

MULTITIMER Multifunction Relay SN 7920



0276442



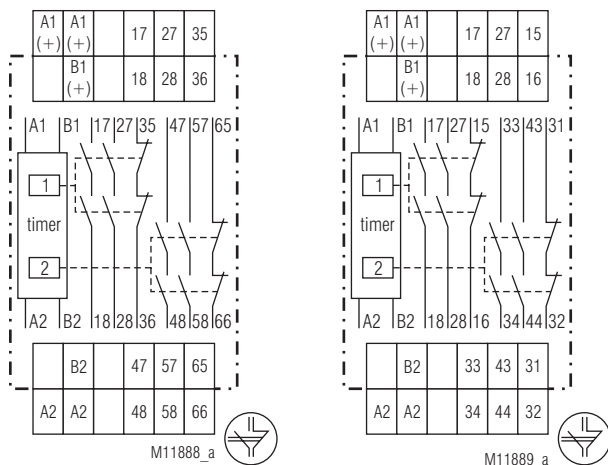
Your Advantages

- Higher flexibility (8 function in one unit)
- To switch high DC-loads with mechanical forcibly guided contacts according to IEC 61810-3

Features

- According to IEC/EN 61 812-1, DIN EN 50155
- 8 functions settable via rotational switch:
 - Delay on energisation (AV)
 - Fleeting on make (EW)
 - Delay pulse (IE)
 - Flasher, start with pulse (BI)
 - Delay on de-energisation (RV)
 - Pulse forming function (IF)
 - Fleeting on break (AW)
 - Delay on energisation and de-energisation (AV / RV)
- 8 time ranges from 0.05 s ... 300 h selectable via rotational switches
- Voltage range AC/DC 24 ... 230 V
- High DC switching capacity
- With time interruption / time adding input
- Adjustment aid for quick setting of long time values
- Contacts:
 - 1 NC + 2 NO delayed
 - 1 NC + 2 NO delayed or instantaneous
- LED indicators for operation, contact position and time delay
- DIN rail or screw mounting
- 52.5 mm width

Circuit Diagrams



SN 7920.54

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Approvals and Markings



Applications

Time dependent controls for industrial and railway applications.

Connection Terminals

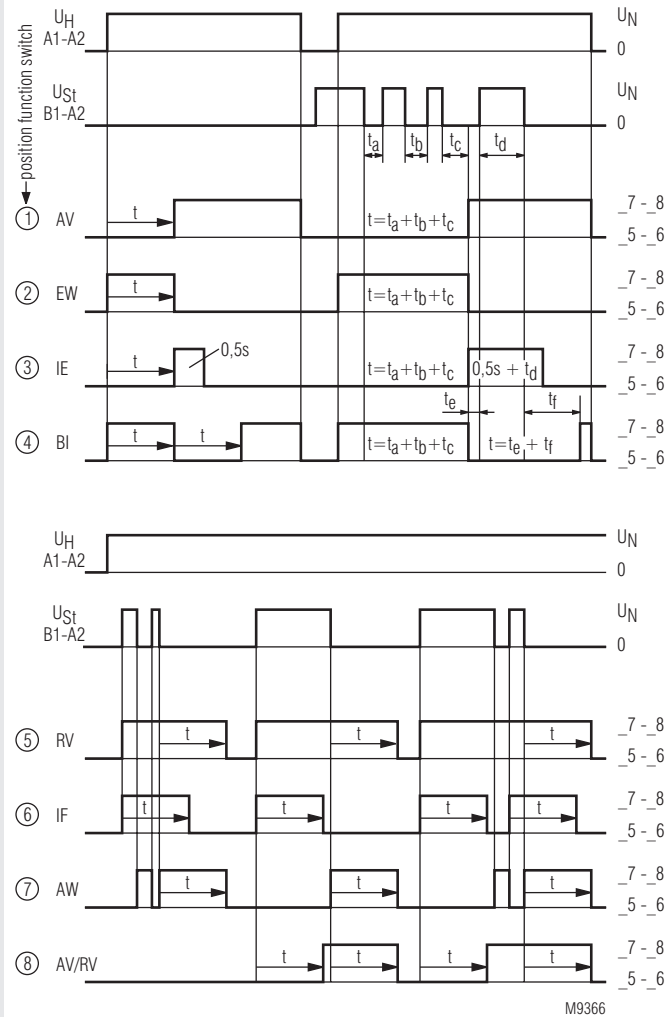
Terminal designation	Signal description
A1(+) / A2	Auxiliary voltage
B1(+) / B2	Control input, dependent of 3position rotational switch
17, 18 ; 27, 28	Forcibly guided NO contacts Relay 1
35, 36 ; 15, 16 ¹⁾	Forcibly guided NC, Relay 1
47, 48 ; 57, 58 33, 34 ¹⁾ ; 43, 44 ¹⁾	Forcibly guided NO contacts Relay 2
65, 66 ; 31, 32 ¹⁾	Forcibly guided NC, Relay 2

¹⁾ at SN 7920.54/001

Indicators

green LED:	on, when voltage connected
yellow LED "R/t":	shows status of output relay and time delay:
- Continuously off:	output relay not active;
- Continuously on:	no time delay
	output relay active;
	no time delay
- Flashing (short on, long off)	output relay not active; time delay
- Flashing (long on, short off)	output relay active; time delay
yellow LED (right) 1:	shows status of delayed relay
yellow LED (right) 2:	shows status of delayed / instantaneous relay

Function Diagram for delayed output relay (relay 1)



① ... ⑧ = position of function switch

- | | |
|----------------------------------|---|
| ① AV = Delay on energisation | ⑤ RV = Delay on de-energisation |
| ② EW = Fleeting on make | ⑥ IF = Pulse forming function |
| ③ IE = Delayed pulse | ⑦ AW = Fleeting on break |
| ④ BI = Flasher, start with pulse | ⑧ AV/RV = Delay on energisation and de-energisation |

Function of Relay 2

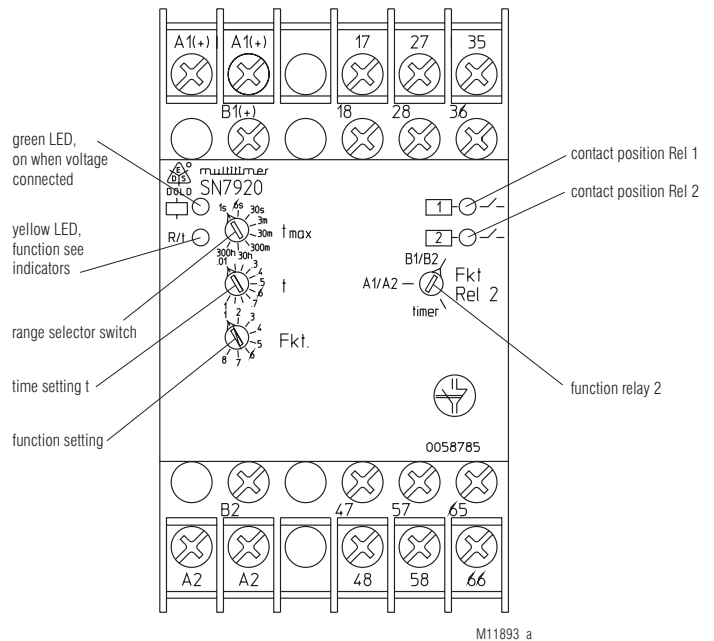
The function of relay 2 can be altered with the 3position rotational switch:

Timer: relay 2 has function of relay 1

A1(+) / A2: relay 2 functions as instantaneous relay controlled by A1(+)/A2

B1(+) / B2: relay 2 functions as instantaneous relay controlled by B1(+)/B2

Setting



Notes for setting

Function- and time range setting

The function and time setting via rotary switches are enabled only when the auxiliary voltage is connected. Changing of these rotary switches while during operation does not take an effect.

Adjustment assistance

The flashing period of the yellow LED is $1 \text{ s} \pm 4\%$ and can be used to adjust the time. Especially on the lower end of scale and for long times it is suitable as the multiplication factors between the different time ranges are exact without tolerance.

Example:

The required time is 40 min. It has to be adjusted within the range 3 ... 300 min. The time check takes too long as several timing cycles would be necessary for a precise value.

For faster adjustment the setting is made to 0.03 ... 3 min. On this range the potentiometer should be set to 0.4 min (= 24 sec). With the right potentiometer setting the LED must show 24 flashing cycles. After that the time range is switched over to 3 ... 300 min and the setting is complete.

Time interruption / Time adding

The timing cycle can be interrupted by controlling input B1(+) with control voltage. Removing the control signal will continue the timing cycle (time addition).

Control input B1(+) / B2(-) (galvanic separated)

The functions RV, IF, AW, AV / RV have to be controlled via control input B1(+) / B2. Example: With external link A2 / B2 input B1(+) can be operated with positive voltage against A1(+) or with external link A1(+) / B1(+) input B2 can be operated with negative voltage against A2.

If with function IF the inputs B1(+) and A1 are controlled simultaneously, (link B2 / A2 existing) a pulse with the adjusted length is started.

Technical Data	
Time Circuit	
Time ranges:	8 time ranges in one unit, settable via rotational switch 0.05 ... 1 s 0.3 ... 30 min 0.06 ... 6 s 3 ... 300 min 0.3 ... 30 s 0.3 ... 30 h 0.03 ... 3 min 3 ... 300 h continuous, 1:100 on relative scale
Time setting t:	
Recovery time:	
A1(+) / A2:	≤ 100 ms
Repeat accuracy:	± 0.5 % of selected end of scale value + 20 ms
Voltage and temperature influence:	< 1 % with the complete operating range
Input	
Auxiliary voltage A1(+) / A2	
Nominal voltage U_N :	AC/DC 24 ... 230 V
Voltage range:	AC 0.7 ... 1.1 U_N ; DC 0.8 ... 1.25 U_N
Control input B1(+) / B2	
Nominal voltage U_N :	galvanic separated AC/DC 12 ... 230 V
Voltage range:	AC 0.7 ... 1.1 U_N ; DC 0.8 ... 1.25 U_N
Control current:	1.3 mA
Release voltage B1(+) / B2	
AC / DC	approx. 7 V
Nominal power consumption	
AC 24 ... 230 V:	approx. 4 VA
DC 24 V:	approx. 3 W
DC 110 V:	approx. 2.5 W
Nominal frequency:	45 ... 400 Hz
Min. on/off time of control input B1(+) / B2	
AC 50 Hz:	approx. 20 ms / ca. 30 ms
DC:	approx. 6 ms / ca. 30 ms
Output	
Contacts:	
	2 NO contacts, 1 NC contact delayed 2 NO contacts, 1 NC contact delayed or as instantaneous contact parametrizable
Contact material:	AgSnO ₂ + 0,2 µm Au
Measured nominal voltage:	AC 250 V
Thermal current I_{th}:	max. 6 A / contact (see quadratic total current limit curve)
Switching capacity	IEC/EN 60 947-5-1
to AC 15	
NO contacts:	3 A / AC 230 V
NC contacts:	2 A / AC 230 V
to DC 13:	6 A / DC 24 V 1 A / DC 110 V 0,5 A / DC 220 V
to DC 13 at 0.1 Hz:	8 A / DC 24 V
Electrical life	IEC/EN 60 947-5-1
NO contacts	
at 3 A, AC 230 V:	1 x 10 ⁵ switching cycles
at 2 A, AC 230 V:	2.5 x 10 ⁵ switching cycles
at 1 A, AC 230 V:	1 x 10 ⁶ switching cycles
NC contacts	
at 2 A, AC 230 V:	50000 switching cycles
at 0.5 A, AC 230 V:	1 x 10 ⁶ switching cycles
at 5 A, AC 230 V cos φ = 1:	2 x 10 ⁵ switching cycles
at 8 A, AC 230 V cos φ = 1:	1 x 10 ⁵ switching cycles
to DC 1 at 2 A, DC 110 V:	5 x 10 ⁵ switching cycles
to DC 13 at 0.5 A, DC 110 V:	5 x 10 ⁵ switching cycles
to DC 13 at 1 A, DC 24 V:	5 x 10 ⁵ switching cycles
Permissible switching frequency:	36 000 switching cycles / h
Short circuit strength:	1 kA / AC 250 V
Max. fuse rating:	10 A gG / gL; machine C8 IEC/EN 60 947-5-1
Mechanical life:	≥ 30 x 10 ⁶ switching cycles

Technical Data	
General Data	
Operating:	Continuous
Temperature range	
Operation:	- 40 ... + 75 °C
Storage:	- 40 ... + 75 °C
Relative air humidity:	93 % at 40 °C
Altitude:	< 2.000 m
Clearance and creepage distances	
Rated voltage:	IEC 60 664-1 300 V
Overvoltage category:	III
Rated impulse voltage / pollution degree:	
Auxiliary voltage A1(+) / A2 / control input B1(+) / B2	6 kV / 2 (reinforced insulation)
Auxiliary voltage A1(+) / A2 / contacts:	6 kV / 2 (reinforced insulation)
Control input B1(+) / B2 / contacts:	6 kV / 2 (reinforced insulation)
contact / contact:	4 kV / 2 (basis insulation)
Insulation test voltage, type test:	4 kV; 1 min 2,5 kV; 1 min
EMC	
Electrostatic discharge:	8 kV (air) IEC/EN 61 000-4-2
HF-irradiation	
80 MHz ... 6 GHz:	20 V / m IEC/EN 61 000-4-3
Fast transients:	4 kV IEC/EN 61 000-4-4
Surge voltages between wires for power supply:	2 kV IEC/EN 61 000-4-5
between wire and ground:	4 kV IEC/EN 61 000-4-5
HF-wire guided:	20 V IEC/EN 61 000-4-6
Interference suppression:	Limit value class B EN 55011
Degree of protection	
Housing:	IP 40 IEC/EN 60 529
Terminals	IP 20 IEC/EN 60 529
Housing:	
	Thermoplastic with V0 behaviour according to UL subject 94
Vibration according to	
Duration per direction:	156 min
Frequency range:	10 ... 150 Hz
Transition frequency:	60 Hz
< 60 Hz:	with constant amplitude ± 0.35 mm
> 60 Hz:	with constant acceleration 5 g
Shock according to	
Shock form:	IEC 60068-2-27 half sine wave
Peak acceleration:	5 g _n
Shock duration:	30 ms
Number of shocks per direction and polarity:	3
Vibration and shock resistance acc. to	
Climate resistance:	DIN EN 61 373 Category 1, Class B
Terminal designation:	40 / 075 / 04 IEC/EN 60 068-1
Wire connection:	EN 50 005 2 x 2.5 mm ² solid or 2 x 1.5 mm ² stranded wire with sleeve DIN 46 228/-1/-2/-3/-4
Insulation of wires or sleeve length:	10 mm
Wire fixing:	Flat terminal with self-lifting clamping piece IEC/EN 60 999-1
Fixing torque:	0,8 Nm
Mounting:	DIN rail mounting (IEC/EN60715) or screw mounting M4, 90 mm hole pattern, with additional clip available as accessory
Weight:	280 g
Dimensions	
Width x height x depth:	52.5 x 90 x 98 mm

Classification to DIN EN 50155

Vibration and

shock resistance: Category 1, Class B IEC/EN 61 373

Ambient temperature: T1, T2, T3, TX compliant

Protective coating of the PCB: No

Standard Type

SN 7920.54 AC/DC 24 ... 230 V

Article number: 0058785

- Output: 2 x 2 NO, 2 NC contacts
- Nominal voltage U_N : AC/DC 24 ... 230 V
- Time ranges: from 0.05 s ... 300 h
- Width: 52.5 mm

Variant

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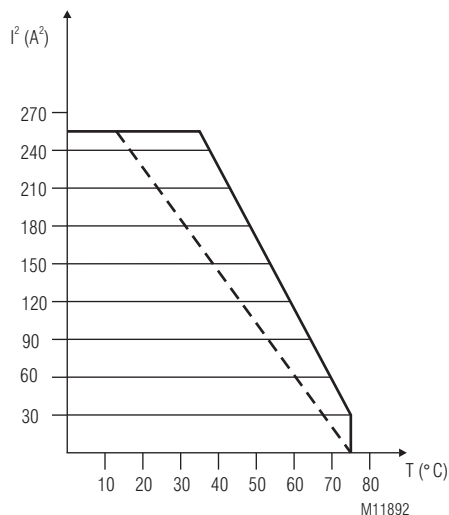
different terminal designation
see Circuit Diagram

Accessories

ET 4086-0-2:

Additional clip for screw mounting
Article number: 0046578

Characteristic



— device mounted on distance with air circulation

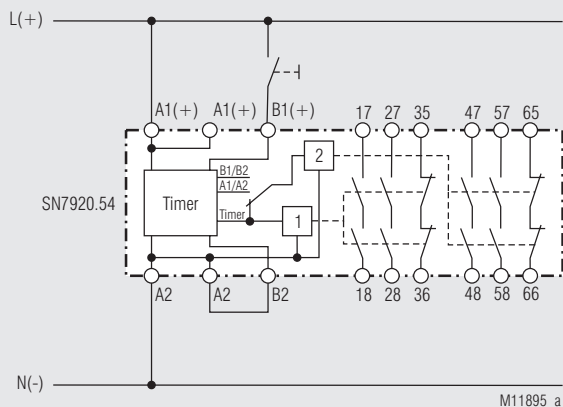
- - - device mounted without distance heated by
devices with same load

$$\sum I_{th}^2 = I_{th1}^2 + I_{th2}^2 + I_{th3}^2 + I_{th4}^2$$

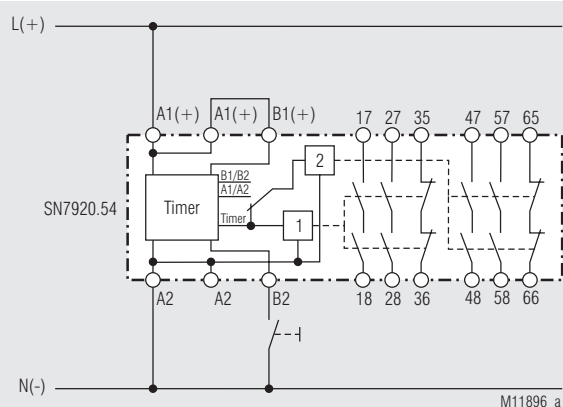
I_{th1} , I_{th2} , I_{th3} , I_{th4} : current in contact paths

Quadratic total current limit curve

Application Examples



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