Modular Time Relays, type TR
IEC 61812-1, IEC 61000-6-2 & EN 50178

Product Guide

- Variable ac/dc control voltage
- High accurracy
- 18 mm module width

Adjustable, multifunctional and compact Time Relay solutions

Modular time relays, type TR

Eaton time relays including all time delay functions

Eaton's type TR range of time relays comprises 3 models offering 9 different functions to meet the varied time control needs required for controlling such applications as fans, pumps and lighting.

By having a flexible supply and control voltage input the time relays can be easily applied without the need of additional power supplies. The status of supply voltage, time sequence and output relay is visible on the front by LED indicators.
All rotary adjustment buttons are located on the front. The recessed position of the buttons prevents from unintentional adjustment.

All models are of a compact design, 18 mm wide. Staggered terminals allow easy access to the lower level terminals even if upper terminals are wired.

Technical characteristics

- Designed in accordance with IEC 61812-1, IEC 61000-6-2 & EN 50178.
- Time adjustment from 50 milliseconds up to 100 hours.
- Outgoing change-over contact rated 8 Amps / 250 V.
- Flexible voltage supply & control input
- 12 V - 240 $V_{ac/dc}$ for TRL07 & TRLPG
- 24 V - 240 $_{Vac/dc}$ for TRL04.

Advantages of Eaton time relays

- 3 models offering 9 different functions.
- Staggered terminals allow easy access.
- LED status indicators on front.
- High level of accuracy.
- Variable supply & control voltage offers flexible applications.
- Overvoltage protection class III available on all types.
- Compact 18 mm wide modular design for all functions.
- Recessed adjustment buttons avoid unintentional adjustment.

See page 4 for the explanation of functions of Eaton time relays, type TR.
See page 6 for the dimensional drawings of Eaton time relays, type TR.
See page 6 for the connection schemes for Eaton time relays, type TR.
See page 7 for the technical details of Eaton time telays, type TR.

Reference of available functions by type

For further details about the different functionalities of time relays, are explained in chapter 2. Here you find a detailed description of the individual functionalities, supported by pictograms.

Type	TRL04	TRL07	TRLPG
Function			
ON Delay (voltage controlled)	X	X	
OFF Delay (with control input)	X	X	
Single shot leading edge (with control input)		X	
Single shot trailing edge (with control input)		X	
ON Delay (with control input)		X	
Single shot leading edge (voltage controlled)	X	X	
Symmetric pulse generator (pause first)	X	X	
Asymmetric pulse generator (pause first)			X
Asymmetric pulse generator (pulse first)			X

TRL04

Time relays, multifunctional type, with 4 functions

Available functions are:
E = ON Delay (voltage controlled)
R = OFF Delay (with control input)
Wu = Single shot leading edge (voltage controlled)
Bp = Symmetric pulse generator (pause first)

Description	Available functions	Nominal current	Contact configuration	Supply & control voltage input	Width	QPC	Eaton list number
Time relay, multifunctional - with 4 functions	E, R, Wu, Bp	8 A	1 co	24…240 Vac/dc	18 mm	1	**TRL04**

TRL07

Time relays, multifunctional type, with 7 functions

Available functions are:
E = ON Delay (voltage controlled)
R = OFF Delay (with control input)
Ws = Single shot leading edge (with control input)
Wa = Single shot trailing edge (with control input)
Es = ON Delay (with control input)
Wu = Single shot leading edge (voltage controlled)
Bp = Symmetric pulse generator (pause first)

Description	Available functions	Nominal current	Contact configuration	Supply & control voltage input	Width	QPC	Eaton list number
Time relay, multifunctional - with 7 functions	E, R, Ws, Wa, Es, Wu, Bp	8 A	1 co	12…240 Vac/dc	18 mm	1	**TRL07**

TRLPG

Time relays, asymmetric pulse generator, with 2 functions

Available functions are:
Ip = Asymmetric pulse generator (pause first)
Ii = Asymmetric pulse generator (pulse first)

Description	Available functions	Nominal current	Contact configuration	Supply & control voltage input	Width	QPC	Eaton list number
Time relay, asymmetric pulse generator	Ip, Ii	8 A	1 co	12…240 Vac/dc	18 mm	1	**TRLPG**

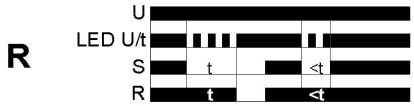
Modular time relays, technical details

Time relays, reference of available functions by type.

ON Delay - voltage controlled (E)

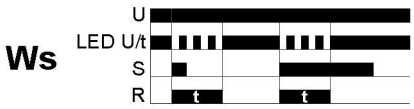
When the supply voltage U is applied, the set interval t begins (green LED U/t flashes). After the interval t has expired (green LED U/t illuminated) the output relay R switches into on-position (yellow LED illuminated). This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the expiry of the interval t, the interval already expired is erased and is restarted when the supply voltage is next applied.

OFF Delay - with control input (R)



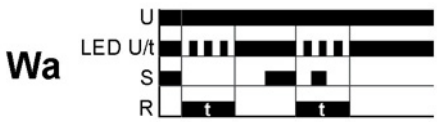
The supply voltage U must be constantly applied to the device (green LED U/t illuminated). When the control contact S is closed, the output relay R switches into on-position (yellow LED illuminated). If the control contact is opened, the set interval t begins (green LED flashes). After the interval t has expired (green LED U/t illuminated) the output relay switches into off-position (yellow LED not illuminated). If the control contact is closed again before the interval t has expired, the interval already expired is erased and is restarted.

Single shot leading edge - with control input (Ws)



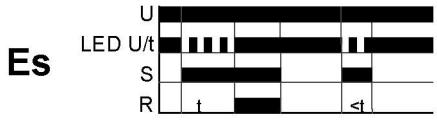
The supply voltage U must be constantly applied to the device (green LED U/t illuminated). When the control contact S is closed, the output relay R switches into on-position (green LED U/t illuminated) and the set interval t begins (green LED U/t flashes). After the interval t has expired (green LED U/t illuminated) the output relay switches into off-position (yellow LED not illuminated). During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

Single shot trailing edge - with control input (Wa)



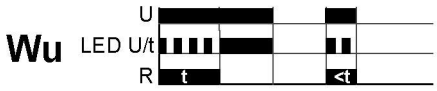
The supply voltage U must be constantly applied to the device (green LED U/t illuminated). Closing the control contact S has no influence on the condition of the output R. When the control contact is opened, the output relay switches into on-position (yellow LED illuminated) and the set interval t begins (green LED U/t flashes). After the interval t has expired (green LED U/t illuminated), the ouput relay switches into off-position (yellow LED not illuminated). During the interval, the control contact can be operated any number of times. A further cycle can only be started when the cycle run has been completed.

ON Delay - with control input (Es)



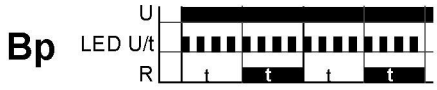
The supply voltage U must be constantly applied to the device (green LED U/t illuminated). When the control contact S is closed, the set interval t begins (green LED U/t flashes). After the interval t has expired (green LED U/t illuminated) the output relay R switches into on-position (yellow LED illuminated). This status remains until the control contact is opened again. If the control contact is opened before the interval t has expired, the interval already expired is erased and is restarted with the next cycle.

Single shot leading edge - voltage controlled (Wu)



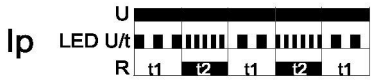
When the supply voltage U is applied, the output relay R switches into on-position (yellow LED illuminated) and the set interval t begins (green LED U/t flashes). After the interval t has expired (green LED U/t illuminated) the output relay switches into off-position (yellow LED not illuminated). This status remains until the supply voltage is interrupted. If the supply voltage is interrupted before the interval t has expired, the output relay switches into off-position. The interval already is erased and is restarted when the supply voltage is next applied.

Symmetric pulse generator - pause first (Bp)



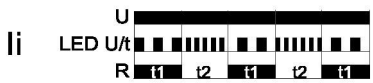
When the supply voltage U is applied, the set interval t begins (green LED U/t flashes). After the interval t has expired, the output relay R switches into on-position (yellow LED illuminated) and the set interval t begins again. After the interval t has expired, the output relay switches into off-position (yellow LED not illuminated). The output relay is triggered at a ratio of 1:1 until the supply voltage is interrupted.

Asymmetric pulse generator - pause first (Ip)



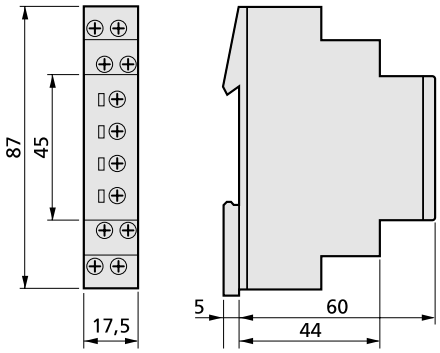
When the supply voltage U is applied, the set interval t1 begins (green LED U/t flashes slowly). After the interval t1 has expired, the output relay R switches into on-position (yellow LED illuminated) and the set interval t2 begins (green LED U/t flashes fast). After the interval t2 has expired, the output relay switches into off-position (yellow LED not illumminated). The output relay is triggered at the ratio of t1:t2 until the supply voltage is interrupted.

Asymmetric pulse generator - pulse first (Ii)



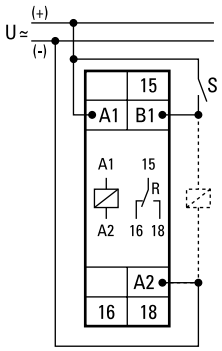
When the supply voltage U is applied, the output relay R switches into on-position (yellow LED illuminated) and the set interval t1 begins (green LED U/t flashes slowly). After the interval t1 has expired, the output relay switches into off-position (yellow LED not illuminated) and the set interval t2 begins (green LED U/t flashes fast). After the interval t2 has expired, the output relay switches into on-position (yellow LED illuminated). The output relay is triggered at the ratio of t1:t2 until the supply voltage is interrupted.

Time relays, dimensional drawings, type TR

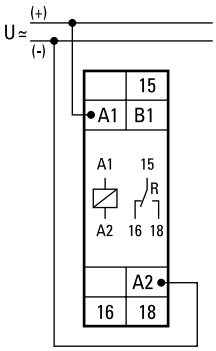


Time relays, type TR

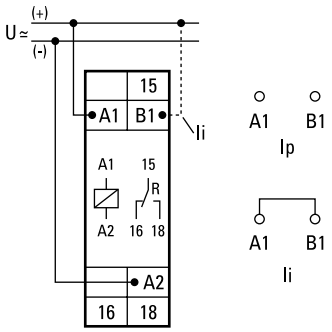
Time relays, connection schemes, type TR



TRL04/TRL07 with control input.



TRL04/TRL07 without control input.



TRLPG.

Products		Time relays, type TR		
		TRL04	TRL07	TRLPG
General				
Main Standards		IEC 61812-1, IEC 61000-6-2, EN 50178		
Additional standards		IEC 61000-6-3, IEC 61000-4-2, IEC 61000-4-4, IEC 61000-4-6		
Protection class open air		IP20	IP20	IP20
Protection class enclosed (accessible front)		IP40	IP40	IP40
Permissible ambient temperature (acc. IEC 68-1)		-25…+55 °C	-25…+55 °C	-25…+55 °C
Storage temperature		-25…+70 °C	-25…+70 °C	-25…+70 °C
Relative humidity (acc. IEC 721-3-3 class 3K3)		15% to 85%	15% to 85%	15% tot85%
Pollution degree (acc. IEC 664-1)		Class 2, if built-in class 3	Class 2, if built-in class 3	Class 2, if built-in class 3
Vibration resistance (acc. IEC 68-2-6)		10 to 55 Hz / 0,35 mm	10 to 55 Hz / 0,35 mm	10 to 55 Hz / 0,35 mm
Shock resistance (acc. IEC 68-2-27)		15 g 11 ms	15 g 11 ms	15 g 11 ms
Mounting position		any	any	any
Incoming supply circuit				
Supply voltage		24 - 240 $V_{ac/dc}$	12 - 240 $V_{ac/dc}$	12 - 240 $V_{ac/dc}$
Supply voltage tolerance		24 V -/- 15%...- 240 V + 10%	12 V -/- 10%.....- 240 V + 10%	12 V -/- 10%.....- 240 V +10%
Incoming supply terminals		A1(+) - A2	A1(+) - A2	A1(+) - A2
Rated power consumption		4 VA (1,5W)	4 VA (1,5W)	4 VA (1,5W)
Rated frequency for ac voltage		48 to 63 Hz	48 to 63 Hz	48 to 63 Hz
Duty cycle		100%	100%	100%
Reset time		100 ms	100 ms	100 ms
Residual ripple to DC		10%	10%	10%
Drop off voltage		> 30% of nominal voltage	> 30% of nominal voltage	> 30% of nominal voltage
Rated impulse withstand voltage	U_{imp}	4 kV	4 kV	4 kV
Overvoltage category (acc. IEC 60664-1)		III	III	III
Incoming control circuit				
Control supply terminals		A1-B1	A1-B1	A1-B1
Loadable		yes	yes	yes
Maximum cable length		10 mtr.	10 mtr.	10 mtr.
Trigger level (sensitivity)		Automatic adaptation to supply voltage	Automatic adaptation to supply voltage	Automatic adaptation to supply voltage
Minimum duration control pulse length at ac		100 ms	100 ms	-
Minimum duration control pulse length at dc		50 ms	50 ms	-

Products		Time relays, type TR		
		TRL04	TRL07	TRLPG
Outgoing circuit				
Outgoing potential free contact		1 x co	1 x co	1 x co
Rated voltage		250 V_{ac}	250 V_{ac}	250 V_{ac}
Switching capacity ac *)		2000 VA (8 A / 250 V)	2000 VA (8 A / 250 V)	2000 VA (8 A / 250 V)
Switching capacity dc *)		50 VA	50 VA	50 VA
Maximum lamp load: *)				
Incandescent lamp		500 VA	500 VA	500 VA
Energy saving lamp		50 VA	50 VA	50 VA
Fluorescent lamp single - Uncompensated (inductive)		120 VA	120 VA	120 VA
Fluorescent lamp single - Compensated (capacitive)		36 VA	36 VA	36 VA
Fluorescent lamp double - Series compensated		360 VA	360 VA	360 VA
Fluorescent lamp single/double - HF Electronic		120 VA	120 VA	120 VA
Mechanical endurance		20.000.000 x	20.000.000 x	20.000.000 x
Electrical endurance at 1000 VA cosphi = 1,0		200.000 x	200.000 x	200.000 x
Maximum switching frequency at 100 VA pf=1,0 (acc. IEC 947-5-1)		60x / min	60x / min	60x / min
Maximum switching frequency at 1000 VA pf=1,0 (acc. IEC 947-5-1)		6x / min	6x / min	6x / min
Maximum back-up fuse - fast acting		8 A fast	8 A fast	8 A fast
Rated impulse withstand voltage	U_{imp}	4 kV	4 kV	4 kV
Overvoltage category (acc. IEC 60664-1)		III	III	III
Accuracy				
Base accuracy		±1% of maximum scale value	±1% of maximum scale value	±1% vof maximum scale value
Adjusting accuracy		< 5% of maximum scale value	< 5% of maximum scale value	< 5% vof maximum scale value
Repetition accuracy		< 0,5% or ±5 ms	< 0,5% or ±5 ms	< 0,5% or ±5 ms
Voltage influence		-	-	-
Temperature influence		< 0,01% / °C	< 0,01% / °C	< 0,01% / °C
Dimensions & weight				
Width		18 mm	18 mm	18 mm
Height		87 mm	87 mm	87 mm
Depth (excl. DIN-profile)		60 mm	60 mm	60 mm
Weight		72 gram	72 gram	72 gram
Terminals for main & auxiliary contacts				
Terminal capacity		1 x 0,5....2,5 mm^2 with/without multicore cable end		
		1 x 4 mm^2 without multicore cable end		
		2 x 0,5....1,5 mm^2 without multicore cable end		
		2 x 2,5 mm^2 flexible with/without multicore cable end		
Terminal screw head type (Pozidrive)		PZ 1	PZ 1	PZ 1
Maximum torque		1,0 Nm	1,0 Nm	1,0 Nm

Note:
*) In case multipole circuits are installed in one panel it is required to multiply above mentioned (lamp)load by the applicable load factor according the IEC 60439-1.

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