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Panasonic Electric Works
TS2-I-24V-0S

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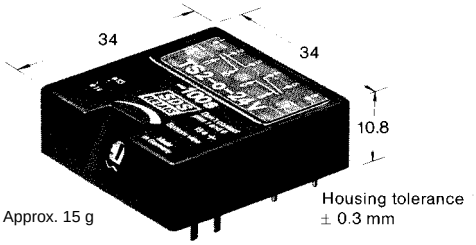
Discontinued

TS

Panasonic
ideas for life

NEW PCB TIME DELAY RELAY TIME-ON OR TIME-OFF DELAY OR PULSE RELAY

TS-RELAYS



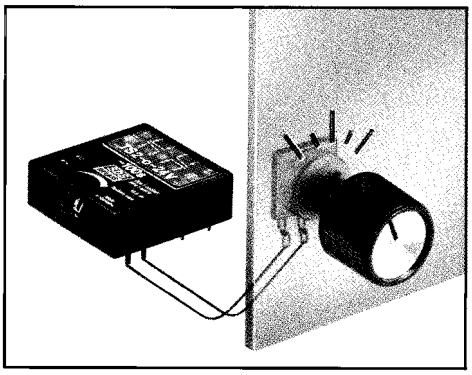
Approx. 15 g

Housing material: CRASTIN SK-615 FR Polycarbonate
Basic grid 2.54 mm
PCB hole dia. ∅ 1.3 mm ± 0.1 mm

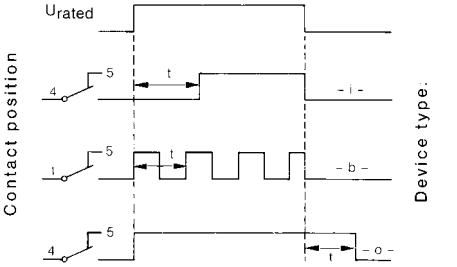
- **The elegant solution to time delay problems.**
- **High repeat accuracy and reliability.**
- **Not susceptible to external disturbance.**
- **Increase in timing delay by using an external capacitor with time-off delay device – o –.**
- **No auxiliary power supply required with time-off delay operation.**
- **No „first cycle effect“, with the time-on delay device. The first and following operations are of the same duration.**

Characteristics

			Remarks
Contact arrangement	(NO = normally open, NC = normally closed, CO = changeover)	2NO2NC (2CO)/3NO1NC (2NO1CO)/4NO	
Max. make/rated/break current	A	20 / 5 / 5	
Voltage switching range	V	10^{-5}-250	
Power switching range	W (VA)	10^{-10}-100 (1000)	
Contact material		AuAg10	See also the S relay data sheet
Volumetric/contact resistance	mΩΩ	30 / 10	
Operational life [1]			
5 A, 1000 VA / 5 A, 100 W	switching ops.	$6 \cdot 10^4 / 3 \cdot 10^5$	
4 A, 1000 VA / 0.1 A, 1 W	switching ops.	$10^5 / 2 \cdot 10^8$	
Voltage withstand: cont./cont.- control circuitry	V_{eff}	750 / 1500	
Insulation resistance: cont./cont.- control circuitry	ΩΩ	$10^{13} / 10^{10}$	
Shock-, vibration resistance	g, g/Hz	50, 20 / 1000	Independant of position
Life of trimmer		>100 operations	Typically 1000 ops.
Type of protection Potentiometer/Contacts		dust tight / IP50	
Storage temperature	°C	-20 / +85	
Permiss. ambient temp. at max. load	°C	-20 / +65	Consequently, time tol.: < 4% with -i- devices 25 % with -0- devices
Min. control pulse duration at rated voltage.	ms	100	



Operation



+ The trimmer is omitted on the -i/-o- 0 s device. This must be replaced by an external potentiometer. The time delay thus achievable is 20s per 100 kΩ ΩΩwith the -i- devices and approx 20s per 1 MΩΩwith the -o- devices. The minimum time delays are 1s (with -i-) and 0.3 s (with -o-).
* With the -o- 0 s device, the pulse frequency is 5 Hz. max., and is inversely proportional to R_{ext} (e.g. at 12 kΩ ΩThe pulse frequency is 1 Hz).
** Connect C_{ext} between pins 12 and 13!

Operating characteristics

Type: – i – "on" delay – b – pulse relay	Operating voltage V	Current consumpt. mA
TS2-/TS3-/TS4 – i / – b – 5 V	4.0 – 9.0	40
TS2-/TS3-/TS4 – i / – b – 12 V	8.5 – 18.0	20
TS2-/TS3-/TS4 – i / – b – 24 V	17.0 – 30.0	11

Rated time: „on“ delay „i“	0 s +)	10 s	100 s	800 s
Minimum timing range [s] typical at rated voltage	1-1000	0.3-10	1-100	8-800
Time tolerance at U_{rated} ± 10%	< 1%			
pulse relay „b“	pulse frequency	0.04 … 5 Hz*		

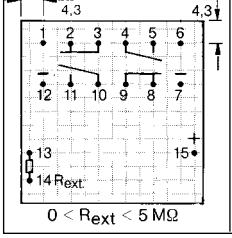
Type: – o – "off" delay	Operating voltage V	Current consumpt. mA
TS2-/TS3-/TS4 – o – 5 V	4.0 – 9.0	31
TS2-/TS3-/TS4 – o – 12 V	8.5 – 18.0	23
TS2-/TS3-/TS4 – o – 24 V	18.0 – 28.0	23

Rated time: „off“ delay „o“	0 s +)	10 s	100 s
Minimum timing range [s] typical at rated voltage	0.3-100	0.3-10	1-100
Time tolerance at U_{rated} ± 10%	–	approx 20%	
Time delay increase with C_{ext} per µF**	–	1.5 s	4.7 s

Connection diagrams (bottom view) Warning! No reverse battery protection

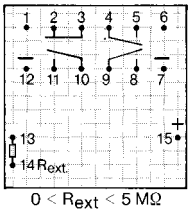
Warning! pins 1 and 6 may not be connected.
Pins 7 and 12 are negative and connected internally

TS2–i, –o– or –b – 5, 12, 24 V – 0 s



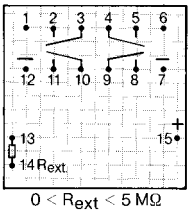
0 < R_{ext} < 5 MΩ

TS3–i, –o– or –b – 5, 12, 24 V – 0 s



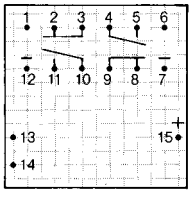
0 < R_{ext} < 5 MΩ

TS4–i, –o– or –b – 5, 12, 24 V – 0 s

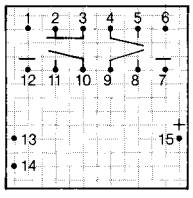


0 < R_{ext} < 5 MΩ

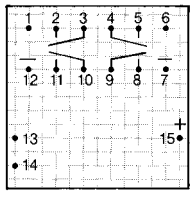
TS2–i, –o– or –b – 5, 12, 24 V – 10 s or – 100 s – i – 800 s, – b – 25 s



TS3–i, –o– or –b – 5, 12, 24 V – 10 s or – 100 s – i – 800 s, – b – 25 s



TS4–i, –o– or –b – 5, 12, 24 V – 10 s or – 100 s – i – 800 s, – b – 25 s



Ordering example

TS 2 – i – 24 V – 10 s

Type
i = time-„on“ o = time-„off“ delay
b = pulse relay
Rated voltage
Rated time

Note:
Excitation voltage ripple should be maintained below 5% by use of appropriate smoothing.
Strong external magnetic fields influence relay data.
[1] Data concerning operational life is based on resistive loads and ambient temperature of 20-30°C.

TR-W Wiping function on request

With surge voltages (1.2/50µsec) over DC 500V TS-i. b. w relays may not operate as intended.