

MACX-TR-2T-MUL(-PT)

Multifunctional time relay

Data sheet
300002_en_01

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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 (14 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".

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3 Ordering data

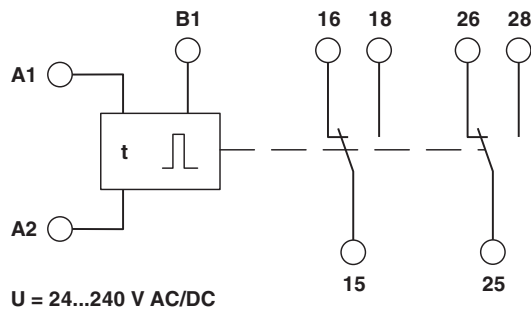
Description	Type	Order No.	Pcs./Pkt.
Multifunctional time relay, 24 V AC/DC ... 240 V AC/DC wide-range supply, with 14 functions, time range adjustable (10 ms ... 999 h:59 min), two configuration possibilities, password protection, supporting dry contacts, PNP and NPN proximity switch inputs, 2 PDTs, screw connection	MACX-TR-2T-MUL	1103345	1
Multifunctional time relay, 24 V AC/DC ... 240 V AC/DC wide-range supply, with 14 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-2T-MUL-PT	1103355	1
Accessories	Type	Order No.	Pcs./Pkt.
Bluetooth NFC adapter	MACX-BLUETOOTH-NFC	1142259	1

4 Technical data

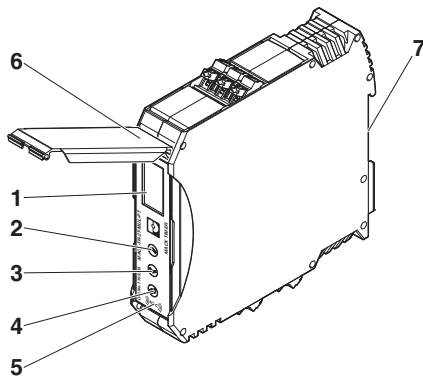
Input data	
Input voltage range	24 V AC/DC ... 240 V AC/DC (-15% ... +10%)
Nominal frequency	48 Hz ... 63 Hz
Temperature coefficient, typical	≤ 0.01 %/°C
Recovery time	100 ms
Setting range time	10 ms ... 999 h 59 min.
Setting accuracy	≤ 0.5 % (> 1 s)
Repeat accuracy	≤ 0.05 % (> 1 s)
Nominal power consumption	2.5 VA (0.8 W)
Output data	
Contact type	2 floating PDT contacts
Contact material	AgSnO ₂
Maximum switching voltage	400 V AC
Interrupting rating (ohmic load) max.	2000 VA (8 A / 250 V AC)
Output fuse	10 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. 1x 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	8 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	EN 300 330, EN 301 489-03, EN 301 489-1, EN 60947-5-1, EN 61812-1, EN 62311, EN IEC 63000	
UKCA		
UL, USA/Canada	UL/C-UL Listed UL 508	
TÜV	EN 60947-5-1	
CCC	GB/T 14048.5	
Morocco	N° 2573-14, N° 2574-14	
Conformance with RoHS	2011/65/EU(CE) S.I.2012/3032(UKCA)	
Conformance with Radio Equipment Directive	2014/53/EU(CE) S.I.2017/1206(UKCA)	

5 Basic circuit diagram

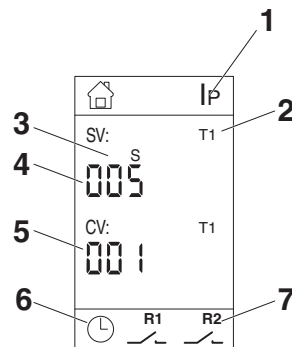


6 Structure



- 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

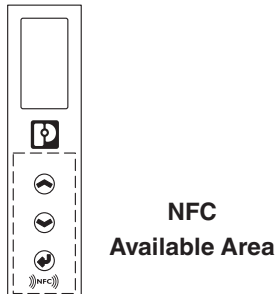
7 Display description



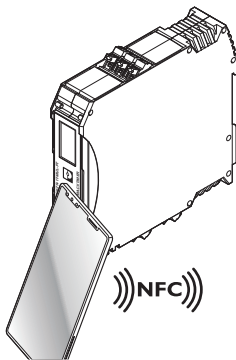
- 1 Current running function
- 2 Current runtime category
- 3 Time set unit
- 4 Time set value
- 5 Current value of time (countdown)
- 6 Symbol t: time running status
Flashing - countdown is running
Off - end of current countdown
- 7 Symbol R1/R2: relay status
Pick up/drop out

8 Communication

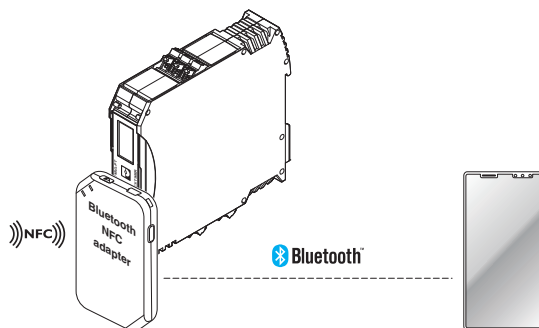
The module supports NFC communication and provides a wide NFC recognition area.



Android or IOS system: connect via NFC interface of mobile phone using Monitoring and Timer Relay APP and module.



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



9 Installation



WARNING: Danger to life by electric shock!

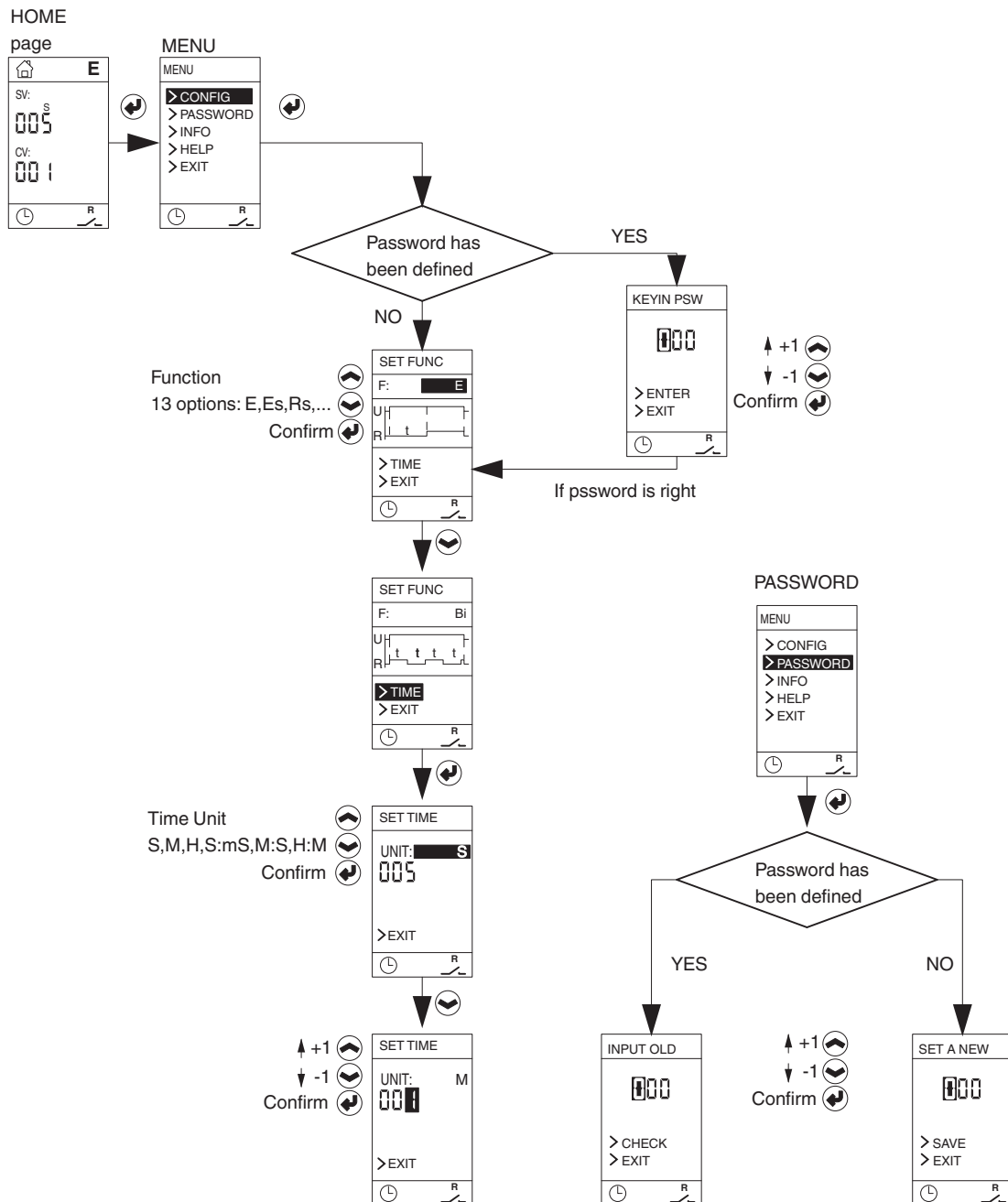
The device can be snapped onto a 35 mm DIN rail according to EN 60715.

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.

Please refer to the following figure for parameters and passwords.





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
- 14 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).

For the star delta function, T2 time setting range is limited to 50 mS ... 100 mS, if the T2 value exceeds the set range, then T2 is set to 50 mS as default.

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 Ip, time T1 5 s, T2 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.

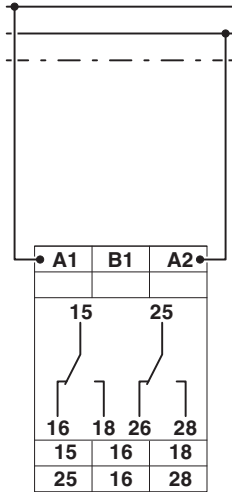


Figure 1 Connection without control contact

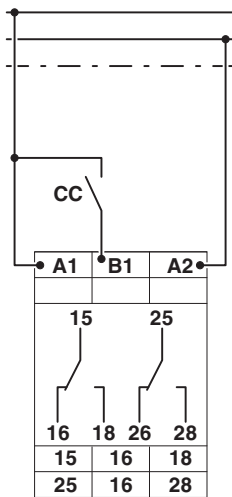


Figure 2 Connection with control contact

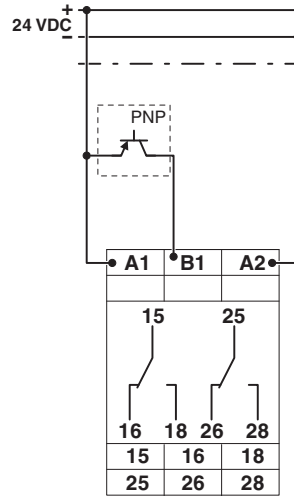


Figure 3 Connection with PNP proximity switch control contact

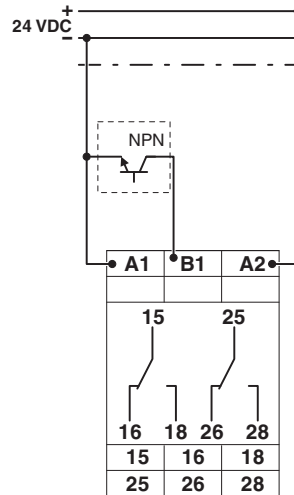


Figure 4 Connection with NPN proximity switch control contact

12 Function

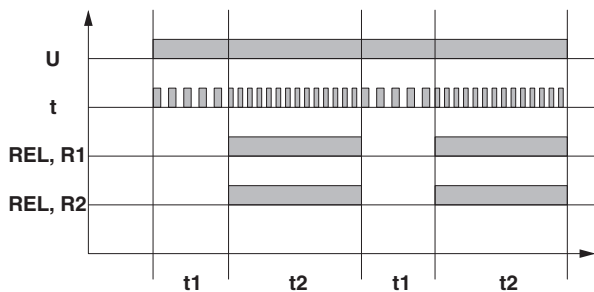
Ip: switched-mode beginning with pause (2 times can be set)

When supply voltage U is applied, set time t1 starts running (symbol t flashes at 0.75 Hz). Once time t1 has elapsed, output relay R1 and R2 pick up (symbol R1 and R2 pick up) and set time t2 starts running (symbol t flashes at 1.5 Hz).

Once time t2 has elapsed, output relay R1 and R2 drop out (symbol R1 and R2 drop out) and set time t1 starts running (symbol t flashes at 0.75 Hz).

The output relay R1 and R2 are controlled by set time t1 and t2 until the supply voltage is interrupted.

Time t1 = Pause time t2 = Pulse time



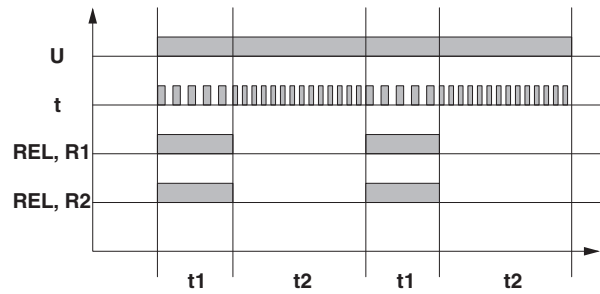
Ii: switched-mode beginning with pulse (2 times can be set)

When supply voltage U is applied, output relay R1 and R2 pick up (symbol R1 and R2 pick up) and set time t1 starts running (symbol t flashes at 0.75 Hz). Once time t1 has elapsed, output relay R1 and R2 drop out (symbol R1 and R2 drop out) and set time t2 starts running (symbol t flashes at 1.5 Hz).

Once time t2 has elapsed, output relay R1 and R2 pick up (symbol R1 and R2 pick up) and set time t1 starts running (symbol t flashes at 0.75 Hz).

The output relay R1 and R2 are controlled by set time t1 and t2 until the supply voltage is interrupted.

Time t1 = Pulse time t2 = Pause time

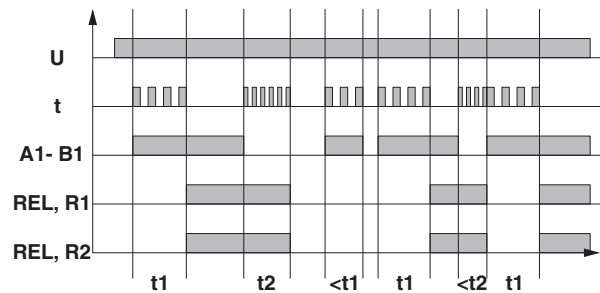


ERs: With Switch-On and Release Delay With Control Contact

Supply voltage U must be applied permanently at the device. When control contact A1-B1 is closed, set time t1 starts running (symbol t flashes at 0.75 Hz). Once time t1 has elapsed (symbol t disappears), output R1 and R2 pick up (symbol R1 and R2 pick up). If control contact A1-B1 opens, set time t2 starts running (symbol t flashes at 1.5 Hz). Once time t2 has elapsed (symbol t disappears), output relay R1 and R2 drop out (symbol R1 and R2 drop out).

If control contact is switched before time t1 (t2) has elapsed, the elapsed time is deleted and restarted with the next cycle.

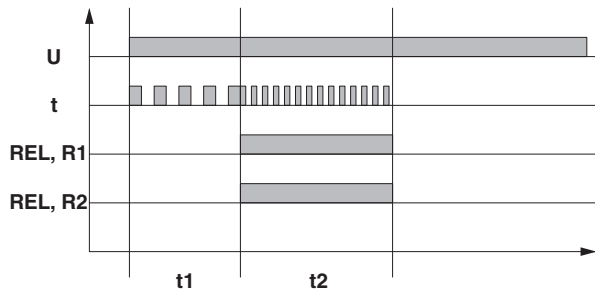
Time t1 = switch-on delay time, time t2 = release delay time



EWu: With switch-on delay and single shot leading edge, voltage controlled

When supply voltage U is applied, set time t1 starts running (symbol t flashes at 0.75 Hz). Once time t1 has elapsed, output relay R1 and R2 pick up (symbol R1 and R2 pick up) and set time t2 starts running (symbol t flashes at 1.5 Hz). Once time t2 has elapsed (symbol t disappears), output relay R1 and R2 drop out (symbol R1 and R2 drop out). If the supply voltage U is interrupted before time t1+t2 has elapsed, the elapsed time is deleted and will be restarted when supply voltage U is applied at the next time.

Time t1 = switch-on delay time time t2 = relay running time

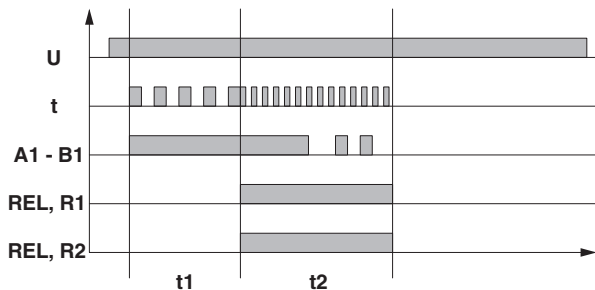


EWs: With switch-on delay and single shot leading edge with control contact

Supply voltage U must be applied permanently at the device. When control contact A1-B1 is closed, set time t1 starts running (symbol t flashes at 0.75 Hz). Once time t1 has elapsed, output relay R1 and R2 pick up (symbol R1 and R2 pick up) and set time t2 starts running (symbol t flashes at 1.5 Hz).

Once time t2 has elapsed (symbol t disappears), output relay R1 and R2 drop out (symbol R1 and R2 drop out). The control contact can be freely switched during the running time. Another cycle cannot be started until the current cycle has been completed.

Time t1 = switch-on delay time time t2 = relay running time

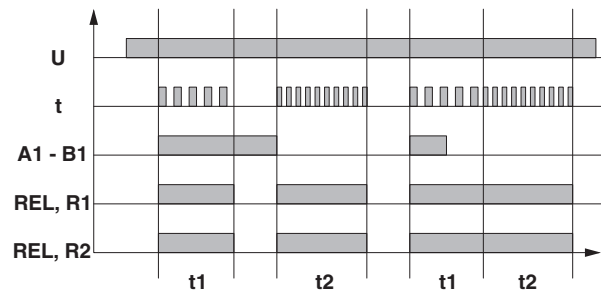


WsWa: With single shot leading edge and single shot trailing edge with Control Contact

Supply voltage U must be applied permanently at the device. If control contact A1-B1 is closed, output relay R1 and R2 pick up (symbol R1 and R2 pick up) and set time t1 starts running (symbol t flashes at 0.75 Hz). Once time t1 has elapsed (symbol t disappears), output relay R1 and R2 drop out (symbol R1 and R2 drop out)

If control contact opens, output relay R1 and R2 pick up (symbol R1 and R2 pick up) and set time t2 starts running (symbol t flashes at 1.5 Hz). Once time t2 has elapsed (symbol t disappears), output relay R1 and R2 drop out (symbol R1 and R2 drop out). The control contact can be freely switched during the running time.

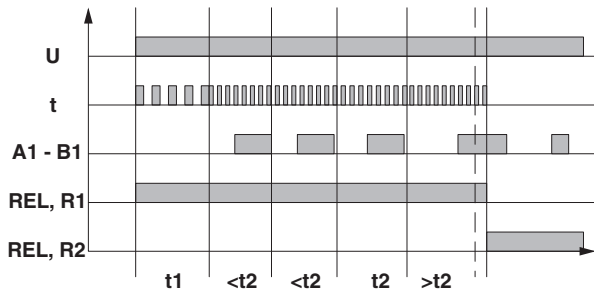
Time t1 = switch-on delay time time t2 = relay running time



Wt: pulse sequence evaluation

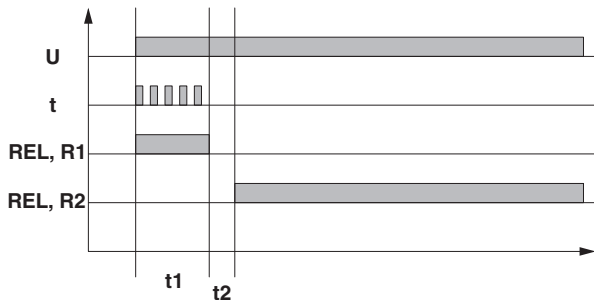
When supply voltage U is applied, set time t1 starts running (symbol t flashes at 0.75 Hz) and the output relay R1 picks up (symbol R1 picks up). Once time t1 has elapsed, and set time t2 starts running (symbol t flashes at 1.5 Hz).

To keep the output relay R1 picked up, the control contact must be closed and opened again within the set time t2. Otherwise, output relay R1 drops out (symbol R1 drops out) while output relay R2 picks up (symbol R2 picks up). Other pulses of all control contacts are ignored. In order to restart this function, supply voltage must be disconnected and applied again.



YΔ: star delta startup

When supply voltage U is applied, set time t1 starts running (symbol t flashes) and the output relay R1 picks up (symbol R1 picks up). Once time t has elapsed (symbol t disappears), the output relay R1 drops out (symbol R1 drops out). After the output relay R1 has dropped out and the time interval t2 has elapsed, the output relay R2 picks up (symbol R2 picks up). This state continues until supply voltage U is interrupted. If the supply voltage is interrupted before time t has elapsed, the elapsed time is deleted (relay does not pick up). The time will be restarted when supply voltage U is applied at the next time



Ip': Switched-Mode Beginning With Pause+ R2 inst.

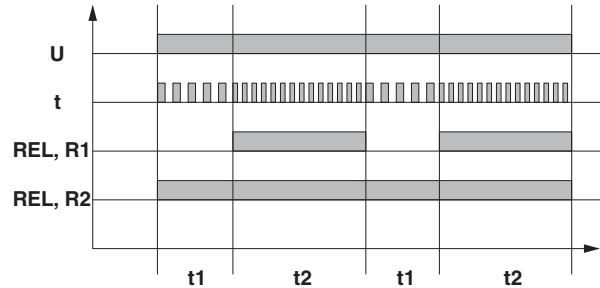
When supply voltage U is applied, set time t1 starts running (symbol t flashes at 0.75 Hz). Once time t1 has elapsed, output relay R1 picks up (symbol R1 picks up) and set time t2 starts running (symbol t flashes at 1.5 Hz).

Once time t2 has elapsed, output relay R1 drops out (symbol R1 drops out) and set time t1 starts running (symbol t flashes at 0.75 Hz).

The output relay R1 is controlled by set time t1 and t2 until the supply voltage is interrupted. Output relay R2

immediately picks up when the power is on (symbol R2 picks up), and is disconnected when the power is off (symbol R2 drops out).

Time t1 = Pause time t2 = Pulse time



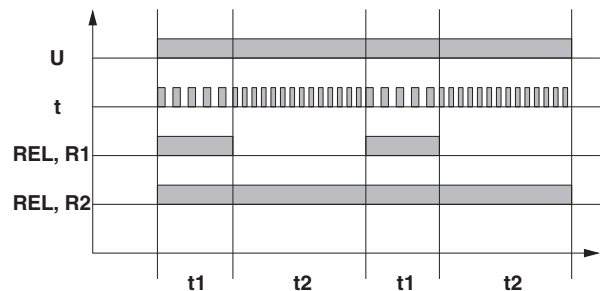
Ii': Switched-Mode Beginning With Pulse + R2 inst.

When supply voltage U is applied, the output relay R1 picks up (symbol R1 picks up) and set time t1 starts running (symbol t flashes at 0.75 Hz). Once time t1 has elapsed, output relay R1 drops out (symbol R1 drops out) and set time t2 starts running (symbol t flashes at 1.5 Hz).

Once time t2 has elapsed, the output relay R1 picks up (symbol R1 picks up) and set time t1 starts running (symbol t flashes at 0.75 Hz).

The output relay R1 is controlled by set time t1 and t2 until the supply voltage is interrupted. Output relay R2 immediately picks up when the power is on (symbol R2 picks up), and is disconnected when the power is off (symbol R2 drops out).

Time t1 = Pulse time t2 = Pause time



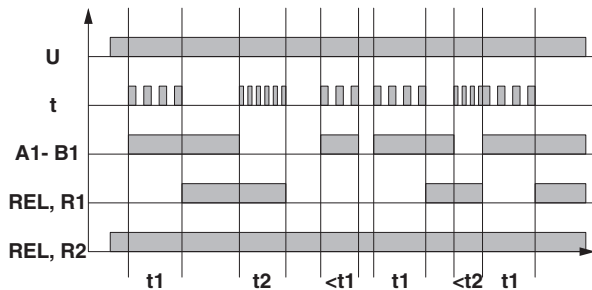
ERs': With Switch-On and Release Delay With Control Contact + R2 inst.

Supply voltage U must be applied permanently at the device. When control contact A1-B1 is closed, set time t1 starts running (symbol t flashes at 0.75 Hz). Once time t1 has elapsed (symbol t disappears), the output relay R1 drops out (symbol R1 picks up). If control contact A1-B1 opens, set time t2 starts running (symbol t flashes at 1.5 Hz). Once time t2 has elapsed (symbol t disappears), output relay R1 drops out (symbol R1 drops out).

If control contact is switched before time t1 (t2) has elapsed, the elapsed time is deleted and restarted with the next cycle.

The output relay R1 is controlled by set time t1 and t2 until the supply voltage is interrupted. Output relay R2 immediately picks up when the power is on (symbol R2 picks up), and is disconnected when the power is off (symbol R2 drops out).

Time t1 = switch-on delay time, time t2 = release delay time

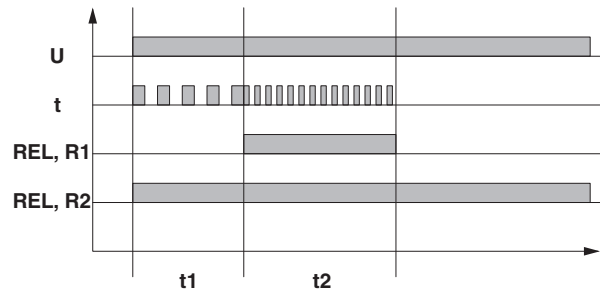


EWu': With switch-on delay and single shot leading edge, voltage controlled + R2 inst.

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 R1 picks up (symbol R1 picks up) and set time t2 starts running (symbol t flashes at 1.5 Hz). Once time t2 has elapsed (symbol t disappears), output relay R1 drops out (symbol R1 drops out). If the supply voltage U is interrupted before time t1+t2 has elapsed, the elapsed time is deleted and will be restarted when supply voltage U is applied at the next time.

The output relay R1 is controlled by set time t1 and t2 until the supply voltage is interrupted. Output relay R2 immediately picks up when the power is on (symbol R2 picks up), and is disconnected when the power is off (symbol R2 drops out).

Time t1 = switch-on delay time time t2 = relay running time



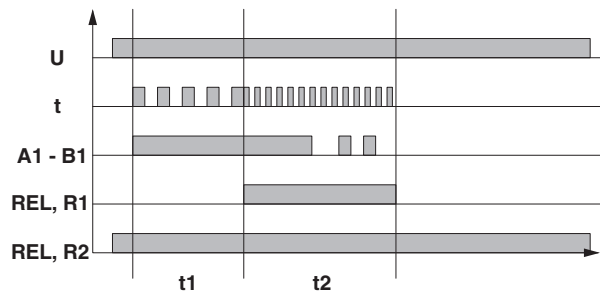
EWs': With switch-on delay and single shot leading edge with control contact + R2 inst.

Supply voltage U must be applied permanently at the device. When control contact A1-B1 is closed, set time t1 starts running (symbol t flashes at 0.75 Hz). Once time t1 has elapsed, the output relay R1 picks up (symbol R1 picks up) and set time t2 starts running (symbol t flashes at 1.5 Hz).

Once time t2 has elapsed (symbol t disappears), output relay R1 drops out (symbol R1 drops out). The control contact can be freely switched during the running time. Another cycle cannot be started until the current cycle has been completed.

The output relay R1 is controlled by set time t1 and t2 until the supply voltage is interrupted. Output relay R2 immediately picks up when the power is on (symbol R2 picks up), and is disconnected when the power is off (symbol R2 drops out).

Time t1 = switch-on delay time time t2 = relay running time



WsWa': With single shot leading edge and single shot trailing edge with Control Contact + R2 inst.

Supply voltage U must be applied permanently at the device. If control contact A1-B1 is closed, the output relay R1 picks up (symbol R1 picks up) and set time t1 starts running (symbol t flashes at 0.75 Hz). Once time t1 has elapsed (symbol t disappears), the output relay R1 drops out (symbol R1 drops out).

If control contact opens, the output relay R1 picks up (symbol R1 picks up) and set time t2 starts running (symbol t flashes at 1.5 Hz). Once time t2 has elapsed (symbol t disappears), output relay R1 drops out (symbol R1 drops out). The control contact can be freely switched during the running time.

The output relay R1 is controlled by set time t1 and t2 until the supply voltage is interrupted. Output relay R2 immediately picks up when the power is on (symbol R2 picks up), and is disconnected when the power is off (symbol R2 drops out).

Time t1 = switch-on delay time time t2 = relay running time

