ETD-SL-1T-S

Star/delta timer relay

INTERFACE

Data sheet
102573_en_06

1   Description

Increasingly higher demands are being placed on safety and system availability – across all sectors. Processes are becoming more and more complex, not only in mechanical engineering and the chemical industry, but also in plant and automation technology. Demands on power engineering are also increasing constantly.

The timer relays in the ETD series can be used to control time sequences in production and process technology.

Features

– One adjustable time
– Time range of 500 ms to 3 minutes (four setting ranges)
– Additional changeover time
– Star/delta startup
– Power supply via power module can be selected
– Two floating PDTs

⚠	**WARNING: Risk of electric shock** Never carry out work when voltage is present.
ℹ	Make sure you always use the the latest documentation. It can be downloaded at www.phoenixcontact.net/download.

PHŒNIX CONTACT

INSPIRING INNOVATIONS

2   Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Star/delta timer relay	ETD-SL-1T-S	2867924	1

Accessories	Type	Order No.	Pcs. / Pkt.
Power modules, pluggable, for EMD-SL-..., supply voltage: 20 V DC ... 30 V DC	EMD-SL-PS- 24DC	2885359	1
Power modules, pluggable, for EMD-SL-..., supply voltage: 20.2...26.4 V AC	EMD-SL-PS- 24AC	2866103	1
Power modules, pluggable, for EMD-SL-..., supply voltage: 88...121 V AC	EMD-SL-PS-110AC	2866116	1
Power modules, pluggable, for EMD-SL-..., supply voltage: 108 V AC ... 132 V AC	EMD-SL-PS-120AC	2885731	1
Power modules, pluggable, for EMD-SL-..., supply voltage: 195...264 V AC	EMD-SL-PS-230AC	2866129	1

3   Technical data

Input data	
Input voltage range	24 V DC (see Power modules) 24 V AC ... 230 V AC (see Power modules)
Nominal frequency	50 Hz ... 60 Hz
Temperature coefficient, typical	≤ 0.01 %/K
Recovery time	500 ms
Time setting range	500 ms ... 3 min (4 time end ranges)
Changeover time	40 ms / 60 ms / 80 ms / 100 ms
Function	S: Star/delta startup
Basic accuracy	± 1 % (of scale end value)
Setting accuracy	≤ 5 % (of scale end value)
Repeat accuracy	≤ 0.5 % ±5 ms
Nominal power consumption	2.5 VA (1 W)

Output data	
Contact type	2 floating PDT contacts
Nominal insulation voltage	250 V AC (in acc. with IEC 60664-1)
Interrupting rating (ohmic load) max.	750 VA (3 A/250 V AC, module aligned, ≤ 5 mm spacing) 1250 VA (5 A/250 V AC, module not aligned, ≥ 5 mm spacing)
Output fuse	5 A (fast-blow)

General data	
Service life mechanical	Approx. 2×10^7 cycles
Service life, electrical	Approx. 2×10^5 cycles at ohmic load, 1000 VA
Switching frequency	max. 60 (per minute at 100 VA ohmic load) max. 6 (per minute at 1000 VA ohmic load)
Operating mode	100% operating factor
Degree of protection	IP40 (housing) / IP20 (connection terminal blocks)
Pollution degree	2 (according to EN 50178)
Surge voltage category	III, basic insulation (as per EN 50178)
Rated insulation voltage	300 V (According to EN 50178)
Inflammability class acc. to UL 94	V0

General data (Continued)

Assembly	on TS 35 profile rail acc. to EN 60715
Mounting position	Any
Width	22.5 mm
Height	113 mm
Length	90 mm
Type of housing	Polyamide PA, self-extinguishing
Color	green
Weight	160 g

Connection data

Conductor cross section, solid	0.5 mm² ... 2.5 mm²
Conductor cross section, stranded	0.5 mm² ... 2.5 mm²
Stripping length	8 mm
Type of connection	Screw connection
Tightening torque	1 Nm

Ambient conditions

|	
Ambient temperature (operation)	-25 °C ... 55 °C -25 °C ... 40 °C (corresponds to UL 508)
Ambient temperature (storage/transport)	-25 °C ... 70 °C
Permissible humidity (operation)	15 % ... 85 %
Climatic class	3K3 (in acc. with EN 60721)

Conformance / approvals

Conformity	CE compliant
UL, USA / Canada	UL/C-UL listed UL 508

Conformance with EMC directive 2004/108/EC

Immunity to interference according to	EN 61000-6-2
Emitted interference according to	EN 61000-6-4

Conformance with LV directive 2006/95/EC

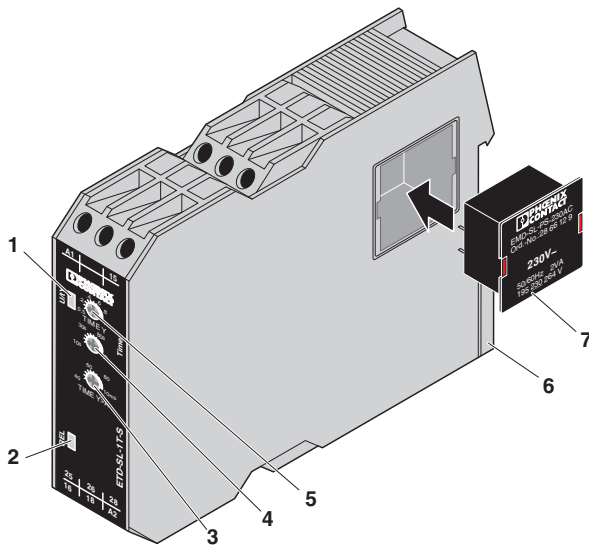|	
Industrial timer relays according to	EN 61812-1/A11

4   Block diagram
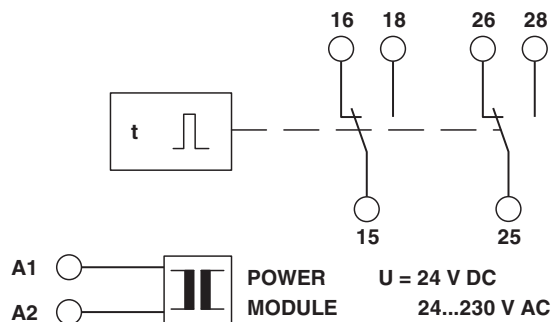
5 Safety notes

⚠️ **WARNING: Risk of electric shock**
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6 Structure

1 "U/tY" LED: Supply voltage and adjustable time tY
2 "REL" LED: Output relay
3 Rotary switch "TIME Y>Δ": Changeover time
4 Rotary switch "TIME Y": Time end range
5 "TIME Y" potentiometer: Preset value
6 Universal snap-on foot for EN DIN rails
7 Power module

7 Power supply

The power module for power supply is supplied in a transport casing to prevent the connection legs from being bent.
To install the power module in the relay housing, remove the transport casing and position the power module in the recess in the side of the housing (ensure that it is the right way round). The red locking latches snap in with an audible click when the power module is securely positioned.
To remove the power module, press the two red locking latches together and pull out the power module.
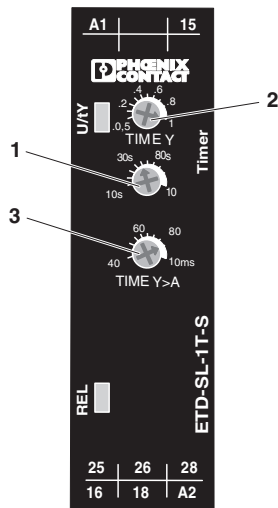
8 Installation

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The module can be snapped onto all 35 mm DIN rails according to EN 60715.

9   Time setting

Example:

1   Specification of the time end range using a rotary switch, e.g. 1 m (1 minute)

2   Fine setting of the time using a potentiometer, e.g. 0.5

   Set time: 0.5 * 1 minute = 0.5 minutes = 30 seconds

3   Setting of the turnaround time, e.g. 80 ms

10   Diagnostics
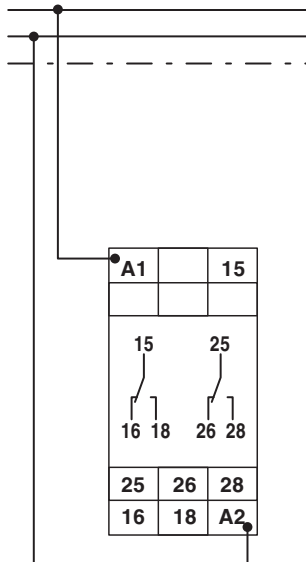
The LEDs indicate the following error states:

"U/tY" LED (Green)

–   LED flashes: Voltage present, set star time t1 running
–   LED ON: Voltage present, set star time t1 has elapsed

"REL" LED (Yellow)

–   LED ON: Output relay has picked up
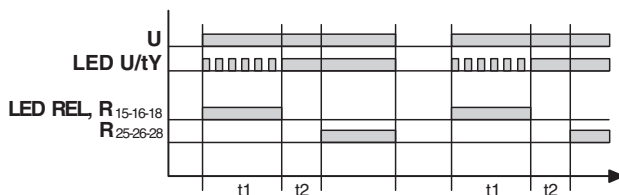–   LED OFF: Output relay has dropped out

11   Connection example

12   Function

> ⚠ **ATTENTION: Module can become damaged**
> Only set the functions when the module is switched off.

S: Star/Delta Startup

When supply voltage U is applied, the output relay for the star contactor picks up (yellow "REL" LED is ON) and set star time t1 starts running (green "U/tY" LED flashes). Once the star time has elapsed (green "U/tY" LED is ON) the output relay for the star contactor drops out (yellow "REL" LED is OFF) and set changeover time t2 starts running.

Once the changeover time has elapsed, the output relay for the delta contactor picks up. In order to restart the function, the supply voltage must be interrupted and applied again.