

Time relays range

Ordering data



- Control input with voltage-related triggering
- No triggering

Description

The time relays are designed in a modular 17.5 mm housing making it well suited for building applications. The devices offer four or seven time ranges from 0.05 seconds up to 100 hours.

Ordering details

Timing function	Rated control supply voltage	Time ranges	Control input	Output	Type	Order code
Multi ¹⁾	24-240 V AC 24-48 V DC	7 (0.05 s - 100 h)	■	1 c/o	T-MFE	4TQB119011R0000
ON-delay			-		T-ONE	4TQB119010R0000
Star-delta change-over		4 (0.05 s - 10 min)	-	2 n/o	T-SDE ²⁾	4TQB119012R0000

¹⁾ Functions: ON-delay, OFF-delay with auxiliary voltage, Impulse-ON, Impulse-OFF with auxiliary voltage, Flasher starting with ON, Flasher starting with OFF, Pulse former

²⁾ Transition time 50 ms fixed

Application examples

Elevators, escalators, gates, compressors and doors - here too timers ensure optimum and time-delayed opening as required. A typical application for timers is delayed switching. Switching several rows of lamps on and off in corridors, stairwells, staircases, etc, is a widespread application in which the excellent functionality of the timers is undisputed.

Air conditioning systems, heaters and fans can be found everywhere in buildings - just like the timers long used to switch them. On-delay, off-delay and a range of other functions cover all requirements.

Time relays range

Technical data



Data at $T_a = 25\text{ °C}$ and rated values, unless otherwise indicated

		T-MFE, T-ONE	T-SDE
Input circuit - Supply circuit			
Rated control supply voltage U_s		24-240 V AC / 24-48 V DC	
Rated control supply voltage U_s tolerance		-15...+10 %	
Rated frequency		DC or 50/60 Hz	
Frequency range AC		47-63 Hz	
Typical power consumption		max. 3.5 VA	
Power failure buffering time		min. 20 ms	
Release voltage		> 10 % of the minimum rated control supply voltage U_s	
Input circuit - Control circuit			
Control input, control function	A1-Y1/B1	start timing external	
Kind of triggering		voltage-related triggering	
Resistance to reverse polarity		yes	
Parallel load / polarized		yes / yes	
Maximum cable length to the control inputs		50 m - 100 pF/m	
Minimum control pulse length		20 ms	
Control voltage potential		see rated control supply voltage	
Timing circuit			
Time ranges	7 time ranges 0.05 s - 100 h	1.) 0.05-1 s 2.) 0.5-10 s 3.) 5-100 s 4.) 0.5-10 min 5.) 5-100 min 6.) 0.5-10 h 7.) 5-100 h	
	4 time ranges 0.05 s - 10 min (T-SDE)	1.) 0.05-1 s 2.) 0.5-10 s 3.) 5-100 s 4.) 0.5-10 min	
Recovery time		< 50 ms	
Accuracy within the rated control supply voltage tolerance		$\Delta t < 0.005\%$ / V	
Accuracy within the temperature range		$\Delta t < 0.06\%$ / °C	
Repeat accuracy (constant parameters)		$\Delta t < \pm 0.5\%$	
Setting accuracy of time delay		$\pm 10\%$ of full-scale value	
Star-delta transition time	T-SDE	fixed 50 ms	
Star-delta transition time tolerance	T-SDE	± 3 ms	
Indication of operational states			
Control supply voltage / timing	U: green LED	: control supply voltage applied : timing	
Relay energized	R, R1, R2: yellow LED	: output relay energized	
Operating elements and controls			
Adjustment of the time range		front-face rotary switch, direct reading scales	
Fine adjustment of the time value		front-face potentiometer	
Preselection of the timing function at multifunction devices		front-face rotary switch, direct reading scales	

¹⁾ Prior to first commissioning and after a six month stop of operation.

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		T-MFE, T-ONE	T-SDE
Output circuit			
Kind of output	15-16/18	Relay, 1 c/o contact	-
	17-18; 17-28		Relay, 2 n/o contacts
Contact material		AgNi alloy, Cd free	
Rated operational voltage U_e		250 V	
Minimum switching voltage / minimum switching current		12 V / 100 mA	
Maximum switching voltage / maximum switching current		See load limit curves	
Rated operational current I_e	AC-12 (resistive) at 230 V	4 A	4 A
	AC-15 (inductive) at 230 V	3 A	3 A
	DC-12 (resistive) at 24 V	4 A	4 A
	DC-13 (inductive) at 24 V	2 A	2 A
AC rating (UL 508)	utilization category (Control Circuit Rating Code)	B 300	
	max. rated operational voltage	300 V AC	
	maximum continuous thermal current at B300	5 A	
	maximum continuous thermal current at C300	-	
	max. making/breaking apparent power at B300	3600 VA / 360 VA	
	max. making/breaking apparent power at C300	-	
AC rating (UL 60947-5-1) (CT-MKC)	utilization category		
	max. rated operational voltage		
	max. continuous thermal current		
Mechanical lifetime		30 x 10 ⁶ switching cycles	
Electrical lifetime		0.1 x 10 ⁶ switching cycles	
Max. fuse rating to achieve short-circuit protection	n/c contact	6 A fast-acting	
	n/o contact	10 A fast-acting	
General data			
Mean time between failures (MTBF)		on request	
Duty cycle		100%	
Dimensions		see 'Dimensional drawings'	
Mounting		DIN rail (IEC/EN 60715), snap-mounting without any tool	
Mounting position		any	
Minimum distance to other units	horizontal / vertical	no / no	
Material of housing		UL 94 V-2	
Degree of protection	housing / terminals	IP50 / IP20	
Electrical connection			
Connecting capacity	fine-stranded with(out) wire and ferrule	2 x 0.5-1.5 mm ² (2 x 20-16 AWG)	
		1 x 0.5-2.5 mm ² (1 x 20-14 AWG)	
	rigid	2 x 0.5-1.5 mm ² (2 x 20-16 AWG)	
		1 x 0.5-4 mm ² (1 x 20-12 AWG)	
Stripping length		7 mm (0.28 in)	
Tightening torque		0.5-0.8 Nm (4.43-7.08 lb.in)	
Environmental data			
Ambient temperature range	operation / storage	-20 ... +60 °C / -40 ... +85 °C	
Climatic class	EC/EN 60068-2-30	3K3	
Relative humidity range		25-85%	
Vibration, sinusoidal	IEC/EN 60068-2-6	20 m/s ² ; 10 cycles, 10...150...10 Hz	
Shock (half-sine)	IEC/EN 60068-2-27	150 m/s ² , 11 ms	

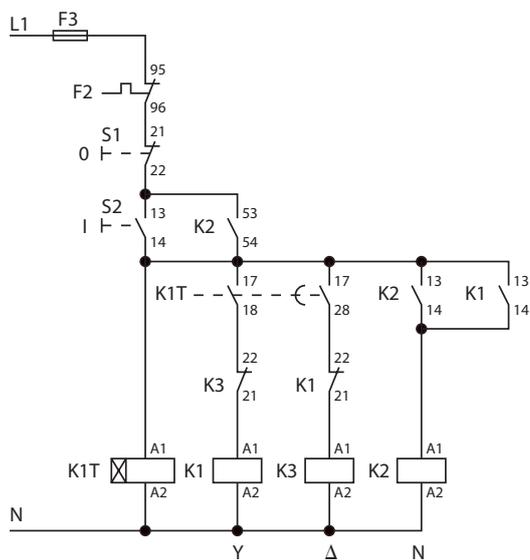
Time relays range

Technical data

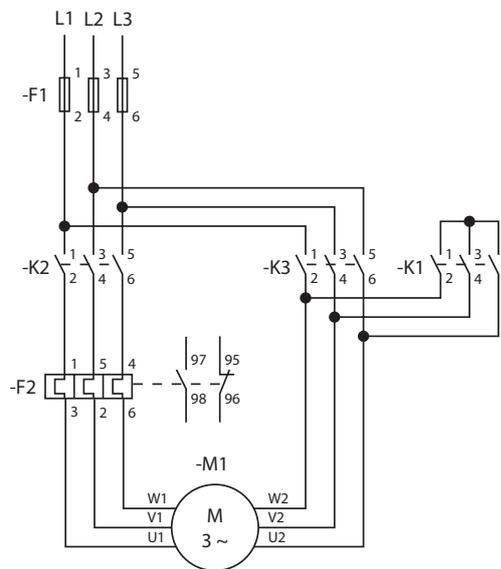


		T-MFE, T-ONE	T-SDE
Isolation data			
Rated insulation voltage U_i	input circuit / output circuit	300 V	
	output circuit 1 / output circuit 2	not available	300 V
Rated impulse withstand voltage U_{imp}	between all isolated circuits	4 kV; 1.2/50 μ s	
Power-frequency withstand voltage test (test voltage)	between all isolated circuits	2.5 kV; 50 Hz; 60 s	
Basic insulation (IEC/EN 61140)	input circuit / output circuit	300 V	
Protective separation (IEC/EN 61140, EN 50178)	input circuit / output circuit	250 V	
Pollution degree		3	
Overvoltage category		III	
Standards / Directives			
Standards		IEC/EN 61812-1	
Low Voltage Directive		2014/35/EU	
EMC Directive		2014/30/EU	
RoHS Directive		2011/65/EU incl. 2015/863/EU	
Electromagnetic compatibility			
Interference immunity to		IEC/EN 61000-6-2	
electrostatic discharge	IEC/EN 61000-4-2	level 3 (6 kV / 8 kV)	
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	level 3 (10 V / m)	
electrical fast transient / burst	IEC/EN 61000-4-4	level 3 (2 kV / 5 kHz)	
surge	IEC/EN 61000-4-5	level 4 (2 kV L-L)	
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	level 3 (10 V)	
Interference emission			
high-frequency radiated	IEC/CISPR 22, EN 55022	class B	
high-frequency conducted	IEC/CISPR 22, EN 55022	class B	

Example of application - Star-delta changeover



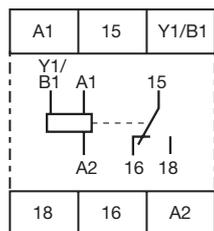
Control circuit diagram



Power circuit diagram

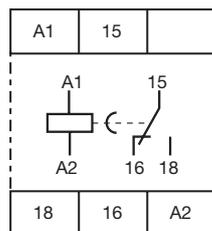
Connection diagrams

T-MFE



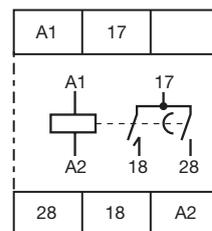
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

T-ONE



A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact

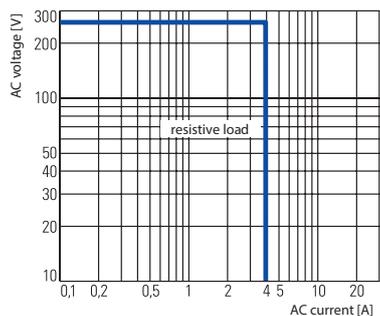
T-SDE



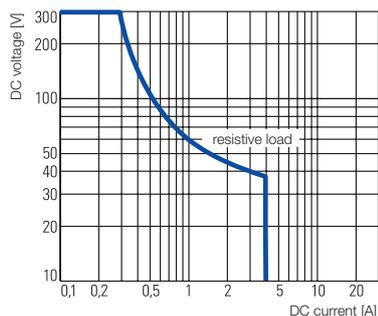
A1-A2	Supply: 24-48 V DC or 24-240 V AC
17-18	1st n/o contact (star contactor)
17-28	2nd n/o contact (delta contactor)

Load limit curves

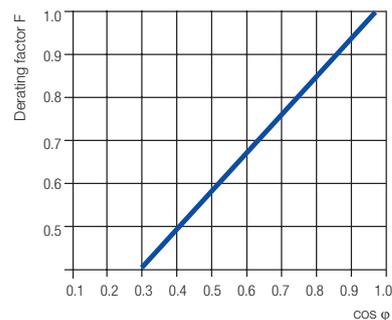
AC load (resistive)



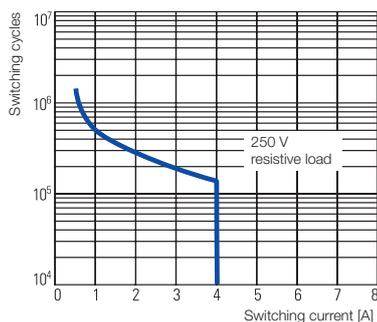
DC load (resistive)



Derating factor F for inductive AC load

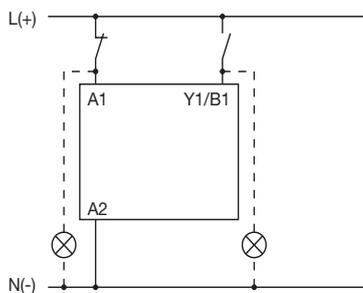


Contact lifetime

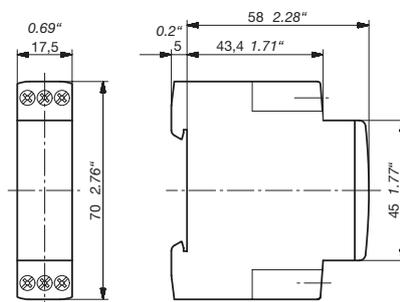


Wiring notes for devices with control input

A parallel load to the control input is possible



Dimensional drawings in mm and inches



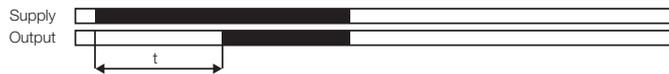
Devices with 1 c/o contact or 2 n/o contacts

Time relays range

Technical diagrams

On delay functions (Delay on make) ☒

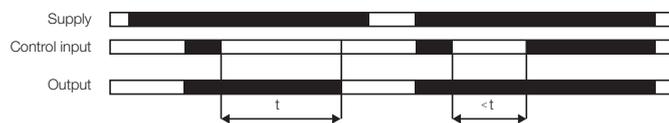
On-delay



This function requires a continuous control supply voltage for timing. Timing begins when a control supply voltage is applied. When the selected time delay is complete, the output relay energizes. If the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

OFF delay functions (Delay on break) ■

OFF-delay with auxiliary voltage



This function requires a continuous control supply voltage for timing. If the control input is closed, the output relay energizes immediately. If the control input is opened, the time delay starts. When the selected time delay is complete, the output relay de-energizes. If control input re-closes before the time delay is complete, the time delay is reset and the output relay does not change state. Timing starts again when the control input re-opens. If the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Impulse-ON functions 1 □ ☒

Impulse-ON (interval)



This function requires a continuous control supply voltage for timing. The output relay energizes immediately when the control supply voltage is applied and de-energizes after the set pulse time is complete. If the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Impulse-OFF functions 1 □ ■

Impulse-OFF with auxiliary voltage



This function requires a continuous control supply voltage for timing. The output relay energizes immediately when the control input is de-energized and the output de-energizes after the set pulse time is complete. If the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Flasher starting with ON functions □ ☒

Flasher starting with ON



Applying a control supply voltage starts timing with symmetrical ON & OFF times. The cycle starts with an ON time first. If the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Time relays range

Technical diagrams

Flasher starting with OFF functions $\square \blacksquare$

Flasher starting with OFF



Applying a control supply voltage starts timing with symmetrical ON & OFF times. The cycle starts with an OFF time first. If the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

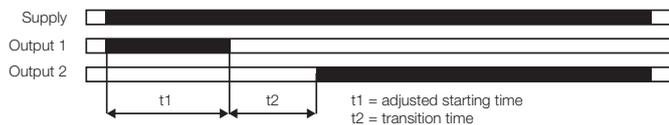
Pulse former $\square \square$

Puls former (single shot)



This function requires a continuous control supply voltage for timing. Closing the control input energizes the output relay immediately and starts timing. Operating the control input during the time delay has no effect. When the selected ON time is complete, the output relay de-energizes. After the ON time is complete, it can be restarted by closing the control input. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Star-Delta changeover $\triangle \triangle 1 \square$



This function requires a continuous control supply voltage for timing. Applying a control supply voltage, energizes the star contactor connected to output 1 and begins the set starting time t_1 . When the starting time is complete, the first output contact de-energizes the star contactor. When the transition time t_2 is complete, the second output contact energizes the delta contactor. The delta contactor remains energized as long as the control supply voltage is applied. t_2 is fixed to 50 ms or in some variants adjustable.