

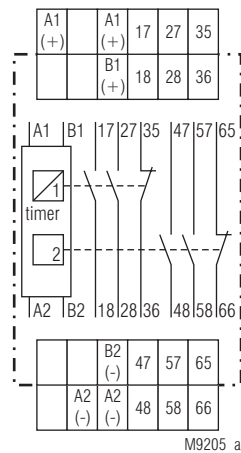
## MULTITIMER

Multifunction Relay for railway application  
according to DIN EN 50155; SN 7920

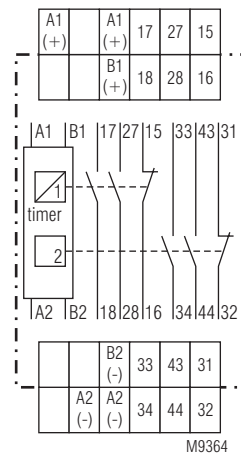


- According to IEC/EN 61 812-1
- 8 functions settable via rotational switch:
  - Delay on energisation (AV)
  - Fleeting on make (EW)
  - Delay pulse (IE)
  - Flasher, start with pulse (BI)
  - Delay on de-energisation (RV)
  - Pulse forming function (IF)
  - Fleeting on break (AW)
  - Delay on energisation 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
- 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
- Suitable to switch high inductive DC loads (DC 110 V)
- LED indicators for operation, contact position and time delay
- 52.5 mm width

### Circuit Diagram



SN 7920



SN 7920/001

### Approvals and Marking



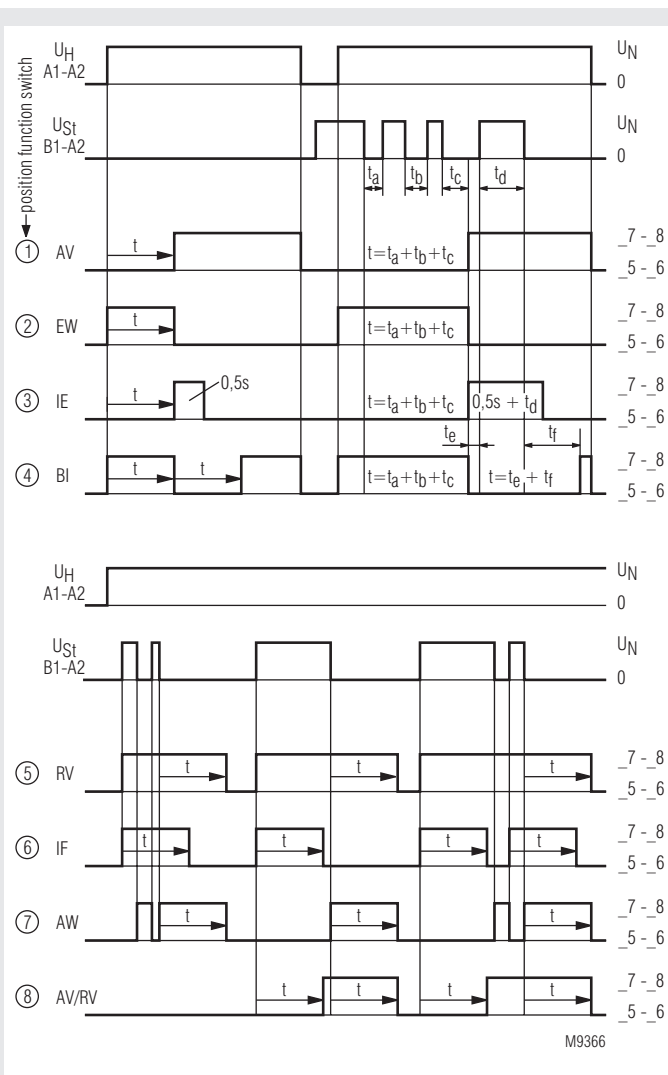
### Applications

- Timing circuit in railway applications according to DIN EN 50 155
- To switch high DC-loads

### 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;                     |
|  | no time delay                                |
| - Continuously on:   | 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) <span style="border: 1px solid black; padding: 0 2px;">1</span> : | shows status of delayed relay                |
| yellow LED (right) <span style="border: 1px solid black; padding: 0 2px;">2</span> : | 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

## Notes

### Adjustment assistance

The flashing period of the yellow LED is  $1 s \pm 4 \%$  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 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

With the functions AV, EW, IE and BI the time delay 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(-). 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 A1 and B1 are controlled simultaneously, 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

#### Time setting t:

continuous, 1:100 on relative scale

#### Recovery time:

at DC 24 V:

approx. 15 ms

at DC 110 V:

approx. 50 ms

at AC 110 V:

approx. 80 ms

#### Repeat accuracy:

$\pm 0.5 \%$  of selected end of scale value + 20 ms

#### Voltage and

#### temperature influence:

< 1 % with the complete operating range

## Input

### Auxiliary voltage

#### Nominal voltage $U_N$ :

AC/DC 24 ... 230 V

#### Voltage range:

0.7 ... 1.1  $U_N$

### Control input B1 / B1:

galvanic separated

#### Voltage range:

AC/DC 10 ... 270 V

#### Control current B1(+) / B1(-):

1 mA

#### Reverse polarity protection:

1 kV

#### Min. on/off time of

#### control input B1(+) / B1(-):

AC 50 Hz:

approx. 15 ms / approx. 30 ms

DC:

approx. 5 ms / approx. 30 ms

#### Release voltage (B1/B2)

AC 50 Hz:

approx. 6 V

DC:

approx. 9 V

#### Nominal power consumption

AC 24 V:

approx. 2.5 VA

AC 110 V:

approx. 6 VA

DC 24 V:

approx. 3 W

DC 110 V:

approx. 3 W

#### Nominal frequency:

45 ... 400 Hz

## Technical Data

### Output

**Contacts:** 2 NO contacts, 1 NC contact delayed  
2 NO contacts, 1 NC contact delayed  
or as instantaneous contact  
programmable  
8 A

### Thermal current $I_{th}$ : Switching capacity to AC 15

NO contacts: 3 A / AC 230 V  
NC contacts: 2 A / AC 230 V

### Electrical life

NO contacts  
at 3 A, AC 230 V:  $1 \times 10^5$  switching cycles IEC/EN 60 947-5-1  
at 2 A, AC 230 V:  $1 \times 2.5 \times 10^5$  switching cycles  
IEC/EN 60 947-5-1

at 1 A, AC 230 V:  $1 \times 10^6$  switching cycles IEC/EN 60 947-5-1  
NC contacts

at 2 A, AC 230 V: 50000 switching cycles IEC/EN 60 947-5-1  
at 0.5 A, AC 230 V:  $1 \times 10^6$  switching cycles IEC/EN 60 947-5-1

at 5 A, AC 230 V resistive load  
 $\cos \varphi = 1$ :  $2 \times 10^5$  switching cycles  
to DC 1 at 2 A, DC 110 V:  $5 \times 10^5$  switching cycles IEC/EN 60 947-5-1  
to DC 13 at 0.5 A, DC 110 V:  $1 \times 10^6$  switching cycles IEC/EN 60 947-5-1

### Short circuit strength

**max. fuse rating:** 6 A gL; machine C8 IEC/EN 60 947-5-1

**Mechanical life:**  $\geq 30 \times 10^6$  switching cycles

## General Data

**Operating:** Continuous  
**Temperature range:** - 40 ... + 75 °C

### Clearance and creepage distances

rated impuls voltage /  
pollution degree:  
Contacts, auxiliary voltage,  
control input B1/B2: 4 kV / 2 IEC 60 664-1

### EMC

Electrostatic discharge: 8 kV (air) IEC/EN 61 000-4-2  
HF-irradiation: 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: 1 kV IEC/EN 61 000-4-5  
between wire and ground: 4 kV IEC/EN 61 000-4-5  
HF-wire guided: 10 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 resistance:** Amplitude 0.35 mm,  
frequency 10 ... 55 Hz, IEC/EN 60 068-2-6

**Climate resistance:** 40 / 060 / 04 IEC/EN 60 068-1

**Terminal designation:** EN 50 005

**Wire connection:** 2 x 2.5 mm<sup>2</sup> solid or  
2 x 1.5 mm<sup>2</sup> stranded wire with  
sleeve DIN 46 228/-1/-2/-3/-4

**Wire fixing:** Flat terminal with self-lifting  
clamping piece IEC/EN 60 999-1

**Mounting:** DIN rail IEC/EN 60 715

**Weight:** 260 g

## Dimensions

**Width x height x depth:** 52.5 x 90 x 98 mm

## Standard Type

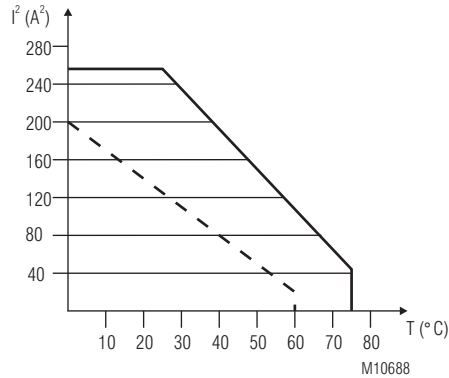
SN 7920 AC/DC 24 ... 230 V

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

SN 7920/001 different terminal designation  
see Circuit Diagram

## Characteristic



— device mounted on distance with air circulation

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

i = total current over the contacts

### Quadratic total current limit curve

## Application Example

