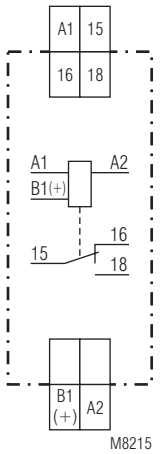
MULTITIMER
Multifunction Relay
IK 7817N/200, SK 7817N/200

0239763

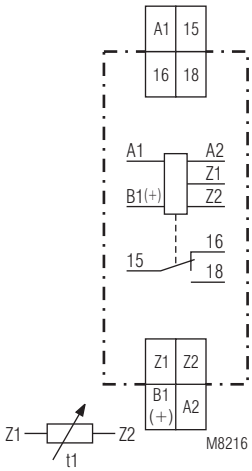

IK 7817N/500


SK 7817N/500

Circuit Diagrams



IK 7817N.81/200
SK 7817N.81/200



IK 7817N.81/500
SK 7817N.81/500

Connection Terminals

Terminal designation	Signal description
A1	L / +
A2	N / -
B1(+)	Control input (different function depending on chosen timing function) control with reference to A2
15, 16, 18	Changeover contact
Z1, Z2 (only at variant /500)	Input to connect a remote potentiometer for time setting t1

- According to IEC/EN 61812-1
- 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 0.02 s ... 300 h selectable via rotational switches
- Voltage range AC/DC 12 ... 240 V
- With time interruption / time adding input
- Adjustment aid for quick setting of long time values
- Suitable for 2-wire proximity sensor control
- 1 changeover contact
- LED indicators for operation, contact position and time delay
- Devices available in 2 enclosure versions:
  IK 7817N: depth 59 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  SK 7817N: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- DIN rail or screw mounting
- 17.5 mm width

IK/SK 7817N/500: as IK/SK 7817N/200 but with
- 2 additional functions:
  - Cyclic timer, start with break (TP)
  - Fleeting on make and break (EW / AW)
- second time setting t2 for functions
  - Cyclic timer, start with pulse (TI) or break (TP), based on the separate setting of pulse and break time the flasher function can be used as cyclic timer.
  - Fleeting on make and break (EW/AW)
  - Delay on energisation and de-energisation (AV / RV)
  - Delay pulse (IE): setting of pulse length
- Connection facility for external potentiometer 10 kΩ

Approvals and Markings

CE

Application

Time dependent controls for industrial and railway applications.

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

Notes

Control of A1-A2 with proximity sensors
The input can be controlled by DC 3 wire or AC/DC 2 wire proximity sensors. For operating voltage > 24 V and usage of sensors without built-in short circuit protection a protection resistor on A1 is recommendend to reduce the inrush current. The dimension is as follows:

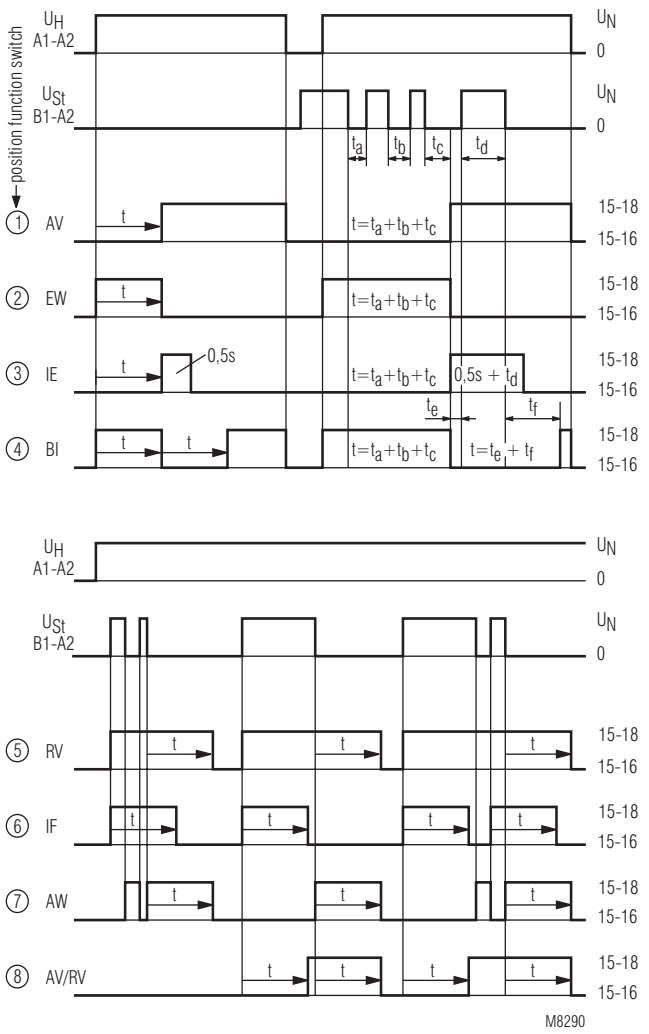
$R_v \approx$ operating voltage / max. switching current of sensor

The series resistor must not be selected higher than necessary.
Max. values are:

Operating voltage:	48 V	60 V	110 V	230 V
Series resistor R_v max:	270 Ω	390 Ω	680 Ω	1.8 kΩ (1 W)

All technical data in this list relate to the state at the moment of edition. We reserve the right for technical improvements and changes at any time.

Function Diagram

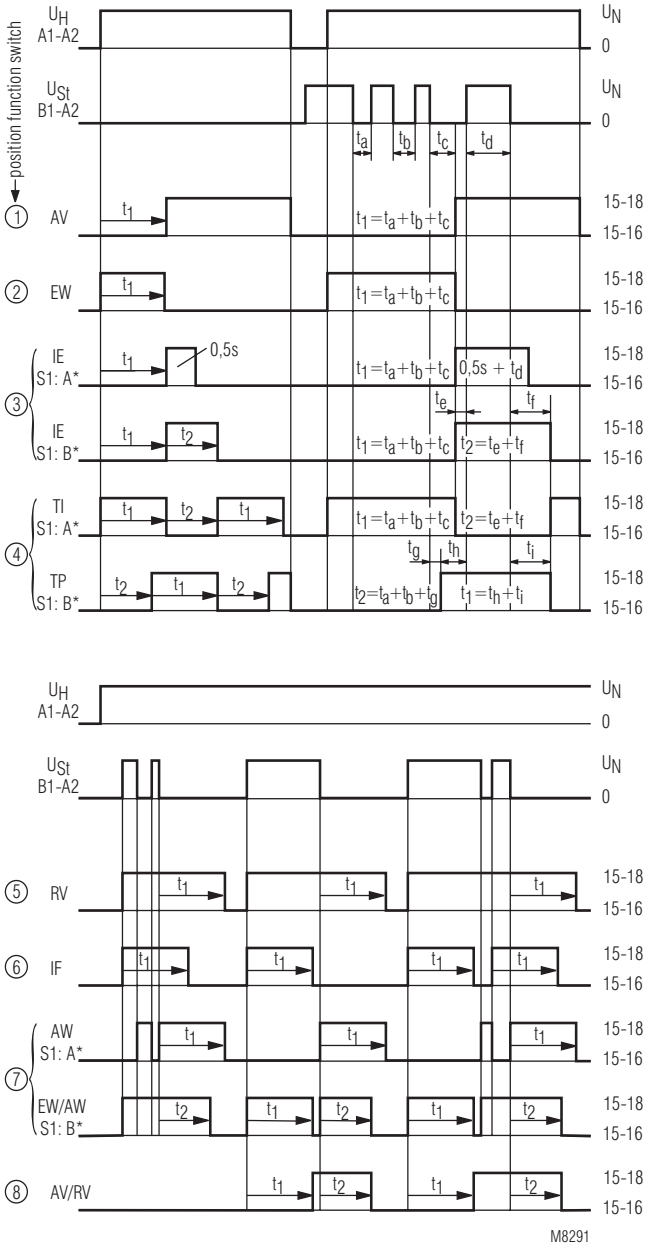


IK 7817N/200, SK 7817N/200

① ... ⑧ = position of function switch

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

Function Diagram



*) A and B indicate the position of function slide switch S1

IK 7817N/500, SK 7817N/500

① ... ⑧ = position of function switch

① AV = Delay on energisation
② EW = Fleeting on make
③ IE = Delay pulse
S1 in position A:
t1: adjustable, t2 = 0.5 s fixed
S1 in position B:
t1 and t2 adjustable
④ TI = Cyclic timer, start with pulse
S1 in position A
TP = Cyclic timer, start with break
S1 in position B
⑤ RV = Delay on de-energisation
⑥ IF = Pulse forming function
⑦ AW = Fleeting on break
S1 in position A
EW/AW = Fleeting on make and break
S1 in position B
⑧ AV/RV = Delay on energisation and de-energisation

Notes

Setting
If the function switch is altered during operation, the new setting is valid immediately (like a restart of the relay).
A new adjustment of the time or time range is also immediately valid.
Please note, that a change of function, time range or time setting during elapse of time can lead to unintended switching of the output contacts.

Adjustment assistance
The flashing period of the yellow LED is 1 s ± 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).

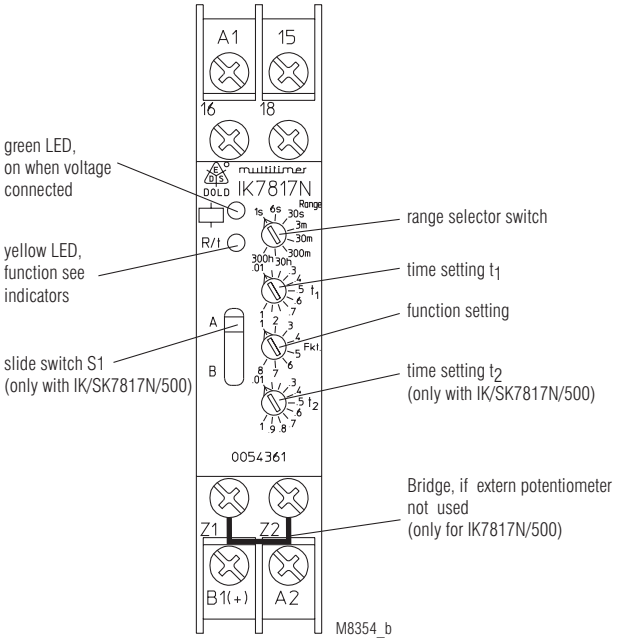
Control input B1
The functions RV, IF, AW, AV / RV have to be controlled via input B1 (+) with voltage against A2. The control signal could be the same as the auxiliary/control voltage of A1 or any other voltage between 12 and 240 V AC or DC. Operating a parallel load between B1 and A2 is also possible.

If with function IF the inputs A1 and B1 are contolled simultaneously a pulse with the adjusted length is started.
With the variant IK/SK 7817N/500 the output pulse can be disabled by setting the slide switch in positon "B".

Remote potentiometer
The setting of t1 on variant IK/SK 7817N/500 can also be made by a remote potentiometer of 10 kOhms. The connection is made via Z1-Z2. When connecting a remote potentiometer the rotational switch for t1 has to be set to min. If no remote potentiometer is required the terminals Z1-Z2 have to be linked.
The wires to the remote potentiometer should be installed separately from the lines with mains voltage. If this is not possible, a screened cable is recommendet where the shield is connected to Z1.
To terminals Z1 and Z2 no external voltage must be connected, as the unit might be damaged.
Terminals Z1-Z2 do not have a galvanic separation to terminals A1 -A2!

Additional function
With the variant IK/SK 7817N/500 additional features can be selected for the functions position 3, 4 and 7 using the slide switch S1 on the relay front in position "B". At the same time a second time setting t2 is available on the lower rotational switch for the functions 3, 4 , 7 and 8 (see function Diagram). The time range is the same as for t1.

Setting



Attention
If no remote potentiometer at IK/SK 7817N/500 is required the terminals Z1-Z2 have to be linked.

Technical Data

Time circuit

Time ranges:	8 time ranges in one unit, settable via rotational switch
	0.02 ... 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 t1, t2:	continuous, 1:100 on relative scale (t2 only at IK/SK 7817N/500)
Recovery time:	
at DC 24 V:	approx. 15 ms
at DC 240 V:	approx. 50 ms
at AC 230 V:	approx. 80 ms
Repeat accuracy:	± 0.5 % of selected end of scale value + 20 ms
Voltage and temperature influence:	< 1 % with the complete operating range

Input

Nominal voltage U_N:	AC/DC 12 ... 240 V
Voltage range:	0.8 ... 1.1 U_N
Release voltage (A1/A2)	
AC 50 Hz:	approx. 7.5 V
DC:	approx. 7 V
Max. permitted residual current with 2-wire proximity sensor control (A1-A2)	
up to AC/DC 150 V:	AC resp. DC 5 mA
up to AC/DC 264 V:	AC resp. DC 3 mA
Control current B1:	Input resistance approx. 220 kΩ in series with diode
Min. on/off time of control input B1(+):	
AC 50 Hz:	approx. 48 ms / approx. 77 ms
DC:	approx. 40 ms / approx. 80 ms
IK 7817N/200:	
AC 50 Hz:	approx. 15 ms / approx. 60 ms
DC:	approx. 5 ms / approx. 60 ms
Release voltage (B1/A2)	
AC 50 Hz:	approx. 5 V
DC:	approx. 4 V
Nominal power consumption	
at AC 12 V:	approx. 2,5 VA
at AC 24 V:	approx. 3 VA
at AC 240 V:	approx. 4,5 VA
at DC 12 V:	approx. 1,5 W
at DC 24 V:	approx. 1,5 W
at DC 240 V:	approx. 1,5 W
Nominal frequency:	45 ... 400 Hz

Output

Contacts:	1 changeover contact	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	max. 4 A (see see quadratic total current limit curve)	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60947-5-1
to DC 13 at 0.1 Hz:	1 A / DC 24 V	IEC/EN 60947-5-1
Electrical life		
to AC 15 at 1 A, AC 230 V:	1.5 x 10^5 switch. cycles	IEC/EN 60 947-5-1
Permissible switching frequency	36 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gG / gL	IEC/EN 60947-5-1
Mechanical life:	≥ 30 x 10^6 switching cycles	

Technical Data

General Data

Operating mode:	Continuous operation	
Temperature range:		
Operation:	- 40 ... + 60 °C (higher temperature with limitations see quadratic total current limit curve)	
Storage:	- 40 ... + 70 °C	
Relative air humidity:	93 % at 40 °C	
Altitude:	< 2000 m	
Clearance and creepage distances		
Rated impulse voltage / pollution degree:	4 kV / 2 (basis insulation)	IEC 60664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	6 kV (contact)	IEC/EN 61000-4-2
	8 kV (air)	IEC/EN 61000-4-2
HF-irradiation		
80 MHz ... 1 GHz:	20 V / m	IEC/EN 61000-4-3
1 GHz ... 2.7 GHz:	10 V / m	IEC/EN 61000-4-3
Fast transients:	4 kV	IEC/EN 61000-4-4
Surge voltages between		
wires for power supply:	2 kV	IEC/EN 61000-4-5
between wire and ground:	4 kV	IEC/EN 61000-4-5
HF-wire guided:	10 V	IEC/EN 61000-4-6
Interference suppression		
IK 7817N/200:	Limit value class B	EN 55011
IK 7817N/300, IK 7817N/500:	Limit value class A*) *) The device is designed for the usage under industrial conditions (Class A, EN 55011). When connected to a low voltage public system (Class B, EN 55011) radio interference can be generated. To avoid this, appropriate measures have to be taken	
Degree of protection		
Housing:	IP 40	IEC/EN 60529
Terminals:	IP 20	IEC/EN 60529
Housing:	Thermoplastic with V0 behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm, frequency 10 ... 55 Hz,	IEC/EN 60068-2-6
Climate resistance:	40 / 060 / 04	IEC/EN 60068-1
Terminal designation:	EN 50005	
Wire connection:	DIN 46228/-1/-2/-3/-4	
Cross section:	2 x 2,5 mm^2 solid or 2 x 1,5 mm^2 stranded wire with sleeve	
Stripping length:	10 mm	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60999-1
Fixing torque:	0.8 Nm	
Mounting:	DIN rail mounting (IEC/EN 60715) or screw mounting M4, 90 mm hole pattern, with additional clip available as accessory	
Weight:		
IK 7817N/200:	approx. 65 g	
SK 7817N/200:	approx. 84 g	

Dimensions

Width x height x depth:	
IK 7817N/200:	17.5 x 90 x 59 mm
SK 7817N/200:	17.5 x 90 x 98 mm

Classification to DIN EN 50155

Vibration and shock resistance:	Category 1, Class B	IEC/EN 61373
Ambient temperature:	T1, T2 compliant T3 and TX with operational limitations	
Protective coating of the PCB:	No	

Standard Type

IK 7817N.81/200 AC/DC 12 ... 240 V
Article number: 0054359
- Output: 1 changeover contact
- Nominal voltage U_N: AC/DC 12 ... 240 V
- Time ranges: from 0.02 s ... 300 h
- Width: 17.5 mm

SK 7817N.81/200 AC/DC 12 ... 240 V
Article number: 0058364
- Output: 1 changeover contact
- Nominal voltage U_N: AC/DC 12 ... 240 V
- Time ranges: from 0.02 s ... 300 h
- Width: 17.5 mm

Variant

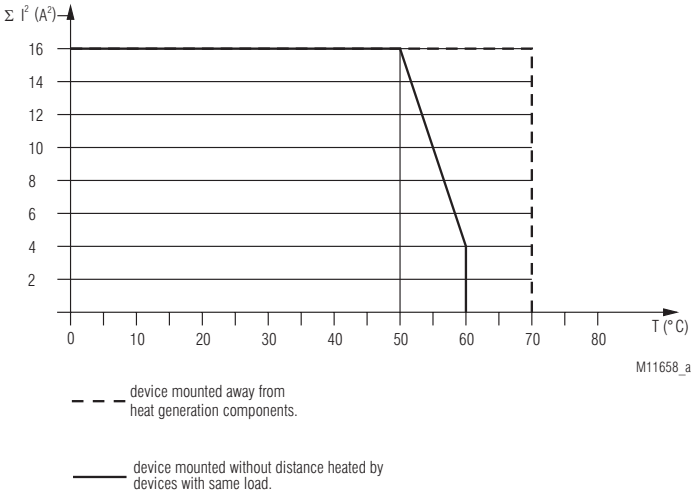
IK/SK 7817N.81/500: With 2 additional functions selectable via slide switch S1:
- Cyclic timer, start with break (TP)
- Fleeting on make and break (EW/AW) second time setting t2, connection facility for remote potentiometer 10 kΩ (t1)

Ordering example for variant

IK 7817N .81 /_ _ _ AC/DC 12 ... 240 V

- Nominal voltage
- Variant
- Contacts
- Type

Characteristics

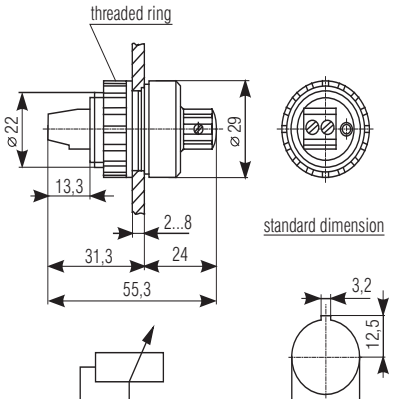


Accessories

AD 3: External potentiometer 10 kΩ
Article number: 0028962

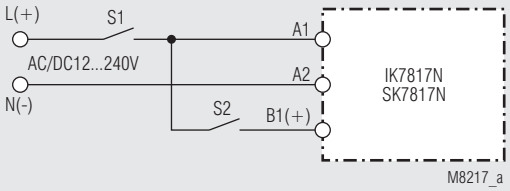
The external potentiometer is used for remote setting of the time delay. The internal potentiometer of the timer must be set to min. time delay.

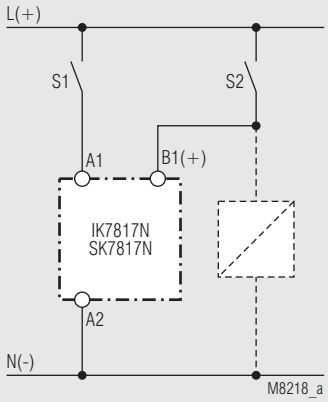
Degree of protection front side: IP 40



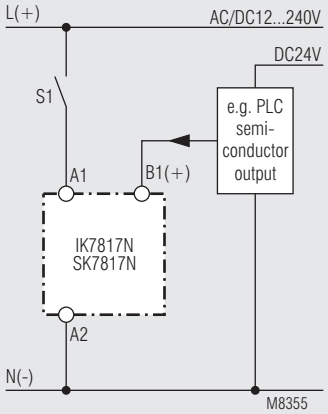
ET 4086-0-2: Additional clip for screw mounting
Article number: 0046578

Connection Examples





Control with parallel connected load



Connection with 2 different control voltages.