ETD-BL-1T-230(-PT)

Multifunctional time relay with various functions and adjustable times



Data sheet
106395_en_04

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1 Description

Requirements pertaining to safety and system availability increase constantly – regardless of the industry. Processes are becoming more and more complex, not only in the mechanical engineering and chemical industry but also in plant and automation technology. Demands on power engineering are also constantly on the rise.
Timer relays of the ETD series are available for controlling the time sequences in production and process engineering.

Features

- Adjustable time
- Time range from 50 ms to 1 h
- Non-floating control input
- Delay functions
- Wiper functions
- 1 floating PDT

WARNING: Risk of electric shock
Never carry out work when voltage is present.

Make sure you always use the latest documentation.
It can be downloaded from the product at phoenixcontact.net/products.
This document is valid for the products listed in the “Ordering data”.

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3 Ordering data

Description	Type	Order No.	Pcs./Pkt.
Compact multi-functional timer relay with 4 functions and an adjustable time range (50 ms - 1 h), with screw connection, 1 PDT	ETD-BL-1T-230	2905813	1
Compact multi-functional timer relay with 4 functions and an adjustable time range (50 ms - 1 h), with push-in connection, 1 PDT	ETD-BL-1T-230-PT	2905814	1

4 Technical data

Input data	
Input voltage range	24 V AC/DC ... 240 V AC/DC -15 % ... +10 %
Nominal frequency	48 Hz ... 63 Hz
Temperature coefficient, typical	≤ 0.01 %/K
Recovery time	100 ms
Time setting range	50 ms ... 1 h (5 time end ranges)
Function	E: With switch-on delay R: With release delay and control contact Es: With switch-on delay and control contact Ws: With single shot leading edge and control contact
Basic accuracy	± 1 % (of scale end value)
Setting accuracy	≤ 5 % (of scale end value)
Repeat accuracy	≤ 0.5 % ±5 ms

Output data	
Contact type	1 floating PDT
Maximum switching voltage	250 V AC (in acc. with IEC 60664-1)
Interrupting rating (ohmic load) max.	1250 VA (5 A/250 V AC)
Output fuse	5 A (fast-blow)

Control contact	
Control contact	Non-floating, terminals A1-B1
Control pulse length	≥ 50 ms (DC)

General data	
Mechanical service life	15 x 10^6 cycles
Service life, electrical	1 x 10^5 cycles
Operating mode	100% operating factor
Degree of protection	IP40 (housing) / IP20 (connection terminal blocks)
Degree of pollution	2 (according to EN 50178)
Overvoltage category	III, basic insulation (as per EN 50178)
Flammability rating according to UL 94	V0
Mounting	on standard DIN rail NS 35 in accordance with EN 60715
Mounting position	any
Width	17.5 mm
Height	88 mm
Depth	65.5 mm
Color	gray

Connection data	Screw connection	Push-in connection
Conductor cross section, solid	0.14 mm² ... 2.5 mm²	0.5 mm² ... 2.5 mm²
Conductor cross section, flexible	0.14 mm² ... 2.5 mm²	0.5 mm² ... 2.5 mm²
AWG	20 ... 14	26 ... 14
Stripping length	8 mm	8 mm

Ambient conditions	
Ambient temperature (operation)	-25 °C ... 55 °C
Ambient temperature (storage/transport)	-25 °C ... 70 °C
Permissible humidity (operation)	15 % ... 85 %

Conformance / approvals	
Conformance	CE-compliant
UL, USA / Canada	
UL, USA / Canada	UL 508 Listed

Conformance with EMC Directive 2014/30/EU	
Noise immunity according to	EN 61000-6-2
Noise emission according to	EN 61000-6-3

Conformance with Low Voltage Directive 2006/95/EC (valid until 2016-04-19) / 2014/35/EU (valid from 2016-04-20)

5 Safety notes



WARNING: Risk of electric shock

Never carry out work when voltage is present.

6 Basic circuit diagram

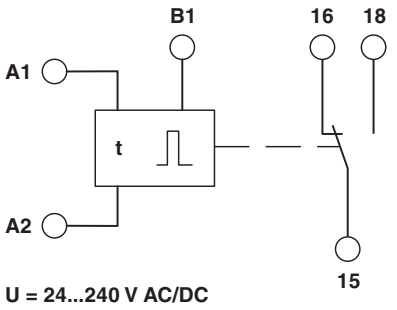
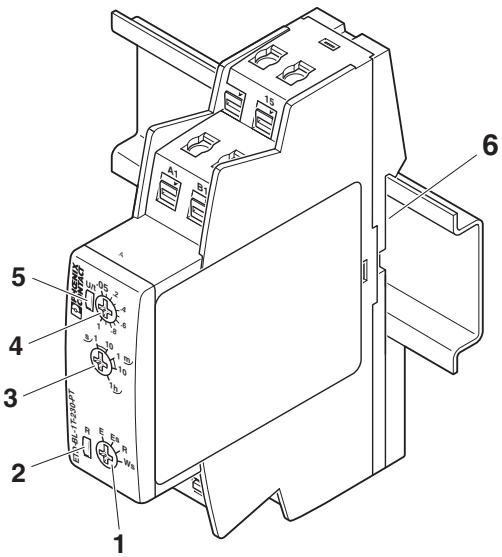


Figure 1 Block diagram

7 Structure



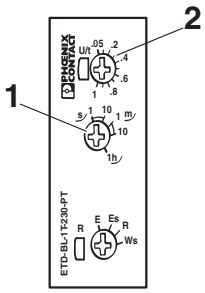
1 "FUNCTION" rotary switch: Function selection
2 LED "R": output relay
3 Rotary switch "TIME": Time end range
4 "TIME" potentiometer: Preset value
5 "U/t" LED: Supply and adjustable time TIME
6 Snap-on foot for DIN rail mounting

8 Installation

WARNING: Risk of electric shock
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The module can be snapped onto all 35 mm DIN rails according to EN 60715.

9 Time setting



1 Specification of the time end range using a rotary switch, e.g. 10 m (10 minutes)
2 Fine setting of the time using a potentiometer, e.g. 0.4

Set time: 0.4 x 10 minutes = 4 minutes

10 Diagnostics

The LEDs indicate the following error states:

"U/t" LED (Green)

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

“R” LED (yellow)

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

11 Connection examples

NOTE:
When the control input is connected to a parallel load, ensure that the minimum load connected in parallel is > 1 VA.

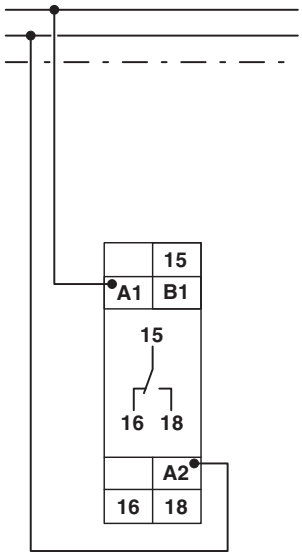


Figure 2 Connection without control contact

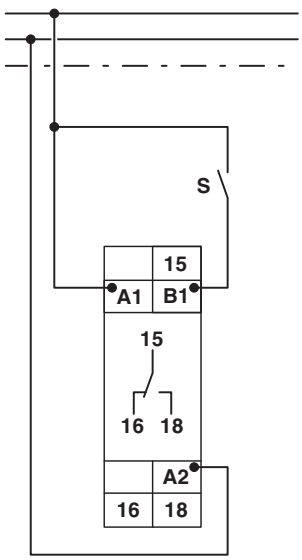


Figure 3 Connection with control contact

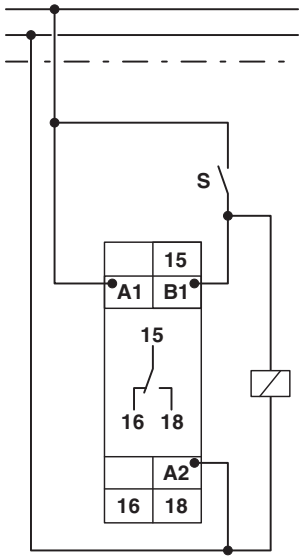


Figure 4 Connection with control contact and parallel load (e.g. relay)

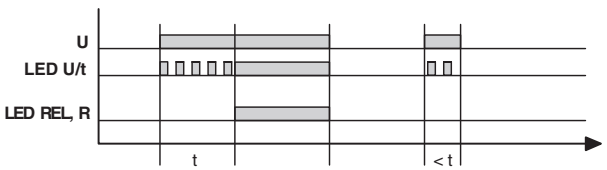
12 Function

NOTE: Module can become damaged

Only set the functions when the module is switched off.

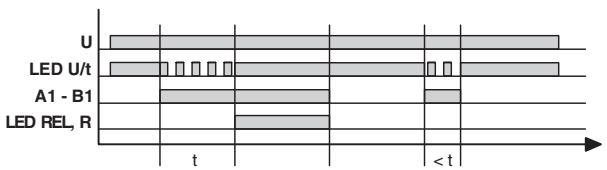
E: With Switch-On Delay

When supply voltage U is applied, set time t starts running (green "U/t" LED flashes). Once time t has elapsed (green "U/t" LED is ON), the output relay picks up (yellow "REL" LED is ON). This state is maintained until supply voltage U is interrupted. If supply voltage U is interrupted before time t has elapsed, the elapsed time is deleted (relay does not pick up). The next time supply voltage U is applied, the time is restarted.



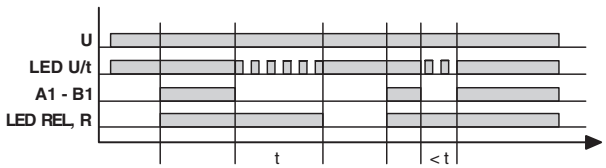
Es: With Switch-On Delay and Control Contact

Supply voltage U must be applied permanently at the device (green "U/t" LED is ON). When control contact A1-B1 is closed, set time t starts running (green "U/t" LED flashes). Once time t has elapsed (green "U/t" LED is ON), the output relay picks up (yellow "REL" LED is ON). This state is maintained until the control contact is opened. If the control contact is opened before time t has elapsed, the elapsed time is deleted (relay does not pick up) and restarted with the next cycle.



R: With Release Delay and Control Contact

Supply voltage U must be applied permanently at the device (green "U/t" LED is ON). When control contact A1-B1 is closed, the output relay picks up (yellow "REL" LED is ON). If control contact A1-B1 is opened, set time t starts running (green "U/t" LED flashes). Once time t has elapsed (green "U/t" LED is ON), the output relay drops out (yellow "REL" LED is OFF). If the control contact is closed again before time t has elapsed, the elapsed time is deleted and restarted with the next cycle.



Ws: With single shot leading edge and control contact

Supply voltage U must be applied permanently at the device (green "U/t" LED is ON). When control contact A1-B1 is closed, the output relay picks up (yellow "REL" LED is ON) and set time t starts running (green "U/t" LED flashes). Once time t has elapsed (green "U/t" LED is ON), the output relay drops out (yellow "REL" LED is OFF).
The control contact can be freely switched during this time. Another cycle cannot be started until the current cycle has been completed.

