7S.14...0220	7S.14...0310	7S.16
			
			

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

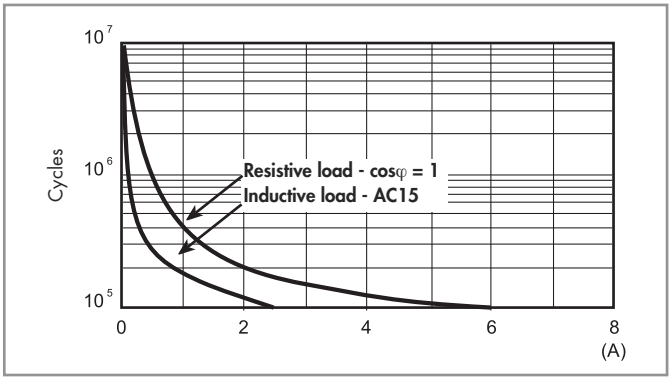


H 7S12 - Maximum DC breaking capacity - 7S.12

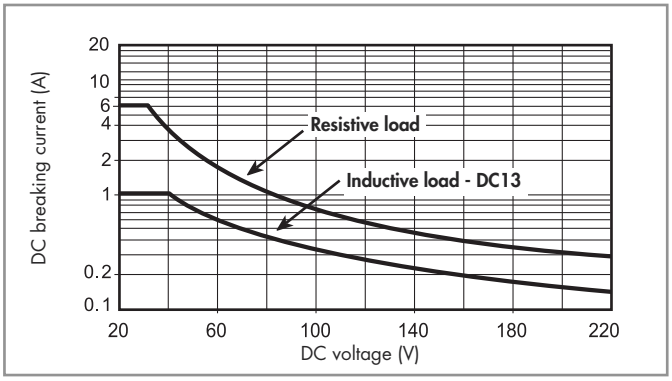


- When switching a load having voltage and current values under the curve, an electrical life of ≥ 100·10³ can be expected.

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 ≥ 100·10³ can be expected.

Coil specifications

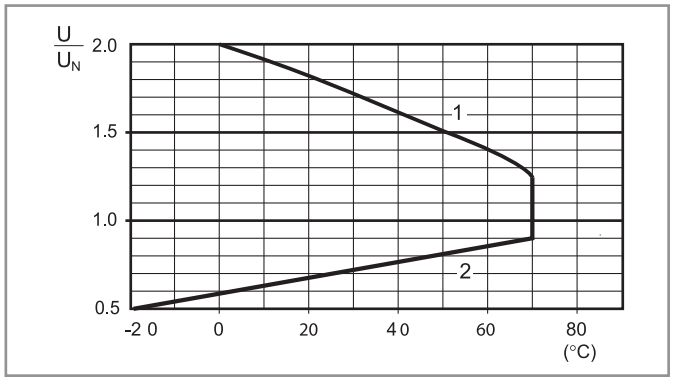
Coil data - 7S.12

Nominal voltage U_N	Coil code	Operating range U_{min}	Operating range U_{max}	Must drop-out voltage U_r	Rated input current at U_N I_N	Rated power at U_N
V		V	V	V	mA	W
24	**9**.024	16.8	30	2.9	33	0.8

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

Nominal voltage U_N	Coil code	Operating range U_{min}	Operating range U_{max}	Must drop-out voltage U_r	Rated input current at U_N I_N	Rated power at U_N
V		V	V	V	mA	W
24	**9**.024	16.8	30	2.9	33	0.8
110	9.110	77	138	13.2	7.5	0.8

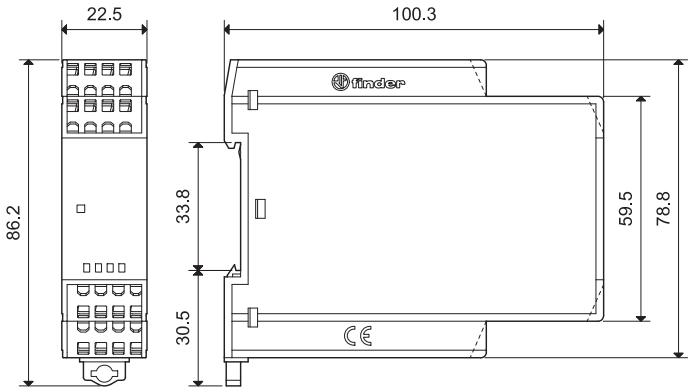
R 7S - DC coil operating range v ambient temperature - 7S.12 / 7S.14 / 7S.16

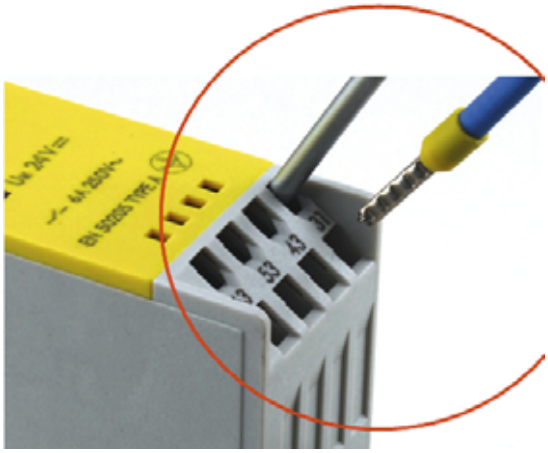


1 - Max. permitted coil voltage.
2 - Min. pick-up voltage with coil at ambient temperature.

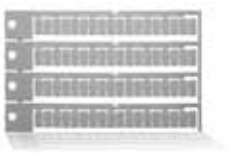
Outline drawings

7S
Screwless terminal





Accessories



060.72

Sheet of marker tags, plastic, 72 tags, 6x12 mm	060.72

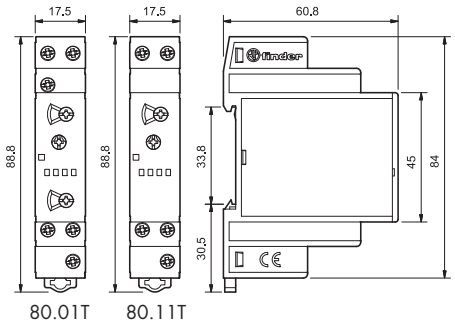
Features

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 0.1s to 24h
- 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

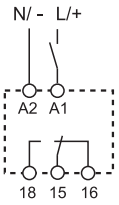


80.01T 80.11T

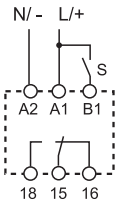
80.01T

- 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)

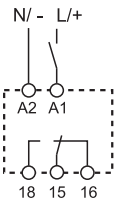


Wiring diagram
(with control signal)

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	AC	(10.8...265) V	(16.8...265) V
	DC	(10.8...265) V	(16.8...265) V
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	$100 \cdot 10^3$	$100 \cdot 10^3$
Ambient temperature range	°C	–10...+50	–10...+50
Protection category		IP 20	IP 20
Approvals (according to type)			

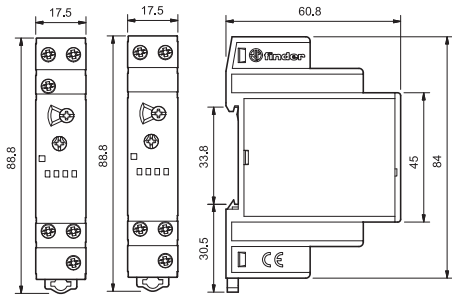
Features

Mono-function timer range

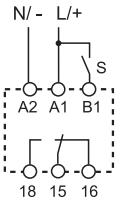
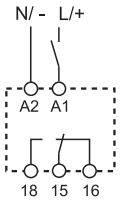
80.41T - Off-delay with control signal, multi-voltage
80.61T - Power off-delay (True off-delay), multi-voltage

- 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 0.1s to 24h (type 80.41T)
- Four time scales from 0.1s 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 80.61T

	80.41T	80.61T
		
	• Multi-voltage • Mono-function	• Multi-voltage • Mono-function
	BE: Off-delay with control signal	**BI:** Power off-delay (True off-delay)
		
	Wiring diagram (with control signal)	Wiring diagram (without control signal)
Contact specification		
Contact configuration	1 CO (SPDT)	1 CO (SPDT)
Rated current/Maximum peak current A	16/30	8/15
Rated voltage/Maximum switching voltage V AC	250/400	250/400
Rated load AC1 VA	4,000	2,000
Rated load AC15 (230 V AC) VA	750	400
Single phase motor rating (230 V AC) kW	0.55	0.3
Breaking capacity DC1: 30/110/220 V A	16/0.3/0.12	8/0.3/0.12
Minimum switching load mW (V/mA)	500 (10/5)	300 (5/5)
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	± 1
Recovery time ms	≤ 50	—
Minimum control impulse ms	50	500 (A1-A2)
Setting accuracy-full range %	± 5	± 5
Electrical life at rated load in AC1 cycles	$100 \cdot 10^3$	$100 \cdot 10^3$
Ambient temperature range °C	–10...+50	–10...+50
Protection category	IP 20	IP 20
Approvals (according to type)	CE cULus EAC	

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	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

No. of poles
1 = 1 CO (SPDT)

Supply version
0 = AC (50/60 Hz)/DC

Supply voltage
240 = (12 ... 240)V AC/DC (80.01)
240 = (24 ... 240)V AC/DC (80.11, 80.41, 80.61)

Versions
0 = Standard

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

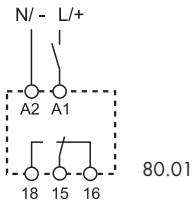
LED*	Supply voltage	NO output contact	Contacts Open	Contacts Closed
	OFF	Open	15 - 18	15 - 16
	ON	Open	15 - 18	15 - 16
	ON	Open (Timing in Progress)	15 - 18	15 - 16
	ON	Closed	15 - 16	15 - 18

* 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

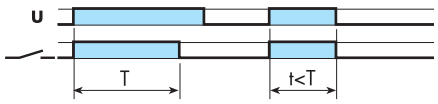
Without control signal = Start via contact in supply line (A1).
With control signal = Start via contact into control terminal (B1).

Without control signal

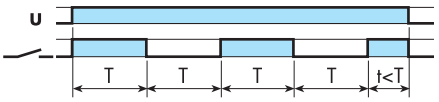


Type 80.01T

(AI) On-delay.
Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs when power is removed.

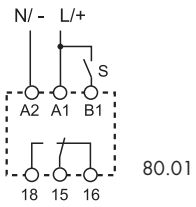


(DI) Interval.
Apply power to timer. Output contacts transfer immediately. After the preset time has elapsed, contacts reset.

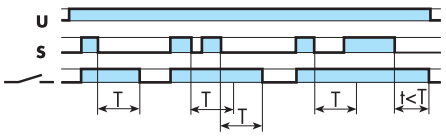


(SW) Symmetrical flasher (starting pulse on).
Apply power to timer. Output contacts transfer immediately and cycle between ON and OFF for as long as power is applied. The ratio is 1:1 (time on = time off).

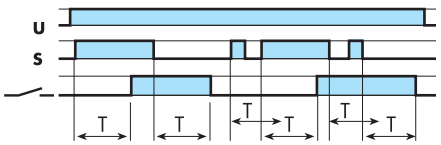
With control signal



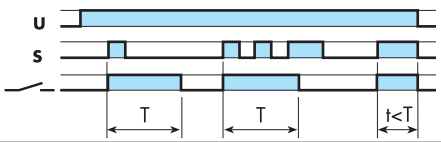
80.01T



(BE) Off-delay with control signal.
Power is permenently 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.

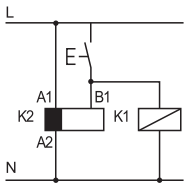


(CE) On- and off-delay with control signal.
Power is permenently applied to the timer. Closing the control signal (S) initiates the preset delay, after which time the output contacts transfer. Opening the control signal initiates the same preset delay, after which time the output contacts reset.

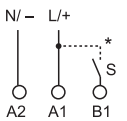


(DE) Interval with control signal on.
Power is permenently applied to the timer.
On momentary or maintained closure of control signal (S), the output contacts transfer, and remain so for the duration of the preset delay, after which they reset.

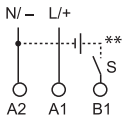
NOTE: The function must be set before energising the timer.



• 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).

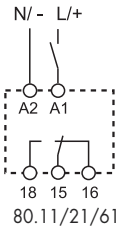


** A voltage other than the supply voltage can be applied to the control signal (B1), example:
A1 - A2 = 230 V AC
B1 - A2 = 12 V DC

Functions

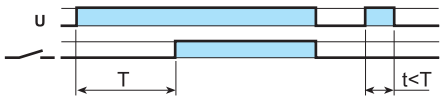
Wiring diagram

Without control signal



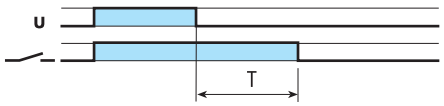
80.11/21/61

Type 80.11T



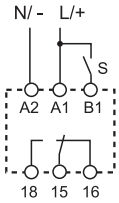
(AI) On-delay.
Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs when power is removed.

80.61T

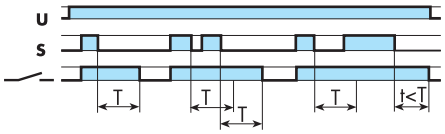


(BI) True off-delay.
Apply power to timer (minimum 300ms). Output contacts transfer immediately. Removal of power initiates the preset delay, after which time the output contacts reset.

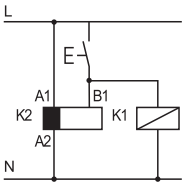
With control signal



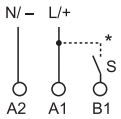
80.41T



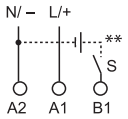
(BE) Off-delay with control signal.
Power is permenently applied to the timer.
The output contacts transfer immediately on closure of the control signal (S). Opening the control signal initiates the preset delay, after which time the output contacts reset.



- 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).



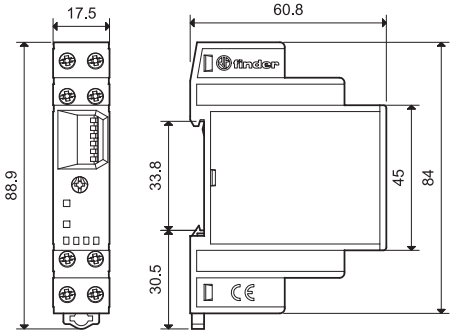
** A voltage other than the supply voltage can be applied to the control signal (B1), example:
A1 - A2 = 230 V AC
B1 - A2 = 12 V DC

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

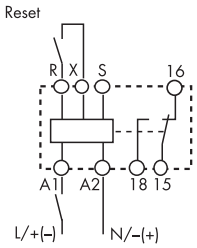
81.01T
Screw terminal



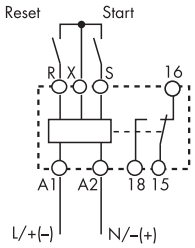
81.01T

- 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	$100 \cdot 10^3$
Ambient temperature range	°C	–10...+50
Protection category		IP 20
Approvals (according to type)		CE

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)

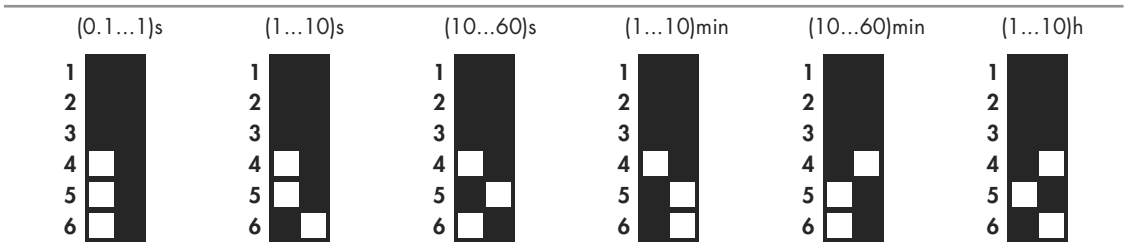
Supply voltage
230 = (12 ... 230)V AC/DC

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
		mm^2	1x6 / 2x4	1x4 / 2x2.5
		AWG	1x10 / 2x12	1x12 / 2x14

Time range setting



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

Functions

U = Supply voltage

S = Control signal

R = Reset

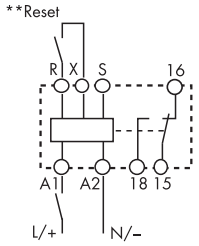
= Output contact

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

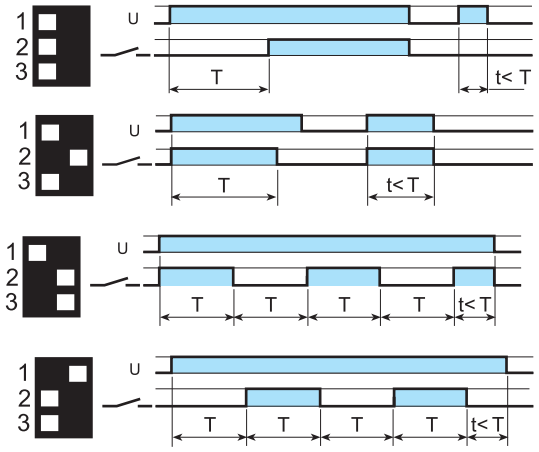
Without control signal = Start via contact in supply line (A1).
With control signal = Start via contact into control terminal (B1).

Wiring diagram

Without control signal



**Connection of the Reset (R-X) is optional



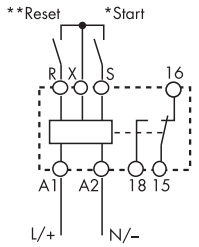
(AI) On-delay.
Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs when power is removed.

(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).

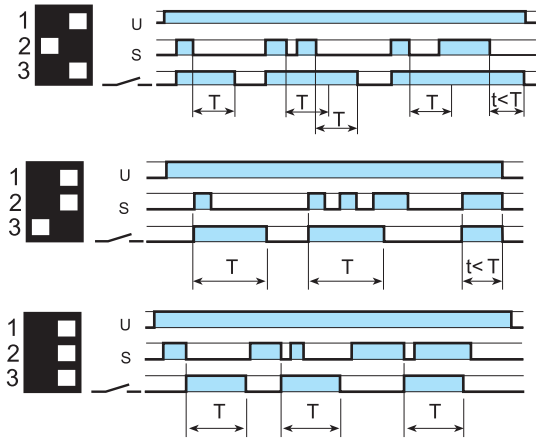
(SP) Symmetrical flasher (starting pulse off).
Apply power to timer. First transfer of contact occurs after preset time has elapsed. The timer now cycles between OFF and ON as long as power is applied. The ratio is 1:1 (time on = time off).

With control signal



* Terminals R, S & X must not be directly connected to the timer supply voltage, but they should be considered to be at supply voltage potential for the purposes of insulation.

**Connection of the Reset (R-X) is optional



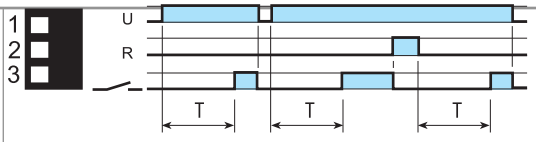
(BE) Off-delay with control signal.
Power is permenently applied to the timer. The output contacts transfer immediately on closure of the control signal (S). Opening the control signal initiates the preset delay, after which time the output contacts reset.

(DE) Interval with control signal on.
Power is permenently 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.

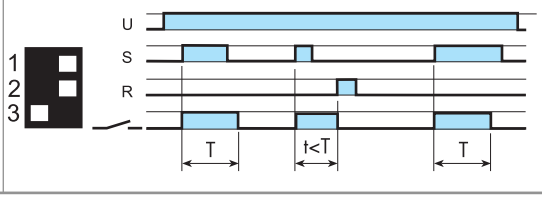
(EEb) Interval with control signal off.
Power is permenently applied to the timer.
On opening of the Signal Switch (S) the output contacts transfer, and remain so for the duration of the preset delay, after which they reset.

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.

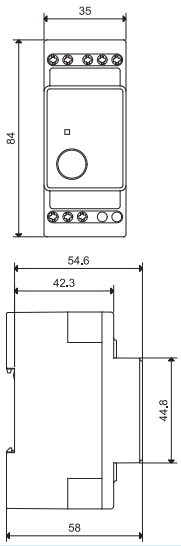
Features

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	$100 \cdot 10^3$
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 EAC

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.

1 3	.	0	1	.	0	.	0 2 4	.	0	0	0	0	T

Series

Type
0 = Step/Monostable, 35 mm rail (EN 60715) mount, 35 mm wide

No. of poles
1 = 1 pole

Supply voltage
024 = 24 V AC/DC

Supply version
0 = AC (50/60 Hz)/DC

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

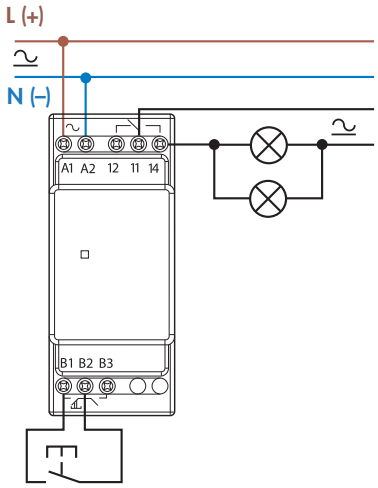
Monostable
On closure of a switch between terminals (B2-B3) the output contact will close, and remain so, until the switch opens.

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

Wiring diagrams

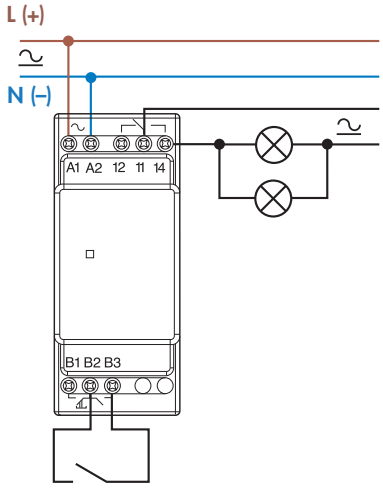
Type 13.01T
Step wiring diagram

Red LED indication:
Continuous = relay ON



Type 13.01T
Monostable wiring diagram

Red LED indication:
Continuous = relay ON



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