Time control technique

DOLD

Product range

Safety technique

- Safety switching devices
- Standstill / speed monitoring
- Multifunctional safety devices
- Wireless Safety System
- Safety switches
- Guard locks
- Key transfer

Monitoring technique

- Residual current monitors
- Insulation monitors
- Insulation fault location system
- Measuring and monitoring relays
- Fault annunciators and fault annunciator systems
- SMS-Telecontrol module

Power electronics

- Solid-state relays /- contactors
- Reversing contactors
- Softstarters
- Motor brake relays
- Speed and phase controllers
- Multifunctional motor control units

Control technique

- Latching / interface / switching relays
- Interface modules
- Power supply units
- I / O modules
- CANopen PLC
- CANopen I / O modules

Time control technique

- Multifunction relays
- Flasher relays
- Cyclic timers
- Fleeting action relays
- Pulse extender
- Star delta timers
- Timers
  - on delayed
  - off delayed

Installation technique

- Time switches
- Remote switches
- Specific installation electronics

- Machinery and plant
- Power generation/distribution
- Oil and gas industry
- Automation
- Transport and material handling systems
- Rail technology
- Aviation/marine industry
- Paper and printing industry
- Food industry
- Rubber/plastics industry
- Heating and refrigeration
- Automotive
- Mining/metal working
- Chemical/pharmaceutical applications
- Medical technology
- Water/waste water treatment
- Cable cars/ski lifts

… and wherever safety has high priority.
We can cover your industrial applications as well!

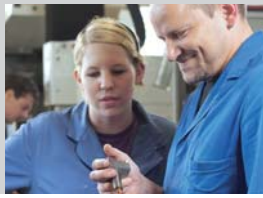
DOLD –
Solutions for you









The DOLD philosophy, "Our experience. Your safety" constitutes our program: Offering solutions based on over 80 years of experience with a workforce of more than 400 employees, we manufacture high quality products using state-of-the-art production plant at our Furtwangen facility in Germany.

The comprehensive product range includes relay modules, safety relays with positively-driven contacts and electronic housings with virtually unparalleled production detail. The combination of know-how, innovation and experience makes us one of the leading worldwide manufacturers.

Apart from standard solutions, we are also the right partner when individual industrial solutions with that special touch are required.

Staying in close contact with our customers is very important to us. We listen, analyze and act by offering flexible, custom high-tech solutions, from a single source.

Thanks to our own development laboratory, highly automated production facilities with a modern tool & die shop in addition to injection moulding facility togehter with a well organized sales and marketing department, we guarantee high quality and short delivery times. Your benefits: Increased plant and machine availability, planning reliability and low production costs.

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Functional index

Product selection

Multifunction relays

Function	Time range from ... to [s ... h]	Nominal voltage AC	Nominal voltage AC	Nominal voltage AC/DC	Output contacts	Enclosure design	Width [mm]	Type	Page
Multifunction relay	0,02 ... 300			+	1 C/O	Distribution board	17,5	**IK 7817N/200**	17
Multifunction relay	0,02 ... 300	+	+	+	1 C/O; 2 C/O	Distribution board	17,5	**RK 7817**	23
Multifunction relay	0,02 ... 300			+	1 C/O	Switch cabinet	17,5	**SK 7817N/200**	17
Multifunction relay	0,05 ... 300		+	+	1 C/O	Switch cabinet	22,5	**BC 7935N**	27
Multifunction relay, digital	0,02 ... 9999	+		+	1 C/O; 2 C/O	Switch cabinet	22,5	**MK 7830N**	30
Multifunction relay	0,02 ... 300			+	2 C/O	Switch cabinet	22,5	**MK 7850N/200**	34
Multifunction relay	0,05 ... 300			+	2 x 2 NO; 2 NC	Switch cabinet	52,5	**SN 7920**	40

NC= normally closed contact, NO = normally open contact, C/O = changeover contact

Flasher relays

Function	Time range from ... to [s ... h]	Time range from ... to [s ... min]	Time range from ... to [s ... s]	Nominal voltage AC	Nominal voltage DC	Nominal voltage AC/DC	Output contacts	Enclosure design	Width [mm]	Type	Page
Flasher relay		0,1 ... 60		+		+	1 C/O	Distribution board	17,5	**IK 7816**	44
Flasher relay			0,05 ... 100	+	+		1 C/O	Distribution board	17,5	**IK 7827**	47
Flasher relay	0,1 ... 10			+		+	1 C/O; 2 C/O	Distribution board	17,5	**RK 7816**	49
Flasher relay		0,1 ... 60		+		+	1 C/O	Switch cabinet	17,5	**SK 7816**	44
Flasher relay			0,5 ... 100	+		+	1 C/O	Switch cabinet	22,5	**BC 7932N**	53
Flasher relay			0,05 ... 300	+		+	2 C/O	Switch cabinet	22,5	**MK 7851**	55
Flasher relay			0,5	+		+	1 C/O; 2 C/O	Switch cabinet	22,5	**MK 7852**	57
Flasher relay			0,3 ... 3	+	+		1 C/O; 2 C/O	Switch cabinet	45	**BA 7981**	59

C/O = changeover contact

Product selection

Fleeting action relays / Pulse extender / Star delta timer

Function	Time range from ... to [s ... h]	Time range from ... to [s ... min]	Time range from ... to [s ... s]	Nominal voltage AC	Nominal voltage DC	Nominal voltage AC/DC	Output contacts	Enclosure design	Width [mm]	Type	Page
Fleeting action relay		0,1 ... 60		+		+	1 C/O	Distribution board	17,5	**IK 7815**	61
Star-delta timer			0,5 ... 100	+		+	2 NO	Distribution board	17,5	**IK 7818**	64
Fleeting action relay			0,25 ... 640	+		+	1 C/O	Distribution board	17,5	**IK 7820**	66
Fleeting action relay			0,05 ... 1	+	+		1 C/O	Distribution board	17,5	**IK 7826**	68
Fleeting action relay	0,1 ... 10			+		+	1 C/O; 2 C/O	Distribution board	17,5	**RK 7815**	49
Fleeting action relay		0,1 ... 60		+		+	1 C/O	Switch cabinet	17,5	**SK 7815**	61
Fleeting action relay			0,25 ... 640	+		+	1 C/O	Switch cabinet	17,5	**SK 7820**	66
Fleeting action relay			0,05 ... 100	+		+	1 C/O	Switch cabinet	22,5	**BC 7931N**	70
Star-delta timer			0,5 ... 100	+		+	2 NO	Switch cabinet	22,5	**BC 7936N**	72
Star-delta timer			0,5 ... 100	+		+	1 FM; 1 NO	Switch cabinet	22,5	**MK 7853N**	74
Fleeting action relay			0,3 ... 0,6	+		+	1 C/O; 2 C/O	Switch cabinet	22,5	**MK 9988**	77
Fleeting action relay			0,05 ... 300	+		+	2 C/O	Switch cabinet	22,5	**MK 9989**	79

NC= normally closed contact, NO = normally open contact, C/O = changeover contact, FM = contact fleeting on make

Product selection

Cyclic timers

Function	Time range from ... to [s ... h]	Nominal voltage AC	Nominal voltage DC	Nominal voltage AC/DC	Output contacts	Enclosure design	Width [mm]	Type	Page
Cyclic timer	0,05 ... 300			+	1 C/O	Distribution board	17,5	**IK 7854**	81
Cyclic timer	0,05 ... 300			+	1 C/O	Switch cabinet	17,5	**SK 7854**	81
Cyclic timer	0,05 ... 300		+	+	1 C/O	Switch cabinet	22,5	**BC 7937N**	85
Cyclic timer	0,05 ... 300			+	2 C/O	Switch cabinet	22,5	**MK 7854N**	88
Cyclic timer	0,25 ... 32	+		+	1 C/O; 2 C/O	Switch cabinet	35	**EO 7864**	93
Cyclic timer	0,25 ... 32	+		+	1 C/O; 2 C/O	Switch cabinet	45	**BA 7864**	93

C/O = changeover contact

Product selection

Timers on delayed

Function	Time range from ... to [s ... h]	Time range from ... to [s ... min]	Time range from ... to [s ... s]	Nominal voltage AC	Nominal voltage DC	Nominal voltage AC/DC	Output contacts	Enclosure design	Width [mm]	Type	Page
Timer		0,1 ... 60		+		+	1 C/O	Distribution board	17,5	**IK 7813**	96
Timer		0,25 ... 640		+		+	1 C/O	Distribution board	17,5	**IK 7814**	99
Timer		0,05 ... 60		+	+		1 C/O; 2 C/O	Distribution board	17,5	**IK 7825**	102
Timer			0,06 ... 160			+	1 Ty	Distribution board	17,5	**IK 8808**	104
Timer	0,05 ... 300					+	1 w	Distribution board	17,5	**IK 9906**	106
Timer	0,1 ... 10			+		+	1 C/O; 2 C/O	Distribution board	17,5	**RK 7813**	49
Timer	0,1 ... 10			+		+	1 C/O; 2 C/O	Distribution board	17,5	**RK 7814**	49
Timer		0,1 ... 60		+		+	1 C/O	Switch cabinet	17,5	**SK 7813**	96
Timer		0,25 ... 640		+		+	1 C/O	Switch cabinet	17,5	**SK 7814**	99
Timer	0,05 ... 300					+	1 C/O	Switch cabinet	17,5	**SK 9906**	106
Timer	0,05 ... 10			+		+	1 C/O	Switch cabinet	22,5	**BC 7930N**	110
Timer	0,05 ... 16			+		+	1 C/O	Switch cabinet	22,5	**BC 7934N**	112
Timer		0,25 ... 640		+		+	2 C/O	Switch cabinet	22,5	**MK 7858**	114
Timer	0,05 ... 100			+		+	2 C/O	Switch cabinet	22,5	**MK 9906**	116
Timer	0,05 ... 300					+	2 C/O	Switch cabinet	22,5	**MK 9906N**	118
Timer	0,05 ... 100			+		+	2 C/O	Switch cabinet	22,5	**MK 9906N/600**	122
Timer			0,05 ... 300	+	+		2 C/O	Switch cabinet	22,5	**MK 9908**	124
Timer			0,2 ... 180	+	+		2 C/O	Switch cabinet	45	**AA 7512**	126
Timer	0,2 ... 60			+			1 NO, 1 NC	Switch cabinet	45	**AA 7610**	128
Timer	0,15 ... 60			+			2 NO, 2 NC	Switch cabinet	45	**AA 7616**	131
Timer	0,05 ... 100					+	2 C/O	Switch cabinet	45	**AA 9906/200**	116
Timer			0,05 ... 100	+	+		1 C/O; 2 C/O	Switch cabinet	45	**BA 7903**	134
Timer			0,05 ... 300	+	+		1 C/O; 2 C/O	Switch cabinet	45	**BA 7905**	136
Timer	0,2 ... 60			+			1 NO, 1 NC	Front panel mounting	48	**EC 7610**	128
Timer	0,15 ... 60			+			2 C/O	Front panel mounting	48	**EC 7616**	131
Timer		0,01 ... 9999		+	+		1 C/O; 2 C/O	Front panel mounting	48	**EC 7801**	138
Timer	0,01 ... 99,99			+	+		1 C/O; 2 C/O; 1 T	Front panel mounting	48	**EC 9621**	140
Timer	0,2 ... 60			+			2 NO, 2 NC	Front panel mounting	72	**EF 7610**	128
Timer	0,15 ... 60			+			2 NO, 2 NC	Front panel mounting	72	**EF 7616**	131
Timer	0,2 ... 60			+			1 NO, 1 NC	Front panel mounting	96	**EH 7610**	128
Timer	0,15 ... 60			+	+		2 NO, 2 NC	Front panel mounting	96	**EH 7616**	131

NC= normally closed contact, NO = normally open contact, C/O = changeover contact, FM = contact fleeting on make, Ty = thyristor, T = transistor output

Product selection

Timers off delayed

Function	Release delay	Time range from ... to [s ... h]	Time range from ... to [s ... min]	Time range from ... to [s ... s]	Nominal voltage AC	Nominal voltage DC	Nominal voltage AC/DC	Output contacts	Enclosure design	Width [mm]	Type	Page
Timer	without control signal			0,05 ... 300			+	1 C/O	Distribution board	17,5	**IK 7819**	142
Timer	with control signal		0,25 ... 640		+		+	1 C/O	Distribution board	17,5	**IK 7823**	145
Timer	with control signal	0,05 ... 300					+	1 C/O	Distribution board	17,5	**IK 9962**	147
Timer	without control signal			0,05 ... 300			+	1 C/O	Switch cabinet	17,5	**SK 7819**	142
Timer	with control signal		0,25 ... 640		+		+	1 C/O	Switch cabinet	17,5	**SK 7823**	145
Timer	with control signal	0,05 ... 300					+	1 C/O	Switch cabinet	17,5	**SK 9962**	147
Timer	with control signal	0,05 ...10			+	+	+	1 C/O	Switch cabinet	22,5	**BC 7933N**	151
Timer	without control signal			0,05 ... 300			+	1 C/O	Switch cabinet	22,5	**BC 7938N**	142
Timer	with control signal	0,05 ... 16			+	+	+	1 C/O	Switch cabinet	22,5	**BC 7939N**	153
Timer	without control signal			0,05 ... 300	+		+	1 C/O	Switch cabinet	22,5	**MK 7863**	155
Timer	without control signal			0,05 ... 300			+	2 C/O	Switch cabinet	22,5	**MK 7873N**	157
Timer	without control signal			0,05 ... 600	+		+	1 C/O	Switch cabinet	22,5	**MK 9961**	160
Timer	with control signal	0,05 ... 100			+		+	2 C/O	Switch cabinet	22,5	**MK 9962**	173
Timer	with control signal	0,05 ... 300					+	2 C/O	Switch cabinet	22,5	**MK 9962N**	162
Timer	without control signal			0,2 ... 180	+	+		2 C/O	Switch cabinet	45	**AA 7562**	166
Timer	with control signal	0,15 ... 60			+			1 NO, 1 NC	Switch cabinet	45	**AA 7666**	168
Timer	without control signal			0,05 ... 300	+	+		2 C/O	Switch cabinet	45	**BA 7954**	171
Timer	with control signal	0,05 ... 100			+	+		2 C/O	Switch cabinet	45	**BA 7962**	173
Timer	with control signal	0,15 ... 60			+			1 NO, 1 NC	Front panel mounting	48	**EC 7666**	168
Timer	with control signal	0,15 ... 60			+			1 NO, 1 NC	Front panel mounting	72	**EF 7666**	168
Timer	with control signal	0,15 ... 60			+	+		2 C/O	Front panel mounting	96	**EH 7666**	168

NC= normally closed contact, NO = normally open contact, C/O = changeover contact

Time control technique

Advantages of DOLD time control units

- A timing relay is a special relay variant which can be used to realize specific timing functions in a cost-effective manner.
- Electronic timing relays with semiconductor outputs for frequent wear-less switching
- Easy and cost-effective stockkeeping because of only a single device (multifunctional relays)
- Save space by narrow design
- Elapsed time indication for electromechanical timing relays
- Non-resetting on voltage failure designs for electromechanical timing relays

Technology

Timing relays are available as electropneumatic, electromechanical and electronic design.
Electropneumatic and electromechanical timing relays work with conventional relay contacts. Electronic timing relays work with conventional relay contacts or with solid-state relays.

Functions

- **Delay on operate:**
  Initiation is by applying the operating voltage. Once the set delay time has lapsed the relay switches to its operated condition.
- **Release delay:**
  When the operating voltage is applied the relay immediately switches to its operated condition. When the operating voltage is interrupted, the release delay time starts. Once the set delay time has lapsed the relay switches to its normal position.
  There is a distinction between devices without and such with control signal:
  Devices without auxiliary voltage can only be realized for short times (up to 5 minutes). Devices with auxiliary supply are also suited for longer time range. Here, the delay function is intiated by operation of the control input. These products are also suited for applications with very short operating times.
- **Flasher timers:**
  When the operating voltage is applied the relay switches to its operated condition (on the lead edge of the pulse). Once the pulse time has lapsed the relay switches to its normal position. After the end of the dead time it returns to its operated condition and so on (pulse time = dead time).
- **Cyclic timers:**
  Same functions as the flasher timer, but pulse time and dead time are different and therefore they can be separately adjusted.
- **Fleeting action:**
  A fleeting action NO relay switches to its operated condition without delay when the operating voltage is applied. Once the set fleeting time has lapsed the relay switches to its normal position. A fleeting action NC relay has voltage applied to the control input via the control contact. When the control contact is opened the relay immediately switches to its operated condition. Once the set fleeting time has lapsed the relay switches to its normal position.
- **Pulse shapers:**
  Convert the input pulse to an output pulse with a defined length (set time).
- **Multifunction relays:**
  These devices can be used for each one of the above functions. Needed functions can be adjusted on the device.
- **Star delta timers:**
  The star contact is closed when the operating voltage is applied. Once the set fleeting time has lapsed the star contact opens and after a short dead time (contact transit time 35 to 100 ms) the delta contact closes.

For MK9906N, MK 9962N, MK 7854N, MK 7850N and IK/SK 9906, IK/SK 9962, IK/SK 7854, IK/SK 7817N:

- Voltage range AC/DC 12-240 V
- 8 time ranges from 0.05 s - 300 h
- Setting aid for quick setting of long times
- LEDs for ready-for-operation, contact position, time sequence
- Optionally with timing interruption/time addition and with connection to a remote potentiometer
- Optionally 1 changeover contact programmable as instantaneous contact (for MK....N models with the exception MK 9962N)

Applications

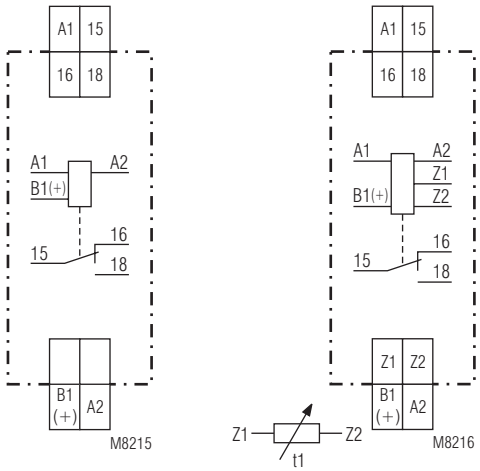
- **Delay on operate:**
  Lead timing circuits (e.g. preheating); delay times in control systems: delayed starting of plant components, e.g. starting of slipring motors (switching starting resistors), burner controls, escalators, elevators
- **Release delay:**
  After-run timing, e.g. fans, lighting controls, staircase lighting, minute lighting, delayed switching to emergency generating set/lighting
  Without auxiliary voltage: used for release times < 5 minutes
  With auxiliary voltage: used for release times > 5 minutes and for very short operating times
- **Flasher timers:**
  trigger fault indicators or navigation lights, for example: flashing lights on cranes, wind parks, airport lighting systems
- **Cyclic timers:**
  traffic light control systems, automatic baking machines
- **Fleeting action**
  Fleeting NO timers: dosing systems, washing facilities
  Fleeting NC timers:
- **Pulse shapers:**
  in switch cabinets, for example: setting the length of different signals
- **Multifunction relays:**
  versatile by function selection
- **Star delta timers:**
  automatic starting control for motors, for example

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

- 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 0.02 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

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

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

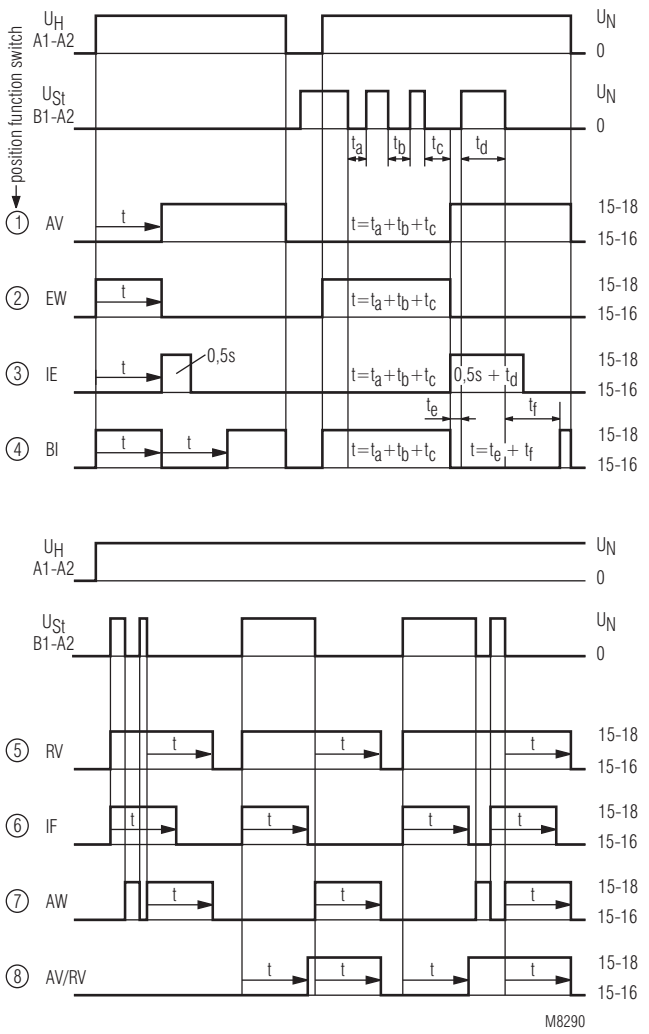
Control of A1-A2 with proximity sensors
The input can be controlled by DC 3 wire or AC/DC 2 wire proximity sensors. For operating voltage > 24 V and usage of sensors without built-in short circuit protection a protection resistor on A1 is recommendend to reduce the inrush current. The dimension is as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

Function Diagram

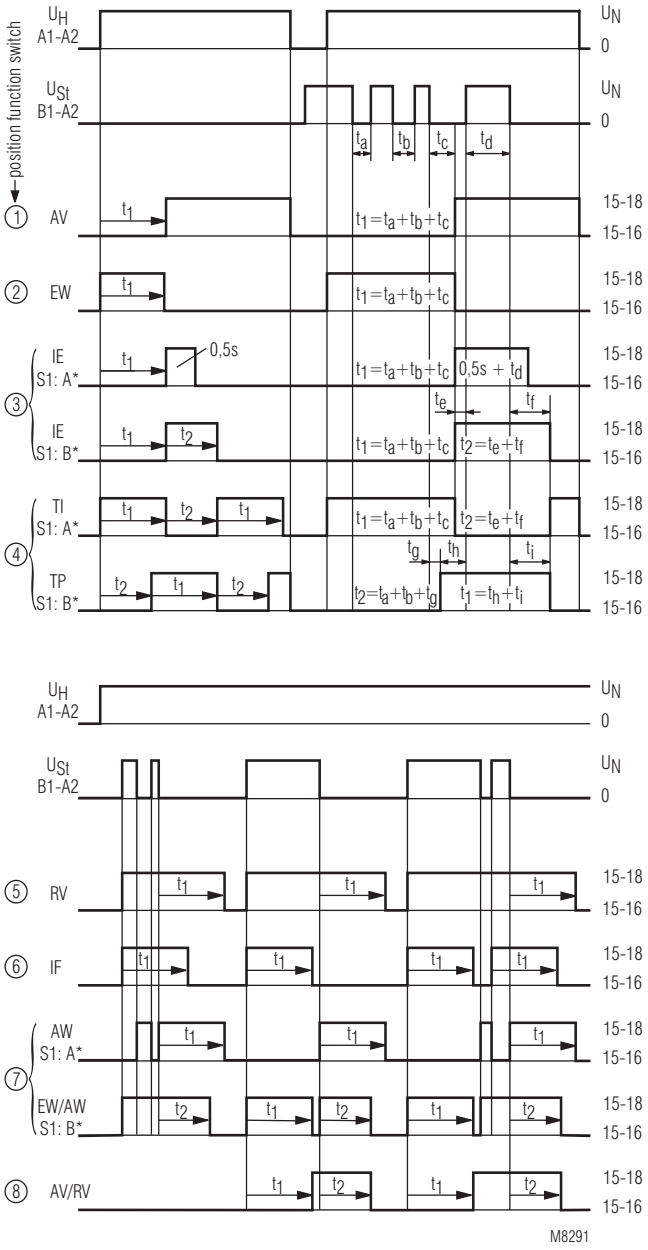


IK 7817N/200, SK 7817N/200

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).

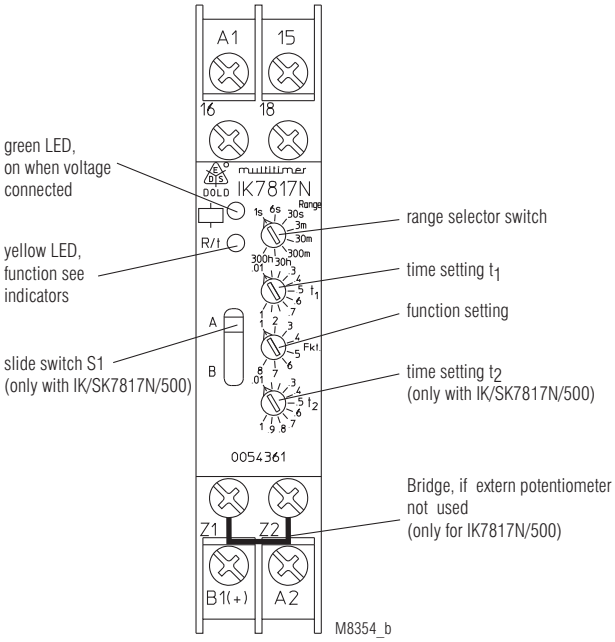
Control input B1
The functions RV, IF, AW, AV / RV have to be controlled via input B1 (+) with voltage against A2. The control signal could be the same as the auxiliary/control voltage of A1 or any other voltage between 12 and 240 V AC or DC. Operating a parallel load between B1 and A2 is also possible.

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. 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	
AC 12 V:	approx. 1.5 VA
AC 24 V:	approx. 2 VA
AC 240 V:	approx. 3 VA
DC 12 V:	approx. 1 W
DC 24 V:	approx. 1 W
DC 240 V:	approx. 1 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 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13 at 0.1 Hz:	1 A / DC 24 V	IEC/EN 60 947-5-1
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 gL	IEC/EN 60 947-5-1
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:	< 2.000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF-irradiation		
80 MHz ... 1 GHz:	20 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 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:	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:	DIN 46 228/-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 60 999-1
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 61 373
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

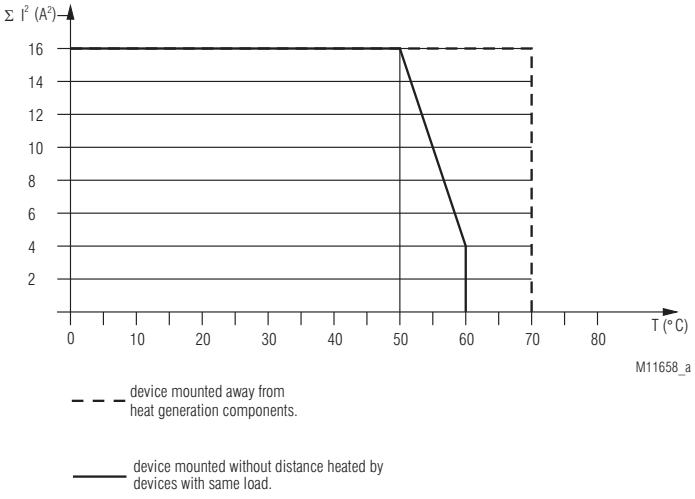
IK/SK 7817N.81/500: With 2 additional functions selectable via slide switch S1:
- Cyclic timer, start with break (TP)
- Fleeting on make and break (EW/AW) second time setting t2, connection facility for remote potentiometer 10 kΩ (t1)

Ordering example for variant

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

- Nominal voltage
- Variant
- Contacts
- Type

Characteristics

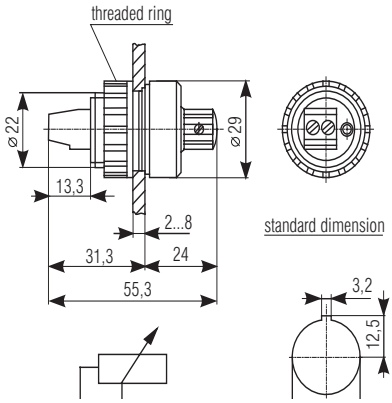


Accessories

AD 3: External potentiometer 10 kΩ
Article number: 0028962

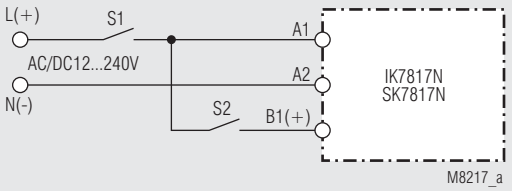
The external potentiometer is used for remote setting of the time delay. The internal potentiometer of the timer must be set to min. time delay.

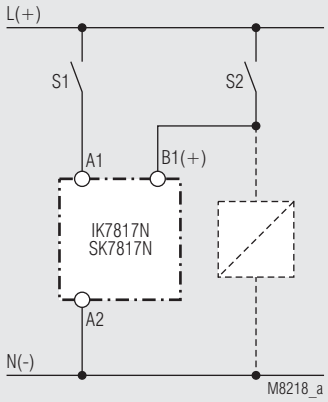
Degree of protection
front side: IP 60



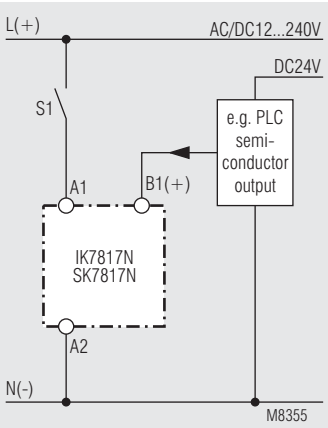
ET 4086-0-2: Additional clip for screw mounting
Article number: 0046578

Connection Examples





Control with parallel connected load



Connection with 2 different control voltages.

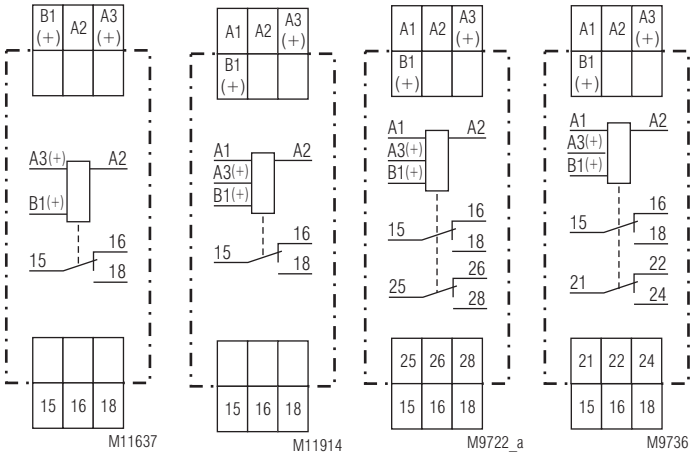
MULTITIMER
Multifunction relay
RK 7817

0274527

Product Description

The multifunction timers RK 7817 in compact stepped front enclosures fulfills all the demands to modern time control devices. It completes the RK- timer range that covers with only a few single function variants all common timing functions, time ranges and voltage models. The MULTI-TIMER offers 8 functions, simply selectable via rotary switch and time ranges between 0.02 s and 300h. Besides the standard 1 c/o contact also a second c/o contact or an instantaneous c/o contact is available as option. Therefore this multifunction timer is suitable to realize flexible, time depending controls in industry and building automation.

Circuit Diagrams



RK 7817.81 with aux. voltage AC/DC 24 V or DC 12 V

RK 7817.81

RK 7817.82

RK 7817.32

Connection Terminals

Terminal designation	Signal description
A1, A3(+), A2	Auxiliary voltage
B1(+), A2	Control input (different control functions depending on selected time function)
15, 16, 18	1. changeover contact (delayed)
25, 26, 28 21, 22, 24	2. changeover contact (delayed) 2. changeover contact (instantaneous contact)

Your Advantages

- Timers in compact design enclosures for consumer units
  - multifunction relay RK 7817 with 8 functions and adjustment aid for quick setting of long times

Features

- According to IEC/EN 61 812-1
- 8 time ranges adjustable from 0.02 s to 300 h via rotational switches
- Dual-voltage-version AC 230 V + AC/DC 24 V or AC 110 ... 127 V + AC/DC 24 V
- Signle-voltage-version AC/DC 24 V or DC 12 V
- 1 changeover contact
- As option units with second changeover contact (only for voltage AC 230 V + AC/DC 24)
  - on delayed
  - as instantaneous contact
- 8 functions via rotational switches adjustable:
  - delay on energisation (AV)
  - fleeting on make (EW)
  - delayed pulse (IE)
  - flasher, start with puls (BI)
  - delay on de-energisation (RV)
  - pulse forming function (IF)
  - fleeting on break (AW)
  - delay on energisation and de-energisation (AV / RV)
- With time interruption / time adding
- LED indicators for operation, contact position and time delay
- As option with plug in terminal blocks for exchange of devices, available
  - with screw terminals
  - with cage clamp terminals
- Width: 17.5 mm

Approvals and Markings

CE c UL us LISTED * Canada / USA

* see variants

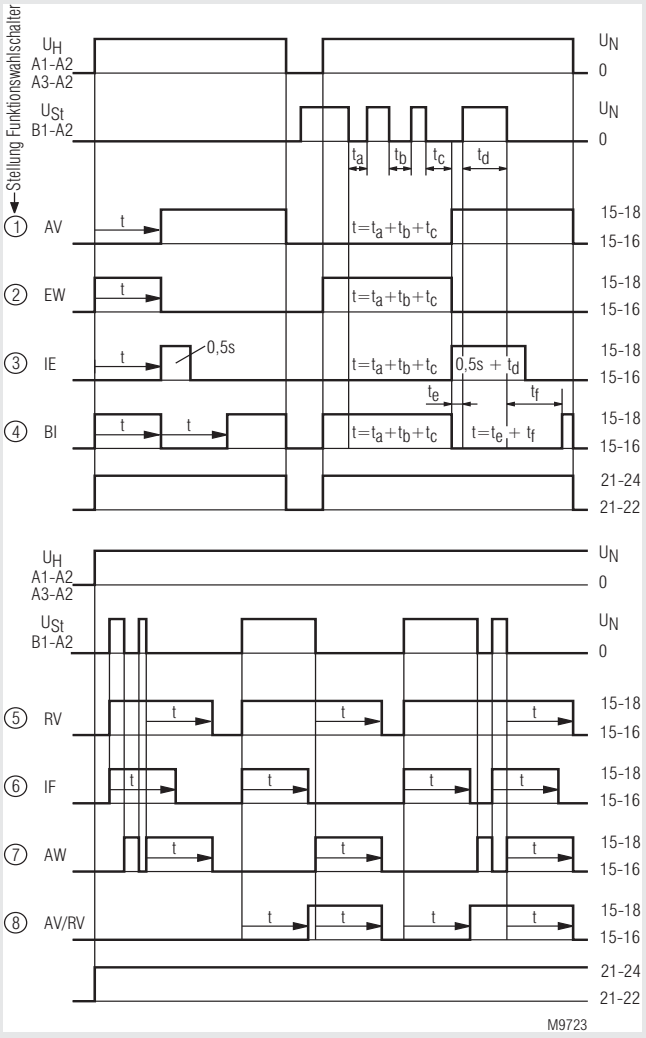
Application

Time dependent controls

Indicators

green LED:	on, when supply connected
yellow LED "R/t":	shows status of output relay and time delay (15-16-18):
-Continuous off:	output relay not active; no time delay
-Continuous on:	output relay active no time delay
-Flashing (short on, long off)	time delay: output relay not active
-Flashing (long on, short off)	time delay: output relay active

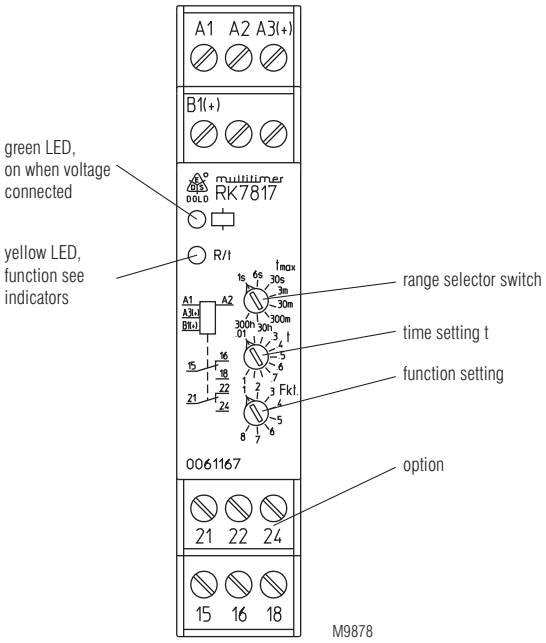
Function Diagramms



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 pusle	⑧	AV/RV	=	Delay on energisation and de-energisation

Setting RK 7817



Notes for setting of the RK 7817

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 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 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
The control input B1 (+) has to be supplied with voltage against A2 with the functions RV, IF, AW, AV / RV. The control signal could be the same as the auxiliary/control voltage of A1 and A3 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 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.	
	0.02*) ... 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
	*) 0.08 s bei Funktion AV und IE	
Time setting:	infinite, 1:100 on relative scale	
Recovery time:	< 100 ms	
Repeat accuracy:	≤ 0.8 % of set time delay + 20 ms	
Voltage influence:	≤ 1 %	
Temperature influence:	≤ 2 % at range 0 ... +60°C ≤ 5 % at range -20 ... 0°C	

Input

Nominal voltage U_N:	AC/DC 24 V [1] + AC 230 V [2] or AC/DC 24 V [1] + AC 110 ... 127 V [2] or AC/DC 24 V [1] or DC 12 V [1] [1] at terminals A3-A2 [2] at terminals A1-A2
Voltage range	
AC:	0.8 ... 1.1 U_N
DC:	0.9 ... 1.25 U_N
Release voltage A1 - A2:	AC 50 Hz approx. 30 V
Release voltage A3 - A2:	DC approx. 4 V
Control current B1:	Input resistance approx. 150 kΩ in series with diode
Min. operate / off time of the control contact B1(+)	
AC 50 Hz:	approx. 25 ms / approx. 60 ms
DC:	approx. 15 ms / approx. 60 ms
Release voltage (B1-A2)	
AC 50 Hz:	approx. 5 V
DC:	approx. 4 V
Nom. consumption AC 24 V:	approx. 1 VA
Nom. consumption AC 230 V:	approx. 7.5 VA
Nom. consumption DC 24 V:	approx. 0.5 W
Nominal frequency:	50 Hz / 60 Hz
Frequency range:	± 5 %

Output

Contacts		
RK 7817.81:	1 changeover contact delayed (15-16-18)	
RK 7817.82:	2 changeover contact delayed (15-16-18), (25-26-28)	
RK 7817.32:	1 changeover contact delayed (15-16-18) 1 changeover contact as instantaneous contact (21-22-24)	
Thermal current I_{th}:	4 A	
Switching capacity according to AC 15		
NO contact:	2 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life:	> 1 x 10^5 switch. cycl.	IEC/EN 60 947-5-1
Mechanical life:	> 1 x 10^7 switching cycles	
Permissible switching frequency (without / at load):	7200 / 360 switching cycles / h	

Technical Data

General Data

Nominal operating mode:	continuous operation	
Temperature range:	- 20 ... + 60°C	
Clearance and creepage distance rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge (ESD):	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V/m	IEC/EN 61 000-4-3
Fast transients:	4 kV	IEC/EN 61 000-4-4
Surge voltage 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:	10 V	IEC/EN 61 000-4-6
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Enclosure:	thermoplastic with VO behaviour according to UL Subject 94	
Vibration resistance:	Amplitude 0.35 mm Frequency 10 ... 55 Hz,	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:		DIN 46 228-1/-2/-3/-4
Fixed screw terminals		
Cross section:	0.34 ... 2.5 mm² (AWG 22 - 14) solid or 0.34 ... 2.5 mm² (AWG 22 - 14) stranded wire with and without ferrules	
Stripping length:	7 mm	
Wire fixing:	Captive slotted screw / M2.5	
Plug-in screw terminals		
Cross section:	0.2 ... 2.5 mm² (AWG 24 - 12) solid or 0.2 ... 2.5 mm² (AWG 24 - 12) stranded wire with and without ferrules	
Stripping length:	7 mm	
Wire fixing:	Captive slotted screw / M2.5	
Plug-in cage clamp terminals		
Cross section:	0.2 ... 2.5 mm² (AWG 24 - 12) solid or 0.25 ... 2.5 mm² (AWG 24 - 12) stranded wire with and without ferrules	
Stripping length:	10 mm	
Wire fixing:	Cage clamp terminal	
Fixing torque:	0.5 Nm	EN 60 999-1
Mounting:	DIN-rail	IEC/EN 60 715
Weight:	70 g	

Dimensions

Width x height x depth:	
RK 7817:	17.5 x 90 x 66 mm
RK 7817 PC:	17.5 x 121 x 66 mm
RK 7817 PS:	17.5 x 107 x 66 mm

UL-Data

Switching capacity:
Ambient temperature 60°C: Pilot duty B300
4A 240Vac G.P.
4A 30Vdc G.P.

Wire connection: 60°C / 75°C copper conductors only
AWG 22 - 14 Sol/Str Torque 0.5 Nm

Technical data that is not stated in the UL-Data, can be found in the technical data section.

Standard Type

RK 7817.81/61 AC 230 V + AC/DC 24 V 0.02 s ... 300 h
Article number: 0061137
- Multifunction relay
- Output: 1 changeover contact
- Nominal voltage U_N: AC 230 V + AC/DC 24 V
- Width: 17.5 mm

Variant

RK 7817.81/61: with UL-approval

Ordering example for variant

RK 7817 .81 _ _ /61 AC 230 V + AC/DC 24 V 50 Hz 0,02 s - 300 h

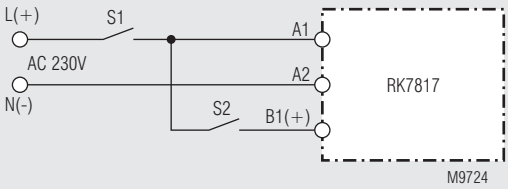
- Time range
- Nominal frequency
- Nominal voltage
- with UL-approval (1 changeover contact)
- Type of terminals
  - without indication: terminal blocks fixed, with screw terminals
  - PC (plug in cage clamp): pluggable terminal blocks with cage clamp terminals
  - PS (plug in screw): pluggable terminal blocks with screw terminals
- Contact
- Type

Options with Pluggable Terminal Blocks

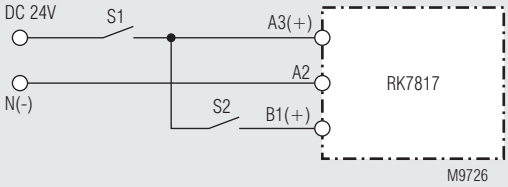
Screw terminal
(PS/plugin screw)

Cage clamp terminal
(PC/plugin cage clamp)

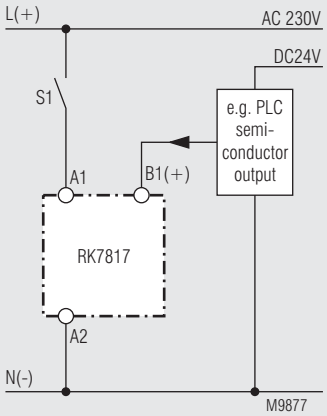
Connection Example



Control with AC 230 V



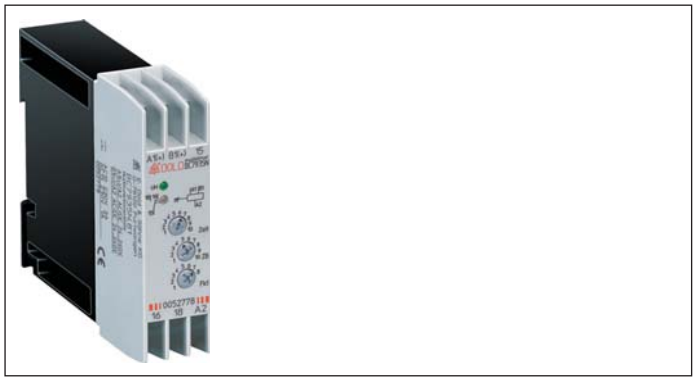
Control with DC 24 V



Controlled via A1 and B1 with different voltages.

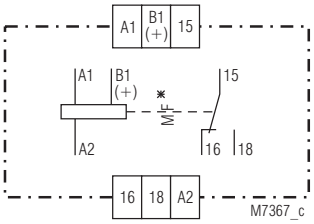
MULTITIMER
Multifunction Relay
BC 7935N

0225499



- According to IEC/EN 61 812-1
- 8 functions selectable by rotational switch:
  - AV - operate delay
  - EW - fleeting on make
  - IE - delayed pulse function
  - BE - flasher start with impulse
  - RV - release delay
  - IF - pulse forming
  - AW - fleeting on break
  - AV/RV - operate / release delay
- With 10 time ranges up to 300 h selectable by rotational switch
- Time addition via control input B1 for the functions AV, EW, IE, BE
- Time ranges up to 300 h
- AC/DC 24 ... 240 V
- 1 changeover contact
- LED indicators for voltage supply and contact position, flashing function during elapse of time
- Wire connection: also 2 x 1.5 mm² stranded ferruled (isolated), DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3
- Width 22.5 mm

Circuit Diagram



Approvals and Markings

CE

Applications

Time-dependent controllers

Indicators

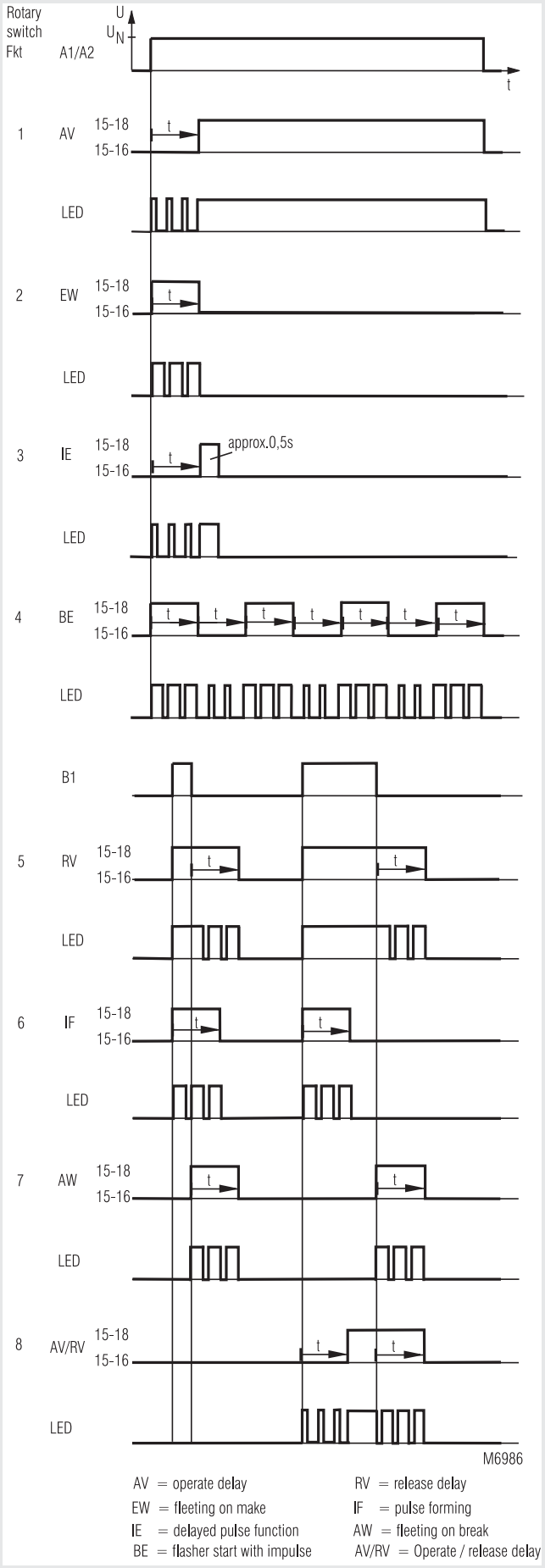
green LED:	on, when supply connected.
yellow LED:	on, when output relay active. Flashes during time delay, pulse-pause-ratio indicates the state of the output relay (see Function Diagramm).

Notes

The functions RV, IF, AW, AV/RV have to be controlled by input B1(+) according to the connection Diagram.
At the functions AV,EW,IE, BE the timing cycle can be stopped by closing S2 (see Diagram). When opening S2 the timing cycles continues.

Technical Data

Function Diagram



Technical Data

Time Circuit

Time ranges:	0.05 ... 1 s	1.5 ... 30 min
	0.15 ... 3 s	15 ... 300 min
	0.5 ... 10 s	1.5 ... 30 h
	1.5 ... 30 s	15 ... 300 h
	5 ... 100 s	
	15 ... 300 s	
	selectable by switch (ZB)	
Time setting:	infinitely variable 1:20	
Recovery time:	50 ms	
Repeat accuracy:	2 %	
Voltage influence:	≤ 1 %	
Temperature influence:	0.05 % / K	

Input

Nominal voltage U_N
A1 / A2, B1(+) / A2: AC/DC 24 ... 240 V, DC 12 V
Voltage range: 0.8 ... 1.1 U_N
Nominal consumption:

AC		DC	
24 V	240 V	24 V	240 V
1.1 VA	4.1 VA	0.93 W	1.95 W

Nominal frequency: 50 / 60 Hz
Release voltage: AC: ≥ 15 % U_N, DC: ≥ 5 % U_N
Min. ontime of control input B1: AC 30 ms, DC 10 ms

Output

Contacts:	1 changeover contact	
Thermal current I_{th}:	4 A	
Switching capacity		
to AC 15:	3 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	typ. 150 000 switching cycles	
Short circuit strength		
max. fuse rating:	4 A gL	IEC/EN 60 947-5-1
Mechanical life:	10^8 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:	0 ... + 60°C	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V/m	IEC/EN 61 000-4-3
Fast transients:	2 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:	2 kV	IEC/EN 61 000-4-5
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplastic with V0 behaviour to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	0 / 060 / 04	IEC/EN 60 068-1
Terminal arrangement:	DIN 46 199-5	
Terminal designation:	EN 50 005	

Technical Data

Wire connection:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated) or 2 x 1.5 mm² stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3
Wire fixing:	Terminal screws M 3.5 Box terminal with wire protection
Mounting:	DIN rail IEC/EN 60 715
Weight:	105 g

Dimensions

Width x height x depth:	22.5 x 84 x 97 mm

Standard Type

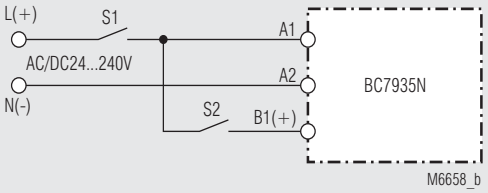
BC 7935N.81 AC/DC 24 ... 240 V 50/60 Hz
Article number: 0052778

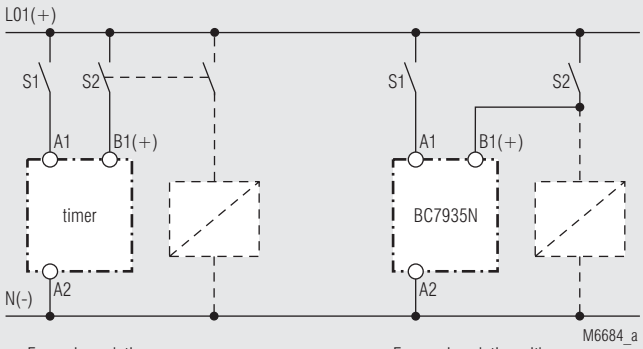
- Front colour grey, with box terminals
- Output: 1 changeover contact
- Nominal voltage U_N: AC/DC 24 ... 240 V
- Width: 22.5 m

Ordering Example

BC 7935N .81 AC/DC 24 ... 240 V 50 / 60 Hz
- 50 / 60 Hz: Nominal frequency
- AC/DC 24 ... 240 V: Nominal voltage
- .81: Contacts
- BC 7935N: Type

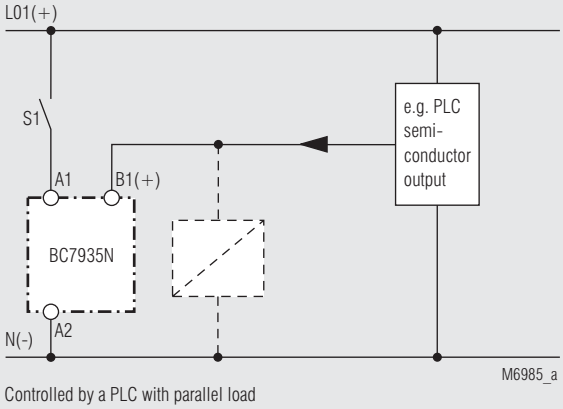
Connection Examples





Expensive solution to operate an additional parallel load

Economic solution with DOLD BC7935N



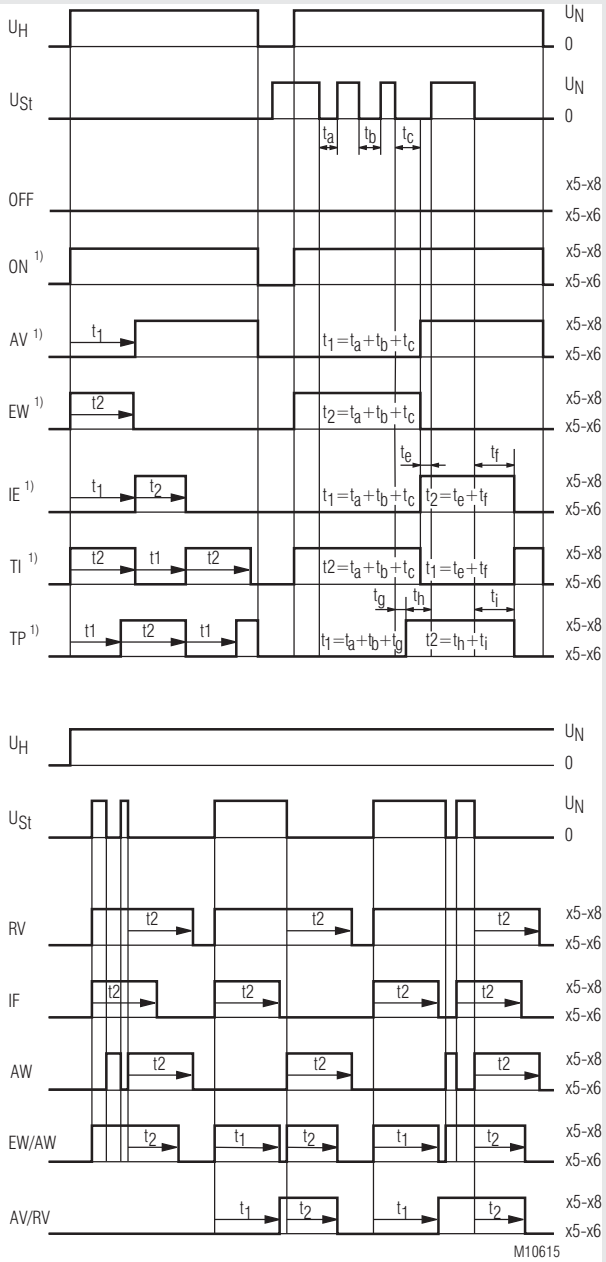
Controlled by a PLC with parallel load

MULTITIMER
Multifunction Relay, digital
MK 7830N

DOLD

0265927

Function Diagram



U_H = Operating voltage A1-A2 or A3-A2
U_{ST} = Control voltage Bx-A2 x = 1, 2

1) These functions can also be started by the control input B1 if configured accordingly.
The interruption of time then is not available.

Your advantages
- Always the correct timer on stock
- Space saving in industrial cabinets because 2 multifunction relays in one compact enclosure
- Precise time delay by digital setting

Features
- According to IEC/EN 61 812-1
- Digital adjustable multifunction timer
- Functions can be adjusted separately for each output relay
  - Off (OFF)
  - Instantaneous contact (ON)
  - On-delay (AV)
  - Fleeting on make (EW)
  - Delayed pulse with adjustable pulse length (IE)
  - Cyclic timer, start with impulse (TI)
  - Cyclic timer, start with break (TP)
  - Off-delay (RV)
  - Pulse forming function (IF)
  - Fleeting on break (AW)
  - Fleeting on make and break (EW / AW)
  - On and off delay (AV / RV)
  - Relay 1 = Relay 2, both switch simultaneously
- Dual voltage model AC 230 V + AC/DC 24 V
- 2 changeover contacts
- 2 times separately adjustable from 0.02s to 9999h
- LED-indicator
- As option with pluggable terminal blocks for easy exchange of devices
  - with screw terminals
  - or with cage clamp terminals
- Width: 22.5 mm

Approvals and Markings

CE

Applications

The MK 7830N is the ideal timer for timing control functions in industry. The simple and userfriendly configuration allows an optimised adaption to the application. The multifunction timer is also suitable for service and maintenance as it can replace timers with different functions and time ranges.

Indicators

The LED indicates the device status

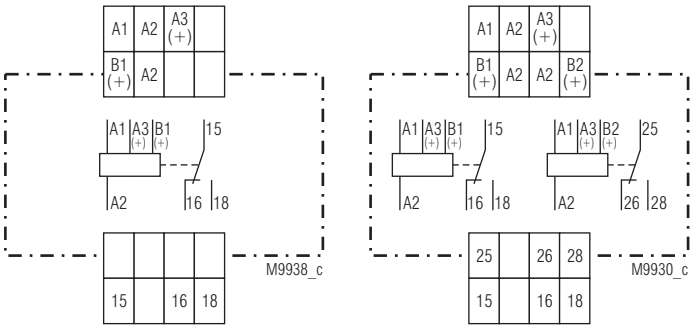
OFF:	No operation voltage (A1/A2 bzw. A3/A2).
green:	The device is in operating mode
orange flashing:	The device is in set up mode
red:	Failure

For the chosen output relay the setting parameters are cyclically displayed

Display mode 1:	For the chosen output relay the setting parameters are cyclically displayed.
Display mode 2:	For the chosen output relay the time delay is displayed. The remaining time until the contact switches is indicated. This mode is only available when at least one time value t1 or t2 of the timing function is set to > 1 sec.

By pressing the button „ ⬆ “ the display can be toggled between relay 1 and relay 2. 2 display modes are available, the change between the modes is made by pressing the button „ ⬇ “.

Circuit Diagrams



MK 7830N.81 MK 7830N.82

Connection Terminals

Terminal designation	Signal description
A1	Supply voltage (L; AC 230 V)
A3(+)	Supply voltage (L / +; AC/DC 24 V)
A2	Supply voltage (N / -)
B1(+)	Control input (different function depending on chosen timing function). Control with reference to A2
B2(+) *)	Control input (different function depending on chosen timing function). Control with reference to A2
15, 16, 18	Changeover contact
25, 26, 28 *)	Changeover contact

*) only at MK7830N.82

Error Indication

In case of a failure the status LED is red and the text in the display shows the failure description

„Err.1“: Parameter checksum failure for output relay 1. The failure can be resolved by new configuration of output relay 1.

„Err.2“: Parameter checksum failure for output relay 2. The failure can be resolved by new configuration of output relay 2.

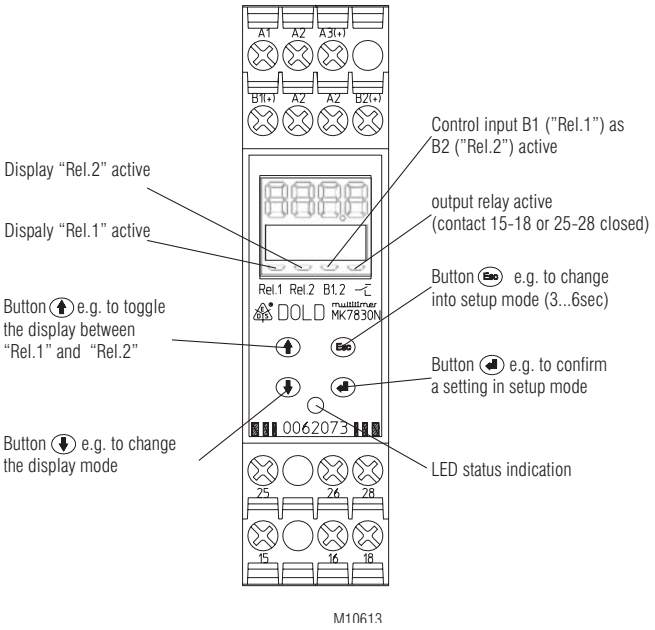
Notes

Factory setting
The output relays Rel.1 and Rel.2 are set to function OFF. The contacts 15-16 and 25-26 are closed. The function setup is described in section “Programming”.

Control inputs B1 and B2
The control inputs are assigned to the corresponding output relays. The input B1(+) acts on Rel.1, the input B2(+) on Rel.2. The functions RV, IF, AW,EW/AW and AV/RV have always to be controlled with one of the control inputs with reference to A2. For the functions ON, AV, EW, IE, TI and TP the control can be selected between B1, B2 and operating voltage during setup.
To control B1(+) and B2(+) the voltage of A1, A3, or any other voltage in the range of AC/DC24-240 can be used.
When with selected function IF the control inputs B1 or B2 are connected to the unit simultaneously with A1 or A3 an output pulse of the length t2 is generated.

Interruption of time delay / time addition with B1 or B2
If for the functions AV, EW, IE, TI and TP the control is assigned to the operating voltage the time delay can be stopped by activating the corresponding control input. It continues the time delay by de-activating the control input (time addition).

Setting



Technical Data

Time circuit

Time ranges:	7 time ranges in one unit
	20*) ... 9999 ms (Δt = 1 ms)
	0.1 ... 999.9 s (Δt = 0.1 s)
	1 ... 9999 s (Δt = 1 s)
	0.1 ... 999.9 min (Δt = 0.1 min)
	1 ... 9999 min (Δt = 0.1 min)
	0.1 ... 999.9 h (Δt = 0.1 h)
	1 ... 9999 h (Δt = 1 h)
	*) 80 ms at function RV
Time setting t1, t2:	digital (see Setting)
Recovery time:	< 100 ms
Repeat accuracy	
Start with operation voltage:	± (0.03 % of set value + 50 ms)
Start control input:	± (0.03 % of set value + 20 ms)
Saving the parameters:	≥ 1 x 10^5 Writing cycles

Input

Nominal voltage U_N:	AC/DC 24 V[1] or AC 230 V[2]
	[1] at terminals A3-A2
	[2] at terminals A1-A2
Voltage range:	
AC:	0.8 ... 1,1 U_N
DC:	0.9 ... 1.25 U_N
Release voltage (A1-A2):	
AC 50 Hz:	75 V
Release voltage (A3-A2):	
DC:	7 V
Control voltage (B1-A2 ; B2-A2):	AC/DC 12 ... 240 V
Control current B1; B2:	input resistance approx. 150 kΩ in series with diode
Min. on/off time of control input B1(+); B2 (+):	
AC 50 Hz:	25 ms / 80 ms
DC:	10 ms / 80 ms
Release voltage (B1-A2; B2-A2):	
AC 50 Hz:	4.5 V
DC:	4 V
Nominal power consumption:	
AC 24 V:	1.4 VA
AC 230 V:	9 VA
DC 24 V:	0.9 W
Nominal frequency:	50 Hz
Frequency range:	± 5 %

Technical Data

Output

Contacts:		
MK 7830N.81:	1 changeover contact	
MK 7830N.82:	2 changeover contacts Rel.1: contact 15-16-18 Rel.2: contact 25-26-28	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	2 x 4 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13:	1 A / DC 24 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	1.5 x 10^5 switching cycles	
Permissible switching frequency:	36 000 switching cycles / h	
Short circuit strength		
max. fuse rating:	4 A gL	IEC/EN 60 947-5-1
Mechanical life:	≥ 1 x 10^8 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	0 ... + 55 °C	
Storage:	-20 ... + 70 °C	
Relative air humidity:	93 % at 40 °C	
Altitude:	< 2,000 m	
Clearance and creepage distances		
rated impulse voltage /		
Input / Output:	4 kV / 3 (basis insulation)	IEC 60 664-1
Output / Output:	4 kV / 3 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF-irradiation		
80 MHz ... 1 GHz:	12 V / m	IEC/EN 61 000-4-3
1 GHz ... 2,7 GHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	2 kV	IEC/EN 61 000-4-4
Surge voltages between		
wires for power supply A3, A2:	1 kV	IEC/EN 61 000-4-5
wires for power supply A1, A2:	2 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 55 011
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:	10 / 055 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection		DIN 46 228-1/-2/-3/-4
Screw terminals (integrated):	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated) or 2 x 1.5 mm² stranded ferruled (isolated) or 2 x 2.5 mm² solid	
Insulation of wires or sleeve length:	8 mm	
Plug in with screw terminals		
max. cross section for connection:	1 x 2.5 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated)	
Insulation of wires or sleeve length:	8 mm	

Technical Data

Plug in with cage clamp terminals		
max. cross section for connection:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled	
min. cross section for connection:	0.5 mm²	
Insulation of wires or sleeve length:	12 $^{\pm 0.5}$ mm	
Wire fixing:	Plus-minus terminal screws M 3.5 box terminals with wire protection or cage clamp terminals	
Wire fixing:	Box terminals with wire protection	
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	approx. 130 g	

Dimensions

Width x heigth x depth	
MK 7830N:	22.5 x 90 x 99 mm
MK 7830N PC:	22.5 x 111 x 99 mm
MK 7830N PS:	22.5 x 104 x 99 mm

Standard Type

MK 7830N.82 AC/DC 24 V + AC 230 V 50 Hz

Article number:	0062073
• Ausgang:	2 changeover contacts
• Nominal voltage U_N:	AC/DC 24 V + AC 230 V
• Time ranges:	from 0.02 s ... 9999 h
• Width:	22.5 mm

Ordering Example

MK 7830N .82 _ _ AC/DC 24 V + AC 230 V

- AC/DC 24 V + AC 230 V: Nominal voltage
- _ _: Type of terminals
  without indication: terminal blocks fixed with screw terminals
  PC (plug in cage clamp): pluggable terminal blocks with cage clamp terminals
  PS (plug in screw): pluggable terminal blocks with screw terminals
- .82: Contacts
- MK 7830N: Type

Options with Pluggable Terminal Blocks

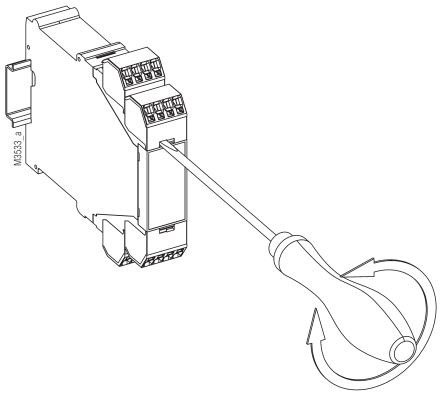
Screw terminal
(PS/plugin screw)

Cage clamp
(PC/plugin cage clamp)

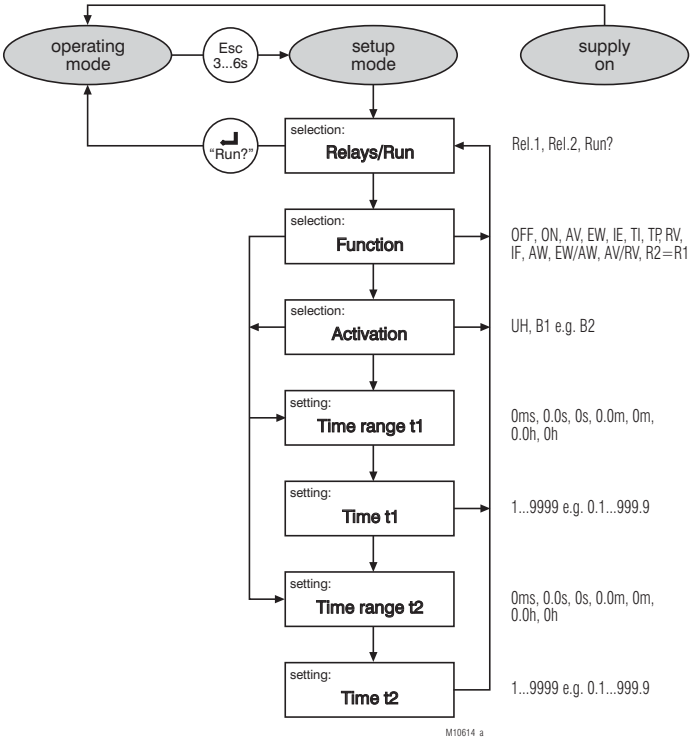
Notes

Removing the terminal blocks with cage clamp terminals

1. The unit has to be disconnected.
2. Insert a screwdriver in the side recess of the front plate.
3. Turn the screwdriver to the right and left.
4. Please note that the terminal blocks have to be mounted on the belonging plug in terminations.

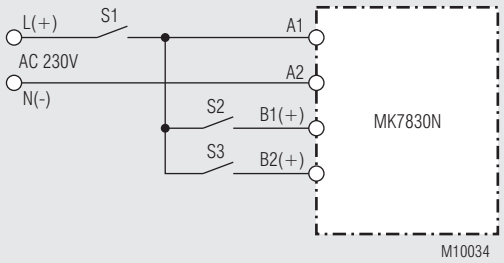


Programming

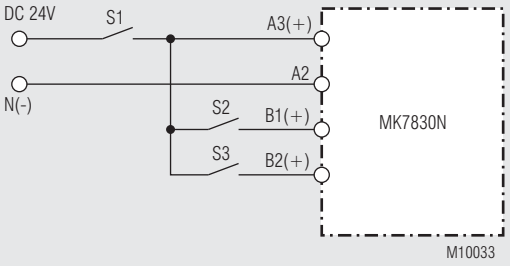


If the button „ (Esc) “ is pressed and released after 3 to 6 sec while the power is applied, the unit changes into setup mode. The status LED indicates this flashing yellow. When changing to setup mode the time delay is interrupted and the output relays de-energize to position 15-16 and 25-26.
. In setup mode the first step “Relais/Run” selects the output relay Rel.1 or Rel.2 to be configured. Using the buttons „ (↑) “ and „ (↓) “ scrolls through the possible selections in this level. The button „ (↵) “ confirms the selection and moves to the next level. After completing the programming cycle the level “Relais/Run” is again displayed while the parameters are finally stored in the unit.
The new settings are activated when changing to operating mode either by selecting Run? In level “Relais/Run” or by switching the unit off and on.

Connection Examples



Control with AC 230 V

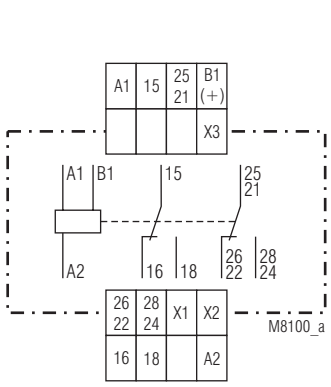


Control with DC 24 V

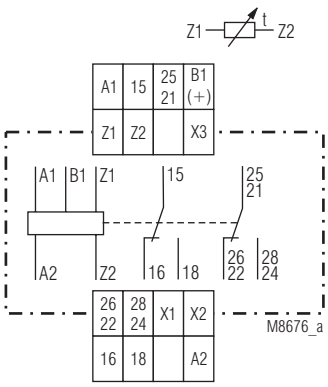
MULTITIMER
Multifunction Relay
MK 7850N/200

0239280

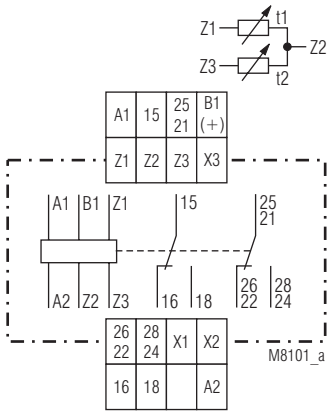
Circuit Diagrams



MK 7850N.82/200



MK 7850N.82/300



MK 7850N.82/500

Your Advantages
- Up to 10 functions in one unit
- Simplified storage
- Increased flexibility
- Quick setting of long time values

Features
- According to IEC/EN 61 812-1
- 8 functions settable via rotational switch:
  - Delay on energisation (AV)
  - Fleeting on make (EW)
  - Delayed 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 to 300 h selectable via rotational switches
- Voltage range AC/DC 12 ... 240 V
- With time interruption / time adding input for all functions
- Suitable for 2-wire proximity sensor control
- 2 changeover contacts, one programmable as instantaneous contact
- LED indicators for operation, contact position and time delay
- Wire connection: also 2 x 1.5 mm² stranded ferruled, or 2 x 2.5 mm² solid DIN 46 228-1/-2/-3/-4
- as option with pluggable terminal blocks for easy exchange of devices
  - with screw terminals
  - or with cage clamp terminals
- 22.5 mm width

MK 7850N/500: as MK 7850N/200 but with
- 2 additional functions:
  - Cyclic timer, start with break (TP)
  - Fleeting on make and break (EW / AW)
- second time setting t_2 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) and setting of pulse length
- Connection facility for 2 external potentiometers

Approvals and Markings

Canada / USA A025518 * see variants

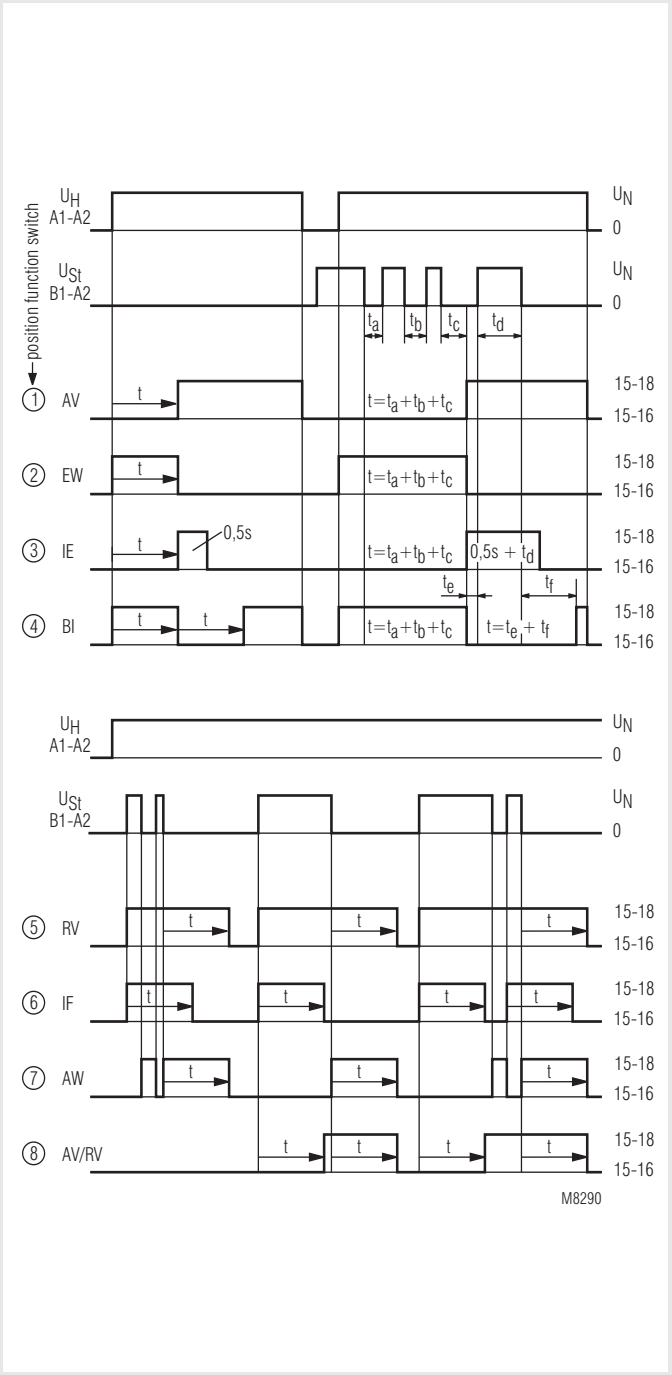
Application

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

Function Diagram

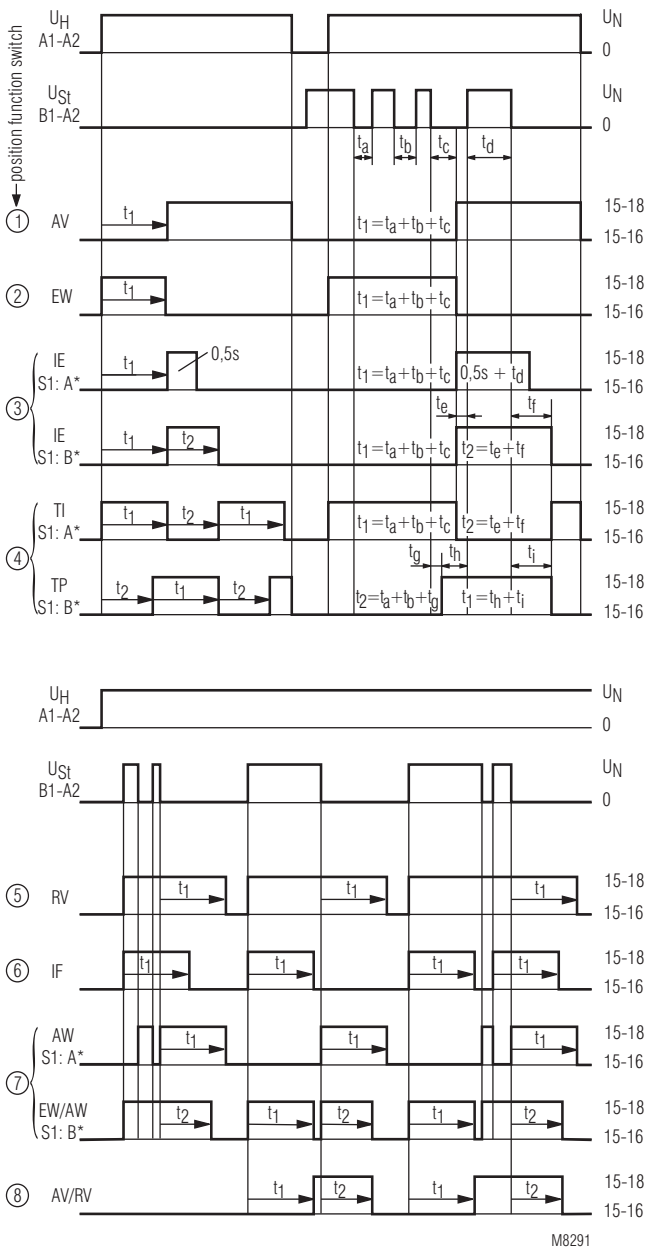


MK 7850N/200

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

MK 7850N/500

①... ⑧ = position of function switch

① AV = Delay on energisation
② EW = Fleeting on make
③ IE = Delayed pulse
S1 in positon 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

Connection Terminals

Terminal designation	Signal description
A1, A2	Auxiliary voltage
B1(+), A2	Control input (various control possible, depending on the time function)
X1, X2	Control input (2. delayed C/O contact or instantaneous contact) X1/X2 not bridged: 2nd delayed C/O contact 25-26-28 X1/X2 bridged: 2nd instantaneous C/O contact 21-22-24
X3, X2	Control input (Time interruption/time adding) X3/X2 bridged: Time interruption X3/X2 not bridged: continued time delay (with time adding)
Z1, Z2	Input for connection of a external potentiometer for time setting t1
Z3, Z2	Input for connection of a external potentiometer for time setting t2
15, 16, 18	1st C/O contact (delayed)
21, 22, 24, 25, 26, 28	2nd C/O contact (delayed), if X1/X2 not bridged 2nd C/O contact (instantaneous), if X1/X2 bridged

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)

Instantaneous contact
By external wire links the output function of the device can be altered from 2 delayed contacts to 1 delayed **and** 1 instantaneous contact. The contact 25-26-28 is delayed without bridge on X1-X2, it is instantaneous with bridge on X1-X2. The legend term is 21-22-24. The instantaneous contact switches when the operating voltage is connected. To terminals X1 and X2 no other voltage potentials must be connected, as the unit might be damaged.

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 B1
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).

Notes

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 controlled simultaneously a pulse with the adjusted length is started. With the variant MK 7850N/500 the output pulse can be disabled by setting the slide switch in Position "B".

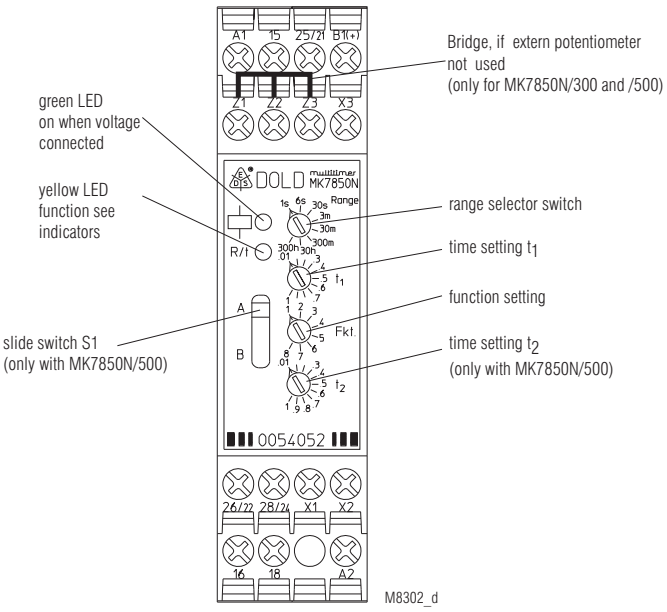
Time interruption and time addition with X3
On all functions, also with RV,IF, AW (EW/AW) and AB/RV the time delay can be interrupted during timing by bridging the terminals
X2 - X3. By opening the bridge the time continues (time addition).
While X2 and X3 are bridged the control input is disabled and the yellow LED remains in the state it had at stop. No external voltage must be connected to X2 and X3 as the unit may be damaged.

Remote potentiometers
Both settings on variant MK 7850N/500 can also be made by remote potentiometers of 10 kOhms:
- terminals Z1 - Z2: potentiometer for time t1
- terminals Z2 - Z3: potentiometer for time t2

When connecting a remote potentiometer the corresponding potentiometer has to be set to min. If no remote potentiometers are required the terminals Z1-Z2 resp. Z2-Z3 have to be linked.
The wires to the remote potentiometers 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 Z2.
To terminals Z1, Z2 and Z3 no external voltage must be connected, as the unit might be damaged.

Additional function
With the variant MK 7850N/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 potentiometer (see Function Diagram) the time range is the same as for t1.

Setting



Attention
If no remote potentiometers at MK 7850N/500 are required the terminals Z1-Z2 resp. Z2-Z3 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 MK 7850N/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)	
	Delayed contact
AC 50 Hz:	approx. 7.5 V
DC:	approx. 7 V
	Instantaneous contact
AC 50 Hz:	approx. 3 V
DC:	approx. 3.3 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:	approx. 1mA, over complete voltage range
Min. on/off time of control input B1(+):	
AC 50 Hz:	approx. 15 ms / approx. 60 ms
DC:	approx. 5 ms / approx. 60 ms
Release voltage (B1/A2)	
AC 50 Hz:	approx. 3.5 V
DC:	approx. 3 V
Nominal power consumption	
AC 12 V:	approx. 1.5 VA
AC 24 V:	approx. 2 VA
AC 240 V:	approx. 3 VA
DC 12 V:	approx. 1 W
DC 24 V:	approx. 1 W
DC 240 V:	approx. 1 W
Nominal frequency:	45 ... 400 Hz

Output

Contacts		
MK 7850N.82:	2 changeover contacts, one programmable as instantaneous contact:	
without bridge X1-X2:	25-26-28 delayed changeover contact	
with bridge X1-X2:	21-22-24 instantaneous contact at U_N on A1-A2	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	see quadratic total current limit curve (max. 4 A per contact)	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13 at 0.1 Hz:	1 A / DC 24 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	1.5 x 10^5 switching cycles	
Permissible switching frequency:	36 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gL	IEC/EN 60 947-5-1
Mechanical life:	≥ 30 x 10^6 switching cycles	

Technical Data

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 40 ... + 60 °C (higher temperature see quadratic total current limit curve)	
Storage:	- 40 ... + 70 °C	
Relative air humidity:	93 % at 40 °C	
Altitude:	< 2.000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF-irradiation		
80 MHz ... 1 GHz:	20 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	2 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:	10 V	IEC/EN 61 000-4-6
Interference suppression:	Limit value class B	EN 55 011
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		DIN 46 228-1/-2/-3/-4
Screw terminals (integrated):	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled or 2 x 1.5 mm² stranded ferruled or 2 x 2.5 mm² solid	
Insulation of wires or sleeve length:	8 mm	
Plug in with screw terminals		
max. cross section for connection:	1 x 2.5 mm² solid or 1 x 2.5 mm² stranded ferruled	
Insulation of wires or sleeve length:	8 mm	
Plug in with cage clamp terminals		
max. cross section for connection:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled	
min. cross section for connection:	0.5 mm²	
Insulation of wires or sleeve length:	12 $^{\pm 0.5}$ mm	
Wire fixing:	Plus-minus terminal screws M 3.5 box terminals with wire protection or cage clamp terminals	
Wire fixing:	Box terminals with wire protection	
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	approx. 150 g	

Dimensions

Width x heigth x depth	
MK 7850N/200:	22.5 x 90 x 97 mm
MK 7850N/200 PC:	22.5 x 111 x 97 mm
MK 7850N/200 PS:	22.5 x 104 x 97 mm

Classification to DIN EN 50155

Vibration and shock resistance:	Category 1, Class B	IEC/EN 61 373
Ambient temperature:	T1, T2 compliant T3 and TX with operational limitations	
Protective coating of the PCB:	No	

UL-Data

Switching capacity:

Ambient temperature 60°C:	Pilot duty B300 5A 250Vac G.P.
Wire connection:	60°C / 75°C copper conductors only
Screw terminals fixed:	AWG 20 - 12 Sol/Str Torque 0.8 Nm
Plug in screw:	AWG 20 - 14 Sol Torque 0.8 Nm AWG 20 - 16 Str Torque 0.8 Nm
Plug in cage clamp:	AWG 20 - 12 Sol/Str

Technical data that is not stated in the UL-Data, can be found in the technical data section.

CCC-Data

Switching capacity:
to AC 15
NO contact: 1.5 A / AC 230 V

Technical data that is not stated in the CCC-Data, can be found in the technical data section.

Standard Types

MK 7850N.82/200/61 AC/DC 12 ... 240 V
Article number: 0056618

- Output: 2 changeover contacts, one programmable as instantaneous contact
- Nominal voltage U_N: AC/DC 12 ... 240 V
- Time ranges: from 0.02 s ... 300 h
- Width: 22.5 mm

Variants

MK 7850N.82/300: 8 functions with connection facility for 1 remote potentiometer 10 kΩ (t1).

MK 7850N.82/500: second time setting t2, connection facility for 2 remote potentiometers 10 kΩ to adjust t1 and t2,
2 additional functions selectable via slide switch S1:
- Cyclic timer, start with break (TP)
- Fleeting on make and break (EW/AW)

Ordering example for variants

MK 7850N .82 _ _ /_ _ _ /61 AC/DC 12 ... 240 V

- Nominal voltage with UL-approval (Canada / USA)
- Variant
- Type of terminals
  without indication: terminal blocks fixed, with screw terminals
  PC (plug in cage clamp): pluggable terminal blocks with cage clamp terminals
  PS (plug in screw): pluggable terminal blocks with screw terminals
- Contacts
- Type

Options with Pluggable Terminal Blocks

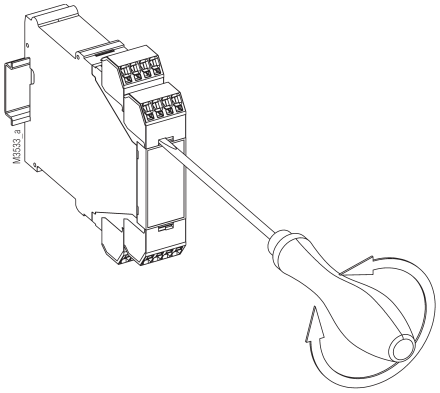
Screw terminal (PS/plugin screw)

Cage clamp (PC/plugin cage clamp)

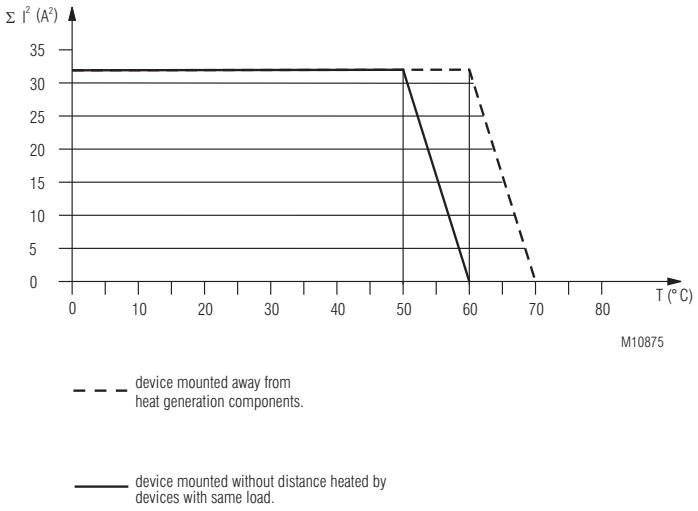
Notes

Removing the terminal blocks with cage clamp terminals

1. The unit has to be disconnected.
2. Insert a screwdriver in the side recess of the front plate.
3. Turn the screwdriver to the right and left.
4. Please note that the terminal blocks have to be mounted on the belonging plug in terminations.



Characteristic



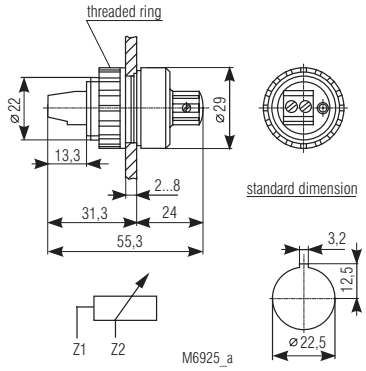
quadratic total current limit curve

Accessories

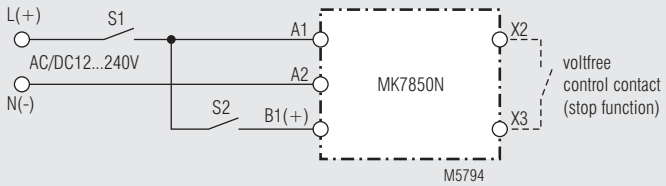
AD 3: External potentiometer 10 kΩ
Article number: 0028962

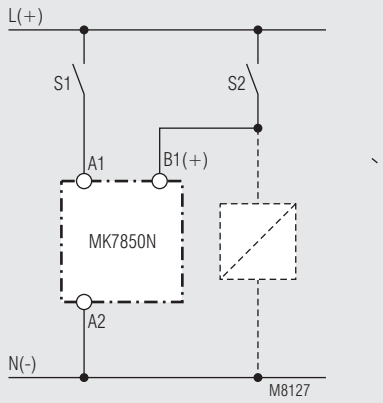
The external potentiometer is used for remote setting of the time delay. The internal potentiometer of the timer must be set to min. time delay.

Degree of protection front side: IP 60

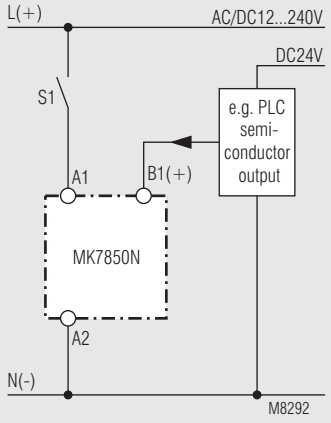


Connection Examples





Control with parallel connected load

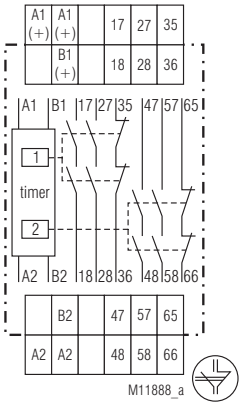


Connection with 2 different control voltages.

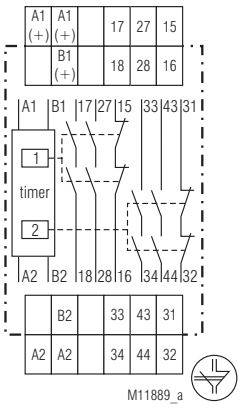
MULTITIMER
Multifunction Relay
SN 7920

0276442

Circuit Diagrams



SN 7920



SN 7920/001

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 7920/001	

Your Advantages
- Higher flexibility (8 function in one unit)
- To switch high DC-loads (DC 110 V) 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

Approvals and Markings

CE

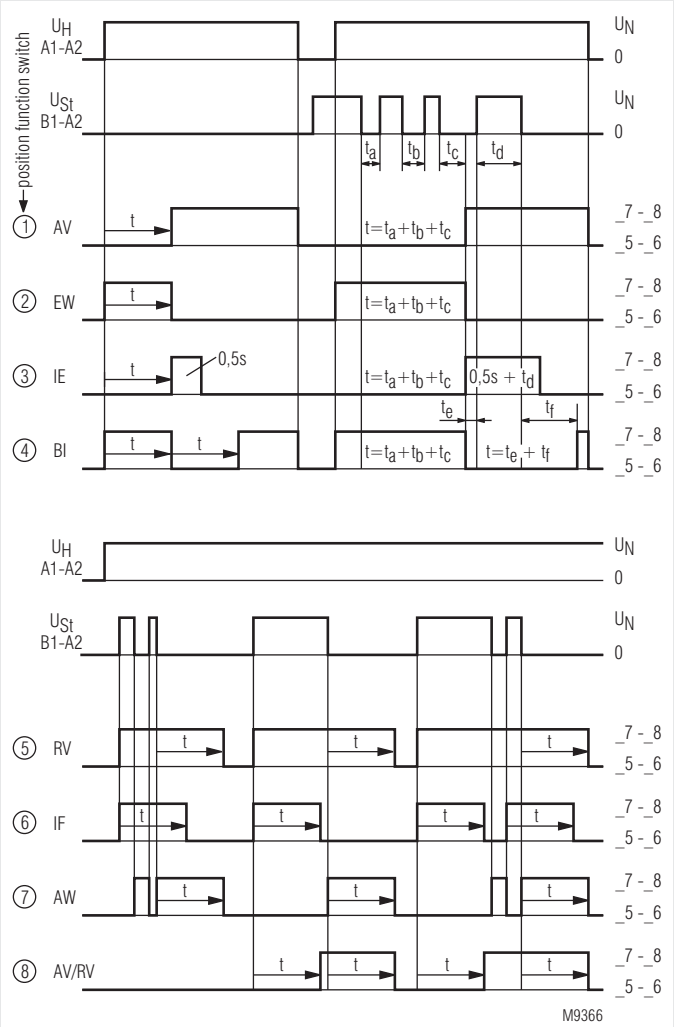
Applications

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
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)



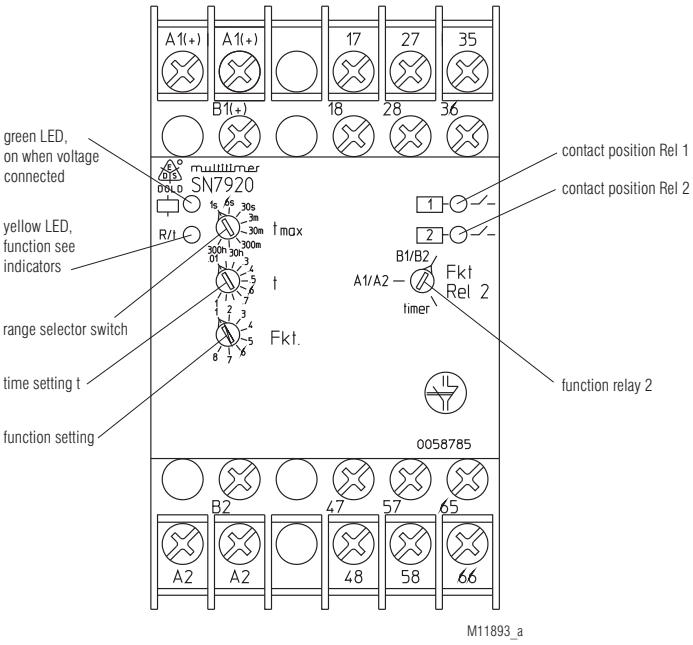
① ... ⑧ = position of function switch

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 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 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
Time setting t:	continuous, 1:100 on relative scale
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	galvanic separated
Nominal voltage U_N:	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:	1 A / DC 110 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 Schaltspiele
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:	Continous	
Temperature range		
Operation:	- 40 ... + 75 °C	
Storage:	- 40 ... + 75 °C	
Altitude:	< 2.000 m	
Clearance and creepage distances	IEC 60 664-1	
Rated voltage:	300 V	
Overvoltage category:	III	
Rated impulse voltage / pollution degree:		
Auxiliary voltage A1(+) / A2 / control input B1(+) / B2	6 kV / 2	
Auxiliary voltage A1(+) / A2 / contacts:	6 kV / 2	
Control input B1(+) / B2 / contacts:	6 kV / 2	
contact / contact:	4 kV / 2 (basis insulation)	
Insulation test voltage, type test:	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:	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 ... 150 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^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 compilant	
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

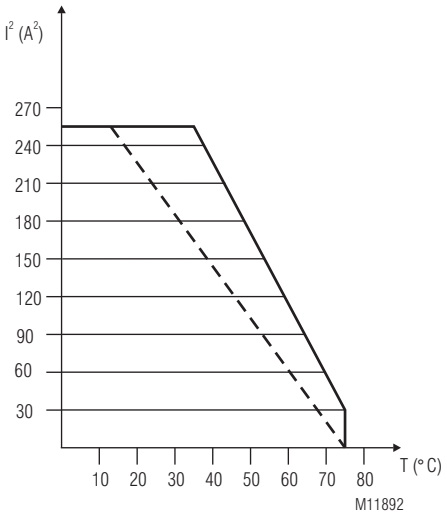
Variant

SN 7920/001	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

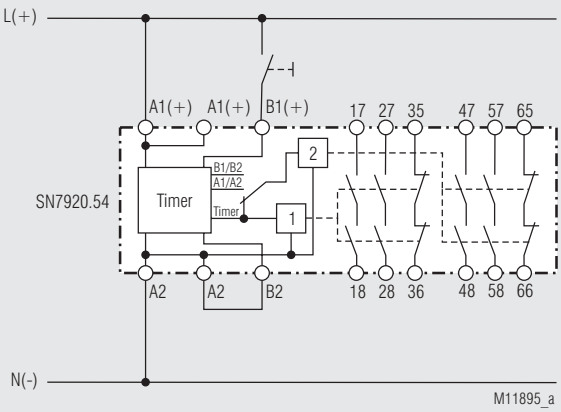
– – – device mounted without distance heated by devices with same load

$$\Sigma I^2_{th} = I^2_{th1} + I^2_{th2} + I^2_{th3} + I^2_{th4}$$

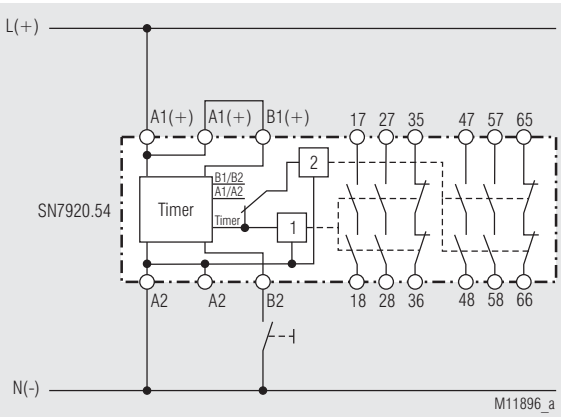
I_{th1} , I_{th2} , I_{th3} , I_{th4} : current in contact paths

Quadratic total current limit curve

Application Examples



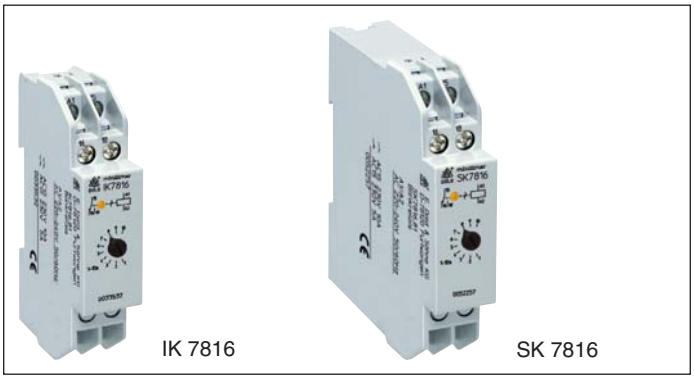
SN 7920



SN 7920/001

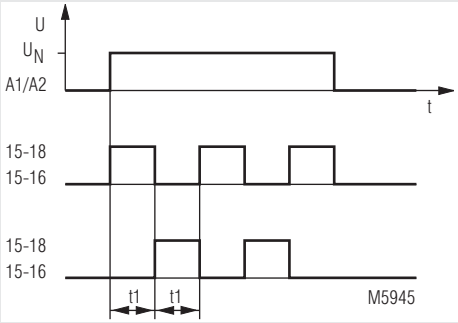
MINITIMER
Flasher Relay
IK 7816, SK 7816

0222114



- According to IEC/EN 61 812-1
- Pulse time up to 100 s
- Adjustable flashing time
- Repeat accuracy ≤ 1 %
- Start with a pulse
- LED indicator for contact position
- 1 changeover contact
- Devices available in 2 enclosure versions:
  IK 7816: depth 58 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  SK 7816: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable ducts
- Width 17.5 mm

Function Diagram



Approvals and Markings

CE

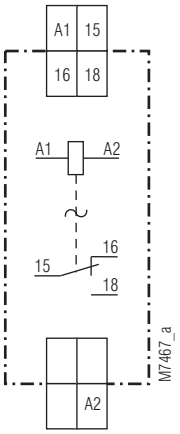
Application

Time-based control equipment

Indicator

LED: on when the output relay is activated (contact 15 - 18 is closed)

Circuit Diagram



Notes

A change of the time setting is directly valid.
If a time is changed during time elaps, the output relay may energise unintended.

Connection Terminals

Terminal designation	Signal description
A1	L / +
A2	N / -
15, 16, 18	Changeover contact

Technical Data

Time circuit

Time range:	0.1 ... 1 s = 300 ... 30 pulses/min
	0.3 ... 3 s
	1 ... 10 s
	3 ... 30 s
	10 ... 100 s
	1 ... 10 min
	3 ... 30 min
	6 ... 60 min
Pulse duty factor:	1 : 1
Setting:	Infinitely variable, on relative scale
Recovery time	
tw 50 / 100:	< 60 ms
Repeat accuracy:	0.1 %
Voltage influence:	≤ 1 % at 0.8 ... 1.1 U_N
Temperature influence:	0.05 % / K

Input

Nominal voltage U_N:	AC/DC 12 V, AC/DC 24 V,
	AC 110 ... 127 V, AC 220 ... 240 V
Voltage range:	0.8 ... 1.1 U_N with AC and
	DC 48 % residual ripple
	0.9 ... 1.25 U_N in battery operating mode
Release voltage:	15 % U_N
Nominal consumption:	AC/DC 24 V 0.6 W
	AC 230 V 50 Hz 3.5 VA
Nominal frequency:	50 / 60 Hz
Frequency range:	± 5 %

Output

Contacts:	1 changeover contact	
Contact material:	$AgSnO_2$	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	max. 10 A	
	(see quadratic total current limit curve)	
Switching capacity		
to AC 15		
NO contact:	10 A / AC 230V	IEC/EN 60 947-5-1
NC contact:	5 A / AC 230 V	IEC/EN 60 947-5-1
Glow lamp load:	1200 W	
Electrical life:		IEC/EN 60 947-5-1
AC 15 at 3 A, AC 230 V:	5 x 10^5 switching cycles	
Permissible switching frequency:	6 000 switching cycles/h	
Short circuit strength		
max. fuse rating:	10 AgL	IEC/EN 60 947-5-1
max. line circuit breaker:	B16	IEC/EN 60 947-5-1
Mechanical life:	> 30 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:		
Operation:	- 20 ... + 60°C	
Storage:	- 25 ... + 70°C	
Relative air humidity:	95 % at 40 °C	
Altitude:	< 2.000 m	
Clearance and creepage distances		
Rated impulse voltage/ pollution degree:	4 kV / 2 (base insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	10 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.5 GHz:	3 V / m	IEC/EN 61 000-4-3
2.5 GHz ... 2.7 GHz:	1 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 55 011

Technical Data

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 Subj. 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz,	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:		DIN 46 228-1/-2/-3/-4
Cross section:	2 x 2,5 mm^2 solid or	
	2 x 1,5 mm^2 stranded ferruled	
Stripping length:	10 mm	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0.8 Nm	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Weight		
IK 7816:	75 g	
SK 7816:	94 g	

Dimensions

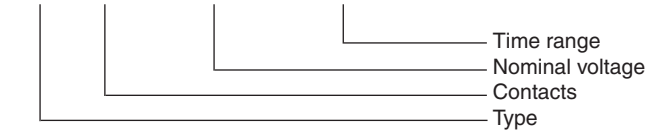
Width x height x depth	
IK 7816:	17.5 x 90 x 58 mm
SK 7816:	17.5 x 90 x 98 mm

Standard Type

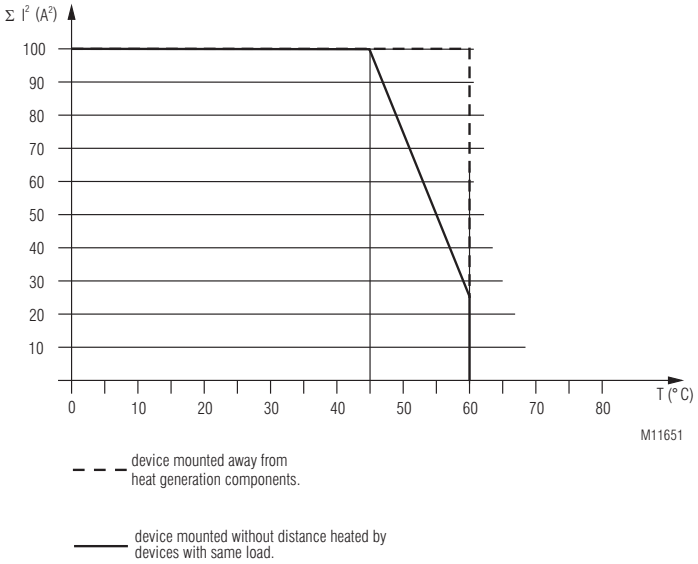
IK 7816.81 AC 220 ... 240 V 1 ... 10 s	
Article number:	0033532
• Output:	1 changeover contact
• Nominal voltage U_N:	AC 220 ... 240 V
• Time range:	1 ... 10 s
• Width:	17.5 mm
SK 7816.81 AC 220 ... 240 V 1 ... 10 s	
Article number:	0052257
• Output:	1 changeover contact
• Nominal voltage U_N:	AC 220 ... 240 V
• Time range:	1 ... 10 s
• Width:	17.5 mm

Ordering Eexample

IK 7816 .81 AC 220 ... 240 V 1 ... 10 s

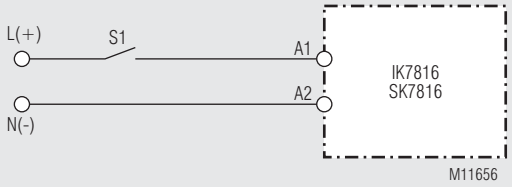


Characteristic



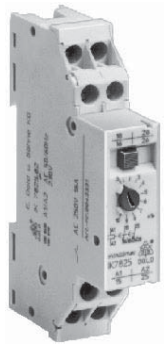
Quadratic total current limit curve

Connection Example



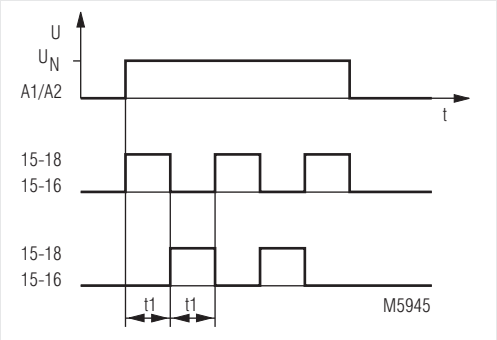
MINITIMER
Flasher Relay
IK 7827

0221568

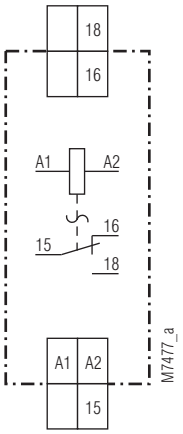


- According to IEC/EN 61 812-1
- Pulse time up to 100 s
- IK 7827 start with pulse
- IK 7827/100 start with pause
- Repeat accuracy ≤ 0.5 % + 10 ms
- Pushbutton for manual actuation of the contact
- 1 changeover contact for 16 A
- Width 17.5 mm

Function Diagram



Circuit Diagram



Approvals and Markings

CE

Application

- Time-dependent controllers

Indicators

Push button:	pressed, when relay energized

Technical Data

Time ranges:	0.05 ... 1 s (equivalent to 600 ... 30 pulses / min.) 0.5 ... 10 s 5 ... 100 s
Tolerance of end value:	- 5 ... + 25 % of nominal value
Time setting:	steppless, 1:20 on relative scale
Recovery time:	approx. 60 ms (during run-down o the pulse time) approx. 700 ms (during run-down of the pause time)
Repeat accuracy:	< ± 0.5 % + 10 ms
Voltage influence:	< 1 % over voltage range
Temperature influence:	< 0.1 % / K

Input

Nominal voltage U_N:	AC 24, 230 V DC 24 V
Voltage range:	90 ... 110 % U_N
Nominal consumption	
AC:	2.3 VA
DC:	1.5 W
Nominal frequency:	50 Hz
Frequency range:	± 5 %

Output

Contacts	
IK 7827.81:	1 changeover contact
Release time of the contacts:	< 30 ms
Thermal current I_{th}:	16 A
Electrical life	at 500 switching cycles / h
under ohmic load AC 230 V:	6 A 150 x 10^4 switching cycles 10 A 72 x 10^4 switching cycles 16 A 12 x 10^4 switching cycles
Inductive load cos φ 0.6:	10 A 10 x 10^4 switching cycles
DC load:	see limit curve for arc-free operation
Short circuit strength	
max. fuse rating:	16 A gL IEC/EN 60 947-5-1
Mechanical life:	> 3 x 10^6 switching cycles

Technical Data

General Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 45 °C	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 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
Interference suppression:	Limit value class B	EN 55 011
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:	20 / 045 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded ferruled DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	100 g	

Dimensions

Width x height x depth: 17.5 x 89 x 58 mm

Standard Type

IK 7827.81	AC 230 V	50 Hz	0.5 ... 10 s
Article number:			0043335
• Output:			1 changeover contacts
• Nominal voltage U_N:			AC 230 V
• Time range:			0.5 ... 10 s
• Width:			17.5 mm

Variant

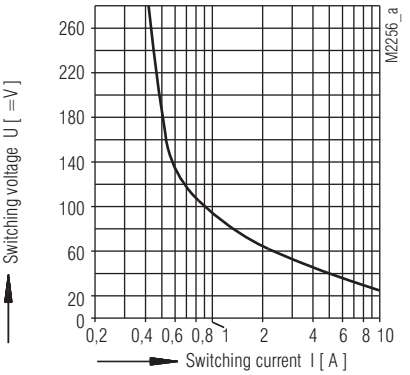
IK 7827.81/100: start with break

Ordering example for variant

IK 7827 .81 / _ _ _ AC 230 V 50 Hz 1 s

- 1 s — Time range limit value
- 50 Hz — Nominal frequency
- AC 230 V — Nominal voltage
- _ _ _ — Variant, if required
- .81 — Contact
- IK 7827 — Type

Characteristics



safe braking, no continuous arcing
max. 1000 switching cycles / h
contact spacing min. 0,6mm

Limit curve for arc-free operation

MINITIMER
Time Relay With Operate Delay
RK 7813, RK 7814, RK 7815, RK 7816

0257876

RK 7813, RK 7815, RK 7816

RK 7814

Product Description

The timers of the RK series in compact stepped front enclosures fulfill all the demands to modern time control devices. With only a few variants this relay series covers all common timing functions, time ranges and voltage models. The single function modules are on delay range as well as fleeting on make or flasher timers. Besides the standard 1 c/o contact also a second c/o contact or an instantaneous c/o contact is available as option. Therefore these timers are suitable to realize most time depending controls in industry and building automation. As supplement also a multifunction timer with 8 functions is available in this series.

Your Advantages
- Timers in compact design enclosures for consumer units
  - timer RK 7813 on delayed
  - timer RK 7814 on delayed
  - fleeting action relay RK 7815
  - flusher relay RK 7816

Features
- According to IEC/EN 61 812-1
- RK 7813, RK 7815, RK 7816: Time ranges up to 10 h
- RK 7814: 4 time ranges up to 16 h
- LED indicator for state of contact
- Dual-voltage-version AC 230 V + AC/DC 24 V or AC 110 ... 127 V + AC/DC 24 V
- 1 changeover contact
- As option units with second changeover contact (only for voltage AC 230 V + AC/DC 24)
  - on delayed
  - as instantaneous contact
- Start with impuls only for version RK 7816
- Start with space only for version RK 7816._ _ /_10
- As option with plug in terminal blocks for exchange of devices, available
  - with screw terminals
  - with cage clamp terminals
- Width: 17.5 mm

Approvals and Markings

CE | c UL us LISTED * Canada / USA

* see variants

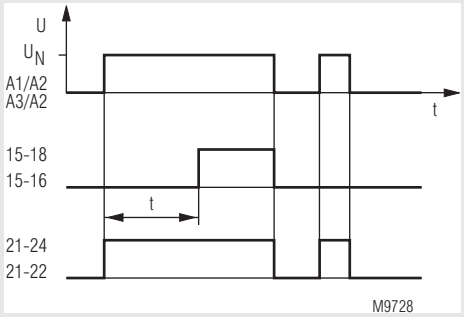
Application

Time dependent controls

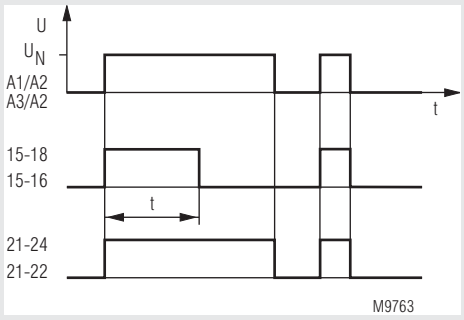
Indicator

LED:	on, when corresponding output relay is active (Contact 15 - 18 closed)

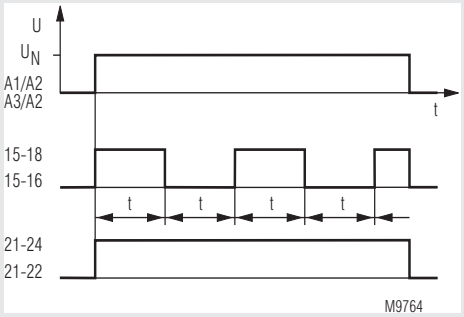
Function Diagrams



RK 7813, RK 7814

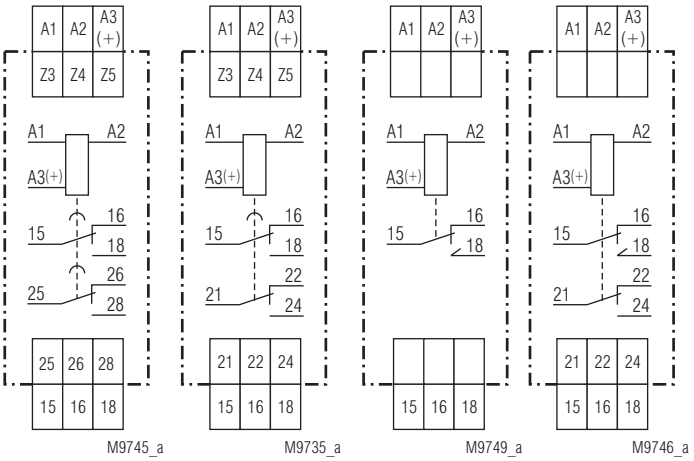


RK 7815



RK 7816

Circuit Diagrams

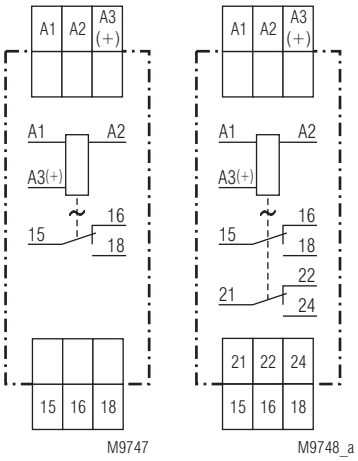


RK 7813.82 without Z3, Z4, Z5
RK 7814.82

RK 7813.32 without Z3, Z4, Z5
RK 7814.32

RK 7815.71

RK 7815.77



RK 7816.81

RK 7816.32

Connection Terminals

Terminal designation	Signal description
A1, A3(+), A2	Auxiliary voltage
Z3, Z4, Z5	Programming time ranges (RK7814)
15, 16, 18	1. changeover contact (delayed)
25, 26, 28 21, 22, 24	2. changeover contact (delayed) 2. changeover contact (instantaneous contact)

Technical Data

Time circuit

Time ranges

RK 7813, RK 7815, RK 7816:	0,1	...	1	s	1,0	...	10 min
	1,0	...	10	s	10	...	100 min
	10	...	100	s	1	...	10 h

Time ranges

RK 7814: 4 time ranges are settable via terminals Z3-Z4-Z5

Bridge Z3 Z4 Z5	Device with second ranges	Device with minute ranges (on request)
0 0—0	0.05 - 0.5 s	0.4 - 4 min
0———0	0.2 - 2 s	1.5 - 15 min
0—0—0	1.5 - 15 s	12 - 120 min
0 0 0	12 - 120 s	96 - 960 min

Time setting: infinite, 1:10 on relative scale
Recovery time: < 100 ms
Repeat accuracy: ≤ 0.5 % of set time delay + 10 ms
Voltage influence: ≤ 1 %
Temperature influence: 0.25 % / K

Input

Nominal voltage U_N: AC/DC 24 V [1] + AC 230 V [2] or
AC/DC 24 V [1] + AC 110 ... 127 V [2]

[1] at terminals A3-A2
[2] at terminals A1-A2

Voltage range
AC: 0.8 ... 1.1 U_N
DC: 0.9 ... 1.25 U_N
Release voltage A1 - A2: AC 50 Hz approx. 40 V
Release voltage A3 - A2: DC approx. 5 V
Nom. consumption AC 24 V: approx. 1 VA
Nom. consumption AC 230 V: approx. 6 VA
Nom. consumption DC 24 V: approx. 0.4 W
Nominal frequency: 50 Hz / 60 Hz
Frequency range: ± 5 %

Output

Contacts
RK 7813.81, RK 7814.81,
RK 7815.71, RK 7816.81: 1 changeover contact delayed (15-16-18)
RK 7813.82, RK 7814.82: 2 changeover contact delayed (15-16-18), (25-26-28)

RK 7813.32, RK 7814.32,
RK 7815.77, RK 7816.32: 1 changeover contact delayed (15-16-18)
1 changeover contact as instantaneous contact (21-22-24)

Thermal current I_{th}: 4 A
Switching capacity
according to AC 15
NO contact: 2 A / AC 230 V IEC/EN 60 947-5-1
NC contact: 1 A / AC 230 V IEC/EN 60 947-5-1
Electrical life: > 1 x 10^5 switch. cycl. IEC/EN 60 947-5-1
Mechanical life: > 1 x 10^7 switching cycles
Permissible switching frequency
(without / at load): 7200 / 360 switching cycles / h

Technical Data

General Data

Nominal operating mode: continuous operation
Temperature range: - 40 ... + 60°C
Clearance and creepage distance
rated impulse voltage /
pollution degree: 4 kV / 2 IEC 60 664-1
EMC
Electrostatic discharge (ESD): 8 kV (air) IEC/EN 61 000-4-2
HF irradiation: 10 V/m IEC/EN 61 000-4-3
Fast transients: 4 kV IEC/EN 61 000-4-4
Surge voltage
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: 10 V IEC/EN 61 000-4-6
Interference suppression: Limit value class B EN 55 011
Degree of protection
Housing: IP 40 IEC/EN 60 529
Terminals: IP 20 IEC/EN 60 529
Enclosure: thermoplastic with VO 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: DIN 46 228-1/-2/-3/-4
Fixed screw terminals
Cross section: 0.34 ... 2.5 mm² (AWG 22 - 14) solid or
0.34 ... 2.5 mm² (AWG 22 - 14) stranded wire with and without ferrules
Stripping length: 7 mm
Wire fixing: Captive slotted screw / M2.5
Plug-in screw terminals
Cross section: 0.2 ... 2.5 mm² (AWG 24 - 12) solid or
0.2 ... 2.5 mm² (AWG 24 - 12) stranded wire with and without ferrules
Stripping length: 7 mm
Wire fixing: Captive slotted screw / M2.5
Plug-in cage clamp terminals
Cross section: 0.2 ... 2.5 mm² (AWG 24 - 12) solid or
0.25 ... 2.5 mm² (AWG 24 - 12) stranded wire with and without ferrules
Stripping length: 10 mm
Wire fixing: Cage clamp terminal
Fixing torque: 0.5 Nm EN 60 999-1
Mounting: DIN-rail IEC/EN 60 715
Weight:
RK 7813: 60 g
RK 7814: 65 g
RK 7815: 60 g
RK 7816: 60 g

Dimensions

Width x height x depth:
RK 781_: 17.5 x 90 x 66 mm
RK 781_ PC: 17.5 x 121 x 66 mm
RK 781_ PS: 17.5 x 107 x 66 mm

UL-Data

Switching capacity:
Ambient temperature 60°C: Pilot duty B300
4A 240Vac G.P.
4A 30Vdc G.P.

Wire connection: 60°C / 75°C copper conductors only
AWG 22 - 14 Sol/Str Torque 0.5 Nm

Technical data that is not stated in the UL-Data, can be found in the technical data section.

Standard Types

RK 7813.81/61 AC 230 V + AC/DC 24 V 1 ... 10 s
Article number: 0061585
- Time relay, operate delayed
- Output: 1 changeover contact
- Nominal voltage U_N: AC 230 V + AC/DC 24 V
- Width: 17.5 mm

RK 7814.81/61 AC 230 V + AC/DC 24 V 120 s
Article number: 0061169
- Time relay, operate delayed
- Output: 1 changeover contact
- Nominal voltage U_N: AC 230 V + AC/DC 24 V
- Width: 17.5 mm

RK 7815.71/61 AC 230 V + AC/DC 24 V 1 ... 10 s
Article number: 0061587
- Fleeting action relay
- Output: 1 changeover contact
- Nominal voltage U_N: AC 230 V + AC/DC 24 V
- Width: 17.5 mm

RK 7816.81/61 AC 230 V + AC/DC 24 V 1 ... 10 s
Article number: 0061593
- Flasher relay
- Output: 1 changeover contact
- Nominal voltage U_N: AC 230 V + AC/DC 24 V
- Width: 17.5 mm

Variant

RK 7813.81/61, RK 7814.81/61,
RK 7815.71/61, RK 7816.81/61
RK 7817.81/61: with UL-approval

RK 7816.81/010/61: same as RK 7816._ _ / _ _ _
but start with break

Ordering example for variant

RK 781_ .81 _ _ /010 /61 AC 230 V + AC/DC 24 V 120 s

- 120 s: Set time delay
- AC 230 V + AC/DC 24 V: Nominal voltage
- /61: with UL-approval (1 changeover contact)
- /010: Variant
- _ _: Type of terminals
  without indication: terminal blocks fixed, with screw terminals
  PC (plug in cage clamp): pluggable terminal blocks with cage clamp terminals
  PS (plug in screw): pluggable terminal blocks with screw terminals
- .81: Contact
- RK 781_: Type

Options with Pluggable Terminal Blocks

Screw terminal
(PS/plugin screw)

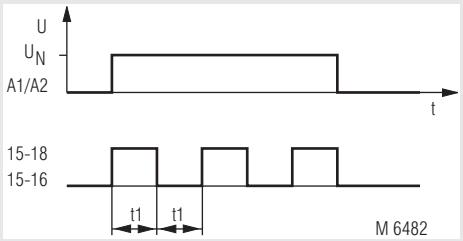
Cage clamp terminal
(PC/plugin cage clamp)

MINITIMER
Flasher Relay
BC 7932N

0221546

- According to IEC/EN 61 812-1
- Adjustable flashing frequency, pulse times to 100 s
- Start with pulse
- Repeat accuracy ≤ 0.5 % + 10 ms
- 2-voltage design
- LED indicator for contact position
- 1 changeover contact
- Wire connection: also 2 x 1.5 mm² stranded ferruledb (isolated), DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3
- Width 22.5 mm

Function Diagram



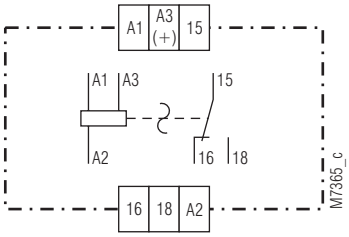
Approvals and Markings

CE

Indicators

LED: on when output relay activated (contacts 15-18 are closed)

Circuit Diagram



Connection Terminals

Terminal designation	Signal description
A1, A3(+), A2	Operating voltage
15, 16, 18	Changeover contact

Technical Data

Time Circuit

Time ranges:	0.05 ... 1 s	(pulse or space)
	0.5 ... 10 s	
	5 ... 100 s	
Time setting:	stepless 1:20	
Recovery time:	≤ 100 ms	
Repeat accuracy:	≤ 0.5 % + 10 ms	
Voltage influence:	≤ 1 %	
Temperature influence:	< 0.25 % / K	

Input

Nominal voltage U_N		
(Operating voltage):	AC/DC 24 V[1] + AC 230 V[2]	
	AC/DC 24 V[1] + AC 110 ... 127 V[2]	
	AC/DC 24 V[1] + AC 42 V[2]	
	[1] at terminals A3-A2	
	[2] at terminals A1-A2	
Voltage range:	AC 0.8 ... 1.1 U_N	
	DC 0.9 ... 1.25 U_N	
Nominal consumption:	AC: 4 VA	
	DC: 0.4 W	
Nominal frequency:	50 / 60 Hz	
Frequency range:	± 5 % f_N	
Release voltage:	15 % U_N	

Output

Contacts:	1 changeover contact	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	4 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	1.5 x 10^5 switching cycles	
Permissible switching frequency:	36 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	10^8 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 20 ... + 60 °C	
Storage:	- 25 ... + 70 °C	
Relative air humidity:	95 % at 40 °C	
Altitude:	< 2.000 m	
Clearance and creepage distances		
overvoltge category / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	6 kV (contact)	IEC/EN 61 000-4-2
	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 2.7 GHz:	20 V / m	IEC/EN 61 000-4-3
Fast transients:	4 kV	IEC/EN 61 000-4-4
Surge voltages		
between A1/A2:	2 kV	IEC/EN 61 000-4-5
between A3(+)/A2:	0,5 kV	IEC/EN 61 000-4-5
between A1, A2/PE:	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 55 011

Technical Data

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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:		
Cross section:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated) or 2 x 1.5 mm² stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3	
Insulation of wires or sleeve length:	10 mm	
Wire fixing:	Terminal screws M 3.5 Box terminal with wire protection	
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	80 g	

Dimensions

Width x height x depth:	22.5 x 84 x 97 mm

Standard Type

BC 7932N.81 AC/DC 24 V + AC 230 V 50/60 Hz 0.5 ... 10 s

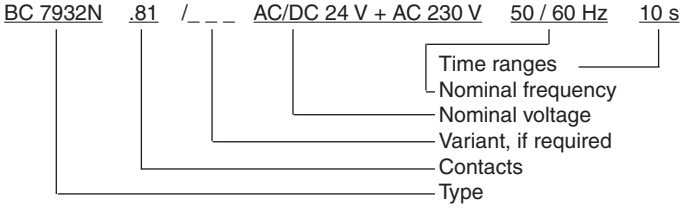
Article number:	0052669
• Front colour grey, with box terminals	
• Output:	1 changeover contact
• Nominal voltage U_N:	AC/DC 24 V + AC 230 V
• Time range:	0.5 ... 10 s
• Width:	22.5 mm

Variant

BC 7932N/100:	Start with space

Ordering example for variant

BC 7932N .81 /_ _ _ AC/DC 24 V + AC 230 V 50 / 60 Hz 10 s

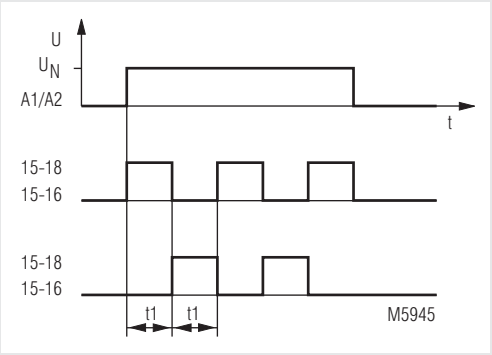


MINITIMER
Flasher Relay
MK 7851

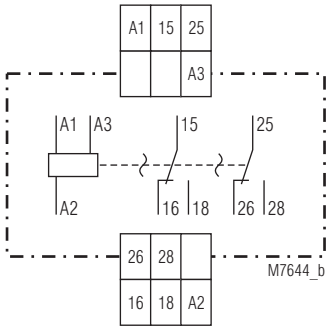
DOLD

- According to IEC/EN 61 812-1
- Adjustable flashing frequency, impulse time up to 300 s
- Repeat accuracy < ± 0.5 %
- Adjustable on absolute scale
- Start with impulse
- Available start with space
- dual-voltage version
- LED indication for operation and contact position
- 2 changeover contacts
- Width 22.5 mm

Function Diagram



Circuit Diagram



MK 7851.82/024

Approvals and Markings

CE

Indicators

upper LED:	on, when supply connected
lower LED:	on, when output relay active (contact 15-18 closed)

Technical Data

Time circuit

Time ranges:	0.05 ... 1 s = 600...30 Impulses/min
	0.15 ... 3 s
	0.5 ... 10 s
	1.5 ... 30 s
	3 ... 60 s
	5 ... 100 s
	15 ... 300 s
Pulse duty factor:	1:1
Time setting:	steppless on absolute scale
Recovery time	
tw 50 / 100:	< 40 ms
Repeat accuracy:	< ± 0.5 % of the max. scale value
Voltage influence:	≤ 1 %
Temperature influence:	< 0.1 % / K

Input

Nominal voltage U_N:	AC/DC 24 V[1] + AC 110 ... 127 V[2]
	AC/DC 24 V[1] + AC 230 ... 240 V[2]
	[1] at terminals A3 - A2
	[2] at terminals A1 - A2
	also available as
	single voltage version:
	AC/DC 12 V, AC/DC 42 ... 48 V
Voltage range:	AC 0.8 ... 1.1 U_N
	DC 0.9 ... 1.25 U_N
Release voltage:	15 % U_N
Permissible residual current:	5 mA

Nominal consumption:	AC 230 V	DC 24 V	DC 42 V
	8.5 VA	1 W	1 W

Nominal frequency:	50 / 60 Hz
Frequency range:	± 5 % f_N

Technical Data

Output

Contacts:	2 changeover contacts	
Release time:	approx. 30 ms	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15:		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	2 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	5 x 10^5 switching cycles	
Permissible siwtching frequency:	6 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gL	
Mechanical life:	> 30 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 60°C	
Clearance and creepage distances		
rated impulse voltage/ pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V/m	IEC/EN 61 000-4-3
Fast transients:	2 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:	2 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 55 011
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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 1.5 mm² solid or 2 x 1.0 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Weight:	150 g	

Dimensions

Width x height x depth:	22.5 x 82 x 99 mm

Standard Type

MK 7851 AC/DC24V + AC220...240V 50/60Hz 0.5 ... 10 s

Article number:	0044846	stock item
• Output:	2 changeover contacts	
• Nominal voltage U_N:	AC/DC 24 V + AC 220 ... 240 V	
• Time range:	0.5 ... 10 s	
• Width:	22.5 mm	

Variant

MK 7851/1 _ _ : start with space

Ordering example for variants

MK 7851 /_ _ _ AC/DC24V + AC230... 240V 50/60 Hz 15 ... 300 s

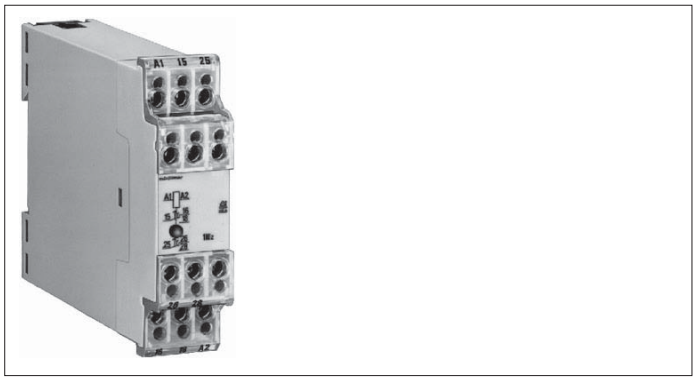
- Time range
- Nominal frequency
- Nominal voltage
- Variant, if required
- Type

Accessories

ET 4752-143: Marking plate
Article number: 0043203

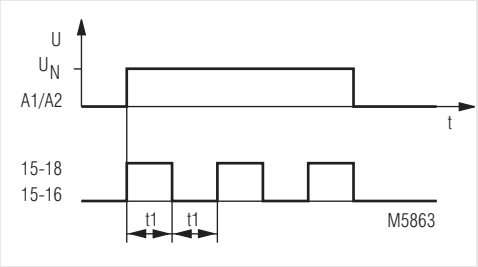
MINITIMER
Flasher Relay
MK 7852

0276769

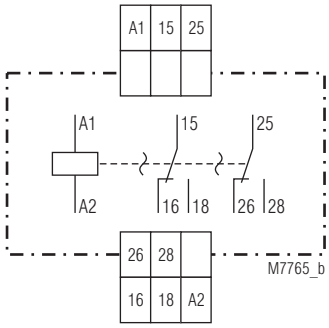


- According to IEC/EN 61 812-1
- Pulse time 0.5 s fixed
- Start with pulse
- Repeat accuracy < 1 %
- LED display for contact position
- Changeover contact 1 or 2 changeover contact
- Width: 22.5 mm

Function Diagram



Circuit Diagram



MK 7852.82

Approvals and Marking

CE

Application

Time-based control equipment

Indicator

LED: on when the output relay is activated

Technical Data

Time circuit

Pulse and space times:	0.5 s / 0.5 s ± 20 % start with flashing-on
Time setting:	fixed
Repeat accuracy:	< 1 %
Voltage influence:	< ± 1 %
Temperature influence:	< ± 0.05 % / K

Input

Nominal voltage U_N:	AC/DC 24, 42 V	
	AC 110 ... 127, 220 ... 240 V	
Voltage range:	0.8 ... 1.1 U_N	
Nominal consumption:	AC/DC 24, 42 V	0.8 VA / 0.8 W
	AC 110 V	2.2 VA
	AC 127 V	2.9 VA
	AC 230 V	4 VA
	AC 240	5 VA
Nominal frequency:	50 / 60 Hz	

Output

Contacts		
MK 7852.81:	1 changeover contacts	
MK 7852.82:	2 changeover contacts	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15:		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		
to AC 15 at 3 A, AC 230 V:	5 x 10^5 switch. cycl.	IEC/EN 60 947-5-1
Permissible operating frequency:	depends on the flasher frequency	
Short circuit strength max. fuse ratinge:	6 A gL	IEC/EN 60 947-5-1
Mechanical life:	> 30 x 10^6 switching cycles	

Technical Data

General Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 60 °C	
Clearance and creepage distances		
rated impulse voltage/ pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF-irradiation:	10 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:	10 V	IEC/EN 61 000-4-6
Interference suppression:	Limit value class B	EN 55 011
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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 1,5 mm^2 solid or 2 x 1,0 mm^2 stranded ferruled DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Weight:	130 g	

Dimensions

Width x height x depth:	22.5 x 82 x 99 mm

Standard Type

MK 7852.82 AC 220 ... 240 V	50 / 60 Hz	
Article number:	0023867	stock item
• Output:	2 changeover contacts	
• Nominal voltage U_N:	AC 220 ... 240 V	
• Width:	22.5 mm	

Ordering Example

MK 7852 .81 AC 220 ... 240 V 50 / 60 Hz

- 50 / 60 Hz — Nominal frequency
- AC 220 ... 240 V — Nominal voltage
- .81 — Contacts
- MK 7852 — Type

Accessories

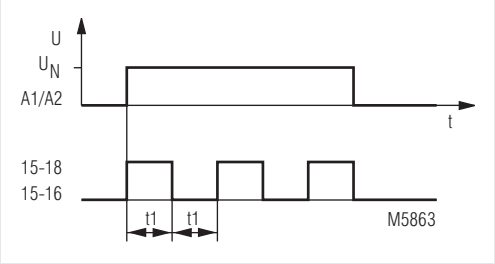
ET 4752-143:	Marking plate Article number: 0043203

MINITIMER
Flasher Relay
BA 7981

0227772

- According to IEC/EN 61 812-1
- Impulse time up to 3 s settable
- Repeat accuracy < ± 3 %
- Setting on absolute scale
- Start with impulse
- LED display for operation and contact position
- Available with 1 or 2 changeover contacts, as well as with semiconductor output
- Width 45 mm

Function Diagrams



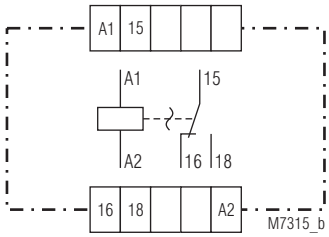
Approvals and Markings

CE

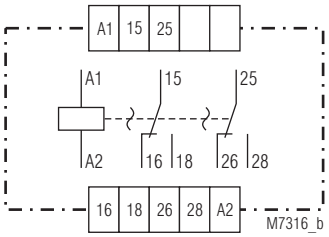
Application

Time dependent controls

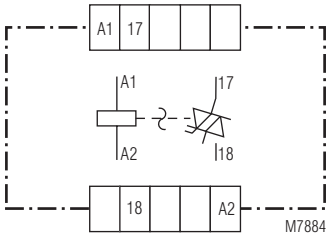
Circuit Diagrams



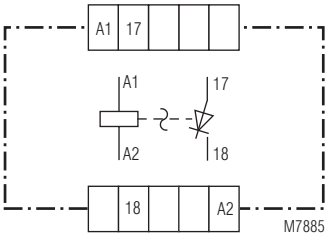
BA 7981.81



BA 7981.82



BA 7981.91



BA 7981.95

Indication

upper LED:	on when supply connected
lower LED:	on, when corresponding output relay is active

Notes

When DC-connection, pay attention to the corect polarity

Technical Data

Time circuit

Impulse time:	0.3 ... 3 s ≙ 100 ... 10 Imp./min.
Pulse duty factor:	1 : 1
Time setting:	infinite external setting
Repeat accuracy:	< ± 3 %
voltage influence:	< ± 1 %
Temperature influence:	< 0.4 % / K

Input

Nominal voltage U_N:	AC	24	42	110	127	230	240	V
	DC	24	V					
Voltage range:	0.8 ... 1.1 U_N							
Nominal consumption:	AC	24	42	110	127	230	240	V
without load		0.8	1.8	5	5	10	10	VA
	DC	24	V					
		0.8	W					
Nominal frequency:	50 / 60 Hz							

Output

Contacts		
BA 7981.81:	1 changeover contact	
BA 7981.82:	2 changeover contacts	
Release time of the contacts:	50 ms	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		
to AC 15 at 1 A, AC 230 V:	≥ 2,5 x 10^5 Schaltsp.	IEC/EN 60 947-5-1
Permissible switching frequency:	depends on the flasher frequency	
Short circuit strength max. fuse rating:	6 A fast, 4 A slow	IEC/EN 60 947-5-1
Mechanical life:	> 30 x 10^6 switching cycles	

Semiconductor Outputs

BA 7981.91:	Triac
Switching voltage:	AC 12 ... 275 V
Output current:	4 A
BA 7981.95:	Transistor
Switching voltage:	DC 0 ... 30 V
Output current:	5 A

General Data

Operating mode:	Continuous operation	
Temperature range:	20 ... + 60 °C	
Clearance and creepage distances		
overvoltage category / contamination level:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge (ESD):	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V/m	IEC/EN 61 000-4-3
Fast transients:	2 kV	IEC/EN 61 000-4-4
Surge voltage 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
Interference suppression:	Limit value class B	EN 55 011
Degree of protection:		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplast with V0 behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0,35 mm Frequenz 10 ... 55 Hz,	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal arrangement:	DIN 46 199-5	
Terminal designation:	EN 50 005	

Technical Data

Wire connection:	2 x 2,5 mm² solid or 2 x 1,5 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999
Mounting:	DIN rail	IEC/EN 60 715
Weight:	250 g	
Dimensions		
Width x height x depth:	45 x 73 x 133 mm	

Standard Type

BA 7981.81 AC 230 V 50/60 Hz 0,3 ... 3 s

Article number:	0022425	stock item
• Output:	1 changeover contact	
• Nominal voltage U_N:	AC 230 V	
• Impulse time:	0,3 ... 3 s	
• Width:	45 mm	

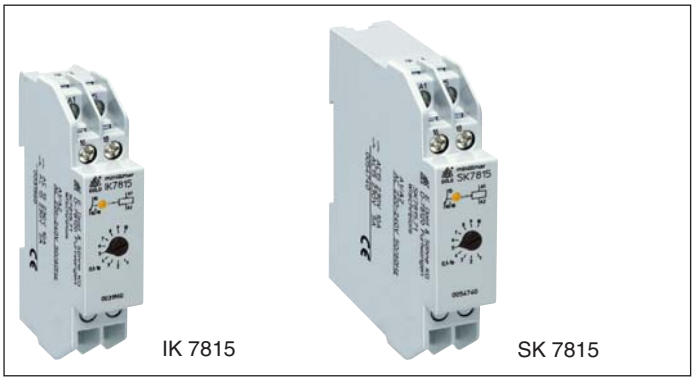
Ordering Example

BA 7981 .95 5 A AC 230 V 50 / 60 Hz

- Nominal frequency
- Nominal voltage
- Output current
- Contacts
- Type

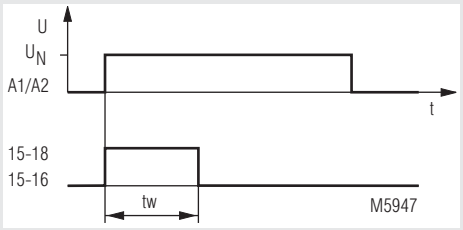
MINITIMER
Fleeting Action Relay
IK 7815, SK 7815

0222113



- According to IEC/EN 61 812-1
- Fleeting time up to 60 min.
- Adjustable fleeting time
- Repeat accuracy ≤ ± 1 %
- LED indicator for contact position
- 1 changeover contact
- Devices available in 2 enclosure versions:
  IK 7815: depth 58 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  SK 7815: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- Width 17.5 mm

Function Diagram



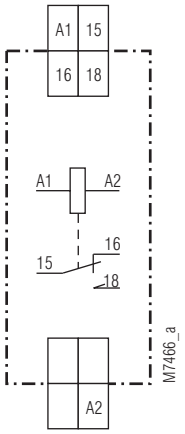
Approvals and Markings

CE

Application

Time-based control equipment

Circuit Diagram



Geräteanzeigen

LED: on when the output relay is activated (contact 15 - 18 is closed)

Notes

A change of the time setting is directly valid.
If a time is changed during time elaps, the output relay may energise unintended.

Connection Terminals

Terminal designation	Signal description
A1	L / +
A2	N / -
15, 16, 18	Changeover contact

Technical Data

Time circuit

Fleeting time ranges:	0,1... 1 s	1 ... 10 min
	0,3 ... 3 s	3 ... 30 min
	1 ... 10 s	6 ... 60 min
	3 ... 30 s	
	10 ...100 s	
Setting:	Infinitely variable, on relative scale	
Recovery time		
tw 50 / 100:	< 60 ms	
Repeat accuracy:	0.1 %	
Voltage influence:	≤ 1 % bei 0.8 ... 1.1 U_N	
Temperature influence:	0.05 % / K	

Input

Nominal voltage U_N:	AC/DC 12 V, AC/DC 24 V, AC 110 ... 127 V, AC 220 ... 240 V	
Voltage range:	0.8 ... 1.1 U_N with AC and DC 48 % residual ripple	
	0.9 ... 1.25 U_N in battery operating mode	
Release voltage:	15 % U_N	
Nominal consumption:	AC/DC 24 V	0.6 W
	AC 230 V 50 Hz	3.5 VA
Nominal frequency:	50 / 60 Hz	
Frequency range:	± 5 %	

Output

Contacts:	1 changeover contact	
Contact material:	$AgSnO_2$	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	max. 10 A (see quadratic total current limit curve)	
Switching capacity		
to AC 15		
NO contact:	10 A / AC 230V	IEC/EN 60 947-5-1
NC contact:	5 A / AC 230 V	IEC/EN 60 947-5-1
Glow lamp load:	1200 W	
Electrical life:		IEC/EN 60 947-5-1
AC 15 at 3 A, AC 230 V:	5 x 10^5 switching cycles	
Permissible switching frequency:	6 000 switching cycles/h	
Short circuit strength		
max. fuse rating:	10 AgL	IEC/EN 60 947-5-1
max. line circuit breaker:	B16	
Mechanical life:	> 30 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:		
Operation:	- 20 ... + 60°C	
Storage:	- 25 ... + 70°C	
Relative air humidity:	95 % at 40 °C	
Altitude:	< 2.000 m	
Clearance and creepage distances		
rated impulse voltage/ pollution degree:	4 kV / 2 (base insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	10 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.5 GHz:	3 V / m	IEC/EN 61 000-4-3
2.5 GHz ... 2.7 GHz:	1 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 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529

Technical Data

Housing:	Thermoplastic with V0 behaviour according to UL Subj. 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz,	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:		DIN 46 228-1/-2/-3/-4
Cross section:	2 x 2,5 mm^2 solid or 2 x 1,5 mm^2 stranded ferruled	
Stripping length:	10 mm	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0.8 Nm	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Weight		
IK 7815:	75 g	
SK 7815:	94 g	

Dimensions

Width x height x depth	
IK 7815:	17.5 x 90 x 58 mm
SK 7815:	17.5 x 90 x 98 mm

Standard Type

IK 7815.71 AC 220 ... 240 V 0.1 ... 1 s

Article number:	0031960
• Output:	1 changeover contact
• Nominal voltage U_N:	AC 220 ... 240 V
• Fleeting time:	0.1 ... 1 s
• Width:	17.5 mm

SK 7815.71 AC 220 ... 240 V 0.1 ... 1 s

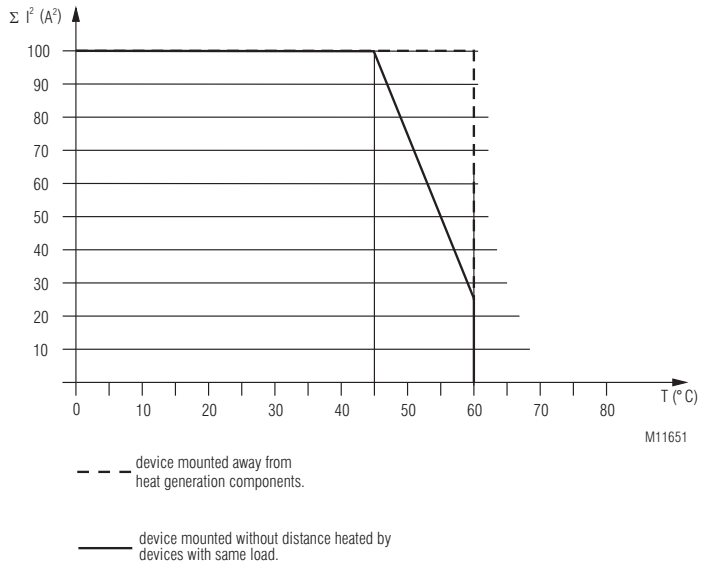
Article number:	0054740
• Output	1 changeover contact
• Nominal voltage U_N:	AC 220 ... 240 V
• Fleeting time:	0.1 ... 1 s
• Witdth:	17.5 mm

Variant

IK 7815 .71 AC 220 ... 240 V 0.1 ... 1 s

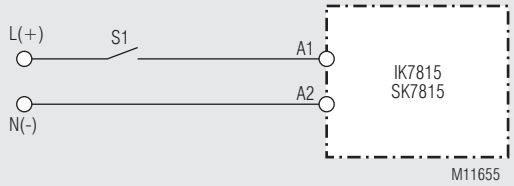
- 0.1 ... 1 s — Time range
- AC 220 ... 240 V — Nominal voltage
- .71 — Contacts
- IK 7815 — Type

Characteristic



Quadratic total current limit curve

Connection Example

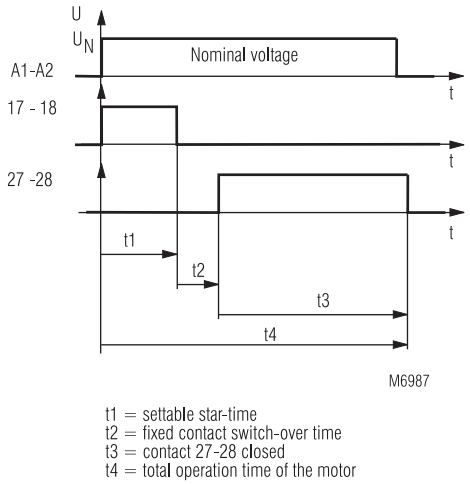


MINITIMER
Star-Delta Time Relay
IK 7818

0222116

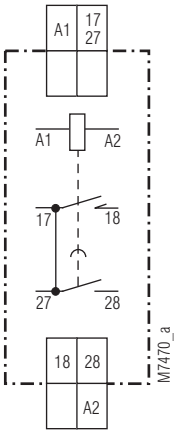
- According to IEC/EN 61 812-1
- 1 NO contact fleeting on make, 1 NO contact operate delayed
- Delay up to 100 s
- Width 17.5 mm

Function Diagram



t1 = settable star-time
t2 = fixed contact switch-over time
t3 = contact 27-28 closed
t4 = total operation time of the motor

Circuit Diagram



Approvals and Markings

CE

Application

Star-delta starting circuits for three-phase motors

Function

IK 7818 is a static star-delta time relay with two separate output relays. Relay 1 is energized as soon as the operating voltage is available and returns to its home position when the set starting period is over. When the contact changeover time - that has to be indicated when an order is placed - has expired, the second relay is actuated and remains switched on as long as the star-delta time relay is provided with voltage.

Technical Data

Time circuit

Time ranges:	0.5 ... 10 s 1.5 ... 30 s 3.0 ... 60 s 5.0 ... 100 s
Time setting:	Infinitely variable, on relative scale
Contact changeover time:	approx. 100 ms Depending on order approx. 35 ms See ordering
Recovery time:	
tw 50 / 100:	< 40 ms
Repeat accuracy:	≤ 0.5 %
Voltage influence:	≤ 1 % bei 0.8 ... 1.1 U_N
Temperature influence:	0.1 % / K

Input

Nominal voltage U_N:	AC 110 ... 127, 220 ... 240 V AC/DC 24 V
Voltage range:	AC 0.8 ... 1.1 U_N DC 0.9 ... 1.25 U_N
Nominal consumption:	
AC 230 V:	4 VA
AC/DC 24 V:	0.2 W
Nominal frequency:	50 / 60 Hz
Frequency range:	± 5 %

Output

Contacts	
IK 7818.38:	1 NO contact / fleeting on make 1 NO contact / operate delayed
Release time of the contacts:	About 40 ms
Nominal output voltage:	AC 250 V
Thermal current I_{th}:	3 A at t_u = 45°C

Technical Data

Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	5 x 10^5 switching cycles (see characteristics)	
Permissible switching frequency:	6 000 switching cycles/h	
Short circuit strength		
max. fuse rating:	4 AgL	IEC/EN 60 947-5-1
Mechanical life:	100 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 60°C	
Clearance and creepage distances		
Rated impulse voltage/ pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	6 kV (contact)	IEC/EN 61 000-4-2
HF irradiation:	10 V/m	IEC/EN 61 000-4-3
Fast transients:	2 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
Interference suppression:	Limit value class B	EN 55 011
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 Subj. 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded ferruled DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Weight:	75 g	

Dimensions

Width x height x depth:	17.5 x 90 x 58 mm

Standard Type

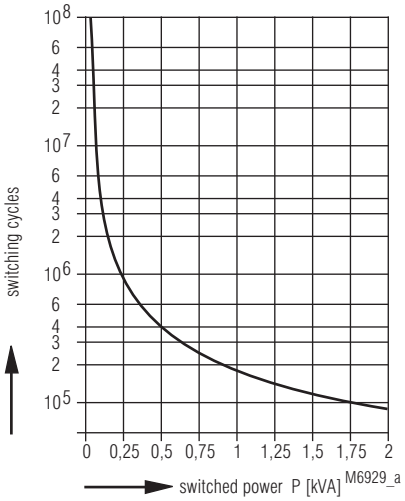
IK 7818.38 AC 220 ... 240 V	10 s / 100 ms
Article number:	0040962
• Nominal voltage U_N:	AC 220 ... 240 V
• Delay:	0.5 ... 10 s
• Contact changeover time:	100 ms
• Width:	17.5 mm

Ordering Example

IK 7818 .38 AC 220 ... 240 V 50 / 60 Hz 30 s / 35 ms

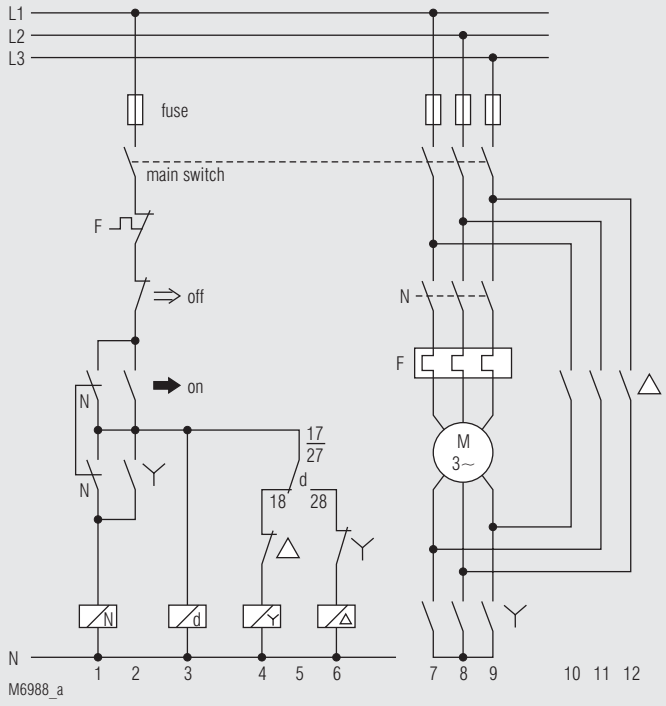
- 30 s / 35 ms — Time range max. value/ changeover time
- 50 / 60 Hz — Nominal frequency
- AC 220 ... 240 V — Nominal voltage
- .38 — Contacts
- IK 7818 — Type

Characteristics



Electrical life

Connection Example



d = star-delta timer
N = main contactor
Y = star contactor
Δ = delta contactor

Example of the control circuit of a star-delta starting unit with the electronic time relay IK 7818:
The star-delta time relay is energized by pressing the „On“ pushbutton and the contact d moves to position 17 / 27 · 18. The star contactor Y is activated. The mains supply contactor N is switched on via the contact Y in the current path 2 and locks via the contacts N in the current path 1. The motor M starts in the Y circuit during the delay set on the time relay d. When the delay is over, the contact 17 / 27 · 18 opens and the Y contactor is released. After about 35 ms or 100 ms (depending on the unit), the contact d 17 / 27 · 28 closes and the Δ–contactor is activated. The motor M continues to run in the Δ–circuit until the mains supply contactor N is de-energized by pressing the „Off“ pushbutton.

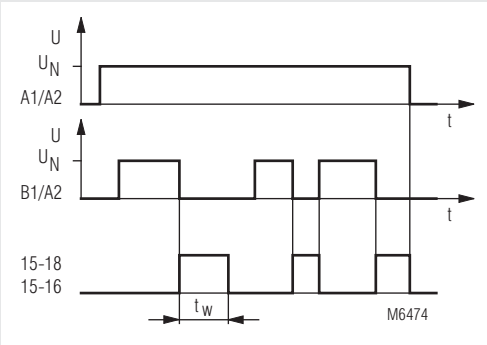
The whole of the starting procedure commences again from the beginning after the system has been switched off and after every interruption in the starting operation.
The purpose of the NC contact Y in the current path 6 and Δ in the current path 4 is to make sure that the Y and Δ contactor are not connected through at the same time if the Y or Δ contactor happens to „stick“.

MINITIMER
Fleeting Action Relay, Fleeting On Brake
IK 7820, SK 7820

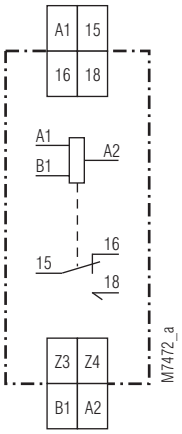
0276768

- According to IEC/EN 61 812-1
- With 4 time ranges from 0.25 ... 640 s
- Adjustable
- With auxiliary voltage
- For wide voltage range AC 50/60 Hz 110 ... 240 V
- Control input operated with nominal voltage; no voltage free contact necessary
- LED indicator for status of contact
- 1 changeover contact
- Devices available in 2 enclosure versions:
  IK 7820: depth 59 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  SK 7820: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- Width: 17.5 mm

Function Diagram



Circuit Diagram



IK 7820.73, SK 7820.73

Approvals and Marking

CE

Applications

Time-dependent controllers

Indicators

LED: on, when output relay activated (contact 15 - 18 closed)

Notes

The control input B1 relative to A2 has the same voltage range as A1-A2. In a 3-phase system B1 can also be connected to a different phase then A1 if the neutral is connected to A2. As the control input is operated with voltage, the control contact can also switch additional loads, e.g. contactors with the same A2 reference. This allows to use less contacts (see connection Diagram).

Technical Data

Time circuit

Time ranges:	4 different time ranges programmable via terminals:

time range	bridge
0.25 ... 2.5 s	Z4----- A2
1 ... 10 s	Z3---------- A2
8 ... 80 s	Z3---- Z4----- A2
64 ... 640 s	(without)

Tolerance of the max. scale value:	- 5 ... + 25 %
Time setting:	infinitely variable 1:10 on relative scale
Min. closing time (Control input B1):	≥ 20 ms
Repeat accuracy (Control input B1):	≤ 40 ms
Repeat accuracy:	≤ 0.5 % + 20 ms
Voltage influence:	≤ 1 %
Temperature influence:	≤ 0.25 % / K

Technical Data

Input

Nominal voltage U_N:	AC 110 ... 240 V, AC/DC 24 V	
Voltage range:	0.8 ... 1.1 U_N	
Nominal consumption		
(A1-A2)**:**	AC 230 V:	approx. 8 VA
	AC 24 V:	approx. 1.5 VA
	DC 24 V:	approx. 0.7 W
Nominal frequency:	50 / 60 Hz	
Reset voltage:	15 % U_N	
Input current B1:	approx. 0.3 mA	

Output

Contacts:		
IK 7820.73, SK 7820.73:	1 changeover contact (fleeting on brake)	
Thermal current I_{th}:	10 A up to 45°C (see continuous current limit curve)	
Switching capacity		
to AC 15		
NO contact:	10 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	5 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		
to AC 15 at 3 A, AC 230 V:	≥ 5 x 10^5 switch. cycl.	IEC/EN 60 947-5-1
Short circuit strength		
max. fuse rating:	10 A gL	IEC/EN 60 947-5-1
Mechanical life:	≥ 30 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 60 °C	
Clearance and creepage distances		
rated impuls voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	6 kV (air)	IEC/EN 61 000-4-2
HF-irradiation:	10 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 (0.5 kV at AC/DC 24 V)	IEC/EN 61 000-4-5
between wire and ground:	2 kV	IEC/EN 61 000-4-5
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplastic wiht Vo behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz,	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	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	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Weight		
IK 7820:	70 g	
SK 7820:	89 g	

Dimensions

Width x heigth x depth	
IK 7820:	17.5 x 90 x 59 mm
SK 7820:	17.5 x 90 x 98 mm

Standard Type

IK 7820.73 AC 110 ... 240 V 0,25 ... 640 s

Article number:	0047159
• Nominal voltage U_N:	AC 110 ... 240 V
• Time range:	0.25 ... 640 s adjustable
• Width:	17.5 mm

SK 7820.73 AC 110 ... 240 V 0,25 ... 640 s

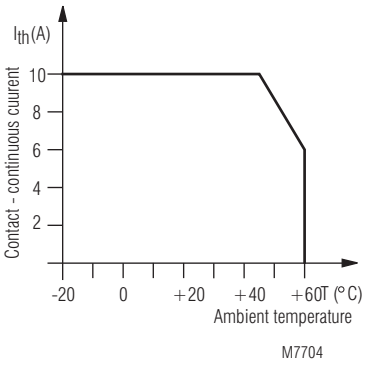
Article number:	0054754
• Nominal voltage U_N:	AC 110 ... 240 V
• Time range:	0.25 ... 640 s adjustable
• Width:	17.5 mm

Ordering Example

IK 7820 .73 AC 110 ... 240 V 50 / 60 Hz 0,25 ... 640 s

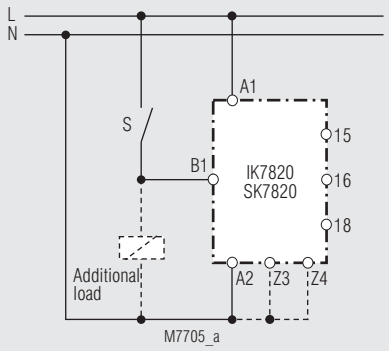
- Time range
- Nominal frequency
- Nominal voltage
- Contacts
- Type

Characteristics



Continuous current limit curve

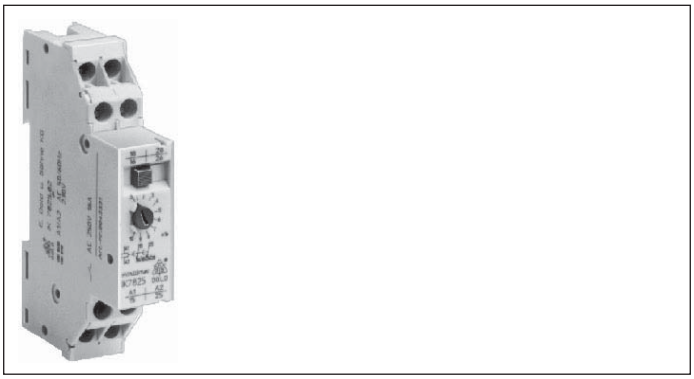
Connection Example



Remarks:
Z3, Z4... Programming of time range
S... Control contact for function
Contact S can also switch additional load connected inparallel to ow relay

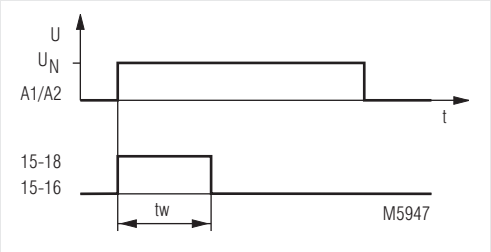
MINITIMER
Fleeting Action Relay
IK 7826

0221567

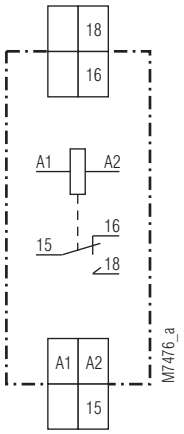


- According to IEC/EN 61 812-1
- Fleeting action 0.05 ... 1 s, adjustable
- Fleet make contact
- Repeat accuracy ≤ 0.5 % + 10 ms
- Pushbutton for manual actuation of the contact
- 1 changeover contact for 16 A
- Width 17.5 mm

Function Diagram



Circuit Diagram



Approvals and Markings

CE

Applications

- Time-dependent controllers

Indicators

Push button:	pressed, when relay energized

Technical Data

Fleeting action:	0.05 ... 1 s
Tolerance of end value:	- 5 ... + 25 % of nominal value
Time setting:	stepless, 1:20 on relative scale
Recovery time:	approx. 60 ms (during time run-down) approx. 700 ms (after time run-down)
Repeat accuracy:	< ± 0.5 % + 10 ms

Input

Nominal voltage U_N:	AC 24, 127, 230 V DC 24 V
Voltage range:	90 ... 110 % U_N
Nominal frequency:	50 Hz
Frequency range:	± 5 %
Nominal consumption	
AC:	2.3 VA
DC:	1.5 W
Voltage influence:	< 1 % over voltage range
Temperature influence:	< 0.1 % / K

Output

Contacts	
IK 7826.71:	1 changeover contact (fleet make contact)
Release time of the contacts:	< 30 ms
Thermal current I_{th}:	16 A
Electrical life	at 500 switching cycles / h
under ohmic load AC 230 V:	6 A 150 x 10^4 switching cycles 10 A 72 x 10^4 switching cycles 16 A 12 x 10^4 switching cycles
Inductive load cos φ 0.6:	10 A 10 x 10^4 switching cycles
DC load:	see limit curve for arc-free operation
Short circuit strength	
max. fuse rating:	16 A gL IEC/EN 60 947-5-1
Mechanical life:	> 3 x 10^6 switching cycles

Technical Data

General Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 45 °C	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	2 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:	2 kV	IEC/EN 61 000-4-5
Interference suppression:	Limit value class B	EN 55 011
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:	20 / 045 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded ferruled DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Weight:	100 g	

Dimensions

Width x height x depth:	17.5 x 89 x 58 mm

Standard Type

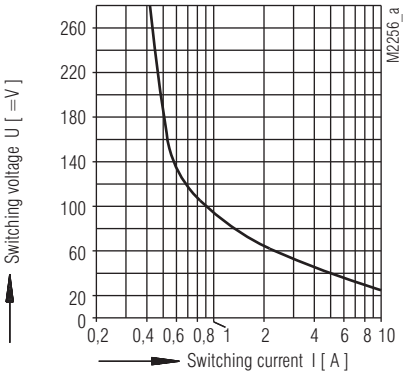
IK 7826.71 AC 230 V 50 Hz	0.05 ... 1 s	
Article number:	0043114	stock item
• Output:	1 changeover contact (fleet make contact)	
• Nominal voltage U_N:	AC 230 V	
• Fleeting action:	0.05 ... 1 s	
• Width:	17.5 mm	

Ordering Example

IK 7826 .71 AC 230 V 50 Hz 1 s

- 1 s — Time range limit value
- 50 Hz — Nominal frequency
- AC 230 V — Nominal voltage
- .71 — Contact
- IK 7826 — Type

Characteristics



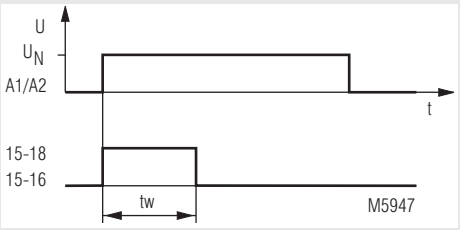
safe braking, no continuous arcing
max. 1000 switching cycles / h
contact spacing min. 0,6mm

Limit curve for arc-free operation

MINITIMER
Fleeting Action Relay
BC 7931N

- According to IEC/EN 61 812-1
- Fleeting action
- Repeat time adjustable to 100 s
- Repeat accuracy ≤ 0.5 % + 10 ms
- Dual voltage supply
- LED indicator for contact position
- 1 changeover contact
- Wire connection: also 2 x 1.5 mm² stranded ferruled (isolated), DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3
- Width 22.5 mm

Function Diagram



Approvals and Markings

CE

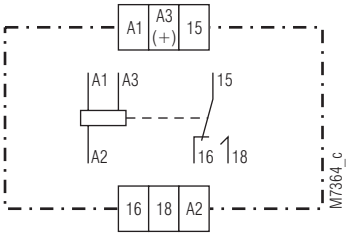
Applications

Time-dependent controllers

Indicators

LED: on when output relay activated (contacts 15-18 are closed)

Circuit Diagram



Connection Terminals

Terminal designation	Signal description
A1, A3(+), A2	Operating voltage
15, 16, 18	Changeover contact

Technical Data

Time Circuit

Time ranges:	0.05 ... 1 s 0.5 ... 10 s 5 ... 100 s	
Time setting:	stepless 1:20	
Recovery time:	≤ 100 ms	
Repeat accuracy:	≤ 0.5 % + 10 ms	
Voltage influence:	< 1 % over voltage range	
Temperature influence:	< 0.25 % / K	

Input

Nominal voltage U_N		
(Operating voltage):	AC/DC 24 V[1)] + AC 230 V[2)] AC/DC 24 V[1)] + AC 110 ... 127 V[2)] AC/DC 24 V[1)] + AC 42 V[2)] [1)] at terminals A3-A2 [2)] at terminals A1-A2	
Voltage range:	AC 0.8 ... 1.1 U_N DC 0.9 ... 1.25 U_N	
Nominal consumption:	AC: 4 VA DC: 0.4 W	
Nominal frequency:	50 / 60 Hz	
Frequency range:	± 5 % f_N	
Release voltage:	15 % U_N	

Output

Contacts:	1 changeover contact	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	4 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life:		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	1.5 x 10^5 switching cycles	
Permissible switching frequency:	36 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	10^8 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 20 ... + 60 °C	
Storage:	- 25 ... + 70 °C	
Relative air humidity:	95 % at 40 °C	
Altitude:	< 2.000 m	
Clearance and creepage distances		
overvoltge category / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	6 kV (contact)	IEC/EN 61 000-4-2
	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:		
80 MHz ... 2.7 GHz:	20 V/m	IEC/EN 61 000-4-3
Fast transients:	4 kV	IEC/EN 61 000-4-4
Surge voltages		
between A1/A2:	2 kV	IEC/EN 61 000-4-5
between A3(+)/A2:	0,5 kV	IEC/EN 61 000-4-5
between A1, A2/PE:	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 55 011

Technical Data

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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:		
Cross section:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated) or 2 x 1.5 mm² stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3	
Insulation of wires or sleeve length:	10 mm	
Wire fixing:	Terminal screws M 3.5 Box terminal with wire protection	
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	80 g	

Dimensions

Width x height x depth:	22.5 x 84 x 97 mm

Standard Type

BC 7931N.71 AC/DC 24 V + AC 230 V 50/60 Hz 0.5 ... 10 s

Article number:	0052663
• Front colour grey, with box terminals	
• Output:	1 changeover contact
• Nominal voltage U_N:	AC/DC 24 V + AC 230 V
• Time range:	0.5 ... 10 s
• Width:	22.5 mm

Ordering Example

BC 7931N .71 AC/DC 24 V + AC 230 V 50/60 Hz 1 s

- 1 s — Time range end value
- 50/60 Hz — Nominal frequency
- AC/DC 24 V + AC 230 V — Nominal voltage
- .71 — Contacts
- BC 7931N — Type

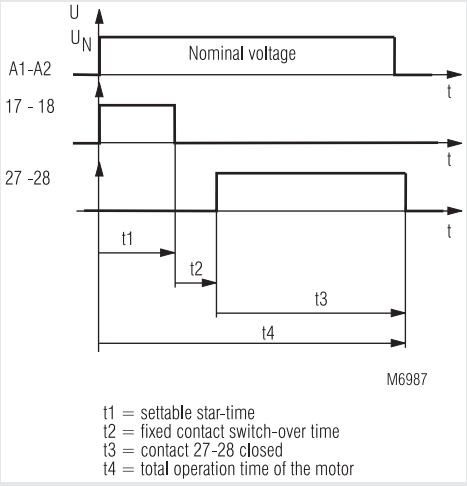
MINITIMER
Star-Delta-Timer
BC 7936N

DOLD

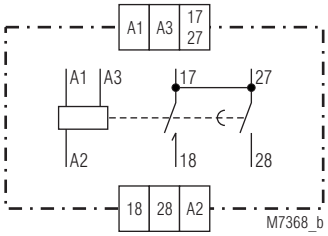
0225500

- According to IEC/EN 61 812-1
- Time ranges up to 100 s
- Repeat accuracy ≤ 0.5 % + 10 ms
- 2-voltage design
- LED indicators for contact position
- 1 NO contact fleeting make
  1 NO contact operate delayed
- Wire connection: also 2 x 1.5 mm² stranded ferruled (isolated), DIN 46 228-1/-2/-3/-4 or
  2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3
- Width 22.5 mm

Function Diagram



Circuit Diagram



Approvals and Markings

CE

Applications

Star-Delta starting of 3-phase motors

Indicators

upper LED:	on, when output relay acitvated (contacts 17-18 are closed)
lower LED:	on, when output relay acitvated (contacts 27-28 are closed)

Technical Data

Time Circuit

Time ranges:	0.5 ... 10 s 1.5 ... 30 s 3.0 ... 60 s 5.0 ... 100 s
Time setting:	infinitely variable 1 : 20
Contact switch-over time:	35 ms 80 ms 100 ms
Recovery time:	≤ 100 ms
Repeat accuracy:	≤ 0.5 % + 10 ms
Voltage influence:	≤ 1 %
Temperature influence:	0.25 % / K

Input

Nominal voltage U_N:	AC/DC 24 V[1] + AC/DC 42 ... 48 V[2] AC/DC 24 V[1] + AC 110 ... 127 V[2] AC/DC 24 V[1] + AC 220 ... 240 V[2] [1] on terminals A3-A2 [2] on terminals A1-A2
Voltage range:	AC 0.8 ... 1.1 U_N DC 0.9 ... 1.25 U_N
Nominal consumption:	
AC 230 V:	3.6 VA
DC 24 V:	0.35 W
Nominal frequency:	50 / 60 Hz
Release voltage:	≥ 15 % U_N

Output

Contacts:	1 NO contact fleeting on make 1 NO contact operate delayed	
Thermal current I_{th}:	4 A	
Switching capacity		
to AC 15:	3 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	5 x 10^5 switching cycles	

Technical Data

Short-circuit strength
max. fuse rating: 4 AgL IEC/EN 60 947-5-1
Mechanical life: 10^8 switching cycles

General Data

Operating mode: Continuous operation
Temperature range: - 20 ... + 60°C
Clearance and creepage distances
rated impulse voltage / pollution degree: 4 kV / 2 IEC 60 664-1
EMC
Electrostatic discharge: 8 kV (contact) IEC/EN 61 000-4-2
HF irradiation: 10 V/m IEC/EN 61 000-4-3
Fast transients: 2 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: 2 kV IEC/EN 61 000-4-5
Interference suppression: Limit value class B EN 55 011
Degree of protection
Housing: IP 40 IEC/EN 60 529
Terminals: IP 20 IEC/EN 60 529
Housing: Thermoplastic with V0 behaviour to UL subject 94
Vibration resistance: Amplitude 0.35 mm IEC/EN 60 068-2-6
frequency 10 ... 55 Hz
Climate resistance: 20 / 060 / 04 IEC/EN 60 068-1
Terminal designation: EN 50 005
Wire connection: 1 x 4 mm² solid or
1 x 2.5 mm² stranded ferruled (isolated) or
2 x 1.5 mm² stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or
2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3
Wire fixing: Terminal screws M 3.5
Box terminal with wire protection
Mounting: DIN rail IEC/EN 60 715
Weight: 85 g

Dimensions

Width x height x depth: 22.5 x 84 x 97 mm

Standard Type

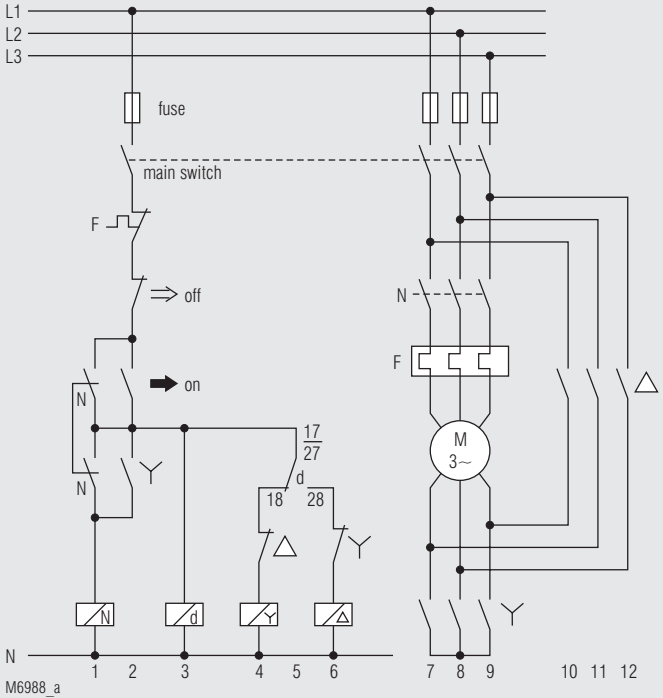
BC 7936N.38 AC/DC 24 V + AC 220 V ... 240 V 50/60 Hz 30 s 35 ms
Article number: 0052779
- Front colour grey, with box terminals
- Nominal voltage U_N: AC/DC 24 V + AC 220 V ... 240 V, 50/60 Hz
- Time range: 1.5 ... 30 s
- Contact switch-over time: 35 ms
- Width: 22.5 mm

Ordering Example

BC 7936N .38 AC/DC 24 V + AC 220 ... 240 V 50 / 60 Hz 100 s / 35 ms

- Time range end value/ contact switch-over time
- Nominal frequency
- Nominal voltage
- Contacts
- Type

Connection Examples



d = star-delta timer
N = main contactor
Y = star contactor
Δ = delta contactor

MINITIMER
Star-Delta Timer
MK 7853N

DOLD

0267517

- According to IEC/EN 61 812-1
- Time delay up to 100 s
- Repeat accuracy < ± 0.5 %
- Wire connection: also 2 x 1.5 mm² stranded ferruled, or 2 x 2.5 mm² solid DIN 46 228-1/-2/-3/-4
- As option with pluggable terminal blocks for easy exchange of devices
  - with screw terminals
  - or with cage clamp terminals
- Width 22.5 mm

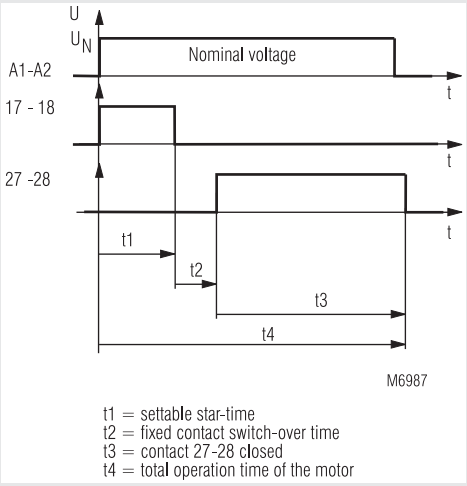
Product Description

The MK 7853N is a static star-delta-timer with 2 separate output relays. As soon as the operating voltage is applied, relay 1 will be energized and falls back after time delay. After elapse of the contact changeover time, the second relay switches on and remains in active position, as long as the star-delta-timer is energized.

Approvals and Markings

CE

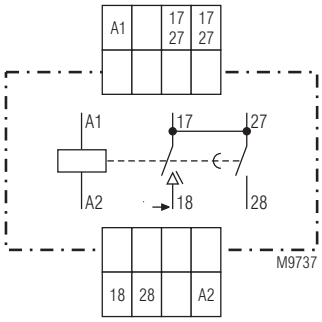
Function Diagram



Applications

Star-delta-starting circuit for squirrel cage motors

Circuit Diagram



Connection Terminals

Terminal designation	Signal description
A1, A2	Voltage supply AC/DC
17, 18	NO contacts for star contactor
27, 28	NO contacts for delta contactor

Indicators

1 yellow LED each:	on, when Y-Rel1 e.g. Δ-Rel2 energized

Technical Data

Time circuit

Time ranges:	0.5 ... 10 s 1.5 ... 30 s 3.0 ... 60 s 5.0 ... 100 s
Contact changeover time:	approx. 100 ms approx. 35 ms please state when ordering
Time setting:	stepless on absolute scale
Recovery time	
tw 50 / 100:	40 ms
Repeat accuracy:	≤ ± 0.5 % of the max. scale value
Voltage influence:	≤ 1 %
Temperature influence:	0.1 % / K

Input

Nominal voltage U_N:	AC/DC 24 V; AC/DC 42 V; AC/DC 48 V AC 110 ... 127 V; AC 220 ... 240 V; AC 380 ... 400 V
Voltage range:	0.8 ... 1,1 U_N
Nominal consumption:	AC 230 V AC/DC 24 V 7 VA 0.6 W
Nominal frequency:	50 / 60 Hz
Frequency range:	± 5 % f_N

Output

Contacts:	1 fleeting on make 1 NO contact delay on	
Contact material:	$AgSnO_2$ + 0,2 µm Au	
Measured nominal voltage:	AC 250 V	
Release time:	40 ms	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15:		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	5 x 10^5 switching cycles	
Permissible switching frequency:	6 000 switching cycles / h	
Short-circuit strength max. fuse rating:	6 A gL	IEC/EN 60 947-5-1
Mechanical life:	20 x 10^6 switching cycles	

General Data

Operating mode	Continuous operation	
Temperature range		
Operation:	- 20 ... + 60 °C	
Storage:	- 45 ... + 60 °C	
Relative air humidity:	93 % at 40 °C	
Altitude:	< 2,000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	10 V / m	IEC/EN 61 000-4-3
1 GHz ... 2 GHz:	3 V / m	IEC/EN 61 000-4-3
2 GHz ... 2.7 GHz:	1 V / m	IEC/EN 61 000-4-3
Fast transients:	2 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:	2 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 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplastic with V0 behaviour according with UL Subj. 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1

Technical Data

Terminal designation:	EN 50 005	
Wire connection		DIN 46 228-1/-2/-3/-4
Screw terminals (integrated):	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled or 2 x 1.5 mm² stranded ferruled or 2 x 2.5 mm² solid	
Insulation of wires or sleeve length:	8 mm	
Plug in with screw terminals		
max. cross section for connection:	1 x 2.5 mm² solid or 1 x 2.5 mm² stranded ferruled	
Insulation of wires or sleeve length:	8 mm	
Plug in with cage clamp terminals		
max. cross section for connection:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled	
min. cross section for connection:	0.5 mm²	
Insulation of wires or sleeve length:	12 $^{\pm 0.5}$ mm	
Wire fixing:	Plus-minus terminal screws M 3.5 box terminals with wire protection or cage clamp terminals	
Fixing torque:	0.4 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	140 g	

Dimensions

Width x height x depth:	
MK 7853N:	22.5 x 90 x 97 mm
MK 7853N PC:	22.5 x 111 x 97 mm
MK 7853N PS:	22.5 x 104 x 97 mm

Standard Type

MK 7853N AC 220 ... 240 V 30 s / 35 ms	
Article number:	0061017
• Output:	1 fleeting on make 1 NO contact delay on
• Nominal voltage U_N:	AC 220 ... 240 V
• Time range / changeover time:	1.5 ... 30 s / 35 ms
• Width:	22.5 mm

Ordering Example

MK 7853N _ _ AC 220 ... 240 V 30 s / 35 ms

- Changeover time
- Time range
- Nominal voltage
- Type of terminals
  - without indication: terminal blocks fixed with screw terminals
  - PC (plug in cage clamp): pluggable terminal blocks with cage clamp terminals
  - PS (plug in screw): pluggable terminal block with screw terminals
- Type

Options with Pluggable Terminal Blocks

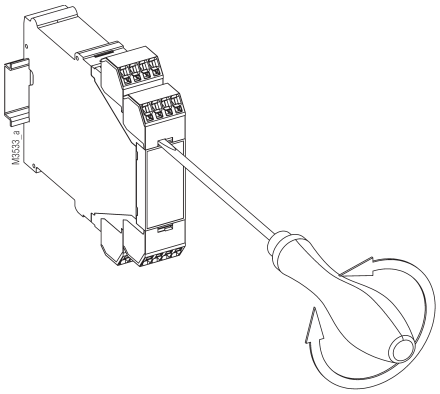
Screw terminal
(PS/plugin screw)

Cage clamp
(PC/plugin cage clamp)

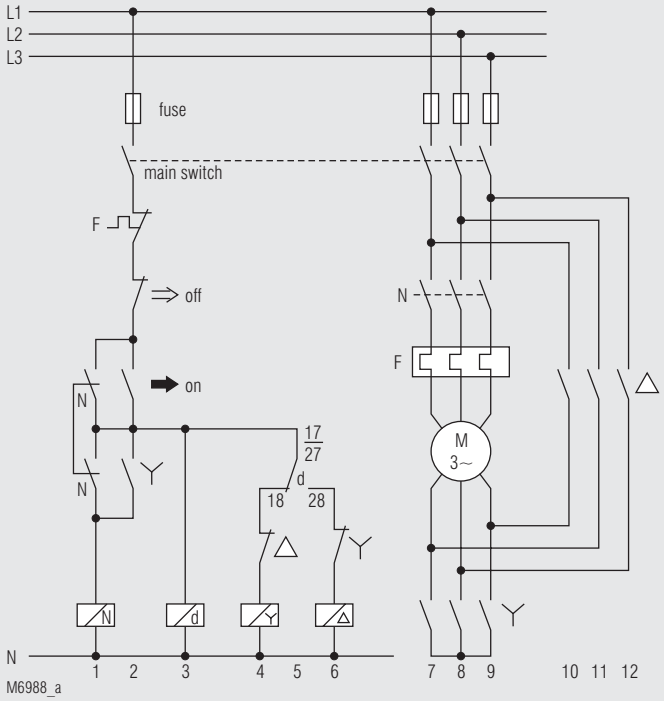
Notes

Removing the terminal blocks with cage clamp terminals

1. The unit has to be disconnected.
2. Insert a screwdriver in the side recess of the front plate.
3. Turn the screwdriver to the right and left.
4. Please note that the terminal blocks have to be mounted on the belonging plug in terminations.



Connection Examples



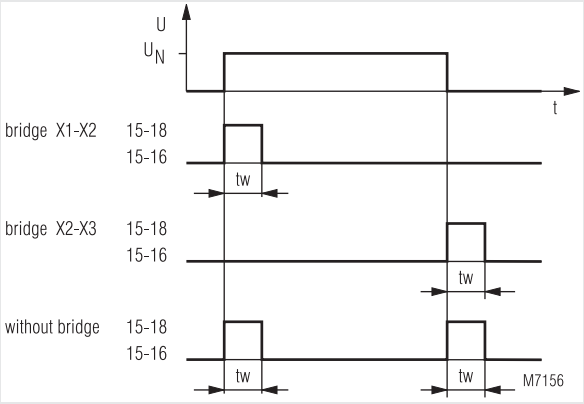
d = star-delta timer
N = main contactor
Y = star contactor
Δ = delta contactor

MINITIMER
Fleeting Action Timer
MK 9988

0226784

- According to IEC/EN 61 812-1
- Programmable: fleeting on make, fleeting on break, fleeting on make and brake
- Fleeting time 0.3 ... 0.6 s fixed
- Repeat accuracy < ± 5 %
- LED indication for supply and contact position
- 2-wire-proximity sensor control
- Available with 1 or 2 changeover contacts
- Width 22.5 mm

Function Diagram



Approvals and Markings

CE

Applications

Time-dependent controllers

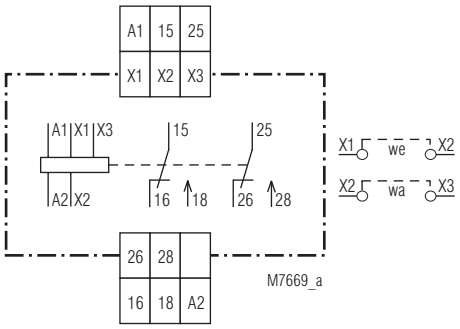
Indicators

LED: on, when supply connected

Notes

Info On terminals X1, X2, X3 only short wire links must be used to avoid capacitive coupled interference.

Circuit Diagram



MK 9988.52

Connection Terminals

Terminal designation	Signal description
A1, A2	operating voltage
X1, X2, X3	Programming inputs X1, X2, X3 open: fleeting on make and break X1, X2 bridged: fleeting on make X2, X3 bridged: fleeting on break
15, 16, 18	1. fleeting (changeover contact)
25, 26, 28	2. fleeting (changeover contact)

Technical Data

Time circuit

Fleeting time:	0.3 ... 0.6 s fixed
Repeat accuracy:	< ± 5 %
Min. switch-off time:	1 s
Voltage influence:	- 5 % / + 10 %
Temperature influence:	± 0.25 % / K

Input

Nominal voltage U_N:	AC 110, 127, 220 ... 240 V AC/DC 24, 42, 48 V
Voltage range:	0.8 ... 1.1 U_N
Nominal power consumption:	8 VA / AC 230 V
Nominal frequency:	50 / 60 Hz
Permissible residual current:	≤ 5 mA

Output

Contacts:		
MK 9988.51:	1 fleeting (changevoer contact) programmable	
MK 9988.52:	2 fleeting (changeover contacts) programmable	
Contact material:	$AgSnO_2$	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15:		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	5 x 10^5 switching cycles	
Permissible switching frequency:	3 000 switching cycles / h	
Short-circuit strength max. fuse rating:	6 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	20 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 20 ... + 60 °C	
Storage:	- 40 ... + 70 °C	
Relative air humidity	93 % at 40 °C	
Altitude:	< 2,000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2,5 kV; 1 min	
EMC		
Electrostatic discharge:	6 kV (contact)	IEC/EN 61 000-4-2
	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	20 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 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:	12 V	IEC/EN 61 000-4-6
Interference suppression:	Limit value class B	EN 55 011
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 Subj. 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1

Technical Data

Terminal designation:	EN 50 005	
Wire connection:	2 x 1.5 mm^2 solid or stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Insulation of wires or sleeve length:	8 mm	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0.4 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	140 g	

Dimensions

Width x height x depth:	22.5 x 82 x 99 mm

Standard Type

MK 9988.51 AC 220 ... 240 V 50 / 60 Hz

Article number:	0003532
• Output:	1 fleeting (changevoer contact)
• Nominal voltage U_N:	AC 220 ... 240 V
• Width:	22.5 mm

Ordering Example

MK 9988 .51 AC 230 V 50 / 60 Hz

- 50 / 60 Hz — Nominal frequency
- AC 230 V — Nominal voltage
- .51 — Contacts
  - .51 = 1 fleeting (changevoer contact)
  - .52 = 2 fleeting (changevoer contact)
- MK 9988 — Type

Accessories

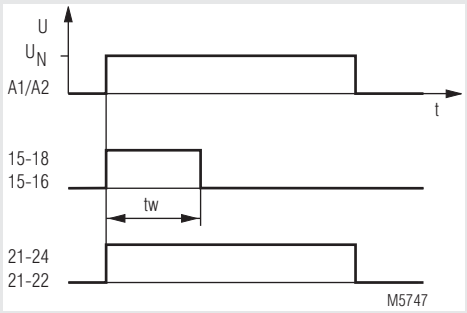
ET 4752-143:	Marking plate Article number: 0043203

MINITIMER
Fleeting Action Relay, adjustable
MK 9989

0221584

- According to IEC/EN 61 812-1
- Fleeting make
- Fleeting time up to 300 s or on request
- Repeat accuracy < ± 0,5 %
- Setting on absolute scale
- Available as 2-voltage version
- LED displays for availability and contact position
- 2 fleeting make or
  1 fleeting make and 1 non-delayed changeover contact
- Also available with instantaneous contact
- Also available with CSA approval
- Width 22.5 mm

Function Diagram



Approvals and Markings

CE

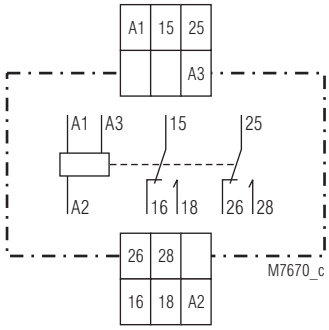
Applications

Time-dependent circuits

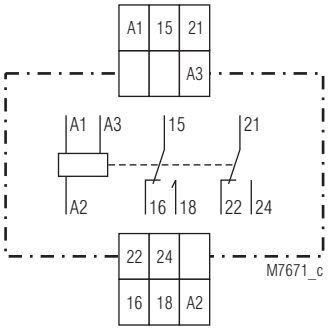
Indicators

upper LED: on, when supply connected
lower LED: on,when output relay active

Circuit Diagrams



MK 9989



MK 9989.77

Connection Terminals

Terminal designation	Signal description
A1, A3(+), A2	operating voltage
15, 16, 18	1. fleeting (changeover contact)
25, 26, 28 21, 22, 24	2. fleeting (changeover contact) Instantaneous contact (changeover contact) at MK 9989.77

Technical Data

Time circuit

Time ranges:	0.05 ... 1 s	1.5 ... 30 s
	0.15 ... 3 s	5 ... 100 s
	0.5 ... 10 s	15 ... 300 s
	Other time ranges on request	
Time setting:	Stepless on absolute scale	
Recovery time		
tw 50 / 100:	< 40 ms	
Repeat accuracy:	< ± 0.5 % of full-scale value	
Voltage influence:	≤ 1 %	
Temperature influence:	± 0.1 % / K	

Input

Nominal voltage U_N:	AC/DC 24 V[1] + AC 220 ... 240 V[2]
	[1] at terminals A3 - A2
	[2] at terminals A1 - A2
Voltage range:	AC 0.8 ... 1.1 U_N
	DC 0.9 ... 1.25 U_N
Release voltage:	15 % U_N
Nominal power consumption:	AC 230 V DC 24 V
	8.5 VA 1 W
Nominal frequency:	50 / 60 Hz
Frequency range:	± 5 % f_N
Permissible residual current:	5 mA

Output

Contacts		
MK 9989:	2 fleeting make (changeover contacts)	
MK 9989.77:	1 fleeting make (changeover contact)	
	1 non-delayed changeover contact	
Contact material:	$AgSnO_2$	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15:		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	5 x 10^5 switching cycles	
Permissible switching frequency:	6 000 switching cycles / h	
Short-circuit strength max. fuse rating:	6 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	> 30 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operating	
Temperature range		
Operation:	- 20 ... + 60 °C	
Storage:	- 25 ... + 70 °C	
Relative air humidity	93 % at 40 °C	
Altitude:	< 2,000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	12 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 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:	10 V	IEC/EN 61 000-4-6
Interference suppression:	Limit value class B	EN 55 011

Technical Data

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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 1.5 mm^2 solid or	
	2 x 1.0 mm^2 stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Insulation of wires or sleeve length:	8 mm	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0.4 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	140 g	

Dimensions

Width x height x depth: 22.5 x 82 x 99 mm

Standard Type

MK 9989 AC/DC 24 V + AC 220 ... 240 V 50/60Hz 10 s

Article number:	0044947
• Output:	2 fleeting make (changeover contacts)
• Nominal voltage U_N:	AC/DC 24 V + AC 220 ... 240 V
• Time range:	0.5 ... 10 s
• Width:	22.5 mm

Ordering Example

MK 9989 .77 AC/DC 24 V + AC 230 ... 240 V 50 / 60 Hz 30 s

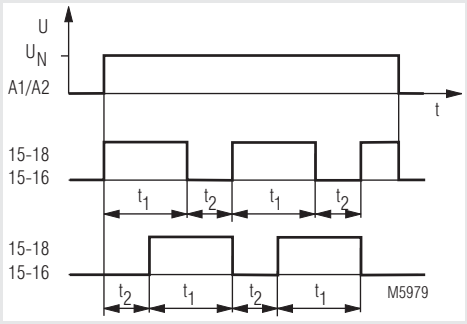
- 30 s — Time range end value
- 50 / 60 Hz — Nominal frequency
- AC/DC 24 V + AC 230 ... 240 V — Nominal voltage
- .77 — Contact
- MK 9989 — Type

MINITIMER
Cyclic Timer
IK 7854, SK 7854

0239762

- According to IEC/EN 61 812-1
- 8 time ranges from 0.05 s to 300 h selectable via rotational switches
- Impulse and break time separately adjustable
- Selectable start with impulse or break
- Voltage range AC/DC 12 ... 240 V
- Adjustment aid for quick setting of long time values
- Suitable for 2-wire proximity sensor control
- LED indicators for operation, contact position and time delay
- 1 changeover contact
- As option connection of 2 remote potentiometers 10 kΩ
- Devices available in 2 enclosure versions:
  IK 7854: depth 59 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  SK 7854: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- 17.5 mm width

Function Diagram



Approvals and Markings

CE

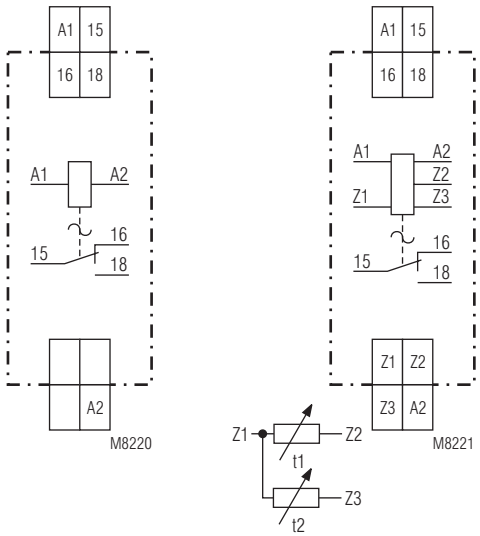
Application

Time-dependent controllers

Indicators

green LED:	on when voltage connected
yellow LED "R/t":	shows status of output relay and time delay:
-Flashing (short on, long off)	output relay not active; time delay t2 (break time)
-Flashing (long on, short off)	output relay active; time delay t1 (pulse time)

Circuit Diagrams



IK 7854.81
SK 7854.81

IK 7854.81/300
SK 7854.81/300

Connection Terminals

Terminal designation	Signal description
A1	L / +
A2	N / -
15, 16, 18	Changeover contact
Z1, Z2, Z3 (only at /300)	Input to connect two remote potentiometer for time setting t1 and t2

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)

Setting
A change of the settings for time range and time will be valid immediately. Please note, that a change of 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 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.

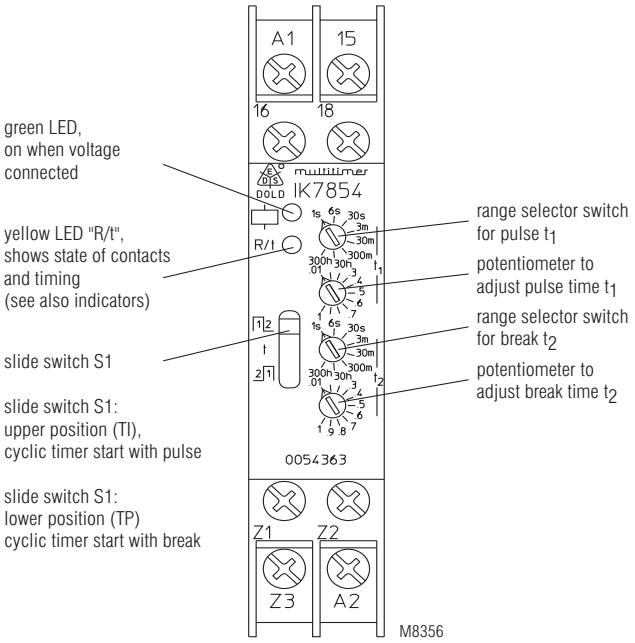
Remote potentiometers
With the variant IK/SK 7854.81/300 both time settings can also be made via remote potentiometers of 10 kOhms:
- Terminals Z1-Z2: potentiometer for pulse time (t1)
- Terminals Z1-Z3: potentiometer for break time (t2)

When connecting a remote potentiometer, the corresponding potentiometer has to be set to min. If no remote potentiometers are required the terminals Z1-Z2 resp. Z2-Z3 have to be linked.

The wires to the remote potentiometers 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, Z2 and Z3 no external voltage must be connected, as the unit might be damaged.
Terminals Z1, Z2 and Z3 do not have a galvanic separation to terminals A1/A2!

Setting



Technical Data

Time circuit

Time ranges:	8 time ranges for pulse and break time, 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 t1, t2:	continuous, 1:100 on relative scale
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 scale value
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
Frequency range (AC):	45 ... 400 Hz
Nominal consumption	
at AC 12 V:	approx.1.5 VA
at AC 24 V:	approx. 2 VA
at AC 230 V:	approx. 3 VA
at DC 12 V:	approx. 1 W
at DC 24 V:	approx. 1 W
at DC 230 V:	approx. 1 W
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

Output

Contacts:		
IK/SK 7854.81:	1 changeover contact	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	4 A (see see quadratic total current limit curve)	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13:	1 A / DC 24 V	
Electrical life		
at AC 15 to 1 A, AC 230 V:	1.5×10^5 switching cycles	IEC/EN 60 947-5-1
Permissible switching frequency:	36 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gL	IEC/EN 60 947-5-1

Technical Data

Mechanical life:	30×10^6 switching cycles	

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:	< 2.000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	20 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients:		
A1/A2:	4 kV	IEC/EN 61 000-4-4
Z1/Z2/Z3:	2 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:	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, frequency10 ... 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:	DIN 46 228-1/-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 60 999-1
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:		
IK 7854:	approx. 65 g	
SK 7854:	approx. 84 g	

Dimensions

Width x height x depth:	
IK 7854:	17.5 x 90 x 59 mm
SK 7854:	17.5 x 90 x 98 mm

Standard Type

IK 7854.81 AC/DC 12 ... 240 V 0.05 s ... 300 h
Article number: 0054362
- Output: 1 changeover contact
- Nominal voltage U_N: AC/DC 12 ... 240 V
- Time ranges: 0.05 s ... 300 h
- Width: 17.5 mm

SK 7854.81 AC/DC 12 ... 240 V 0.05 s ... 300 h
Article number: 0059557
- Output: 1 changeover contact
- Nominal voltage U_N: AC/DC 12 ... 240 V
- Time ranges: 0.05 s ... 300 h
- Width: 17.5 mm

Variant

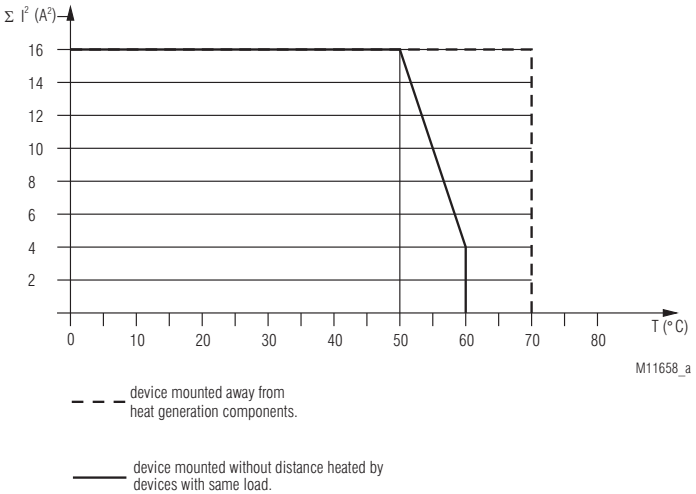
IK 7854.81/300: - Connection facility for 2 remote potentiometers 10 kOhms to adjust pulse and break time

Ordering example for variant

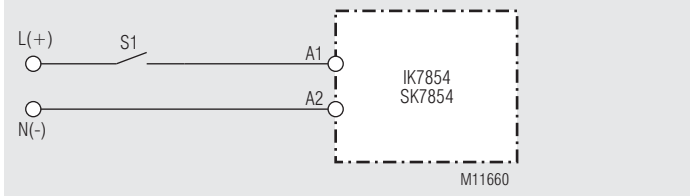
IK 7854 .81 /_ _ _ AC/DC 12 ... 240 V 0.05 s ... 300 h

- Time ranges
- Nominal voltage
- Variant, if required
- Contacts
- Type

Characteristics



Connection Example

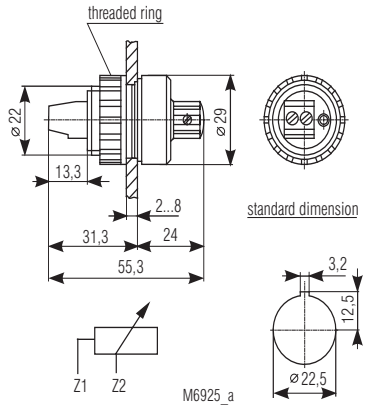


Accessories

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 60

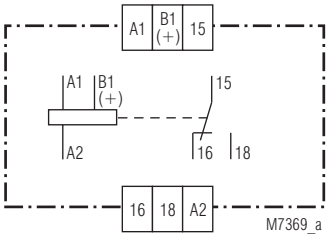


MINITIMER
Cyclic Timer
BC 7937N

0226191

- According to IEC/EN 61 812-1
- With 10 time ranges from 0.05 s ... 300 h
- Impulse and break time separately adjustable
- Selectable start with impulse or break
- AC/DC 24 ... 240 V
- Control input for interruption of the time elapse
- LED indication for voltage supply and contact position
- Flashing function during elapse of time
- 1 changeover contact
- Wire connection: also 2 x 1.5 mm² stranded ferruled (isolated), DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3
- Width 22.5 mm

Circuit Diagram



Approvals and Markings

CE

Applications

Time-dependent controllers

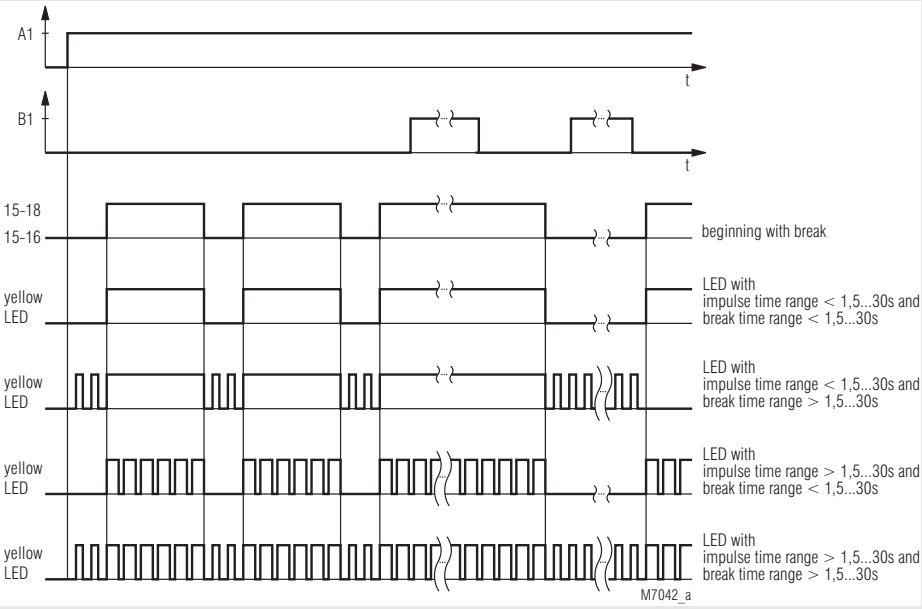
Indicators

green LED:	on, when supply connected
yellow LED:	see Function Diagramm

Notes

When changing the time ranges for impulse / break the device must be reset by disconnecting the supply voltage. By energising control input B1 the time elapse is stopped. E.g. activating control input B1 during timing of T_{impuls} for the time B1 the output is energized for T_{impuls} and T_{B1}.

Function Diagram



Technical Data

Time Circuit

Time ranges:	1) 0.05 ... 1 s	7) 1.5 ... 30 min	
	2) 0.15 ... 3 s	8) 15 ... 300 min	
	3) 0.5 ... 10 s	9) 1.5 ... 30 h	
	4) 1.5 ... 30 s	10) 15 ... 300 h	
	5) 5 ... 100 s		
	6) 15 ... 300 s		
	selectable via time-range-switch (ZB)		
Time setting:	infinite variable via potentiometer (Zeit)		
Recovery time:	≤ 50 ms		
Repeat accuracy:	≤ 2 %		
Voltage influence:	≤ 1 %		
Temperature influence:	≤ 0.05 % / K		

Input

Nominal voltage U_N		
(A1/A2 and B1/A2):	AC/DC 24 ... 240 V, DC 12 V	
Voltage range:	0.8 ... 1.1 U_N	
Nominal consumption:		
at AC 240 V:	4 VA	
at DC 240 V:	1.33 W	
Nominal frequency:	50 / 60 Hz	
Release voltage:	AC: ≥ 15 % U_N	
	DC: ≥ 5 % U_N	

Output

Contacts:	1 changeover contact	
Thermal current I_{th}:	4 A	
Switching capacity		
to AC 15:	3 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13:	2 A / DC 24 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	typ. 150 000 switching cycles	
to DC 13 at 1 A, DC 24 V:	typ. 100 000 switching cycles	
Short circuit strength		
max. fuse rating:	4 A gL	IEC/EN 60 947-5-1
Mechanical life:	10^8 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:	0 ... + 60°C	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	6 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V/m	IEC/EN 61 000-4-3
Fast transients:	2 kV	IEC/EN 61 000-4-4
Surge voltages between		
wired for power supply:	1 kV	IEC/EN 61 000-4-5
between wire and ground:	2 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 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplastic with V0 behaviour to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	0 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	1 x 4 mm² solid or	
	1 x 2.5 mm² stranded ferruled (isolated) or	
	2 x 1.5 mm² stranded ferruld (isolated) DIN 45 228-1/-2/-3/-4 or	
	2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3	

Technical Data

Wire fixing:	Terminal screws M 3.5	
	Box terminal with wire protection	
Mounting:	DIN rail	IEC/EN 06 715
Weigth:	110 g	

Dimensions

Width x height x depth: 22.5 x 84 x 97 mm

Standard Type

BC 7937N.81 AC/DC 24 ... 240 V 50/60 Hz
Article number: 0052780

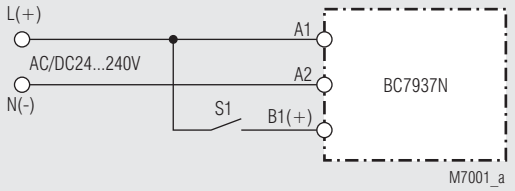
- Front colour grey, with box terminals
- Output: 1 changeover contact
- Nominal voltage U_N: AC/DC 24 ... 240 V
- Width: 22.5 mm

Ordering Example

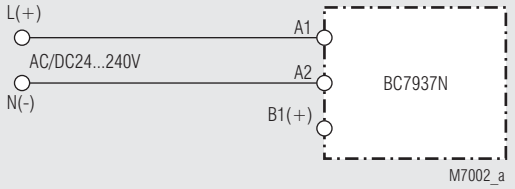
BC 7937N .81 AC/DC 24 ... 240 V 50 / 60 Hz

- 50 / 60 Hz — Nominal frequency
- AC/DC 24 ... 240 V — Nominal voltage
- .81 — Contacts
- BC 7937N — Type

Connection Examples

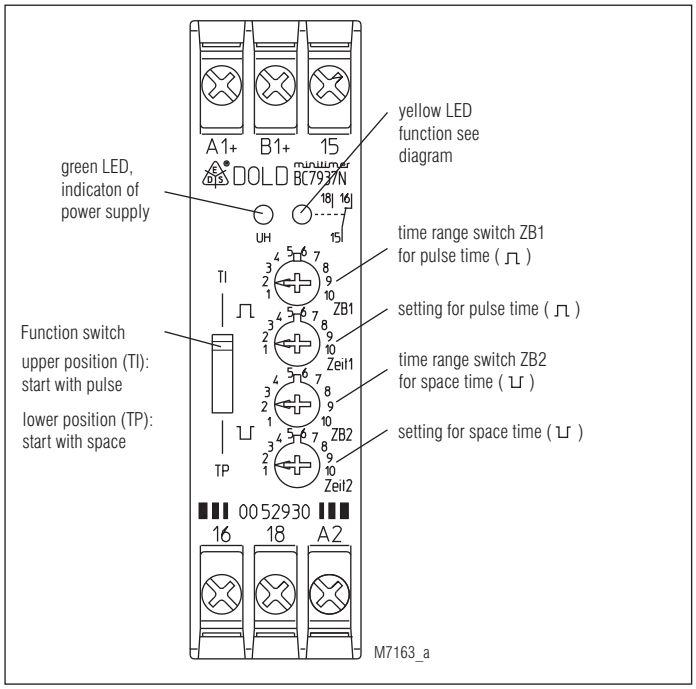


Connection example with control contact S1 for interruption of the time elapse



Connection example without control contact

Setting

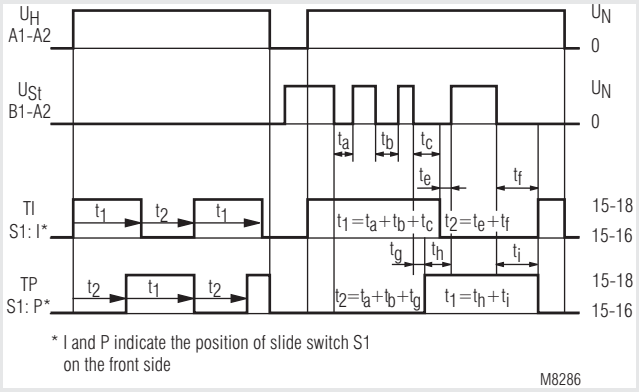

A1+
B1+
15
DOLD
BC7937N
18
16
15
UH
TI
TP
ZB1
Zeit1
ZB2
Zeit2
00529330
16
18
A2
M7163_a
green LED,
indicaton of
power supply
Function switch
upper position (TI):
start with pulse
lower position (TP):
start with space
yellow LED
function see
diagram
time range switch ZB1
for pulse time (⎍)
setting for pulse time (⎍)
time range switch ZB2
for space time (⎎)
setting for space time (⎎)

MINITIMER
Cyclic Timer
MK 7854N

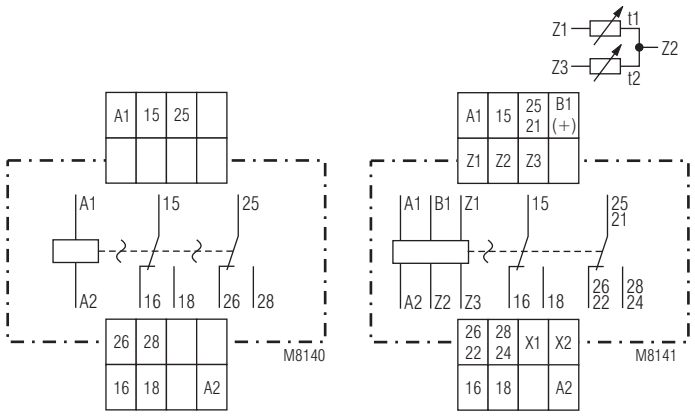
0239281

- According to IEC/EN 61 812-1
- 8 time ranges from 0.05 s to 300 h selectable via rotational switches
- Impulse and break time separately adjustable
- Selectable start with impulse or break
- Voltage range AC/DC 12 ... 240 V
- Adjustment aid for quick setting of long time values
- Suitable for 2-wire proximity sensor control
- LED indicators for operation, contact position and time delay
- 2 changeover contacts
- Wire connection: also 2 x 1.5 mm² stranded ferruled, or 2 x 2.5 mm² solid DIN 46 228-1/-2/-3/-4
- As option 1 changeover contact instantaneously programmable
- As option connection of 2 remote potentiometers
- As option with time interruption / time adding input
- As option with pluggable terminal blocks for easy exchange of devices
  - with screw terminals
  - or with cage clamp terminals
- 22.5 mm width

Function Diagram



Circuit Diagrams



MK 7854N.82 MK 7854N.82/500

Approvals and Markings

CE cULus LISTED * Canada / USA

* see variants

Application

Time-dependent controllers

Indicators

green LED:	on when voltage connected
yellow LED "R/t":	shows status of output relay and time delay:
-Flashing (short on, long off)	output relay not active; time delay t2 (break time)
-Flashing (long on, short off)	output relay active; time delay t1 (pulse time)

Connection Terminals

Terminal designation	Signal description
A1	L / +
A2	N / -
15, 16, 18	Changeover contact
25, 26, 28	Changeover contact
B1(+)	Control Input (time interruption with time adding)
X1, X2	Control Input (programming 2nd delayed C/O contact or instantaneous contact)
Z1, Z2, Z3	Input to connect two remote potentiometer for time setting t1 and t2

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)

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 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.

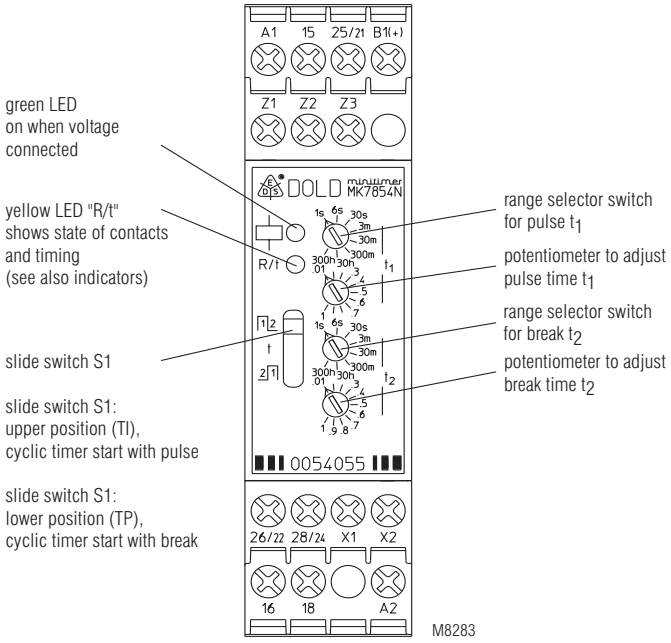
Time interruption / Time adding
With the model MK 7854N.82/500 the timing cycle can be interrupted by controlling input B1 (+) with control voltage. Removing the control signal will continue the timing cycle (time addition). When time interrupted the yellow LED stops to flash and goes to continuous light during pulse time (output relay active), or goes off during break time (output relay inactive).

Control input B1
The control input B1 (+) has to be supplied 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 possible, which allows cost saving circuits.

Instantaneous contact
By external wire lings the output function fo the variant MK 7854N.82/500 can be altered from 2 delayed contacts to 1 delayed **and** 1 instantaneous contact. The instantaneous contact switches when the operating voltage is connected.
To terminals X1 and X2 no other voltage potentials must be connected, as the unit might be damaged.
Remote potentiometers
With the variant MK 7854N.82/500 both time settings can also be made via remote potentiometers of 10 kOhms:
- Terminals Z1-Z2: potentiometer for pulse time (t1)
- Terminals Z2-Z3: potentiometer for break time (t2)

When connecting a remote potentiometer, the corresponding potentiometer has to be set to min. If no remote potentiometers are required the terminals Z1-Z2 resp. Z2-Z3 have to be linked.
The wires to the remote potentiometers 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 Z2.
To terminals Z1, Z2 and Z3 no external voltage must be connected, as the unit might be damaged.

Setting



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 t1, t2:	continuous, 1:100 on relative scale
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
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
Frequency range (AC):	45 ... 400 Hz
Nominal consumption	
at AC 12 V:	approx.1.5 VA
at AC 24 V:	approx. 2 VA
at AC 230 V:	approx. 3 VA
at DC 12 V:	approx.1 W
at DC 24 V:	approx. 1 W
at DC 230 V:	approx. 1 W
Release voltage (A1/A2)	
	Delayed contact
AC 50 Hz:	approx. 7.5 V
DC:	approx. 7 V
	Instantaneous contact
AC 50 Hz:	approx. 3 V
DC:	approx. 3.3 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)	
MK 7854N.82/500:	approx. 1 mA, over complete voltage range
Release voltage (B1/A2)	
AC 50 Hz:	approx. 3.5 V
DC:	approx. 3 V

Technical Data

Output

Contacts:		
MK 7854N.82:	2 changeover contacts	
MK 7854N.82/500:	2 changeover contacts, one programmable as instantaneous contact	
without bridge X1-X2:	25-26-28 delayed changeover contact	
with bridge X1-X2:	21-22-24 instantaneous contact at U_N on A1-A2	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	see quadratic total current limit curve (max. 4 A per contact)	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13:	1 A / DC 24 V	
Electrical life		IEC/EN 60 947-5-1
at AC 15 to 1 A, AC 230 V:	1.5 x 10^5 switching cycles	
Permissible switching frequency:	36 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gL	IEC/EN 60 947-5-1
Mechanical life:	30 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 40 ... + 60 °C (higher temperature see quadratic total current limit curve)	
Storage:	- 40 ... + 70 °C	
Relative air humidity:	93 % at 40 °C	
Altitude:	< 2,000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:		
Input / Output:	4 kV / 2 (basis insulation)	IEC 60 664-1
Output / Output:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	20 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	2 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:	10 V	IEC/EN 61 000-4-6
Interference suppression:	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 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplasic 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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:		EN 50 005

Technical Data

Wire connection		DIN 46 228-1/-2/-3/-4
Screw terminals (integrated):	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled or 2 x 1.5 mm² stranded ferruled or 2 x 2.5 mm² solid	
Insulation of wires or sleeve length:	8 mm	
Plug in with screw terminals		
max. cross section for connection:	1 x 2.5 mm² solid or 1 x 2.5 mm² stranded ferruled	
Insulation of wires or sleeve length:	8 mm	
Plug in with cage clamp terminals		
max. cross section for connection:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled	
min. cross section for connection:	0.5 mm²	
Insulation of wires or sleeve length:	12 $^{\pm 0.5}$ mm	
Wire fixing:	Plus-minus terminal screws M 3.5 box terminals with wire protection or cage clamp terminals	
Fixing torque:	max. 0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	150 g	

Dimensions

Width x heigth x depth:	
MK 7854N:	22.5 x 90 x 97 mm
MK 7854N PC:	22.5 x 111 x 97 mm
MK 7854N PS:	22.5 x 104 x 97 mm

UL-Data

Switching capacity:	
Ambient temperature 60°C:	Pilot duty B300 5A 250Vac G.P.
Wire connection:	60°C / 75°C copper conductors only
Screw terminals fixed:	AWG 20 - 12 Sol/Str Torque 0.8 Nm
Plug in screw:	AWG 20 - 14 Sol Torque 0.8 Nm AWG 20 - 16 Str Torque 0.8 Nm
Plug in cage clamp:	AWG 20 - 12 Sol/Str

Technical data that is not stated in the UL-Data, can be found in the technical data section.

Standard Type

MK 7854N.82/61 AC/DC 12 ... 240 V 0.05 s ... 300 h

Article number:	0054053
• Output:	2 changeover contacts
• Nominal voltage U_N:	AC/DC 12 ... 240 V
• Time ranges:	0.05 s ... 300 h
• Width:	22.5 mm

Variant

MK 7854N.82/500/61:

- Connection facility for 2 remote potentiometers 10kOhms to adjust pulse and break time
- 2 changeover contacts, one programmable as instantaneous contact
- Additional control input B1 for time interruption / time addition

Ordering example for variant

MK 7854N .82 _ _ / _ _ _ /61 AC/DC 12 ... 240 V 0,05 s ... 300 h

- Time range
- Nominal voltage
- with UL-approval
- Variant, if required
- Type of terminals
  without indication:
  terminal blocks fixed with screw terminals
  PC (plug in cage clamp):
  pluggable terminal blocks with cage clamp terminals
  PS (plug in screw):
  pluggable terminal blocks with screw terminals
- Contacts
- Type

Options with Pluggable Terminal Blocks

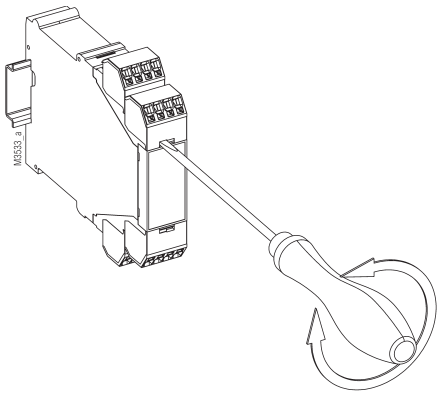
Screw terminal
(PS/plugin screw)

Cage clamp
(PC/plugin cage clamp)

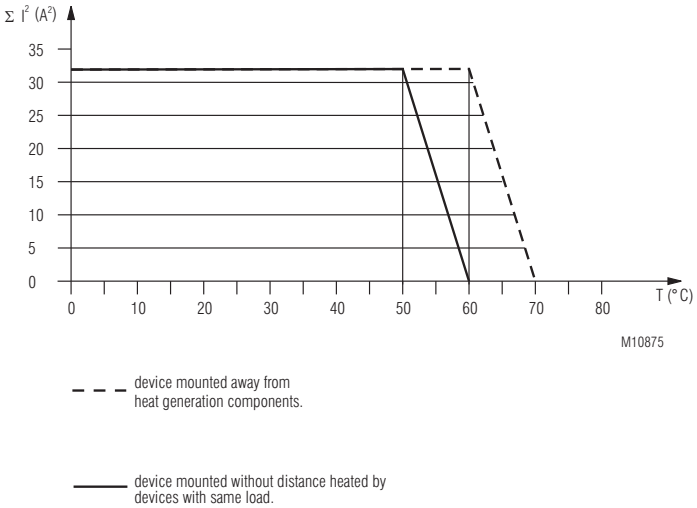
Notes

Removing the terminal blocks with cage clamp terminals

1. The unit has to be disconnected.
2. Insert a screwdriver in the side recess of the front plate.
3. Turn the screwdriver to the right and left.
4. Please note that the terminal blocks have to be mounted on the belonging plug in terminations.



Characteristics



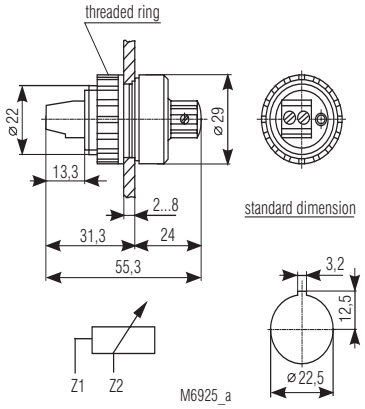
Quadratic total current limit curve

Accessories

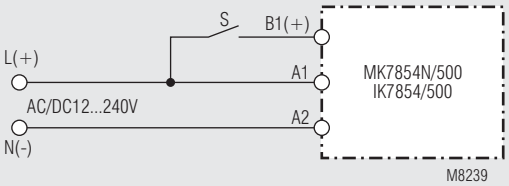
AD 3: External potentiometer 10 kΩ
Article number: 0028962

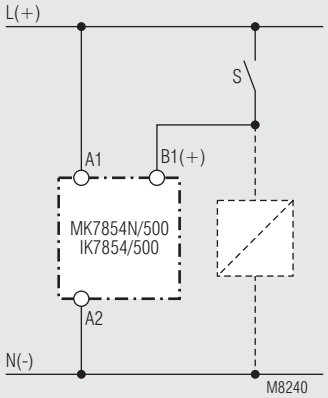
The external potentiometer is used for remote setting of the time delay. The internal potentiometer of the timer must be set to min. time delay.

Degree of protection front side: IP 60

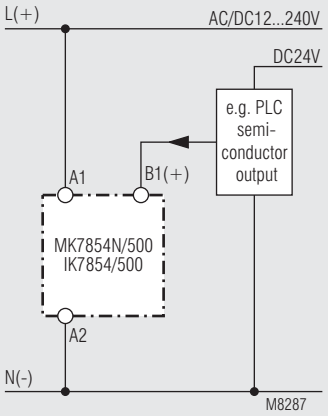


Connection Examples





Control with parallel connected load



Connection with 2 different control voltages

MINITIMER
Pulse Control Timer
BA 7864, EO 7864

0227773

BA 7864

EO 7864

EO 7864 with
front frame ET 4048-3

- According to IEC/EN 61 812-1
- Time range up to 32 h
- Seperate setting of impulse- and space time
- For impulse- and space time 4 time ranges each
- Repeat accuracy < ± 0.5 %
- Setting on relative scale
- Dual-voltage-version
- Programmable for start with impulse or space
- LED indication for operation and contact position
- BA 7864 available with remote potentiometer contact Z1-Z2, Z3-Z4
- EO 7864 with 11-pole socket
- Available with 1 or 2 changeover contacts, or semiconductor output (BA 7864)
- BA 7864: width 45 mm
  EO 7864: front size 35 x 48 mm

Approvals and Markings

CE

Application

Time dependent controls

Indication

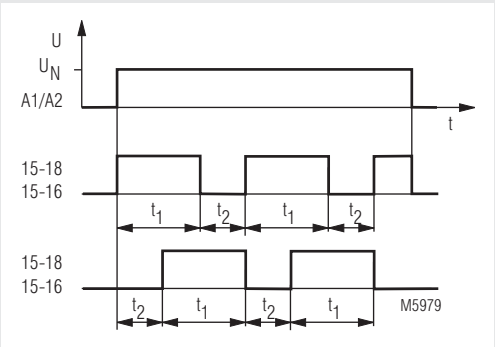
red LED:	on when operating voltage applied
green LED:	on when output relay activated

Notes

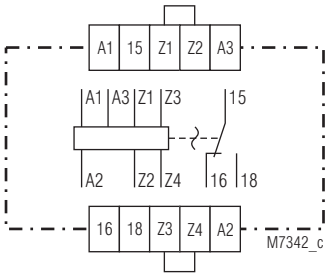
By an external bridge via terminals 6-7 of the plug-in-socket the EO 7864 can be programmed for the start with space.

The BA 7864.- - starts with impulse, whereas the special version of the device BA 7864.- -/010 starts with space. For the variants BA 7864.81 and BA 7864.81/010 a remote setting of the impulse- or space time is possible via two external variable resistors.

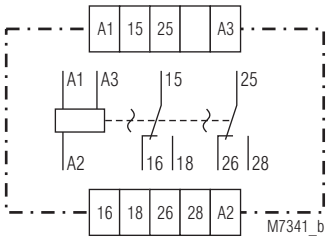
Function Diagram



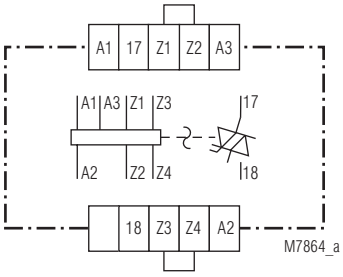
Circuit Diagrams



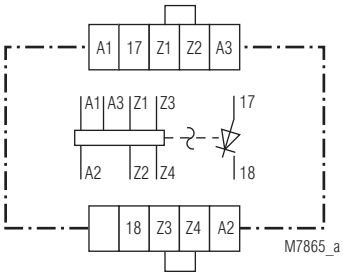
BA 7864.81



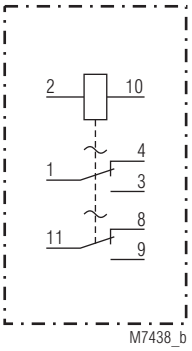
BA 7864.82



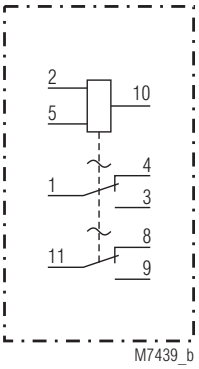
BA 7864.91



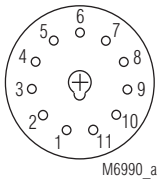
BA 7864.95



EO 7864.82
(single-voltage version)



EO 7864.82
(dual-voltage version)



bottom view
looking on pins

Technical Data

Time circuit

Time range:	impulse and space seperately adjustable in 4 steps:			
	0.25 ... 2.5 s	or	0.25 ... 2.5 min	
	1 ... 10 s		1 ... 10 min	
	8 ... 80 s		8 ... 80 min	
	64 ... 640 s		64 ... 640 min	
		or	0.75 ... 7.5 min	
			3 ... 30 min	
			24 ... 240 min	
			3.2 ... 32 h	
	other combinations of these time ranges for impulse or space, on demand.			
Time setting:	for impulse and space seperately infinite on relative scale (1:10)			
Recovery time:	< 30 ms			
Operate time:	< 25 ms			
Release time:	approx. 12 ms			
Remote setting				
BA 7864.81:	AD 3 1 MΩ (2 pieces, for impulse- and space time)			
Repeat accuracy:	< ± 0.5 % of the scale max. value			
Voltage influence:	< 1 % over the whole voltage range			
Temperature range:	< 0.1 % / K			

Input

Nominal voltage U_N:	AC/DC 24, 42 V AC/DC 24[1)] + AC 110 ... 127 V[2)] AC/DC 24[1)] + AC 220 ... 240 V[2)] [1)] to terminals A3-A2 or terminals 5-10 [2)] to terminals A1-A2 or terminals 2-10

Technical Data

Voltage range

AC/DC 24 V and AC/DC 42 V:	AC and DC (residual ripple ≤ 20 %) 0.8 ... 1.2 U_N DC (residual ripple = 48 %) 0.8 ... 1.1 U_N	
AC 110 ... 127 V and AC 220 ... 240 V:	0.8 ... 1.1 U_N	
Nominal consumption:	AC 24 V	0.7 VA
	AC 42 V	1.2 VA
	AC 110 V	2.5 VA
	AC 230 V	5 VA
	DC 24 V	0.6 W
	DC 42 V	1.2 W
Nominal frequency:	50 / 60 Hz	

Relay Output

Contacts		
BA 7864.81:	1 changeover contact	
BA 7864.82:	2 changeover contacts	
EO 7864.81:	1 changeover contact	
EO 7864.82:	2 changeover contacts	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15:	5 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	1.5 x 10^5 switching cycles	
Short circuit strength		
max. fuse rating:	5 A gL	IEC/EN 60 947-5-1
Mechanical life:	> 30 x 10^6 switching cycles	

Solid state output

BA 7864.91:	Triac
Switching voltage:	AC 12 ... 275 V
Switching current:	4 A
BA 7864.95:	Transistor
Switching voltage:	DC 15 ... 30 V
Switching current:	5 A

General Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 60 °C	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V/m	IEC/EN 61 000-4-3
Fast transients:	2 kV	IEC/EN 61 000-4-4
Surge voltages:	1 kV	IEC/EN 61 000-4-5
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplast with V0-behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10...55Hz, IEC/EN 60 068-2-6	
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Wire connection:		
BA 7864:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
EO 7864:	via plug-in-socket suitable to the 11-pole socket according to IEC 67-1-18 a	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Weight		
BA 7864:	200 g	
EO 7864:	110 g	

Technical Data

Dimensions

Width x height x depth

BA 7864:	45 x 73 x 133 mm
EO 7864:	35 x 48 x 109 mm
Front-panel cut-out	
EO 7864:	$45^{+0.6}$ x $45^{+0.6}$ mm

Standard Types

BA 7864.81 AC/DC 24 V + AC 220 ... 240 V 640 s On / 640 s Off

Article number:	0032194	stock item
• Output:	1 changeover contact	
• Nominal voltage U_N:	AC/DC 24 V + AC 220 ... 240 V	
• Time setting for impulse and space:	0.25 ... 640 s	
• Width:	45 mm	

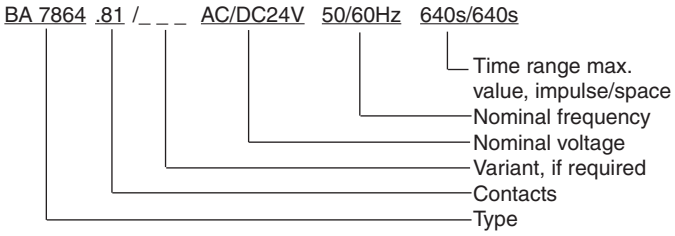
EO 7864.82 AC/DC 24 V + AC 220 ... 240 V 640 m On / 640 m Off

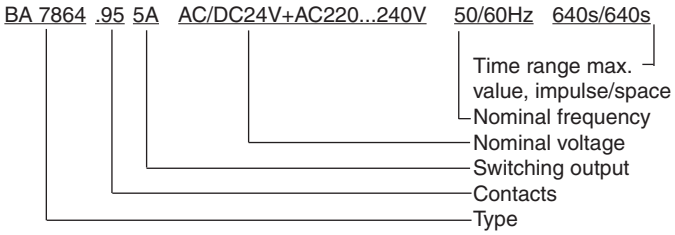
Article number:	0032222	stock item
• Output:	2 changeover contacts	
• Nominal voltage U_N:	AC/DC 24 V + AC 220 ... 240 V	
• Time setting for impulse and space:	0.25 ... 640 m	
• Front size:	35 x 48 mm	

Variants

BA 7864. _ _ /010:	start with space
BA 7864.81/100:	programmable, start with space, when X3, X4 bridged

Ordering examples for variants



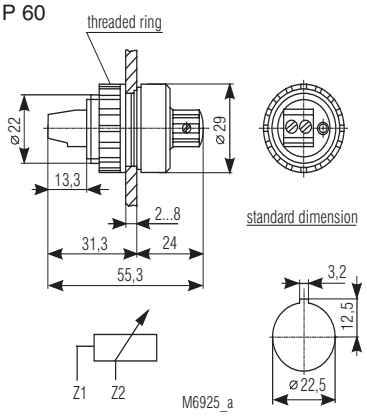


Accessories

for BA 7864.81:

AD 3:	External variable resistor 1 MΩ Article number: 0028962

Degree of protection front side: IP 60



for EO-version:
for DIN rail mounting:

ET 4048-21:	plug-in socket without fixing clamp Article number: 0028049
ET 4048-22:	plug-in socket with fixing clamp Article number: 0028050

for flush mounting:

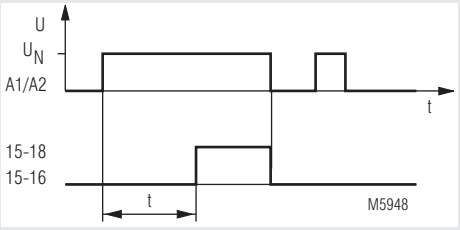
ET 4048-13:	plug-in adapter Article number: 0010784
ET 4048-3:	front frame Article number: 0004979

MINITIMER
Time Relay With Operate Delay
IK 7813, SK 7813

0222111

- According to IEC/EN 61 812-1
- 1 changeover contact
- Delay up to 60 min.
- Repeat accuracy ≤ 1 %
- LED indicator for contact position
- Devices available in 2 enclosure versions:
  IK 7813: depth 58 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  SK 7813: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable ducts
- Width 17.5 mm

Function Diagram



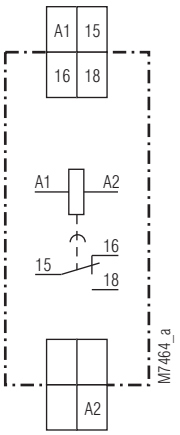
Approvals and Markings

CE

Application

Time-based control equipment

Circuit Diagram



Indicator

LED: on when the output relay is activated (contact 15 - 18 is closed)

Notes

A change of the time setting is directly valid.
If a time is changed during time elaps, the output relay may energise unintended.

Connection Terminals

Terminal designation	Signal description
A1	L / +
A2	N / -
15, 16, 18	Changeover contact

Technical Data

Time circuit

Time ranges:	0,1 ... 1 s 1 ... 10 min 0,3 ... 3 s 3 ... 30 min 1 ... 10 s 6 ... 60 min 3 ... 30 s 10 ... 100 s
Time setting:	Infinitely variable, on relative scale
Recovery time	
tw 50 / 100:	< 60 ms
Repeat accuracy:	0.1 %
Voltage influence:	≤ 1 % at 0.8 ... 1.1 U_N
Temperature influence:	0.05 % / K

Input

Nominal voltage U_N:	AC/DC 12 V, AC/DC 24 V, AC 110 ... 127 V, AC 220 ... 240 V
Voltage range:	0.8 ... 1.1 U_N with AC and DC 48 % residual ripple 0.9 ... 1.25 U_N in battery operating mode
Release voltage:	15 % U_N
Nominal consumption:	AC/DC 24 V 0.6 W AC 230 V 50 Hz 3.5 VA
Nominal frequency:	50 / 60 Hz
Frequency range:	± 5 %

Output

Contacts:	1 changeover contact
Contact material:	$AgSnO_2$
Measured nominal voltage:	AC 250 V
Release time of the contacts:	< 20 ms
Thermal current I_{th}:	max. 10 A (see quadratic total current limit curve)
Switching capacity	
to AC 15	
NO contact:	10 A / AC 230 V IEC/EN 60 947-5-1
NC contact:	5 A / AC 230 V IEC/EN 60 947-5-1
Glow lamp load:	1200 W
Electrical life:	IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	5 x 10^5 switching cycles
Permissible switching frequency:	6000 switching cycles/h
Short circuit strength	
max. fuse rating:	10 AgL IEC/EN 60 947-5-1
max. line circuit breaker:	B16
Mechanical life:	> 30 x 10^6 switching cycles

General Data

Operating mode:	Continuous operation
Temperature range:	
Operation:	- 20 ... + 60°C
Storage:	- 25 ... + 70°C
Relative air humidity:	95 % at 40 °C
Altitude:	< 2.000 m
Clearance and creepage distances	
rated impulse voltage/ pollution degree:	4 kV / 2 (base insulation) IEC 60 664-1
Overvoltage category:	III
Insulation test voltage, type test:	2.5 kV; 1 min
EMC	
Electrostatic discharge:	8 kV (air) IEC/EN 61 000-4-2
HF irradiation:	
80 MHz ... 1 GHz:	12 V / m IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 V / m IEC/EN 61 000-4-3
Fast transients:	4 kV IEC/EN 61 000-4-4
Surge voltage 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 55 011
Degree of protection	
Housing:	IP 40 IEC/EN 60 529
Terminals:	IP 20 IEC/EN 60 529

Technical Data

Housing:	Thermoplastic with V0 behaviour according to UL Subj. 94
Vibration resistance:	Amplitude 0.35 mm IEC/EN 60 068-2-6 frequency 10 ... 55 Hz
Climate resistance:	20 / 060 / 04 IEC/EN 60 068-1
Terminal designation:	EN 50 005
Wire connection:	DIN 46 228-1/-2/-3/-4
Cross section:	2 x 2,5 mm^2 solid or 2 x 1,5 mm^2 stranded ferruled
Stripping length:	10 mm
Wire fixing:	Flat terminals with self-lifting clamping piece IEC/EN 60 999-1
Fixing torque:	0.8 Nm IEC/EN 60 999-1
Mounting:	DIN rail IEC/EN 60 715
Weight:	
IK 7813:	75 g
SK 7813:	94 g

Dimensions

Width x height x depth:	
IK 7813:	17.5 x 90 x 58 mm
SK 7813:	17.5 x 90 x 98 mm

Standard Type

IK 7813.81 AC 220 ... 240 V 0.1 ... 1 s

Article number:	0033628
• Output:	1 changeover contact
• Nominal voltage U_N:	AC 220 ... 240 V
• Time range:	0.1 ... 1 s
• Width:	17.5 mm

SK 7813.81 AC 220 ... 240 V 0.1 ... 1 s

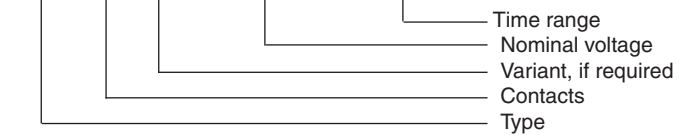
Article number:	0054738
• Output:	1 changeover contact
• Nominal voltage U_N:	AC 220 ... 240 V
• Time range:	0.1 ... 1 s
• Width:	17.5 mm

Variant

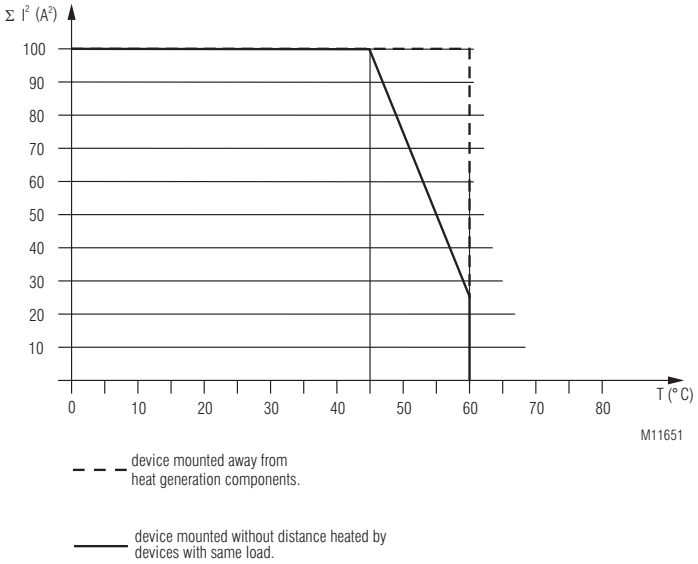
IK 7813.81/107:	with a time of 5 s or 0.4 s to be used in 3-phase voltage systems changeover control

Ordering example for variant

IK 7813 .81 /_ _ _ AC 220 ... 240 V 1 ... 10 s

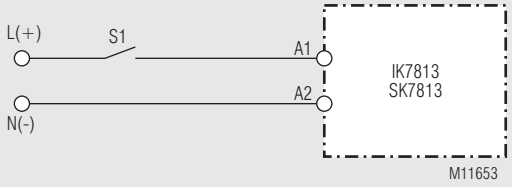


Characteristic



Quadratic total current limit curve

Connection Example



MINITIMER
Time Relay With Operate Delay
IK 7814, SK 7814

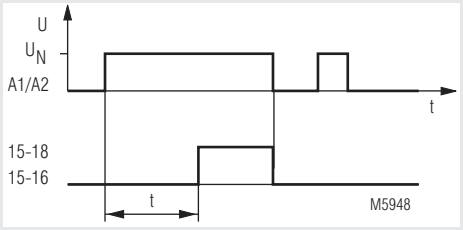
0222112

IK 7814

SK 7814

- According to IEC/EN 61 812-1
- 4 time ranges up to 640 min.
- Repeat accuracy ≤ 1 %
- LED indicator for contact position
- 1 changeover contact
- Devices available in 2 enclosure versions:
  IK 7814: depth 58 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  SK 7814: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable ducts
- Width 17.5 mm

Function Diagram



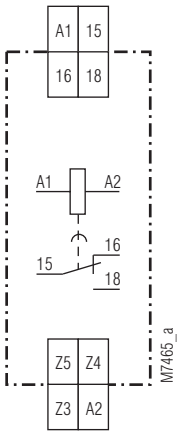
Approvals and Markings

CE

Application

Time-based control equipment

Circuit Diagram



Indicator

LED: on when the output relay is activated (contact 15 - 18 is closed)

Notes

A change of the time setting is directly valid.
If a time is changed during time elaps, the output relay may energise unintended.

The terminals Z3, Z4, Z5 are not galvanically separated to the terminals A1/A2!

Connection Terminals

Terminal designation	Signal description
A1	L / +
A2	N / -
Z3, Z4, Z5	Control inputs for programming of the time ranges
15, 16, 18	Changeover contact

Technical Data

Time circuit

Time ranges: 4 time ranges can be programmed externally via the terminals Z3 - Z4 - Z5

Bridge Z3 Z4 Z5	Unit with second ranges	Unit with minute ranges
0 0—0	0.25 - 2.5 s	0.25 - 2.5 min
0———0	1 - 10 s	1 - 10 min
0—0—0	8 - 80 s	8 - 80 min
0 0 0	64 - 640 s	6 - 640 min

Time setting: Infinitely variable, on relative scale
Recovery time
tw 50 / 100: < 60 ms
Repeat accuracy: 0.1 %
Voltage influence: ≤ 1 % at 0.8 ... 1.1 U_N
Temperature influence: 0.05 % / K

Input

Nominal voltage U_N: AC/DC 12 V, AC/DC 24 V, AC 110 ... 127 V, AC 220 ... 240 V
Voltage range: 0.8 ... 1.1 U_N with AC and DC 48 % residual ripple
0.9 ... 1.25 U_N in battery operating mode
Release voltage: 15 % U_N
Nominal consumption: AC/DC 24 V 0.6 W
AC 230 V 50 Hz 3.5 VA
AC 240 V 50 Hz 4 VA
Nominal frequency: 50 / 60 Hz
Frequency range: ± 5 %

Output

Contacts: 1 changeover contact
Contact material: $AgSnO_2$
Measured nominal voltage: AC 250 V
Thermal current I_{th}: max. 10 A
(see quadratic total current limit curve)

Switching capacity
at AC 15
NO contact: 10 A / AC 230 V IEC/EN 60 947-5-1
NC contact: 5 A / AC 230 V IEC/EN 60 947-5-1
Glow lamp load: 1200 W
Electrical life: IEC/EN 60 947-5-1
AC 15 at 3 A, AC 230 V: 5 x 10^5 switching cycles
Permissible switching frequency: 6 000 switching cycles/h
Short circuit strength
max. fuse rating: 10 AgL IEC/EN 60 947-5-1
max. line circuit breaker: B16
Mechanical life: > 30 x 10^6 switching cycles

General Data

Nominal operating mode: Continuous operation
Temperature range:
Operation: - 20 ... + 60°C
Storage: - 25 ... + 70°C
Relative air humidity: 95 % at 40 °C
Altitude: < 2.000 m
Clearance and creepage distances
Rated impulse voltage/ pollution degree: 4 kV / 2 (base insulation) IEC 60 664-1
Overvoltage category: III
Insulation test voltage, type test: 2.5 kV; 1 min
EMC
Electrostatic discharge: 8 kV (air) IEC/EN 61 000-4-3
HF irradiation
80 MHz ... 1 GHz: 10 V / m IEC/EN 61 000-4-3
1 GHz ... 2.5 GHz: 3 V / m IEC/EN 61 000-4-3
2.5 GHz ... 2.7 GHz: 1 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 55 011

Technical Data

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 Subj. 94
Vibration resistance: Amplitude 0.35 mm frequency 10 ... 55 Hz, IEC/EN 60 068-2-6
Climate resistance: 20 / 060 / 04 IEC/EN 60 068-1
Terminal designation: EN 50 005
Wire connection: DIN 46 228-1/-2/-3/-4
Cross section: 2 x 2,5 mm² solid or
2 x 1,5 mm² stranded ferruled
Stripping length: 10 mm
Wire fixing: Flat terminals with self-lifting clamping piece IEC/EN 60 999-1
Fixing torque: 0.8 Nm IEC/EN 60 999-1
Mounting: DIN rail IEC/EN 60 715
Weight
IK 7814: 75 g
SK 7814: 94 g

Dimensions

Width x height x depth:
IK 7814: 17.5 x 90 x 58 mm
SK 7814: 17.5 x 90 x 98 mm

Standard type

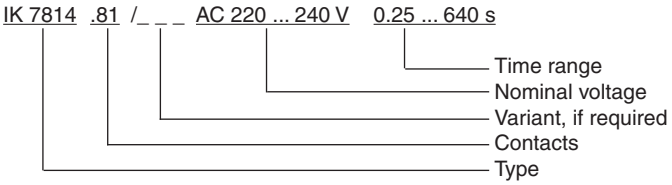
IK 7814.81 AC 220 ... 240 V 0.25 ... 640 s
Article number: 0031959
- Output: 1 changeover contact
- Nominal voltage U_N: AC 220 ... 240 V
- Time range: 0.25 ... 640 s
- Width: 17.5 mm

SK 7814.81 AC 220 ... 240 V 0.25 ... 640 s
Article number: 0054739
- Output 1 changeover contact
- Nominal voltage U_N: AC 220 ... 240 V
- Time range: 0.25 ... 640 s
- Width: 17.5 mm

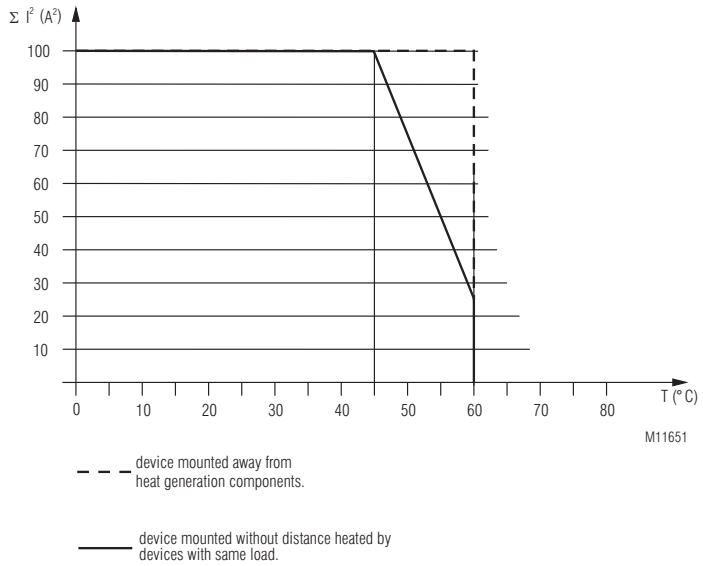
Variante

IK 7814.81/107: to be used in 3-phase voltage systems changeover control

Ordering example for variant

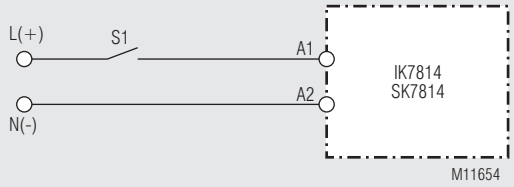


Characteristic



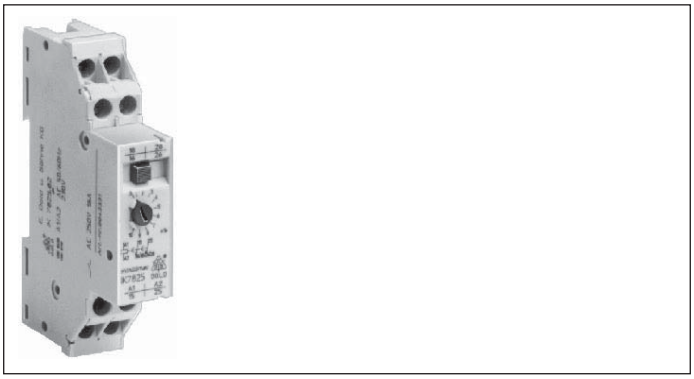
Quadratic total current limit curve

Connection Example



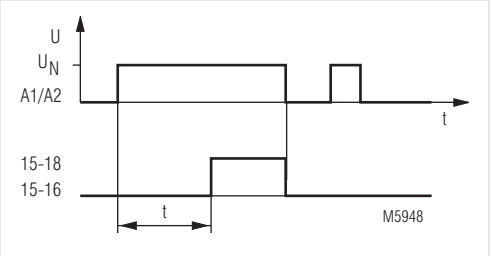
MINITIMER
Time Delay Relay, Operate Delay Type
IK 7825

0221566

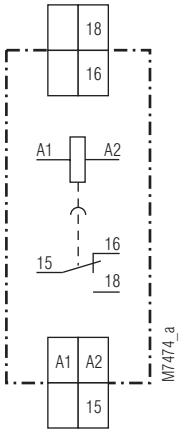


- According to IEC/EN 61 812-1
- Delay of 0.05 s ... 60 min.
- Repeat accuracy ≤ 0.5 % + 10 ms
- Pushbutton for manual actuation of the contact
- 1 or 2 changeover contacts for 16 A
- Width 17.5 mm

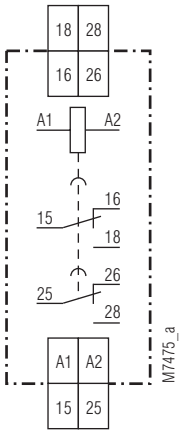
Function Diagram



Circuit Diagrams



IK 7825.81



IK 7825.82

Approvals and Markings

CE

Applications

- Time-dependent controllers

Indicators

Push button:	pressed, when relay energized

Technical Data

Time ranges:	0.05 ... 1 s
	0.5 ... 10 s
	5 ... 100 s
	0.5 ... 10 min.
	1.5 ... 30 min.
	3 ... 60 min.
Tolerance of end value:	- 5 ... + 25 % of nominal value
Time setting:	steppless, 1:20 on relative scale
Recovery time:	approx. 60 ms (after time run-down)
	approx. 700 ms (during time run-down)
Repeat accuracy:	< ± 0.5 % + 10 ms
Voltage influence:	< 1 % over voltage range
Temperature influence:	< 0.1 % / K

Input

Nominal voltage U_N:	AC 24, 127, 230 V
	DC 24 V
Voltage range:	90 ... 110 % U_N
Nominal consumption	
AC:	2.3 VA
DC:	1.5 W
Nominal frequency:	50 Hz
Frequency range:	± 5 %

Output

Contacts	
IK 7825.81:	1 changeover contact delayed
IK 7825.82:	2 changeover contacts delayed
Release time of the contacts:	< 30 ms
Thermal current I_{th}:	16 A
Electrical life	at 500 switching cycles / h
under ohmic load AC 230 V:	6 A 150 x 10^4 switching cycles
	10 A 72 x 10^4 switching cycles
	16 A 12 x 10^4 switching cycles
Inductive load cos. φ 0.6:	10 A 10 x 10^4 switching cycles
Direct current load:	see limti curve for arc-free operation
Short circuit strength	
max. fuse rating:	16 A gL
Mechanical life:	> 3 x 10^6 switching cycles
General Data	

Technical Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 45 °C	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 3	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 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
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermplastic 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:	20 / 045 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded ferruled DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Weight:	100 g	

Dimensions

Width x height x depth:	17.5 x 89 x 58 mm

Standard Type

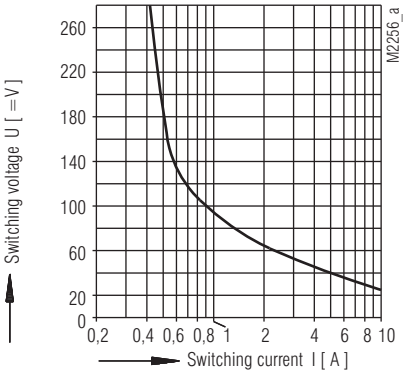
IK 7825.81	AC 230 V	50 Hz	5 ... 100 s
Article number:		0043326	stock item
• Output:		1 changeover contact delayed	
• Nominal voltage U_N:		AC 230 V	
• Time range:		5 ... 100 s	
• Width:		17.5 mm	

Ordering Example

IK 7825 .81 AC 230 V 50 Hz 1 s

- 1 s — Time range limit value
- 50 Hz — Nominal frequency
- AC 230 V — Nominal voltage
- .81 — Contact
- IK 7825 — Type

Characteristics



safe braking, no continuous arcing
max. 1000 switching cycles / h
contact spacing min. 0,6mm

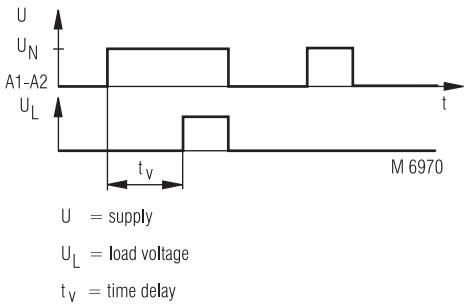
Limit curve for arc-free operation

MINITIMER
Time Relay, With Operate Delay
IK 8808

0221569

- For two-wire technology
- According to IEC/EN 61 812-1
- programmable time ranges between 0.06 ... 160 s or 0.06 ... 160 min
- Programmable nominal voltage AC/DC 24 ... 240 V
- Repeat accuracy ≤ ± 1 %
- Thyristor output for 10 ... 800 mA
- Width 17.5 mm

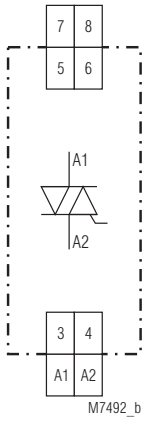
Function Diagram



Unit Programming

Terminals	Bridge	Time sec/min	Voltage AC/DC [V]
5 - 6 7 - 8		16 ... 160	
5 - 6 7 - 8	X X	2 ... 20	
5 - 6 7 - 8	X	0.25 ... 2.5	
5 - 6 7 - 8	X	0.06 ... 0.6	
3 - 4	X		24 ... 60
3 - 4			60 ... 240

Circuit Diagram



Approvals and Markings

CE

Application

Time-based control equipment

Notes

The units must be connected in accordance with the connection examples. Voltage may not be applied to the time relay when it is not loaded; if this is done, the time relay will be destroyed. Connections A1 and A2 have advance pole protection.

Technical Data

Time circuit

Time ranges:	0.06 ... 0.6 s or 0.06 ... 0.6 min 0.25 ... 2.5 s 0.25 ... 2.5 min 2 ... 20 s 2 ... 20 min 16 ... 160 s 16 ... 160 min
Time setting:	Infinitely variable, on relative scale
Recovery time	
tw 50 / 100:	≤ 100 ms / ≤ 25 ms
Repeat accuracy:	± 1 % of the full scale
Temperature influence:	≤ 0.15 % / K

Input

Nominal voltage U_N:	AC/DC 24 ... 60 V and AC/DC 60 ... 240 V
Voltage range:	0.8 ... 1.1 U_N
Nominal frequency:	50 / 60 Hz
Frequency range:	± 20 %
Residual current:	≤ 3 mA during the operating time
Voltage drop:	≤ 3.5 V after the operating time has ended

Output

Type of output:	Thyristor
Load current (min.):	10 mA
Load current (max.):	0.8 A (20°C)
Load current reduction:	10 mA
Max. overload:	25 A max. 10 ms 50 A max. 1 ms
Dielectric strength:	1 400 V max. 100 µs
Thermal current I_{th}:	0.8 A

Technical Data

General Data

Nominal operating mode:	Continuous operation	
Temperature range:	- 20 ... + 60°C	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
Fast transient:	1 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
Interference suppression:	Limit value class B	EN 55 011
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:	20 / 060 / 04	IEC/EN 60 068-1
Wire connection:	2 x 2.5 mm^2 solid or 2 x 1.5 mm^2 stranded ferruled DIN 46 228-1/-2/-3/-4	
Wire fixing:	Terminals with self-lifting clamping piece	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Weight:	58 g	

Dimensions

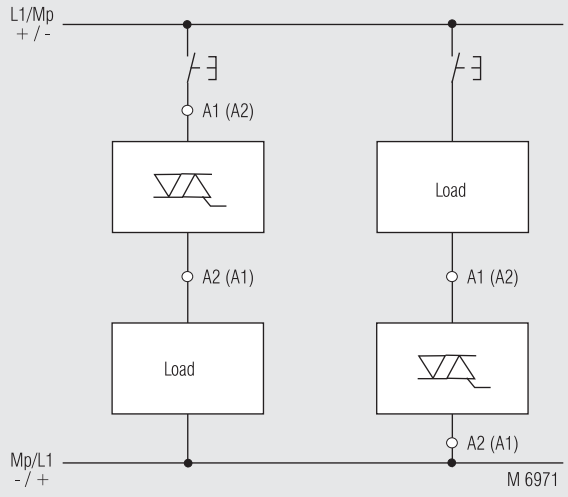
Width x height x depth:	17.5 x 89 x 58 mm

Standard Type

IK 8808 0.06 ... 160 s

Article number:	0023180	stock item
• Nominal voltage U_N:	AC/DC 24 ... 240 V	
• Time range:	0.06 ... 160 s	
• Width:	17.5 mm	

Connection Example



MINITIMER
Timer, On delayed
IK 9906, SK 9906

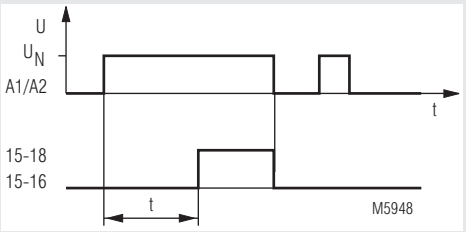
0239761

IK 9906

SK 9906

- According to IEC/EN 61 812-1
- 8 time ranges from 0.05 s to 300 h selectable via rotational switches
- Voltage range AC/DC 12 ... 240 V
- Adjustment aid for quick setting of long time values
- Suitable for 2-wire proximity sensor control
- 1 changeover contact
- As option connection of a remote potentiometer 10 kΩ
- As option with time interruption / time adding input
- LED indicators for operation, contact position and time delay
- Devices available in 2 enclosure versions:
  IK 9906: depth 59 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  SK 9906: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct.
- 17.5 mm width

Function Diagram



Approvals and Markings

CE

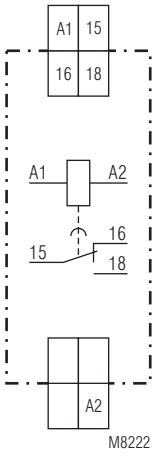
Application

Time-dependent controllers

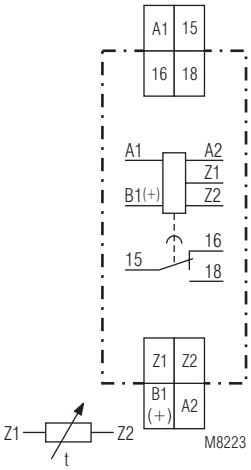
Indicators

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

Circuit Diagrams



IK 9906.81
SK 9906.81



IK 9906.81/500
SK 9906.81/500

Connection Terminals

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

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)

Setting
A change of the settings for time range and time will be valid immediately. Please note, that a change of 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 the range 3 ... 300 min. The time check takes too long as several timing cycles would be necessary for a precise value.

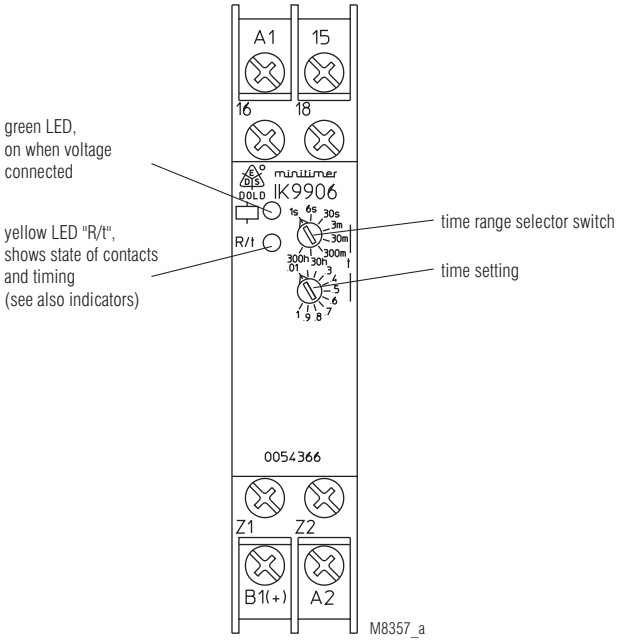
For faster adjustment the setting is made to 0.03 ... 3 min. On this range the potentiometer should be set to 0.4 min (= 24 sec). With the right potentiometer setting the LED must show 24 flashing cycles. After that the time range is switched over to 3 ... 300 min and the setting is complete.

Time interruption / Time adding
With the model IK/SK 9906.81/500 the timing cycle can be interrupted by controlling input B1 (+) with control voltage. Removing the control signal will continue the timing cycle (time addition). When time is interrupted the yellow LED goes off.

Control input B1
The control input B1 (+) has to be supplied 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.

Remote potentiometer
With the variant IK/SK 9906.81/500 the time setting can also be made via remote potentiometer of 10 kOhms. It is connected to the terminals Z1-Z2. The corresponding potentiometer on the relay 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 potentiometers 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!

Setting



Technical Data

Time circuit

Time ranges:	8 time ranges 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 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
Frequency range (AC):	45 ... 400 Hz
Nominal consumption	
at AC 12 V:	approx.1.5 VA
at AC 24 V:	approx. 2 VA
at AC 240 V:	approx. 3 VA
at DC 12 V:	approx.1 W
at DC 24 V:	approx. 1 W
at DC 240 V:	approx. 1 W
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 voltage (B1/A2)	
IK/SK 9906.81/500:	AC/DC 12 ... 240 V
Voltage range (B1/A2):	0.8 ... 1.1 UN
Control current (B1)	
IK/SK 9906.81/500:	input resistance approx. 220 kΩ in series with diode
Release voltage (B1/A2)	
IK/SK 9906.81/500:	
AC 50 Hz:	approx. 5 V
DC:	approx. 4 V

Output

Contacts		
IK/SK 9906.81:	1 changeover contact	
Contact material::	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	4 A (see see quadratic total current limit curve)	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13:	1 A / DC 24 V	
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 gL	IEC/EN 60 947-5-1
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:	< 2.000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	20 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients:		
A1/A2 and B1(+)/A2	4 kV	IEC/EN 61 000-4-4
Z1/Z2:	2 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:	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:	DIN 46 228-1/-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 60 999-1
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:		
IK 9906:	approx. 65 g	
SK 9906:	approx. 84 g	

Dimensions

Width x height x depth:	
IK 9906:	17.5 x 90 x 59 mm
SK 9906:	17.5 x 90 x 98 mm

Standard Type

IK 9906.81 AC/DC 12 ... 240 V 0.05 s ... 300 h

Article number:	0054364
• Output:	1 changeover contact
• Nominal voltage U_N:	AC/DC 12 ... 240 V
• Time ranges:	0.05 s ... 300 h
• Width:	17.5 mm

SK 9906.81 AC/DC 12 ... 240 V 0.05 s ... 300 h

Article number:	0054364
• Output:	1 changeover contact
• Nominal voltage U_N:	AC/DC 12 ... 240 V
• Time ranges:	0.05 s ... 300 h
• Width:	17.5 mm

Variant

IK/SK 9906.81/500:

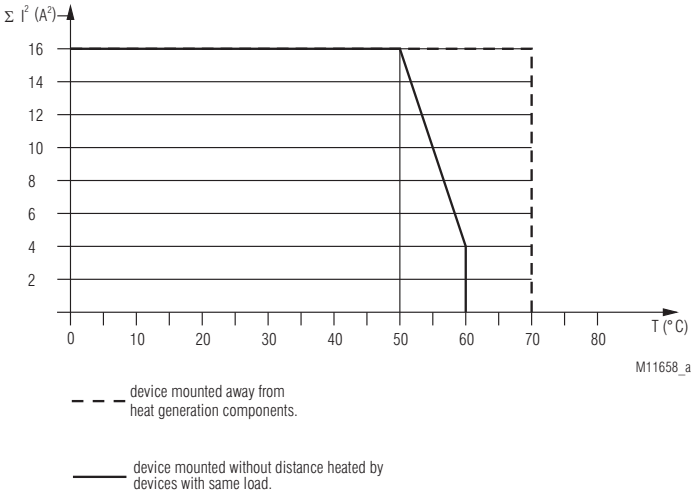
- Connection facility for a remote potentiometer 10 kOhms to adjust the time
- Additonal control input B1 for time interruption / time additon

Ordering example for variant

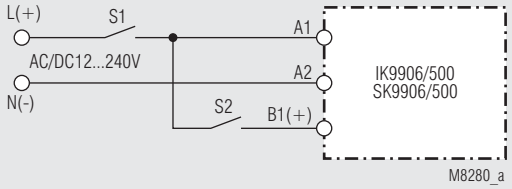
IK 9906 .81 /_ _ _ AC/DC 12 ... 240 V 0.05 s ... 300 h

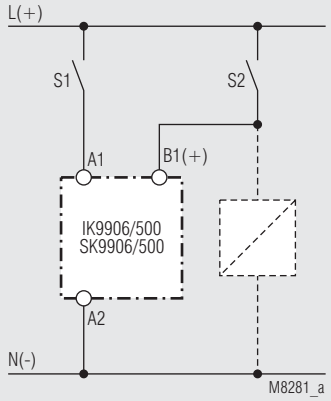
- Time range
- Nominal voltage
- Variant, if required
- Contacts
- Type

Characteristics

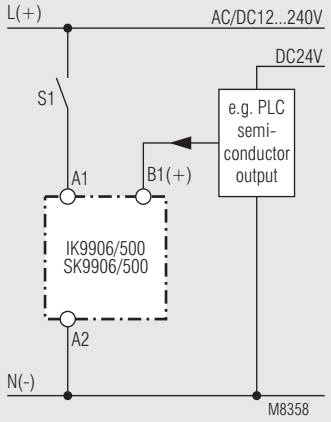


Connection Diagrams





Control with parallel connected load



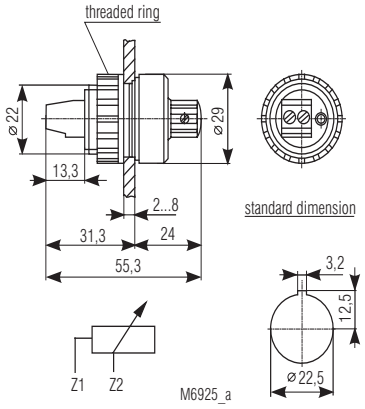
Connection with 2 different control voltages

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.

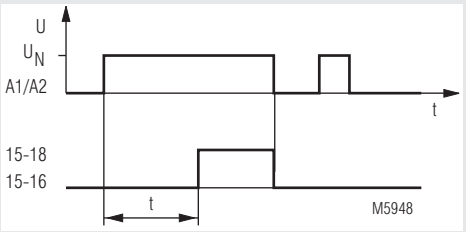
Degree of protection front side: IP 60



MINITIMER
Timer, On Delayed
BC 7930N

- According to IEC/EN 61 812-1
- Time delay between 0.05 s ... 10 h
- Repeat accuracy ≤ 0.5 % + 10 ms
- Dual voltage supply
- LED indicator for contact position
- 1 changeover contact
- Wire connection: also 2 x 1.5 mm² stranded ferruled (isolated), DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3
- Width 22.5 mm

Function Diagram



Approvals and Markings

CE

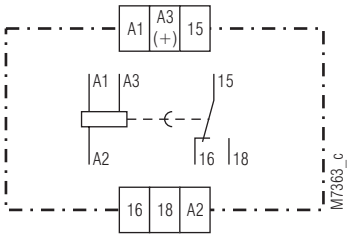
Applications

Time dependent controllers

Indicators

LED: on when output relay activated (contacts 15-18 are closed)

Circuit Diagram



Connection Terminals

Terminal designation	Signal description
A1, A3(+), A2	Operating voltage
15, 16, 18	Changeover contact

Technical Data

Time Circuit

Time ranges:	0.05 ... 1 s		0.5 ... 10 min.	
	0.15 ... 3 s		1.5 ... 30 min.	
	0.5 ... 10 s		3 ... 60 min.	
	1.5 ... 30 s		0.15 ... 3 h	
	5 ... 100 s		0.5 ... 10 h	
	15 ... 300 s			
Time setting:	stepless 1:20			
Recovery time:	≤ 100 ms			
Repeat accuracy:	≤ 0.5 % + 10 ms			
Voltage influence:	≤ 1 %			
Temperature influence:	≤ 0.25 % / K			

Input

Nominal voltage U_N		
(Operating voltage):	AC/DC 24 V[1] + AC 230 V[2]	
	AC/DC 24 V[1] + AC 110 ... 127 V[2]	
	AC/DC 24 V[1] + AC 42 V[2]	
	AC/DC 12 V	
	[1] at terminals A3-A2	
	[2] at terminals A1-A2	
Voltage range:	0.8 ... 1.1 U_N at AC	
	0.9 ... 1.25 U_N at DC	
Nominal consumption:	AC: 4 VA	
	DC: 0.4 W	
Nominal frequency:	50 / 60 Hz	
Frequency range:	± 5 % f_N	
Release voltage:	15 % U_N	

Output

Contacts:	1 changeover contact	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	4 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	1.5 x 10^5 switching cycles	
Permissible switching frequency:	36 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	10^8 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 20 ... + 60 °C	
Storage:	- 25 ... + 70 °C	
Relative air humidity:	95 % at 40 °C	
Altitude:	< 2.000 m	
Clearance and creepage distances		
overvoltge category / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	6 kV (contact)	IEC/EN 61 000-4-2
	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation 80 MHz ... 2.7 GHz:	20 V / m	IEC/EN 61 000-4-3
Fast transients:	4 kV	IEC/EN 61 000-4-4
Surge voltages		
between A1/A2:	2 kV	IEC/EN 61 000-4-5
between A3(+)/A2:	0,5 kV	IEC/EN 61 000-4-5
between A1, A2/PE:	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 55 011

Technical Data

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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:		
Cross section:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated) or 2 x 1.5 mm² stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3	
Insulation of wires or sleeve length:	10 mm	
Wire fixing:	Terminal screws M 3.5 Box terminal with wire protection	
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	80 g	

Dimensions

Width x height x depth:	22.5 x 84 x 97 mm

Standard Type

BC 7930N.81 AC/DC 24 V + AC 230 V 5 ... 100 s

Article number:	0052652
• Front colour grey, with box terminals	
• Output:	1 changeover contact
• Nominal voltage U_N:	AC/DC 24 V + AC 230 V
• Time range:	5 ... 100 s
• Width:	22.5 mm

Ordering Example

BC 7930N .81 AC/DC 24 + AC 230 V 50 / 60 Hz 10 s

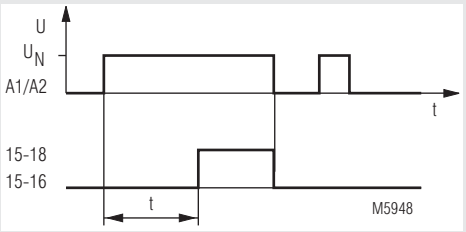
- 10 s — Time range end value
- 50 / 60 Hz — Nominal frequency
- AC/DC 24 + AC 230 V — Nominal voltage
- .81 — Contacts
- BC 7930N — Type

MINITIMER
Time Relay With Operate Delay
BC 7934N

0225282

- According to IEC/EN 61 812-1
- 8 switching ranges from 0.05 s ... 16 h
- Infinite variable delay on every range 1 : 10
- Dual-voltage design as standard (e.g. AC 230 V + AC/DC 24 V)
- LED indicator for contact position
- 1 changeover contact
- Wire connection: also 2 x 1.5 mm² stranded ferruled (isolated), DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3
- Width 22.5 mm

Function Diagram



Approvals and Markings

CE

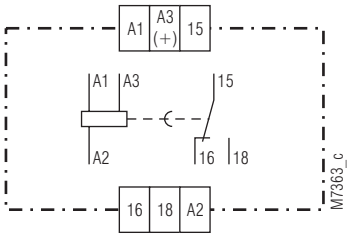
Applications

Time-dependent controllers

Indicators

LED: on when output relay activated (contacts 15 - 18 are closed)

Circuit Diagrams



Connection Terminals

Terminal designation	Signal description
A1, A3(+), A2	Operating voltage
15, 16, 18	Changeover contact

Technical Data

Time Circuit

Time ranges:	8 switching ranges	
	0.05 ... 0.5 s	0.4 ... 4 min.
	0.2 ... 2 s	1.5 ... 15 min.
	1.5 ... 15 s	0.2 ... 2 h
	0.2 ... 2 min.	1.6 ... 16 h
Time setting:	infinitely variable 1:10	
Recovery time:	≤ 100 ms	
Repeat accuracy:	≤ 0.5 % + 10 ms	
Voltage influence:	≤ 1 %	
Temperature influence:	≤ 0.25 % / K	

Input

Nominal voltage U_N		
(Operating voltage):	AC/DC 24 V[1)] + AC 230 V[2)]	
	AC/DC 24 V[1)] + AC 110 ... 127 V[2)]	
	AC/DC 24 V[1)] + AC 42 V[2)]	
	[1)] on terminals A3-A2	
	[2)] on terminals A1-A2	
Voltage range:	0.8 ... 1.1 U_N with AC	
	0.9 ... 1.25 U_N with DC	
Nominal consumption:	AC: 4 VA	
	DC: 0.4 W	
Nominal frequency:	50 / 60 Hz	
Frequency range:	± 5 % f_N	
Release voltage:	15 % U_N	

Output

Contacts:	1 changeover contact	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	4 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	1.5 x 10^5 switching cycles	
Permissible switching frequency:	36 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	10^8 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 20 ... + 60 °C	
Storage:	- 25 ... + 70 °C	
Relative air humidity:	95 % at 40 °C	
Altitude:	< 2.000 m	
Clearance and creepage distances		
overvoltge category / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	6 kV (contact)	IEC/EN 61 000-4-2
	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation 80 MHz ... 2,7 GHz:	20 V/m	IEC/EN 61 000-4-3
Fast transients:	4 kV	IEC/EN 61 000-4-4
Surge voltages		
between A1/A2:	2 kV	IEC/EN 61 000-4-5
between A3(+)/A2:	0,5 kV	IEC/EN 61 000-4-5
between A1, A2/PE:	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 55 011

Technical Data

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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:		
Cross section:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated) or 2 x 1.5 mm² stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3	
Insulation of wires or sleeve length:	10 mm	
Wire fixing:	Terminal screws M 3.5 Box terminal with wire protection	
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	80 g	

Dimensions

Width x height x depth:	22.5 x 84 x 97 mm

Standard Type

BC 7934N.81 AC/DC 24 V + AC 230 V 16 h
Article number: 0052673

- Front colour grey, with box terminals
- Output: 1 changeover contact
- Nominal voltage U_N: AC/DC 24 V + AC 230 V
- Time ranges: from 0.05 s ... 16 h
- Width: 22.5 mm

Ordering Example

BC 7934N .81 AC/DC 24 + AC 230 V 0.05 s ... 16 h

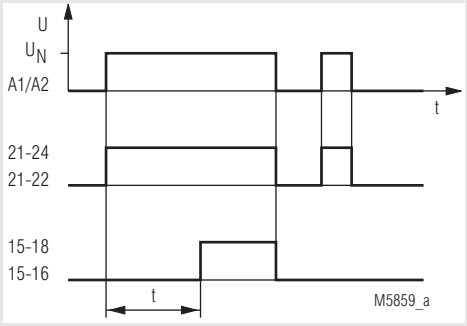
- 0.05 s ... 16 h — Time range end value
- AC/DC 24 + AC 230 V — Nominal voltage
- .81 — Contacts
- BC 7934N — Type

MINITIMER
Time Relay With Operate Delay
MK 7858

0221577

- According to IEC/EN 61 812-1
- Delay of 0.25 ... 640 s or min.
- 4 switchable time ranges
- Repeat accuracy ≤ ± 0.5 %
- Can be controlled with 2-wire initiators at terminals A1-A2, residual current ≤ 5 mA
- Available as 2-voltage version
- Available with instantaneous contact
- 2 changeover contacts
- 2 LED displays for power supply and contact position
- Width 22.5 mm

Function Diagram



Approvals and Markings

CE

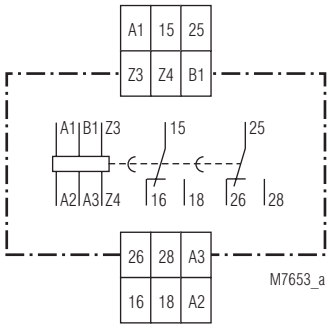
Application

Time-dependent controllers

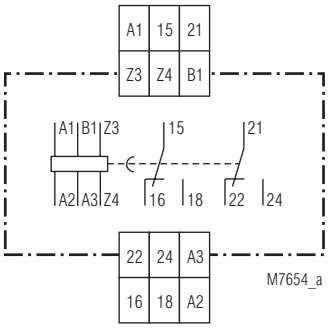
Indicators

upper LED: on, when supply connected
lower LED: on, when output relay energized

Circuit Diagram



MK 7858.82/024



MK 7858.32/024

Connection Terminals

Terminal designation	Signal description
A1, A3(+), A2	Operating voltage
Z3, Z4, B1	Control inputs for programming of the time ranges
15, 16, 18	1. Wechslerkontakt (verzögert)
25, 26, 28	MK7858.82/024 2. Wechslerkontakt (verzögert) MK7858.32/024
21, 22, 24	2. Wechslerkontakt (Sofortkontakt)

Technical Data

Time circuit

Time ranges: 4 time ranges can be programmed externally via terminals Z3-Z4-B1

Bridge Z3 Z4 B1	Device with seconds ranges	Device with minutes ranges
0 0—0	0.25 - 2.5 s	0.25 - 2.5 min
0———0	1 - 10 s	1 - 10 min
0—0—0	8 - 80 s	8 - 80 min
0 0 0	64 - 640 s	6 - 640 min

Time setting: steppless
Recovery time
tw 50 / 100: 40 ms
Repeat accuracy: ≤ ± 0.5 % of set value
Voltage influence: ≤ 1 %
Temperature influence: < 0.1 % / K

Input

Nominal voltage U_N: 2-voltage version
AC/DC 24 V[1] + AC 110 ... 127 V[2]
AC/DC 24 V[1] + AC 230 V[2]
[1] at terminals A3 - A2
[2] at terminals A1 - A2
Voltage range: AC 0.8 ... 1.1 U_N
DC 0.9 ... 1.25 U_N

Nominal consumption	AC 230 V	DC 24 V
MK 7858.82/024:	8.5 VA	1 W
MK 7858.32/024:	9.5 VA	1 W

Nominal frequency: 50 / 60 Hz
Frequency range: ± 5 % f_N
Release voltage: 15 % U_N
Permissible residual current: 5 mA

Output

Contacts
MK 7858.82/024: 2 delayed changeover contacts
MK 7858.32/024: 1 delayd chageover contact
1 non-delayed changeover contact
Contact material: AgNi 0.15µ, gold plated
Measured nominal voltage: AC 250 V
Thermal current I_{th}: 5 A
Switching capacity
to AC 15:
NO contact: 3 A / AC 230 V IEC/EN 60 947-5-1
NC contact: 1 A / AC 230 V IEC/EN 60 947-5-1
Electrical life IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V: 5 x 10^5 switching cycles
Permissible operating frequency: 3 000 switching cycles / h
Short circuit strength
max. fuse rating: 6 A gG / gL IEC/EN 60 947-5-1
Mechanical life: 30 x 10^6 switching cycles

General Data

Operating mode: Continuous operation
Temperature range
Operation: - 20 ... + 60 °C
Storage: - 20 ... + 60 °C
Altitude: < 2,000 m
Clearance and creepage distances
rated impulse voltage / pollution degree: 4 kV / 3 IEC 60 664-1
EMC
Electrostatic discharge: 4 kV (air) IEC/EN 61 000-4-2
HF irradiation:
80 MHz ... 1 Ghz: 12 V / m IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz: 10 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: 10 V IEC/EN 61 000-4-6
Interference suppression Limit value class B EN 55 011

Technical Data

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: 20 / 60 / 04 IEC/EN 60 068-1
Terminal designation: EN 50 005
Wire connection: 2 x 1.5 mm^2 solid or
2 x 1.0 mm^2 stranded wire with sleeve DIN 46 228-1/-2/-3/-4
Wire fixing: Flat terminals with self-lifting clamping piece IEC/EN 60 999-1
Fixing torque: 0.4 Nm
Mounting: DIN rail IEC/EN 60 715
Weight: 150 g

Dimensions

Width x height x depth: 22.5 x 82 x 99 mm

Standard Type

MK 7858.82/024 AC/DC 24 V + AC 220 ... 240 V 640 s
Article numer: 0039447
- Output: 2 changeover contacts, delayed
- Nominal voltage U_N: AC/DC 24 V + AC 220 ... 240 V
- Time ranges: 0.25 ... 640 s
- Width: 22.5 mm

Order Example

MK 7858 .82 /024 AC/DC 24 V + AC 220 ... 240 V 640 s

- 640 s — Time range limit value
- AC/DC 24 V + AC 220 ... 240 V — Nominal voltage
- .82 — Contact
- MK 7858 — Type

Accessories

ET 4752-143: Marking plate
Article number: 0043203

Safety Remark

- when operating the unit the general standards for electrostatic endangered part have to be ovserved

MINITIMER
Timer, On Delayed
MK 9906, AA 9906/200

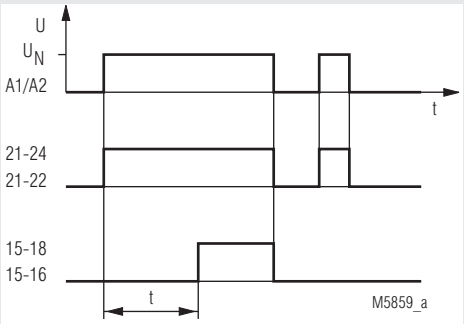
0221582


MK 9906


AA 9906/200

- According to IEC/EN 61 812-1
- Time delay of 0.05 s ... 100 h
- Repeat accuracy ≤ ± 0.5 %
- Adjustable on absolute scale
- MK 9906 as a 2-voltage version
- AA 9906/200 with wide input range AC/DC 24 ... 240 V
- Available with instantaneous contact
- LED indicators for operation and contact position
- Controllable by proximity sensors
- 2 changeover contacts
- MK 9906: width 22.5 mm
  AA 9906/200: width 45 mm

Function Diagram



Approvals and Markings

CE

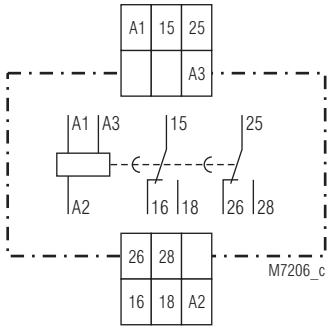
Applications

Time-dependent controllers

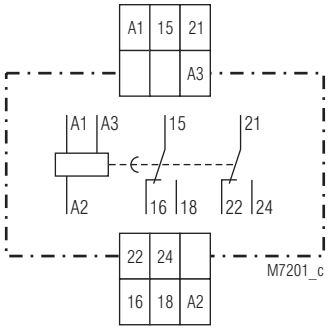
Indicators

upper LED: on, when supply connected
lower LED: on, when output relay active (contact 15-18 closed)

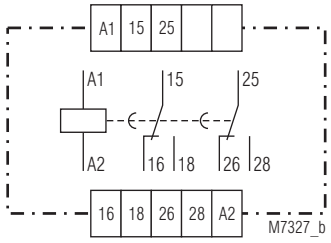
Circuit Diagrams



MK 9906.82



MK 9906.32



AA 9906.82/200

Connection Terminals

Terminal designation	Signal description
A1, A3(+), A2	Operating voltage
15, 16, 18 25, 26, 28	2 changeover contacts (delayed, MK 9906.82, AA 9906.82/200
21, 22, 24	Changeover contact (instantaneous contact, MK 9906.32)

Technical Data

Time Circuit

Time ranges:	0.05 ...	1 s	0.5 ...	10 min
	0.15 ...	3 s	1.5 ...	30 min
	0.5 ...	10 s	3 ...	60 min
	1.5 ...	30 s	5 ...	100 min
	3 ...	60 s	0.15 ...	3 h
	5 ...	100 s	0.5 ...	10 h
	15 ...	300 s	1.5 ...	30 h
			5 ...	100 h

Time setting: steppless on an absolute scale
Recovery time
tw 50 / 100: 40 ms
Repeat accuracy: ≤ ± 0.5 % of the scale limit value
Voltage influence: ≤ 1 %
Temperature influence: < 0.1 % / K

Input

Nominal voltage U_N:
MK 9906: AC/DC 24 V [1] + AC 110 ... 127 V [2]
AC/DC 24 V [1] + AC 230 ... 240 V [2]
also available (on request)
as single-voltage version
AC/DC 12 V, AC/DC 42 ... 48 V
[1] at terminals A3 - A2
[2] at terminals A1 - A2
AA 9906/200: AC/DC 24 ... 240 V
Voltage range:
MK 9906: AC 0.8 ... 1.1 U_N
DC 0.9 ... 1.25 U_N
AA 9906/200: AC 19 ... 264 V
DC 19 ... 300 V

Technical Data

Nominal consumption:	AC 230 V	DC 24 V	DC 42 V
	8.5 VA	1 W	1 W
Nominal frequency:	50 / 60 Hz		
Frequency range	± 5 % f_N		
Resetting voltage:	15 % U_N		
Permissible residual current:	5 mA		

Output

Contacts		
MK 9906:	2 changeover contacts	
MK 9906.32:	1 changeover contact, non-delayed 1 changeover contact, delayed	
AA 9906.82/200:	2 changeover contacts	
Measured nominal voltage:	AC 250 V	
Release time:	30 ms	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15		
MK 9906		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
AA 9906/200		
NO contact:	10 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	5 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	5 x 10^5 switching cycles	
Permissible switching frequency:	6 000 switching cycles / h	
Short circuit strength max. fuse rating:	6 A gL	IEC/EN 60 947-5-1
Mechanical life:	> 30 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation and Storage		
MK 9906:	- 20 ... + 60 °C	
AA 9906/200:	- 40 ... + 60 °C	
Relative air humidity:	93 % at 40 °C	
Altitude:	< 2,000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:		
Input/output:	4 kV / 2 (Basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2,5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
MK 9906:		
80 MHz ... 1 GHz:	10 V / m	IEC/EN 61 000-4-3
1 GHz ... 2 GHz:	3 V / m	IEC/EN 61 000-4-3
2 GHz ... 2.7 GHz:	1 V / m	IEC/EN 61 000-4-3
AA 9906/200:		
80 MHz ... 1 GHz:	10 V / m	IEC/EN 61 000-4-3
1 GHz ... 2 GHz:	10 V / m	IEC/EN 61 000-4-3
2 GHz ... 2.7 GHz:	10 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:	2 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 55 011
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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	

Technical Data

Wire connection:		
MK 9906:	2 x 1.5 mm² solid or 2 x 1.0 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
AA 9906/200:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Insulation of wires or sleeve length		
MK 9906:	8 mm	
AA 9906/200:	10 mm	
Fixing torque:		
MK 9906:	0.4 Nm	
AA 9906/200:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight		
MK 9906:	140 g	
AA 9906/200:	160 g	

Dimensions

Width x height x depth	
MK 9906:	22.5 x 82 x 99 mm
AA 9906/200:	45 x 77 x 127 mm

Standard Types

MK 9906 AC/DC 24 V + AC 220 ... 240 V 0.5 ... 10 s

Article number:	0044853
• Output:	2 changeover contacts
• Nominal voltage U_N:	AC/DC 24 V + AC 220 ... 240 V
• Width:	22.5 mm

AA 9906.82/200 AC/DC 24 ... 240 V 1,5 ... 30 s

Article number:	0039285
• Output:	2 changeover contacts
• Nominal voltage U_N:	AC/DC 24 ... 240 V
• Width:	45 mm

Ordering Example

MK 9906 .82 AC/DC 24 V + AC 230 ... 240 V 50 / 60 Hz 100 s

- Time range limit value
- Nominal frequency
- Nominal voltage
- Contacts
- Type

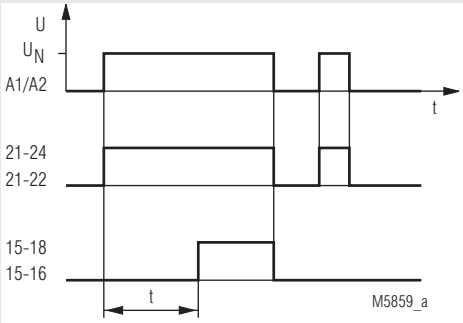
Accessories

for MK 9906:	
ET 4752-143	Marking plate Article number: 0043203
for AA 9906/200:	
K 70-34	Cover Article number: 0011790

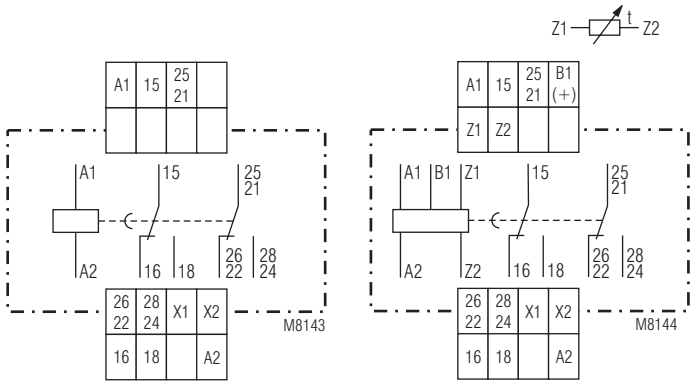
MINITIMER
Timer, On delayed
MK 9906N

0239282

Function Diagram



Circuit Diagrams



MK 9906N.82 MK 9906N.82/500

Connection Terminals

Terminal designation	Signal description
A1	L / +
A2	N / -
15, 16, 18	Changeover contact
25, 26, 28	Changeover contact
B1(+)	Control Input (time interruption with time adding)
X1, X2	Control Input (programming 2nd delayed C/O contact or instantaneous contact)
Z1, Z2	Input to connect a remote potentiometer for time setting t1

Your Advantages
- 8 time ranges in one unit
- Simplified storage
- High accuracy
- Quick setting of long time values

Features
- According to IEC/EN 61 812-1
- 8 time ranges from 0.05 s to 300 h selectable via rotational switches
- Voltage range AC/DC 12 ... 240 V
- Adjustment aid for quick setting of long time values
- Suitable for 2-wire proximity sensor control
- 2 changeover contacts, one programmable as instantaneous contact
- LED indicators for operation, contact position and time delay
- Wire connection: also 2 x 1.5 mm² stranded ferruled, or 2 x 2.5 mm² solid DIN 46 228-1/-2/-3/-4
- As option connection of a remote potentiometer
- As option with time interruption / time adding input
- As option with pluggable terminal blocks for easy exchange of devices
  - with screw terminals
  - or with cage clamp terminals
- 22.5 mm width

Approvals and Markings

CE | cULus LISTED * Canada / USA

* see variants

Applications

Time-dependent controllers

Indicators

green LED:	on when voltage connected
yellow LED "R/t":	shows status of output relay and time delay:
- Flashing (long on, short off)	output relay not active; time delay
- Continuously on:	output relay active after 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)

Instantaneous contact
By external wire links the output function of the device can be altered from 2 delayed contacts to 1 delayed **and** 1 instantaneous contact. The instantaneous contact switches when the operating voltage is connected. To terminals X1 and X2 no other voltage potentials must be connected, as the unit might be damaged.

Notes

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 mutiplication 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.

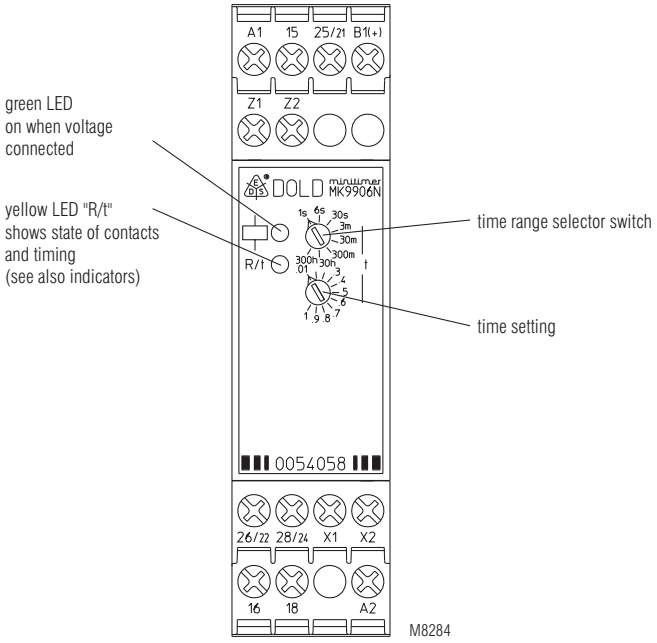
Time interruption / Time adding
With the model MK 9906N.82/500 the timing cycle can be interrupted by controlling input B1 (+) with control voltage. Removing the control signal will continue the timing cycle (time addition). When time is interrupted the yellow LED goes off.

Control input B1
The control input B1 (+) has to be supplied 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, which allows cost saving circuits.

Remote potentiometers
With the variant MK 9906N.82/500 the time setting can also be made via remote potentiometer of 10 kOhms. It is connected to the terminals Z1-Z2. The corresponding potentiometer on the relay 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 potentiometers 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 Z2.
To terminals Z1 and Z2 no external voltage must be connected, as the unit might be damaged.

Setting



Technical Data

Time circuit

Time ranges:	8 time ranges 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 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 temperatue 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
Frequency range (AC):	45 ... 400 Hz
Nominal consumption	
at AC 12 V:	approx. 1.5 VA
at AC 24 V:	approx. 2 VA
at AC 240 V:	approx. 3 VA
at DC 12 V:	approx. 1 W
at DC 24 V:	approx. 1 W
at DC 240 V:	approx. 1 W
Release voltage (A1/A2)	

	Delayed contact	Instantaneous contact
AC 50 Hz:	approx. 7.5 V	approx. 3 V
DC:	approx. 7 V	approx. 3.3 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 voltage (B1/A2)	
MK 9906N.82/500:	AC/DC 12 ... 240 V
Voltage range (B1/A2):	0.8 ... 1.1 UN
Control current (B1)	
MK 9906N.82/500:	approx. 1 mA, over complete voltage range
Release voltage (B1/A2)	
MK 9906N.82/500	
AC 50 Hz:	approx. 3.5 V
DC:	approx. 3 V

Output

Contacts	
MK 9906N.82:	2 changeover contacts, one programmable as instantaneous
contact:	
without bridge X1-X2:	25-26-28 delayed changeover contact
with bridge X1-X2:	21-22-24 instantaneous contact at U_N on A1-A2
Contact material:	AgNi
Measured nominal voltage:	AC 250 V
Thermal current I_{th}:	see quadratic total current limit curve (max. 4 A per contact)
Switching capacity	
to AC 15	
NO contact:	3 A / AC 230 V IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V IEC/EN 60 947-5-1
to DC 13:	1 A / DC 24 V
Electrical life	
to AC 15 at 1 A, AC 230 V:	1.5 x 10^5 switching cycles IEC/EN 60 947-5-1
Permissible switching frequency:	36 000 switching cycles / h
Short circuit strength max. fuse rating:	4 A gL IEC/EN 60 947-5-1
Mechnical life:	≥ 30 x 10^6 switching cycles

Technical Data

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 40 ... + 60 °C (higher temperature see quadratic total current limit curve)	
Storage:	- 40 ... + 70 °C	
Relative air humidity:	93 % at 40 °C	
Altitude:	< 2,000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:		
Input / Output:	4 kV / 2 (basis insulation)	IEC 60 664-1
Output / Output:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	20 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	2 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:	10 V	IEC/EN 61 000-4-6
Interference suppression:	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 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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:		EN 50 005
Wire connection		DIN 46 228-1/-2/-3/-4
Screw terminals (integrated):	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled or 2 x 1.5 mm² stranded ferruled or 2 x 2.5 mm² solid	
Insulation of wires or sleeve length:	8 mm	
Plug in with screw terminals		
max. cross section for connection:	1 x 2.5 mm² solid or 1 x 2.5 mm² stranded ferruled	
Insulation of wires or sleeve length:	8 mm	
Plug in with cage clamp terminals		
max. cross section for connection:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled	
min. cross section for connection:	0.5 mm²	
Insulation of wires or sleeve length:	12 $^{\pm 0.5}$ mm	
Wire fixing:	Plus-minus terminal screws M 3.5 box terminals with wire protection or cage clamp terminals	
Fixing torque:	max. 0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	150 g	

Dimensions

Width x heigth x depth	
MK 9906N:	22.5 x 90 x 97 mm
MK 9906N PC:	22.5 x 111 x 97 mm
MK 9906N PS:	22.5 x 104 x 97 mm

UL-Data

Switching capacity:

Ambient temperature 60°C:	Pilot duty B300 5A 250Vac G. P.
Wire connection:	60°C / 75°C copper conductors only
Screw terminals fixed:	AWG 20 - 12 Sol/Str Torque 0.8 Nm
Plug in screw:	AWG 20 - 14 Sol Torque 0.8 Nm AWG 20 - 16 Str Torque 0.8 Nm
Plug in cage clamp:	AWG 20 - 12 Sol/Str

Technical data that is not stated in the UL-Data, can be found in the technical data section.

Standard Type

MK 9906N.82/61 AC/DC 12 ... 240 V 0.05 s ... 300 h

Article number:	0057517
• Output:	2 changeover contacts, one programmable as instantaneous contact
• Nominal voltage U_N:	AC/DC 12 ... 240 V
• Time ranges:	0.05 s ... 300 h
• Width:	22.5 mm

Variants

MK 9906N.82:	without connection facility for a remote potentiometer.
MK 9906N.82/500:	with connection facility for a remote potentiometer 10 kΩ to adjust the time and additional control input B1 for time interruption / time addition.

Ordering example for variants

MK 9906N .82 _ _ / _ _ _ /61 AC/DC 12 ... 240 V 0,05 s ... 300 h

- Time range
- Nominal voltage
- with UL-approval (Canada / USA)
- Variant, if required
- Type of terminals
  - without indication: terminal blocks fixed, with screw terminals
  - PC (plug in cage clamp): pluggable terminal blocks with cage clamp terminals
  - PS (plug in screw): pluggable terminal blocks with screw terminals
- Contacts
- Type

Options with Pluggable Terminal Blocks

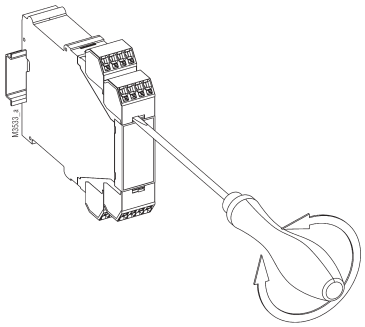
Screw terminal
(PS/plugin screw)

Cage clamp
(PC/plugin cage clamp)

Notes

Removing the terminal blocks with cage clamp terminals

1. The unit has to be disconnected.
2. Insert a screwdriver in the side recess of the front plate.
3. Turn the screwdriver to the right and left.
4. Please note that the terminal blocks have to be mounted on the belonging plug in terminations.

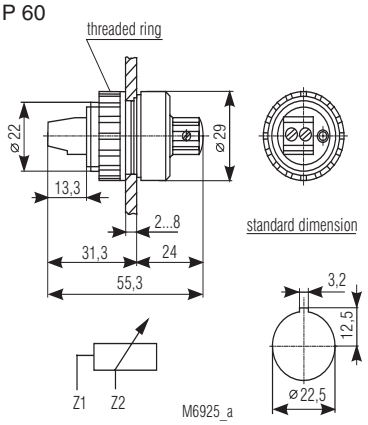


Accessories

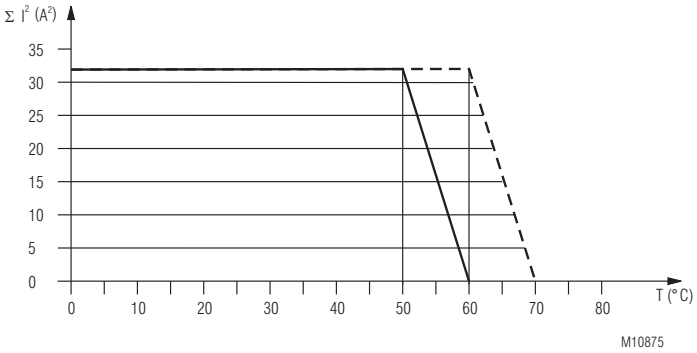
AD 3: External potentiometer 10 kΩ
Article number: 0028962

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 60



Characteristics

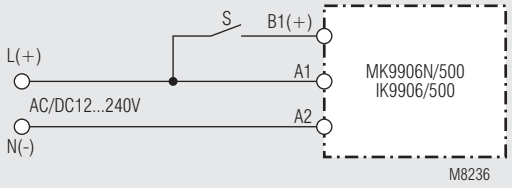


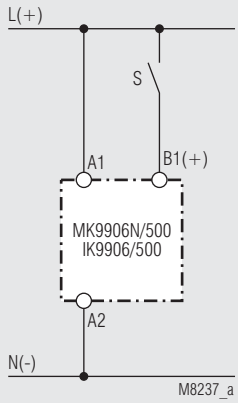
device mounted away from heat generation components.

device mounted without distance heated by devices with same load.

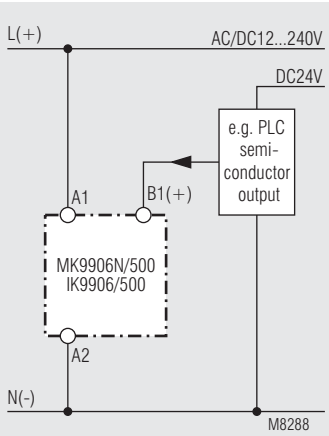
Quadratic total current limit curve

Connection Examples





Control with parallel connected load

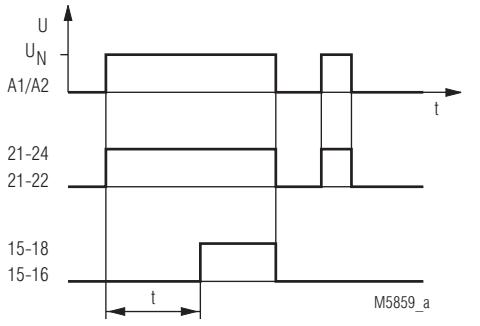


Connection with 2 different control voltages

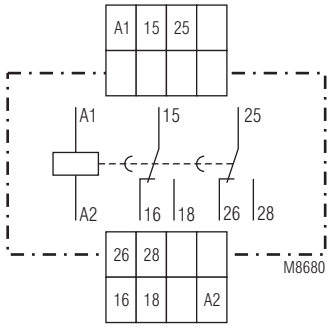
MINITIMER
Timer, On delayed
MK 9906N/600

0272762

Function Diagram



Circuit Diagrams



MK 9906N.82/600

Your Advantages
- For different time ranges
- Simplified storage
- High accuracy

Features
- According to IEC/EN 61 812-1
- Delay from 0.05 s ... 100 h
- Repeat accuracy ≤ ± 0.5 %
- Setting on absolute scale
- LED indicators for operation and state of contacts
- Controlled with 2-wire initiators
- 2 changeover contacts
- Wire connection: also 2 x 1.5 mm² stranded ferruled, or 2 x 2.5 mm² solid DIN 46 228-1/-2/-3/-4
- As option with pluggable terminal blocks for easy exchange of devices
  - with screw terminals
  - or with cage clamp terminals
- Width: 22.5 mm

Approvals and Markings

AE68

Application

Time-dependent controllers

Indications

upper LED:	on when supply connected
lower LED:	on, when corresponding output relay is active (contact 15 - 18 closed)

Technical Data

Time circuit

Time ranges:	0.05 ... 1 s		0.5 ... 10 min		
	0.15 ... 3 s		1.5 ... 30 min		
	0.5 ... 10 s		3 ... 60 min		
	1.5 ... 30 s		0.15 ... 3 h		
	3 ... 60 s		0.5 ... 10 h		
	5 ... 100 s		1.5 ... 30 h		
	15 ... 300 s		5 ... 100 h		
Time setting:	Stepless, setting on absolute scale				
Recovery time					
tw 50 / 100:	40 ms				
Repeat accuracy:	≤ ± 0.5 % end of scale value				
Voltage influence:	≤ 1 %				
Temperature influence:	< 0.1 % / K				

Input

Nominal voltage U_N:	AC/DC 24 V, AC 110 ... 127 V		
	AC/DC 24 V, AC 230 ... 240 V		
Voltage range:	AC 0.8 ... 1.1 U_N		
	DC 0.9 ... 1.25 U_N		
Nominal consumption:	AC 230 V	DC 24 V	DC 42 V
	8.5 VA	1 W	1 W
Nominal frequency:	50 / 60 Hz		
Frequency range:	± 5 % f_N		
Release voltage:	15 % U_N		
Permissible residual current:	5 mA		

Technical Data

Output

Contacts:	2 changeover contacts	
Release time:	30 ms	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	2 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		
to AC 15 at 3 A, AC 230 V:	5 x 10^5 switch. cycles	IEC/EN 60 947-5-1
Permissible switching frequency:	6 000 switching cycles / h	
Short circuit strength		
max. fuse rating:	6 A gL	IEC/EN 60 947-5-1
Mechnical life:	> 30 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 60 °C	
Clearance and creepage distances		
rated impulse voltage / pollution degree:		
Input / Output:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	4 kV	IEC/EN 61 000-4-4
Surge voltage between		
wires for power supply:	1 kV	IEC/EN 61 000-4-5
between wire and ground:	2 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 55 011
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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection		DIN 46 228-1/-2/-3/-4
Screw terminals (integrated):	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated) or 2 x 1.5 mm² stranded ferruled (isolated) or 2 x 2.5 mm² solid	
Insulation of wires or sleeve length:	8 mm	
Plug in with screw terminals		
max. cross section for connection:	1 x 2.5 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated)	
Insulation of wires or sleeve length:	8 mm	
Plug in with cage clamp terminals		
max. cross section for connection:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated)	
min. cross section for connection:	0.5 mm²	
Insulation of wires or sleeve length:	12 $^{\pm 0,5}$ mm	
Wire fixing:	Plus-minus terminal screws M 3.5 box terminals with wire protection or cage clamp terminals	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	140 g	

Dimensions

Width x heigth x depth	
MK 9906N:	22.5 x 90 x 97 mm
MK 9906N PC/600:	22.5 x 111 x 97 mm
MK 9906N PS/600:	22.5 x 104 x 97 mm

Standard Type

MK 9906N.82/600 AC 220 ... 240 V 1.5 ... 30 s

Article number:	0056017
• Output:	2 Wechsler
• Nominal voltage U_N:	AC 220 ... 240 V
• Width:	22.5 mm

Variants

MK 9906N.82/608: DC 24 V, 2 changeover contacts
inrush current:
≤ 100 mA, typ. at DC 24 V: 80 mA
recovery time:
t_w 50/100: ≤ 20 ms
(suitable to be controlled by reed contacts)

Ordering example for variants

MK 9906N .82 _ _ / 6 _ _ AC 230 ... 240 V 50/60 Hz 100 s

- Time range max. value
- Nominal frequency
- Nominal voltage
- Variant, if required
- Type of terminals
  without indication:
  terminal blocks fixed, with screw terminals
  PC (plug in cageclamp):
  pluggable terminal blocks with cage clamp terminals
  PS (plug in screw):
  pluggable terminal blocks with screw terminals
- Contacts
- Type

Options with Pluggable Terminal Blocks

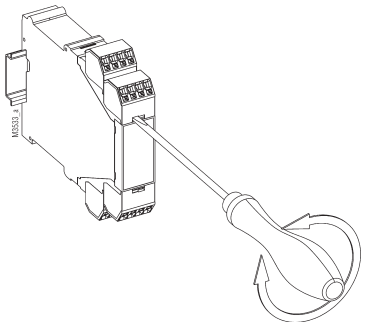
Screw terminal
(PS/plugin screw)

Cage clamp
(PC/plugin cage clamp)

Notes

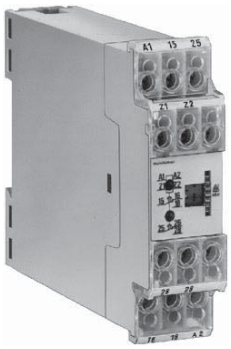
Removing the terminal blocks with cage clamp terminals

1. The unit has to be disconnected.
2. Insert a screwdriver in the side recess of the front plate.
3. Turn the screwdriver to the right and left.
4. Please note that the terminal blocks have to be mounted on the belonging plug in terminations.



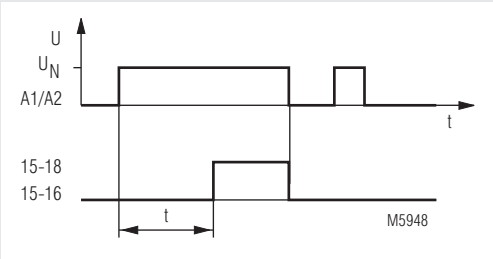
MINITIMER
Timer, Delay On Make
MK 9908

0226796

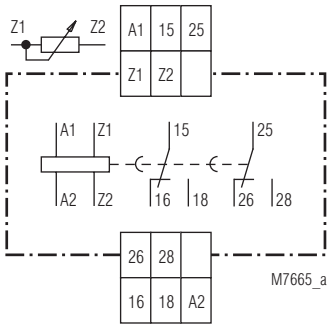


- According to IEC/EN 61 812-1
- Delay up to 300 s
- Repeat accuracy < ± 1 %
- Remote potentiometer connection
- Control with 2-wire-initiators possible
- LED-indication for supply and contact position
- 2 changeover contacts
- Width 22.5 mm

Function Diagram



Circuit Diagram



MK 9908.82

Approvals and Markings

CE

Application

Time dependent controls

Indication

upper LED:	on when operating voltage applied
lower LED:	on when output relay activated

Technical Data

Time circuit

Time ranges:	0.05 ... 1 s 0.15 ... 3 s 0.5 ... 10 s 1.5 ... 30 s 5 ... 100 s 15 ... 300 s
Time setting:	stepless on absolute scale remote setting by external potentiometer
Recovery time	
tw 50 / 100:	< 200 ms / < 100 ms
Repeat accuracy:	< ± 1 % of the max. scale value
Voltage influence:	≤ 2 % at 0.8 ... 1.1 U_N
Temperature influence:	≤ 0.3 % / K

Input

Nominal voltage U_N:	AC 24, 42, 110 ... 127, 220 ... 240 V DC 24 V with polarity protection
Voltage range:	0.8 ... 1.1 U_N at AC
Permissible residual current:	5 mA
Nominal consumption	
AC 230 V:	7 VA
Nominal frequency:	50 / 60 Hz
Frequency range:	± 5 % f_N

Technical Data

Output

Contacts:	2 changeover contacts delayed	
Release time of the contacts:	approx. 40 ms	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15:		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	2 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	5 x 10^5 switching cycles	
Permissible switching frequency:	6 000 switching cycles / h	
Short circuit strength		
max. fuse rating:	6 A gL	IEC/EN 60 947-5-1
Mechanical life:	30 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 60°C	
Clearance and creepage distances		
rated impulse voltage /		
pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF-irradiation:	10 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:	10 V	IEC/EN 61 000-4-6
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplast with V0-behaviour according to UL subj. 94	
Vibration resistance	Amplitude 0.35 mm frequency 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 1.5 mm² solid or 2 x 1.0 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Weight:	150 g	

Dimensions

Width x height x depth: 22.5 x 82 x 99 mm

Standard Type

MK 9908 AC 220 ... 240 V 0.5 ... 10 s

Article number:	0044923	stock item
• Output:	2 changeover contacts, delayed	
• Nominal voltage U_N:	AC 220 ... 240 V	
• Time range:	0.5 ... 10 s	
• Width:	22.5 mm	

Ordering example

MK 9908 /_ _ AC 220 ... 240 V 50 / 60 Hz 15 ... 300 s

- Time range
- Nominal frequency
- Nominal voltage
- Variant, if required
- Type

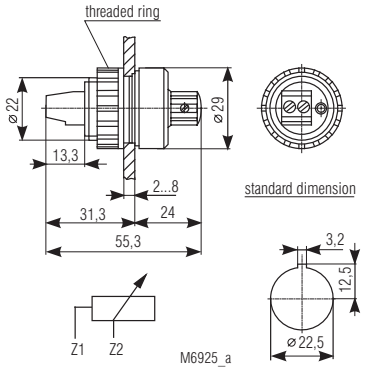
Accessories

ET 4752-143: Making plate
Article number: 0043203

AD 3: External potentiometers

0.05	...	1 s	1 MΩ
0.15	...	3 s	2.2 MΩ
0.5	...	10 s	10 MΩ
1.5	...	30 s	20 MΩ
5	...	100 s	20 MΩ
15	...	300 s	20 MΩ

Degree of protection front side: IP 60

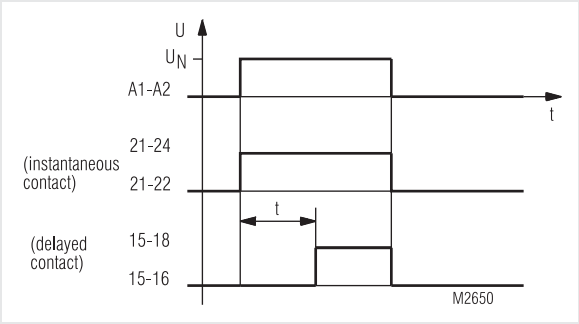


MINITIMER
Timer, On Delayed
AA 7512

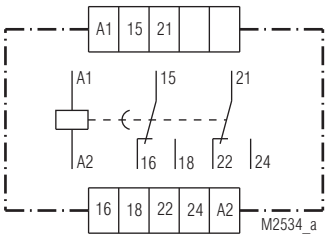
Your Advantage
- Non sensitive to electromagnetical influence by pneumatic time element

Features
- According to IEC/EN 61 812-1
- Delay up to 180 s
- Repeat accuracy < ± 5 %
- 1 changeover contact delayed, 1 changeover contact without delay
- Width 45 mm

Function Diagram



Circuit Diagram



AA 7512.32

Approvals and Markings

CE

Application

Time dependent controls

Function

With the on-delayed timer AA 7512 the delay is achieved by a pair of bellows that is compressed by a magnet system. With an adjustable regulating system the time for the expansion of the bellows is defined. The bellow then operates the switch contacts.

Notes

For the DC-version the mounting distance should not be smaller than 8 mm.

Technical Data

Time circuit

Time ranges:	0.2 ... 30 s 0.2 ... 180 s
Time setting:	infinitely
Repeat accuracy:	≤ ± 5 % of the final range value
Min. transition time:	25 ms
Temperature influence:	0.5 % / K under certain circumsances, variation and temperature errors can be added.

Input

Nominal voltage U_N:	AC 24, 42, 110, 127, 230, 240 V 50 or 60 Hz	
Voltage range:	AC 0.85 ... 1.1 U_N DC 0.8 ... 1.1 U_N	
Nominal consumption:	Initial position 22 VA 5.5 W	Active position 7 VA 5.5 W
Nominal frequency:	50 Hz	

Technical Data

Output

Contacts

AA 7512.32:	1 changeover contact, without delay 1 changeover contact, delayed	
Operate time of contacts:	< 50 ms	
Release time of contacts:	< 25 ms	
Thermal current I_{th}:	4 A	
Nominal breaking capacity	AC 110 V	AC 230 V
cos φ 1 ... 0.7:	2 A	2 A
cos φ 0.4:	1 A	1 A
	DC 110 V	DC 220 V
ohmic:	0.25 A	0.25 A
inductive:	0.03 A	0.02 A
Electrical life:	1.2×10^6 switching cycles 1 500 switches/h at 30 % of the switching capacity 0.8×10^6 switching cycles 1 000 switches/h at 50 % of the switching capacity 0.3×10^6 switching cycles 500 switches/h at 100 % of the switching capacity	
Permissible switching frequency:	1 500 switching cycles / h	
Short circuit strength max. fuse rating:	2 A gL	IEC/EN 60 947-5-1
Mechanical life:	> 3×10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:	- 10 ... + 55 °C	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF-irradiation:	10 V/m	IEC/EN 61 000-4-3
Fast transients:	2 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:	2 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 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminhhals:	IP 10	IEC/EN 60 529
Housing:	Thermoplast 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:	The device is only to be used in dry rooms, in closed switch cabinets or switch boxes.	
Terminal arrangement:	DIN 46 199-5	
Terminal designation:	EN 50 005	
Wire connection:	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	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:		
AC:	270 g	
DC:	310 g	

Dimensions

Width x height x depth: 45 x 77 x 124 mm

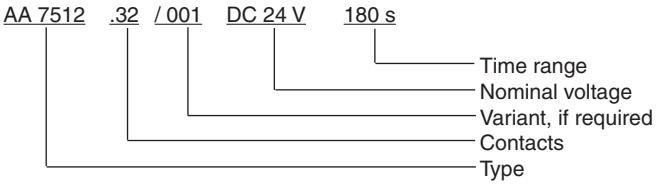
Standard Type

AA 7512.32 AC 230 V 50 Hz 0.2 ... 30 s	
Article number:	0009429
• Output:	1 changeover contact, instantaneous 1 changeover contact, delayed
• Nominal voltage U_N:	AC 230 V
• Time range:	0.2 ... 30 s
• Width:	45 mm

Variant

AA 7512.32/001:	DC-version, as option: DC 12, 24, 42, 48, 110, 220 V, DC 12 ... 220 V

Ordering example for variant



MINITIMER
Timer, On Delayed
AA 7610, EC 7610, EF 7610, EH 7610

0258303

AA 7610

EC 7610

EF 7610

EH 7610

- According to IEC/EN 61 812-1
- Delay up to 60 h
- Repeat accuracy ≤ ± 0.5 %
  (≤ ± 1 % at range 6 s)
- Time display
- Delayed and instantaneous contact
- As option no-voltage safe version
- AA 7610: 45 mm
  EC 7610: front surface 48 x 72 mm
  EF 7610: front surface 72 x 72 mm
  EH 7610: front surface 96 x 96 mm

Approvals and Markings

CE

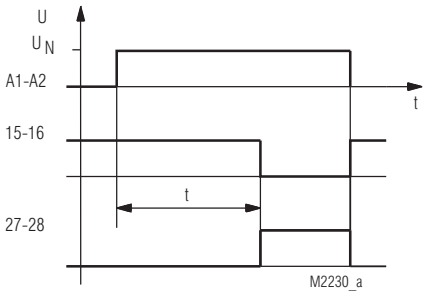
Application

Time dependent controls

Indications

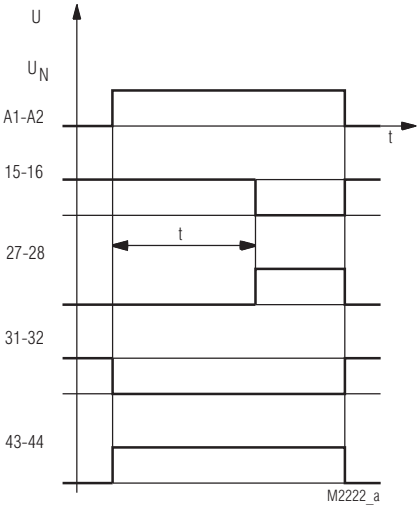
Time display: via red pointer at device-scale
Switch position display: via sign

Function Diagram

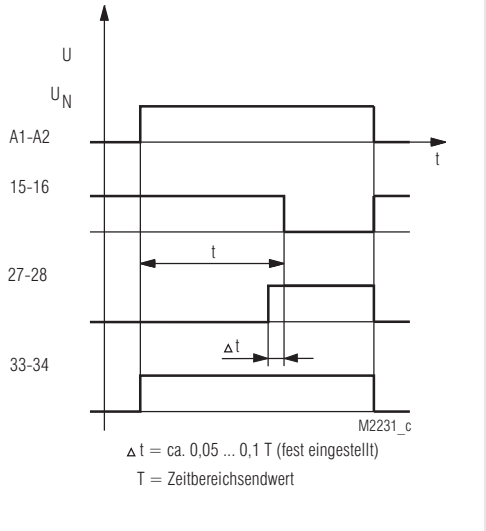


AA 7610.21

Function Diagrams

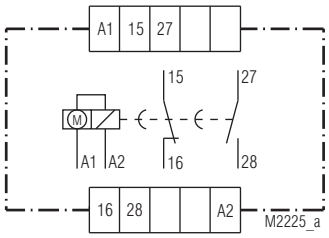


EF 7610.24

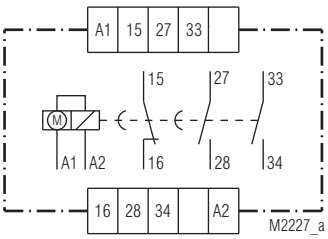


AA 7610.22/034

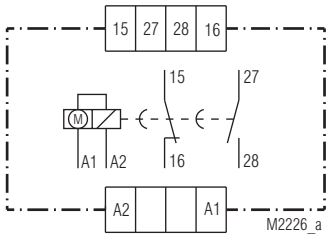
Circuit Diagrams



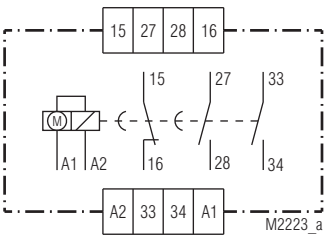
AA 7610.21



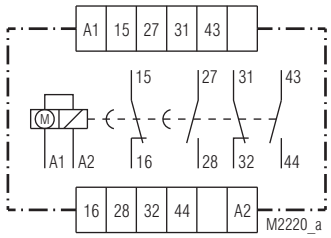
AA 7610.22/034



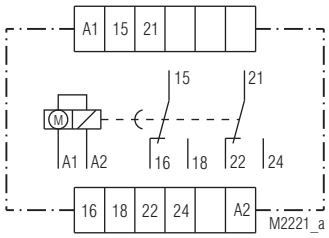
EC 7610.21



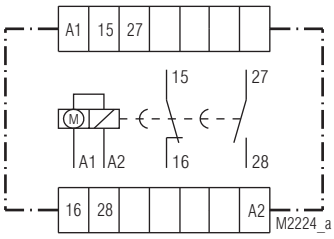
EC 7610.22/034



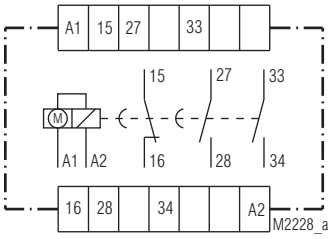
EF 7610.24



EF 7610.32



EH 7610.21



EH 7610.22/034

Technical Data

Time circuit

Time ranges:	0.2 ... 6 s 2 ... 60 s 0.2 ... 6 min 2 ... 60 min 0.2 ... 6 h 2 ... 60 h
Time setting:	infinite via black setting pointer on absolute scale
Recovery time:	< 150 ms
Repeat accuracy:	< ± 0.5 % of the max. scale value (< ± 1 % at range 6 s)

Input

Nominal voltage U_N:	AC 24, 110, 127, 230, 240 V
Voltage range:	0.8 ... 1.1 U_N
Nominal consumption:	5 VA
Nominal frequency:	50 / 60 Hz
Frequency range:	± 5 %

Output

Contacts	
AA 7610.21, EC 7610.21 u. EH 7610.21:	1 NC contact, delayed 1 NO contact, delayed
EF 7610.24:	1 NC contact, delayed 1 NO contact, delayed 1 NC contact, instantaneous 1 NO contact, instantaneous
EF 7610.32:	1 C/O contact, delayed 1 C/O contact, instantaneous
Operate time of contacts:	< 35 ms
Release time:	< 60 ms
Thermal current I_{th}:	4 A (10 A at 20°C and U_N)
Switching capacity	
to AC 15:	3 A / AC 230 V IEC/EN 60 947-5-1
Electrical life	IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	1 x 10^5 switching cycles
to AC 15 at 1 A, AC 230 V:	5 x 10^5 switching cycles
Permissible switching frequency:	3 000 switching cycles / h
Short circuit strength	
max. fuse rating:	10 A gL IEC/EN 60 947-5-1
Mechanical life:	> 30 x 10^6 switching cycles or > 15 000 h

Technical Data

General Data

Operating mode:	Continuous operation
Temperature range:	- 20 ... + 55°C
Clearance and creepage distances	
rated impulse voltage / pollution degree:	4 kV / 2 IEC 60 664-1
EMC	
Electrostatic discharge:	8 kV (air) IEC/EN 61 000-4-2
HF irradiation:	10 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:	10 V IEC/EN 61 000-4-6
Interference suppression:	Limit value class B EN 55 011
Degree of protection:	IEC/EN 60 529
EC 7610, EF 7610, EH 7610:	Housing -front side: IP 40 Housing: IP 30 Klemmen: IP 10
AA 7610:	Housing: IP 40 Terminals: IP 20
Housing:	Thermoplast with V0-behaviour according to UL Subject 94
Vibration resistance:	Amplitude 0.35 mm frequency 10...55Hz, IEC/EN 60 068-2-6
Climate resistance:	20 / 055 / 04; A/B/C IEC/EN 60 068-1
Terminal designation:	EN 50 005
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4
Wire fixing:	Flat terminals with self-lifting clamping piece IEC/EN 60 999-1
Fixing torque:	0.8 Nm
Mounting	
AA 7610:	DIN rail IEC/EN 60 715
Flush mounting	
EC 7610, EF 7610, EH 7610:	2 clamps with screws
Weight:	
AA 7610:	320 g
EC 7610:	500 g
EF 7610:	400 g
EH 7610:	460 g

Dimensions

Width x height x depth	
AA 7610:	45 x 77 x 125 mm
EC 7610:	48 x 72 x 120 mm
EF 7610:	72 x 72 x 128 mm
EH 7610:	96 x 96 x 138 mm
Front panel cut-out	
EC 7610:	44 x 67 mm
EF 7610:	67 x 67 mm
EH 7610:	ø 91^{+1} mm

Standard Type

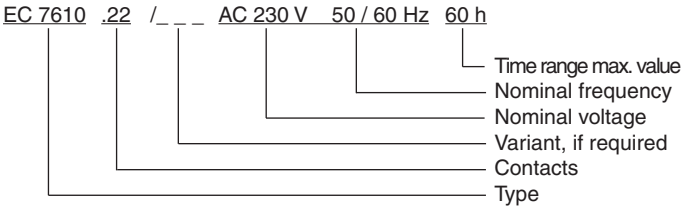
AA 7610.21 AC 230 V 50/60 Hz 60 min

Article number:	0000661	stock item
• Output:	1 NC contact, delayed 1 NO contact, delayed	
• Nominal voltage U_N:	AC 230 V	
• Time range:	2 ... 60 min	
• Width:	45 mm	

Variants

AA 7610.22/034:	According to VDE 0116 with pre contact: delayed, closing
EC 7610.22/034:	According to VDE 0116 with pre contact: delayed, closing
EF 7610.32/100:	no-voltage safe
EH 7610.22/034:	According to VDE 0116 with pre contact: delayed, closing

Ordering example for variants



Accessories

for EC 7610:

ZS 700.06:	Lockable cover Article number: 0004057
ET 7001.407.034:	Plug-in-socket for EC 7610.21 Article number: 0004072

for EF 7610:

ZS 700.07:	Lockable cover Article number: 0004058
ET 7616-0-22:	Sealing ring for sealing at the front side Article number: 0045909

MINITIMER
Timer, On Delayed
AA 7616, EC 7616, EF 7616, EH 7616

0227769

AA 7616

EC 7616

EF 7616

EH 7616

- According to IEC/EN 61 812-1
- Delay up to 60 h
- 6 switchable time ranges, adjustable on front side
- Repeat accuracy ≤ ± 0.5 % (≤ ± 1 % for ranges 3 s and 6 s)
- Time lapse display
- Switching position display (except for EH 7616)
- With instantaneous contact
- Available no-voltage safe
- EF 7616: front side, protected against beam water, IP 65
- AA 7616: width 45 mm
  EC 7616: front surface 48 x 72 mm
  EF 7616: front surface 2 x 72 mm
  EH 7616: front surface 96 x 96 mm

Approvals and Markings

CE

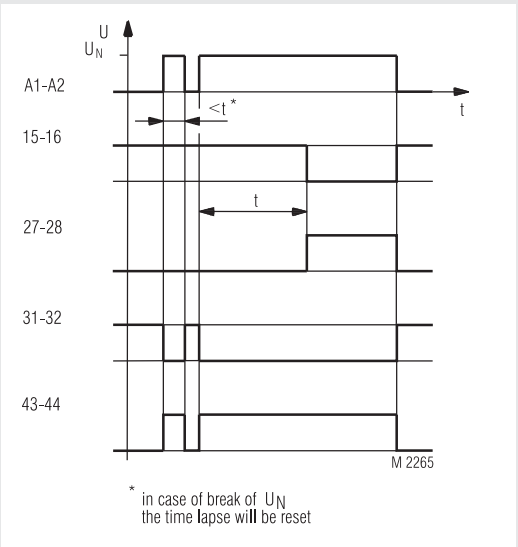
Application

Time dependent controls

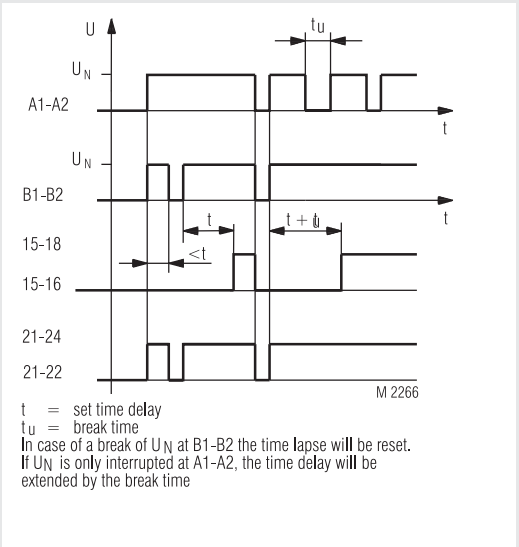
Function

Quick start:
For short times, the quick start is recommendable for a higher repeat accuracy. Here the version AA 7616.32 is necessary. The terminals A1-A2 always remain at nominal voltage (synchronous motor is continuously operating). Time elapse starts when connecting nominal voltage to B1-B2
Frequency selection:
The frequency change-over 50/60Hz is done by moving a switch on the back side of the device with a screw driver
Timer AA 7616.__/100, EC 7616.__/100, EF 7616.__/100, EH 7616.__/100 delay on make, no-voltage save
When energizing the clutch it will be locked by a barrier, so that in case of a voltage loss. The already expired time remains stored; also the non-delayed contacts remain in the closed position. After elapse of the set time, the barrier will be opened and the delayed contacts will be actuated. If the set-time should start again after a stop of the time lapse, the time setting in the no-voltage condition has to be turned down to 0 and back again to the pre-set time value.

Function Diagrams

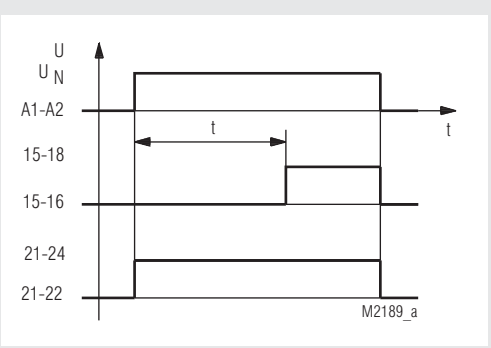


AA 7616.24

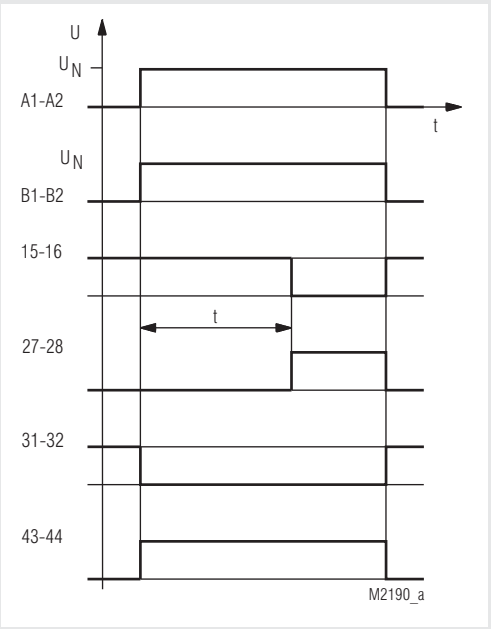


AA 7616.32

Function Diagrams

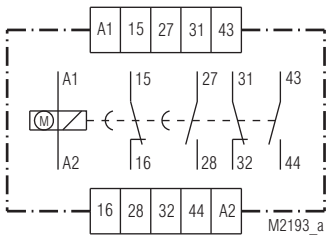


EC 7616.32

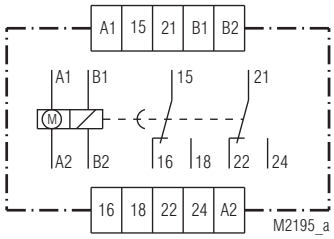


EF 7616.24, EH 7616.24

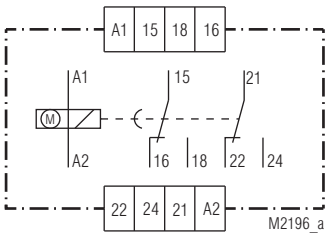
Circuit Diagrams



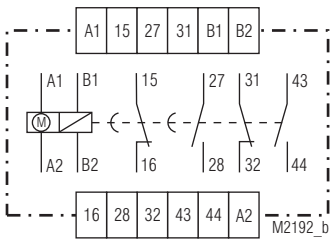
AA 7616.24



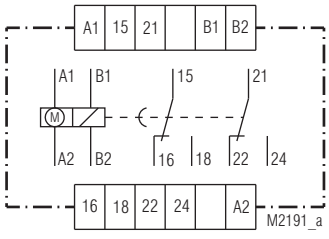
AA 7616.32



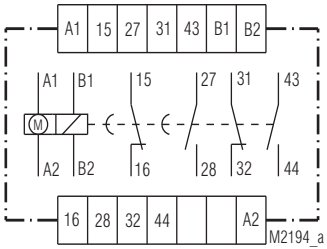
EC 7616.32



EF 7616.24



EF 7616.32



EH 7616.24

Indication

Time display:	via red pointer at device-scale
Red sign:	visible, when NO contacts closed (not for EH 7616)

Technical Data

Time circuit

Time range:	6-range-versions 0.15 ... 3 s 1.5 ... 30 s 15 ... 300 s 0.4 ... 10 s 4 ... 100 s 40 ...1000 s or 0.15 ... 3 s 0.15 ... 3 min 0.15 ... 3 h 1.5 ...30 s 1.5 ...30 min 1.5 ... 30 h or 0.2 ... 6 s 0.2 ... 6 min 0.2 ... 6 h 2 ...60 s 2 ...60 min 2 ... 60 h
Time setting:	infinite via black (white) setting pointer on absolute scale
Recovery time:	150 ms
Repeat accuracy:	≤ ± 0.5 % of the max. scale value (for 3 and 6 s ≤ ± 1 %)
EH 7616, DC-version:	≤ ± 3 % of the max. scale value

Input

Nominal voltage U_N:	AC 24, 42, 110, 127, 230, 240 V
Special voltages	
AA 7616:	AC 12, 400, 415 V
EH 7616:	DC 12, 24, 48, 60*, 110*, 230* V *) with external series resistore
Voltage range:	0.8 ... 1.1 U_N
Nominal consumption:	AC 7 VA DC 12 V 5 W DC 24 V 5 W DC 48 V 7 W DC 60 V 10 W DC 110 V 13 W DC 230 V 18 W
Nominal frequency:	50 / 60 Hz switchable
Frequency range:	± 5 % f_N
Frequency influence:	reverse proportional

Output

Contacts	
AA 7616.24, EF 7616.24, EH 7616.24:	1NC contact, delayed 1 NC contact, instantaneous 1 NO contact, delayed 1 NO contact, instantaneous
AA 7616.32, EC 7616.32, EF 7616.32:	1 changeover contact, delayed 1 changeover contact, instantaneous
Operate time of contacts:	< 35 ms
Release time:	< 60 ms
Thermal current I_{th}:	4 A
Switching capacity	
to AC 15:	3 A / AC 230 V IEC/EN 60 947-5-1
Electrical life	IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	1 x 10^5 switching cycles
to AC 15 at 1 A, AC 230 V:	5 x 10^5 switching cycles
Permissible switching frequency:	3 000 switching cycles / h
Short circuit strength max. fuse rating:	10 A gL IEC/EN 60 947-5-1
Mechanical life:	> 30 x 10^6 switching cycles or > 15 000 h

General Data

Operating mode:	Continuous operation
Temperature range:	- 20 ... + 55°C
Clearance and creepage distances	
rated impulse voltage / pollution degree:	4 kV / 2 IEC 60 664-1

Technical Data

EMC

Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 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:	10 V	IEC/EN 61 000-4-6
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		IEC/EN 60 529
AA 7616:	Housing: IP 40 Terminals: IP 20	
EC, EH 7616:	Hosuing-front: IP 40 Housing: IP 30 Terminals: IP 10	
EF 7616:	Housing-front: IP 65	
Housing:	Thermoplast with V0-behaviour according to UL Subject 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10...55Hz,	IEC/EN 60 068-2-6
Climate resistance:	20 / 055 / 04; A/B/C	IEC/EN 60 068-1
Terminal arrangement:	DIN 46 199-5	
Terminal designation:	EN 50 005	
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0.8 Nm	
Mounting		
AA 7616:	DIN rail	IEC/EN 60 715
Flush mounting		
EC 7616, EF 7616, EH 7616:	2 clamps with screws	
Weight:		
AA 7616:	320 g	
EC 7616:	320 g	
EF 7616:	400 g	
EH 7616:	450 g	

Dimensions

Width x height x depth	
AA 7616:	45 x 77 x 127 mm
EC 7616:	48 x 72 x 120 mm
EF 7616:	72 x 72 x 128 mm
EH 7616:	96 x 96 x 138 mm
Front panel cut-out	
EC 7616:	44 x 67 mm
EF 7616:	67 x 67 mm
EH 7616:	ø 91^{+1} mm
Front surface	
EC 7616:	48 x 72 mm
EF 7616:	72 x 72 mm
EH 7616:	96 x 96 mm

Standard Type

AA 7616.24 AC 230 V 50/60 Hz 0.15 s ... 30 h

Article number:	0000678
• Time range:	0.15 s ... 30 h
• Nominal voltage U_N:	AC 230 V
• Output:	1 NC contact, delayed 1 NC contact, instantaneous 1 NO contact, delayed 1 NO contact, instantaneous
• Width:	45 mm

Variants

AA 7616._ _ /100:	no-voltage safe
AA 7616._ _ /102:	switchable from auto-reset to no-voltage safe version
AA 7616.24/103:	with switchable no-voltage safe function holding current ≥ 5 mA
EC 7616._ _ /100:	no-voltage safe
EF 7616._ _ /100:	no-voltage safe
EH 7616._ _ /100:	no-voltage safe

Ordering example for variants

AA 7616 .24 /_ _ _ AC 230 V 50 / 60 Hz 60 h

- 60 h — Time range max. value
- 50 / 60 Hz — Nominal frequency
- AC 230 V — Nominal voltage
- /_ _ _ — Variant, if required
- .24 — Contacts
- AA 7616 — Type

Accessories

for EC 7616:

ZS 700.06:	Lockable cover Article number: 0004057
ET 7001.407.034:	Plug-in-socket for EC 7616.21 Article number: 0004072

for EF 7616:

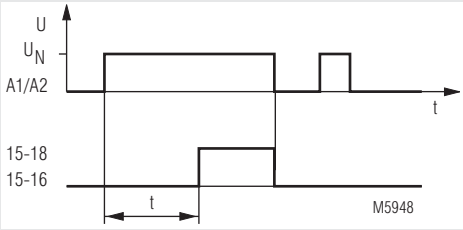
ZS 700.07:	Lockable cover Article number: 0004058
ET 7616-0-22:	Sealing ring for sealing at the front side Article number: 0045909

MINITIMER
Timer, On Delayed
BA 7903

0276770

- According to IEC/EN 61 812-1
- Delay up to 100 s
- Repeat accuracy < ± 3 %
- For AC 24 ... 240 V and DC 24 ... 60 V without series resistor
- 2 changeover contacts
- Width: 45 mm

Function Diagram



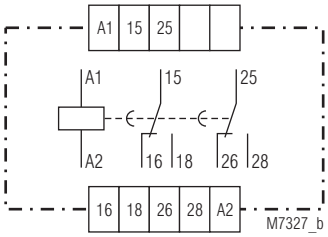
Approvals and Markings

CE

Application

Time dependent control

Circuit Diagram



Connection Terminals

Terminal designation	Signal description
A1, A2	Voltage supply AC or DC
15, 16, 18; 25, 26, 28	C/O contacts delayed

Technical Data

Time circuit

Time ranges:	0.05 ... 1 s	0.5 ... 10 s	5 ... 100 s
Recovery time			
tw 50 / 100:	300 ms		
Repeat accuracy:	≤ ± 3 % of max. scale value		
Voltage influence:	≤ 3 %		
Temperature influence:	≤ ± 0.3 % / K		

Input

Nominal voltage U_N:	AC 24, 42, 110, 127, 230, 240 V DC 24, 48, 60 V		
Voltage range:	0.8 ... 1.1 U_N		
Nominal consumption:	AC 230 V 10 VA	AC 24 V 1 VA	DC 24 V 1 W
Nominal frequency:	50 / 60 Hz		
Frequency range:	± 5 % f_N		

Output

Contacts		
BA 7903.81:	1 changeover contact, delayed	
BA 7903.82:	2 changeover contacts, delayed	
Contact material		
BA 7903.81:	$AgSnO_2$ 0,2µ, gold plated	
BA 7903.82:	AgNi 0,2µ, gold plated	
Measured nominal voltage:	AC 250 V	
Release time:	10 ms	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15		
BA 7903.81:		
NO contact:	10 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	5 A / AC 230 V	IEC/EN 60 947-5-1
BA 7903.82:		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1

Technical Data

Electrical life
to AC 15 at 3 A, AC 230 V

BA 7903.81:	2.5 x 10^5 switch. cycl.	IEC/EN 60 947-5-1
BA 7903.82:	0.5 x 10^5 switch. cycl.	IEC/EN 60 947-5-1
Permissible switching frequency:	6000 switching cycles / h	
Short circuit strength max. fuse rating		
BA 7903.81:	10 A gL	IEC/EN 60 947-5-1
BA 7903.82:	6 A gL	IEC/EN 60 947-5-1
Mechanical life:	50 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	-10 ... + 50 °C	
Storage:	-10 ... + 50 °C	
Altitude:	< 2.000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 3 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V/m	IEC/EN 61 000-4-3
Fast transients:	2 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:	2 kV	IEC/EN 61 000-4-5
Interference suppression:	Limit value class B	EN 55 011
Degree of protection:		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplast 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:	10 / 050 / 04	IEC/EN 60 068-1
Terminal arrangement:	DIN 46 199-5	
Terminal designation:	EN 50 005	
Wire connection:	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	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	170 g	

Dimensions

Width x heigth x depth:	45 x 74 x 133 mm

Standard Type

BA 7903.81 AC 230 V 50 / 60 Hz 0.5 ... 10 s

Article number:	0044217
• Output:	1 changeover contact delayed
• Nominal voltage U_N:	AC 230 V
• Time range:	0.5 ... 10 s
• Width:	45 mm

Ordering Example

BA 7903 .81 DC 24 V 100 s

- 100 s — Time range end value
- DC 24 V — Nominal voltage
- .81 — Contacts
- BA 7903 — Type

MINITIMER
Timer, On Delayed
BA 7905

0227956

Your Advantages
- Safe connection of machine parts during start up
- High repeat accuracy
- Wide setting rangeh
- Easy setting

Features
- According to IEC/EN 61 812-1
- Delay up to 300 s
- Repeat accuracy < ± 1 %
- Voltage up to DC 220 V without series resistor
- With remote potentiometer connection
- with LED indication for operation and contact position
- 1 or 2 changeover contacts
- Width 45 mm

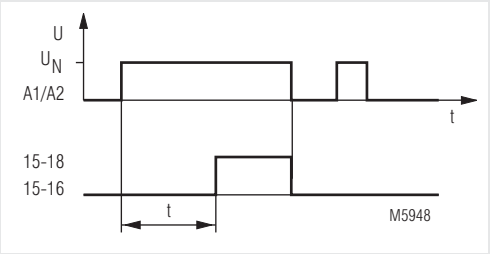
Product Description

The timer BA 7905 can be used to switch devices and controls with an adjustable on delay. With these timer the start behaviour of machine parts e. g. the starting of motors can be influenced. With a potentiometer the time delay can be adjusted simply over a large setting range.

Approvals and Markings

CE

Function Diagram



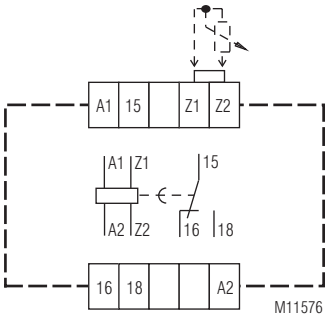
Application

Time dependent control

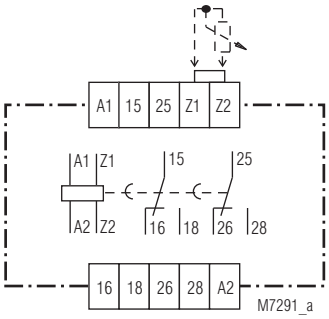
Indication

upper LED: on when operating voltage applied
lower LED: on when output relay activated

Circuit Diagrams



BA 7905.81



BA 7905.82

Connection Terminals

Terminal designation	Signal description
A1(+), A2(-)	Voltage supply AC/DC
Z1, Z2	External potentiometers
15, 16, 18	C/O contacts (output relays)
25, 26, 28	C/O contacts (2nd output relays)

Technical Data

Time circuit

Time ranges:	0.05 ... 1 s	1.5 ... 30 s
	0.15 ... 3 s	5 ... 100 s
	0.5 ... 10 s	15 ... 300 s
Setting:	Stepless, setting on absolute scale. Connection possibility for external variable resistor on terminal Z1-Z2 (5-6). Variable resistor in the device to be set to the minimum value and bridge Z1-Z2 (5-6) is to be removed.	
Recovery time		
tw 50 / 100:	100/50 ms	
Repeat accuracy:	≤ ± 1 % of max. scale value	
Voltage influence:	0.5 %	
Temperature influence:	0.2 % / K	

Input

Nominal voltage U_N:	AC 24, 42, 110 ... 127, 230, 240 V		
	DC 24, 42, 60, 110 ... 127, 220 V		
Voltage range:	0.8 ... 1.1 U_N		
Nominal consumption:	AC 24	230	V
	1.9	18	VA
	DC 24	220	V
	0.8	2.6	W
Nominal frequency:	50 / 60 Hz		
Frequency range:	± 5 % f_N		

Output

Contacts		
BA 7905.81:	1 changeover contact, delayed	
BA 7905.82:	2 changeover contacts, delayed	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Release time:	10 ms	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15:	3 A / AC 230 V	IEC/EN 60 947-5-1
to DC 14:	2 A / DC 24 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V		
BA 7905.81:	2.5 x 10^5 switching cycles	
BA 7905.82:	0.5 x 10^5 switching cycles	
Permissible switching frequency:	6000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gL	IEC/EN 60 947-5-1
Mechanical life:	50 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:		
Operation:	- 20 ... + 60 °C	
Storage:	- 20 ... + 60 °C	
Altitude:	< 2,000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree		
in- / output:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:		
80 MHz ... 1 GHz:	12 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	2 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:	2 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 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529

Technical Data

Housing:	Thermoplast with V0 behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10...55Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 050 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	170 g	

Dimensions

Width x height x depth: 45 x 74 x 133 mm

Standard Type

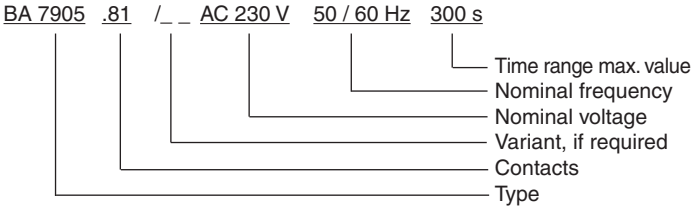
BA 7905.81 AC 230 V 50/60 Hz 0.5 ... 10 s

Article number:	0021737
• Output:	1 changeover contact, delayed
• Nominal voltage U_N:	AC 230 V
• Time range:	0.5 ... 10 s
• Width:	45 mm

Varianten

BA 7905.82/200	with guided contacts

Ordering example for variants

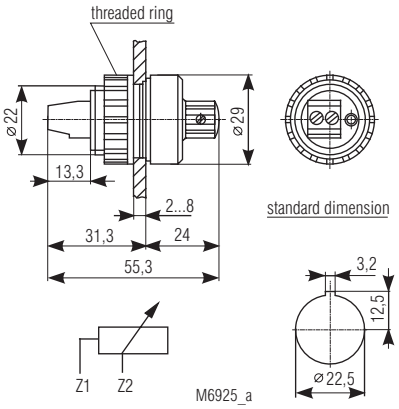


Accessories

AD 3: External variable resistor
Article number:: 0028962

0.05 ... 1 s	1 MΩ
0.15 ... 3 s	2.2 MΩ
0,5 ... 10 s	10 MΩ
1.5 ... 30 s	10 MΩ
5 ... 100 s	10 MΩ
15 ... 300 s	20 MΩ

Degree of protection front side: IP60



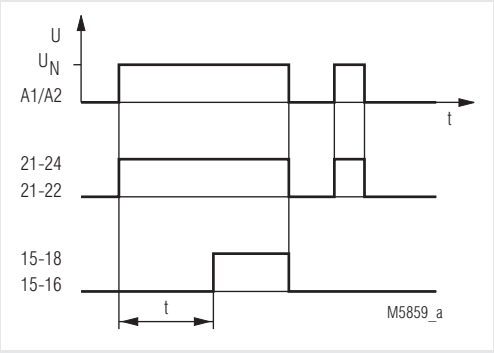
K 70-34: Transparent cover for AI 905
Article number: 0011790

MINITIMER
Digital Time Relay, on delayed
EC 7801

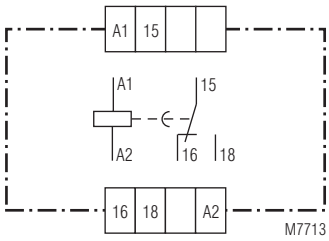
0257848

- According to IEC/EN 61 812-1
- For delay up to 9999 min.
- Repeat accuracy < ± 1 %
- LED indicators for power supply and state of contact
- 1 changeover contact
- As option with second C/O as instantaneous contact
- As option 2, 3 or 4 decades
- 48 x 72 mm front surface

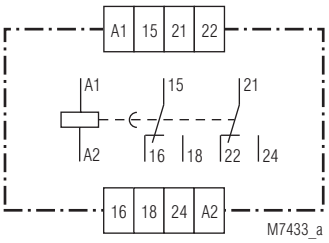
Function Diagram



Circuit Diagrams



EC 7801.81



EC 7801.32

Approvals and Markings

CE

Application

Time dependent controls

Indicators

LED left:	on when supply connected
LED right:	on, when corresponding output relay is active

Technical Data

Time circuit

Time range:	2 decades
	0.01 ... 0.99 s
	0.1 ... 9.9 s
	1 ... 99 s
	0.01 ... 0.99 min
	0.1 ... 9.9 min
	1 ... 99 min
	3 decades
	0.01 ... 9.99 s
	0.1 ... 99.9 s
	1 ... 999 s
	0.01 ... 9.99 min
	0.1 ... 99.9 min
	1 ... 999 min
	4 decades
	0.01 ... 99.99 s
	0.1 ... 999.9 s
	1 ... 9999 s
	0.01 ... 99.99 min
	0.1 ... 999.9 min
	1 ... 9999 min
Time setting:	digital on decaded pre-selection switch
Recovery time:	20 ms
Repeat accuracy:	± 1 % + 10 ms
Voltage influence:	≤ 0.5 % at 0.8 ... 1.1 U_N
Temperature influence:	≤ 0.1 % / K

Technical Data

Input

Nominal voltage U_N:	AC 24, 42, 110, 127, 230, 240 V DC 24 V with polarity protection
Voltage range:	0.8 ... 1.1 U_N
Nominal consumption:	AC 3.5 VA DC 2.5 W
Nominal frequency:	50 / 60 Hz
Frequency range:	± 5 %

Output

Contacts		
EC 7801.81:	1 changeover contact, delayed	
EC 7801.32:	1 changeover contacts instantaneous 1 changeover contact, delayed	
Thermal current I_{th}:	5 A	
Switching capacity		
according to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		
acc. to AC 15 at 3 A, AC 230 V:	2.5 x 10^5 switching cycles	IEC/EN 60 947-5-1
Permissible switching frequency:	6 000 switching cycles / h	
Short circuit strength		
max. fuse rating:	4 A gL	IEC/EN 60 947-5-1
Mechanical life:	30 x 10^6 switching cycles	

General Data

Nominal operating mode:	continuous operation	
Temperaturr range:	- 20 ... + 60°C	
Clearance and creepage distance		
rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge (ESD):	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V/m	IEC/EN 61 000-4-3
Fast transients:	4 kV	IEC/EN 61 000-4-4
Interference suppression:	Limit value class A	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplastic with VO behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	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	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Flush mounting:	2 clamps with screws	
Weight:	340 g	

Dimensions

Width x height x depth:	48 x 72 x 120 mm
Front panel cut-out:	44 x 67 mm

Standard Type

EC 7801.81 AC 230 V 50/60 Hz 1 ... 999 s

Article number:	0034652
• Output:	1 changeover contact
• Nominal voltage U_N:	AC 230 V
• Time range:	1 ... 999 s
• Width:	48 x 72 mm front surface

Ordering Example

EC 7801 .81 AC 240 V 50 / 60 Hz 999 h

- 999 h — Time range
- 50 / 60 Hz — Nominal frequency
- AC 240 V — Nominal voltage
- .81 — Contacts
- EC 7801 — Type

Accessories

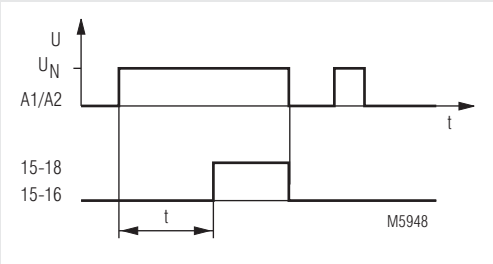
ZS 700.06: Cover
Article number: 000405

MINITIMER
Digital Time Relay, on delayed
EC 9621

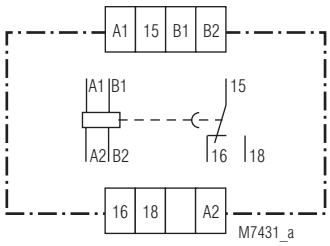
DOLD

- According to IEC/EN 61 812-1
- For delay up to 99.99 h
- Repeat accuracy < ± 0.5 %
- LED indicators for power supply and state of contact
- As option with time progression indication
- As option 1 or 2 changeover contacts or semiconductor outputs
- 48 x 72 mm front surface

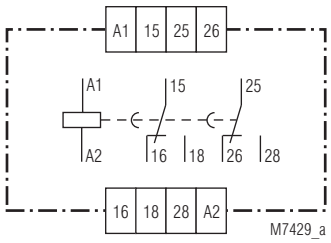
Function Diagram



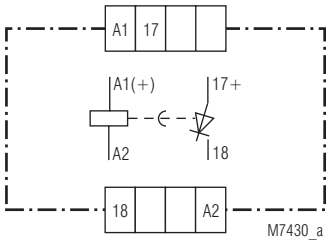
Circuit Diagrams



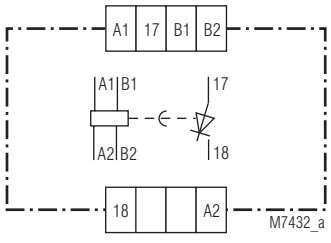
EC 9621.81/05



EC 9621.82



EC 9621.95



EC 9621.95/05

Approvals and Markings

CE

Application

Time dependent controls

Indicators

LED left:	on when supply connected
LED right:	on, when corresponding output relay is active

Technical Data

Time circuit

Time range:	2 decades
	0.01 ... 0.99 s
	0.1 ... 9.9 s
	1 ... 99 s
	0.1 ... 9.9 min
	1 ... 99 min
	0.1 ... 9.9 h
	1 ... 99 h
	4 decades
	0.001 ... 9.999 s
	0.01 ... 99.99 s
	0.1 ... 999.9 s
	0.01 ... 99.99 min
	0.1 ... 999.9 min
	0.01 ... 99.99 h
Time setting:	digital on decaded pre-selection switch
Recovery time:	20 ms
Repeat accuracy:	≤ ± 0.5 % of full scale value
Temperature and voltage influence:	max. ± 0.025 % of the pre-selected time over the complete temperature and voltage range

Input

Nominal voltage U_N:	AC 24, 42, 110, 127, 230, 240 V
	DC 24 V
Voltage range:	0.8 ... 1.1 U_N
Nominal consumption:	AC 3 VA
	DC 1.5 W
Nominal frequency:	50 / 60 Hz
Frequency range:	± 5 %

Technical Data

Output

Contacts

EC 9621.81:	1 changeover contact	
EC 9621.82:	2 changeover contacts	
EC 9621.95:	1 transistor output	
Release time of the contacts:	10 ms	
Thermal current I_{th}:	10 A	
Switching capacity according to AC 15		
NO contact:	10 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	5 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
acc. to AC 15 bei 3 A, AC 230 V:	1 C/O contact: 2.5 x 10^5 switching cycles 2 C/O contact: 0.5 x 10^5 switching cycles	
Switching capacity of semiconductor outputs:	switching voltage: 14 ... 31.2 V switching current: max. 130 mA voltage drop: 1.5 V max. residual current: 0.1 mA	
Permissible switching frequency:	6 000 switching cycles / h	
Short circuit strength		
max. fuse rating:	4 A gL	IEC/EN 60 947-5-1
Mechanical life:	> 30 x 10^6 switching cycles	

General Data

Nominal operating mode:	continuous operation	
Temperaturr range:	- 20 ... + 60°C	
Clearance and creepage distance		
rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge (ESD):	6 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V/m	IEC/EN 61 000-4-3
Fast transients:	4 kV	IEC/EN 61 000-4-4
Surge voltage 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
Interference suppression:	Limit value class A	EN 55 011
Degree of protection:		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Enclosure:	Thermoplastic with VO behaviour according to UL Subject 94	
Vibration resistance:	Amplitude 0.35 mm Frequency: 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with sleeve DIN 46 288-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Weight:	260 g	

Dimensions

Width x height x depth:	48 x 72 x 120 mm
Front panel cut-out:	44 x 67 mm

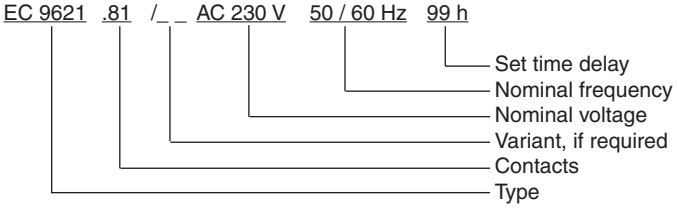
Standard Type

EC 9621.81/03 AC 230 V 50 / 60 Hz 99 h	
Article number:	0006477
• Output:	1 changeover contact
• Nominal voltage U_N:	AC 230 V
• Set time delay:	99 h
• Front surface:	48 x 72 mm

Variants

EC 9621. _ _ /03:	time progression indication with 10-level LED chain
EC 9621. _ _ /05:	An additional control possibility contains' by a logic voltage. By the galvanic separation of logic input a direct control over gates are possible . The input can be controlled with DC-voltage by DC 10 V to 32 V. Signal voltages under DC 7 V are detected as „L-Signal“ and voltages over DC 10 V are detected as „H-Signal“. Time delay can be started or deleted by the control voltage or by the auxiliary voltage. This version can be supplied only with a contact or a semiconductor output

Ordering example for variants



Accessories

ET 7001.404.034:	Plug-in-socket for digital-time-relays EC 9621.81, EC 9621.82 Article number: 007000
ET 9620-11:	Plug-in-socket for digital-time-relays EC 9621.95 Article number: 0020444
ZS 700.06:	Cover Article number: 0004057

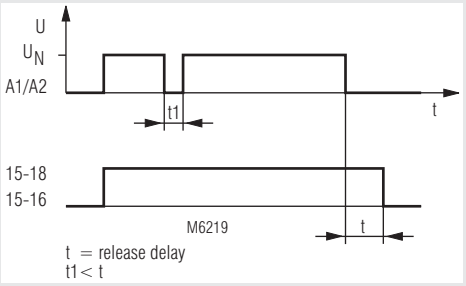
MINITIMER
Timer, Release Delay
IK 7819, SK 7819, BC 7938N

0221565

IK 7819 SK 7819 BC 7938N

- According to IEC/EN 61 812-1
- Release delay, with control signal
- No-voltage safe
- 1 changeover contact
- Delay of 0.05 ... 300 s
- Wide voltage range
- Repeat accuracy ≤ 1 %
- LED indicator for operation
- Devices available in 3 enclosure versions:
  IK 7819: depth 58 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  SK 7819,
  BC 7938N: depth 98 mm, with terminals at the top for cabinets with mouning plate and cable duct
- IK/SK 7819: width 17.5 mm
  BC 7938N: width 22.5 mm

Function Diagram



Approvals and Markings

CE

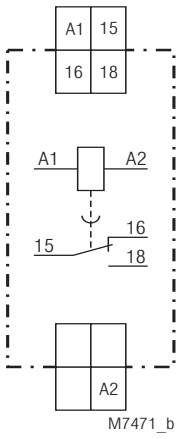
Application

Time-dependent controllers

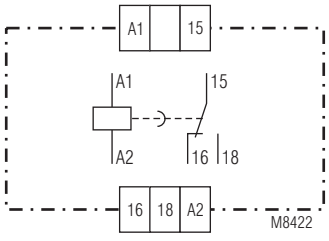
Notes

A change of the settings for time range will be valid immediately.
Please note, that a change of time range or time setting during elapse of time can lead to unintended switching of the output contacts.

Circuit Diagrams



IK/SK 7819.81



BC 7938N.81

Connection Terminals

Terminal designation	Signal description
A1	L / +
A2	N / -
15, 16, 18	Changeover contact

Technical Data

Time ranges:	0.05 ... 1 s 0.15 ... 3 s 0.5 ... 10 s 1.5 ... 30 s 5 ... 100 s 15 ... 300 s
Time setting:	infinite on relative scale
Recovery time:	100 ms
Repeat accuracy:	≤ 1 % of end of scale value
Min. on-time at time range 15 ... 300 s:	AC/DC 24 V - 300 ms AC/DC 42 V - 250 ms AC/DC 80 V - 200 ms
Temperature influence:	< 0.1 % / K

Input

Nominal voltage U_N:	AC/DC 24 V AC/DC 42 ... 60 V AC/DC 110 ... 240 V
Voltage range:	
for AC/DC 24 V:	
with 48 % residual ripple	AC / DC 20.5 ... 27 V
with ≤ 10 % residual ripple	DC 20.5 ... 30 V
for AC/DC 42 ... 60 V:	
with 48 % residual ripple	AC / DC 30 ... 66 V
with ≤ 10 % residual ripple	DC 30 ... 80 V
with AC/DC 110 ... 240 V:	
with 48 % residual ripple	AC / DC 60 ... 264 V
with ≤ 10 % residual ripple	DC 60 ... 300 V
Release voltage:	> 10 % U_N
Nominal consumption	
for AC/DC 24 V:	0.05 VA / W
for AC/DC 60 V:	0.12 VA / W
for AC/DC 240 V:	0.4 VA / W
Nominal frequency:	50/60 Hz
Frequency range:	± 5 %
Switch-on current	
for AC/DC 24 V:	0.6 A
for AC/DC 60 V:	0.7 A
for AC/DC 240 V:	1.1 A

Output

Contacts:	1 changeover contact	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V DC see limit curve for arc-free operation	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	≥ 1.5 x 10^5 switching cycles	
Permissible switching frequency	72 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	> 10^8 switching cycles	

Technical Data

General Data

Operating mode:	Continuous operation	
Temperature range:		
Operation:	- 20 ... + 60 °C	
Storage:	- 25 ... + 65 °C	
Relative air humidity:	95 % at 40 °C	
Altitude:	< 2.000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	6 kV (contact)	IEC/EN 61 000-4-2
	8 kV (air)	IEC/EN 61 000-4-2
HF-irradiation		
80 MHz ... 1 GHz:	12 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients		
IK / SK 7819:	4 kV	IEC/EN 61 000-4-4
BC 7938N:	2 kV	IEC/EN 61 000-4-4
Surge voltages between wires for power supply		
IK/SK 7819:	2 kV	IEC/EN 61 000-4-5
BC7938N:	1 kV	IEC/EN 61 000-4-5
between wire and ground		
IK/SK 7819:	4 kV	IEC/EN 61 000-4-5
BC7938N:	2 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 55 011
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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	DIN 46 228-1/-2/-3/-4	
Cross section		
IK/SK 7819:	2 x 2.5 mm^2 solid or 2 x 1.5 mm^2 stranded ferruled	
BC 7938N:	1 x 4 mm^2 solid or 2 x 1.5 mm^2 stranded ferruled 1 x 2.5 mm^2 stranded ferruled (isolated)	
Stripping length:	10 mm	
Wire fixing:		
IK/SK 7819:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
BC 7938N:	Plus-minus terminal screws M3.5 Box terminal with wire protection	
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight		
IK 7819:	70 g	
SK 7819:	89 g	
BC 7938N:	105 g	

Dimensions

Width x height x depth	
IK 7819:	17.5 x 90 x 58 mm
SK 7819:	17.5 x 90 x 98 mm
BC 7938N:	22.5 x 84 x 98 mm

Standard Type

IK 7819.81 AC/DC 110 ... 240 V 0.15 ... 3 s
Article number: 0044645
- Output: 1 changeover contact
- Nominal voltage U_N: AC/DC 110 ... 240 V
- Time range: 0.15 ... 3 s
- Width: 17.5 mm

SK 7819.81 AC/DC 110 ... 240 V 0.15 ... 3 s
Article number: 0054741
- Output: 1 changeover contact
- Nominal voltage U_N: AC/DC 110 ... 240 V
- Time range: 0.15 ... 3 s
- Width: 17.5 mm

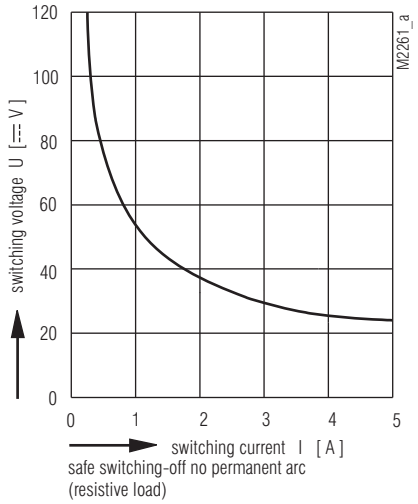
BC 7938N.81 AC/DC 110 ... 240 V 0.5 ... 10 s
Article number: 0055774
- Front color grey, with box terminals
- Output: 1 changeover contact
- Nominal voltage U_N: AC/DC 110 ... 240 V
- Time range: 0.5 ... 10 s
- Width: 22.5 mm

Ordering Example

IK 7819 .81 AC/DC 24 V 0.5 ... 10 s

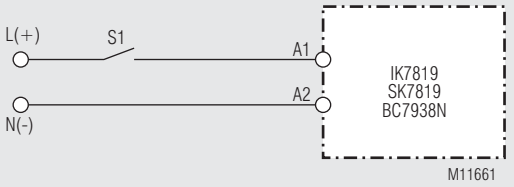
- 0.5 ... 10 s: Time range
- AC/DC 24 V: Nominal voltage
- .81: Contact
- IK 7819: Type

Characteristic



Limit curve for arc-free operation

Connection Example

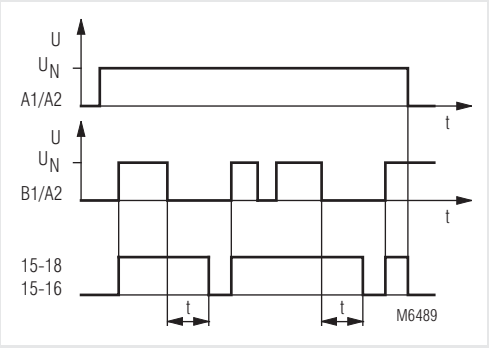


MINITIMER
Time Delay Relay, Release Delay Type
IK 7823, SK 7823

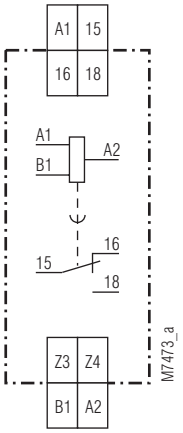
0232813

- According to IEC/EN 61 812-1
- With 4 time ranges of 0.25 ... 640 s or 0.25 ... 640 min
- Adjustable
- With auxiliary voltage
- For wide voltage range AC 50/60 Hz 110 ... 240 V
- Control input operated with nominal voltage; no voltage free contact necessary
- LED indicator for status of contact
- 1 changeover contact
- **Devices available in 2 enclosure versions:**
  IK 7823: depth 59 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  SK 7823: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- Width 17.5 mm

Function Diagram



Circuit Diagram



IK 7823.81, SK 7823.81

Approvals and Markings

CE

Applications

Time-dependent controllers

Indicators

LED: on, when output relay activated (contact 15 - 18 closed)

Notes

The control input B1 relative to A2 has the same voltage range as A1-A2. In a 3-phase system B1 can also be connected to a different phase then A1 if the neutral is connected to A2. As the control input is operated with voltage, the control contact can also switch additional loads, e.g. contactors with the same A2 reference. This allows to use less contacts (see connection Diagram).

Technical Data

Time circuit

Time ranges: 4 different time ranges programmable via terminals:

s - time range	min - time range	bridge
0.25 ... 2.5 s	0.25 ... 2.5 min	Z4-----A2
1 ... 10 s	1 ... 10 min	Z3---------- A2
8 ... 80 s	8 ... 80 min	Z3-----Z4-----A2
64 ... 640 s	64 ... 640 min	(without)

Tolerance of the max. scale value: - 5 ... + 25 %
Time setting: infinitely variable 1:10 on relative scale
Min. closing time (Control input B1): ≥ 20 ms
Repeat accuracy: ≤ 0.5 % + 20 ms
Voltage influence: ≤ 1 %
Temperature influence: ≤ 0.25 % / K

Input

Nominal voltage U_N: AC 110 ... 240 V, AC/DC 24 V
Voltage range: 0.8 ... 1.1 U_N
Nominal consumption (A1-A2)**:**
AC 230 V: approx. 8 VA
AC 24 V: approx. 1.5 VA
DC 24 V: approx. 0.7 W
Nominal frequency: 50 / 60 Hz
Reset voltage: 15 % U_N
Input current B1: approx. 0.3 mA

Technical Data

Output

Contacts:

IK 7823.81:	1 changeover contact	
Thermal current I_{th}:	10 A up to 45°C (see continuous current limit curve)	
Switching capacity		
to AC 15		
NO contact:	10 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	5 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	≥ 5 x 10^5 switching cycles	
Short circuit strength		
max. fuse rating:	10 A gL	IEC/EN 60 947-5-1
Mechanical life:	≥ 30 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 60°C	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	6 kV (air)	IEC/EN 61 000-4-2
HF-irradiation:	10 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 (0.5 kV at AC/DC 24 V)	IEC/EN 61 000-4-5
between wire and ground:	2 kV	IEC/EN 61 000-4-5
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplastic wiht Vo behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 60 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Weight		
IK 7823:	70 g	
SK 7823:	88 g	

Dimensions

Width x heigth x depth	
IK 7823:	17.5 x 90 x 59 mm
SK 7823:	17.5 x 90 x 98 mm

Standard Type

IK 7823.81 AC 110 ... 240 V 0.25 ... 640 s
Article number: 0047161 stock item
- Nominal voltage U_N: AC 110 ... 240 V
- Time range: 0.25 ... 640 s adjustable
- Width: 17.5 mm

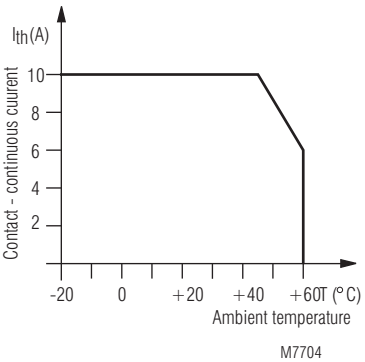
SK 7823.81 AC 110 ... 240 V 0.25 ... 640 s
Article number: 0052258
- Nominal voltage U_N: AC 110 ... 240 V
- Time range: 0.25 ... 640 s adjustable
- Width: 17.5 mm

Ordering Example

IK 7823 .81 AC 110 ... 240 V 50 / 60 Hz 0.25 ... 640 s

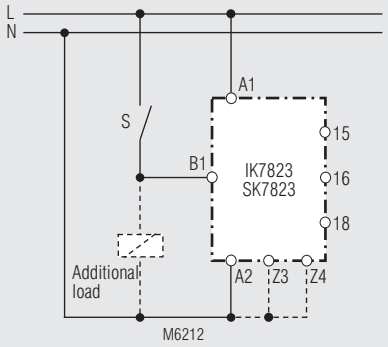
- Time range
- Nominal frequency
- Nominal voltage
- Contacts
- Type

Characteristics



Continuous current limit curve

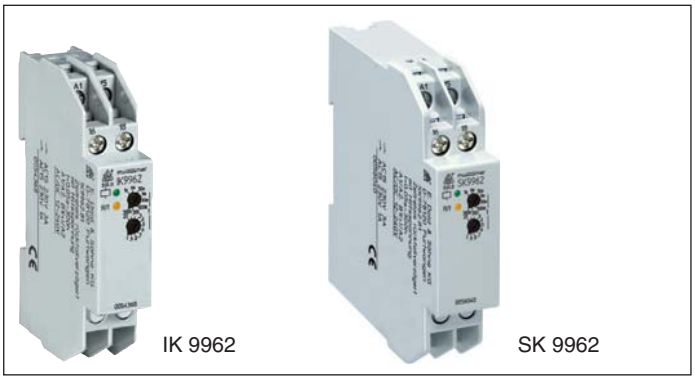
Connection Example



Remarks:
Z3, Z4... Programming of time range
S... Control contact for function
Contact S can also switch additional load connected inparallel to ow relay.

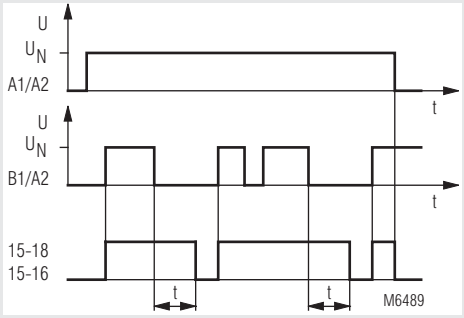
MINITIMER
Timer, Off delayed
IK 9962, SK 9962

0239764



- According to IEC/EN 61 812-1
- Release delay, with control signal
- 8 time ranges from 0.05 s to 300 h selectable via rotational switch
- Voltage range AC/DC 12 ... 240 V for auxiliary supply and control input
- No voltfree control contact necessary
- Adjustment aid for quick setting of long time values
- LED indicators for operation, contact position and time delay
- 1 changeover contact
- As option connnection of remote potentiometer 10 kΩ
- Devices available in 2 enclosure versions:
  IK 9962: depth 59 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43 880
  SK 9962: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- 17.5 mm width

Function Diagram



Approvals and Markings

CE

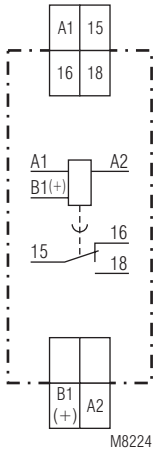
Application

Time dependent controllers

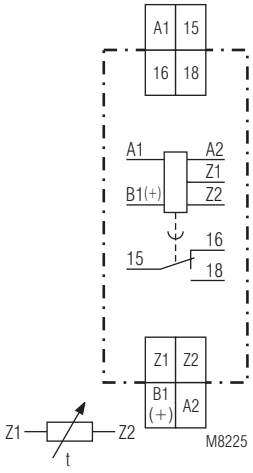
Indicators

green LED:	on when auxiliary voltage connected
yellow LED "R/t":	shows status of output relay and time delay:
- LED off	output relay not active; no time delay
- LED continuously on	output relay active; no time delay (^= B1 input active)
- Flashing (long on, short off)	output relay active; time delay

Circuit Diagrams



IK 9962.81
SK 9962.81



IK 9962.81/300
SK 9962.81/300

Connection Terminals

Terminal designation	Signal description
A1	L / +
A2	N / -
15, 16, 18	Changeover contact
B1(+)	Control input (control of time delay) Control with reference to A2
Z1, Z2 (only at variant /300)	Input to connect a remote potentiometer for time setting

Notes

Setting
A change of the settings for time range and time will be valid immediately. Please note, that a change of time range or time setting during elapse of time can lead to unintended switching of the output contacts.

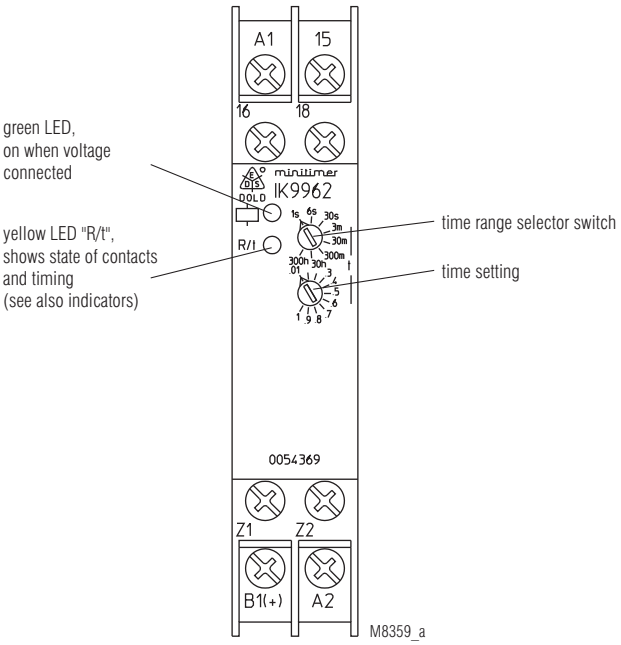
Adjustment assistance
The flashing period of the yellow LED is 1 s ± 4% and can be used to adjust the time. Especially on the lower end of scale and for long times it is suitable as the multiplication factors between the different time ranges are exact without tolerance.
Example:
The required time is 40 min. It has to be adjusted within 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.

Remote potentiometer
With the variant IK/SK 9962.81/300 the time setting can also be made via remote potentiometer of 10 kOhms. It is connected to the terminals Z1-Z2. The corresponding potentiometer on the relay 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!

Control input B1
The unit needs a continuously connected auxiliary supply on A1-A2. The timing is controlled via input B1. The control unit B1 (+ with DC) has to be supplied 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 (e. g. contactor) between B1 and A2 is allowed.

Setting



Technical Data

Time circuit

Time ranges:	8 time ranges 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:	continuous, 1:100 on relative scale
Recovery time:	
at DC 24 V:	approx. 15 ms
at DC 240 V:	approx. 50 ms
at AC 230 V:	approx. 80 ms
Minimum on time (B1):	
AC 50 Hz:	approx. 15 ms
DC:	approx. 5 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 U_H:	AC/DC 12 ... 240 V
Voltage range:	0.8 ... 1.1 U_N
Frequency range (AC):	45 ... 400 Hz
Nominal consumption	
at AC 12 V:	approx. 1.5 VA
at AC 24 V:	approx. 2 VA
at AC 240 V:	approx. 3 VA
at DC 12 V:	approx. 1 W
at DC 24 V:	approx. 1 W
at DC 240 V:	approx. 1 W
Release voltage (A1/A2)	
AC 50 Hz:	approx. 7.5 V
DC:	approx. 7 V
Control voltage (B1/A2):	AC/DC 12 ... 240 V
Voltage range (B1/A2):	0.8 ... 1.1 U_N
Control current (B1):	input resistance approx. 220 kΩ in series with diode
Release voltage (B1/A2)	
AC 50 Hz:	approx. 5 V
DC:	approx. 4 V

Output

Contacts		
IK/SK 9962.81:	1 changeover contact	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	4 A (see see quadratic total current limit curve)	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13:	1 A / DC 24 V	
Electrical life		
to AC 15 at 1 A, AC 230 V:	1.5 x 10^5 switching cycles	IEC/EN 60 947-5-1
Permissible switching frequency:	30 000 switching cycles / h	
Short circuit strength		
max. fuse rating:	4 A gG / gL	IEC/EN 60 947-5-1
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:	< 2.000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	20 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients:		
A1/A2 and B1(+)/A2	4 kV	IEC/EN 61 000-4-4
Z1/Z2:	2 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:	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:	DIN 46 228-1/-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 60 999-1
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:		
IK 9962:	approx. 65 g	
SK 9962:	approx. 84 g	

Dimensions

Width x height x depth:	
IK 9962:	17.5 x 90 x 59 mm
SK 9962:	17.5 x 90 x 98 mm

Standard Types

IK 9962.81 AC/DC 12 ... 240 V 0.05 ... 300 h
Article number: 0054368
- Output: 1 changeover contact
- Auxiliary voltage U_H: AC/DC 12 ... 240 V
- Time ranges: 0.05 ... 300 h
- Width: 17.5 mm

SK 9962.81 AC/DC 12 ... 240 V 0.05 ... 300 h
Article number: 0056040
- Output: 1 changeover contact
- Auxiliary voltage U_H: AC/DC 12 ... 240 V
- Time ranges: 0.05 ... 300 h
- Width: 17.5 mm

Variant

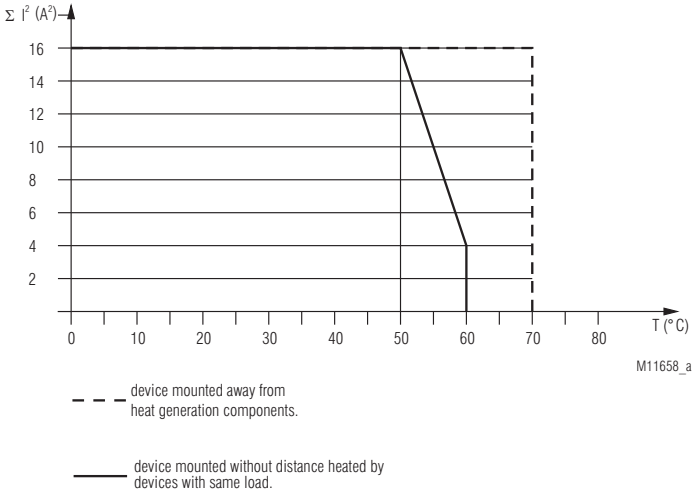
IK/SK 9962.81/300: Connection facility for a remote potentiometer 10 kΩ to adjust the time

Ordering example for variant

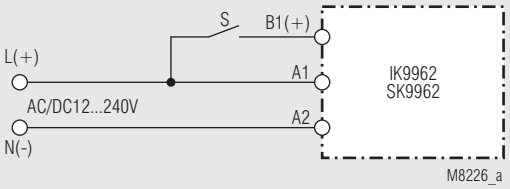
IK 9962 .81 /_ _ _ AC/DC 12 ... 240 V 0.05 s ... 300 h

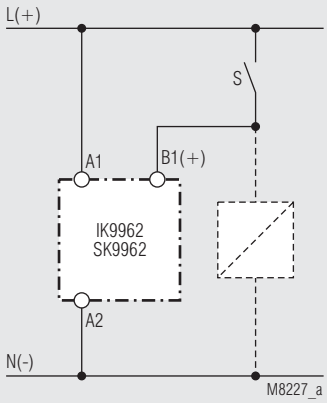
- Time range
- Auxiliary voltage
- Variant, if required
- Contacts
- Type

Characteristics

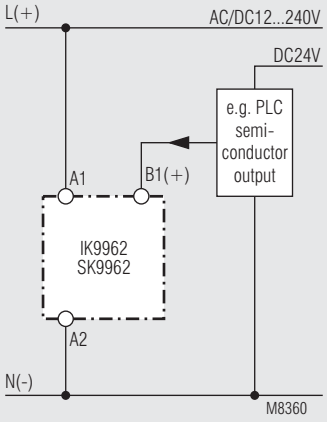


Connection Examples





Control with parallel connected load



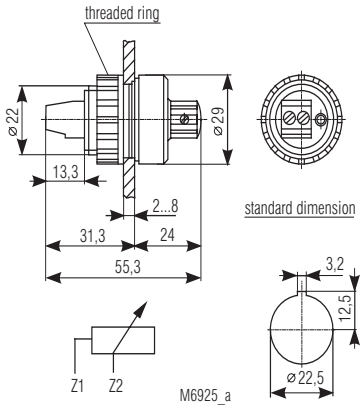
Connection with 2 different control voltages

Accessories

AD 3: External potentiometer 10 kΩ
Artikelnummer: 0028962

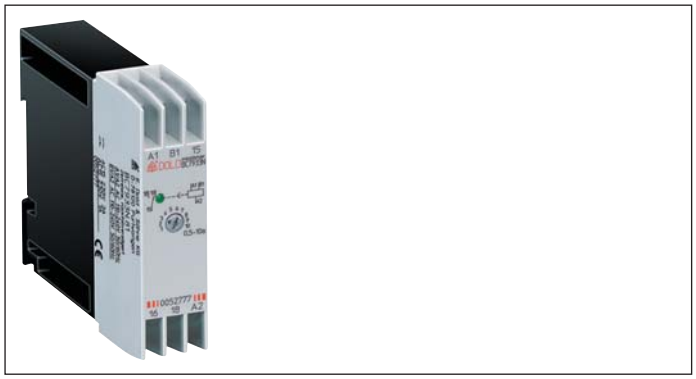
The external potentiometer is used for remote setting of the time delay. The internal potentiometer of the timer must be set to min. time delay.

Degree of protection front side: IP 60



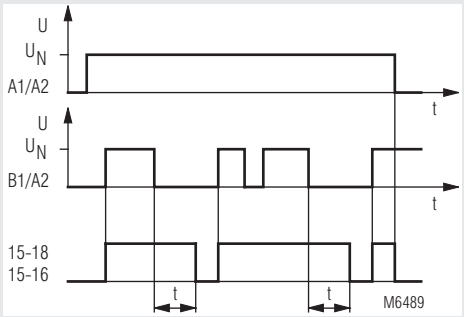
MINITIMER
Timer, Release Delay
BC 7933N

0225284



- According to IEC/EN 61 812-1
- Release delay with control signal
- Settable release delay between 0.05 s and 10 h
- With auxiliary voltage
- Wide voltage range AC 110 ... 240 V
- Control input operated with nominal voltage, No voltage free contact necessary
- LED indicator for status of contact
- 1 changeover contact
- Wire connection: also 2 x 1.5 mm² stranded ferruled (isolated), DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3
- Width 22.5 mm

Function Diagram



Approvals and Markings

CE

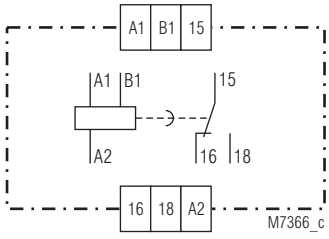
Applications

Time-dependent control circuits

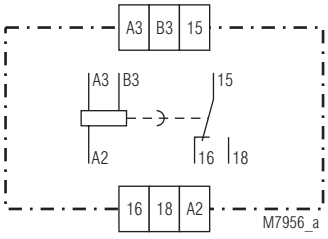
Indicators

yellow LED:	on, when output relay activated (contact 15 - 18 closed)

Circuit Diagrams



BC 7933N



BC 7933N/200

Notes

The relay needs a supply voltage continuously connected to A1-A2.
At relays with auxiliary supply < AC 180 V the control input must not be operated before the auxiliary supply is present for at least 150 ms. In this case also the recovery time after time delay is 150 ms.

Connection Terminals

Terminal designation	Signal description
A1, A3, A2	Operating voltage
B1, B3	Control input
15, 16, 18	Changeover contact

Technical Data

Time Circuit

Time ranges:	0.05 ... 1 s	0.5 ... 10 m
	0.15 ... 3 s	1.5 ... 30 m
	0.5 ... 10 s	0.15 ... 3 h
	1.5 ... 30 s	0.5 ... 10 h
	5 ... 100 s	
	15 ... 300 s	
Time setting:	infinitely variable 1:20	
Min. closing time:	(Control input B1)	
	AC: 15 ms	
	DC: 5 ms	
Recovery time:	< 50 ms	
Repeat accuracy:	≤ 0.5 % + 10 ms	
Voltage influence:	≤ 1 %	
Temperature influence:	≤ 0.25 % / K	

Input

Nominal voltage U_N		
(Operating voltage):	(A1/A2 and B1/A2)	
	AC 110 ... 240 V	
	AC 42 ... 48 V / DC 48 V	
	AC/DC 24 V	
Voltage range:	AC: 0.8 ... 1.1 U_N	
	DC: 0.9 ... 1.25 U_N	
Nominal consumption:	AC: 4 VA	
	DC: 0.4 W	
Nominal frequency:	AC: 50 / 60 Hz	
Frequency range:	AC: 45 ... 65 Hz	
Reset voltage:	(Control input B1)	
	≥ 15 % U_N	

Output

Contacts:	1 changeover contact	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	4 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical contact life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	1.5 x 10^5 switching cycles	
Permissible switching frequency:	36 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gG /gL	IEC/EN 60 947-5-1
Mechanical life:	10^8 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 20 ... + 60 °C	
Storage:	- 25 ... + 70 °C	
Relative air humidity:	95 % at 40 °C	
Altitude:	< 2.000 m	
Clearance and creepage distances		
overvoltge category / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	4 kV (contact)	IEC/EN 61 000-4-2
	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	10 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.5 GHz:	3 V / m	IEC/EN 61 000-4-3
2.5 GHz ... 2.7 GHz	1 V / m	IEC/EN 61 000-4-3
Fast transients:	2 kV	IEC/EN 61 000-4-4
Surge voltages		
between A1/A2:	1 kV	IEC/EN 61 000-4-5
between B1/A2:	1 kV	IEC/EN 61 000-4-5
between A1, A2/PE:	2 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 55 011

Technical Data

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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:		
Cross section:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated) or 2 x 1.5 mm² stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3	
Insulation of wires or sleeve length:	10 mm	
Wire fixing:	Terminal screws M 3.5 Box terminal with wire protection	
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	80 g	

Dimensions

Width x height x depth: 22.5 x 84 x 97 mm

Standard Type

BC 7933N.81 AC 110 ... 240 V 50/60 Hz 0.5 ... 10 s
Article number: 0052777

- Front colour grey, with box terminals
- Output: 1 changeover contact
- Nominal voltage U_N: AC 110 ... 240 V
- Time range: 0.5 ... 10 s
- Width: 22.5 mm

Variant

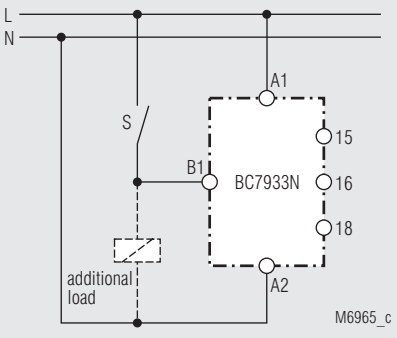
BC 7933N.81/200: Special terminal designation:
A3 corresponds A1, B3 corresponds B1

Ordering example for variant

BC 7933N .81 /_ _ _ AC 110 ... 240 V 50 / 60 Hz 10 s

- Time delay
- Nominal frequency
- Nominal voltage
- Variant, if required
- Contact
- Type

Connection Examples

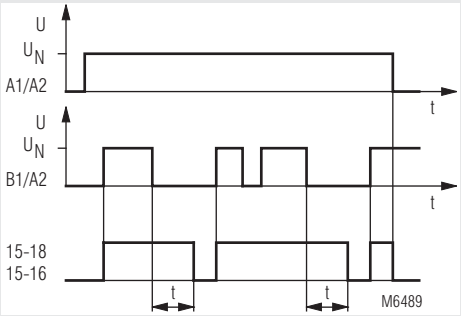


MINITIMER
Timer, Release Delay
BC 7939N

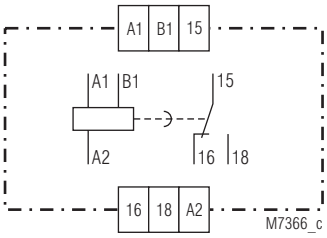
0255080

- According to IEC/EN 61 812-1
- Release delay with control signal
- 8 settable time ranges between 0.05 s and 10 h
- Settable release delay
- With auxiliary voltage
- Wide voltage range AC 110 ... 240 V
- Control input operated with nominal voltage, No voltage free contact necessary
- LED indicator for status of contact
- 1 changeover contact
- Wire connection: also 2 x 1.5 mm² stranded ferruled (isolated), DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3
- Width 22.5 mm

Function Diagram



Circuit Diagram



Connection Terminals

Terminal designation	Signal description
A1, A2	Operating voltage
B1	Control input
15, 16, 18	Changeover contact

Approvals and Markings

CE

Applications

Time-dependent control circuits

Indicators

yellow LED: on, when output relay activated (contact 15 - 18 closed)

Notes

The relay needs a supply voltage continuously connected to A1-A2.
At relays with auxiliary supply < AC 180 V the control input must not be operated before the auxiliary supply is present for at least 150 ms. In this case also the recovery time after time delay is 150 ms.

Technical Data

Time Circuit

Time ranges:	8 settalbe time ranges: 0.05 ... 1 s 0.5 ... 10 m 0.15 ... 3 s 1.5 ... 30 m 0.5 ... 10 s 0.15 ... 3 h 1.5 ... 30 s 0.5 ... 10 h 5 ... 100 s 15 ... 300 s
Time setting:	infinitely variable 1:10
Min. closing time:	(Control input B1) AC: 15 ms DC: 5 ms
Recovery time:	< 50 ms
Repeat accuracy:	≤ 0.5 % + 10 ms
Voltage influence:	≤ 1 %
Temperature influence:	≤ 0.25 % / K

Input

Nominal voltage U_N	
(Operating voltage):	(A1/A2 and B1/A2) AC 110 ... 240 V AC 42 ... 48 V / DC 48 V AC/DC 24 V
Voltage range:	AC: 0.8 ... 1.1 U_N DC: 0.9 ... 1.25 U_N
Nominal consumption:	AC: 4 VA DC: 0.4 W
Nominal frequency:	AC: 50 / 60 Hz
Frequency range:	AC: 45 ... 65 Hz
Reset voltage:	(Control input B1) ≥ 15 % U_N

Output

Contacts:		
BC 7939N.81:	1 changeover contact	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	4 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical contact life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	1.5 x 10^5 switching cycles	
Permissible switching		
frequency:	36 000 switching cycles / h	
Short circuit strength		
max. fuse rating:	4 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	10^8 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 20 ... + 60 °C	
Storage:	- 25 ... + 70 °C	
Relative air humidity:	95 % at 40 °C	
Altitude:	< 2.000 m	
Clearance and creepage		
distances		
overvoltge category /		
pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage,		
type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	4 kV (contact)	IEC/EN 61 000-4-2
	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	10 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.5 GHz:	3 V / m	IEC/EN 61 000-4-3
2.5 GHz ... 2.7 GHz	1 V / m	IEC/EN 61 000-4-3
Fast transients:	2 kV	IEC/EN 61 000-4-4
Surge voltages		
between A1/A2:	1 kV	IEC/EN 61 000-4-5
between B1/A2:	1 kV	IEC/EN 61 000-4-5
between A1, A2/PE:	2 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 55 011

Technical Data

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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:		
Cross section:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled (isolated) or 2 x 1.5 mm² stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2.5 mm² stranded ferruled DIN 46 228-1/-2/-3	
Insulation of wires		
or sleeve length:	10 mm	
Wire fixing:	Terminal screws M 3.5 Box terminal with wire protection	
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	80 g	

Dimensions

Width x height x depth: 22.5 x 84 x 97 mm

Standard Type

BC 7939N.81 AC 110 ... 240 V 50/60 Hz 16 h
Article number: 0056391

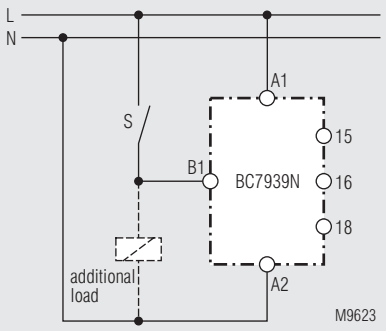
- Front colour grey, with box terminals
- Output: 1 changeover contact
- Nominal voltage U_N: AC 110 ... 240 V
- Time range: 0.05 ... 16 h
- Width: 22.5 mm

Ordering Example

BC 7939N .81 AC 110 ... 240 V 50 / 60 Hz 0.05 ... 16 h

- Time delay
- Nominal frequency
- Nominal voltage
- Contact
- Type

Connection Examples



MINITIMER
Timer, release delay
MK 7863

0226795

Your Adventages
- Simple control with operating voltage
- Energy saving, i.e. no consumption after disconnection of control voltage

Features
- According to IEC/EN 61 812-1
- Release delay, without control signal
- No-voltage safe
- Delay up to 300 s
- Repeat accuracy < ± 3 %
- 1 changeover contact
- Width 22.5 mm

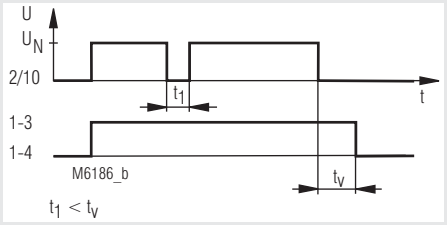
Product Description

True off delayed timer. Connecting the operating voltage will energise the relay, contact 15-18 closes. Removing the operating voltage starts the time delay. After elapse of time, the relay de-energises to 15-16.

Approvals and Markings

CE

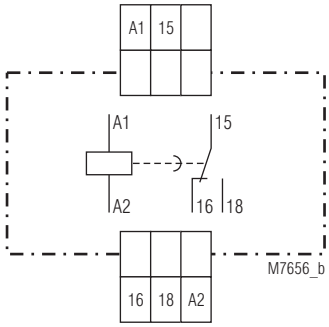
Function diagramm



Indicator

LED: on, when operating voltage applied

Circuit Diagram



Technical Data

Time circuit

Time ranges:	0.05 ... 1 s	0.15 ... 3 s
	0.5 ... 10 s	1.5 ... 30 s
	5 ... 100 s	15 ... 300 s
Time setting:	steppless on absolute scale	
Recovery time:	10 ms	
Repeat accuracy:	< ± 3 %	
Min. setting time:	100 ms	
Voltage influence:	< ± 3 %	
Temperature influence:	< 0.2 % / K	

Input

Nominal voltage U_N (operating voltage):	AC/DC 24, 42 V with pole protection AC 110 ... 127, 230, 240 V	
Voltage range:	0.8 ... 1.1 U_N	
Nominal consumption:	AC 230 V / 9 VA	
Nominal frequency:	50 / 60 Hz	

Output

Contacts:	1 changeover contact, delayed	
Contact material:	$AgSnO_2$	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	5 x 10^5 switching cycles	
Permissible switching frequency:	3 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	50 x 10^6 switching cycles	

Connection Terminals

Terminal designation	Signal description
A1 / A2	Operating voltage
15, 16, 18	Changeover contact

Technical Data

General Data

Operating mode:	Continuous operation	
Temperature range:		
Operation:	- 20 ... + 60 °C	
Storage:	- 25 ... + 75 °C	
Altitude:	< 2.000 m	
Relative air humidity:	95 % at 40 °C	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 3 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	12 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	2 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:	2 kV	IEC/EN 61 000-4-5
HF-wire guided:	10 V	
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplast with V0 behaviour according to UL Subj. 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 1.5 mm² solid or 2 x 1.0 mm² stranded wire with sleeve DIN 46 288-1/-2/-3/-4	
Insulation of wires or sleeve length:	8 mm	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0,4 Nm	
Mounting:	DIN-rail	IEC/EN 60 715
Weight:	270 g	

Dimensions

Width x height x depth: 22.5 x 82 x 99 mm

Standard Type

MK 7863.81 AC 230 V 50/60 Hz 1.5 ... 30 s

Article number:	0024446
• Output:	1 changeover contact, delayed
• Nominal voltage U_N:	AC 230 V
• Time range:	1.5 ... 30 s
• Width:	22.5 mm

Ordering example

MK 7863 .81 AC 230 V 50 / 60 Hz 15 ... 300 s

- Time range
- Nominal frequency
- Nominal voltage
- Contacts
- Type

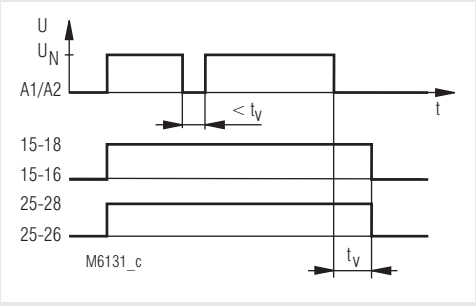
Accessories

ET 4752-143:	Marking plate Article number: 0043203

MINITIMER
Timer, Release Delay
MK 7873N

- According to IEC/EN 61 812-1
- Release delay, without control signal
- No-voltage safe
- Delay up to 300 s
- Repeat accuracy ≤ ± 0.5 %
- No recovery time
- With large voltage range AC/DC 24 ... 240 V
- LED display for power supply
- 2 changeover contacts
- Wire connection: also 2 x 1.5 mm² stranded ferruled, or 2 x 2.5 mm² solid DIN 46 228-1/-2/-3/-4
- With pluggable terminal blocks for easy exchange of devices
  - with screw terminals
  - or with cage clamp terminals
- Width 22.5 mm

Function Diagram



Approvals and Markings

CE

c UL US LISTED
Canada / USA

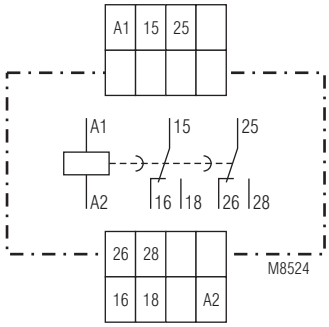
Application

Time dependent controls for industrial and railway applications.

Indicators

LED: on, when supply connected

Circuit Diagram



MK 7873N.82

Connection Terminals

Terminal designation	Signal description
A1, A2	Operating voltage
15, 16, 18, 25, 26, 28	Changeover contacts

Technical Data

Time circuit

Time ranges:	0.05 ... 1 s	0.15 ... 3 s
	0.5 ... 10 s	1.5 ... 30 s
	5 ... 100 s	15 ... 300 s
Time setting:	steppless	
Minimum switch-on time of the control input		
for DC 24 V:	150 ms	
for UC 220 V:	25 ms	
Recovery time		
tw 50 / 100:	0	
Repeat accuracy:	≤ ± 0.5 % of set value	
Voltage influence:	≤ 0.5 %	
Temperature influence:	< 0.2 % / K	

Input

Nominal voltage U_N:		
(Operating voltage):	AC/DC 24 ... 240 V	
Voltage range:	AC 19.2 ... 264 V	
	DC 21.6 ... 300 V	
Nominal consumption		
Effective power:	0.8 W	
Frequency range:	45 ... 400 Hz	
Release voltage:	10 V	

Output

Contacts:	2 delayed changeover contacts	
Contact material:	$AgSnO_2$ + 0.2 µm Au	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13 at 0.1 Hz:	1 A / DC 24 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
at AC 230 V, 6 A, cos φ = 1:	8×10^5 switching cycles	
Permissible operating frequency:		
for time ranges ≤ 10 s:	1 400 switching cycles / h	
for time ranges ≥ 30 s:	700 switching cycles / h	
Short circuit strength		
max. fuse rating:	6 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	30×10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range:		
Operation:	- 20 ... + 60°C	
Storage:	- 25 ... + 60°C	
Relative air humidity:	93 % at 40°C	
Altitude:	< 2,000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF-irradiation		
80 MHz ... 1 GHz:	12 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	5 V / m	IEC/EN 61 000-4-3
Fast transients	2 kV	IEC/EN 61 000-4-4
Surge voltages between		
wires for power supply:	1 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 55 011
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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	

Technical Data

Wire connection		DIN 46 228-1/-2/-3/-4
Screw terminals		
(integrated):	1 x 4 mm² solid or	
	1 x 2.5 mm² stranded ferruled or	
	2 x 1.5 mm² stranded ferruled or	
	2 x 2.5 mm² solid	
Insulation of wires		
or sleeve length:	8 mm	
Plug in with screw terminals		
max. cross section		
for connection:	1 x 2.5 mm² solid or	
	1 x 2.5 mm² stranded ferruled	
Insulation of wires		
or sleeve length:	8 mm	
Plug in with cage clamp terminals		
max. cross section		
for connection:	1 x 4 mm² solid or	
	1 x 2.5 mm² stranded ferruled	
min. cross section		
for connection:	0.5 mm²	
Insulation of wires		
or sleeve length:	$12^{\pm 0.5}$ mm	
Wire fixing:	Plus-minus terminal screws M 3.5 box terminals with wire protection or cage clamp terminals	
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	132 g	

Dimensions

Width x height x depth:	
MK 7873N:	22.5 x 90 x 97 mm
MK 7873N PC:	22.5 x 111 x 97 mm
MK 7873N PS:	22.5 x 104 x 97 mm

Classification to DIN EN 50155

Vibration and shock resistance:	Category 1, Class B	IEC/EN 61 373
Ambient temperature:	T1 compliant	
	T2, T3 and TX with operational limitations	
Protective coating of the PCB:	No	

UL-Data

Switching capacity:	
Ambient temperature 60°C:	Pilot duty B300
	5A 250Vac G.P.
	5A 24Vdc G.P.
Wire connection:	60°C / 75°C copper conductors only
Screw terminals fixed:	AWG 20 - 12 Sol/Str Torque 0.8 Nm
Plug in screw:	AWG 20 - 14 Sol Torque 0.8 Nm
	AWG 20 - 16 Str Torque 0.8 Nm
Plug in cage clamp:	AWG 20 - 12 Sol/Str

Technical data that is not stated in the UL-Data, can be found in the technical data section.

Standard Type

MK 7873N.82/61 AC/DC 24 ... 240V 1.5 ... 30 s

Article number:	0054462
• Output:	2 changeover contacts
• Nominal voltage U_N:	AC/DC 24 ... 240 V
• Time range:	1.5 ... 30 s
• Width:	22.5 mm

Ordering Example

MK 7873N .82 _ _ /61 AC/DC 24 ... 240 V 5 ... 100 s

- Time range
- Nominal voltage
- UL-approval
- Type of terminals
  without indication:
  terminal blocks fixed
  with screw terminals
  PC (plug in cage clamp):
  pluggable terminal blocks
  with cage clamp terminals
  PS (plug in screw):
  pluggable terminal blocks
  with screw terminals
- Contacts
- Type

Options with Pluggable Terminal Blocks

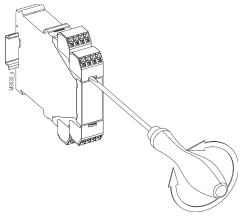
Screw terminal
(PS/plugin screw)

Cage clamp
(PC/plugin cage clamp)

Notes

Removing the terminal blocks with cage clamp terminals

1. The unit has to be disconnected.
2. Insert a screwdriver in the side recess of the front plate.
3. Turn the screwdriver to the right and left.
4. Please note that the terminal blocks have to be mounted on the belonging plug in terminations.

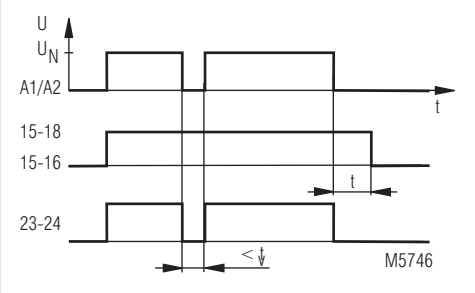


MINITIMER
Timer, Release Delay
MK 9961

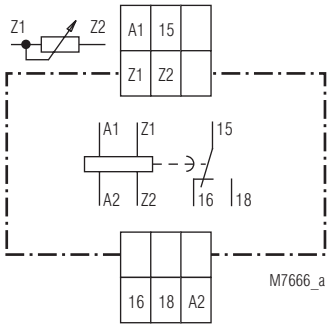
DOLD

- According to IEC/EN 61 812-1
- Delay up to 600 s
- Repeat accuracy < ± 1 %
- Without auxiliary voltage
- Available with instantaneous contact
- Safe resetting
- Remote potentiometer connection to terminal Z1 - Z2 possible
- 2-wire proximity sensor control
- Width 22.5 mm

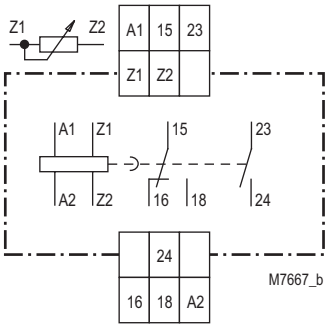
Function Diagram



Circuit Diagrams



MK 9961.81



MK 9961.35

Approvals and Markings

CE cULus LISTED * Canada / USA

* see variant

Indication

LED:	on when operating voltage applied

Technical Data

Time Circuit

Time ranges:	0.05 ... 1 s 3 ... 60 s 0.15 ... 3 s 5 ... 100 s 0.5 ... 10 s 15 ... 300 s 1.5 ... 30 s 30 ... 600 s
Time setting:	infinitely, on absolute scale remote setting via external potentiometer
Repeat accuracy:	< ± 1 %
Min. setting time:	80 ms
Voltage influence:	< ± 1.5 %
Temperature influence:	< 0.1 % / K

Input

Nominal voltage U_N:	AC/DC 24, 42 V with polarity protection AC 110 ... 127, 230, 240 V
Voltage range:	0.8 ... 1.1 U_N
Permissible residual current:	10 mA
Nominal consumption:	AC 230 V / 9 VA
Nominal frequency:	50 / 60 Hz

Output

Contacts		
MK 9961.81:	1 changeover contact, delayed	
MK 9961.35:	1 NO contact, instantaneous 1 changeover contact, delayed	
Thermal current I_{th}		
MK 9961.81:	5 A	
MK 9961.35:	2 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V		
MK 9961.81:	5 x 10^5 switching cycles	
MK 9961.35:	3 x 10^5 switching cycles	
Permissible switching frequency:	3 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gL	IEC/EN 60 947-5-1
Mechanical life:	50 x 10^6 switching cycles	

Technical Data

General Data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 60 °C	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V/m	IEC/EN 61 000-4-3
Fast transients:	2 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
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplast with V0 behaviour according to UL subj. 94	
Vibration resistance:	Amplitude 0.35 mm frequenzy 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:	2 x 1.5 mm² solid or 2 x 1.0 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Weight:	140 g	

Dimensions

Width x height x depth: 22.5 x 82 x 99 mm

Standard Type

MK 9961.81 AC 230 V 50/60 Hz 10 s

Article number:	0021491	stock item
• Output:	1 changeover contact	
• Nominal voltage U_N:	AC 230 V	
• Time range:	0.5 ... 10 s	
• Width:	22.5 mm	

Variant

MK 9961/61: with UL-approval

Ordering example of variant

MK 9961 .81 /_ _ AC 230 V 50/60 Hz 100 s

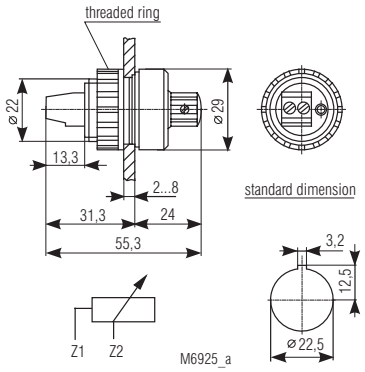
- 100 s — Time range, end value
- 50/60 Hz — Nominal frequency
- AC 230 V — Nominal voltage
- /_ _ — Variant, if required
- .81 — Contacts
- MK 9961 — Type

Accessories

AD 3: External potentiometer

1	MΩ	at time range	1 s
1	MΩ	at time range	3 s
1	MΩ	at time range	10 s
4.7	MΩ	at time range	30 s
10	MΩ	at time range	60 s
10	MΩ	at time range	100 s
20	MΩ	at time range	300 s
20	MΩ	at time range	600 s

Degree of protection front side: IP 60



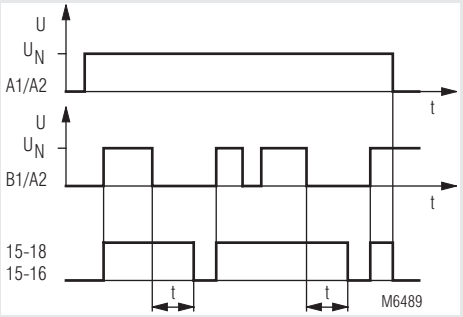
MINITIMER
Timer, Release Delay
MK 9962N

DOLD

0239283

- According to IEC/EN 61 812-1
- Release delay, with control signal
- 8 time ranges from 0.05 s to 300 h selectable via rotational switch
- Voltage range AC/DC 12 ... 240 V for auxiliary supply and control input
- Adjustment aid for quick setting of long time values
- With input for interruption of timing
- LED indicators for operation, contact position and time delay
- 2 changeover contacts
- With remote potentiometer facility as option
- Wire connection: also 2 x 1.5 mm² stranded ferruled, or 2 x 2.5 mm² solid DIN 46 228-1/-2/-3/-4
- As option with pluggable terminal blocks for easy exchange of devices
  - with screw terminals
  - or with cage clamp terminals
- 22.5 mm width

Function Diagram



Approvals and Markings

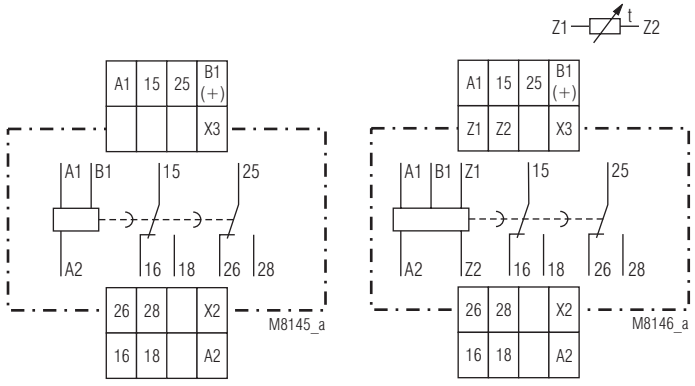
CE | c UL us LISTED * Canada / USA

* see variants

Applications

Time-dependent controllers

Circuit Diagrams



MK 9962N.82

MK 9962N.82/300

Indicators

green LED:	on when auxiliary voltage connected
yellow LED "R/t":	shows status of output relay and time delay:
- LED off	output relay not active; no time delay
- LED continuously on	output relay active; no time delay (≙ B1 input active)
- LED flashing (long on, short off)	output relay active; time delay

Connection Terminals

Terminal designation	Signal description
A1	L / +
A2	N / -
15, 16, 18	Changeover contact
25, 26, 28	Changeover contact
B1(+)	Control Input (start time delay)
X2, X3	Control Input (time interruption with time adding)
Z1, Z2	Input to connect a remote potentiometer for time setting t1

Notes

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 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.

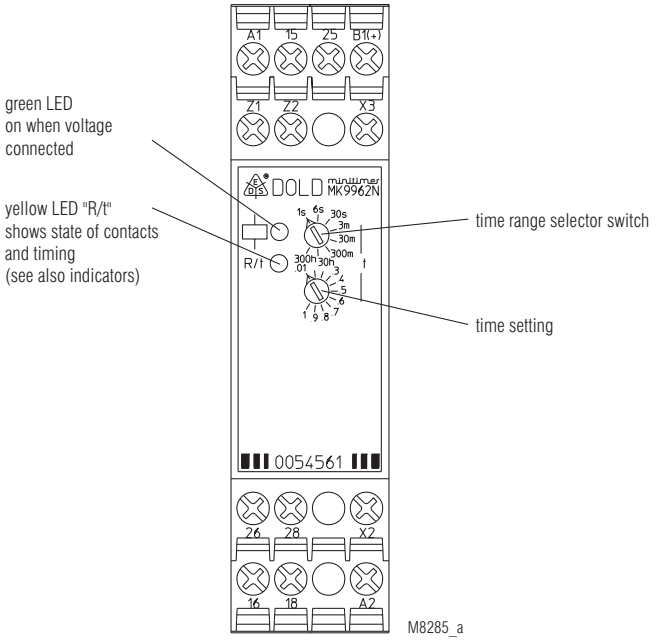
Notes

Remote potentiometer
With the variant MK 9962N.82/300 the time setting can also be made via remote potentiometer of 10 kOhms. It is connected to the terminals Z1-Z2. The corresponding potentiometer on the relay 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 potentiometers 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 Z2.
To terminals Z1 and Z2 no external voltage must be connected, as the unit might be damaged.

Control input B1
The unit needs a continuously connected auxiliary supply on A1-A2. The timing is controlled via input B1. The control unit B1 (+ with DC) has to be supplied 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 (e.g. a contactor) between B1 and A2 is also allowed.

Time interruption and time addition with X2 - X3
The time delay can be interrupted during timing by bridging the terminals X2 - X3. By opening the bridge the time continues (time addition).
While X2 and X3 are bridged the control input is disabled and the yellow LED remains in the state it had at stop. No external voltage must be connected to X2 and X3 as the unit may be damaged.

Setting



Technical Data

Time circuit

Time ranges:	8 time ranges 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:	continuous, 1:100 on relative scale
Minimum on time (B1):	
AC 50 Hz:	approx. 15 ms
DC:	approx. 5 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 U_H:	AC/DC 12 ... 240 V
Voltage range:	0.8 ... 1.1 U_N
Frequency range (AC):	45 ... 400 Hz
Nominal consumption	
at AC 12 V:	approx. 1.5 VA
at AC 24 V:	approx. 2 VA
at AC 240 V:	approx. 3 VA
at DC 12 V:	approx. 1 W
at DC 24 V:	approx. 1 W
at DC 240 V:	approx. 1 W
Release voltage (A1/A2)	
AC 50 Hz:	approx. 7.5 V
DC:	approx. 7 V
Control voltage (B1/A2):	AC/DC 12 ... 240 V
Voltage range (B1/A2):	0.8 ... 1.1 U_N
Control current (B1):	approx. 1 mA, over complete voltage range
Release voltage (B1/A2)	
AC 50 Hz:	approx. 3.5 V
DC:	approx. 3 V

Output

Contacts		
MK 9962N.82:	2 changeover contacts	
Contact material:	AgNi	
Measured nominal voltage:	AC 250 V	
Thermal current I_{th}:	see quadratic total current limit curve (max. 4 A per contact)	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13:	1 A / DC 24 V	
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	1.5 x 10^5 switching cycles	
Permissible switching frequency:	6 000 switching cycles / h	
Short circuit strength max. fuse rating:	4 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	≥ 30 x 10^6 switching cycles	

Technical Data

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 40 ... + 60 °C (higher temperature see quadratic total current limit curve)	
Storage:	- 40 ... + 70 °C	
Relative air humidity:	93 % at 40 °C	
Altitude:	< 2,000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:		
Input / Output:	4 kV / 2 (basis insulation)	IEC 60 664-1
Output / Output:	4 kV / 2 (basis insulation)	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage, type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	20 V / m	IEC/EN 61 000-4-3
1 GHz ... 2.7 GHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	2 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:	10 V	IEC/EN 61 000-4-6
Interference suppression:	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 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:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:		EN 50 005
Wire connection		DIN 46 228-1/-2/-3/-4
Screw terminals (integrated):	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled or 2 x 1.5 mm² stranded ferruled or 2 x 2.5 mm² solid	
Insulation of wires or sleeve length:	8 mm	
Plug in with screw terminals		
max. cross section for connection:	1 x 2.5 mm² solid or 1 x 2.5 mm² stranded ferruled	
Insulation of wires or sleeve length:	8 mm	
Plug in with cage clamp terminals		
max. cross section for connection:	1 x 4 mm² solid or 1 x 2.5 mm² stranded ferruled	
min. cross section for connection:	0.5 mm²	
Insulation of wires or sleeve length:	12 $^{\pm 0.5}$ mm	
Wire fixing:	Plus-minus terminal screws M 3.5 box terminals with wire protection or cage clamp terminals	
Fixing torque:	max. 0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	150 g	

Technical Data

Dimensions

Width x heigth x depth

MK 9962N:	22.5 x 90 x 97 mm
MK 9962N PC:	22.5 x 111 x 97 mm
MK 9962N PS:	22.5 x 104 x 97 mm

UL-Data

Switching capacity:	
Ambient temperature 60°C:	Pilot duty B300 5A 250Vac G.P.
Wire connection:	60°C / 75°C copper conductors only
Screw terminals fixed:	AWG 20 - 12 Sol/Str Torque 0.8 Nm
Plug in screw:	AWG 20 - 14 Sol Torque 0.8 Nm AWG 20 - 16 Str Torque 0.8 Nm
Plug in cage clamp:	AWG 20 - 12 Sol/Str

Technical data that is not stated in the UL-Data, can be found in the technical data section.

Standard Type

MK 9962N.82/61 AC/DC 12 ... 240 V 0.05 ... 300 h

Article number:	0054105
• Output:	2 changeover contacts
• Auxiliary voltage U_H:	AC/DC 12 ... 240 V
• Time ranges:	0.05 ... 300 h
• Width:	22.5 mm

Variants

MK 9962N.82/300/61:	Connection facility for a remote potentiometer 10 kΩ to adjust the time

Ordering example for variants

MK 9962N .82 _ _ / _ _ _ /61 AC/DC 12 ... 240 V 0.05 s ... 300 h

- Time range
- Auxiliary voltage
- with UL-approval
- Variant,if required
- Type of terminals
  without indication:
  terminal blocks fixed, with screw terminals
  PC (plug in cage clamp):
  pluggable terminal blocks with cage clamp terminals
  PS (plug in screw):
  pluggable terminal blocks with screw terminals
- Contacts
- Type

Options with Pluggable Terminal Blocks

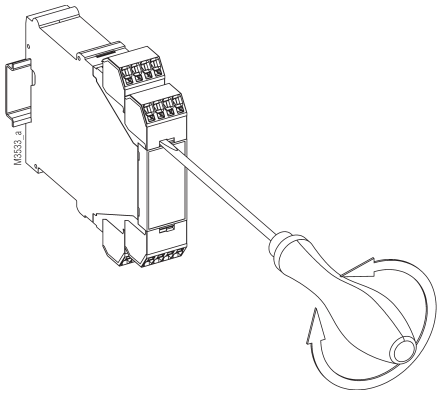
Screw terminal
(PS/plugin screw)

Cage clamp
(PC/plugin cage clamp)

Notes

Removing the terminal blocks with cage clamp terminals

1. The unit has to be disconnected.
2. Insert a screwdriver in the side recess of the front plate.
3. Turn the screwdriver to the right and left.
4. Please note that the terminal blocks have to be mounted on the belonging plug in terminations.

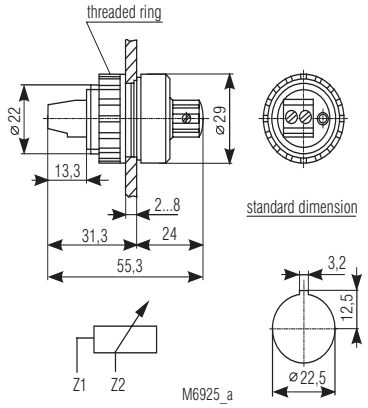


Accessories

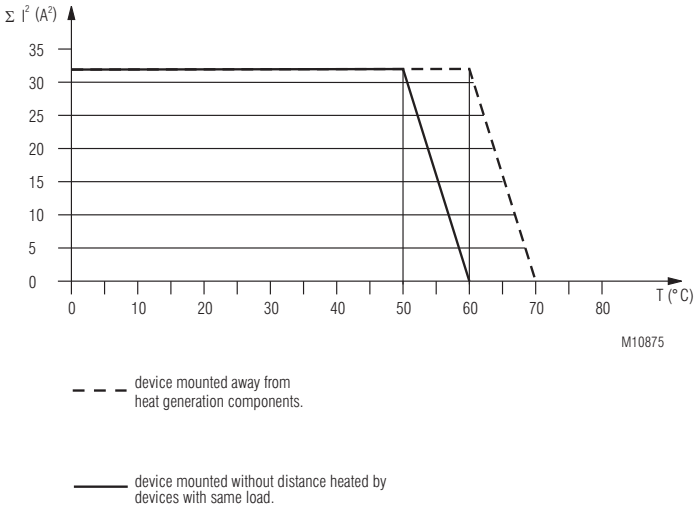
AD 3: External potentiometer 10 kΩ
Article number: 0028962

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 60

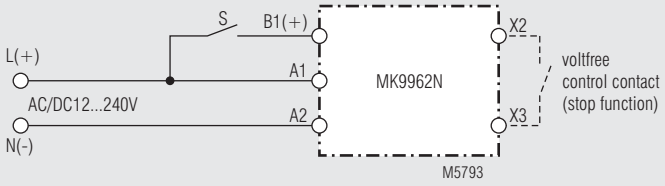


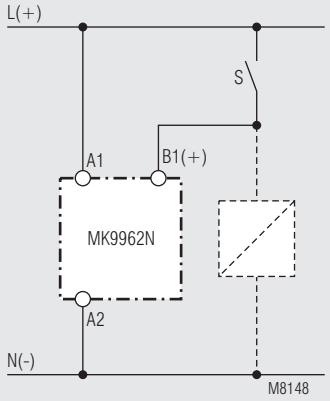
Characteristics



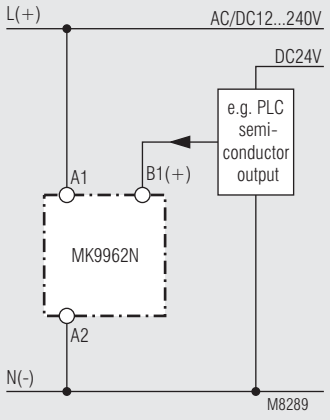
Quadratic total current limit curve

Connection Examples





Control with parallel connected load



Connection with 2 different control voltages

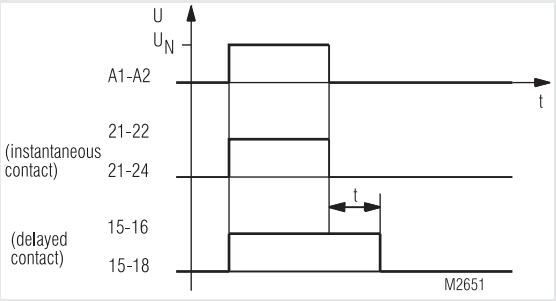
MINITIMER
Timer, Release Delay
AA 7562

0232906

Your Advantage
- Non sensitive to electromagnetical influence by pneumatic time element

Features
- According to IEC/EN 60 812-1
- Delay up to 180 s
- Repeat accuracy < ± 5 %
- 1 changeover contact delayed, 1 changeover contact without delay
- Width 45 mm

Function Diagram



Approvals and Markings

CE

Application

Time dependent controls

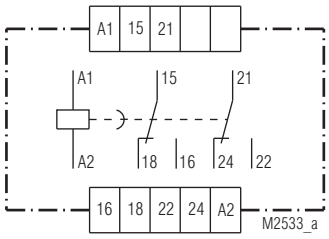
Function

With the release delayed timer AA 7562 the delay is achieved by a pair of bellows that is compressed by a magnet system. With an adjustable regulating system the time for the expansion of the bellows is defined. The bellow then operates the switch contacts.

Notes

The mounting distance should not be smaller than 8 mm.

Circuit Diagram



AA 7562.32

Connection Terminals

Terminal designation	Signal description
A1	L / +
A2	N / -
15, 16, 18	Changeover contacts delayed
21, 22, 24	Changeover contacts not delayed

Technical Data

Time Circuit

Time ranges:	0.2 ... 30 s 0.2 ... 180 s
Time setting:	infinitely
Repeat accuracy:	≤ ± 5 % of the final range value
Min. transition time:	25 ms
Temperature influence:	0.5 % / K under certain circumstances, variation and temperature errors can be added.

Input

Nominal voltage U_N:	AC 24, 42, 110, 127, 230, 240 V 50 or 60 Hz DC 12, 24, 42, 48, 110, 220 V	
Voltage range:	AC 0.85 ... 1.1 U_N DC 0.8 ... 1.1 U_N	
Nominal consumption:	Initial position 22 VA 5.5 W	Active position 7 VA 5.5 W
Nominal frequency:	50 Hz	

Output

Contacts

AA 7562.32:	1 changeover contact, without delay 1 changeover contact, delayed	
Contact material:	Ag	
Measured nominal voltage:	AC 250 V	
Operating time of contacts:	< 50 ms	
Release time of contacts:	< 25 ms	
Thermal current I_{th}:	4 A	
Nominal breaking capacity	AC 110 V	AC 230 V
cos φ 1 ... 0.7:	2 A	2 A
cos φ 0.4:	1 A	1 A
	DC 110 V	DC 220 V
ohmic:	0.25 A	0.25 A
inductive:	0.03 A	0.02 A
Electrical life:	1.2×10^6 switching cycles 1 500 switches/h at 30 % of the switching capacity 0.8×10^6 switching cycles 1 000 switches/h at 50 % of the switching capacity 0.3×10^6 switching cycles 500 switches/h at 100 % of the switching capacity	
Permissible switching frequency:	1 500 switching cycles / h	
Short circuit strength max. fuse rating:	2 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	> 3×10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 10 ... + 55 °C	
Storage:	- 10 ... + 55 °C	
Altitude:	< 2,000 m	
Clearance and creepage distances		
rated impulse voltage / pollution degree:	4 kV / 2	IEC 60 664-1
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF-irradiation:	10 V/m	IEC/EN 61 000-4-3
Fast transients:	2 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:	2 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 55 011

Technical Data

Degree of protection

Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 10	IEC/EN 60 529
Housing:	Thermoplast with V0-behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10...55Hz,IEC/EN 60 068-2-6	
Climate resistance:	The device is only to be used in dry rooms, in closed switch cabinets or switch boxes	
Terminal arrangement:	DIN 46 199-5	
Terminal designation:	EN 50 005	
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0.8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	270 g AC-version 310 g DC-version	

Dimensions

Widht x height x depth: 45 x 77 x 124 mm

Standard Type

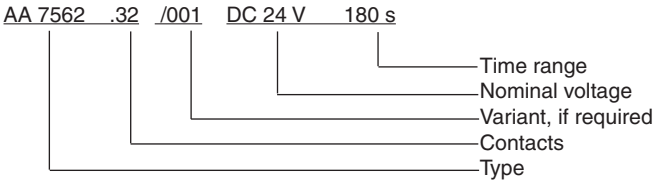
AA 7562.32 AC 230 V 50 Hz 0.2 ... 30 s

Article number:	0009431
• Output:	1 changeover contact, instantaneous 1 changeover contact, delayed
• Nominal voltage U_N:	AC 230 V
• Time range:	0.2 ... 30 s
• Width:	45 mm

Variant

AA 7562.32/001:	DC-version, as option for: DC 12, 24, 42, 48, 110, 220 V

Ordering example for variant



MINITIMER
Timer, Release Delay
AA 7666, EC 7666, EF 7666, EH 7666

0227770

AA 7666

EC 7666

EF 7666

EH 7666

- According to IEC/EN 61 812-1
- Delay up to 60 h
- 6 time ranges on one unit, adjustable at front side
- Repeat accuracy ≤ ± 0.5 %
  (≤ ± 1 % for the range 3 and 6 s)
- Time lapse display
- Switching position display (except for EH 7666)
- With instantaneous contact
- No voltage safe
- EF 7666: front side protected against beam water, IP 65
- AA 7666: width 45 mm
  EC 7666: front size 48 x 72 mm
  EF 7666: front size 72 x 72 mm
  EH 7666: front size 96 x 96 mm

Approvals and Markings

CE

Application

Time dependent controls

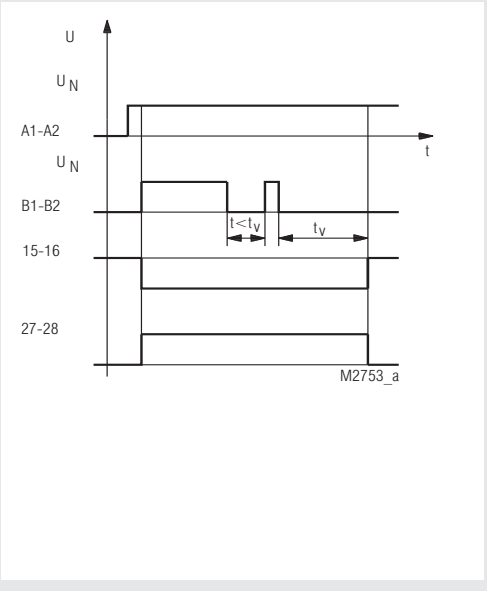
Indication

Time display:	via red pointer at scale of the device
Switching position:	red sign when NO contacts are closed (not for EH 76669
Time range display:	final scale value in a window

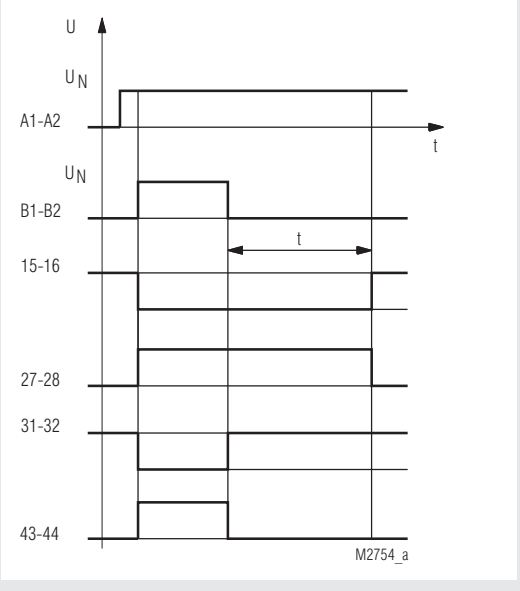
Notes

The frequency changing switch 50 / 60 Hz is located on the bottom side of the unit.

Function Diagrams

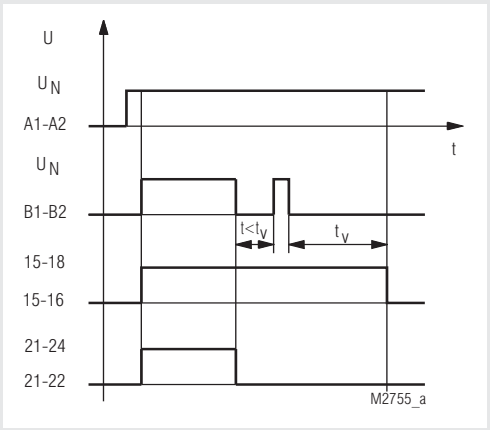


AA 7666.21, EC 7666.21, EH 7666.21



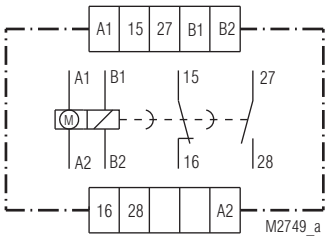
EF 7666.24

Function Diagrams

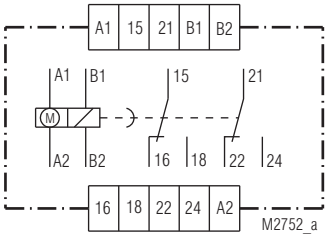


AA 7666.32, EF 7666.32

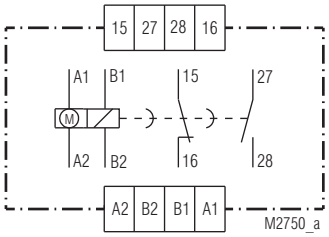
Circuit Diagrams



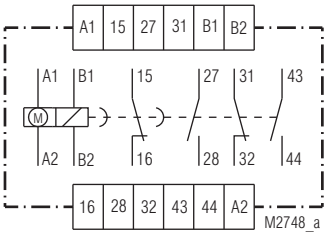
AA 7666.21



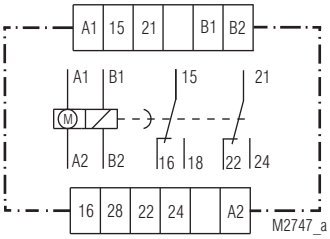
AA 7666.32



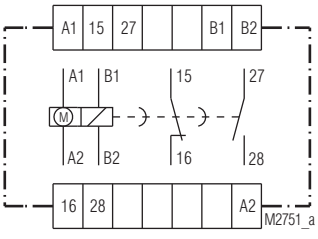
EC 7666.21



EF 7666.24



EF 7666.32



EH 7666.21

Technical Data

Time circuit

Time ranges:	6-range models 0.15 ... 3 s 1.5 ... 30 s 15 ... 300 s 0.4 ... 10 s 4 ... 100 s 40 ...1000 s or 0.15 ... 3 s 0.15 ... 3 min 0.15 ... 3 h 1.5 ...30 s 1.5 ...30 min 1.5 ... 30 h or 0.2 ... 6 s 0.2 ... 6 min 0.2 ... 6 h 2 ...60 s 2 ...60 min 2 ... 60 h
Time setting:	infinite with black (white) setting pointer on absolute scale
Recovery time:	< 150 ms
Repeat accuracy:	≤ ± 0.5 % of max. scale value (at 3 and 6 s ≤ ± 1 %)
EH 7666, DC-version:	≤ ± 3 % of the max. scale value

Technical Data

Input

Nominal voltage U_N:	AC 24, 42, 110, 127, 230, 240 V
Special voltages	
AA 7666:	AC 12, 400, 415 V
EH 7666:	DC 12, 24, 48, 60*, 110*, 230* V * with external series resistance
Voltage range:	0.8 ... 1.1 U_N
Nominal consumption:	AC 7 VA DC 12 V 5 W DC 24 V 5 W DC 48 V 7 W DC 60 V 10 W DC 110 V 13 W DC 230 V 18 W
Nominal frequency:	50 / 60 Hz to e selected
Frequency range:	± 5 % f_N
Frequency influence:	reverse proportional

Output

Contacts	
AA 7666.21, EC 7666.21, EF 7666.21, EH 7666.21:	1 NC contact, delayed 1 NO contact, delayed
EF 7666.24:	1 NO contact, instantaneous 1 NC contact, instantaneous 1 NC contact, delayed 1 NO contact, delayed
EF 7666.32:	1 changeover contact, delayed 1 changeover contact, instantaneous
Operate time of contacts:	< 35 ms
Release time:	< 60 ms
Thermal current I_{th}:	4 A
Switching capacity	
to AC 15:	3 A / AC 230 V IEC/EN 60 947-5-1
Electrical life	IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:	1 x 10^5 switching cycles
to AC 15 at 1 A, AC 230 V:	5 x 10^5 switching cycles
Permissible switching frequency:	3 000 switching cycles / h
Short circuit strength max. fuse rating:	10 A gL IEC/EN 60 947-5-1
Mechanical life:	> 30 x 10^6 switching cycles or > 15 000 h

General Data

Operating mode:	Continuous operation
Temperature range:	- 20 ... + 55 °C
Clearance and creepage distances	
rated impulse voltage / pollution degree	
inputs:	4 kV / 2 IEC 60 664-1
in-/output:	4 kV / 2 IEC 60 664-1
EMC	
Electrostatic discharge:	8 kV (air) IEC/EN 61 000-4-2
HF irradiation:	10 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:	10 V IEC/EN 61 000-4-6
Interference suppression:	Limit value class B EN 55 011
Degree of protection:	IEC/EN 60 529
AA 7666:	Housing: IP 40 Terminals: IP 20
EC 7666, EH 7666:	Housing-front: IP 40 Housing: IP 30 Terminals: IP 10
EF 7666:	Housing-front: IP 65
Housing:	Thermoplast with V0 behaviour according to UL subject 94
Vibration resistance:	Amplitude 0.35 mm frequency 10...55Hz,IEC/EN 60 068-2-6

Technical Data

Climate resistance:	20 / 055 / 04; A/B/C	IEC/EN 60 068-1
Terminal arrangement:	DIN 46 199-5	
Terminal designation:	EN 50 005	
Wire connection:	2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0.8 Nm	
Mounting		
AA 7666:	DIN rail	IEC/EN 60 715
EC 7666, EF 7666, EH 7666:	flush mounting	
Weight		
AA 7666:	320 g	
EC 7666:	320 g	
EF 7666:	400 g	
EH 7666:	450 g	

Dimensions

Width x height x depth	
AA 7666:	45 x 77 x 127 mm
EC 7666:	48 x 72 x 120 mm
EF 7666:	72 x 72 x 128 mm
EH 7666:	96 x 96 x 138 mm
Front panel cut-out	
EC 7666:	44 x 67 mm
EF 7666:	67 x 67 mm
EH 7666:	ø 91^{+1} mm
Front surface	
EC 7666:	48 x 72 mm
EH 7666:	72 x 72 mm
EH 7666:	96 x 96 mm

Standard Type

AA 7666.32 AC 230 V 50/60 Hz 0.15 s ... 30 h

Article number:	0025127
• Time range:	0.15 s ... 30 h
• Nominal voltage U_N:	AC 230 V
• Output:	1 changeover contact, delayed 1 changeover contact, instantaneous
• Width:	45 mm

Ordering Example

AA 7666 .32 AC 230 V 50 / 60 Hz 30 h

- 30 h — Time-range max. value
- 50 / 60 Hz — Nominal frequency
- AC 230 V — Nominal voltage
- .32 — Contact
- AA 7666 — Type

Accessories

for EC 7666:

ZS 700.06:	Lockable cover Article number: 0004057
ET 7001.407.034:	Plug-in-socket for EC 7666.21 Article number: 0004072

for EF 7666:

ZS 700.07:	Lockable cover Article number: 0004058
ET 7616-0-22:	Sealing ring for sealing at the front side Article number: 0045909

MINITIMER
Timer, Release Delay
BA 7954, AI 954N*

***Only for replacement**
Replacements:
MK 7873N, BA 7954

DOLD

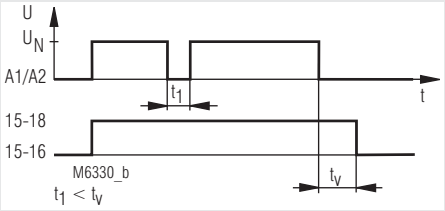
0227771


BA 7954

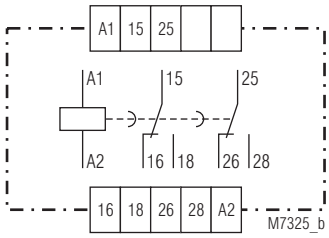

AI 954 N*

- According to IEC/EN 61 812-1
- Release delay, without control signal
- No-voltage safe
- Delay up to 300 s
- Repeat accuracy < ± 1 %
- For 2-wire proximity sensors
- 2 changeover contacts
- Width 45 mm

Function Diagram



Circuit Diagram



BA 7954.82, AI 954 N.0082

Connection Terminals

Terminal designation	Signal description
A1, A2	Operating voltage
15, 16, 18	Changeover contacts (output relay)
25, 26, 28	Changeover contacts (2. output relay)

Approvals and Markings

CE

Indication

LED: on when operating voltage applied

Technical Data

Time Circuit

Time ranges: 0.05 ... 1 s, 0.15 ... 3 s
0.5 ... 10 s, 1.5 ... 30 s
5 ... 100 s, 15 ... 300 s
Time setting: stepless, on absolute scale
Repeat accuracy: ≤ ± 1 %
Min. setting time: 25 ms
Attention!
Time faults when min. setting time < 10 %. When setting time longer, the fault will be less.
Voltage influence: < ± 1 %
Temperature influence < 0.3 % / K

Input

Nominal voltage U_N: AC 24, 42, 110, 127, 230, 240 V
DC 24 V

DC 48 V*: ZWS 20 SL 390 Ω 20 W
DC 60 V*: ZWS 20 SL 640 Ω 20 W
DC 110 V*: ZWS 20 SL 1.5 kΩ 20 W
DC 220 V*: ZWS 35 SL 3.3 kΩ 35 W
*) with external series resistor
The series resistors have to be used together with DC 24 V-devices. The series resistor has to be connected to (+).
Voltage range: 0.8 ... 1.1 U_N
Permissible residual current: ≤ 2.5 mA
Nominal consumption: AC 3 VA

DC	48	60	110/127	220	V
	3.0	3.5	6.5	13.0	W

Nominal frequency: 50 / 60 Hz
Recovery time: ≥ 25 ms

Technical Data

Output

Contacts:		
BA 7954.82, AI 954 N.82:	2 changeover contacts, delayed	
Contact material:	$AgSnO_2$, 0,2µm Au	
Measured nominal voltage:	AC 250 V	
Operate time of the contacts:	≤ 25 ms	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15:		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	2.5 x 10^5 switching cycles	
Permissible switching		
frequency:	6000 switching cycles / h	
Short-circuit strength		
max. fuse rating:	4 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	> 10 x 10^6 switching cycles	

General Data

Operating mode:	Continuous operation	
Temperature range		
Operation:	- 20 ... + 60 °C	
Storage:	- 20 ... + 60 °C	
Altitude:	< 2,000 m	
Clearance and creepage		
distances		
rated impulse voltage /		
pollution degree:	4 kV / 2	IEC 60 664-1
Overvoltage category:	III	
Insulation test voltage,		
type test:	2.5 kV; 1 min	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	10 V / m	IEC/EN 61 000-4-3
1 GHz ... 2 GHz:	10 V / m	IEC/EN 61 000-4-3
2 GHz ... 2.7 GHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	2 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:	2 kV	IEC/EN 61 000-4-5
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplast with V0 behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10...55Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal arrangement:	DIN 46 199-5	
Terminal designation:	EN 50 005	
Wire connection:	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	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Fixing torque:	0,8 Nm	
Mounting:	DIN rail	IEC/EN 60 715
Weight:	260 g	

Dimensions

Width x heigth x depth	
BA 7954:	45 x 73 x 133 mm
AI 954N:	45 x 77 x 127 mm

Standard Type

BA 7954.82 AC 230 V 50 / 60 Hz 0.5 ... 10 s
Article number: 0024075
Nominal voltage U_N: AC 230 V
Time range: 0.5 ... 10 s
Width: 45 mm

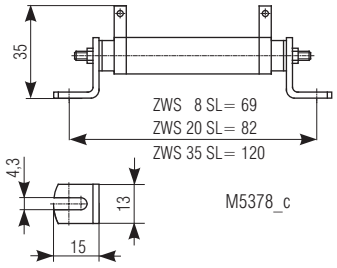
Ordering example for variant

BA 7954 .82 /_ _ _ DC 24 V 0.5 ... 10 s

- Time range
- Nominal voltage
- Variant, if required
- Contacts
- Type

Accessories

ZWS 20 SL, ZWS 35 SL: Series resistors



for BA 7954:
ET 4762-5 Adaptor
Article number: 0023119

for AI 954 N:
K 70-34 Transparent cover
Article number: 0011790

MINITIMER
Timer, Release Delay
BA 7962, MK 9962

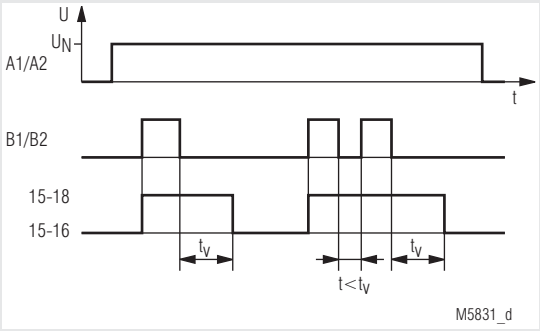
0227978

BA 7962

MK 9962

- According to IEC/EN 61 812-1
- Release delay, with control signal
- Time delay up to 100 h
- Repeat accuracy ≤ ± 1 %
- MK 9962 with dual voltage supply
- Control by voltage free contact
  MK 9962 optionally control by supply voltage
- 2 LED displays for control and contact position
- 2 changeover contacts
- BA 7962, AA 9962: width 45 mm
  MK 9962: width 22.5 mm

Function Diagram



Approvals and Markings

CE

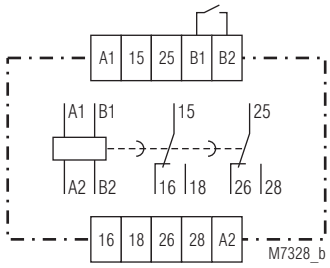
Applications

Time-dependent controllers

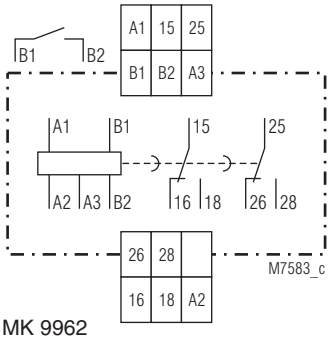
Indication

upper LED: on when control contact closed
lower LED: on when output relay energized

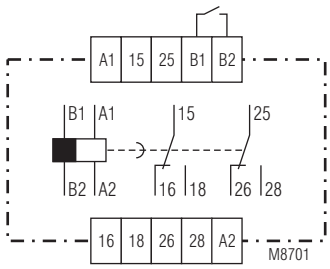
Circuit Diagrams



BA 7962.82



MK 9962



BA 7962.82/200
with forcibly guided contacts

Connection Terminals

Terminal designation	Signal description
A1, A2, A3	Operation voltage
B1, B2	Control input
15, 16, 18	Changeover contacts (output relay)
25, 26, 28	Changeover contacts (2nd output relay)

Technical Data

Time Circuit

Time ranges:

0.05 ... 1 s	0.5 ... 10 min.	0.15 ... 3 h
0.15 ... 3 s	1.5 ... 30 min.	0.5 ... 10 h
0.5 ... 10 s	3 ... 60 min.	1.5 ... 30 h
1.5 ... 30 s		5 ... 100 h
5 ... 100 s		
15 ... 300 s		

Time setting: stepless on absolute scale
Min. switch-on time: 20 ms
Repeat accuracy: ≤ ± 1 % of set value
Voltage influence: ≤ ± 0.5 %
Temperature influence: < ± 0.1 % / K

Input

Nominal voltage U_N:
BA 7962: AC 24, 42, 110, 127, 230, 240 V
DC 24, 48, 60, 110, 220, 240 V
MK 9962: AC/DC 24 V[1] + AC 110 ... 127 V[2]
AC/DC 24 V[1] + AC 220 ... 240 V[2]
AC/DC 24 V[1] + AC/DC 42 V[2]
[1] at terminals A3 - A2
[2] at terminals A1 - A2
Voltage range: 0.8 ... 1.1 U_N at AC
Nominal power consumption:

BA 7962:	AC 3.5 VA	
	DC 24 V	1 W
	DC 48 V	2 W
	DC 60 V	2 W
	DC 110 V	2 W
	DC 220 V	3 W
	DC 240 V	3 W
MK 9962:	AC 24 V	0.8 VA
	AC 42 V	1.8 VA
	AC 110 V	3.5 VA
	AC 230 V	7 VA
	AC 240 V	8 VA
	DC 24 V	0.8 W
	DC 42 V	1.8 W

Nominal frequency: 50 / 60 Hz
Frequency range ± 5 % f_N

Output

Contacts: 2 delayed changeover contacts
Contact material: AgNi 0.2µ, gold plated
Measured nominal voltage: AC 250 V
Thermal current I_{th}: 5 A
Switching capacity
to AC 15

NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1

Electrical life IEC/EN 60 947-5-1
to AC 15 at 3 A, AC 230 V:
BA 7962.82: 0.5 x 10^5 switching cycles
MK 9962: 5 x 10^5 switching cycles
Permissible operating frequency: 6 000 switching cycles / h
Short circuit strength max. fuse rating: 6 A gL IEC/EN 60 947-5-1
Mechanical life: 30 x 10^6 switching cycles

General Data

Operating mode: Continuous operation
Temperature range
Operation, Storage
BA 7962 (AC),
MK 9962: - 20 ... + 60 °C
BA 7962 (DC): - 20 ... + 50 °C
Altitude: < 2,000 m
Clearance and creepage distances
rated impulse voltage / pollution degree: 4 kV / 2 IEC 60 664-1

Technical Data

EMC

Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 1 GHz:	10 V / m	IEC/EN 61 000-4-3
1 GHz ... 2 GHz:	3 V / m	IEC/EN 61 000-4-3
2 GHz ... 2.7 GHz:	1 V / m	IEC/EN 61 000-4-3
Fast transients:	2 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
Interference suppression:	Limit value class B	EN 55 011

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...55Hz IEC/EN 60 068-2-6
Climate resistance: 20 / 060 / 04 IEC/EN 60 068-1
Terminal arrangement: DIN 46 199-5
Terminal designation: EN 50 005
Wire connection:
BA 7962: 2 x 2.5 mm² solid or
2 x 1.5 mm² stranded wire with sleeve
MK 9962: 2 x 1.5 mm² solid or
2 x 1.0 mm² stranded wire with sleeve
DIN 46 228-1/-2/-3/-4
Wire fixing: Flat terminals with self-lifting clamping piece IEC/EN 60 999-1
Fixing torque
BA 7962: 0.8 Nm
MK 9962: 0.4 Nm
Mounting: DIN rail IEC/EN 60 715
Weight
BA 7962 (AC): 240 g
BA 7962 (DC): 150 g
MK 9962: 180 g

Dimensions

Width x height x depth:
BA 7962: 45 x 73 x 133 mm
MK 9962: 22.5 x 82 x 99 mm

Standard Type

MK 9962 AC/DC 24 V + AC 220 ... 240 V 15 ... 300 s
Article number: 0044937
- Output: 2 changeover contacts
- Nominal voltage U_N: AC/DC 24 V + AC 220 ... 240 V
- Time range: 15 ... 300 s
- Width: 22.5 mm

Variants

BA 7962.82/200: 2 guided changeover contacts delayed

Ordering example for variants

MK 9962 .82 /_ _ _ AC 220 ... 240 V 50 / 60 Hz 300 s

- 300 s: Time range end value
- 50 / 60 Hz: Nominal frequency
- AC 220 ... 240 V: Nominal voltage
- /_ _ _: Variant, if required
- .82: Contact
- MK 9962: Type

Accessories

ET 4752-143: Marking plate for MK 9962
Article number: 0043203

Type	Function
BA	
BA 7924	Delay module, release delay
BD	
BD 5935	Emergency stop module
BD 5980N	Two-hand safety relay
BD 5987	Emergency stop module
BG	
BG 5551	Diagnostic module for CANopen
BG 5912	Output module with output contacts
BG 5913.08/_0_ _ _	Input module
BG 5913.08/_1 _ _	Input module
BG 5913.08/_2_ _ _	Input module
BG 5913.08/_3_ _ _	Input module
BG 5914.08/_0_ _ _	Input module
BG 5915.08/_1_ _ _	Input module
BG 5924	Emergency stop module
BG 5925	Emergency stop module
BG 5925/900	Light curtain controller
BG 5925/910	Safety-mat switch gear
BG 5925/920	Switch gear for safety switch
BG 5929	Extension module
BG 5933	Two-hand safety relay
BG 7925	Delay module, release delay
BG 7926	Delay module, release delay
BH	
BH 5552	Diagnostic module for CANopen
BH 5902/01MF2	Light curtain controller
BH 5903	Emergency stop module with voltage failure detection
BH 5904/00MF2	Valve monitoring module
BH 5910	Multifunction safety module
BH 5911	Control unit
BH 5913.08/_0_ _ _	Input module
BH 5914.08/_0_ _ _	Input module
BH 5915.08/_1_ _ _	Input module
BH 5922	Emergency stop monitor
BH 5928	Emergency stop module with time delay
BH 5932	Speed or standstill monitor
BH 5933	Two-hand safety relay
BH 7925	Delay module, release delay

Type	Function
BI	
BI 5910	Radio controlled safety module
BI 5928	Emergency stop module with time delay
BI 6910	Radio controlled safety module
BL	
BL 5903	Emergency stop module with voltage failure detection
BL 5922	Emergency stop monitor
BN	
BN 3081	Extension module
BN 5930.48	Emergency stop module
BN 5930.48/203	Emergency stop module
BN 5930.48/204	Emergency stop module
BN 5983	Emergency stop module
BO	
BO 5988	Emergency stop module
HC	
HC 3096N	Interface module
HC 3098	Interface module
HK	
HK 3087N	Interface module
HL	
HL 3094	Interface module
HL 3096N	Interface module
HO	
HO 3094	Interface module
HO 3095	Interface module
IK	
IK 3079	Interface module
IL	
IL 7824	Delay module, release delay
IN	
IN 7824	Delay module, release delay
IP	
IP 3078	Interface module
IP 5924	Emergency stop module

Type	Function
LG	
LG 3096	Interface module
LG 5924	Emergency stop module
LG 5925	Emergency stop module
LG 5925/034	Safety module for elevator controls
LG 5925/900	Light curtain controller
LG 5925/920	Safety module for safety switches
LG 5928	Emergency stop module with time delay
LG 5929	Extension module
LG 5933	Two-hand safety relay
LG 5944	Safety edge module
LG 7927	Delay module, on delayed
LG 7928	Delay module, release delay
LH	
LH 5946	Standstill monitor
MK	
MK 3096N	Interface module
NE	
NE 5020	Magnetic switch coded
NE 5021	Magnetic switch coded
RE	
RE 5910	Remote control for e-stop
RE 5910/011,	
RE 5910/013	Industrial charger unit AC 230 V
RE 5910/012	Industrial charger unit DC 24 V
RE 6910	Radio controlled enabling switch
RK	
RK 5942	Emergency stop module

Type	Function
S	
SAFEMASTER M	System overview
SAFEMASTER PRO	System overview
SAFEMASTER STS/K	System overview
SAFEMASTER STS	System overview
SAFEMASTER W	System overview
	Wireless safety system, e-stop
SAFEMASTER W	System overview
	Wireless safety system, enabling switch
SP	
SP 3078	Interface module
UF	
UF 6925	Emergency stop module
UG	
UG 3088	Interface module
UG 3096	Interface module
UG 6929	Extension module
UG 6960	Multifunctional safety timer
UG 6961	Multifunctional safety timer
UG 6970	Multifunctional safety module
UG 6980	Multifunctional safety module
UH	
UH 3096	Interface module
UH 5947	Speed monitor
UH 6900	Radio controlled safety module
UH 6932	Speed monitor
UH 6937	Frequency monitor

Type	Function
AA	
AA 9050	Speed monitor
AA 9837	Frequency relay
AA 9838	Frequency relay
AA 9943	Undervoltage relay
AD	
AD 5960	Fault annunciator system
AD 5992	Fault annunciator system
AD 5998	Fault annunciator system
AI	
AI 938	Thermistor motor protection relay
AI 941N	Phase sequence relay
AI 942	Asymmetry relay
AK	
AK 9840	Asymmetry relay
BA	
BA 9036	Voltage relay
BA 9037	Voltage relay
BA 9038	Thermistor motor protection relay
BA 9040	Asymmetry relay
BA 9041	Phase sequence relay
BA 9042	Asymmetry relay
BA 9043	Undervoltage relay
BA 9053	Current relay
BA 9054	Voltage relay
BA 9055	Speed monitor
BA 9054/331	Battery symmetry monitor
BA 9054/332	Battery symmetry monitor
BA 9065	Underload monitor (cos φ)
BA 9094	Temperature monitoring relay
BA 9837	Frequency relay
BC	
BC 9190N	Voltage drop detector
BD	
BD 5936	Standstill monitor
BD 9080	Phase monitor
BH	
BH 9097	Motor load monitor
BH 9098	Motor load transmitter
BH 9140	Reverse power monitoring
EH	
EH 5990	Display unit
EH 5991	Display unit
EH 5994	Display unit
EH 5995	Display unit
EH 5996	Text display unit
EH 9997	Fault annunciator system

Type	Function
EP	
EP 5966	Fault annunciator system
EP 5967	Fault annunciator system
IK	
IK 8839	Current monitor
IK 9044	Voltage monitor
IK 9046	Voltage monitor
IK 9055	Speed monitor
IK 9065	Underload monitor (cos φ)
IK 9076	Valve monitor
IK 9094	Temperature monitoring relay
IK 9143	Frequency relay
IK 9144	Standstill monitor
IK 9168	Phase indicator
IK 9169	Phase monitor
IK 9170	Overvoltage relay, 3-phase
IK 9171	Undervoltage relay, 3-phase
IK 9172	Overvoltage relay, single phase
IK 9173	Undervoltage relay, single phase
IK 9178	Phase sequence indicator
IK 9179	Phase sequence monitor /-relay
IK 9270	Overcurrent relay
IK 9271	Undercurrent relay
IK 9272	Overcurrent relay
IK 9273	Undercurrent relay
IL	
IL 5201/20007	Overcurrent relay
IL 5880	Insulation monitor
IL 5881	Insulation monitor
IL 5882	Residual current monitor
IL 5990	Fault annunciator system
IL 5991	Fault annunciator system
IL 8839	Current monitor
IL 9055	Speed monitor
IL 9059	Phase sequence module
IL 9069	Neutral monitor
IL 9071	Undervoltage relay
IL 9075	Fuse monitor
IL 9077	Over- and undervoltage relay
IL 9079	Undervoltage relay to detect auto-reclosing
IL 9086	Phase monitor with thermistor motor protection
IL 9087	Phase monitor
IL 9094	Temperature monitoring relay
IL 9144	Standstill monitor
IL 9151	Level sensing relay
IL 9163	Thermistor motor protection relay

Type	Function
IL 9171	Undervoltage relay, 3-phase
IL 9176	Undervoltage relay, 3-phase with test key
IL 9270	Overcurrent relay
IL 9271	Undercurrent relay
IL 9277	Over- and undercurrent relay
IL 9837	Frequency relay
IN	
IN 5880/710	Insulation monitor
IN 5880/711	Insulation monitor
INFOMASTER B	System overview
IP	
IP 5880	Insulation monitor
IP 5880/711	Insulation monitor
IP 9075	Fuse monitor
IP 9077	Over- and undervoltage relay
IP 9270	Overcurrent relay
IP 9271	Undercurrent relay
IP 9277	Over- and undercurrent relay
IP 9278	Current asymmetry relay with integrated current transformer up to 15 A
IR	
IR 5882	Residual current monitor
LG	
LG 5130	Noise filter
LK	
LK 5894	Insulation monitor
LK 5895	Insulation monitor
LK 5896	Insulation monitor
MH	
MH 5880	Insulation monitor
MH 9055	Speed monitor
MH 9064	Voltage relay
MH 9143	Mains frequency monitor
MH 9300	Multifunction measuring relay
MH 9397	Motor load monitor
MH 9837N	Frequency relay
MH 9837/5_0	Frequency relay

Type	Function
MK	
MK 5130N	Noise filter
MK 5880N	Insulation monitor
MK 9003-ATEX	Thermistor motor protection relay
MK 9040N	Asymmetry relay
MK 9053N	Current relay
MK 9054N	Voltage relay
MK 9055N	Speed monitor
MK 9056N	Phase sequence relay
MK 9064N	Voltage relay
MK 9065	Underload monitor (cos φ)
MK 9143N	Mains frequency monitor
MK 9151N	Level sensing relay
MK 9163N	Thermistor motor protection relay
MK 9163N-ATEX	Thermistor motor protection relay
MK 9300N	Multifunction measuring relay
MK 9397N	Motor load monitor
MK 9837N	Frequency relay
MK 9837N/5_0	Frequency relay
MK 9994	Lamp tester
MK 9995	Lamp tester
ND	
ND 5015	Residual current transformer
ND 5016	Residual current transformer
ND 5017	Residual current transformer
ND 5018	Residual current transformer
ND 5019	Residual current transformer
OA	
OA 9059	Phase sequence module
RK	
RK 9169	Phase monitor
RK 9179	Phase sequence monitor /-relay
RK 9871	Undervoltage relay
RK 9872	Phase monitor
RL	
RL 9836	Voltage relay
RL 9853	Current relay
RL 9854	Voltage relay
RL 9075	Fuse monitor
RL 9877	Phase monitor
RN	
RN 5883	Residual current monitor, type B for AC and DC systems
RN 5897/010	Insulation monitor
RN 5897/300	Insulation monitor
RN 9075	Fuse monitor
RN 9877	Phase monitor

Type	Function
RP	
RP 5812	SMS-Telecontrol module
RP 5888	Insulation monitor
RP 5990	Common alarm annunciator
RP 5991	Common alarm annunciator
RP 5994	New- / First- /Common signal annunciator
RP 5995	New- / First- /Common signal annunciator
RP 9140	Reverse power monitoring
RP 9800	Voltage and frequency monitor
RP 9810	Voltage and frequency monitor acc. to VDE-AR-N 4105
RP 9811	Voltage and frequency monitor
RR	
RR 5886	Locating current injector
RR 5887	Insulation fault locator
SK	
SK 9055	Speed monitor
SK 9065	Underload monitor (cos φ)
SK 9076	Valve monitor
SK 9094	Temperature monitoring relay
SK 9143	Frequency relay
SK 9144	Standstill monitor
SK 9168	Phase indicator
SK 9169	Phase monitor
SK 9170	Overvoltage relay, 3-phase
SK 9171	Undervoltage relay, 3-phase
SK 9172	Overvoltage relay, single phase
SK 9173	Undervoltage relay, single phase
SK 9178	Phase sequence indicator
SK 9179	Phase sequence monitor /-relay
SK 9270	Overcurrent relay
SK 9271	Undercurrent relay
SK 9272	Overcurrent relay
SK 9273	Undercurrent relay
SL	
SL 5201/20007CT	Overcurrent relay
SL 5880	Insulation monitor
SL 5881	Insulation monitor
SL 5882	Residual current monitor
SL 5990	Fault annunciator system
SL 5991	Fault annunciator system
SL 9055	Speed monitor
SL 9059	Phase sequence module
SL 9065	Underload monitor (cos φ)
SL 9069	Neutral monitor
SL 9071	Undervoltage relay
SL 9075	Fuse monitor
SL 9077	Over- and undervoltage relay
SL 9079	Undervoltage relay to detect auto-reclosing
SL 9086	Phase monitor with thermistor motor protection
SL 9087	Phase monitor
SL 9094	Temperature monitoring relay
SL 9144	Standstill monitor
SL 9151	Level sensing relay
SL 9163	Thermistor motor protection relay
SL 9171	Undervoltage relay, 3-phase
SL 9270	Overcurrent relay
SL 9270CT	Overcurrent relay
SL 9271	Undercurrent relay
SL 9271CT	Undercurrent relay
SL 9277	Over- and undercurrent relay
SL 9277CT	Over- and undercurrent relay
SL 9837	Frequency relay
SP	
SP 5880	Insulation monitor
SP 9075	Fuse monitor
SP 9077	Over- and undervoltage relay
SP 9270	Overcurrent relay
SP 9270CT	Overcurrent relay
SP 9271	Undercurrent relay
SP 9271CT	Undercurrent relay
SP 9277	Over- and undercurrent relay
SP 9277CT	Over- and undercurrent relay
SP 9278	Current asymmetry relay with integrated current transformer up to 15 A
SP 9278CT	Current asymmetry relay with integrated current transformer up to 100 A
UG	
UG 9075	Fuse monitor
UH	
UH 5892	Insulation monitor

Type	Function
BA	
BA 9010	Softstarter
BA 9019	Softstarter with softstop
BA 9026	Softstarter with softstop
BA 9034N	Motor brake relay
BF	
BF 9250	Solid-state contactor
BF 9250/_ _8	Solid-state contactor
BF 9250/002	Semiconductor contactor with analogue input for pulsed output
BF 9250/042	Solid-state contactor with burst control
BH	
BH 9250	Solid-state contactor
BH 9251	Semiconductor contactor with current monitoring
BH 9253	Reversing contactor
BH 9255	Reversing contactor with current monitor
BI	
BI 9025	Softstarter
BI 9028	Softstarter with DC-brake
BI 9028/900	Softstarter for 1-phase motors
BI 9034	Motor brake relay
BI 9254	Reversing contactor with softstart and active power monitoring
BL	
BL 9025	Softstarter
BN	
BN 9011	Softstarter
BN 9034	Motor brake relay
GB	
GB 9034	Motor brake relay
GF	
GF 9016	Softstarter and softstop device
GI	
GI 9014	Softstart- / softstop device
GI 9015	Softstart- / softstop device
IL	
IL 9017	Softstarter
IL 9017/300	Softstarter with softstop
IN	
IN 9017	Phase controller

Type	Function
PF	
PF 9029	Softstarter for heating pumps
PH	
PH 9260	Solid-state relay / - contactor
PH 9260.92	Solid-state relay / - contactor
PH 9260/042	Solid-state relay / - contactor with analogue input for pulse package control
PH 9270	Solid-state relay / - contactor with load circuit monitoring
PH 9270/003	Solid-state relay / - contactor with load current measurement
PI	
PI 9260	Solid-state relay / - contactor
PK	
PK 9260	Solid-state relay / - contactor for resistive load
RP	
RP 9210/300	Softstart / softstop with reverse function
SL	
SL 9017	Softstarter
SX	
SX 9240.01	Speed controller 1-phase
SX 9240.03	Speed controller 3-phase
UG	
UG 9019	Softstarter with softstop
UG 9256	Smart motorstarter
UG 9256/804	Smart motorstarter with autom. phase sequence correction
UG 9256/807	Smart motorstarter with autom. phase sequence correction
UG 9410	Smart motorstarter
UG 9411	Smart motorstarter
UH	
UH 9018	Softstarter

Type	Function
AD	
AD 866	Switching Relay
AD 8851	Latching relay
BA	
BA 7632	Stepping relay
BA 7961	Contact protection relay
BD	
BD 3083/100	Interface module
BG	
BG 5595	Switched power supply
CA	
CA 3056	Input-Output interface relay
CB	
CB 3056	Input-Output interface relay
CB 3057	Output interface relay
CC	
CC 3056	Input-Output interface relay
HC	
HC 3093	Interface relay pluggable
HC 3093.__/3__	Interface relay pluggable
HC 3096N	Interface module
HC 3098	Interface module
HK	
HK 3087N	Interface module
HL	
HL 3094	Interface module
HL 3096N	Interface module
HL 3096N.__C/400	Interface module
HO	
HO 3094	Interface module
HO 3095	Interface module

Type	Function
IG	
IG 3051	Input-Output interface relay
IK	
IK 3050	Interface relay
IK 3070	Input-Output interface relay
IK 3076	Input-Output interface relay
IK 3079	Interface module
IK 5121	Protective diode module
IK 8701	Input-Output interface relay / Switching relay
IK 8802	Input-Output interface relay
IL	
IL 5504	CANopen PLC
IL 5507	Output module, analogue
IL 5508	Input module, analogue
IL 8701	Input-Output interface relay / Switching relay
IN	
IN 5509	Input- / Output module, digital
IN 8701	Input-Output interface relay / Switching relay
IP	
IP 3070/022	Output interface relay
IP 3078	Interface module
IP 5502	Input module, digital
IP 5503	Output module, digital
LG	
LG 3096	Interface module
MK	
MK 3046	Interface relay
MK 3096N	Interface module
MK 8804N	Interface relay
MK 8852	Latching relay
ML	
ML 3045	Input-Output interface relay
ML 3059	Input interface relay

Type	Function
RL	
RL 5596	Switched power supply
SK	
SK 3076	Input-Output interface relay
SP	
SP 3078	Interface module
UG	
UG 3076/007	Interface relay
UG 3088	Interface module
UG 3091	Interface module
UG 3096	Interface module
UG 5122	Diode module
UG 5123	Resistor module
UG 8851	Latching relay
UG 9460	Input- / Output module digital, for Modbus
UG 9461	Input- / Output module analogue, for Modbus
UH	
UH 3096	Interface module

Type	Function
AA	
AA 7512	Timer
AA 7562	Timer
AA 7610	Timer
AA 7616	Timer
AA 7666	Timer
AA 9906/200	Timer
BA	
BA 7864	Cyclic timer
BA 7903	Timer
BA 7905	Timer
BA 7954	Timer
BA 7962	Timer
BA 7981	Flasher relay
BC	
BC 7930N	Timer
BC 7931N	Fleeting action relay
BC 7932N	Flasher relay
BC 7933N	Timer
BC 7934N	Timer
BC 7935N	Multifunction relay
BC 7936N	Star-delta timer
BC 7937N	Cyclic timer
BC 7938N	Timer
BC 7939N	Timer
EC	
EC 7610	Timer
EC 7616	Timer
EC 7666	Timer
EC 7801	Timer
EC 9621	Timer
EF	
EF 7610	Timer
EF 7616	Timer
EF 7666	Timer
EH	
EH 7610	Timer
EH 7616	Timer
EH 7666	Timer
EO	
EO 7864	Cyclic timer

Type	Function
IK	
IK 7813	Timer
IK 7814	Timer
IK 7815	Fleeting action relay
IK 7816	Flasher relay
IK 7817N/200	Multifunction relay
IK 7818	Fleeting action relay
IK 7819	Timer
IK 7820	Fleeting action relay
IK 7823	Timer
IK 7825	Timer
IK 7826	Fleeting action relay
IK 7827	Flasher relay
IK 7854	Cyclic timer
IK 8808	Timer
IK 9906	Timer
IK 9962	Timer
MK	
MK 7830N	Multifunction relay, digital
MK 7850N/200	Multifunction relay
MK 7851	Flasher relay
MK 7852	Flasher relay
MK 7853N	Star-delta timer
MK 7854N	Cyclic timer
MK 7858	Timer
MK 7863	Timer
MK 7873N	Timer
MK 9906	Timer
MK 9906N	Timer
MK 9906N/600	Timer
MK 9908	Timer
MK 9961	Timer
MK 9962	Timer
MK 9962N	Timer
MK 9988	Fleeting action relay
MK 9989	Fleeting action relay

Type	Function
RK	
RK 7813	Timer
RK 7814	Timer
RK 7815	Fleeting action relay
RK 7816	Flasher relay
RK 7817	Multifunction relay
SK	
SK 7813	Timer
SK 7814	Timer
SK 7815	Fleeting action relay
SK 7816	Flasher relay
SK 7817N/200	Multifunction relay
SK 7819	Timer
SK 7820	Fleeting action relay
SK 7823	Timer
SK 7854	Cyclic timer
SK 9906	Timer
SK 9962	Timer
SN	
SN 7920	Multifunction relay

Type	Function
IK	
IK 3070/200	Hybrid relay
IK 3071	Input interface relay
IK 5115	Display unit
IK 8701	Switching relay
IK 8702	Remote switch (Impulse relay)
IK 8702/200	Remote switch (Impulse relay)
IK 8715	Priority relay
IK 8717	Remote switch (Impulse relay)
IK 8717/110	Remote switch (Impulse relay)
IK 8800	Remote switch (Impulse relay)
IK 8805	Remote switch f. central switch. op.
IK 8807	Remote switch f. central switch. op.
IK 8810	Staircase lighting time switch
IK 8810/001	Staircase lighting time switch
IK 8810/002	Staircase lighting time switch
IK 8810/003	Staircase lighting time switch
IK 8810/004	Staircase lighting time switch
IK 8810/005	Fan control timer
IK 8813	Energy saving time switch
IK 8814	Light timing switch
IK 8825	Light timing switch
IK 8830	Stepping switch
IK 8832	Buzzer
IK 9078	Mains relay
IK 9171	Undervoltage relay, 3-phase
IL	
IL 7824	Delay module
IL 8701	Switching relay
IL 8800	Remote switch (Impulse relay)
IL 8805	Remote switch f. central switch. op.
IL 8809	Remote switch for central and group switching operation
IL 9171	Undervoltage relay, 3-phase
IN	
IN 7824	Delay module
IN 8701	Switching relay
OA	
OA 8823	Energy saving time switch
OA 8824	Light timing switch
OA 8825	Light timing switch

Type	Function
RK	
RK 8810/001	Staircase lighting time switch
RK 8810/002	Time switch with pre-warning
RK 8810/003	Light timing switch
RK 8810/004	Energy saving time switch
RK 8810/005	Fan control timer
RK 8810/006	Energy saving time switch
RK 8810/100	Staircase lighting time switch
RK 8832	Buzzer
SK	
SK 8702	Remote switch (Impulse relay)
SK 8702/200	Remote switch (Impulse relay)
SK 8832	Buzzer
SK 9078	Mains relay
SK 9171	Undervoltage relay, 3-phase
SL	
SL 9171	Undervoltage relay, 3-phase

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