

MACX-TR-1T-MUL(-PT)

Multifunctional time relay

Data sheet
300001_en_01

© PHOENIX CONTACT 2020-03-31



1 Description

MACX series industrial time relay, easy to install and control. Precise time setting with countdown monitoring and displaying.

You can use OLED display and buttons on the front panel or NFC wireless communication to configure.

Width of 22.5 mm, effectively save space of the cabinet.

Optional screw and push-in connection.

Features

- OLED display
- Multifunctional (13 functions)
- Adjustable time range from 10 ms to 999 h:59 min
- Wide-range power supply: 24 VAC/DC ... 240 VAC/DC
- Output: 2 PDT dry contact outputs
- Supporting dry contacts, PNP and NPN proximity switch inputs
- Password protection
- Support NFC wireless communication function
- Download app for Android / iOS for free



WARNING: Danger to life by electric shock!



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".

2	Table of contents	
1	Description	1
2	Table of contents	2
3	Ordering data	3
4	Technical data	3
5	Basic circuit diagram	5
6	Structure	5
7	Display description	5
8	Communication	6
9	Installation	6
10	Operating instructions.....	7
11	Connection examples	9
12	Function.....	10

3 Ordering data

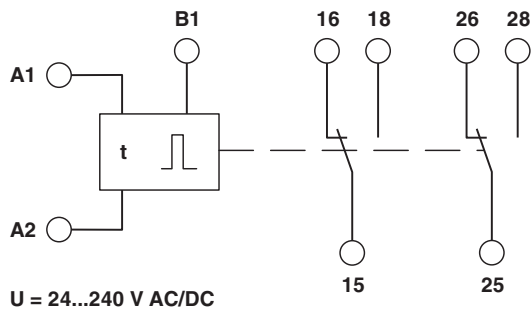
Description	Type	Order No.	Pcs./Pkt.
Multifunctional time relay, 24 V AC/DC ... 240 V AC/DC wide-range supply, with 13 functions, time range adjustable (10 ms ... 999 h:59 min), two configuration possibilities, password protection, supporting dry contacts, PNP and NPN proximity switch inputs, 2 PDTs, screw connection.	MACX-TR-1T-MUL	1096429	1
Multifunctional time relay, 24 V AC/DC ... 240 V AC/DC wide-range supply, with 13 functions, time range adjustable (10 ms ... 999 h:59 min), two configuration possibilities, password protection, supporting dry contacts, PNP and NPN proximity switch inputs, 2 PDTs, push-in connection.	MACX-TR-1T-MUL-PT	1096431	1
Accessories	Type	Order No.	Pcs./Pkt.
Bluetooth NFC adapter	MACX-BLUETOOTH-NFC	1142259	1

4 Technical data

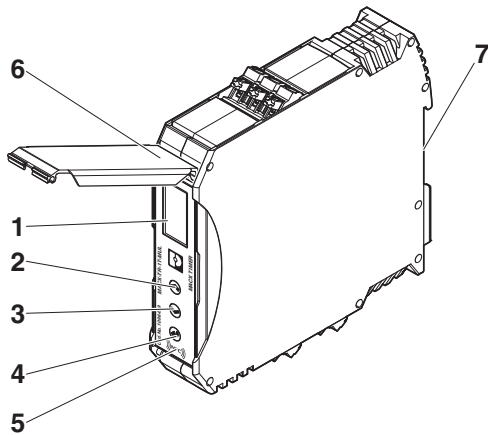
Input data	
Input voltage range	24 V AC/DC ... 240 V AC/DC (-15% ... +10%)
Nominal frequency	48 Hz ... 63 Hz
Temperature coefficient, typical	≤ 0.01 %/°C
Recovery time	100 ms
Setting range time	10 ms ... 999 h 59 min.
Setting accuracy	≤ 0.5 % (> 1 s)
Repeat accuracy	≤ 0.05 % (> 1 s)
Nominal power consumption	2.5 VA (0.8 W)
Output data	
Contact type	2 floating PDT contacts
Contact material	AgNi (90/10)
Maximum switching voltage	400 V AC
Interrupting rating (ohmic load) max.	2000 VA (8 A / 250 V AC)
Output fuse	8 A (fast-blow)
Control contact	
Control contact	Non-floating, terminals A1-B1
Control pulse length	50 ms
General data	
Display	OLED
Mechanical service life	approx. 3x 10 ⁷ cycles
Service life, electrical	approx. 1x 10 ⁵ cycles, resistive load 2000 V A

General data		
Degree of protection	IP20	
Rated insulation voltage	300 V AC	
Mounting	on standard DIN rail NS 35 in accordance with EN 60715	
Mounting position	any	
Width	22.5 mm	
Height	109 mm	
Depth	114 mm	
Type of housing	PBT	
Inflammability class in acc. with UL 94	V0	
Color	traffic grey A RAL 7042	
Overvoltage category	III	
Dielectric strength	2 kV ((2 mA, 60 s) (IEC 60947-5-1))	
Pollution degree	3	
Impulse withstand voltage	4 kV (1.2/50 µs, IEC 60947-5-1)	
Shock resistance	2 g (10 ... 150 Hz, IEC 60068-2-6)	
Vibration resistance	15 g (11 ms, IEC 60068-2-27)	
Connection data	Screw connection	Push-in connection
GRP conductor cross section, solid	0.2 mm ² ... 2.5 mm ²	0.2 mm ² ... 2.5 mm ²
Conductor cross section, flexible	0.2 mm ² ... 2.5 mm ²	0.2 mm ² ... 2.5 mm ²
AWG	24 ... 14	24 ... 14
Stripping length	10 mm	10 mm
Torque	0.5 Nm ... 0.6 Nm / 5 lb in ... 7 lb in	
Ambient conditions		
Ambient temperature (operation)	-25 °C ... 60 °C	
Ambient temperature (storage/transport)	-40 °C ... 85 °C	
Permissible humidity (operation)	10 % ... 95 % (non-condensing)	
Altitude	≤ 2000 m	
Conformance/Approvals		
CE	CE-compliant	
UL, USA/Canada	UL/C-UL Listed UL 508	
CCC	GB/T 14048.5	
Standards/regulations	IEC 60947-5-1 IEC 61812-1	
Conformance with EMC Directive 2014/30/EU		
Noise immunity according to	EN 61000-6-2	
Noise emission according to	EN 61000-6-4	
Conformance with Low Voltage Directive 2014/35/EU		
Conformance with Radio Equipment Directive 2014/53/EU		

5 Basic circuit diagram

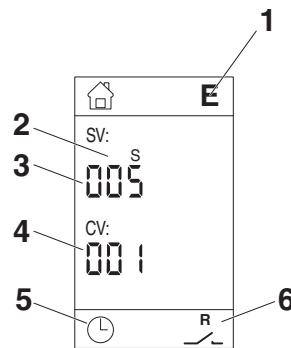


6 Structure



- 1 OLED display
- 2 Up key: plus/moving backward
- 3 Down key: minus/moving forward
- 4 Set key: confirm/menu
- 5 NFC identification
- 6 Transparent cover
- 7 Snap-on foot for DIN rail mounting

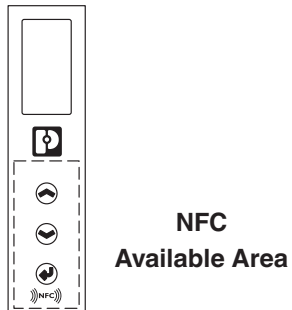
7 Display description



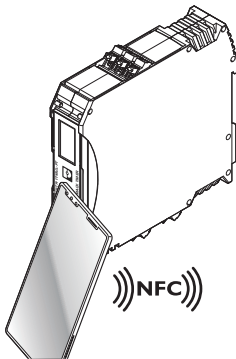
- 1 Current running function
- 2 Time set unit
- 3 Time set value
- 4 Current value of time (countdown)
- 5 Symbol t: time running status
Flashing - countdown is running
Off - end of current countdown
- 6 Symbol R: relay state
Pick up/drop out

8 Communication

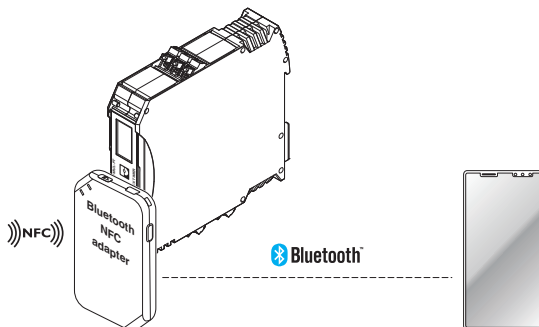
The module supports NFC communication and provides a wide NFC recognition area.



Android system: connect via NFC interface of mobile phone using MACX Timer Relay app and module.



Android or IOS system: connect via Bluetooth NFC adapter (order number: 1142259) and Bluetooth interface of mobile phone using MACX Timer Relay app and module.



9 Installation



WARNING: Danger to life by electric shock!

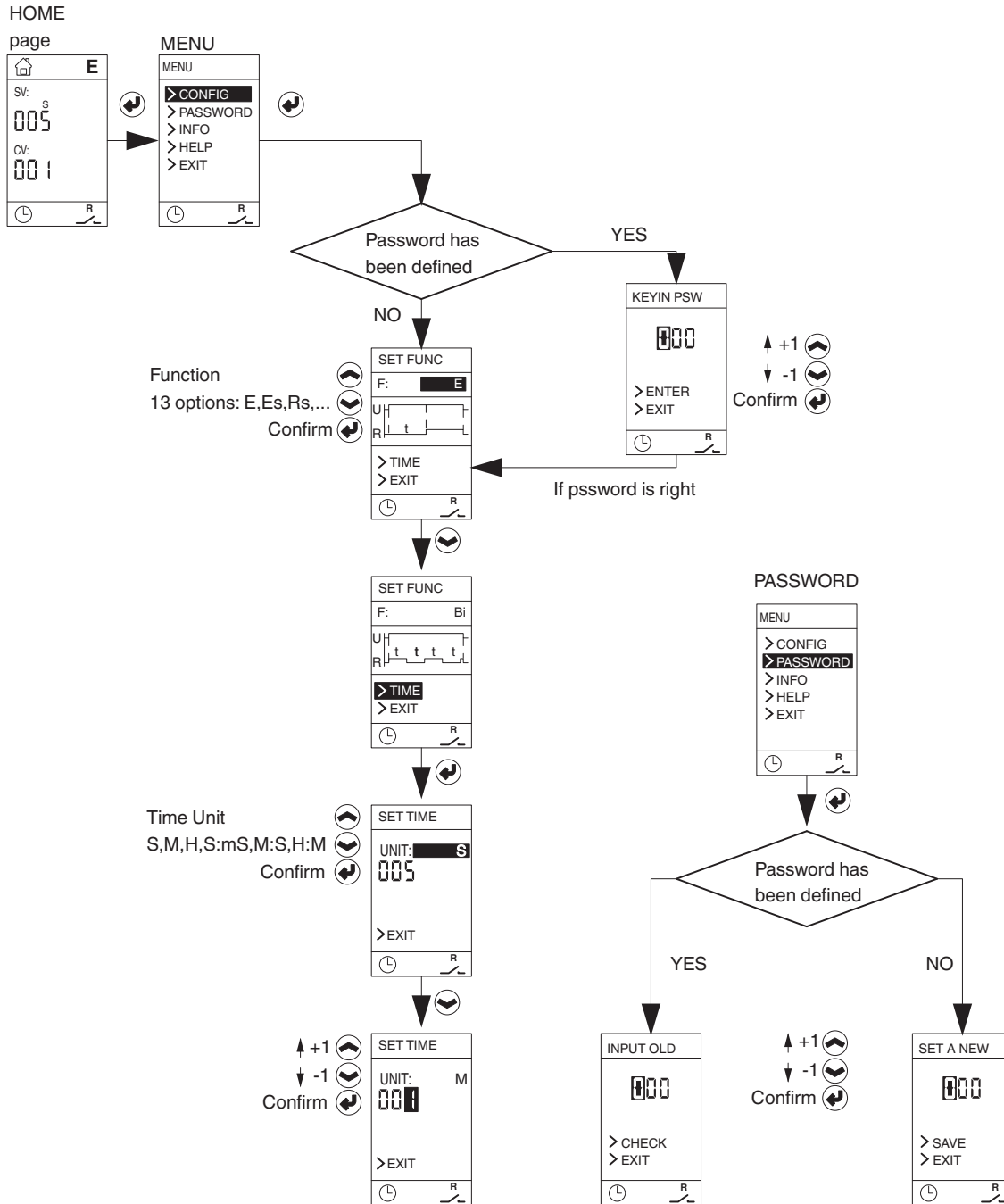
The device can be snapped onto a 35 mm DIN rail according to EN 60715.

UL requirement: Use copper cables approved for $\geq 75^{\circ}\text{C}$.

10 Operating instructions

Press the set key on the home page to enter the menu page.
Use up key and down key to select, and set key to confirm.

For example: set function Bi, time is 1 min.





Except for the home page, if there is no action in 30 s, it will automatically return to the home page.

If there is no action in 3 min, the module automatically goes into a shallow sleep state.

If there is no action in 30 min, the module automatically goes into deep sleep state

CONFIG

- Module function and time configuration
- 13 functions available (refer to section 12)
- 6 time units available

S	M	H	S:10 mS*	M:S	H:M
---	---	---	----------	-----	-----

* actual value in milliseconds = set value x 10 (e.g., if set value is 50, the actual value in milliseconds should be 500).

PASSWORD

- Password settings
- Password is used to protect configuration information, the initial password is set to 000 as default, i.e. no password protection.

INFO

- Product information

HELP

- Key and code description

EXIT

- Return

Initializing

- Press up and set keys together for 3 s to enter the initialization interface, choose "yes", then the module restarts, and resets to the default settings (function E, time 5 s).

11 Connection examples



If it's necessary to control timing through control contacts, such control contact must be connected between terminal A1 and B1.

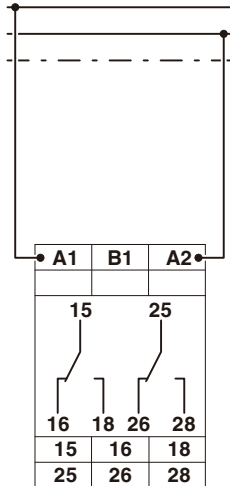


Figure 1 Connection without control contact

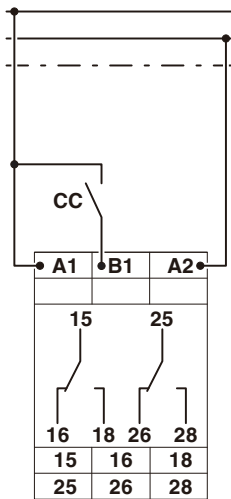


Figure 2 Connection with control contact

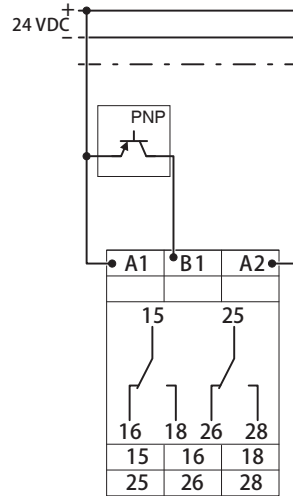


Figure 3 Connection with PNP proximity switch control contact

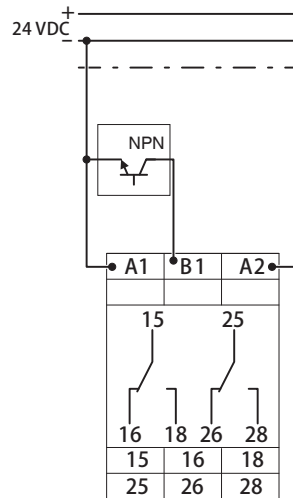
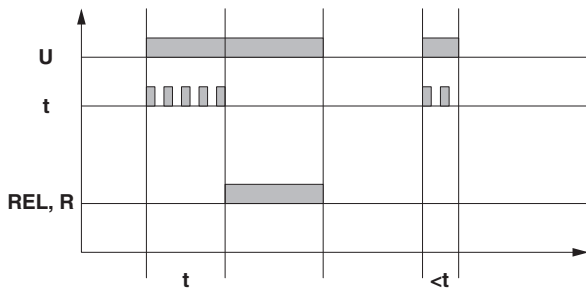


Figure 4 Connection with NPN proximity switch control contact

12 Function

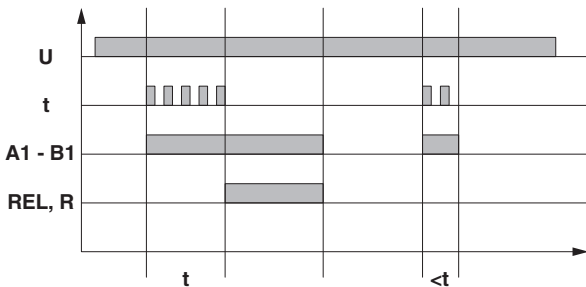
E: With Switch-On Delay

When supply voltage U is applied, set time t starts running (symbol t flashes). Once time t has elapsed (symbol t disappears), the output relay picks up again (symbol R picks up). This state continues until supply voltage U is interrupted. If the supply voltage U is interrupted before time t has elapsed, the elapsed time is deleted (relay does not pick up). The set time will be restarted when supply voltage U is applied at the next time.



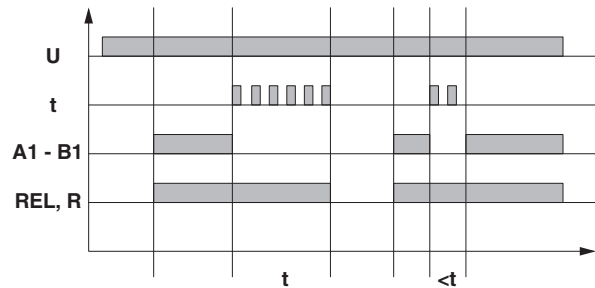
Es: With Switch-On Delay and Control Contact

Supply voltage U must be applied permanently at the device. When control contact A1-B1 is closed, set time t starts running (symbol t flashes). Once time t has elapsed (symbol t disappears), the output relay picks up again (symbol R picks up). This state continues 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.



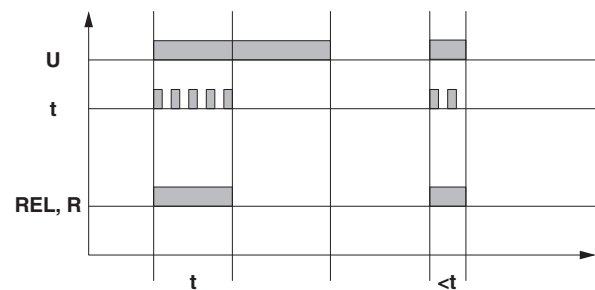
Rs: With release delay and control contact

Supply voltage U must be applied permanently at the device. If control contact A1-B1 is closed, output relay picks up (symbol R picks up). If control contact A1-B1 opens, set time t starts running (symbol t flashes). Once time t has elapsed (symbol t disappears), the output relay drops out (symbol R drops out). If the control contact is closed again before time t has elapsed, the elapsed time is deleted and restarted with the next cycle.



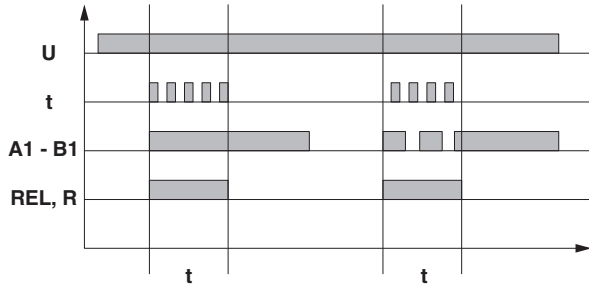
Wu: With single shot leading edge, voltage controlled

When supply voltage U is applied, output relay picks up (symbol R picks up) and set time t starts running (symbol t flashes). Once time t has elapsed (symbol t disappears), the output relay drops out (symbol R drops out). This state continues until supply voltage U is interrupted. If the supply voltage U is interrupted before time t has elapsed, then the output relay drops out (symbol R drops out). The elapsed time is deleted and will be restarted when supply voltage U is applied at the next time.



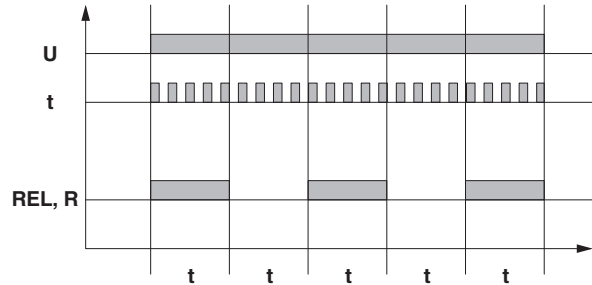
Ws: With single shot leading edge and control contact

Supply voltage U must be applied permanently at the device. If control contact A1-B1 is closed, the output relay picks up (symbol R picks up) and set time t starts running (symbol t flashes). Once time t has elapsed (symbol t disappears), the output relay drops out (symbol R drops out). While time t is running, the control contact can be switched freely. Another cycle cannot be started until the current cycle has been completed.



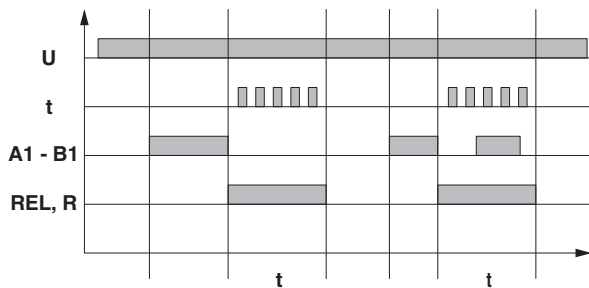
Bi: Flashing beginning with pulse (initial status is 1, 1 settable time point)

When supply voltage U is applied, output relay picks up (symbol R picks up) and set time t starts running (symbol t flashes). Once time t has elapsed (symbol t disappears), the output relay drops out (symbol R drops out), and set time starts running again (symbol t flashes). Output relay is triggered at a ratio of 1:1, until supply voltage is interrupted. For cycle pulse function, pulse and pause time are the same, and there is only one settable time.



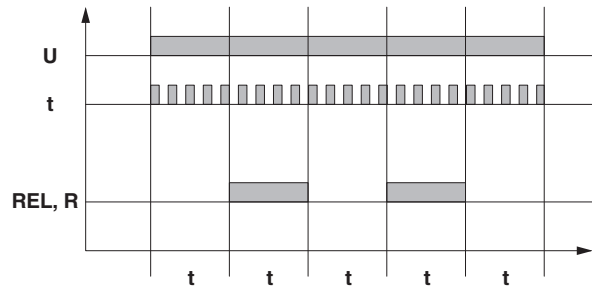
Wa: With single shot trailing edge and control contact

Supply voltage U must be applied permanently at the device. When the control contact is closed, this does not affect the output relay status. If control contact A1-B1 opens, the output relay picks up (symbol R picks up) and set time t starts running (symbol t flashes). Once time t has elapsed (symbol t disappears), the output relay drops out (symbol R drops out). While time t is running, the control contact can be switched freely. Another cycle cannot be started until the current cycle has been completed.



Bp: Flashing beginning with pause (initial status is 0, 1 settable time point)

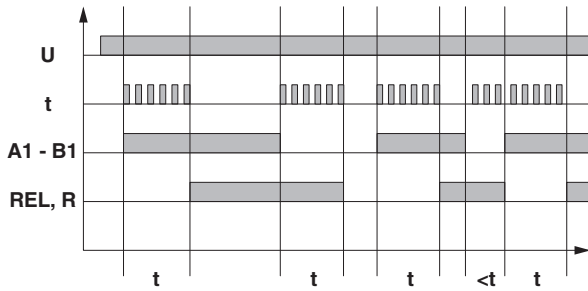
When supply voltage U is applied, set time t starts running (symbol t flashes). Time t has elapsed (symbol t disappears), the output relay picks up (symbol R picks up) and set time starts running again (symbol t flashes). Once time t has elapsed, the output relay drops out (symbol R drops out). Output relay is triggered at a ratio of 1:1, until supply voltage is interrupted. For cycle pulse function, pulse and pause time are the same, and there is only one settable time.



ERs: With switch-on and Release Delay with control contact

Supply voltage U must be applied permanently at the device. When control contact A1-B1 is closed, set time t starts running (symbol t flashes). Once time t has elapsed (symbol t disappears), the output relay picks up again (symbol R picks up). If control contact A1-B1 opens, set time t starts running (symbol t flashes). Once time t has elapsed (symbol t disappears), the output relay drops out (symbol R drops out).

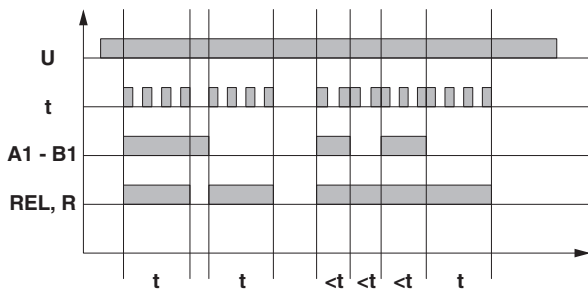
If the control contact is switched before time t has elapsed, the elapsed time is deleted and restarted with the next cycle.



WaBi: With single shot leading edge and shot trailing edge and control contact

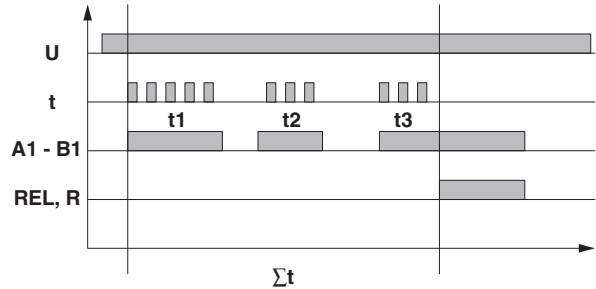
Supply voltage U must be applied permanently at the device. If control contact A1-B1 is closed, the output relay picks up (symbol R picks up) and set time t starts running (symbol t flashes). Once time t has elapsed (symbol t disappears), the output relay drops out (symbol R drops out). If control contact A1-B1 opens, the output relay picks up (symbol R picks up) and set time t starts running (symbol t flashes). Once time t has elapsed (symbol t disappears), the output relay drops out (symbol R drops out).

If the control contact is switched before time t has elapsed, the elapsed time is deleted and restarted with the next cycle.



Ecs: Cumulative on delay with control contact

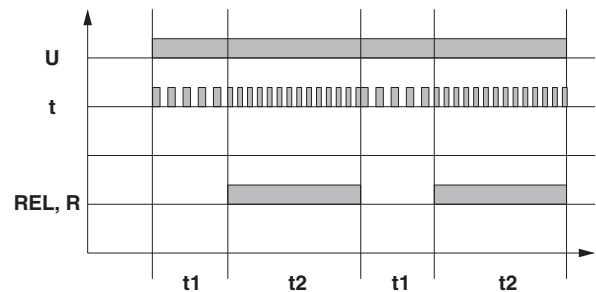
Supply voltage U must be applied permanently at the device. When control contact A1-B1 is closed, set time t starts running (symbol t flashes). If control contact A1-B1 opens, set time t stops running (symbol t disappears). Once the accumulated time Σt has elapsed (symbol t disappears), the output relay picks up (symbol R picks up). This state continues until the control contact is opened (after the accumulated time has elapsed).



Ip: switched-mode beginning with pause (2 times can be set)

When supply voltage U is applied, set time t1 starts running (symbol t flashes at 0.75 Hz). Once time t1 has elapsed, the output relay picks up (symbol R picks up) and set time t2 starts running (symbol t flashes at 1.5 Hz). Once time t2 has elapsed, the output relay drops out (symbol R drops out). The output relay is controlled by set time t1 and t2 until the supply voltage is interrupted.

Time t1 = Pause time t2 = Pulse time



li: switched-mode beginning with pulse (2 times can be set)

When supply voltage U is applied, the output relay picks up (symbol R picks up) and set time t1 starts running (symbol t flashes at 0.75 Hz). Once time t1 has elapsed, the output relay drops out (symbol R drops out) and set time t2 starts running (symbol t flashes at 1.5 Hz). Once time t2 has elapsed, the output relay picks up again (symbol R picks up). The output relay is controlled by set time t1 and t2 until the supply voltage is interrupted.

Time t1 = Pulse time t2 = Pause time

