NEW product

- **Time relays with independently controled times T1 and T2 (7 versions of relays with 1 time function ❶; 7 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: CE

Output circuit - contact data

Number and type of contacts		1 C/O	
Contact material		AgNi	
Max. switching voltage		400 V AC / 300 V DC	
Rated load	AC1	10 A / 250 V AC	
	DC1	10 A / 24 V DC	
Max. load	AC1	16 A / 250 V AC	
Rated current		10 A / 250 V AC	
Min. breaking capacity		0,3 W 5 V, 5 mA	
Contact resistance		≤ 100 mΩ	
Max. operating frequency			
• at rated load		600 cycles/hour	

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_n	
Rated power consumption	AC	≤ 4,5 VA AC: 50 Hz	
	DC	≤ 1,5 W	
Range of supply frequency	AC	48...63 Hz	
Control contact S ❷			
• control voltage		rated supply voltage U_n (between terminals S and A2)	
• min. voltage ❸		0,7 U_n	
• min. time of pulse duration ❸		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	
Overvoltage category		II	
Insulation pollution degree		1	
Flammability degree		V-0 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	≥ 0,5 x 10^5	10 A, 250 V AC
Mechanical life (cycles)		≥ 3 x 10^7	
Dimensions (L x W x H) / Weight		90 ❹ x 17,5 x 63,5 mm / 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 / vibration resistance		15 g / 0,35 mm 10...55 Hz	

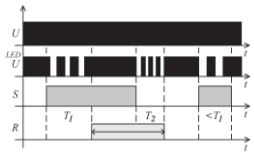
Time module data

Functions ❶		ER, EWa, EWs, EWu + NWu, Ii + Ip, WsWa, Wt
Time ranges		1 s ❺; 10 s; 1 min.; 10 min.; 1 h; 10 h; 100 h
Timing adjustment		smooth - (0,1...1) x time range
Setting accuracy		± 5% ❻ ❺
Repeatability		± 0,5% ❺
Values affecting the timing adjustment	• temperature	± 0,05% / °C
	• humidity	± 0,05% / %HR
Recovery time		≤ 50 ms
LED indicator		green LED U ON - indication of supply voltage U green LED U slow flashing - measurement of T1 time green LED U fast flashing - measurement of T2 time yellow LED R ON/OFF - output relay status

❶ Codes of versions - see "**Ordering codes**", page 215 and descriptions of time functions, page 214. ❷ Control contact S is activated by connecting it to A1 terminal. ❸ Where the control signal is recognizable. ❹ Length with 35 mm rail taps: 98,8 mm. ❺ 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). ❻ Calculated from the final range values, for the setting direction from minimum to maximum.

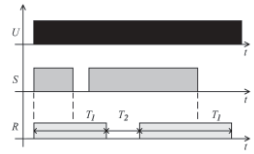
Time functions ❶

ER - ON and OFF delay with control contact S
Relay code: **MT-TER-17S-11-9240**



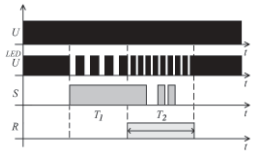
The T1 time lapses from the moment of S activation, and the relay is switched on. After the S signal has been removed, the relay switches off after the T2 time. Should the S contact be activated within the T2 time, the T2 time is reset, and the relay contacts remain on. If S is activated for a time shorter than T1, the unit shall not switch on the relay.

EWa - OFF delay and pause trailing edge with control contact S
Relay code: **MT-TEA-17S-11-9240**



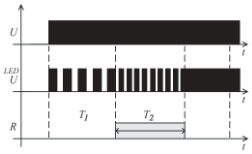
Once the S signal has been activated, the relay is switched on. When the trailing edge occurs, the T1 time starts to be measured. After the T1 time has lapsed, the relay is switched off for the T2 time. The relay may be switched on again after the T2 has lapsed when high state appears on the control input S. In course of measuring the T1 and T2 times, the S contact status is irrelevant.

EWs - ON delay and single shot leading edge with control contact S
Relay code: **MT-TES-17S-11-9240**

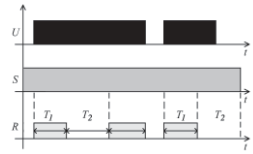


When the S contact has been activated (rising edge), the T1 time is being measured. In course of measuring the T1 and T2 times, the S contact status is irrelevant. After the T1 time, the operating relay switches to the T2 time. After the T2 has lapsed, the operating relay switches off and the unit returns to the initial position awaiting another rising edge on S.

EWu + NWu - ON delay and single shot leading edge voltage controlled or single shot and pause leading edge voltage controlled
Relay code: **MT-TEU-17S-11-9240**



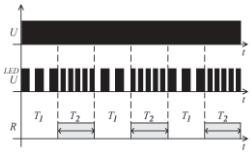
The time relay providing independent regulation of the T1 and T2 times. With supply switched on, the status of the S contact is checked. If the contact is not active, the EWu function is commenced where the operating relay is switched on for the time T2 after the set T1 time has lapsed.



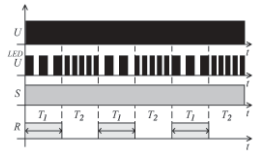
If the S contact is active with the supply on, the operation starts in the NWu function. The operating relay is switched on for the T1 time and then the relay is switched off for the T2 time. After the T2 time, the operating relay is switched on permanently.

A change of the S contact status from 0 to 1 at any time resets the relay and starts the NWu function. A change from 1 to 0 starts a new EWu cycle.

Ii + Ip - Asymmetric flasher pulse or pause first
Relay code: **MT-TIP-17S-11-9240**



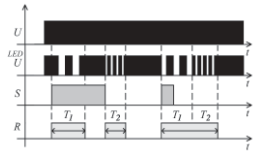
The Ii + Ip time relay operates cyclically (on-off) with independent regulation of the T1 and T2 times. If the S contact is not active with the supply on, the operation shall start from a pause T1 and then the contact shall make T2 - Ip function.



In case the S contact is active with the supply on, the operation shall start with closed R contact on time T1, then R contact opens on time T2 - Ii function.

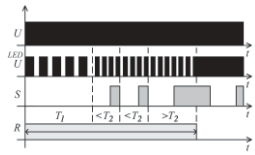
A change of the S contact status from 0 to 1 at any time resets the unit and starts the Ii function. A change from 1 to 0 starts a new Ip cycle.

WsWa - Single shot leading edge and single shot trailing edge with control contact S
Relay code: **MT-TSA-17S-11-9240**



A rising edge on the S contact triggers measurement of the T1 time, and the operating relay is switched on. After T1 the relay switches off. The relay shall be switched on again fro the T2 period after trailing edge on S. If after the T1 time the S status is on a low level, the relay shall be switched on for the T2 time. If after the T2 time the S status is on a high level, the relay shall be switched on for the T1 time.

Wt - Pulse detection
Relay code: **MT-TWT-17S-11-9240**



With the supply on, the operating relay is switched on, and the T1 time is being measured. When the T1 time has been measured, the T2 time measurement starts. For the operating relay to remain on, a rising and trailing edge must occur on the S contact within the T2 time, i.e. a single pulse which starts the T2 time measurement again. At the absence of the pulse, the relay will switch off after the T2 time has lapsed, and the relay may be switched on after the supply has been switched off and on again.

U - supply voltage; **R** - output state of the relay; **S** - control contact state; **T1**, **T2** - measured times
❶ Codes of versions - see "**Ordering codes**", page 215 and descriptions of time functions, page 214.

Additional functions

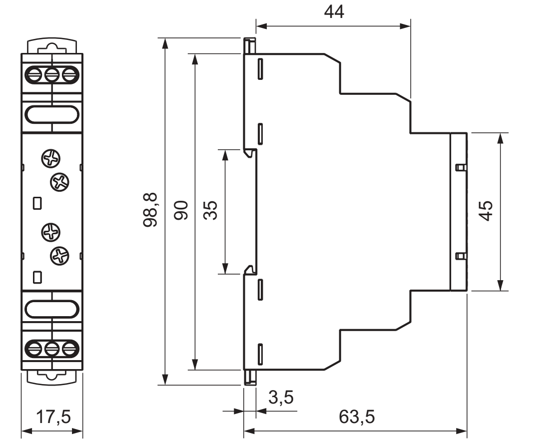
Supply diode: it is lit permanently when the time is not being measured. In course of the T1 time measurement, it flashes at 500 ms period where it is lit for 80% of the time, and off for 20% of the time. For the T2 time, the period is 250 ms.

Adjustment of the set values: the values of time and range are read in the course of the relay's operation. The set values may be modified at any moment.

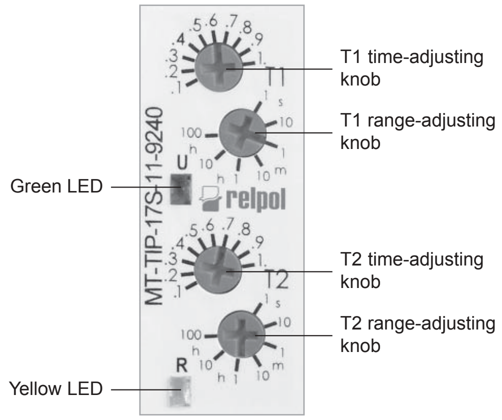
Release:
- for the versions MT-TEU-..., MT-TIP-...: the relay is released with the supply voltage,
- for other versions: the relay is released by connection of the S contact to the A1 line. For DC supply, the positive pole must be connected to the A1 line. The level of the S contact activation is adjusted 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 50 ms, the relay shall be reset. Owing to this, the regeneration time is programmed to 50 ms, and it does not depend on the tolerance of the elements.

Dimensions

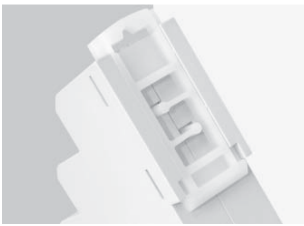


Front panel description



Mounting

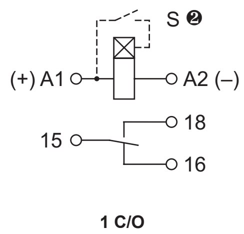
Relays **MT-T..-...** ❶ are designed for direct mounting on 35 mm rail mount acc. to PN-EN 60715. Operational position - any. Maximum size of wires 1 x 2,5 mm^2 (1 x 14 AWG). Rated cross-sectional area of conductors 2 x 1,5 mm^2 (2 x 16 AWG). Maximum screw torque: 0,6 Nm.



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

❶ Codes of versions - see "**Ordering codes**", page 215 and descriptions of time functions, page 214.

Connection diagram



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

Ordering codes

Type | Time functions performed | Cover | Number and type of contacts | Rated supply voltage

M T – T ☐☐ – ☐☐☐ – ☐☐ – ☐☐☐☐

Time functions performed (7 versions of relays) ❶

- **ER** - relay performing a function ER
- **EA** - relay performing a function EWa
- **ES** - relay performing a function EWs
- **EU** - relay performing a function EWu + NWu
- **IP** - relay performing a function Ii + Ip
- **SA** - relay performing a function WsWa
- **WT** - relay performing a function Wt

Cover

17S - installation module, width 17,5 mm

Number and type of contacts

11 - 1 C/O

Rated supply voltage

9240 - 12...240 V AC/DC AC: 50/60 Hz

Example of ordering code:

MT-TIP-17S-11-9240 time relay **MT-TIP-...**, single-function (relay perform function Ii + Ip), 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