



- Multifunction time relay (10 time functions; 8 time ranges)
- Cadmium - free contacts • AC/DC input voltages
- Cover - installation module, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to PN-EN 60715
- Application: in low-voltage systems
- Compliance with standard PN-EN 61812-1
- Recognitions, certifications, directives:

## Output circuit - contact data

Number and type of contacts	1 C/O	
Contact material	AgNi	
Rated / max. switching voltage	AC	250 V / 400 V
Rated load	AC1	16 A / 250 V AC
	DC1	16 A / 24 V DC
Max. breaking capacity	AC1	4 000 VA
Min. breaking capacity	0,3 W 5 V, 5 mA	
Contact resistance	≤ 100 mΩ	

## Input control circuit

Rated voltage	AC: 50/60 Hz AC/DC	12...240 V	terminals (+)A1 – (-)A2
Operating range of supply voltage	0,9...1,1 U <sub>n</sub>		
Rated power consumption	AC	≤ 4,5 VA	AC: 50 Hz
	DC	≤ 1,5 W	
Range of supply frequency	AC	48...63 Hz	
<b>Control contact S ①</b>			
• control voltage	rated supply voltage U <sub>n</sub> (between terminals S and A2)		
• min. voltage ②	0,7 U <sub>n</sub>		
• min. time of pulse duration ②	AC: ≥ 50 ms	DC: ≥ 20 ms	

## Insulation according to PN-EN 60664-1

Insulation rated voltage	250 V AC		
Rated surge voltage	2 500 V 1,2 / 50 μs		
Overtoltage category	II		
Insulation pollution degree	1		
Flammability degree	contact plate: V-0	cover: V-1 UL94	
Dielectric strength	• input - output	2 500 V AC	type of insulation: basic
	• contact clearance	1 000 V AC	type of clearance: micro-disconnection

## General data

Electrical life	• resistive AC1	≥ 0,7 x 10 <sup>5</sup>	16 A, 250 V AC
Mechanical life (cycles)	≥ 3 x 10 <sup>7</sup>		
Dimensions (L x W x H)	90 ③ x 17,5 x 63,5 mm		
Weight	64 g		
Ambient temperature	• storage	-40...+70 °C	
	• operating	-20...+45 °C	
Cover protection category	IP 20 PN-EN 60529		
Relative humidity	up to 85%		
Shock resistance	15 g		
Vibration resistance	0,35 mm 10...55 Hz		

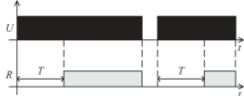
## Time module data

Functions	E, Wu, Bp, Bi, T, R, Ws, Wa, Esa, B permanent switching ON and OFF		
Time ranges	1 s ④; 10 s; 1 min.; 10 min.; 1 h; 10 h; 1 d; 10 d		
Timing adjustment	smooth - (0,1...1) x time range		
Setting accuracy	± 5% (calculate from final range value) ④		
Repeatability	± 0,5% ④		
Values affecting the timing adjustment	• temperature	± 0,01% / °C	
	• humidity	± 0,05% / %HR	
Recovery time	≤ 40 ms		
Min. pulse of the control contact	50 ms		
LED indicator	green LED U ON - indication of supply voltage U green LED U flashing - measurement of T time yellow LED R ON/OFF - output relay status		

① Control contact S is activated by connecting it to A1 terminal. ② Where the control signal is recognizable. ③ Length with 35 mm rail taps: 98,8 mm. ④ For first range setpoint (1 s) setting accuracy and repeatability are smaller than the given ones in technical parameters (significant influence of the operational relay operating time, processor start-time, and the moment of supply switching as referred to the AC supply course).

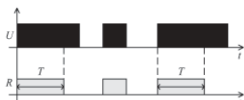
## Time functions

### E - ON Delay



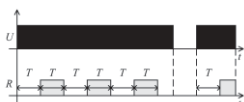
After the supply voltage U has been switched on, the set time T is being measured. After the T time has lapsed, the R operating relay shall start operating and remains in operating position until the supply voltage U is switched off.

### Wu - Single shot leading edge voltage controlled



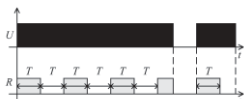
After the supply voltage U has been switched on, the operating relay R starts immediately and the set time T is being measured. After the set time T has lapsed, the operating relay R returns to the initial position.

### Bp - Flasher pause first



After the supply voltage U has been switched on, the set time T is being measured. After the time has lapsed, the operating relay R starts operating and the T time is being measured again. After the time has lapsed, the operating relay R returns to the initial state, and another cycle of the relay operation commences. The relay operates until the supply voltage is switched off.

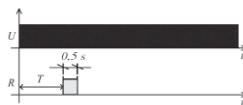
### Bi - Flasher pulse first



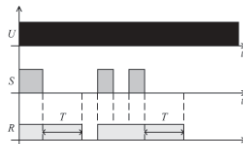
After the supply voltage U has been switched on, the set time T is being measured and the operation relay R is switched on. After the time has lapsed, the operating relay R starts operating and the T time is being measured again. After the time has lapsed, the operating relay R returns to the initial state, and another cycle of the relay operation commences. The relay operates until the supply voltage is switched off.

U - supply voltage; R - output state of the relay; S - control contact state; T - measured time; t - time axis

### T - generating the 0,5 s pulse after the T time

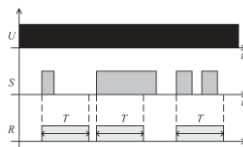


### R - OFF Delay



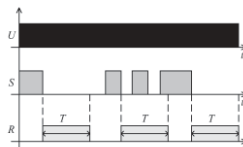
The supply voltage U must be constantly applied to the time relay. After the control contact S has been closed, the operating relay R starts operation immediately. After the control contact S has been opened, the set time T is being measured. After the T time has lapsed, the operating relay R returns to the initial position. When the control contact S is closed again, even before the T time has lapsed, the time measured thus far is reset, and when S is opened, the set time T is being measured again.

### Ws - Single shot leading edge with control contact S



The supply voltage U must be constantly applied to the time relay. After the control contact S has been closed, the operating relay R starts immediately and the set time T is being measured. After the set time T has lapsed, the operating relay R returns to the initial position. In course of measuring the T time, the control contact S may be closed and opened repeatedly with no impact upon the operating relay R. Only after the T time has lapsed, closing of the control contact S will make the operating relay R operate and the T time will be measured.

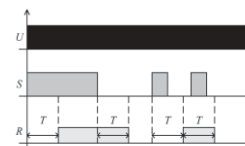
### Wa - Single shot trailing edge with control contact S



The supply voltage U must be constantly applied to the time relay. Closing of the control contact S does

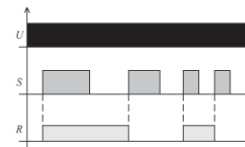
not trigger the measurement of the time delay or operation of the operating relay R. Only opening of the control contact S causes the immediate operation of the operating relay R, and the set time T is being measured. After the T time has lapsed, the operating relay R returns to the initial position. In course of measuring the T time, the control contact S may be closed and opened repeatedly with no impact upon the output relay. Only after the T time has lapsed, closing and opening of S will make the operating relay R operate and the T time will be measured.

### Esa - ON and OFF delay with control contact S



The supply voltage U must be constantly applied to the time relay. After the control contact S has been closed, the set time T is being measured and when it lapses, the operating relay R is switched on. On opening of the control contact S the set time T is measured again, and after the time has lapsed, the operating relay R is switched off. In case the time of closing of the control contact S is shorter than the set time delay T, the operating relay R shall start operation after the set delay has lapsed, and it will continue to operate for the T time. In course of the operation of the R relay, closing of the control contact S does not affect the function.

### B - Bistable relay leading edge with control contact S



Each closing of the control contact S changes the operating relay status to the opposite one (a feature of a bi-stable relay).

### Permanent switching ON and OFF

The functions ON and OFF are selected with TIME potentiometer. In the ON function, the normally open contacts are closed all the time whereas in the OFF function they are open. The position of the FUNC potentiometer is of no significance in these functions as is the preset measurement time. The ON or OFF functions are used for the time relay operation control in electric systems.

## Additional functions

**Supply diode:** it is lit permanently when the time is not being measured. In course of the time measurement, it flashes at 500 ms period where it is lit for 80% of the time, and off for 20% of the time.

### Adjustment of the set values:

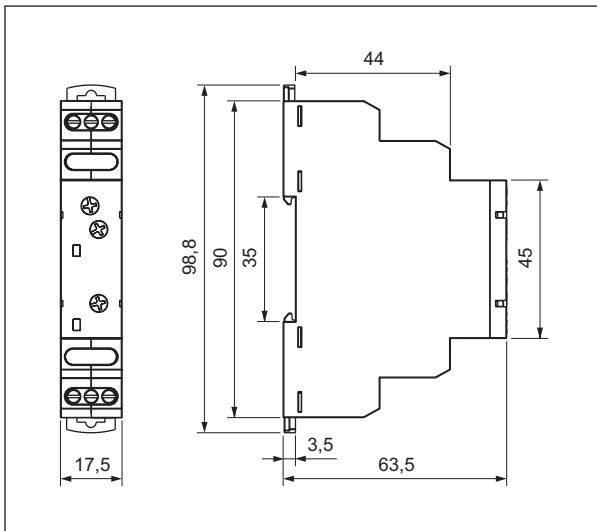
- the values of time and range are read in course of the unit operation. The set values may be modified at any moment,

- the set function is read while the supply is switched on. In course of the unit operation the function cannot be changed.

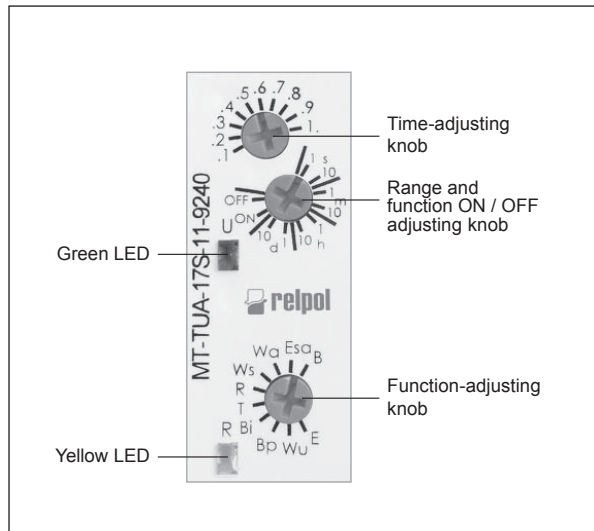
**Release:** the relay is released on connection of the S contact to the A1 line. For DC supply, the positive pole must be connected to the A1 line. The level of the S contact activation is adjusted automatically depending on the supply voltage.

**Supply:** the relay may be supplied with DC voltage or AC voltage 48...63 Hz of 10,8...250 V. A programmed control of the supply voltage has been applied so the processor shall not start operation if the voltage is lower than approximately 10 V. The supply voltage is permanently monitored in course of the operation of the relay. When the voltage drops below 9 V for more than 40 ms, the relay shall be reset. Owing to this, the regeneration time is programmed to 40 ms, and it does not depend on the tolerance of the elements.

### Dimensions

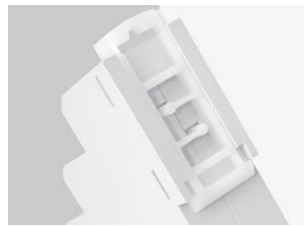


### Front panel description



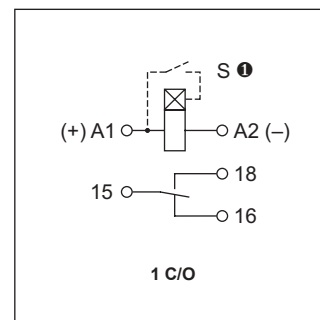
### Mounting

Relays **MT-TUA-...** are designed for direct mounting on 35 mm rail mount acc. to PN-EN 60715. Operational position - any. Maximum size of wires 1 x 2,5 mm<sup>2</sup> (1 x 14 AWG). Rated cross-sectional area of conductors 2 x 1,5 mm<sup>2</sup> (2 x 16 AWG). Maximum screw torque: 0,6 Nm.



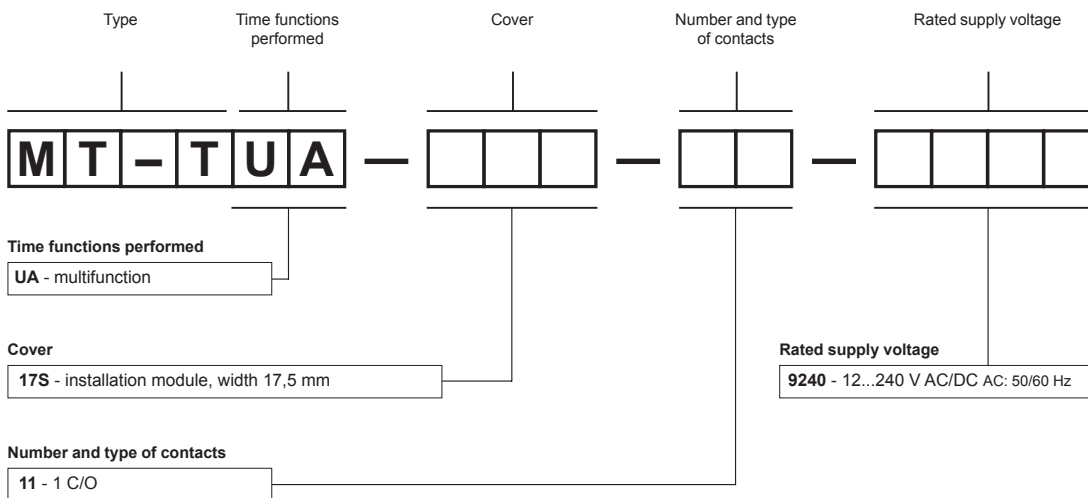
**Two taps:**  
easy assembly on 35 mm rail,  
firm tapping (top and bottom).

### Connection diagram



❶ Control contact S is activated by connecting it to A1 terminal.

### Ordering codes



Example of ordering code:

**MT-TUA-17S-11-9240** time relay **MT-TUA-...**, multifunction (relay perform 10 functions), cover - installation module, width 17,5 mm, with one changeover contact, rated input voltage 12...240 V AC/DC 50/60 Hz, contact material AgNi