

Digital timer for extreme operating conditions CKH

Technical data

Characteristic features

- Electronic timer for accurate delay times
- High degree of setting accuracy from 1 s • and 10 ms (\pm 1 digit)
- Long time ranges: 1 s...>27 h and 10 ms...>16 min •
- Non-resetting on voltage failure
- Manual and electrical start of timing
- Can be used as an impulser with external bridge



Electrical life-expectancy



Timing characteristics	
Time ranges	199 999 s (>27 h) or 0.01999.99 s (>16 min)
Setting accuracy	1 s and 0.01 s (⇔1 digit)
Repetition accuracy	±10 ms
Reset time	Max. 10 ms
Timing	Up or down (selectable by plug connection)
Elapsed time display	7-segment LED, red, 9×4.5 mm, with suppression of non-significant zeroes
Data storage	CMOS memory, min. 4 months retention of data
Main supply	
Supply voltage	See ordering details, page 20; non-resetting in event of a power failure
Voltage tolerance	-15%/+10%
Power consumption	Approx. 6 VA
Duty cycle	100%
Output	······································
Contacts	1 timed changeover contact
Type of contact	Relay with hard silver contacts
Response time	Approx. 12 ms for pull-in or drop-out
Contact rating	Alternating current: 4 A/250 VAC (resistive load, AC1) 1 A/250 VAC (inductive load, AC11)
	Direct current: see diagram, P max. (resistive) 120 W
Switching frequency	Max. 4000 operations/h at rated load
Life	Electrical: see diagram Mechanical: 30 million operations
Control	
Function of inputs	Start: Start of timing period (terminals 10/12) Stop: Interruption of timing period (terminals 9/12)
Type of control contact	 potential-free contact, input resistance 4.7 kΩ «Start» also with the electronic NPN sensor, 12 VDC (-10%/+5%), max. 25 mA
Duration of control pulse	Min. 10 ms
Response time	Approx. 10 ms
	1.5 kVAC (24 VAC version) and 2.5 kVAC (110240 VAC versions), acc. to VDE 0435/201
Surge voltage resistance	5 kV 1.2/50 µs acc. to IEC, Publication 60 (DIN 75106/100)
Interference immunity	>2.5 kV acc. to IEC 255-4, test procedure E5, Class III
Degree of protection	IP40 acc. to DIN 40050 (IP54 or IP65 see page 20)
Ambient temperature	Operation: -10°C to + 50°C, Storage: -25°C to +65°C
Climatic conditions	Climate E acc. to DIN 40040
Vibration resistance	With reliable operation up to 1 g; mechanical strength 2 g; acc to IEC 68-2-6, test FC in 3 planes at 10500 Hz
Terminals	 Screw type terminals for 2×1.5 mm² (min. 0.75 mm²) Tab connectors (2.8×0.8 mm) for female tab or soldering
Mounting	Flush mounting, fixing by spring clip or front frame and 2 screws, mounting position optional
Weigth	400 g





Function

The time base is the full-wave rectified mains frequency of $50 \text{ Hz} \triangleq 10 \text{ ms}$ (see the footnote to the ordering details for direct current or 60 Hz mains frequency).

The timing period can be interrupted via an external contact.

Input of time

- Simultaneous actuations of the «SET» pushbuttons: The set time is displayed in flashing mode.
- Set the time in seconds (or hundredths of a second by briefly or continuously actuating one of the five buttons.
- Store the set time and start the timing period with pushbutton R.
- By pressing the button @P the set time is displayed without influencing any of the functions.

Timing selection

Position B: Selection of timing direction



Timing backwards: without jumper Timing forwards: jumper in position B (The timer is supplied with a jumper)

Connection diagram



CKH 211 Delayed operation timer Function diagram



Function

Start of timing period by the positive edge of the control pulse signal (manually with button R or electrically via terminals 10/12). The output relay switches over with delay t.

The negative edge of the control pulse sets the output to the rest position and time t to zero (timing period runs up) or to the set value (timing period runs down).

Note:

In the event of a supply interruption the elapsed period of t remains stored and runs again when the supply is restored.

The timing period can be interrupted via terminals 9/12 (Stop).

Impulser

Function diagram



Function

After the expiry of the t the output switches over for approx. 240 ms. Time t runs on without interruption (t = period).

Note:

Bridge across terminals 11/12.

In the event of a supply interruption the expired period of t is stored and runs on after the supply voltage is restored.

t is reset by the control pulse (manually with button R or electrically via terminals 10/12).

The timing period can be interrupted via terminals 9/12 (Stop).



Ordering details



Protection accessories

Transparent, flexible cover (IP54)

Permitting direct actuation of the pushbuttons.



82

Transparent, rigid cover (IP65) With hinge, which can be opened optionally by pushbutton or key.



Dimensional drawings

Mounting E:

Fixed by means of clamping spring



Supply voltage |) C KH2 1 1 N 4 7 B4 24 VAC, 50 Hz C8 110 VAC, 50 Hz D4 220 VAC, 50 Hz D6 240 VAC, 50 Hz 1) For 24 VDC and AC 60 Hz the same function can be realized with the SAIA*Impulse Counter CKP and a module (quartz time-base 1 s, order number CJ 815) **Time range** N 1...99'999s E 0.01...999.99 s Mounting A fixing with front frame E fixing with clamping spring Note: The bold typeface denotes the standard versions. Ordering can be by means of the above ASN-code or by description. Example: Digital timer CKH 220 VAC/50 Hz, 1...99 999 s, fixing with front frame CKH 211 D4 N4N7 A Accessories (to be ordered separately)

CJ 330 Transparent, flexible cover (IP54), for mounting E CJ 335 Transparent, flexible cover (IP54), for mounting A CJ 350 Protective cover (replacement) CJ 320 Transparent, rigid cover (IP65), for mounting E CJ 810 Battery pack (replacement)

Panel cut out

⊃**48,5**^{+0,3}









Digital timer CKH

Characteristic features

- an electronic timer for accurate delay times
 can be set with a high degree of precision
- to 1s or 10ms (±1 digit) ● large time ranges from 1s... > 27 h or
- 10ms... > 16 min
- standstill on supply failure
- manual and electrical initiation of timing
- interruption in timing period with display of elapsed or remaining time

Mode of operation

The time-base is the 50Hz mains supply frequency. The full-wave rectified signal (100Hz = 10ms) is internally used as counting input. It is possible to interrupt the timing via an external contact at any time.



Technical data	
General data	
Timing function	delayed operation or as pulser (jumper across connections 11 and 12), standstill on supply failure (see 'Data storage', page 25 for details)
Time ranges	199,999s (=27h 46min 39s) or 0.01999.99s (=16min 39s 990ms)
Timing period	forwards (display of elapsed time) or backwards (display of time remaining), selectable by jumper (see 'Selecting the timing', page 25)
Display	LED 7-segment display, red, 9 × 4.5 mm, with pre-zero suppression
Setting the time	by pushbuttons on front panel (see 'Operation' for details)
Setting accuracy	1s resp. 0.01s
Reset time	max. 10ms
Initiation of timing	manual and electrical (see 'Starting the timing' for details)
Interrupt timing	electrical
Mounting	flush-mounting, fixing with clamping spring or front frame and screws, in any mounting position (see dimension drawings, page 27)
Connections	screw terminals (M3, for wires from min. 0.75 \oplus to max. 2 × 1.5 \oplus) in combination with tags (2.8 × 0.8 mm) for push-on connectors or soldering
Immunity to interference	2.5 kV at inputs and outputs in conformity with IEC 255-4, test procedure E5, class III
Ambient temperature	operation: -10°C to +50°C. In store: -25°C to +65°C
Climatic conditions	climate G in conformity with DIN40040
Vibration strength	operational reliability 1g; mechanical strength 2g; in conformity with IEC68-2-6, test FC in 3 planes at 10500Hz
Protection class (front)	IP40 in conformity with DIN40050 (IP54 resp. IP65, see 'Protection accessories', page 28)
Weight	400 g
Electrical data	
Main supply	
Supply voltage	24VAC, 110VAC, 220VAC, 240VAC; 50Hz; voltage tolerance -15%/+10%
Power consumption	approx. 6VA
Insulation voltage	1,5 kVAC (24VAC) resp. 2.5 kVAC (110240VAC) across the main supply and input connections in conformity with VDE435
Protective measures Surge voltage strength	5kV 1/50µs in conformity with IEC, publication 60
Over-voltages	short-circuit protection by integrated fuse-links
Earth connection	recommended protective measures



Operation

Inputs

Function of the inputs	Start: start of timing Stop: interruption in timing
Type of generator	contacts (for 'Start', also electronic sensors NPN)
Input voltage	see 'Input data summary'
Input resistance	4.7 kΩ
Protective measures	
Input filtering	RC-filter for high frequencies, digital filter for low frequencies (eg. contact-bounce). Schmitt-trigger with 2.5V hysteresis
Interference	see 'Immunity to interference' under 'General data'
Sensor supply	voltage Vs 12VDC (-10%/+5%) current max. 25mA
	SAIA®Proximity Switches of voltage range 'G' (NPN, 3-wire) are compatible with the CKH inputs. See also page 31.
Connection diagrams	see 'Input data summary'

Input data summary



1) NO = normally-open / NC = normally-closed

10

- for setting the time, pushbuttons 'SET' $(R + \Theta P)$ and five pushbuttons for the time value

for displaying the set time, pushbutton '@P'

The following pushbuttons are provided on the

for manually initiating the timing, pushbutton 'R'

Setting the time

timer for operation:

- Simultaneous, brief actuation of 'SET' pushbuttons: The set time is displayed; the display flashes.
- By means of the brief or continuous actuation of one of the five pushbuttons the time is set in seconds (or hundreths of seconds).
- Actuation of pushbutton 'R': The set time is stored. Start of timing.

Display of set time

The set time is displayed without any of the other functions being influenced by pressing pushbutton OP.

Starting the timing

Timing can be initiated manually (with pushbutton R) or electrically (contact, NPN electronic sensor). The following functions are initiated:

- Start of timing from zero (forwards timing) or from the set time (backwards timing) and
- the output contact is brought to its rest position by the negative signal edge at the start of the signal (with the exception of a set time of zero).



View of the universal connection possibilities







Electrical life-expectancy



Outputs	
Type of output	relay (changeover contact)
Breaking capacity	direct current: see graph opposite, P _{max.} (resistive) 120W alternating current: 4A/250VAC (AC1, resistive load), P _{max.} 1000VA 1A/250VAC (AC11, inductive load) in conformity with VDE0660, sections 1 and 2
Insulation voltage	2.5kV across contacts and coil
Life expectancy	mechanical: 20 million operations electrical: see graph opposite
	With an inductive load a spark suppression is imperative for the protection of the contacts (see page 30)

Function diagrams





Pulser (jumper across connections 11 and 12)



Delay times T

T1 delay between start timing (positive signal edge) and start of timing period 3.9...9.6 ms

- T2 delay between reaching set time and operation position of the output contact 9.9...15.6 ms
- T3 delay between start of timing period (negative signal edge) and rest position of the output contact 7.9...13.6 ms
- T4 delay between switching on main supply and the approx. 80 ms ready-to-operate state

GKL

Ordering details

Timing selection



Timing backwards: without jumper Timing forwards: jumper in position B The timer is supplied with a jumper





Fixing by means of clamping spring or front frame and screws

Data storage

Supply voltage

B4

24VAC, 50Hz

C8 110VAC, 50Hz

D4 220VAC, 50Hz D6 240VAC, 50Hz

In the event of an interruption in the main supply $>5 \,\text{ms}$

- the set time, the elapsed time and the state of the output contact are stored, and
- the output contact where in its operating state is brought to its rest position for the duration
 of the supply voltage interruption.

A CMOS memory plus two Ni-Cd batteries are used for the data storage. Guaranteed duration of data storage with fully charged batteries: min. 5 months at $+25^{\circ}$ C or 4 weeks at $+50^{\circ}$ C.

The CKH is supplied with discharged batteries. To fully charge the batteries, the CKH must be connected to the main supply for 22 hours. A 10% duty cycle (eg. $2\frac{1}{2}$ hours per day) is sufficient to maintain the batteries in a fully charged state.

Important note: In no cases may the batteries be employed to supply external consumers.

SODECO

Dimension drawings CNG/CNT/CKG DC **CNP/CKG AC/CKP/CKH** Dimensions 7,5 CKG AC/CKP/CKH □48 14,5 CNP 1 7,5 CKG DC 48 14,5 CNG 4,0 CNT 1 282 ŧ 86 CNP 86 CNG/CNT 120 CKG AC 149,5 CKP / CKH 90 CKG DC 52 □52 Cut-out for flush-mounting applicable to both methods of fixing 24,5⁺⁰³ 048,5⁺⁰³ 7777 48,5+0,3 ١ Fixing with clamping spring. The clamping spring is supplied with the counter when mounting 'E' is quoted in the ordering details. 1...6 1...6 Fixing with front frame and 2 countersunk-head screws M3/90°. The front frame is supplied with the counter when the ordering details include mounting 'C', 'D' or 'A' Mounting 'C' Mounting 'A' ۲ ⊕ 38 38 75 ۲ MЗ **|**◄ 60 4 ۲ МЗ 1 Mounting 'D' 63 **|**-60 -4 37,5 ۲ ¢ МЗ + 4 75