

Control Components

Control and building installation components



saia-burgess

Control Systems and Components

Contents

1	Company presentation		2
2	Product overview		4
3	Timers	Series	7
	electromechanical	KOE	13
	electronic	KOL / KOP.F / KOP.J / KOP.K	16/20/23/26
4	Monitoring relays	Series	29
	analogue and digital	KFE	32
	Temperature monitoring by PTC	KFT	36
5	Energy meters	Series	39
	1-phase energy counters	AAD1 / AAE1	42
	3-phase energy counters	AAE3	45
	Saia® S-Bus S0 module	PCD7.H104S	48
6	Counters	Series	51
	electromechanical		
	Display counters	CMA / CMB / CMM	58/60/63
	Hour meters	CMC / CMT / CMU	66/68/70
	Preset counters	CMM	72
	electronic		
	Display counters	CXL / CXG	74/77/80/83
	Hour meters	CXL	86
	Tachometers / frequency display	CXL	89
	Double function meters for impulses, frequency and time	CXG	92
	Process display for standard analogue signals	CXG	95
	Temperature display	CXM	98
	Multifunctional preset counters	CXE	101
	Multifunctional preset counters	CXF	104
	Electronic preset counters	CXP	107
	Multifunctional preset counters	CXQ	110
7	Item number-/order directory		114
8	Contact addresses		116



Saia® Brief portrait

Saia® – the specialist in controls

Saia stands for the development, production and sale of electronic components and systems for industrial quality control engineering.

Since 1950, electronic time switches have been supplied in large quantities to a wide spectrum of customers.

In 1978 the first Saia® programmable logic controllers (PLCs) came into use. The control panel product range (HMI) has been in existence since the beginning of the 90s. Saia® PCD is an internationally registered brand for control and regulation products.

Saia®'s innovative strength is demonstrated by that fact that, in the 70s, it was one of the first PLCs on the market while now, at the beginning of the 3rd millennium, it is at the forefront of web/IT technology for industrial controllers.

Saia® – a European company

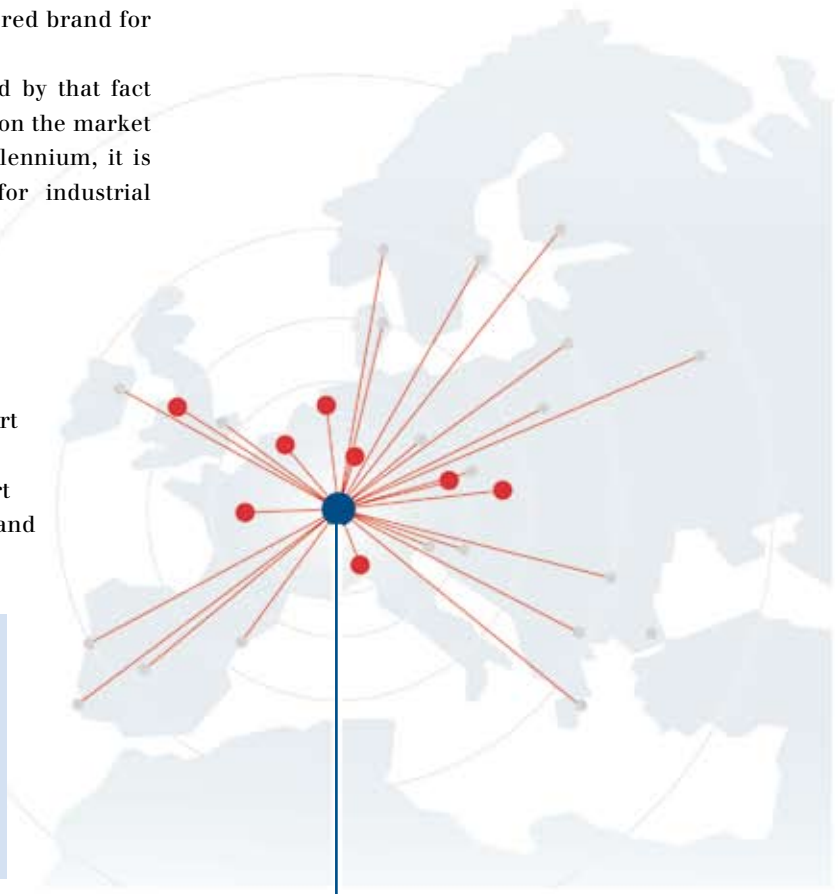
The centre lies at the heart of Europe. All development and production is concentrated there. Sales, customer support and logistics are local on-site. For North America, a wholly owned customer support service is based in Chicago. In Asia, sales and support centres are located in Hong Kong and Shenzhen.

Murten HQ (Switzerland)

- > CHF 80 million annual sales
- > 300 employees
- > 1.5 million electrical I/O points per year
- > 30 000 CPUs per year
- > 600 000 small devices per year

Saia® – reliability as corporate culture

25 successful years as a PLC manufacturer have left their mark. Our customer relations are correspondingly planned for the long term and based on continuity and trust. To safeguard the latter, we favour healthy, organic company development rather than spectacular growth spurts arising from, for example, business acquisitions.



Development

Approximately 40 people work here, including 30 engineers. These resources are evenly distributed among hardware, firmware and software design. The development budget is around 10 % of annual sales.



Subassembly production

On 2 SMD lines, 400 feeder places are available. Effective assembly capacity is 50 000 components per hour. All modern means of testing are provided, such as ICT, AOI and boundary scan.



Assembly

Three differently focussed assembly areas have been set up.

- For small devices in large volumes
- For PLC systems
- For HMI devices

Assembly concludes with a thorough, 100% function test.



Logistics

Key figures:

- 75 000 order items
- 12 000 packages
- 1000 sales items kept in stock
- On-time delivery > 96%
- Less than one week's delivery time for 50% of orders.

European logistics centres: Gouda (NL), Paris (F), Dreieich (D), Murten (CH), Milan (I).



Training & Support

Suitable arrangements are located in Brussels, Gouda, Milan, Salzburg, Padova, Paris, Modena, Frankfurt, Murten, Winterthur, Chicago, Hong Kong and Shenzhen. In total, around 30 support engineers and 30 sales engineers are available to our customers.

Sales and support – global presence

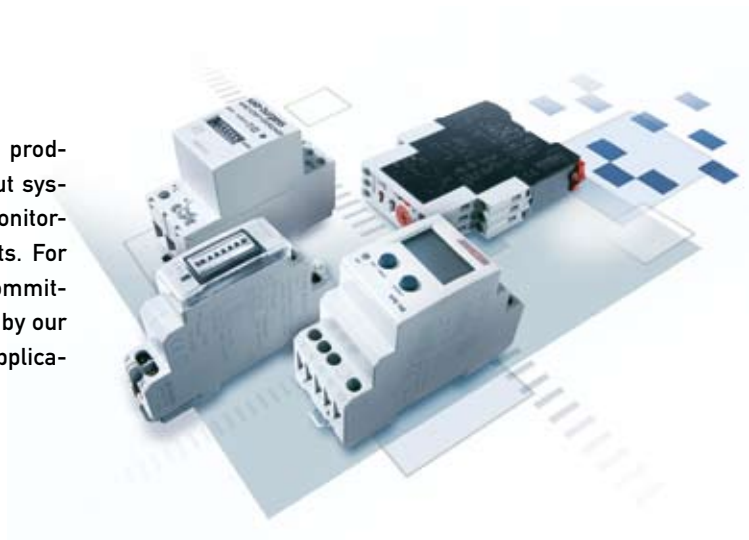
Our sales network consists of branches, representations and contractual partners around the globe. Branch offices are located in Belgium, Germany, France, Italy, Netherlands, Austria, Hungary, USA, China, Hong Kong and UK.

- Head office Saia-Burgess Controls, Murten
- Saia-Burgess representations
- Sales and support, partners



Saia® Control Components

The Control Components business unit stands for products which have a set function as components without system environment. Today this includes timers, monitoring relays, energy meters and other counter products. For Saia® Switzerland as the company location means a commitment to the quality of the components which are used by our customers in installation technology or in industrial applications.



Product overview

Control components

3 | Timers

electromechanical



KOE

- Motor-driven timer
- Mounting on DIN rail or flush mounting with terminals or 11-pole socket

Page 13

electronic



KOL

- Multi function or mono function
- 4 (KOL 1/..251) or 6 time ranges (KOL 3)
- 17.5 mm width for DIN rails

Page 16



KOP.F

- Multi voltage, multi function and multi time relay, for front flush mounting and for socket mounting
- 48 x 48 mm width for DIN rails

Page 20



KOP.J

- Multi function or mono function
- Up to 10 time ranges
- 22.5 mm width for DIN rails

Page 23



KOP.K

- Multi function or mono function
- Up to 10 time ranges
- 22.5 mm width for DIN rails
- 1 or 2 changeover contacts

Page 26

4 | Monitoring relays



KFE

- Voltage and current monitoring, 3-phase asymmetry monitoring
- Phase order, phase failure

Page 32



KFT

- Engine monitoring by PTC
- PTC short circuit monitoring

Page 36

5 | Energy meters

1-phase energy counter



AAD 1

- 1-phase energy counter 230 VAC, 50 Hz to 32 A
- 6-digit or 7-digit

Page 42



AAE 1

- 1-phase energy counter 230 VAC, 50 Hz, 10 (65) A (35 mm)
- 7-digit display

Page 42

3-phase energy counter




AAE 3

- 3-phase energy counter 3 x 230/400 VAC, 50 Hz, 10 (65)A
- 7-digit display for 1 or 2 tariffs

Page 45

5 | Energy meters
Interface module



PCD7.H104S

- Central counting, reading and invoicing with Saia® PCD/PCS
- Transmission of pulses via Saia® S-Bus

Page 48


6 | Counters
Electronic display counter



CMA

- 6-digit mini pulse counter without reset or 5-digit with reset
- Mounting with tension spring

Page 58



CMB

- 6 and 7-digit micro totalising counter
- for flush mounting, DIN rail or plug-in on circuit board

Page 60



CMM

- 8-digit display counter without reset
- 6-digit display counter with manual or electric and manual reset

Page 63

Hour meters electromechanical



CMC

- 7-digit micro timer
- high shock resistance
- for flush mounting or DIN rail

Page 66



CMT

- 7 or 8-digit hour meter 48 x 24 mm
- without reset to zero
- high shock resistance

Page 68

6 | Counters
Hour meters electromechanical




CMU

- 7 or 8-digit hour meter 48 x 24 mm
- without reset to zero
- high shock resistance

Page 70

Preset counters electromechanical




CMM

- 5-digit adding (CMM 152) or 6-digit subtracting (CMM 362) Preset counters
- Manual reset or manual and electric reset

Page 72

Electronic display counter



CXL

- Simple counter for quick and slow counting pulses
- counting direction switchable via control input

Page 74



CXL

- Simple up/down counter
- with counting direction input or differential inputs

Page 77



CXL

- Position display for rotation pulse generator with pulses staggered by 90°

Page 80



CXG

- Pulse counting
- position display
- frequency/speed display
- timer
- short-time measurement

Page 83

6 | Counters

Hour meters
electronic



CXL

- Timer for the recording of run times
- Available display formats: h/min (CXL 231) or h/min or s/ss (CXL 281)

Page 86

Tachometers / frequency display



CXL

- Simple frequency display with gate time measurement
- Input frequency range from 1 Hz–12 kHz

Page 89

Double function counters for pulses, frequency and time



CXG

- Pulse counting with 2 areas or pulse and frequency counting or time and pulse counting or timer with 2 areas

Page 92

Process display for standard analogue signals



CXG

- Galvanically separated current and voltage input
- Automatic min./max. recording

Page 95

Temperature display



CXM

- Input for Pt/Ni 100, galvanically separated (CXM 201)
- Input for J, K, N thermo elements, galvanically separated (CXM 211)

Page 98

Multifunctional preset counters



CXE

- Preset, batch or totalising counter
- 1 or 2 presets

Page 101

6 | Counters



CXF

- Pulse, frequency or time preset counter with sign
- 1 or 2 preset values

Page 104

Electronic preset counters



CXP

- Pulse preset counter, 1 preset value
- Battery-powered (lithium batteries)

Page 107

Multifunctional preset counters



CXQ

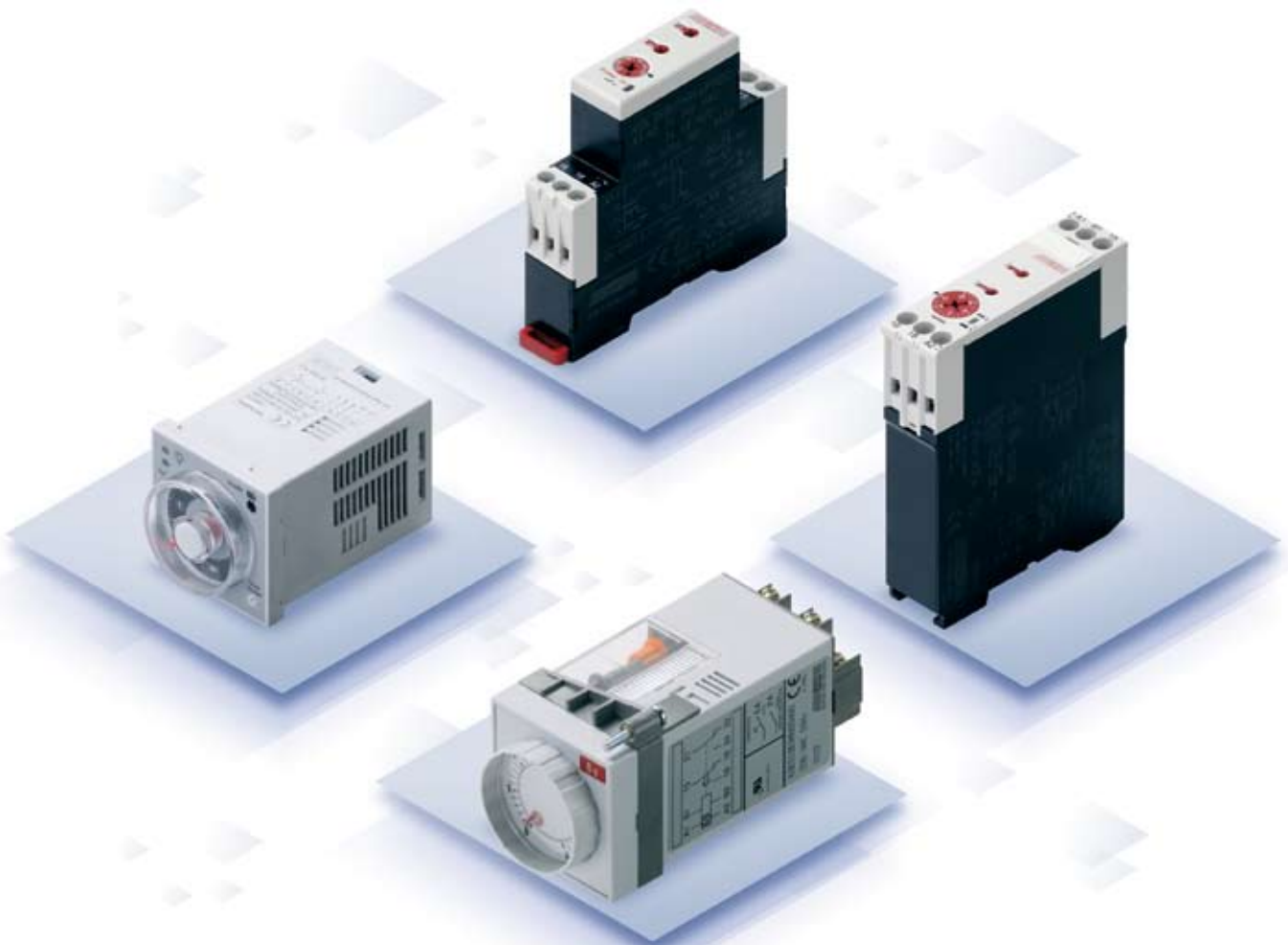
- Preset, batch or totalising counter
- 1 or 2 presets

Page 110

Timers

electromechanical / electronic

		Page
Overview		8
Leader		10
KOE series	electromechanical	13
KOL series	electronic	16
KOP.F series	electronic	20
KOP.J series	electronic	23
KOP.K series	electronic	26



Types and functions

		Electromechanical timers						Electronic timers			
		KOE						KOL			
		KOE 511 A0	KOE 511 E0	KOE 511 F0	KOE 512 A0	KOE 512 E0	KOE 512 F0	KOL 111	KOL 112	KOL 121	KOL 142
Width / Mounting	17.5 mm for DIN rail							•	•	•	•
	22.5 mm for DIN rail										
	45 × 45 mm flush or surface mounting										
	Flush mounting		•			•					
	Surface mounting	•			•						
	Surface or flush mounting with socket			•			•				
Outputs	1 changeover contact										
	2 changeover contacts										
	1 make contact							•	•	•	•
	2 make contacts with joint connection										
	2 changeover contacts, instantaneous and/or timed contact										
	1 timed contact and 1 instantaneous contact as change-over	•	•	•	•	•	•				
Functions	Delayed operation	•	•	•				•			
	Delayed release				•	•	•		•		
	Delayed operation and release										
	Fleeting-on delay timer									•	
	Fleeting-off delay timer										
	Pulse converter										
	Pulse generator										
	Flasher relay										•
	Asymmetrical pulse generator										
	Star-delta timer										
	Delayed release after failure of operating voltage										
	ON/OFF for startup										
Time ranges	4 time ranges 0.15 s to 10 min										
	4 time ranges, 0.75 s to 60 min							•	•	•	•
	6 time ranges, 0.05 s to 10 h										
	10 time ranges, 0.05 s to 60 h										
	12 time ranges, 0.01 s to 10 h										
	6 time ranges 6 s to 60 h	•	•	•	•	•	•				
	6 time ranges 12 s to 120 h	•	•		•	•	•				
Supply voltage	24...48 VDC and 24...240 VAC							•	•	•	•
	24 VAC/DC or 110...240 VAC										
	24...240 VAC/DC										
	24 VAC	•	•	•	•	•	•				
	110...120 VAC	•	•	•	•	•	•				
	230 VAC	•	•	•	•	•	•				
	Catalogue page	13	13	13	13	13	13	16	16	16	16

Other time ranges and supply voltages available on request

							KOP.F	KOP.J				KOP.K					
	KOL 160	KOL 251	KOL 311	KOL 312	KOL 321	KOL 342	KOL 360	KOP 260	KOP 111	KOP 112	KOP 160	KOP 170	KOP 119	KOP 219	KOP 511	KOP 512	KOP 560
16	•							•									
16	•	•															
16			•														
16			•	•													
16			•	•	•												
16				•	•												
16					•												
20						•	•	•									
23							•		•								
23										•							
23										•	•						
23										•	•	•					
23										•	•	•	•				
26														•			
26													•	•			
26															•		
26																•	
26																	•

Timers

Notes



Good to know

Saia-Burgess is one of Europe's leading timer manufacturers. Our partners rely on the high level of quality and the technical know-how «Made in Switzerland».

This is our skill. Because top-quality timers which convince due to their robustness with their numerous areas of use will continue to be in demand in the future. Wherever simple, low-cost solutions are required, the traditional timer cannot be beaten by solutions with high engineering and hardware costs.

Fantastic properties speak for themselves:

- Mono functions and multi functions
- Infrastructure and industry standard
- Designed for environment temperatures up to a maximum of +60 °C
- Dual chamber system for single wire or multistrand wires, screws throughout M3.5 for Pozidrive no. 2
- Very high immunity to interference voltage
- UL, C-UL-licensed
- RoHS and WEEE compliant

Yesterday, today and tomorrow. The suitable range for nearly all areas of application in the industry, manufacture and in the installation area.

We distinguish

Multi function relays with several time ranges

- up to 10 functions
- up to 12 time ranges
- 1 or 2 changeover contacts (instantaneous and/or timed contacts)
- LED for function control
- 24...48 VDC and 24...240 VAC or 24...240 VAC/DC

Mono function relays with several time ranges

- 1 function
- up to 12 time ranges
- 1 or 2 changeover contacts (instantaneous and/or timed contacts)
- LED for function control
- 24...48 VDC and 24...240 VAC or 24...240 VAC/DC

Mono function relays with one time range*

- 1 function
- 1 time function (12 selectable time ranges)
- 2 changeover contacts
- LED for function control
- 24...48 VDC and 24...240 VAC or 24...240 VAC/DC

Width

- 17.5 mm
- 22.5 mm
- 48 × 48 mm

Snap-on mounting on DIN rail 36 mm or screw mounting by adapter (accessories)

- Switchboard installation in 45 × 45 mm section

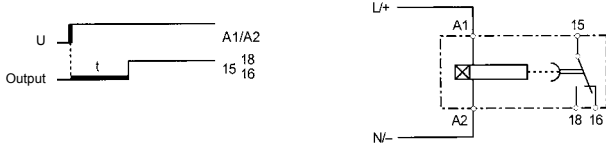
* available on request



Functions

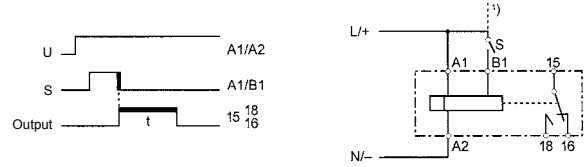
Delayed operation

The time lapse begins when creating the supply voltage (U). After expiry of the set delay time, the relay switches to operating position.



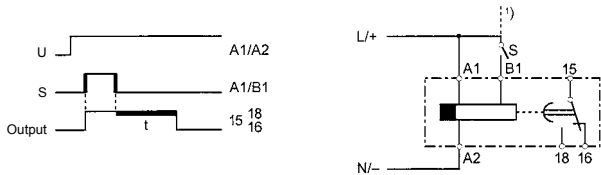
Fleeting-off delay timer

The supply voltage (U) is connected to A1/A2. When opening the start contact (S), the relay switches to operating position. The fleeting-off time starts when opening the control contact.



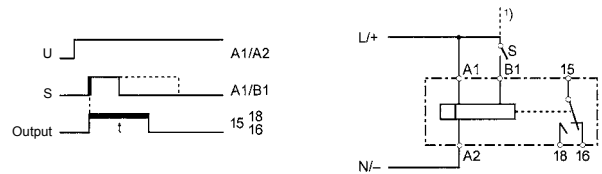
Delayed release

The supply voltage (U) is connected. When closing the B1 control contact, the relay switches to operating position. The delayed release period starts when opening the control contact.



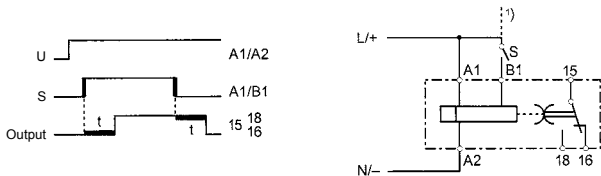
Pulse converter

The supply voltage (U) is connected to A1/A2. When closing the start contact (S), the relay switches to operating position. The fleeting-on time starts when closing the control contact.



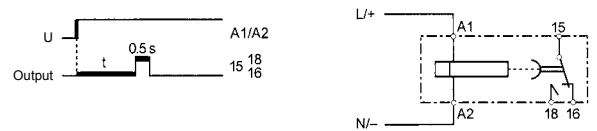
Delayed operation and release

The supply voltage (U) is connected to A1/A2. The start contact (S) is connected to B1. After expiry of the set delay time, the relay switches to operating position. After opening the start contact and expiry of the delay time, the relay switches to idle position.



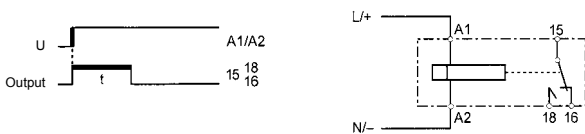
Pulse generator

When creating the supply voltage (U) in A1/A2 and after expiry of the set delay time, the relay switches to operating position for 0.5 s

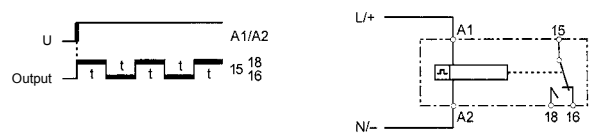


Fleeting-on delay timer

The time lapse starts when creating the supply voltage (U) and immediately switches to operating position. After expiry of the set pulse time, the relay switches to idle position and then returns to operating position (pulse time = interval time).



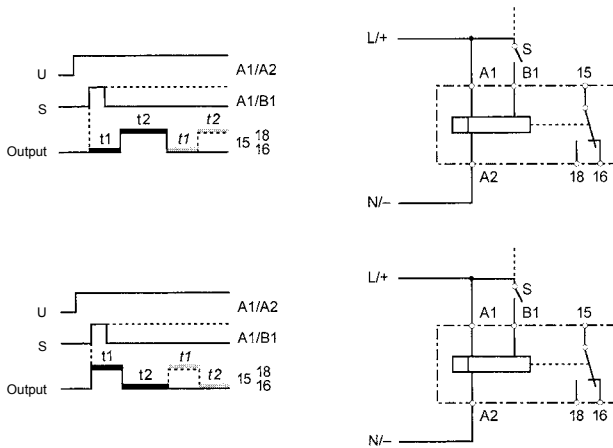
Flasher relay When creating the supply voltage (U), the relay switches to operating position. After expiry of the pulse time, the relay switches to idle position and then returns to operating position (pulse time = interval time).



1) For pulse control, a different voltage than the supply voltage can be optionally used, for example A1-A2=230 VAC and B1-A2=24 VDC.
 2) Output 2 as direct contact programmable by sliding switch on the front (output switches with the supply voltage U or with the control pulses S).
 3) bridge or potentiometer 10 kΩ, at least 0.25 W (low voltage) for external time setting.

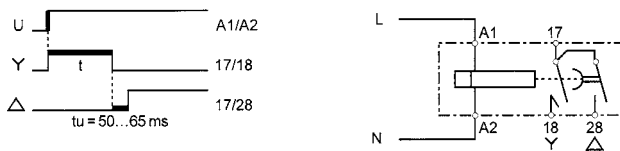
Asymmetrical pulse generator

The supply voltage (U) is connected to A1/A2. When closing to control contact (S), the relay immediately switches to operating position with pulse starting or the relay remains in idle position with interval starting. After expiry of the T1 impulse period, the relays switches to idle position and switches back to operating position after expiry of the T2 period. After opening (S) and expiry of T1 the contact opens with pulse starting or after expiry of the the T1 period, the relay switches to operating position and reverts back to idle position, after expiry of the T2 pulse period. After opening (S), the pulse sequence ends after expiry of T2 with interval starting. The function can be selected at the front using a sliding switch.



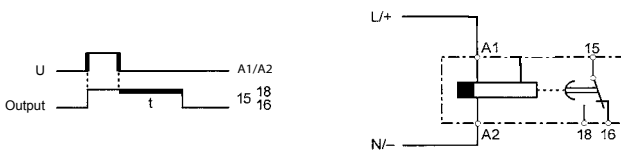
Star-delta timer

When creating the supply voltage (U) on A1/A2, the relay switches to operating position



Delayed release after failure of operating voltage

When creating the supply voltage (U), the relay switches to operating position. The delayed release period (max. 10 minutes) starts when deactivating the operating voltage. The minimum operating time is 800 ms.



KOE

Timer, electromechanical

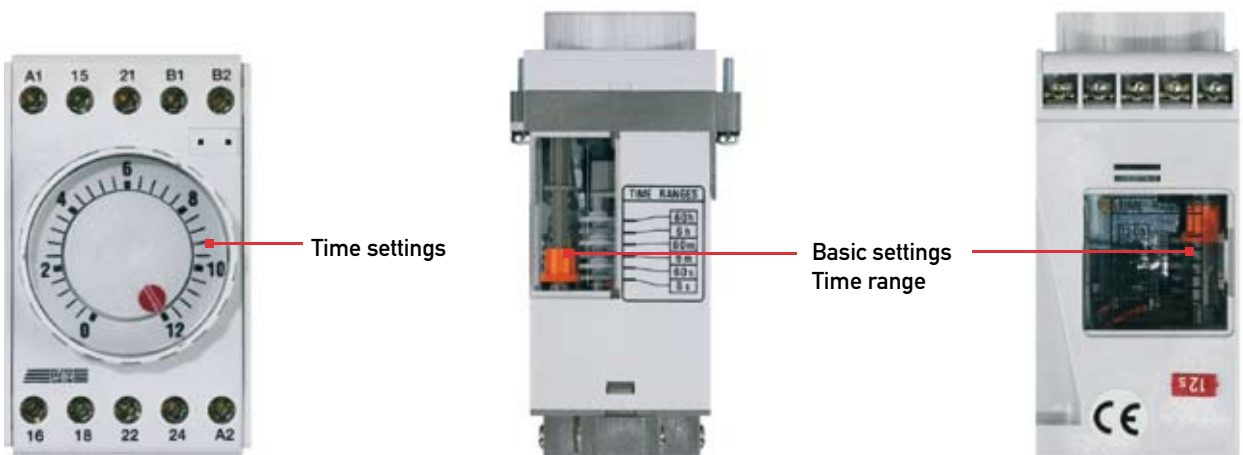
- Motor-driven timer
- Mounting on DIN rail or flush mounting with terminals or 11-pole socket
- 6 time ranges up to 60 h or 120 h
- 3 voltage ranges
- 1 timed and 1 instantaneous contact as potential-free change-over



from left to right: KOE 512, KOE 511

		KOE 511								KOE 512												
Functions	Surface mounting	•	•	•								•	•	•	•							
	Flush mounting				•	•	•	•						•	•	•	•					
	Surface or flush mounting (11-pole socket required)								•	•	•							•	•	•		
	Delayed operation	•	•	•	•	•	•	•	•	•	•											
	Delayed release											•	•	•	•	•	•	•	•	•		
	Resetting on supply standstill at zero voltage	•	•	•	•	•	•	•	•	•	•											
	Operating voltage	24 V, 50 Hz	•		•				•				•						•			
110...120 V, 50 Hz											•							•				
230 V, 50 Hz			•	•		•	•		•			•	•		•	•		•	•			
Time ranges	...60 h	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
	...120 h			•				•						•				•				
Order no.		KOE511 A0MVB4N00	KOE511 A0MVD5N00	KOE511 A0MVD5 V12	KOE511 E0MVB4N00	KOE511 E0MVD1N00	KOE511 E0MVD5N00	KOE511 E0MVD5N12	KOE511 F0MVB4N00	KOE511 F0MVD1N00	KOE511 F0MVD5N00	KOE512 A0MVB4N00	KOE512 A0MVD1N00	KOE512 A0MVD5N00	KOE512 A0MVD5N12	KOE512 E0MVB4N00	KOE512 E0MVD1N00	KOE512 E0MVD5N00	KOE512 E0MVD5N12	KOE512 F0MVB4N00	KOE512 F0MVD5N00	KOE512 F0MVD5N12

Settings



Time settings

Basic settings
Time range

Technical data

Multi time ranges	6 s, 60 s, 6 min, 60 min, 6 h, 60 h (selectable) 12 s, 120 s, 12 min, 120 min, 12 h, 120 h (selectable) Time range setting during installation, at the side of the timer switch behind the front panel. The time is set within the selected range via a button on the front.
Minimum setting time	2% of the time range final value (t_{max})
Setting accuracy	1.5% of the time range final value (t_{max})
Repeat accuracy	$\pm 1.5\%$ of the time range final value (t_{max})
Reset time	KOE 512: 300 ms
Elapsed time indicator	by rotating time indicator
Operating voltage	24 V 50 Hz, 110...120 V 50 Hz, 230 V 50 Hz
Power consumption	<6 VA (total)
Duty cycle	100%
Outputs	1 timed and 1 instantaneous contact as potential-free change-over
Switching capacity	Timed contact: 250 VAC/5 A, 28 VDC/1 A Instantaneous contact: 250 VAC/0.5 A, 38 VDC/0.5 A
Insulation voltage	2 kV / 50 Hz
Protection class	Surface mounting: Front IP 50, terminals IP 30 Flush mounting: Front IP 50, terminals IP 10
Approvals	UL, C-UL
Ambient temperature	-10°C to +55°C
Connections	Screw terminals for $2 \times 2.5 \text{ mm}^2$ (single wire) or $2 \times 1.5 \text{ mm}^2$ (multistrand with end sleeve)
Mounting	Surface mounting: Snap-on mounting on DIN rail 35 mm or screw mounting with 2 M4 screws Flush mounting: Mounting with plastic spring clip $45 \times 45 \text{ mm}$, any mounting position

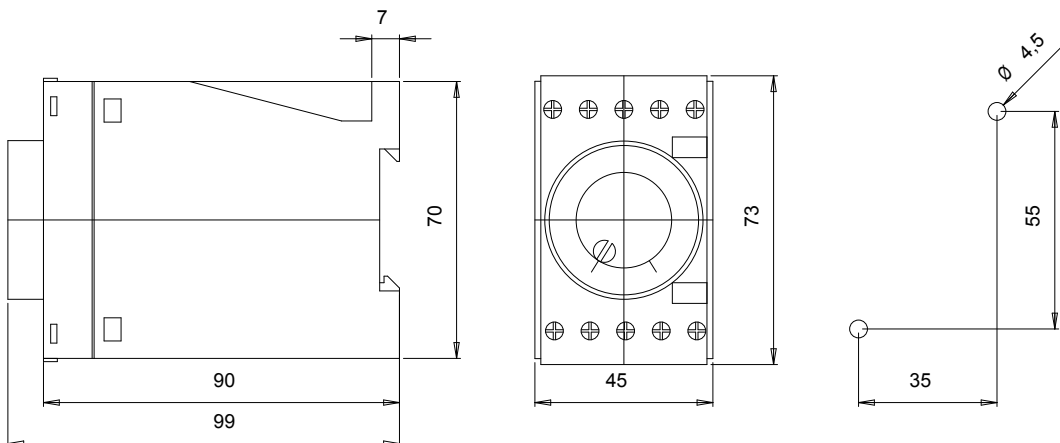
Accessories

Order no.

- 11-pole socket ($47 \times 47 \times 20 \text{ mm}$) for flush mounting, connection with screw terminals	CJ211
- 11-pole socket ($68 \times 68 \times 24 \text{ mm}$) for screw mounting or snap-on mounting on DIN rail 35 mm, Connection with screw terminals	CJ250

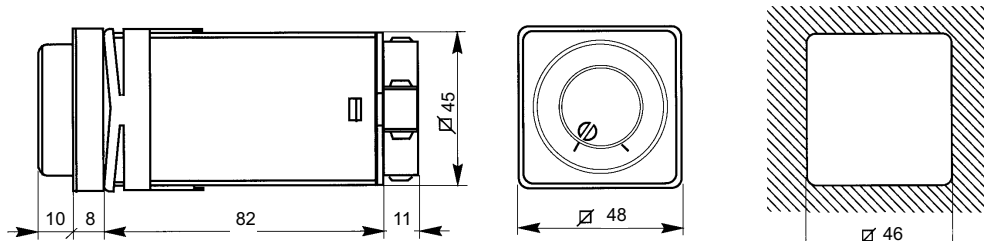
Dimension diagrams

Surface mounting

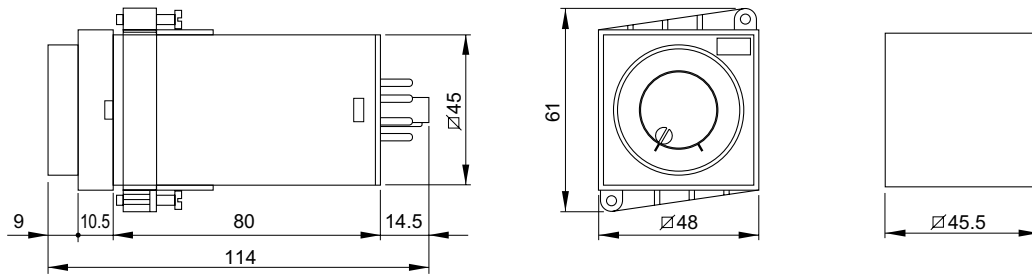


Type A

Flush mounting



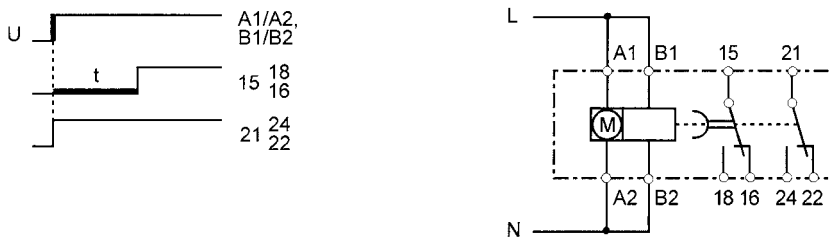
Type E



Type F (11-pole socket)

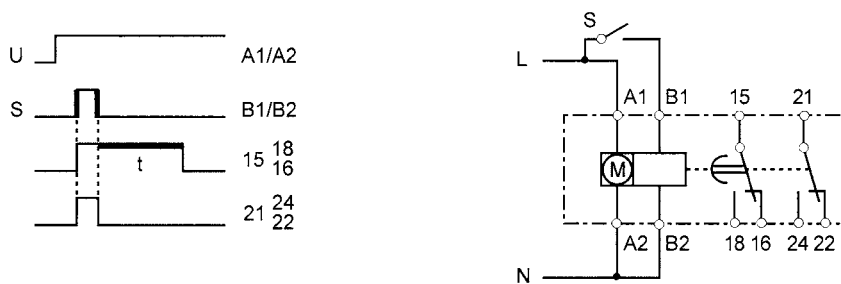
Time diagram and connection diagram

KOE 511: delayed operation, resetting on supply failure (fleeting-on delay timer and pulse lengthening by external wiring)



Voltage interruption for a reset >200 ms

KOE 512: delayed release, standstill at zero voltage



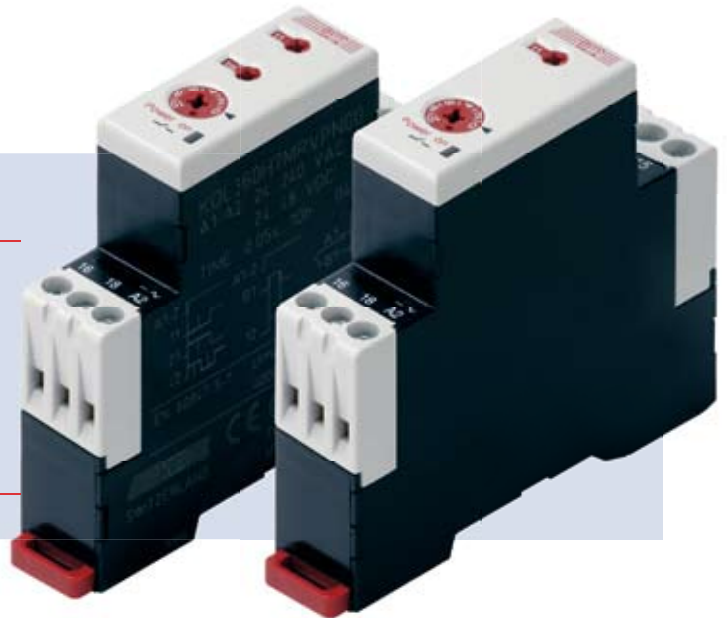
Duration of the control pulse >200 ms

KOL

Timer, electronic

- Multi function or mono function
- 4 (KOL 1/..251) or 6 time ranges (KOL 3)
- 17.5 mm width for DIN rail
- 24 VAC/DC or 110...240 VAC
- 24...48 VDC and 24...240 VAC
- 1 make contact (KOL 1) or 2 make contacts (KOL 251)
- 1 changeover contact (KOL 3)

from left to right: KOL360, KOL 311



		KOL 1/2						KOL 3					
Functions	Delayed operation	•					•	•					•
	Delayed release		•				•		•				•
	Fleeting-on delay timer			•			•			•			•
	Flasher relay				•		•				•		•
	Star-delta timer							•					
Time ranges	0.15 s...10 min												
	0.75 s...1 h	•		•		•							
	0.5 s...1 h		•				•						
	0.05 s...10 h							•	•	•	•	•	•
Operating voltage	24...48 VDC and 24...240 VAC						•	•	•	•	•	•	•
	24 VAC/DC or 110...240 VAC	•	•	•	•	•							
Number of contacts	1 make contact	•	•	•	•	•							
	2 make contacts with a joint connection						•						
	1 changeover contact							•	•	•	•	•	•
Order no.		KOL111H7MNVMN00	KOL112H7MNVMN00	KOL121H7MNVMN00	KOL142H7MNVMN00	KOL160H7MNVMN00	KOL251H7MKVFN00	KOL311H7MRVFN00	KOL312H7MRVFN00	KOL321H7MRVFN00	KOL342H7MRVFN00	KOL360H7MRVFN00	

Settings

Rough time setting
e.g., 1 m = 1 minute

Fine setting time

Divides the value set in the rough setting by a factor of 10

Example: rough setting 1 m = 1 minute
1 unit = 6 s.
If 24 s are necessary,
factor 4 must be set here



Function settings (only with KOL 160/360)
Here you can set the relay function, e.g.,
11 - delayed operation

Technical data

Multi time ranges	KOL 111/ 121/ 142 0.75...15 s, 3...60 s, 0.4...8 min, 3...60 min KOL 251 0.15...3 s, 0.5...10 s, 3 s...60 s, 0.5...10 min	KOL 160/ 112 0.5...10 s, 3...60 s, 0.5...10 min, 3...60 min KOL 311, 312, 321, 342, 360 0.05...1 s, 0.5...10 s, 0.05...1 min, 0.5...10 min, 0.05...1 h, 0.5...10 h
	Time range can be easily selected on the front of the relay, using a screwdriver	
Setting accuracy	± 5% of the time range final value (t_{max})	
Repeat accuracy	1% of the time range final value (t_{max})	
Reset time	KOL 1 = 250 ms or KOL 251, KOL 3 = 100 ms	
Operating voltage	KOL 1 110...240 VAC, 50/60 Hz (A1/A2) 24 VDC/VAC, 50/60 Hz (A3/A2) -15%/+20% (DC) or , -15%/10% (AC)	KOL 251, KOL 3 24...48 VDC and 24...230 VAC, 50/60 Hz
Power consumption	0.5 W at 24 VDC, 9 VA at 240 VAC (KOL 1) or 5 VA at 250 VAC (KOL 251, KOL 3)	
Duty cycle	100%	
Pulse control	Operating voltage range, current 1 mA, duration of the control pulse >250 ms for KOL1 and > 50 ms for KOL 2 or KOL 3	
Outputs	1 make contact (KOL 1), 2 make contacts (KOL 251) or 1 changeover contact (KOL 3)	
Switching capacity	KOL 1 U = 250 VAC, I_{th} = 5 A, P = 1000 VA 1 A/250 VAC (AC14) or 1 A/24 VDC (DC13) in accordance with IEC 60947-5-1	KOL 251 or KOL 3 U = 250 VAC, I_{th} = 5 A, P = 1250 VA 1.5 A/250 VAC (AC15) or 1 A/24 VDC (DC13) in accordance with IEC 60947-5-1
Insulation characteristics	2 kV/50 Hz test voltage in accordance with VDE 0435 and 4 kV 1.2/50 μ s surge voltage in accordance with IEC 60947-5-1 between all inputs and outputs	
EMC/immunity to interference	Surge capacity in accordance with IEC 61000-4-5, 4 kV (2 kV to A3-A2) Burst in accordance with IEC 61000-4-4, 4 kV ESD in accordance with IEC 61000-4-2, 8 kV	
EMC/emissions	electromagnetic fields in accordance with EN 55022, class B	
Approvals	UL, C-UL (KOL 1) or UL, C-UL, Germanischer Lloyd (KOL 251, KOL 3)	
Ambient temperature	KOL 1 -20°C to +50°C	KOL 2 and KOL 3 -20°C to + 60°C
Connections	Screw terminals for 1 × 0.5 mm ² or 2 × 2.5 mm ² , for Pozidrive no. 1 (max. 1 Nm) or screwdriver. Finger protection in accordance with VDE 0106	
Mounting	Snap-on mounting on DIN rail 35 mm or screw mounting by adapter (accessories)	

Accessories

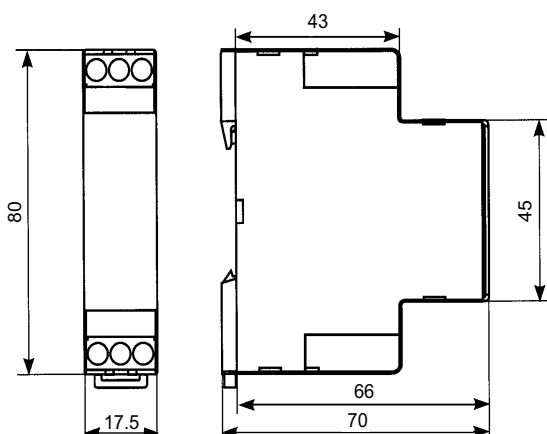
Order no.

- Adapter for screw mounting

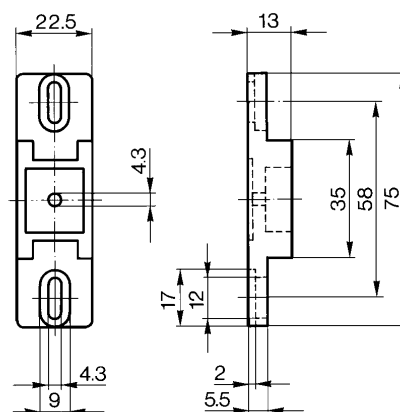
CJ260

Dimension diagrams

Timer



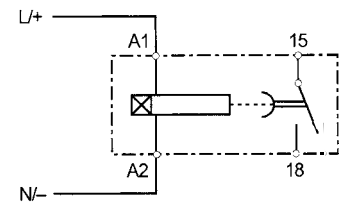
Screw adaptor (accessories, order no. CJ260)




Time diagram and connection diagram

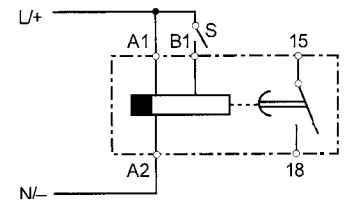
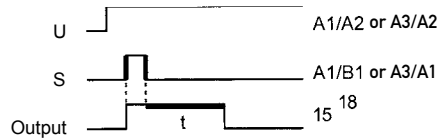
KOL 1/2


Delayed operation (11)



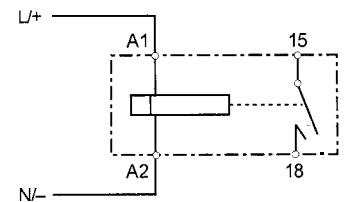
 = LED green: Output in operating mode


Delayed release (12)



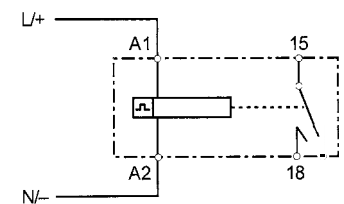
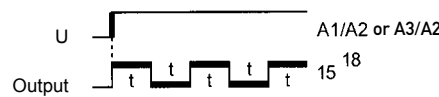
 = LED green: Output in operating mode


Fleeting-on delay timer (21)



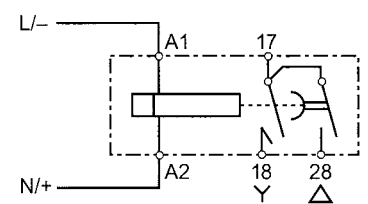
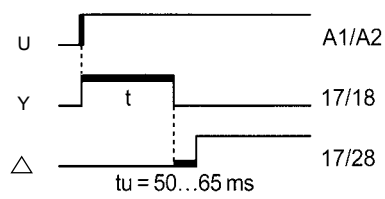
 = LED green: Output in operating mode


Flasher relay (42)



 = LED green: Output in operating mode

Star-delta (51)





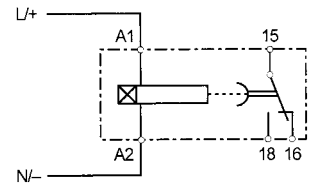
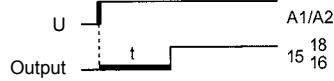
 = LED green: Δ in operating mode

Time diagram and connection diagram



KOL 3

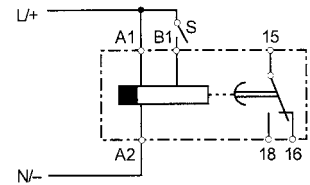
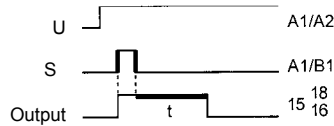
Delayed operation (11)

-  = LED orange: Output in operating mode
-  = LED green: Operating voltage available





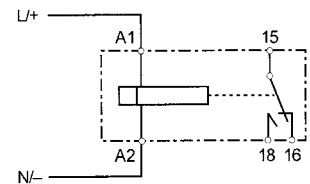
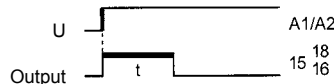
Delayed release (12)

-  = LED orange: Output in operating mode
-  = LED green: Operating voltage available





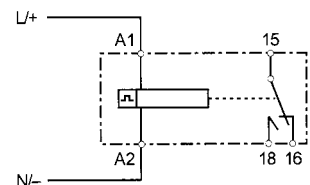
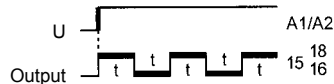
Fleeting-on delay timer (21)

-  = LED orange: Output in operating mode
-  = LED green: Operating voltage available



Flasher relay (42)

-  = LED orange: Output in operating mode
-  = LED green: Operating voltage available



KOP.F

Timer, electronic

- Multi voltage, multi functional and multi timer, for front panel mounting and for socket mounting
- DIN dimensions 48 × 48 mm
- 24...230 VDC/VAC
- 1 changeover contact, 2-pole



		KOP.F
Functions	Delayed operation	•
	Delayed operation with pulse control	•
	Fleeting-on delay timer	•
	Pulse converter	•
	Flasher relay with interval starting and with reset	•
	Delayed release	•
Time ranges	0.1 s...10 h	•
Operating voltage	24...230 VDC/VAC	•
Number of contacts	1 changeover contact, 2-pole	•
Order no.		KOP260F0MWWAN00

Settings



Technical data

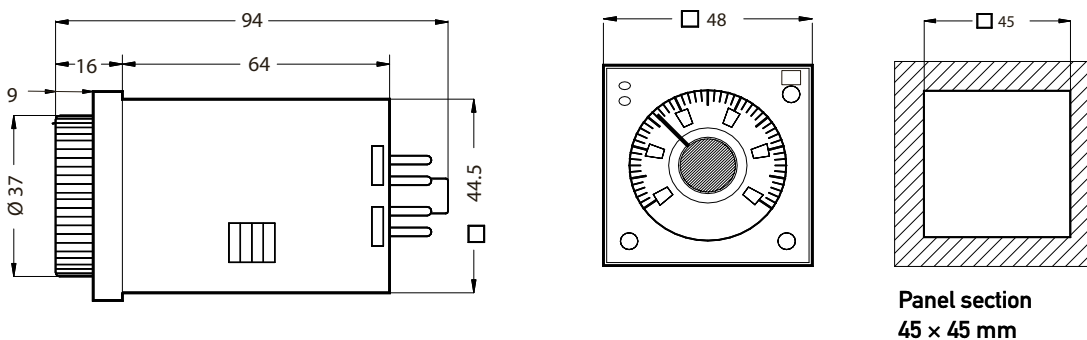
Multi time ranges	0.01...0.5 s, 0.02...1 s, 0.1...5 s, 0.2...10 s 0.01...0.5 min, 0.02...1 min, 0.1...5 min, 0.2...10 min 0.01...0.5 h, 0.02...1 h, 0.1...5 h, 0.2...10 h Time range, time unit and function can be selected on the front of the relay, using a screwdriver
Setting accuracy	± 1% of the time range final value (t_{max})
Repeat accuracy	± 1% of the time range final value (t_{max})
Reset time	100 ms with pulse control 300 ms when controlling operating voltage
Operating voltage	24...230 VDC/VAC, ± 15%, 50/60 Hz
Power consumption	1.5 W with DC, 2.5 VA with AC
Duty cycle	100%
Pulse control	Operating voltage duration, duration of the control pulse >50 ms
Outputs	1 changeover contact, 2-pole, green LED remains lit during timing
Switching capacity	U = 250 VAC, I_{th} = 5 A, P = 1250 VA 2.5 A/250 VAC (AC14), 5 A/24 VDC
Insulation characteristics	2 kVAC/50 Hz test voltage in accordance with VDE 0435 and 4 kV 1.2/50 μ s surge voltage in accordance with EN 60947-5-1 between all outputs and inputs
EMC/immunity to interference	Surge capacity in accordance with IEC 61000-4-5, Burst in accordance with IEC 61000-4-4ESD in accordance with IEC 61000-4-2
EMC/emissions	Electromagnetic fields in accordance with EN 55022, class B
Protection class	Front IP 40
Approvals	UL, C-UL
Ambient temperature	-10°C to +55°C
Mounting	Flush mounting with plastic spring clip or surface mounting with 11-pole socket (accessories) for screw mounting with 2 M3 screws or snap-on mounting on DIN rail 35 mm, any mounting position

Accessories

Order no.

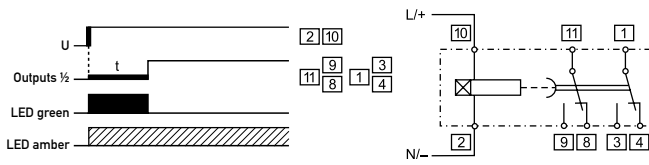
- 11-pole socket (47 × 47 × 20 mm) for flush mounting, connection with screw terminals	CJ211
- 11-pole socket (68 × 68 × 24 mm) for screw mounting or snap-on mounting on DIN rail 35 mm, Connection with screw terminals	CJ250

Dimension diagram

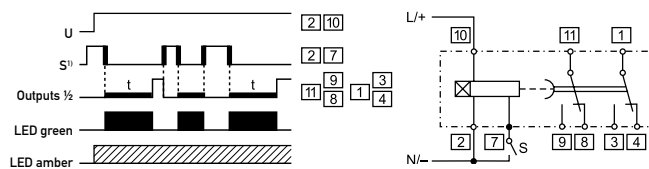


Time diagram and connection diagram

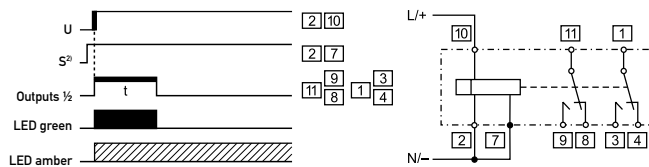
Function A: delayed operation (11)



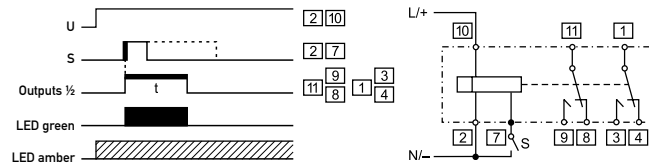
Function A: delayed operation with pulse control (17)



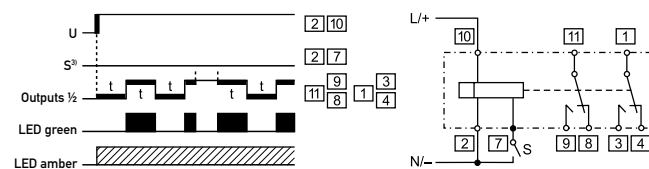
Function B: fleeting-on delay timer (21)



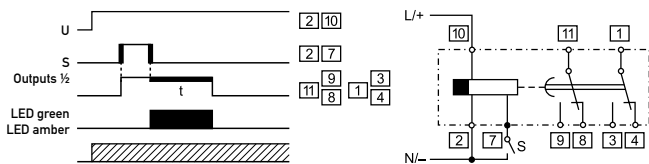
Function B: pulse converter (23)



Function C: flasher relay with interval starting and with reset (47)



Function D: delayed release (12)



¹⁾ The falling edge of S triggers the start of t; the rising edge of S results in t being reset.

²⁾ Function 21 requires a bridge between connections 2 and 7.

KOP.J

Timer, electronic

- Multi function or mono function
- 10 time ranges
- 22.5 mm width for DIN rail
- 24...48 VDC and 24...240 VAC
- 24...240 VAC/DC
- 1 changeover contact

from left to right: KOP 111, KOP 160, KOP 170



		KOP.J				
Functions	Delayed operation	•		•	•	
	Delayed release		•			
	Delayed operation and release					•
	Fleeting-on delay timer			•	•	
	Fleeting-off delay timer			•	•	
	Pulse converter			•	•	
	Pulse generator			•	•	
	Flasher relay with pulse starting			•	•	
	Asymmetrical pulse generator					•
	On/off function for startup and maintenance				•	•
Time ranges	0.05 s...60 h	•	•	•	•	•
Operating voltage	24...48 VDC and 24...240 AC	•	•	•	•	•
	24...240 VDC/VAC			•		
Number of contacts	1 changeover contact	•	•	•	•	•
Order no.		KOP111J7MWVFN00	KOP112J7MWVFN00	KOP160J7MWVFN00	KOP160J7MWVFN00	KOP170J7MWVFN00

Settings

KOP 170

- Start setting with pulses or with interval** (points to T2 dial)
- Fine setting T2** (points to T2 dial)
- Rough setting T2** (e.g., 1 m = 1 minute) (points to T2 knob)
- Rough setting T1** (points to T1 knob)
- T1 fine setting** (Divides the value set in the rough setting by a factor of 10. Example: rough setting 1 m = 1 minute, 1 unit = 6 s. If 24 s are necessary, factor 4 must be set here) (points to T1 dial)

All except KOP 170

- Function settings (only with KOP 160)** (Here you can set the relay function, e.g.: 11 - delayed operation) (points to function knob)
- Rough setting** (points to function knob)
- Fine setting** (points to fine setting dial)

Technical data

Multi time ranges	0.05...1 s, 0.15...3 s, 0.5...10 s 0.05...1 min, 0.15...3 min, 0.5...10 min 0.05...1 h, 0.15...3 h, 0.5...10 h, 3...60 h Time range can be easily selected on the front of the relay, using a screwdriver
Setting accuracy	± 5% of the time range final value (t_{max})
Repeat accuracy	± 0.2% of the set value
Operating voltage	24...48 VDC and 24...240 VAC, 50/60 Hz (VP) 24...240 VAC/DC, 50/60 Hz (VA) DC: ± 20% AC: -15%...+10%
Power consumption	VP version: 5.0 VA(AC) 0.5 W(DC) VA version: 3 VA(AC) 3 W(DC)
Duty cycle	100%
Pulse control	Operating voltage range, current 1 mA, duration of the control pulse >30 ms (DC), >50 ms (AC); interval >55 ms (DC)
Outputs	1 changeover contact, status display by LED
Switching capacity	$U = 440$ VAC, $I_{th} = 8$ A, $P = 2000$ VA 3 A/250 VAC (AC15), 3 A/440 VAC (AC14) or 1 A/24 VDC (DC13) in accordance with IEC 60947-5-1
Insulation characteristics	2.5 kVAC/50 Hz test voltage in accordance with VDE 0435 and 6 kV 1.2/50 μ s surge voltage in accordance with IEC 60947-5-1 between all outputs and inputs
EMC/immunity to interference	Surge capacity in accordance with IEC 61000-4-5, 4 kV Burst in accordance with IEC 61000-4-4, 6 kV ESD in accordance with IEC 61000-4-2, with contact 8 kV, in air 8 kV
Secure disconnection	in accordance with VDE 0106, part 101
Protection class	Housing IP 40, terminals IP 20
Approvals	UL, C-UL, GL
Ambient temperature	open -20°C to +60°C, encapsulated -20°C to +45°C
Connections	Screw terminals for 1×0.5 mm ² or 2×2.5 mm ² (single wire) or 2×1.5 mm ² (multistrand with end sleeve). AWG 14...20, with two-chamber system, M3.5 screws for Pozidrive no. 2 (Philips) and slotted head no. 2, suitable for drill/driver (max. 1.2 Nm). Finger protection in accordance with VDE 0106
Mounting	Snap-on mounting on DIN rail 35 mm or screw mounting by adapter (accessories) and 2 M4 screws. Any mounting position

Accessories

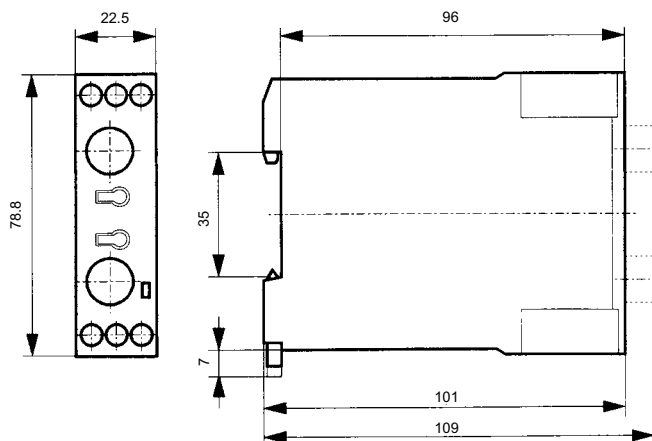
Order no.

- Adapter for screw mounting

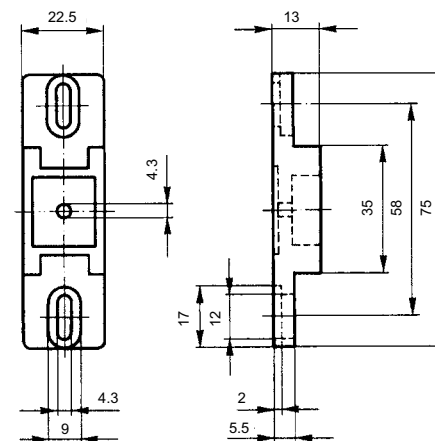
CJ260

Dimension diagrams

Timer

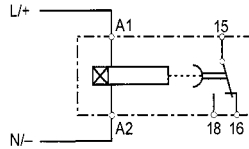
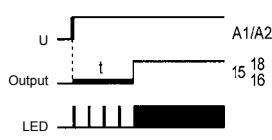


Screw adaptor (accessories - order no.: CJ260)

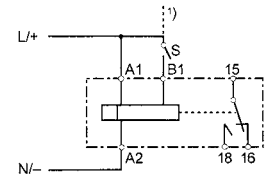
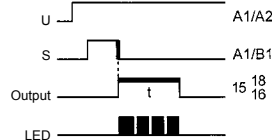


Time diagram and connection diagram

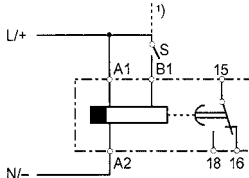
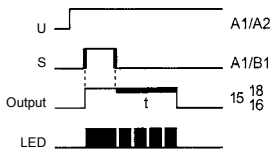
Delayed operation (11)



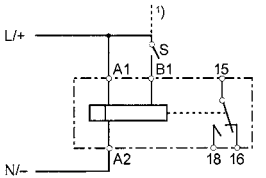
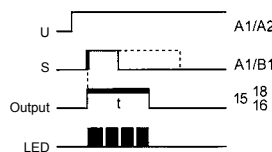
Fleeting-off delay timer (22)



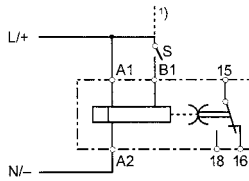
Delayed release (12)



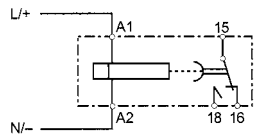
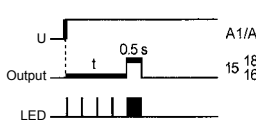
Pulse converter (23)



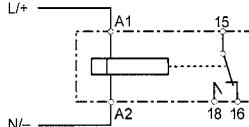
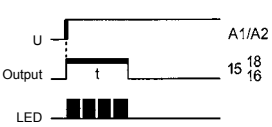
Delayed release and operation (16)



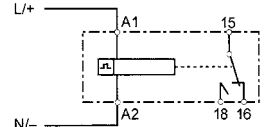
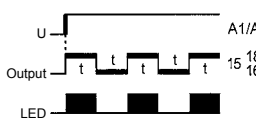
Pulse generator (24)



Fleeting-on delay timer (21)

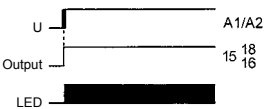


Flasher relay with pulse starting (12)

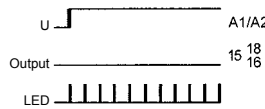


KOP 160: universal timer with 10 time ranges, 8 functions (11, 12, 16, 21, 22, 23, 24, 42) and an on/off function for startup and maintenance

On function

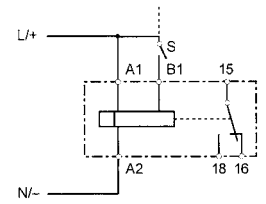
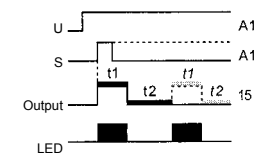
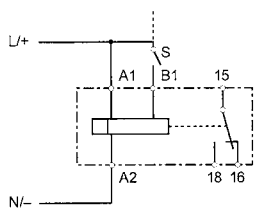
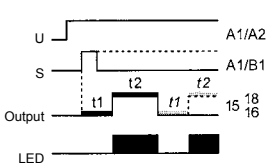


Off function



- Output in rest position, no timing
- ▬ Output in rest position, time running
- ▬ Output in operating position, no timing
- ▬ Output in operating position, time running

Asymmetrical pulse generator



¹⁾ For pulse control, a different voltage than the supply voltage can be optionally used, for example A1-A2=230 VAC and B1-A2=24 VDC.

KOP.K

Timer, electronic

- Multi function or mono function
- Bis 10 time ranges
- 22.5 mm width for DIN rail
- 24...48 VDC and 24...240 VAC, 50/60 Hz
- 24...240 VAC/DC
- 1 or 2 changeover contacts, instantaneous and/or timed contacts

from left to right: KOP219K, KOP511K, KOP560K

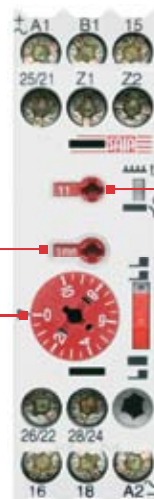


		KOP.K					
Functions	Delayed operation			•		•	•
	Delayed release				•		•
	Delayed release after failure of operating voltage	•	•				
	Delayed operation and release					•	•
	Fleeting-on delay timer					•	•
	Fleeting-off delay timer					•	•
	Pulse converter					•	•
	Pulse generator					•	•
	Flasher relay with pulse starting					•	•
	On/off function for startup and maintenance					•	•
Time ranges	0.05 s...60 h			•	•	•	•
	0.15 s...10 min	•	•				
Operating voltage	24...48 VDC and 24...240 VAC			•	•		•
	24...240 VDC/AC	•	•			•	
Number of contacts	1 changeover contact	•					
	2 changeover contacts		•				
	2 changeover contacts, instantaneous and/or timed contacts			•	•	•	•
Order no.		KOP119K7MVA00	KOP219K7MVA00	KOP511K7MVP00	KOP512K7MVP00	KOP560K7MVA00	KOP560K7MVP00

Settings

Rough time setting
e.g., 1 m = 1 minute

Fine setting time
Divides the value set in the rough setting by a factor of 10 Example:
rough setting 1 m = 1 minute
1 unit = 6 s.
If 24 s are necessary, factor 4 must be set here



Function settings (KOP 560 only)
Here you can set the relay, e.g.:11 - delayed operation

Output 2 as instantaneous contact
programmable by sliding switch on the front (KOP5 only)

Technical data

Multi time ranges	KOP 5 0.05...1 s, 0.15...3 s, 0.5...10 s 0.05...1 min, 0.15...3 min, 0.5...10 min 0.05...1 h, 0.15...3 h, 0.5...10 h, 3...60 h Time range can be easily selected on the front of the relay, using a screwdriver	KOP 119/219 0.15...2.5 s, 1...10 s 8...80 s, 1...10 min
Setting accuracy	± 5% of the time range final value (t_{max})	
Repeat accuracy	± 0.2% of the set value	
Reset time	50 ms	
Operating voltage	24...48 VDC and 24...240 VAC, 50/60 Hz (VP) 24...240 VAC/DC, 50/60 Hz (VA) ± 20% (DC), -15%/+10% (AC)	24...240 VAC/DC, 50/60 Hz (VA)
Power consumption	VP version: 1 W (DC) or 5.0 VA (AC)	VA version: 3 VA(AC) 3 W(DC)
Duty cycle	100%	
Pulse control	Operating voltage range, current 1 mA, duration of the control pulse >30 ms (DC), >50 ms (AC); interval >50 ms (DC)	
Outputs	KOP 219 and KOP 5 2 changeover contacts, status display by LED	KOP 119 1 changeover contact
Switching capacity	KOP 5 $U = 440 \text{ VAC}$, $I_{th} = 8 \text{ A}$, $P = 2000 \text{ VA}$ 3 A/250 VAC (AC15), 3 A/440 VAC (AC14) or 1 A/24 VDC (DC13) in accordance with IEC 60947-5-1 KOP 119/219 $U = 440 \text{ VAC}$, $I_{th} = 5 \text{ A}$, $P = 1200 \text{ VA}$ 1.5 A/250 VAC (AC15) or 1 A/25 VDC (DC13) in accordance with IEC 60947-5-1	
Insulation characteristics	2.5 kVAC/50 Hz test voltage in accordance with VDE 0435 and 6 kV 1.2/50 μs surge voltage in accordance with IEC 60947-5-1 between all inputs and outputs	
EMC/immunity to interference	Surge capacity in accordance with IEC 61000-4-5, 4 kV Burst in accordance with IEC 61000-4-4, 6 kV ESD in accordance with IEC 61000-4-2, with contact 8 kV, in air 8 kV	
Secure disconnection	in accordance with VDE 0106, part 101	
Protection class	Housing IP 40, terminals IP 20	
Approvals	UL, C-UL	
Ambient temperature	open -20°C to +60°C, encapsulated -20°C to +45°C	
Connections	Screw terminals for $1 \times 0.5 \text{ mm}^2$ or $2 \times 2.5 \text{ mm}^2$ (single wire) or $2 \times 1.5 \text{ mm}^2$ (multistrand with end sleeve). AWG 14...20, with two-chamber system, M3.5 screws for Pozidrive no. 2 (Philips) and slotted head no. 2, suitable for drill/driver (max. 1.2 Nm). Finger protection in accordance with VDE 0106	
Mounting	Snap-on mounting on DIN rail 35 mm or screw mounting by adapter (accessories) and 2 M4 screws. Any mounting position	

Accessories

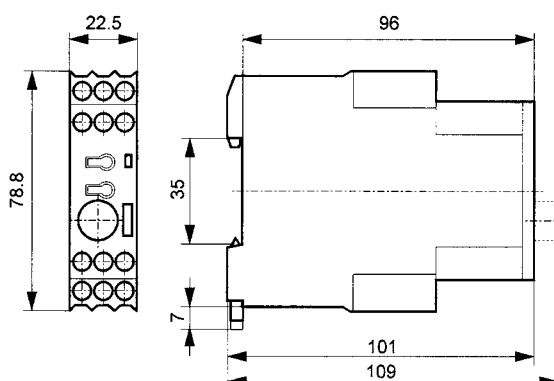
Order no.

- Adapter for screw mounting

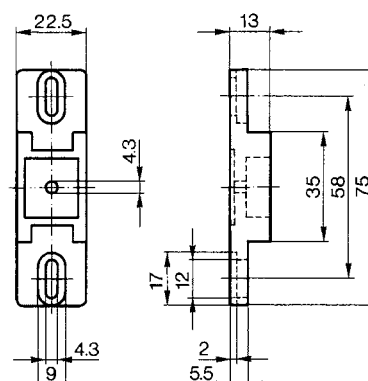
CJ260

Dimension diagrams

Timer

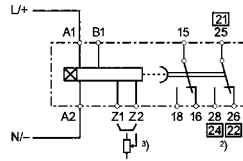
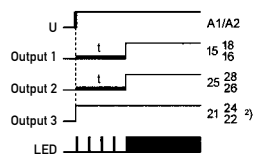


Screw adaptor (accessories - order no. CJ260)

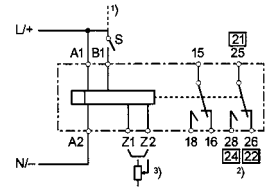
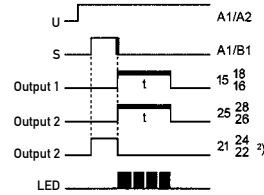


Time diagram and connection diagram

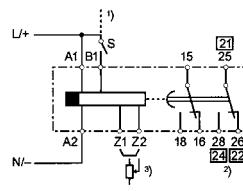
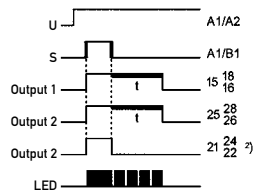
Delayed operation (511/11)



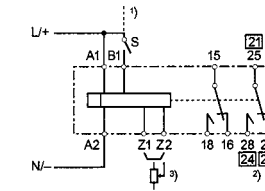
Fleeting-off delay timer (22)



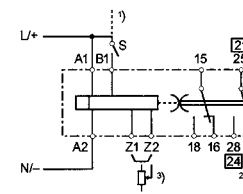
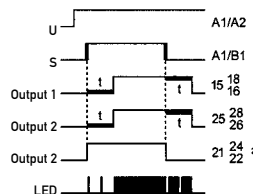
Delayed release (512/12)



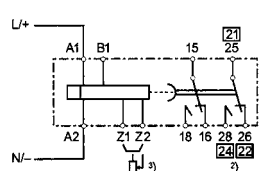
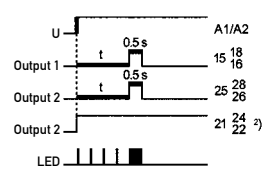
Pulse converter (23)



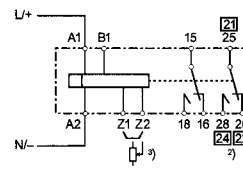
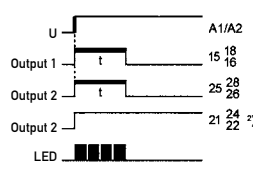
Delayed release and operation (16)



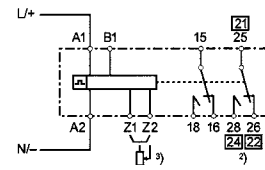
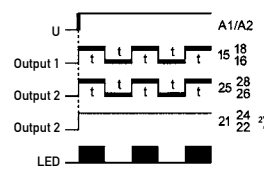
Pulse generator (24)



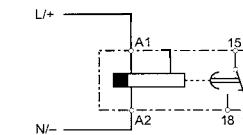
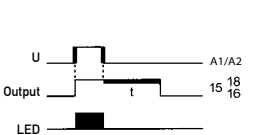
Fleeting-on delay timer (21)



Flasher relay with pulse starting (42)



Delayed release after loss of operating voltage (119/219)

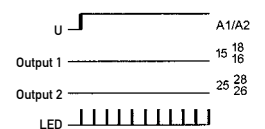


KOP 560: Universal timer with 10 character ranges, 8 functions (11 to 42) and an on/off function for startup and maintenance

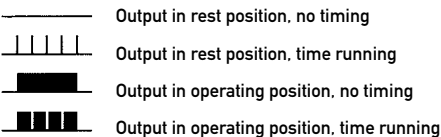
On function



Off function



Function display by LED



- 1) For pulse control, a different voltage than the supply voltage can be optionally used, for example A1-A2=230 VAC and B1-A2=24 Vdc.
- 2) Output 2 as instantaneous contact programmable by sliding switch on the front (output switches with the supply voltage U or with the control pulses S).
- 3) bridge or potentiometer 10 kΩ, at least 0.25 W (low voltage) for external time setting.

Monitoring relays

	Page
Overview	30
Leader	31
KFE series	32
KFT series	36



Types and functions

		Monitoring relays					
		KFE				KFT	
		KFE 102	KFE 103	KFE\tab 300	KFE 302	KFT 100	KFT 200
Functions	Voltage monitoring	•					
	Current monitoring		•				
	monitors phase loss, order, asymmetry and under voltage			•			
	3-phase voltage monitoring (AC)				•		
	Engine monitoring by PTC					•	•
	Short circuit monitoring in the PTC					•	•
	Broken wire detection in the PTC					•	•
	Memory function	•	•		•		•
Width	22.5 mm for DIN rail					•	•
	35 mm for DIN rail	•	•	•	•		
reset	automatic					•	
	manual or automatic						•
	manual	•	•		•		
Setting	parameterizable	•	•				
	analogue			•	•		
Outputs	1 relay (NO contact)					•	
	1 relays (change-over contact)	•	•	•	•		
	2 relays (change-over contact)						•
Operating voltage	230 VAC	•	•				
	3 × 400 VAC			•	•		
Catalogue page		32	32	32	32	36	36

Monitoring relays

Notes



Good to know...

Monitoring relays are switching units which monitor a fall or increase in the current, the power supply voltage or the temperature of an engine above the allowed value in order to prevent damage to systems. Asymmetry and phase order in three-wire systems can also be monitored. Monitoring relays are mainly used in machine and system construction.

We distinguish...

Monitoring of 1-phase or direct voltage

- KFE 102, 230 VAC
setting range: hysteresis 5 to 50%,
memory selection, U_{\min} 15 VAC/DC - U_{\max} 700 VDC / 480 VAC
LCD display

Monitoring of 1-phase or direct current

- KFE 103, 230 VAC
setting range: hysteresis 5 to 50%,
memory selection, I_{\min} 0.1 AAC/DC - I_{\max} 10 AAC/DC
LCD display

Monitoring of phase loss, order, asymmetry and under voltage, 3-phase

- KFE 300, 3 × 400 VAC
asymmetry range 5 to 20 %
LED display for phase faults, asymmetry faults and power supply

Monitoring of 3-phase voltage

- KFE 302, 3 × 400 VAC
monitoring level adjustable by potentiometer,
for under voltage 5% up to 20% U_N ,
for over voltage permanent 1.15 U_N

Thermistor protection relay

Short circuit monitoring, broken wire detection in the PTC

- KFT 100, 230 VAC, without memory function
- KFT 200, 230 VAC, with memory function



KFE 102/103/300/302

Monitoring relays

- Voltage and current monitoring,
3-phase asymmetry monitoring
- Phase order, phase failure
- 3-phase voltage monitoring
- 230 VAC, 3 × 400 VAC 50/60 Hz

from left to right: KFE 102, KFE 300, KFE 302



		KFE 102	KFE 103	KFE 300	KFE 302
Function	Voltage monitoring	•			
	Current monitoring		•		
	Monitors phase loss, order, asymmetry and under voltage			•	
	3-phase voltage monitoring (AC)				•
	Memory function	•	•		•
Setting	Parameterizable, LCD display	•	•		
	Analogue			•	•
Output	1 relay (NO contact)				
	1 relays (change-over contact)	•	•	•	•
Operating voltage	230 VAC	•	•		
	3 × 400 VAC			•	•
Function control	LED display	•	•	•	•
Order no.		KFE102NE1N	KFE103NE1N	KFE300NE9N	KFE302NE9N

Technical data

	KFE 102 voltage monitoring	KFE 103 current monitoring
Operating voltage (U_N)	230 VAC, 50/60 Hz	230 VAC, 50/60 Hz
Tolerance	± 15%	± 15%
Duty cycle	100%	100%
Power consumption	4 VA	4 VA
minimum response time	200 ms	200 ms
Max. cable length for measuring input signal	50 m	50 m
Immunity against micro loss of operating voltage	min. 200 ms	min. 200 ms
Maximum range of input measuring	15...700 VDC 15...480 VAC	0.1 to 10 AAC or 0.1 to 600 AAC (through current converter)
Switching level	as programmed in maximum input range	as programmed in maximum input range
programmable hysteresis	max. 5 to 50% of the set value	max. 5 to 50% of the set value
Time delay (t1)	0.1 to 12 s	0.1 to 12 s
Time delay inhibition (t2)	none	0.1 to 20 s
Error storage	with software programming	with software programming
Programming of parameters	via two buttons	
Visual display of parameters	via button	
Error display	1 red LED	
Output	1 relay output (change-over contact) 8 A, 250 VAC	
Switching capacity	U = 440 VAC, I _{th} = 8 A, P = 200 VA 3 A/250 VAC (AC15), 3 A/440 VAC (AC14) or 1 A/24 VDC (DC13) in accordance with IEC 60947-5-1	
EMC	Surge in accordance with IEC 61 000-4-5: 4 kV Burst in accordance with IEC 61 000-4-4: 2 kV ESD in accordance with IEC for contact 8 kV in air 8 kV	
Protection class	Housing IP40, terminals IP20	
Ambient temperature	Operation (included) -20°C to +55°C Storage: -40°C to +70°C	
Mounting	Surface mounting: snap-on mounting on DIN rail or screw mounting by adaptor and 2 screws M4, any mounting position	
Connections	Screw terminals up to 2*2.5 mm ² (single wire) or 2*1.5 mm ² (multistrand with end sleeve). AWG14...20. M3 screws for Pozidrive or Philips no. 1 and slotted head no. 1 or no. 2.	

KFE 300 phase monitoring

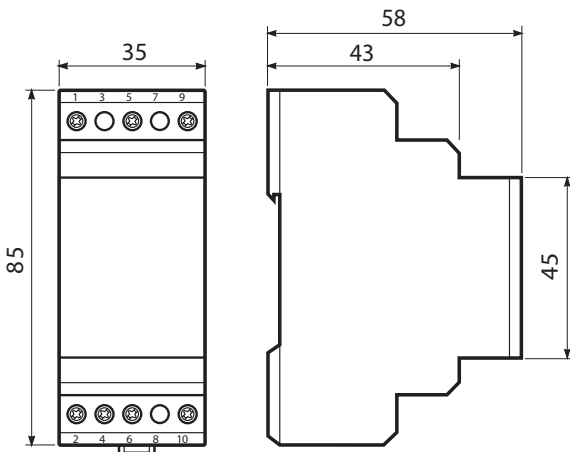
Operating voltage (U_N)	3 × 400 VAC, 0/60 Hz
Tolerance	+ 15% - 20%
Duty cycle	100%
Power consumption	4 VA
Display of power supply	1 green LED
Monitoring level	Asymmetry by potentiometer: 5 to 20%, fixed over voltage 1.11 U_N
Delay of the output signal	fixed, T = 200 ms (idle state); fixed, T = 300 ms (operating state)
Error display for phase	1 red LED
Error display for asymmetry	1 orange LED
Output	1 relay output (change-over contact) 8 A, 250 VAC
Switching capacity	U = 440 VAC, I _{th} = 8 A 3 A/250 VAC (AC15), 3 A/440 VAC (AC14) or 1 A/24 VDC (DC13) in accordance with IEC 60947-5-1
EMC	Surge in accordance with IEC 61000-4-5: 4 kV Burst in accordance with IEC 61000-4-4: 2 kV ESD in accordance with IEC 61000-4-2: for contact 8 kV in air 8 kV
Protection class	Housing IP40, terminals IP20
Ambient temperature	Operation -20°C to +55°C Storage: -40°C to +70°C
Mounting	Surface mounting: snap-on mounting on DIN rail or screw mounting by adaptor and 2 screws M4, any mounting position
Connections	Screw terminals up to 2*2.5 mm ² (single wire) or 2*1.5 mm ² (multistrand with end sleeve). AWG 14...20. M3 screws for Pozidrive or Philips no. 1 and slotted head no. 1 or no. 2.

KFE 302 3-phase energy monitoring

Operating voltage (U_N)	3 × 400 VAC, 50/60 Hz
AC setting range	+ 15% - 20%
Duty cycle	100%
Power consumption	4 VA
Display of power supply	1 green LED
Monitoring level voltage	adjustable by potentiometer, for under voltage 5% up to 20% U_N , for over voltage permanent 1.15 U_N
Time range delay	adjustable by potentiometer 0.1 s to 12 s
Error display	1 red LED
Error storage	can be selected by switch
Output	1 relay output (change-over contact) 8 A, 250 VAC
Switching capacity	U = 440 VAC, I _{th} = 8 A 3 A/250 VAC (AC15), 3 A/440 VAC (AC14) or 1 A/24 VDC (DC13) in accordance with IEC 60947-5-1
EMC	Surge in accordance with IEC 61000-4-5: 4 kV Burst in accordance with IEC 61000-4-4: 2 kV ESD in accordance with IEC 61000-4-2: for contact 8 kV in air 8 kV
Protection class	Housing IP40, terminals IP20
Ambient temperature	Operation (included) -20°C to +55°C Storage: -40°C to +70°C
Mounting	Surface mounting: snap-on mounting on DIN rail or screw mounting by adaptor and 2 screws M4, any mounting position
Connections	Screw terminals up to 2*2.5 mm ² (single wire) or 2*1.5 mm ² (multistrand with end sleeve). AWG 14...20. M3 screws for Pozidrive or Philips no. 1 and slotted head no. 1 or no. 2.

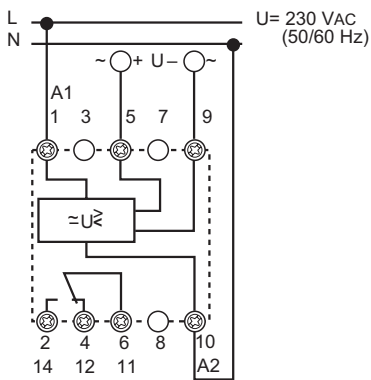
Dimension diagrams

KFE 102/103/300/302

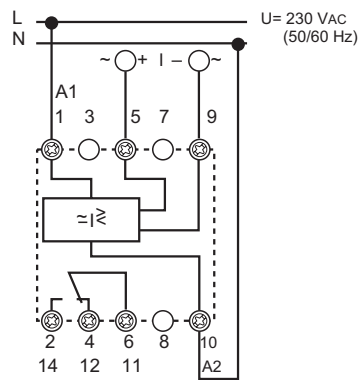


Connection diagram

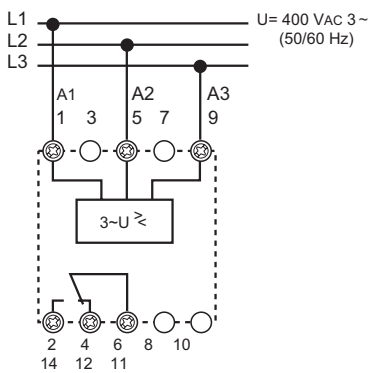
KFE 102



KFE 103



KFE 300/302



KFT 100/200

Monitoring relays

- Engine monitoring by PTC
- PTC short circuit monitoring
- PTC broken wire detection with memory function (KFT200)
- 230 VAC

from left to right: KFT 100, KFT 200



		KFT 100	KFT 200
Function	Engine monitoring by PTC	•	•
	Short circuit monitoring in the PTC	•	•
	Broken wire detection in the PTC	•	•
	Memory function		•
reset	automatic	•	
	manual or automatic		•
Output	1 relay (NO contact)	•	
	2 relays (change-over contact)		•
Operating voltage	230 VAC, 0/60 Hz	•	•
	400 VAC, 0/60 Hz		
Function control	LED display	•	•
Order no.		KFT100JE1N	KFT200KE1N

Technical data

	KFT 100 temperature monitoring	KFT 200 temperature monitoring with saving function
Operating voltage (U _N)	230 VAC, 0/60 Hz	230 VAC, 0/60 Hz
Tolerance	± 15%	± 15%
Duty cycle	100%	100%
Power consumption	≤ 3 VA	≤ 3 VA
minimum response time	100 ms	100 ms
Max. supply cable length	100 m	100 m (cable capacity 10 nF/100 m)
Max. signal and reset cable length	40 m	40 m
Immunity against short operating voltage interruptions	≤ 200 ms	≤ 200 ms
Memory function	no	yes, by memory sliding switch
Insulation characteristics	2.5 kVAC / 50 Hz test voltage in accordance with VDE part 200 and 6 kV surge voltage in accordance with IEC 60947-5-1	
Function control	red LED for errors, green LED for power supply	
Output	1 make contact 8 A	2 changeover contacts 8 A
Switching capacity	U= 440 VAC I _{th} = 8 A P= 2000 VA 3 A/250 VAC (AC 15), 3 A/440 VAC (A14) or 1 A/24 VDC (DC13) in accordance with IEC 60947-5-1	
PTC type	Type A in accordance with DIN VDE D660 part 303	
PTC quantity	up to 6	
PTC monitoring	Short circuit	< 20 Ω
	Temperature OK	> 20 Ω ... < 3 kΩ
	reset	< 1.3 kΩ
	Conductor breakage	> 3 kΩ
EMC	Surge in accordance with IEC 61 000-4-5; 4 kV Burst in accordance with IEC 61 000-4-4; 4 kV ESD in accordance with IEC 61 000-4-2; 8 kV	
Protection class	Housing IP 40, terminals IP 20	
Ambient temperature	Operation (including) -20°C to +55°C Storage: -40°C to +70°C	
Mounting	Surface mounting; snap-on mounting on DIN rail or screw mounting by adaptor (accessories) and 2 screws M4. Any mounting position.	
Connections	Screw terminals for 1 × 0.5 mm ² or 2 × 2.5 mm ² (single wire) or 2 × 1.5 mm ² (multistrand with end sleeve). AWG 14... 20, with two-chamber system. M3.5 screws for Pozidrive no. 2 (or Philips) and slotted head no. 2 suitable for drill/driver (max. 1.2 Nm), finger protection in accordance with VDE 0106	

Accessories

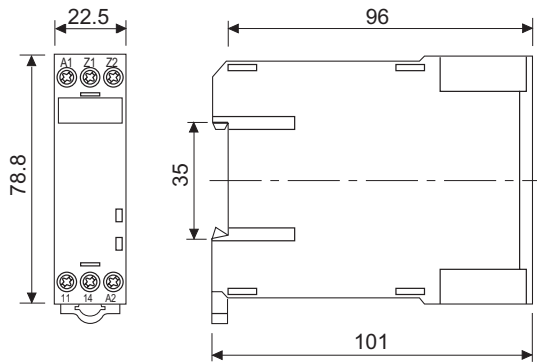
Order no.

- Adapter for screw mounting

CJ260

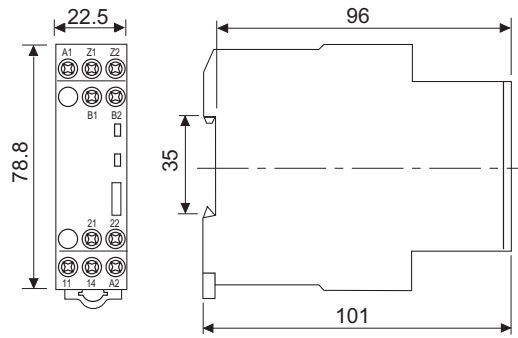
Dimension diagrams

KFT 100



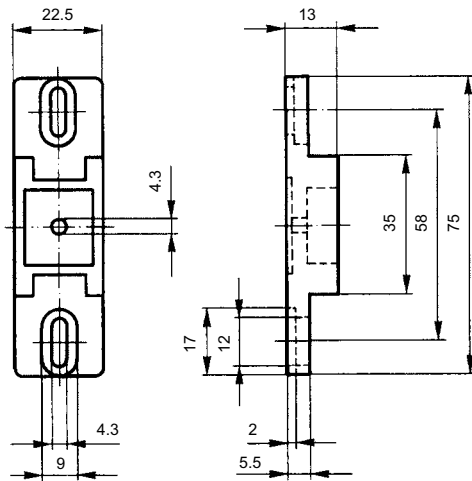
71.91

KFT 200



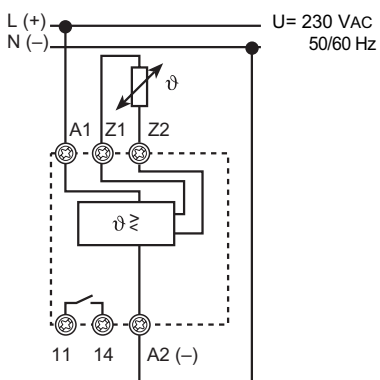
71.92

Adapter for screw mounting (accessories - order no. CJ260)

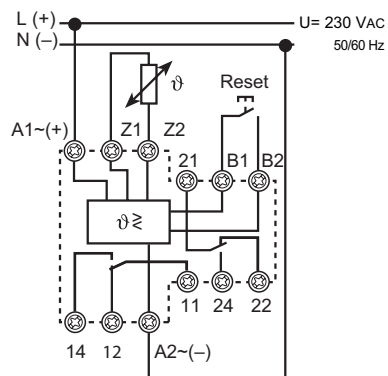


Connection diagram

KFT 100

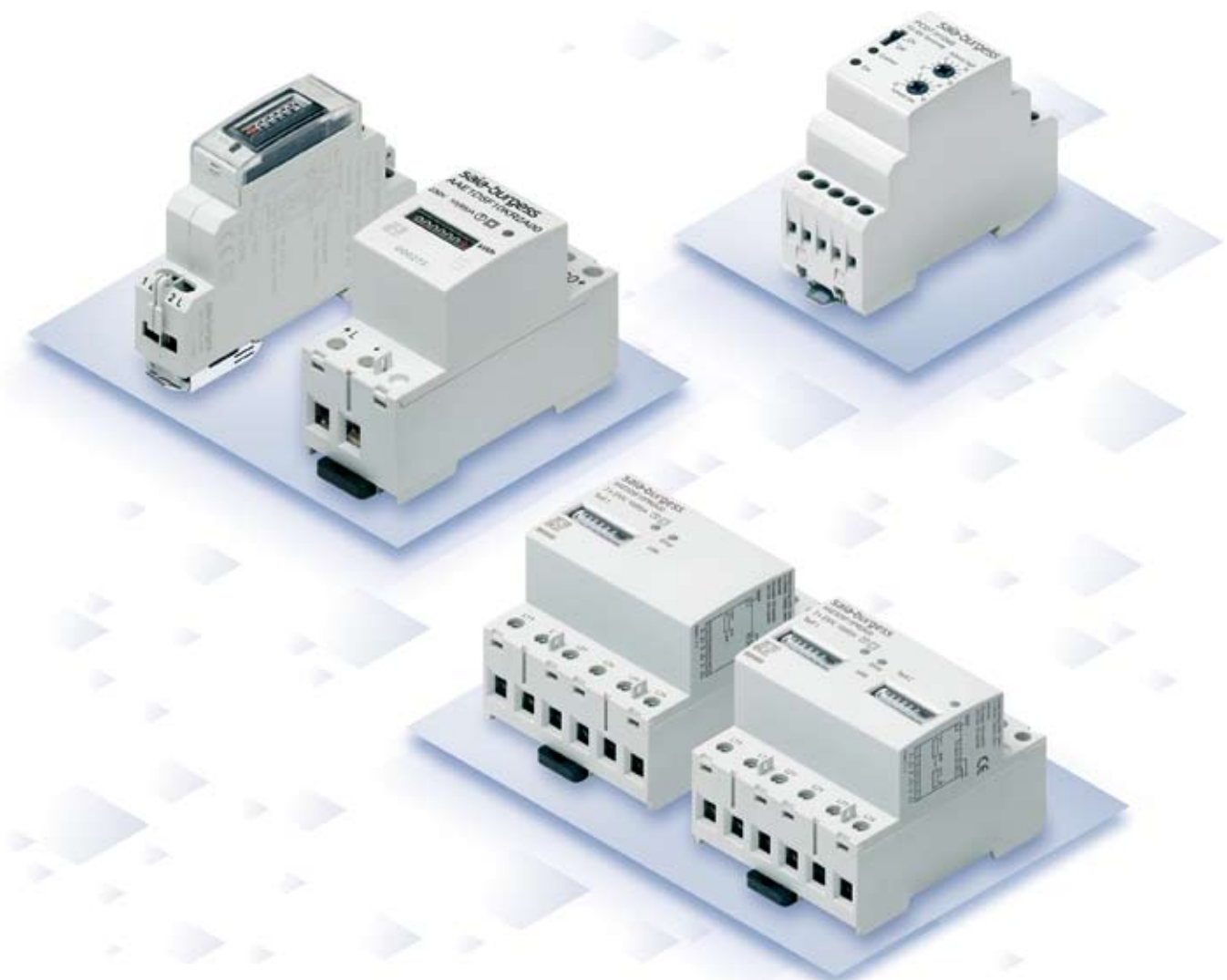


KFT 200



Energy meter counter

		Page
Overview		40
Leader		41
AA1 series	1-phase energy meter, electronic	42
AAE1 series	1-phase energy meter, electronic	42
AAE3 series	Three-phase energy meter, electronic	45
PCD7.H104S	Saia® S-Bus S0 module	48



Types and functions

		Electronic single and three-phase energy meters							
		AAD1			AAE1		AAE3		PCD7
		AAD1 – 5 (20) A	AAD1 – 5 (32) A	AAD1 – 5 (32) A	AAE1 – 10 (65) A	AAE1 – 10 (65) A	AAE3 – 10 (65) A	AAE3 – 10 (65) A	PCD7.H104S
	1-phase alternating current	•	•	•	•	•			
	3-phase current, 1 tariff						•	•	
	3-phase current, 2 tariff						•	•	
Width	17.5 mm for DIN rail (1 TE)	•	•	•					
	35 mm for DIN rail (2 TE)				•	•			•
	70 mm for DIN rail (4 TE)						•	•	
Approvals	without	•							
	PTB approval		•		•		•		
	MID guideline			•		•		•	
Display	6-digit (99999.9 kWh)	•							
	7-digit (999999.9 kWh)		•	•	•	•	•	•	
Nominal/maximum current	$I_N = 5 \text{ A}, I_{\max} = 20 \text{ A}$	•							
	$I_N = 5 \text{ A}, I_{\max} = 32 \text{ A}$		•	•					
	$I_N = 10 \text{ A}, I_{\max} = 65 \text{ A}$				•	•	•	•	
Voltage	230 VAC	•	•	•	•	•			•
	$3 \times 230/400 \text{ VAC}$						•	•	
S0 output	1000 Imp./kWh	•	•	•	•	•			
	100 Imp./kWh						•	•	
Interface	Saia®S-Bus								•
Catalogue page		42	42	42	42	42	45	45	48

Energy meter Note



Good to know

Whether it is in shopping centers, in housing estates or on camping sites and in marinas, increased power costs have resulted in the billing of power costs on the basis of consumption instead of as flat rates becoming ever more popular.

This is why we offer a series of small, low-cost energy meter. Apart from the built-in mechanical meter, they also have a counter impulse output for central power recording in a Saia®PCD and automatic further processing for individual billing on a PC.

The current consumption is also displayed via LED.

The energy meters are insensitive to shock, vibration and electromagnetic manipulation. This ensures that power costs are billed fairly at all times.

The Saia®S-Bus S0 module allows instead of parallel wiring of the individual counter impulse outputs, networking via the Saia®S-Bus. This means that installation costs can be significantly reduced for major projects, e.g. in building automation.

We distinguish between...

1-phase energy meter 20 A and 32 A

- AAD1 – 5 (20) A without approval
- AAD1 – 5 (32) A with PTB approval
- AAD1 – 5 (32) A as per MID

1-phase energy meter 65 A

- AAE1 – 10 (65) A with PTB approval
- AAE1 – 10 (65) A as per MID

Three-phase energy meter 65 A

- AAE3 – 10 (65) A with PTB approval
- AAE3 – 10 (65) A as per MID

MID (Measuring Instruments Directive)

The MID is a Directive published by the European Parliament in March 2004 which specifies basic and measuring instrument-specific requirements for certain groups of devices and assigns the responsibility for initial placing on the market of measuring instruments to the manufacturer. Only when these requirements are fulfilled, may measuring instruments under the MID be brought to market or used in the future. Saia-Burgess meets these requirements and offers the compliance valuation method in accordance with B + D module combination for 1-phase and three-phase energy meters.

The introduction of the European Measuring Instruments Directive (MID) replaces initial calibration at approved test centers with the manufacturer's declaration of compliance. The national regulations for the duration of validity of calibration then apply. Energy meters by Saia can be used to invoice energy costs.

PTB approval

Devices calibrated by a approved test center which were brought to market before 30 October 2006 require a respective national Approval.

PTB is Germany's National Metrology Institute, according to which the Saia-Burgess Controls AG's energy meter are licensed.



AAD1 5 (20)A / 5 (32)A AAE1 10 (65) A

1-phase energy meter, electronic

- 1-phase energy meter 230 VAC, 50 Hz, 5 (20) A, 5 (32) A / 10 (65) A
- 6 or 7-digit, PTB or MID
- Accuracy class 1 as per IEC 62053-21, or B in accordance with EN 50470-3
- S0 output
- Lead-sealable with cap as accessory

from left to right: AAD1, AAE1



		AAD1		AAE1		
Approvals	PTB approval		•		•	
	MID guideline			•	•	
	without	•				
Nominal/maximum current	$I_N = 5 \text{ A}, I_{\text{max}} = 20 \text{ A}$	•				
	$I_N = 5 \text{ A}, I_{\text{max}} = 32 \text{ A}$		•	•		
	$I_N = 10 \text{ A}, I_{\text{max}} = 65 \text{ A}$				•	
Starting current	20 mA	•	•	•		
	40 mA				•	
Voltage	230 VAC, 50 Hz	•	•	•	•	
	$3 \times 230/400 \text{ VAC}, 50 \text{ Hz}$				•	
S0 output	1000 Imp./kWh	•	•	•	•	
	100 Imp./kWh				•	
Electromechanical counter	6-digit	•				
	7-digit		•	•	•	
Order no.		AAD1D5D10KR2 A01	AAD1D5F10KR2 A00	AAD1D5F10KR3A00	AAE1D5F10KR2 A00	AAE1D5F10KR3A00

Applications

For precise power management and individual invoicing at jointly used facilities

- Precise and secure invoicing of power consumption on camping sites, in marinas, at exhibitions and on street markets
- Measurement of renewable power in the private area, e.g. photovoltaics
- Measurement of power consumption for advertising and lighting

Technical Data

Accuracy class	1 (1%) as per IEC 62053-21 or B in accordance with EN 50470-3 (devices in accordance with MID)		
Nominal/maximum current	AAD1 - 20 A	AAD1 - 32 A	AAE1 - 65 A
	$I_N = 5 \text{ A}, I_{\text{max}} = 20 \text{ A}$	$I_N = 5 \text{ A}, I_{\text{max}} = 32 \text{ A}$	$I_N = 10 \text{ A}, I_{\text{max}} = 65 \text{ A}$
Starting current	20 mA	20 mA	40 mA
Voltage	230 VAC, 50 Hz Tolerance -20% / +15%		
Power consumption	Active 0.4 W		
Measurement	direct		
Counting range	0...99 999.9 kWh	0...999 999.9 kWh	0...999 999.9 kWh
Display	4 mm tall figures, decimal place red		
S0 output	Optocoupler max. 30 V/20 mA and 5 V min., impedance 100 Ω, impulse range 50 ms		
Impulse per kWh	1000 Imp./kWh		
Transmission distance	maximum 1000 m (with 30 V/20 mA)		
LED	Red, 2000 Imp./kWh	Red, 200 Imp./kWh	Red, 1000 Imp./kWh
Mounting	on DIN rail 35 mm		
Screwdrivers	Primary circuit: Pozidrive no. 1, Philips no. 1, slotted head no. 1 S0 output: Pozidrive no. 0, Philips no. 0, slotted head no. 1		
Primary circuit connections	max. 6 mm ² , M4	max. 6 mm ² , M4	max. 16 mm ² , M4
S0 impulse outputs	max. 2.5 mm ² , M3	max. 2.5 mm ² , M3	max. 2.5 mm ² , M3.5
Insulation characteristics	4 kV/50 Hz test in accordance with VDE 0435 6 kV 1.2/50 μs surge voltage in accordance with IEC 255-4 Equipment class II		
Ambient temperature	MID product: -10°...+55°C PTB product and without license: -10°...+45°C		
EMC/resistance to interference	Surge voltage in accordance with IEC 61 000-4-5 on primary circuit, 4 kV Surge voltage in accordance with IEC 61 000-4-5 at S0 impulse outputs, 1 kV Burst voltage in accordance with IEC 61 000-4-4, 4 kV ESD in accordance with IEC 61 000-4-2, contact 8 kV, air 15 kV		

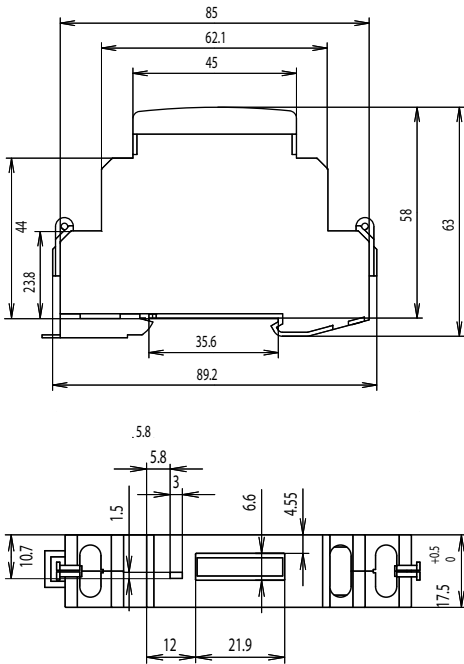
Accessories

		Order no.
Lead-sealing cap for AAD1 32 A	(2 units are recommended for contact protection)	4 104 7420 0
Lead-sealing cap for AAE1 65 A	(2 units are recommended for contact protection)	4 104 7485 0

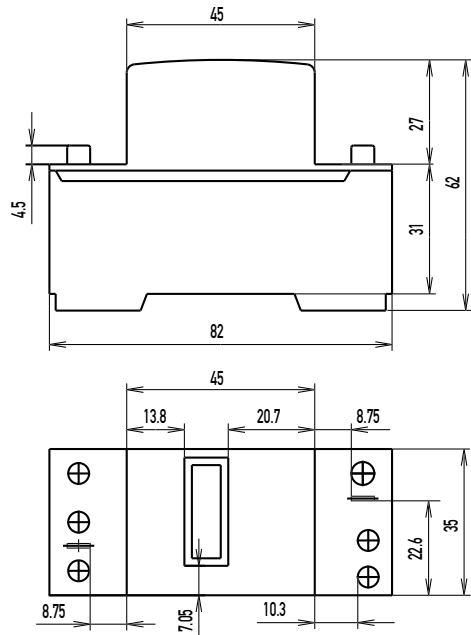
Dimension diagram

Structure

AAD

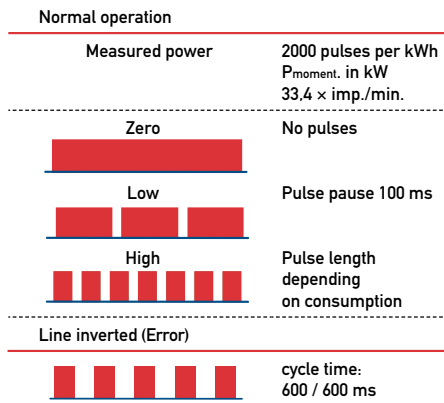


AAE

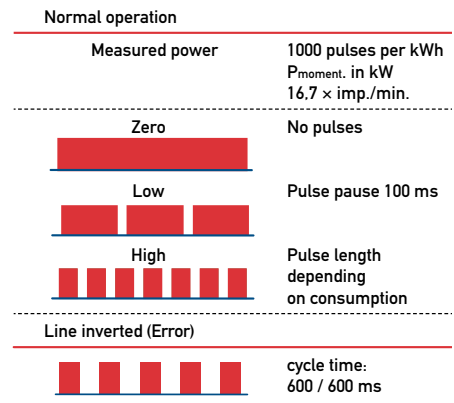


LED function

AAD

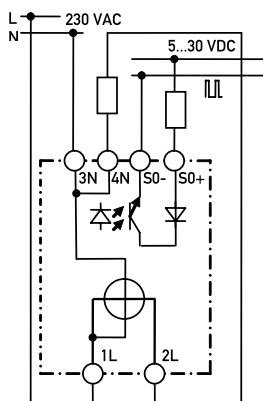


AAE

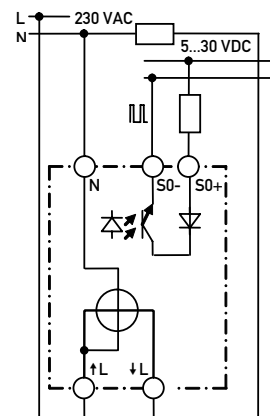


Connection diagram

AAD



AAE



AAE3 10 (65)A

Three-phase energy meter, electronic

- 3-phase energy meter 3 × 230/400 VAC 50 Hz, 10 (65)A
- 7-digit display for 1 or 2 tariffs, lead-sealable with cap as accessory
- Accuracy class 1 as per IEC 62053-21 or B in accordance with EN 50470-3, lead-sealable with cap as accessory
- S0 output

from left to right: AAE3 - 1 tariff, AAE3 - 2 tariffs



		AAE3			
Tariff	1 tariff	•	•		
	2 tariffs			•	•
Approvals	PTB approval	•	•		
	MID guideline		•		•
	without				
Nominal/maximum current	$I_N = 5 \text{ A}, I_{\text{max}} = 20 \text{ A}$				
	$I_N = 5 \text{ A}, I_{\text{max}} = 32 \text{ A}$			•	•
	$I_N = 10 \text{ A}, I_{\text{max}} = 65 \text{ A}$	•	•	•	•
Starting current	20 mA				
	40 mA	•	•	•	•
Voltage	230 VAC, 50 Hz				
	3 × 230/400 VAC, 50 Hz	•	•	•	•
S0 output	1000 Imp./kWh			•	•
	100 Imp./kWh	•	•	•	•
Order no.		AAE3D5F10PR2 A00	AAE3D5F10PR3A00	AAE3D5F11PR2 A00	AAE3D5F11PR3A00

Applications

For precise power management and individual invoicing at jointly used facilities, such as

- Shopping centers, airports, railway stations
- Shared offices, factories, shops, air-conditioned premises
- Holiday homes, houses, bungalows, hotels, hospitals and schools
- Measurement of power consumption for advertising and lighting

Technical Data

Accuracy class	1 (1%) as per IEC 62053-21 or B in accordance with EN 50470-3 (devices in accordance with MID)
Nominal/maximum current	$I_N = 10 \text{ A}$, $I_{\max} = 65 \text{ A}$
Starting current	40 mA
Operating voltage	3 × 230/400 VAC, 50 Hz Tolerance -20% / +15%
Power consumption	Active 0.4 W per phase
Measurement	direct
Counting range	0...999 999.9 kWh
Display	4 mm tall figures, decimal place red
S0 output (interface)	Optocoupler max. 30 V/20 mA and 5 V min., impedance 100 Ω, impulse range 50 ms
Impulse per kWh	100 Imp./kWh.
Transmission distance	maximum 1000 m (with 30 V/20 mA)
LED	Red, 100 Imp/kWh.
Mounting	on DIN rail 35 mm
Screwdrivers	Primary circuit: Pozidrive no. 1, Philips no. 1, slotted head no. 1 S0 output: Pozidrive no. 0, Philips no. 0, slotted head no. 1
Primary circuit connections	max. 16 mm ² , M4, no. 1/2
S0 impulse outputs connections	max. 2.5 mm ² , M3.5, no. 1
Insulation characteristics	4 kV/50 Hz test in accordance with VDE 0435 6 kV 1.2/50 μs surge voltage as per IEC 255-4 Equipment class II
Ambient temperature	MID product: -10°...+55°C PTB product and without license: -10°...+45°C
EMC/resistance to interference	Surge voltage in accordance with IEC 61 000-4-5 on primary circuit, 4 kV Surge voltage in accordance with IEC 61 000-4-5 at S0 impulse outputs, 1 kV Burst voltage in accordance with IEC 61 000-4-4, 4 kV ESD in accordance with IEC 61 000-4-2, contact 8 kV, air 15 kV

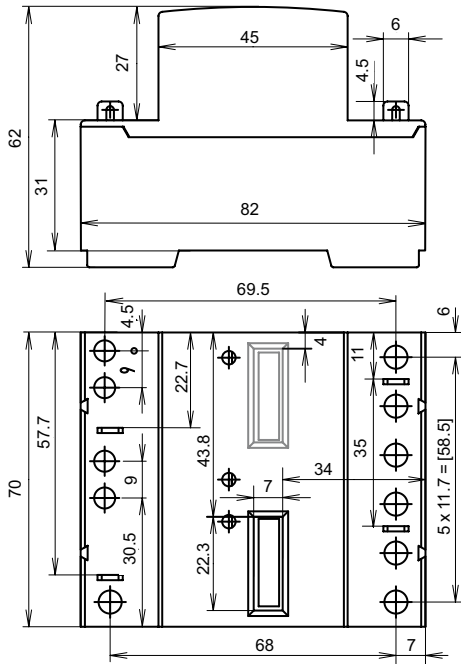
Accessories

Order no.

Lead-sealing cap for AAE3 65 A (4 units are recommended for contact protection)

4 104 7485 0

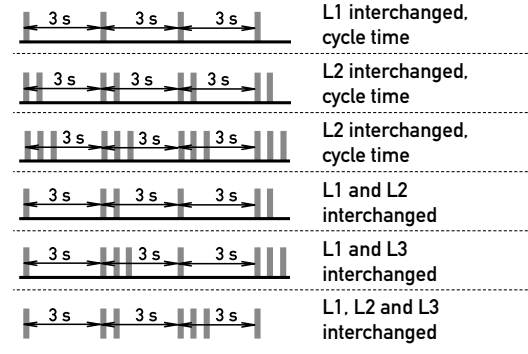
Dimension diagrams



LED function

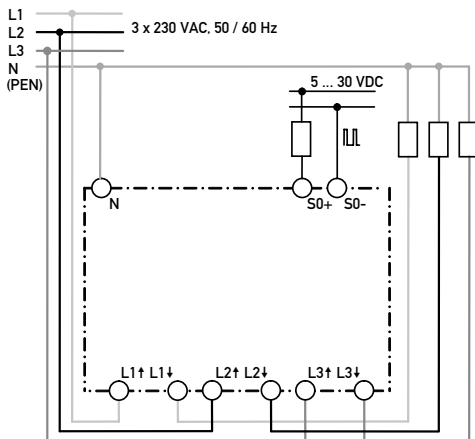
Normal operation	Measured power	100 imp. per kWh
	Zero	Puls pause = 150 ms
	Low	Pmomentarily in kW
	High	= 1.7 × imp./min.

Error LED = Line errors (lines interchanged / not connected)

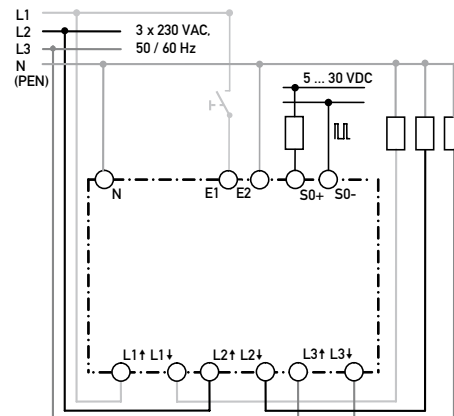


Timing diagram and connection diagram

1 tariff



2 tariffs



PCD7.H104S

Saia® S-Bus S0 module

- Central counting, reading and invoicing with Saia®PCD/PCS
- Transmission of counting impulses via Saia® S-Bus
- Convenient programming/parameterization of energy meter networks with Saia® PG5 Fupla FBoxes
- 230 VAC

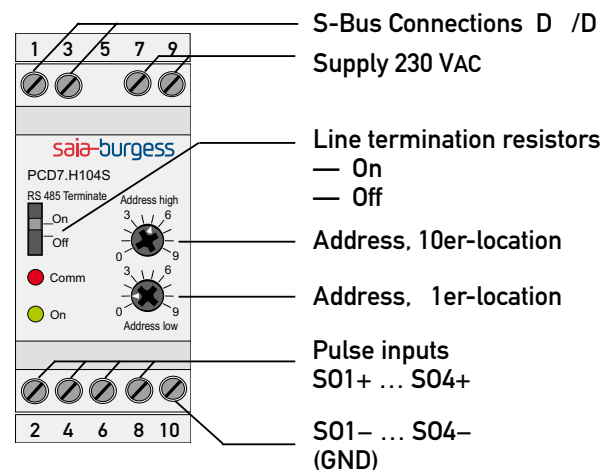


- Low installation costs by transmitting individual consumption details via Saia® S-Bus
- Up to 400 energy meters (4 per Saia® S-Bus S0 module)
- Up to 100 Saia® S-Bus S0 modules can be interconnected
- 4 S0 impulse outputs (S01...S04) per Saia® S-Bus S0 module
- LED signaling: green = operation display
red = bus activity

Applications

- Individual consumption invoicing, e.g. in shared offices, in industry, etc.
- Knowledge of the need for power of the various consumers is important for power management in hotels, motels, homes, hospitals, etc.

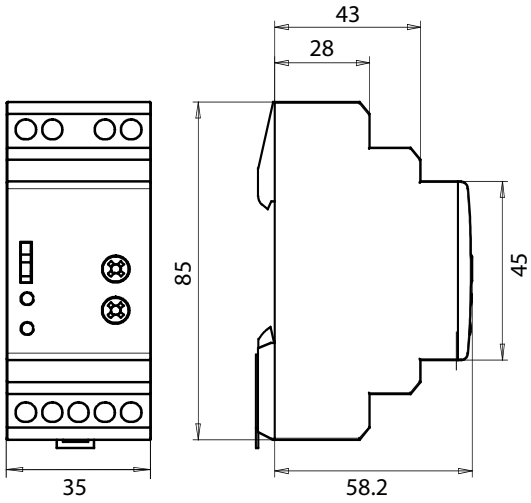
Settings



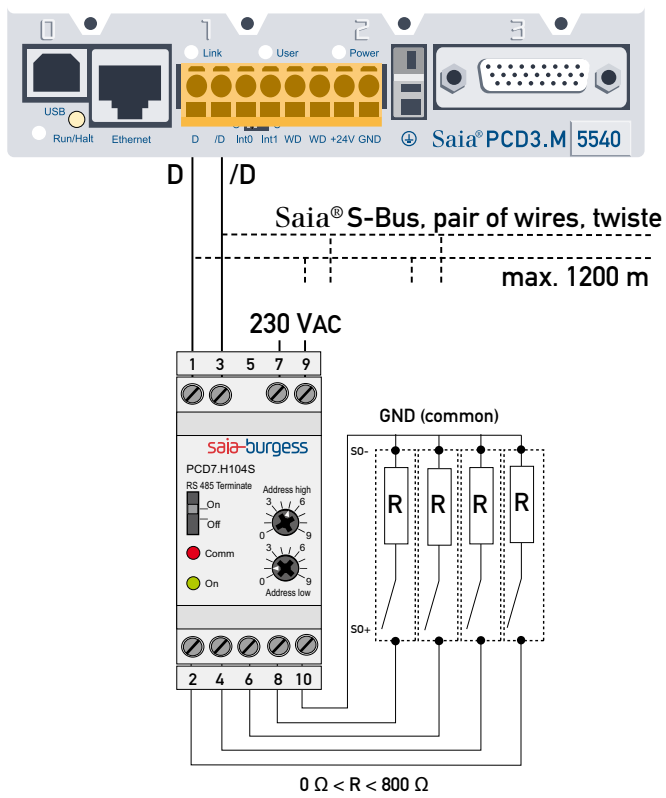
Technical Data

Bus system	Saia® S-Bus
Transmission rate	9600-19200-28800-33600-56600
Transmission mode	Data
Maximum bus length	1200 m (without repeater)
Response time (until system response)	Write: 30 ms Read: 10 ms
Recovery time	30 ms
Data transfer	Only "read/write" register instructions are recognized. Only one register can be read/written. The unit will not respond for unidentified queries. "Automatic transmission rate" is the default setting. The module has a voltage monitoring system. In the event of power failure the registers are saved in EEPROM (S0 number of registers, transmission rate, etc.)
Protection type	IP 40 (IP 20 connections)
Operating voltage	230 VAC (-20/+15%)
Current consumption	< 12 mA
Power consumption	< 3 W
Transmission distance	maximum 1000 m (with 30 V/20 mA)
LEDs	Operation display: green LED (on) Function display: red LED during bus activity
Mounting	on DIN rail 35 mm (IEC 50 022), any position
Terminals	For Pozidrive, Philips or slotted-head screwdrivers no. 1 S0x, S-Bus, 230 VAC - 0.5...2.5 mm ²
Ambient temperature	Temperature -20°C...+55°C Storage temperature -25°C...+70°C
EMC/resistance to interference	Surge voltage in accordance with IEC 61 000-4-5 on primary circuit, 4 kV Surge voltage in accordance with IEC 61 000-4-5 at S0 inputs, 1 kV Burst voltage in accordance with IEC 61 000-4-4, primary circuit 4 kV direct, S0 inputs 2k VCApactive, S-Bus connections 1 k VCApactive ESD in accordance with IEC 61 000-4-2, contact 8 kV, air 8 kV
Insulation characteristics	4 kV/50 Hz test in accordance with VDE 0435 6 kV 1.2/50 µs surge voltage in accordance with IEC 60947-1 Equipment class II
S0 input	corresponds to S0 standard 62053-31 counts the impulses as '0' if RL is < 800 Ω and as '1' if R is > 1 MΩ. Maximum voltage (GND-S0): 13 VDC Maximum power, (in the event of a short circuit): 6 mA Low impulse: min. 30 ms High impulse: min. 30 ms Maximum frequency: 17 Hz

Dimension diagrams



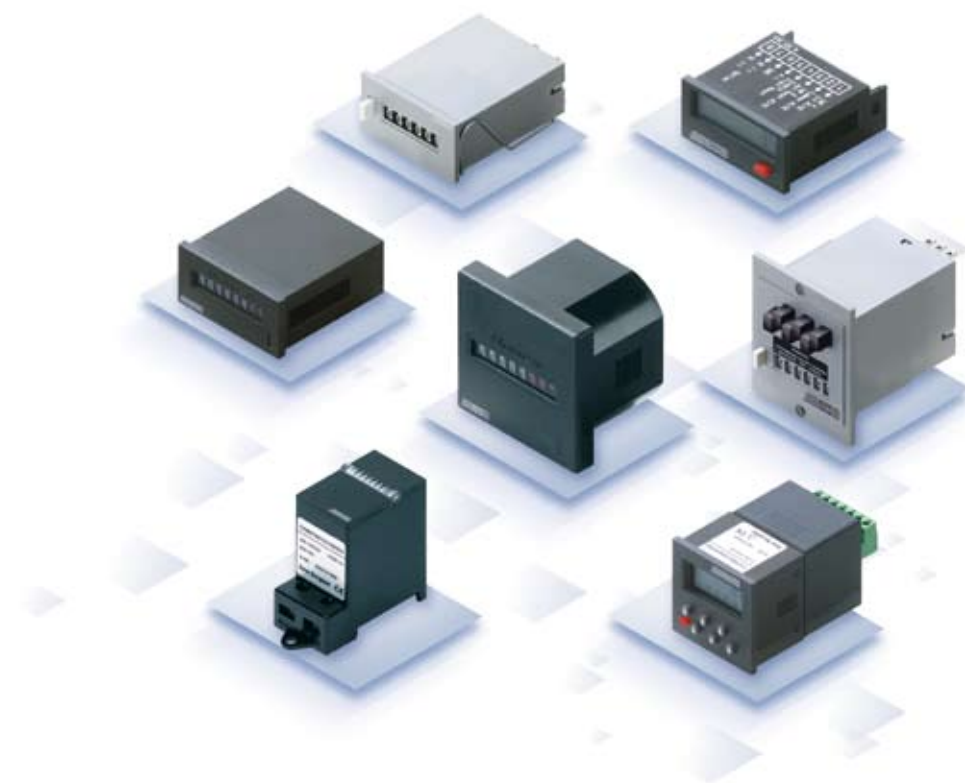
Connection diagram



Counters

electromechanical / electronic

		Page
Overview	Electromechanical counters	52
Overview	Electronic counters	54
Leader		56
CMA series	Electromechanical display counters	58
CMB series	Electromechanical display counters	60
CMM series	Electromechanical display counters	63
CMC Series	Electromechanical hour meters	66
CMT series	Electromechanical hour meters	68
CMU series	Electromechanical hour meters	70
CMM series	Electromechanical preset counters	72
CXL series	Electronic display counters	74
CXL series	Electronic display counters	77
CXL series	Electronic display counters	80
CXG series	Electronic display counters	83
CXL series	Electronic hour meters	86
CXL series	Tachometers, frequency display	89
CXG series	Double function counters for pulses, frequency and time	92
CXG series	Process display for standard analogue signals	95
CXM series	Electronic temperature display	98
CXE series	Multifunctional preset counters	101
CXF series	Multifunctional preset counters	104
CXP series	Electronic preset counters	107
CXQ series	Multifunctional preset counters	110



Types and functions electromechanical

		Display counters			
		CMA		CMB	
		CMA 062	CMA 152	CMB 062	CMB 072
Mounting	Surface mounting for DIN rail				
	Flush mounting	•	•	•	•
	Machine solderable and washable, plug-in on printed circuit board				
Front dimensions	mm	34 × 23	34 × 23	32 × 15	32 × 15
Switchboard mounting dimensions	mm	31 × 20	31 × 20	30 × 13	30 × 13
reset	without reset	•		•	•
	manual reset		•		
	manual and electrical reset				
	down counting, manual and electrical reset				
Counting capacity	99999		•		
	999999	•		•	
	9999999				•
	99999999				
	99999.99 h, decimal places red				
	DC: 999999.99 h / AC: 99999.99 h, decimal places red				
Connections	Strands, 150 mm	•	•	•	•
	Tags for push-on connectors 2.8 × 0.8 mm				
	Connection terminals 2 × 2.5 mm ²				
	Round pins 1.5 mm				
	Solder pins 0.4 × 1.2 mm				
Voltage	12 VDC		•	•	•
	24 VDC	•	•		•
	10...30 VDC				
	4.5...35 VDC				
	24 VAC				
	115 VAC				
	230 VAC				
	20...30 VAC				
	100...130 VAC				
	110...120 VAC				
	187...264 VAC				
	220...240 VAC		•		•
	Catalogue page	58	58	60	60

Additional products on request

						Hour meters				Preset counters	
			CMM			CMC		CMT	CMU	CMM	
CMB 079	CMB 970	CMB 976	CMM 081	CMM 161	CMM 361	CMC 072	CMC 079	CMT 072	CMU 072	CMM 152	CMM 362
•			•	•	•	•	•	•	•	•	•
	•	•									
30 × 58	29 × 14	29 × 36	52 × 28 48 × 24	52 × 28 48 × 24	52 × 28 48 × 24	32 × 15 30 × 13	58 × 30	48 × 24 45 × 22	48 × 48 45 × 45	53 × 53 50 × 50	55 × 55 50 × 50
•	•	•	•	•	•	•	•	•	•	•	•
				•	•					•	•
•	•	•	•	•	•					•	•
			•			•	•	•	•		
•	•	•	•	•	•	•	•	•	•	•	•
	•	•								•	•
•	•	•	•	•	•	•	•	•	•	•	•
			•	•	•	•	•	•	•	•	•
•				•	•			•	•		•
•				•	•			•	•		•
60	60	60	63	63	63	66	66	68	70	72	72

- 1 Company presentation
- 2 Product overview
- 3 Timers
- 4 Monitoring relays
- 5 Energy meters
- 6 Counters
- 7 Item number
- 8 Contact addresses

Types and functions electronic

Electronic display counters

		CXL						
		CXL 201	CXL 211	CXL 261	CXL 241	CXL 231	CXL 281	CXL 221
Mounting	Flush mounting	•	•	•	•	•	•	•
Front dimensions	mm	24 × 48	24 × 48	24 × 48	24 × 48	24 × 48	24 × 48	24 × 48
Switchboard dimensions	mm	22 × 45	22 × 45	22 × 45	22 × 45	22 × 45	22 × 45	22 × 45
Functions	Preset, Batch or totalising counter, 1 presets							
	Preset, Batch or totalising counter, 2 presets							
	Pulse, frequency, time or position preset counter, 1 preset							
	Pulse, frequency, time or position preset counter, 2 presets							
	Pulse preset counter, 1 preset							
	Replacement for electromechanical counters, battery-powered	•	•	•				
	Display counters for pulses	•	•	•				
	Position display				•			
	Frequency/speed display							•
	Time meter/short-time measurement					•	•	
	Process display for standard analogue signals							
	Double function counters for pulses, frequency and Time							
	Temperature display							
Display	Display backlight	•	•	•	•	•	•	•
	6-digit LCD display							
	8-digit LCD display	•	•	•	•	•	•	•
	6-digit, 7-segment LCD display							
	6-digit red, 7-segment LED display							
	5-digit red, 7-segment LED display							
reset	manual and electrical	•	•	•	•	•	•	
	manual (lockable) only min./max. value							
Counting inputs	NPN	•	•	•	•	•	•	•
	PNP	•	•	•	•	•	•	•
	Control with voltage pulses 10...250 VAC/DC	•	•	•		•		
	PT100/Ni100 resistance thermometer							
	J, K, N thermo elements							
	Programmable							
Outputs	Relay outputs							
	Optocoupler							
Supply voltage	Battery-powered	•	•	•	•	•	•	•
	10...30 VDC							
	90...260 VAC							
Interfaces	RS232							
	Catalogue page	74	77	77	80	86	86	89

Additional products on request

Counters Notes



Good to know...

Autarchic display and counting systems are used in different areas of the industry.

They are efficient and low-cost solutions as regards service, production control, operation, upgrading, monitoring and visualisation.

Details on a production system's operating hours provide important information for maintenance work or service intervals. This is the strength of electromechanical counters. Even in voltage-free condition or after a system failure the information can still be retrieved.

The electronic, battery-driven LCD counters meet high demands on functions and connection technology.

Digital recording of signals is too imprecise or costly for many measurement procedures. This is why signals are often analogously recorded in industrial environments. This, for instance, includes temperature, weight, pressure, level, volume, speed, acceleration or position.

For temperature measurement with sensors (Pt and Ni) the temperature dependency of metal resistances is used. The voltage loss at the resistance is measured and represents a measure for the temperature.

Thermo elements (J, K and N) consist of two punctually soldered wires made from various metals. The thermo voltage occurring at the welding spot is measured, amplified and displayed.

We distinguish...

- Display counters electromechanical and electronic
- Preset counters electromechanical and electronic
- Timer meters electromechanical and electronic
- Tachometers/frequency counters electronic
- Process displays for standard analogue signals
- Temperature displays for Pt and Ni sensors or J, K and N thermo elements



Functions

Display counters

These counters have no output signals which are activated at a specific counter reading. They are used to display the counter reading.

The function can range from simple totaling to position display with phase discriminator.

Preset counters

Their function is to trigger a signal at a specific counter reading. In the simplest case this means switching off the machine, but it can also mean triggering control processes (e.g. cutting off materials, further transport of parts, etc.). The outputs are primarily designed as relays (often with change-over function).

Time meters

They record the time in a time unit set for the device. For electromechanical counters in hours with one or two decimal places, for electronic counters the time basis is programmable in hours, minutes or seconds. The resolution is specified by the decimal place. Time counting is started by creating voltage supply on the counter or through control pulses as period measurement principle with one to two separate inputs.

Tachometers

They record pulses per time unit. Typically pulses per second for frequency measurements or pulses per minute for speed measurements or production quantities. There are two measurement principles: Period measurement where the time between two pulses is measured or gateway measurement where the pulses are measured in a time window.

Process display

If process values, such as temperature, pressure or other analogue measurements should be displayed, these devices are used. Process displays can be used to control or shape dimensions.

Temperature displays

The selection is oriented towards the temperature sensor used: Pt and Ni sensors or thermo elements.

For thermo elements we distinguish:

J: (Fe-CuNi)

These thermo elements are widespread, low cost and provide high thermo voltage. The drawback is risk of corrosion.

K: (Ni-CrNi)

The thermo elements are also widespread, have a very good long-term stability but only reduced thermo voltage.

N: (NiCrSi-NiSi)

These thermo elements are not very common, as they have not been on the market for long. They can be used at very high temperatures.

CMA 062/152

Electromechanical display counters

- 6-digit mini pulse counter without reset or 5-digit with reset
- 12 V, 24 V and 230 V
- Flush mounting with tension spring

from left to right: CMA 152 . CMA 062



		CMA 062		CMA 152	
Mounting	Surface mounting for DIN rail				
	Flush mounting	•	•	•	•
	Machine solderable and washable, plugable on circuit board				
reset	without reset	•			
	with reset		•	•	•
	manual and electrical reset				
	down counting, manual and electrical reset				
Counting capacity	99 999		•	•	•
	999 999	•			
	9 999 999				
	99 999 999				
	999 999.99 h, decimal places red				
Connections	DC 999 999.99 h / AC 99 999.99 h, decimal places red				
	Strands 150 mm	•	•	•	•
	Tags for push-on connectors 2.8 × 0.8 mm				
	Connection terminals 2 × 2.5 mm ²				
	Solder pins 0.4 × 1.2 mm				
Operating voltage	Round pins 1.5 mm				
	12 Vdc		•		
	24 Vdc	•		•	
Order no.	220...240 VAC				•
		CMA062M4N0N0N00	CMA152M1N0N0N00	CMA152M4N0N0N00	CMA152E1N0N0N00

Applications

- Machines and appliances, devices with battery operation, heat quantities and water consumption measurement for recording charges and general quantity counting

Settings

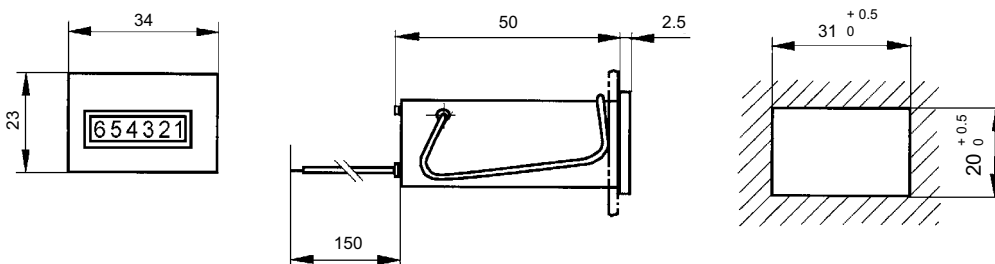


Technical data

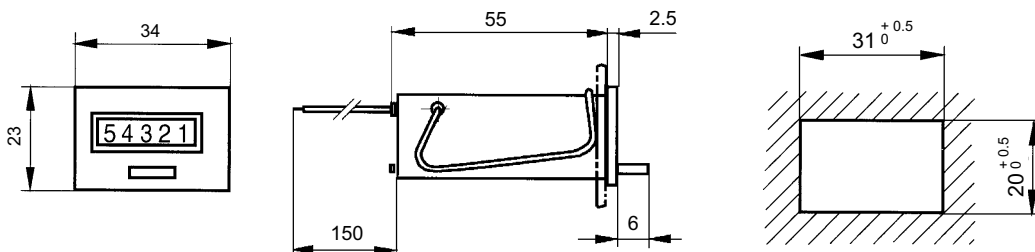
Counting capacity	CMA 062 without reset 999 999	CMA 152 with manual reset 999 999
Counting direction	adding	
Counting frequency	max. 10 i/s (counting pulse at least 50 ms)	
Display	Dials, white figures on black background, approx. 1.7 × 4 mm	
Operating voltage	12 VDC, 24 VDC ± 10%, max. residual ripple 48%	
	230 VAC, 10%	
Power consumption	0.5 W (DC) or 1.5 VA (AC)	
Duty cycle	100%	
Pulse generator	Contacts, electronic sensors NPN/PNP (AC)	
Service life	min. 50 million. counting pulses	
EMC/immunity to interference	DIN IEC 61 000-6-2	
EMC/noise emission	DIN IEC 61 000-6-3	
Protection class	Front IP 40	
Ambient temperature	-10°C to +50°C, no condensation	
Mounting position	any	
Housing colour	light grey	
Dimensions	Front dimensions and switchboard section see dimension diagram	
Connections	Strands AWG 22, approx. 150 mm long	

Dimension diagrams

CMA 062, without reset, flush mounting, mounting with tension spring



CMA 152, with manual reset, flush mounting, mounting with tension spring



Scope of delivery

- Electromechanical display counters
- 1 tension spring

CMB 062/072/079/970/976

Electromechanical display counters

- 6 and 7-digit micro totalising counter for flush mounting, DIN rail or plug-in on circuit board
- High shock resistance
- Low power consumption, suitable for battery operation
- Very compact construction, optically large figures
- Machine solderable and washable (CMB 970/976)
- 12 VDC, 24 VDC, 115 VAC, 0 VAC



from left to right: CMB 062, CMB 079

		CMB 062	CMB 072		CMB 079		CMB 970	CMB 976		
Mounting	Surface mounting for DIN rail					•	•	•		
	Flush mounting	•	•	•	•					
	Machine solderable and washable plug-in on printed circuit board (surface mounting see dimension diagram)						•	•		
reset	without reset	•	•	•	•	•	•	•		
	with reset									
	manual and electrical reset									
	down counting, manual and electrical reset									
Counting capacity	99999									
	999999	•								
	9999999		•	•	•	•	•	•		
	99999999									
	99999.99 h, decimal places red DC 999999.99 h / AC 99999.99 h, decimal places red									
Counting frequency	DC or AC (all voltages) 10 pulses/s		•	•	•	•		•		
	DC 25 pulses/s	•				•	•			
Connections	Strands 150 mm	•	•	•	•					
	Tags for push-on connectors 2.8 × 0.8 mm									
	Connection terminals 2 × 2.5 mm ²					•	•	•		
	Solder pins 0.4 × 1.2 mm						•	•		
	Round pins 1.5 mm							•		
Operating voltage	12 VDC	•	•					•		
	24 VDC			•		•	•			
	110...120 VAC					•				
	220...240 VAC		•			•				
Order no.		CMB062M1N2N0N00	CMB072E1N1N0N00	CMB072M1N1N0N00	CMB072M4N1N0N00	CMB079D1N1N0N00	CMB079E1N1N0N00	CMB079M4N2N0N00	CMB970M4N2N0N00	CMB976M1N1N0N00

Applications

- General quantity counting, alarm systems, coin machines, vending and slot machines, photocopiers, medical technology, washer systems

Technical data

Counting capacity	CMB 062 999 999	CMB 072 / 079 / 970 / 976 9 999 999	
Counting direction	adding		
Counting frequency	max. 10 and 25 pulses/s (see ordering table)		
Display	Dials, white figures on black background. approx. 1.2 × 4 mm (7-digit, optical); 1.7 × 4 mm (6-digit, optical)		
Operating voltage	12 VDC, 24 VDC ± 10%, max. residual ripple 48% 115 VAC, 0 VAC.		
Power consumption	250 mW (DC) or 0.8 VA (AC)		
Duty cycle	100%		
Pulse generator	Contacts, electronic sensors NPN/ PNP (AC)		
Service life	min. 50 million. counting pulses		
EMC/immunity to interference	DIN IEC 61 000-6-2		
EMC/noise emission	DIN IEC 61 000-6-3		
Protection class	CMB 062 / 072 Front IP 65	CMB 079 Front IP 50	CMB 970 / 976 Front IP 65, complete Machine solderable
Ambient temperature	-10°C to +60°C, no condensation		
Mounting position	any		
Housing colour	Plastic transparent PC (polycarbonate)		
Dimensions	Front dimensions and switchboard section see dimension diagram		
Connections	CMB 062 / 072 Strands AWG 22, approx. 150 mm long	CMB 079 Terminals for cable diameter of up to max. 2.5 mm ²	CMB 970 / 976 Solder pins 0.4 × 1.2 mm



CMB 062 / 072



CMB 079



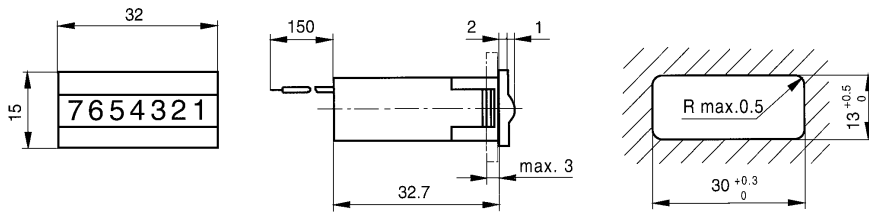
CMB 970



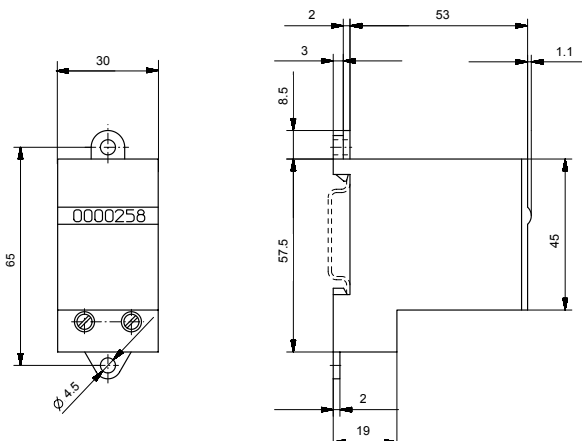
CMB 976

Dimension diagrams

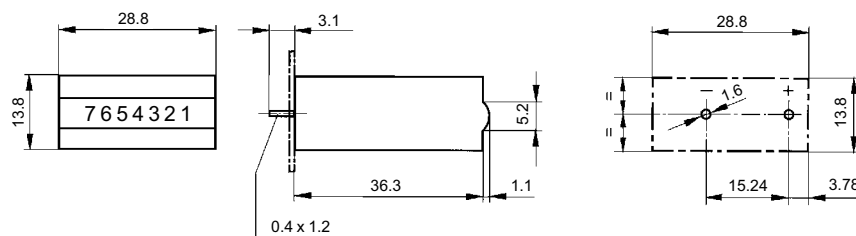
CMB 062, CMB 072, flush mounting, mounting with mould stop springs, connection via strands 150 mm



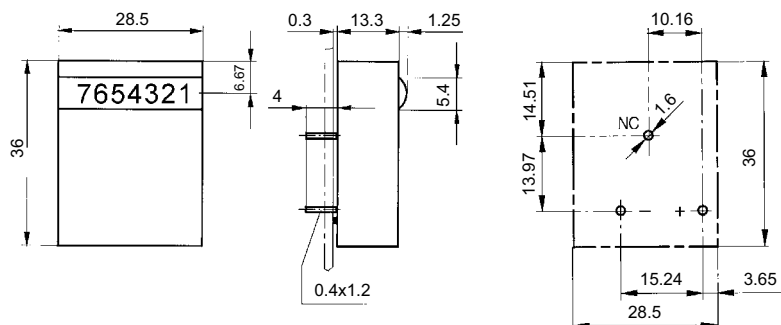
CMB 079, surface mounting and rail mounting, terminals for cable diameter up to a maximum of 2.5 mm²



CMB 970, surface mounting, standing on circuit board, machine solderable and washable



CMB 976, surface mounting, lying on circuit board, machine solderable and washable



Scope of delivery

- 1 display counter

CMM 081/ 161/ 361

Electromechanical display counters

- 8-digit display counter without reset
- 6-digit display counter with manual or manual and electrical reset
- 12/24 VDC
- 24/115/230 VAC



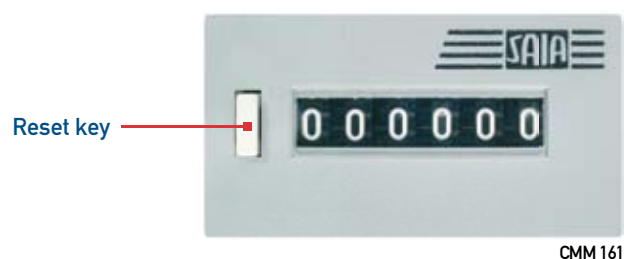
from left to right: CMM 361, CMM 161

		CMM 081		CMM 161			CMM 361		
Mounting	Surface mounting for DIN rail								
	Flush mounting	•	•	•	•	•	•	•	
	Machine solderable and washable, plugable on circuit board								
reset	without reset	•	•						
	with reset			•	•	•	•		
	manual and electrical reset						•	•	
	down counting, manual and electrical reset								
Counting capacity	99 999								
	999 999			•	•	•	•	•	
	9 999 999								
	99 999 999	•	•						
	99 999.99 h, decimal places red DC 999 999.99 h / AC 99 999.99 h decimal places res								
Counting frequency	max. 18 pulses/s	•		•	•	•	•		
	max. 25 pulses/s		•				•	•	
Connections	Strands 150 mm								
	Tags for push-on connectors 2.8 × 0.8 mm	•	•	•	•	•	•	•	
	Connection terminals 2 × 2.5 mm ²								
	Solder pins 0.4 × 1.2 mm								
	Round pins 1.5 mm								
Operating voltage	12 VDC								
	24 VDC		•				•		
	24 VAC			•					
	115 VAC				•				
	230 VAC	•				•		•	
Order no.		CMM081E1N4N0S00	CMM081M4N2N0S00	CMM161B4N4N0S00	CMM161D1N4N0S00	CMM161E1N4N0S00	CMM161M4N2N0S00	CMM361E1N4N0S00	CMM361M4N2N0S00

Applications

- Quantity counting
- Event counting

Settings



Technical data

Counting capacity	CMM 081 without reset 99999999	CMM 161 with manual reset 999999	CMM 361 manual and electrical reset 999999
Counting direction	adding		
Counting frequency	max. 25 i/s (DC) or 18 i/s (AC)		
Display	Dials, white figures on black background, approx. 4 mm		
Operating voltage	24 VDC \pm 10%, max. residual ripple 48% 24 VAC, 115 VAC, 230 VAC, \pm 10%		
Power consumption	Counting: 2 W (DC) or 3 VA (AC); electrical reset: 9 W (DC) or 12 AC)		
Duty cycle	Counting: 100%; electrical reset: 15%, max. 1 min		
Pulse generator	Contacts, electronic sensors NPN/PNP (AC)		
Service life	200 million. counting pulses		
EMC/immunity to interference	DIN IEC 61 000-6-2		
EMC/noise emission	DIN IEC 61 000-6-3		
Protection class	Front IP 40		
Ambient temperature	-10°C to +45°C, no condensation		
Mounting position	condensation		
Housing colour	Makrolon, similar to RAL 7001		
Dimensions	Front dimensions and switchboard section see dimension diagram		
Connections	Flat pin 0.8 \times 2.8 mm with plug-on connector		



CMM 081



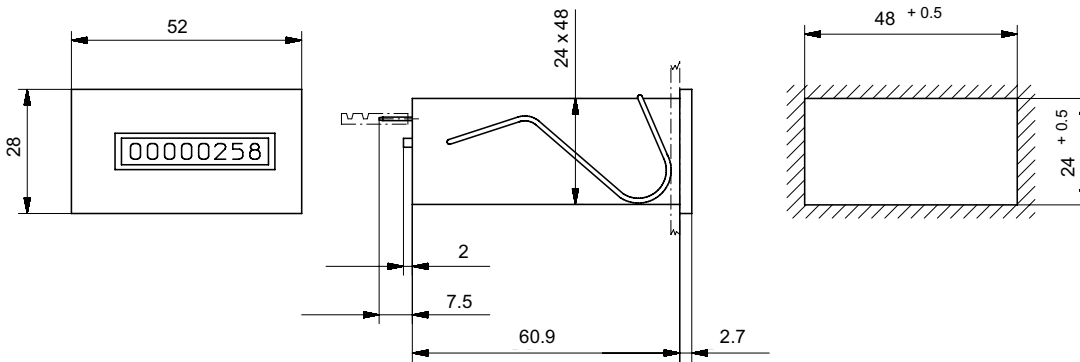
CMM 161



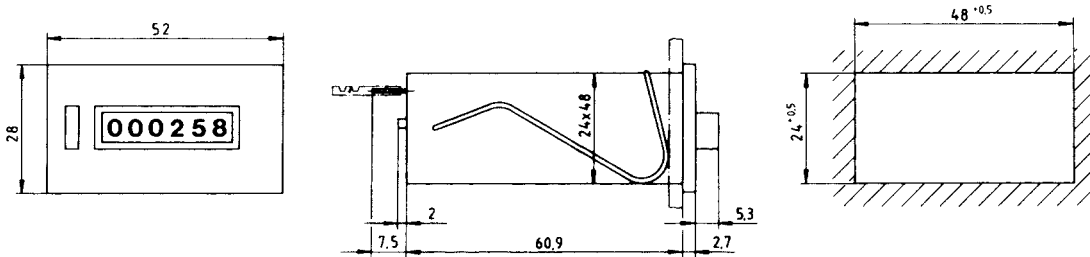
CMM 361

Dimension diagrams

CMM 081, flush mounting, without reset, flat pin 0.8×2.8 mm



CMM 161, flush mounting, manual reset, flat pin 0.8×2.8 mm
 CMM 361, flush mounting, manual and electrical reset, flat pin 0.8×2.8 mm



Scope of delivery

- 1 display counter
- 1 tension spring

CMC 072/079

Electromechanical hour meters

- 7-digit micro time meter, high shock resistance for flush mounting or DIN rail
- Low power consumption, small size, optically large figures
- 4.5...35 VDC, 110...130 VAC, 187...264 VAC



from left to right: CMC 072, CMC 079

		CMC 072		CMC 079	
Mounting	Surface mounting for DIN rail			•	•
	Flush mounting	•			
	Machine solderable and washable, pluggable on circuit board				
reset	without reset	•	•	•	•
	with reset				
	manual and electrical reset				
	down counting, manual and electrical reset				
Counting capacity	99 999				
	999 999				
	9999 999				
	99999 999				
	99999.99 h, decimal places red	•	•	•	•
	DC 999999.99 h / AC 99999.99 h decimal places red				
Connections	Strands 150 mm	•			
	Tags for push-on connectors 2.8 × 0.8 mm				
	Connection terminals 2 × 2.5 mm ²			•	•
	Solder pins 0.4 × 1.2 mm				
	Round pins 1.5 mm				
Operating voltage	4.5...35 VDC	•	•		
	100...130 VAC				•
	187...264 VAC			•	
Order no.		CMC072M4N0L0N00		CMC079M4N0L0N00	
				CMC079E1N0L0N00	
					CMC079D1N0L0N00

Applications

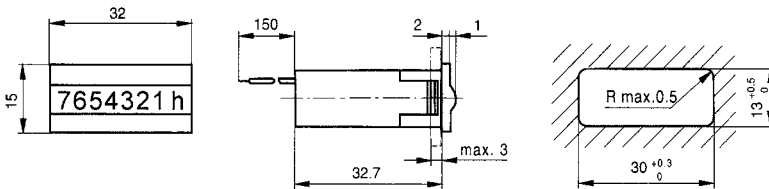
- General timing
- Applications in appliance technology (e. g. medical devices) and in industrial applications
- Flush mounting in control cabinets

Technical data

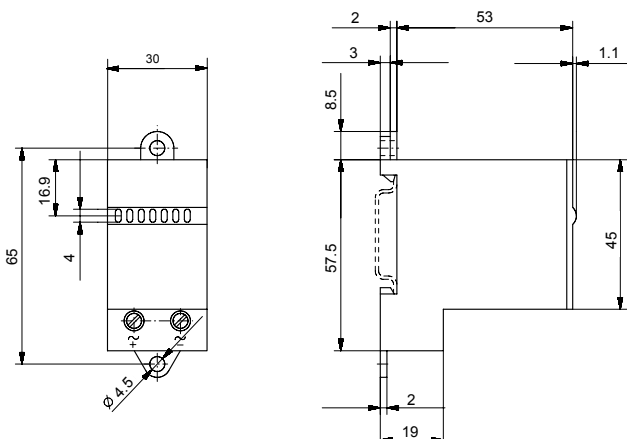
Counting capacity	99 999.99 h, decimal places red	
Accuracy	22.5 ppm at 25°C	
Display	Dials, white figures on black background, approx. 1.2 × 4 mm	
Operating voltage	4.5...35 VDC, residual ripple < 1%	
	100...130 VAC, 187...264 VAC	
Power consumption	CMC 072 / 079	CMC 079
	at $U_B = 5$ VDC typ. 82 mW	5 VDC, 125 mW
	at $U_B = 12$ VDC typ. 135 mW	
	at $U_B = 24$ VDC typ. 135 mW, max. 170 mW	
	(only every 36 s with a pulse length of 32 ms)	
Duty cycle	100%	
EMC/immunity to interference	DIN IEC 61 000-6-2	
EMC/noise emission	DIN IEC 61 000-6-3	
Protection class	Front IP 40 (CMC 079), front IP65 (CMC 072)	
Ambient temperature	CMC 072	CMC 079
	DC -10°C to +60°C, no condensation	DC -10°C to +60°C, no condensation
		AC -10°C to +50°C, no condensation
Mounting position	any	
Housing colour	Plastic PC (polycarbonate)	
Dimensions	Front dimensions and switchboard section see dimension diagram	
Connections	CMC 072	CMC 079
	Strands AWG 22, approx. 150 mm long	Screw terminal connection up to a maximum of 2.5 mm ²
	(red + / black -)	max. starting torque 0.8 Nm

Dimension diagrams

CMC 072, flush mounting, with mould stop springs, connection via strands 150 mm



CMC 079, surface mounting and rail mounting, terminals for cable diameter up to a maximum of 25 mm²



Scope of delivery

- 1 hour meter

CMT 072

Electromechanical hour meters

- 7 or 8-digit hour meter 48 × 24 mm
- Without reset, high shock resistance
- Small size, optically large figures
- IP 65 protection type from the front
- 10...30 VDC, 20...30 VAC, 187...264 VAC



		CMT 072		
Mounting	Surface mounting for DIN rail			
	Flush mounting	•	•	•
	Machine solderable and washable, plugable on circuit board			
reset	without reset	•	•	•
	with reset			
	manual and electrical reset			
	down counting manual and electrical reset			
Counting capacity	99 999			
	999 999			
	9999 999			
	99999 999			
	99999.99 h, decimal places red			
	DC 999999.99 h / AC 99999.99 h decimal places red	•	•	•
Connections	Strands 150 mm			
	Tags for push-on connectors 2.8 × 0.8 mm			
	Connection terminals max. 2.5 mm ²	•	•	•
	Solder pins 0.4 × 1.2 mm			
	Round pins 1.5 mm			
Operating voltage	10...30 VDC			•
	20...30 VAC		•	
	100...130 VAC			
	187...264 VAC	•		
Order no.		CMT072E1N0L0N00	CMT072G4N0L0N00	CMT072T5N0L0N00

Applications

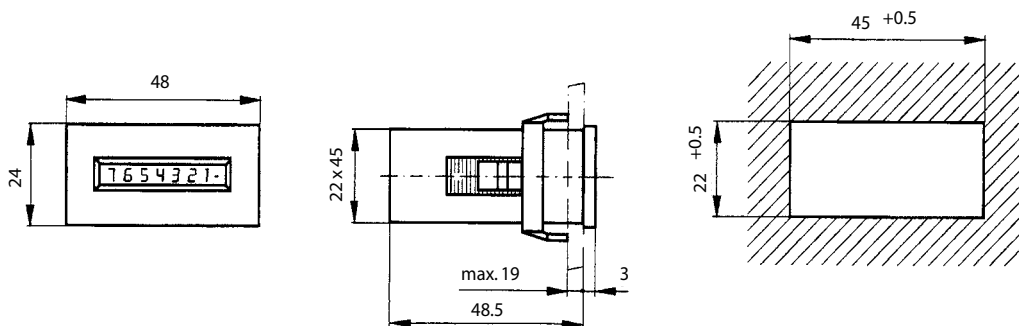
- General timing
- Maintenance intervals for measurement devices (artificial respiration, oxygen, dialysis)
- Small devices, display panels in vehicles

Technical data

Counting capacity	AC: 99999.99 h, decimal places red DC: 999999.99 h, decimal places red
Accuracy	AC: Mains frequency + 30 ms, DC < 0.003% (for 24 h)
Display	Dials, white figures on black background, approx. 1.8 × 4 mm
Operating voltage	10...30 VDC, 20...30 VAC; 187...264 VAC, 50 Hz
Power consumption	10...30 VDC, approx. 500 mW 20...30 VAC, 50 Hz, approx. 0.3 VA 187...264 VAC, 50 Hz, approx. 1.2 VA
Duty cycle	100%
EMC/immunity to interference	DIN IEC 61 000-6-2
EMC/noise emission	DIN IEC 61 000-6-3
Protection class	IP 65 from front in mounted condition
Ambient temperature	-10°C to +50°C, no condensation
Mounting position	any
Housing colour	Plastic PC (polycarbonate)
Dimensions	Front dimensions and switchboard section see dimension diagram
Connections	Screw terminal connection up to a maximum of 2.5 mm ² max. starting torque 0.8 Nm

Dimension diagrams

CMT 072, flush mounting, with tension spring, terminals for cable diameter up to a maximum of 2.5 mm²



Scope of delivery

- 1 hour meter

CMU 072

Electromechanical hour meters

- 7 or 8-digit hour meter 4
- Without reset, high shock resistance
- Small size, optically large figures
- IP 65 protection type from the front
- 10...30 VDC, 20...30 VAC, 100...130 VAC, 187...264 VAC



		CMU 072			
Mounting	Surface mounting for DIN rail				
	Flush mounting	•	•	•	•
	Machine solderable and washable, plugable on circuit board				
reset	without reset	•	•	•	•
	with reset				
	manual and electrical reset				
	down counting manual and electrical reset				
Counting capacity	99 999				
	999 999				
	9999 999				
	99999 999				
	99999.99 h, decimal places red				
	DC 999999.99 h / AC 99999.99 h decimal places red	•	•	•	•
Connections	Strands 150 mm				
	Tags for push-on connectors 2.8 × 0.8 mm				
	Connection terminals max. 2.5 mm ²	•	•	•	•
	Solder pins 0.4 × 1.2 mm				
	Round pins 1.5 mm				
Operating voltage	10...30 VDC				•
	20...30 VAC	•			
	100...130 VAC			•	
	187...264 VAC		•		
Order no.		CMU072B4N0L0N00	CMU072E1N0L0N00	CMU072J1N0L0N00	CMU072T5N0L0N00

Applications

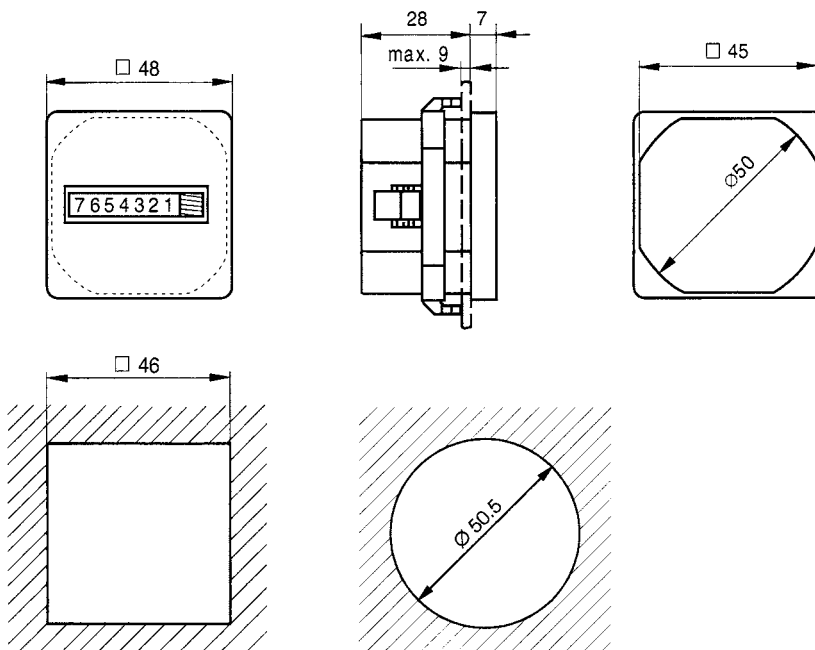
- General timing
- Maintenance intervals for measurement devices (artificial respiration, oxygen, dialysis)
- Small devices, display panels in vehicles

Technical data

Counting capacity	AC: 99999.99 h, decimal places red DC: 999999.99 h, decimal places red
Accuracy	AC: Mains frequency + 30 ms, DC < 0.003% (for 24 h)
Display	Dials, white figures on black background, approx. 1.8 × 4 mm
Operating voltage	10...30 VDC; 20...30 VAC, 50 Hz; 100...130 VAC, 50 Hz; 187...264 VAC, 50 Hz
Power consumption	10...30 VDC, ca. 500 mW 20...30 VAC, 50 Hz, ca. 0.3 VA 100...130 VAC, 50 Hz, ca. 0.6 VA 187...264 VAC, 50 Hz, ca. 1.2 VA
Duty cycle	100%
EMC/immunity to interference	DIN IEC 61 000-6-2
EMC/noise emission	DIN IEC 61 000-6-3
Protection class	up to IP 52, DIN 40 050 from the front
Ambient temperature	-15°C to +50°C, no condensation
Mounting position	any
Housing colour	Plastic PC (polycarbonate)
Dimensions	Front dimensions and switchboard section see dimension diagram
Connections	Screw terminal connection up to a maximum of 2.5 mm ² max. starting torque 0.8 Nm, cable entry from behind

Dimension diagrams

CMU 072, flush mounting, with tension spring, terminals for cable diameter up to a maximum of 2.5 mm²



Scope of delivery

- 1 hour meter

CMM 152/362

Electromechanical preset counters

- 5-digit adding (CMM 152 target or actual value) or 6-digit subtracting (CMM 362 Istwert) preset counter
- Reset manual or manual and electrical
- Potential-free change-over (micro switch) when reaching the preset
- Contact remains changed over until nil or reset performed
- 24 VDC, 115 VAC, 230 VAC

from left to right: CMM 362, CMM 152

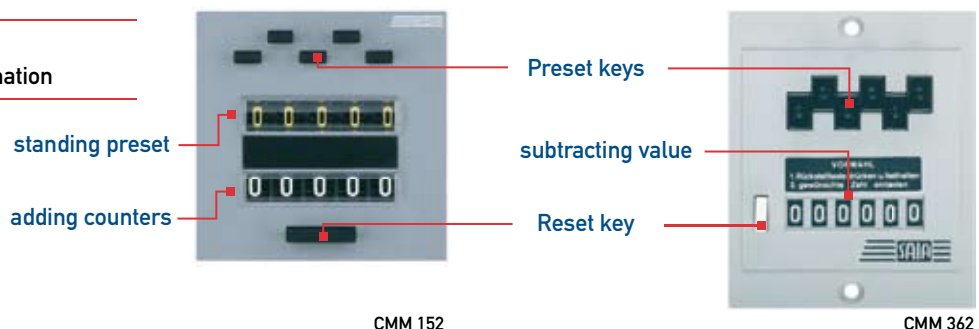


		CMM 152		CMM 362		
Mounting	Surface mounting for DIN rail					
	Flush mounting	•	•	•	•	•
	Machine solderable and washable, pluggable on circuit board					
reset	without reset					
	With reset	•	•			
	Manual and electrical reset					
Counting capacity	down counting, manual and electrical reset			•	•	•
	99 999	•	•			
	999 999			•	•	•
	9999 999					
	99999 999					
	99999.99 h, decimal places red					
Counting frequency	DC 999999.99 h / AC 99999.99 h decimal places red					
	max. 18 pulses/s	•		•	•	
Connections	max. 25 pulses/s		•			•
	Strands 150 mm					
	Tags for push-on connectors 2.8 x 0.8 mm			•	•	•
	Connection terminals 2 x 2.5 mm ²					
	Solder pins 0.4 x 1.2 mm					
Operating voltage	Round pins 1.5 mm	•	•			
	12 VDC					
	24 VDC		•			•
	24 VAC					
	115 VAC				•	
230 VAC	•		•			
Order no.		CMM152E1S4N0 V00	CMM152M4S2N0 V00	CMM362E1S4N0 V00	CMM362D1S4N0 V00	CMM362M4S2N0 V00

Applications

- Quantity counting
- Quantity counting and automation

Settings



CMM 152

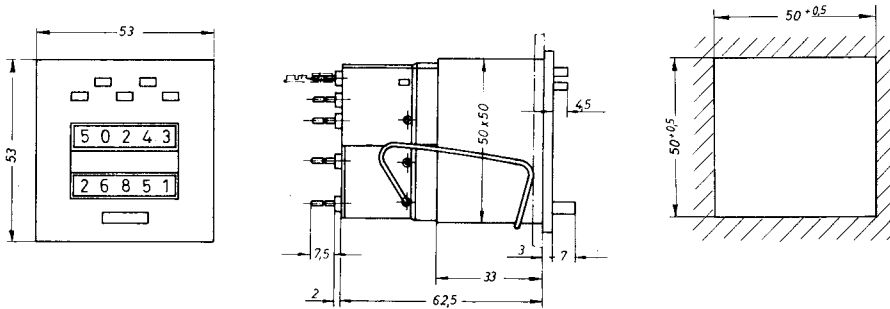
CMM 362

Technical data

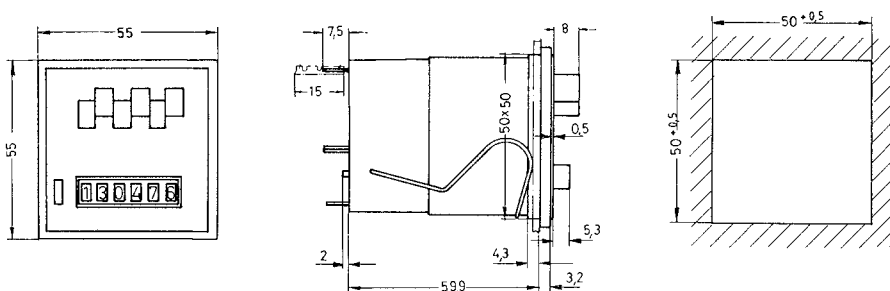
Counting capacity	CMM 152	CMM 362
	manual reset 99 999	manual and electrical reset 999 999
Counting direction	adding	subtracting
Counting frequency	max. 25 pulses/s (DC) or 18 pulses/s (AC)	
Display	Dials, white figures on black background, approx. 4 mm (optical)	
Operating voltage	24 VDC \pm 10%, max. residual ripple 48%	
	115 VAC, 230 VAC, \pm 10%	
Power consumption	CMM 152	CMM 362
	3 W (DC) or 3 AC	4 W (DC) or 4.5 AC
Duty cycle	Counting: 100%; electrical reset (CMM 362): 20%, max. 1 min	
Pulse generator	Contacts, electronic sensors NPN/PNP (AC)	
Service life	100 million. counting pulses	
EMC/immunity to interference	DIN IEC 61 000-6-2	
EMC/noise emission	DIN IEC 61 000-6-3	
Protection class	Front IP 40	
Ambient temperature	CMM 152	CMM 362
	DC -10°C to +60°C AC -10°C to +55°C, no condensation	-10°C to +45°C, no condensation
Mounting position	any	
Housing colour	Makrolon, similar to RAL 7001	
Dimensions	Front dimensions and switchboard section see dimension diagram	
Connections	CMM 152	CMM 362
	Round pins 1.5 mm diameter	Tags for push-on connectors 2.8 \times 0.8 mm

Dimension diagrams

CMM 152, flush mounting, manual reset, round pins 1.5 mm



CMM 362, flush mounting, manual reset and electrical reset, flat pin 0.8 \times 2.8 mm



Scope of delivery

- 1 Counters
- 1 tension spring

CXL 201

Electronic display counters

- Simple counter for quick and slow counting pulses, counting direction switchable via control input
- Battery-powered (lithium battery)
- Optional backlit display
- Resetkey lockable
- Screw terminal connection in 5 mm grid
- Suitable for counting pulses 10...260 VAC/DC



		CXL 201					
Mounting	Flush mounting	•	•	•	•	•	•
Input type	One-channel, adding or subtracting counting method	•	•	•	•	•	•
	With counting direction input			•	•	•	•
	One adding and subtracting counting input each (difference mode)						
	Phase discriminator for incremental shaft encoder with single analysis						
	Phase discriminator for incremental shaft encoder with double analysis						
Display	Standard LCD display		•		•		•
	Display backlight	•		•		•	
Counting inputs	NPN			•	•		
	PNP/NPN					•	•
	Control for 10...260 VAC/DC	•	•				
Order no.		CXL201VGL	CXL201VGN	CXL201VHL	CXL201VHN	CXL201VKL	CXL201VKN

Applications

- Simple quantity counting through voltage pulses or potential-free contacts
- High-voltage versions as replacement for electromechanical counters (counting of relays, activation cycles of engines)

Settings



Reset key, lockable

Technical data

Power supply	internal lithium battery: approx. approx. 8 years at 20°C
Display backlight*	external power supply 24 VDC +/-20%, 50 mA
Display	LCD, 8-digit, 8 mm high
Operating modes	adding and subtracting (selectable)
Counting display	-9 99 99 99...99 99 99 99, overflow is displayed
reset	manual, lockable and electrical
Standards	IEC 55011 class B, IEC 61 000-6-2 IEC 61 010 part 1 (for AC versions only)
Housing	dark grey RAL 7021
Working temperature	-10°C to +55°C, no condensation
Operating temperature	-10°C to +60°C, no condensation
Storage temperature	-20°C to +70°C
Protection type	IP 65 front
Dimensions	Front dimensions and switchboard section see dimension diagram

* only for VGL, VHL and VKL types

Counting inputs

Counting input of the DC devices (max. 30 VDC)

Slowest counting input	max. 30 Hz (NPN)
Fast counting input	max. 12 kHz (PNP), 7 kHz (NPN)
Switching level	NPN: Low 0...0.7 VDC, High 3...30 VDC PNP: Low 0...0.7 VDC, High 4...30 VDC

Counting inputs of high-voltage devices (10...260 VDC/AC)

Counter input	Optocoupler input, max. 30 Hz Minimum pulse time: 16 ms
Switching level	Low 0...2 VDC/AC, High 10...260 VDC/AC

Counting direction change-over (for DC devices only)

Counting mode	s. table
Contact input	Open collector (NPN switching after 0 V)
Switching level	NPN: Low 0...0.7 VDC, High 3...5 VDC

Reset input (for DC and high voltage)

Minimum pulse time	DC: 50 ms, high voltage 16 ms
DC contact input	NPN: Low 0...0.7 VDC, High 3...30 VDC
High-voltage input	10...260 VDC/AC

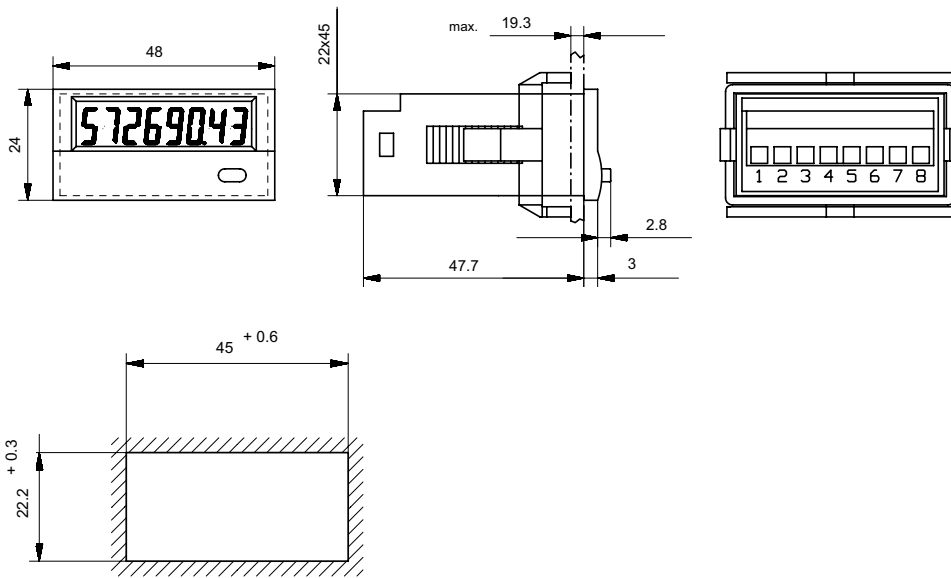
Electrical locking of the reset key (for DC and AC)

Contact input	Open collector NPN (switching after 0 V)
Switching level	NPN: Low 0...0.7 VDC, High 3...5 VDC

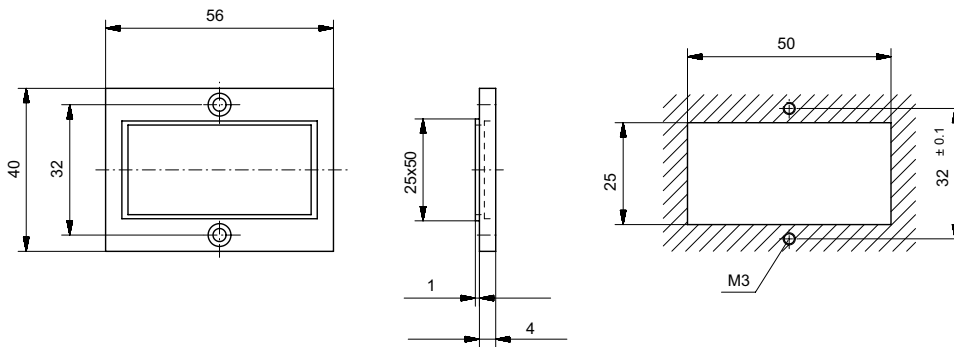
Type CXL201...	Input type	Counting inputs							
		INP A				INP B			
...VHN, ...VHL	One-channel, adding or subtracting counting method	0...0.7 Vdc	counting	NPN	7 kHz	0...0.7 VDC	counting	NPN	30 Hz
...VKN, ...VKL		4...30 VDC	counting	PNP	12 kHz	0...0.7 VDC	counting	NPN	30 Hz
...VGN, ...VGL		10...260 VAC/DC	counting	AC/DC	30 Hz	10...260 VAC/DC	reset	AC/DC	16 ms

Dimension diagrams

Dimensions



Dimensions for mounting frames (included in scope of delivery)



Scope of delivery

- Counters
- Clamping springs
- Front frames for screw mounting (56 × 40 mm), mounting diameter 50 × 25 mm
- Sealing
- Instruction manual

CXL 211/261

Electronic display counters

- Simple up/down counter through counting direction input or differential inputs
- Battery-powered (lithium battery)
- Optional backlit display
- Reset key lockable
- Screw terminal connection in 5 mm grid
- Suitable for counting pulses 10...260 VAC/DC



		CXL 211				CXL 261			
Mounting	Flush mounting	•	•	•	•	•	•		
Input type	One-channel counting method with counting direction input			•	•	•	•		
	One adding and subtracting counting input each (difference mode)	•	•	•	•	•	•		
	Phase discriminator for incremental shaft encoder with single analysis								
	Phase discriminator for incremental shaft encoder with double analysis								
Display	Standard LCD display		•	•	•	•	•		
	Display backlight	•		•	•	•	•		
Counting inputs	NPN			•	•				
	PNP/NPN					•	•		
	Control for 10...260 VAC/DC	•	•			•	•		
Order no.		CXL211VGL	CXL211VGN	CXL211VHL	CXL211VHN	CXL211VJL	CXL211VJN	CXL261VGL	CXL261VGN

Applications

- Simple quantity counting through voltage pulses or potential-free contacts
- High-voltage versions as replacement for electromechanical counters (counting of relays, activation cycles of engines)
- Simple position display

Settings



Reset key,
lockable

Technical data

Power supply	internal lithium battery: approx. 8 years at 20°C
Display backlight*	external power supply 24 VDC +/-20%, 50 mA
Display	LCD, 8-digit, 8 mm high
Operating modes	adding and subtracting (selectable), differential counting
Counting display	-9 99 99 99...99 99 99 99, overflow is displayed
reset	manual, lockable and electrical
Standards	IEC 55011 class B, IEC 61 000-6-2 IEC 61 010 part 1 (for AC versions only)
Housing	dark grey RAL 7021
Working temperature	-10°C to +55°C, no condensation
Operating temperature	-10°C to +60°C, no condensation
Storage temperature	-20°C to +70°C
Protection type	IP 65 front
Dimensions	Front dimensions and switchboard section see dimension diagram

* only for VGL, VHL and VJL types

Counting inputs

Counting inputs of the DC devices (max. 30 VDC)

Slowest counting input	max. 30 Hz (NPN)
Fast counting input	max. 12 kHz (PNP), 7 kHz (NPN)
Switching level	NPN: Low 0...0.7 VDC, High 3...30 VDC PNP: Low 0...0.7 VDC, High 4...30 VDC

Counting inputs of the high-voltage devices (10...260 VDC/AC)

Counter input	Optocoupler input, max. 30 Hz Minimum pulse time: 16 ms
Switching level	Low 0...2 VDC/AC, High 10...260 VDC/AC

Operating mode change-over (for DC devices only)

Operating mode	see table, counting direction and difference Difference
Contact input	Open collector (NPN switching after 0 V)
Switching level	NPN: Low 0...0.7 VDC, High 3...5 VDC

Reset input (for DC and high voltage)

Minimum pulse time	DC: 50 ms, high voltage 16 ms
DC contact input	NPN: Low 0...0.7 VDC, High 3...30 VDC

Electrical locking of the reset key (for DC and AC)

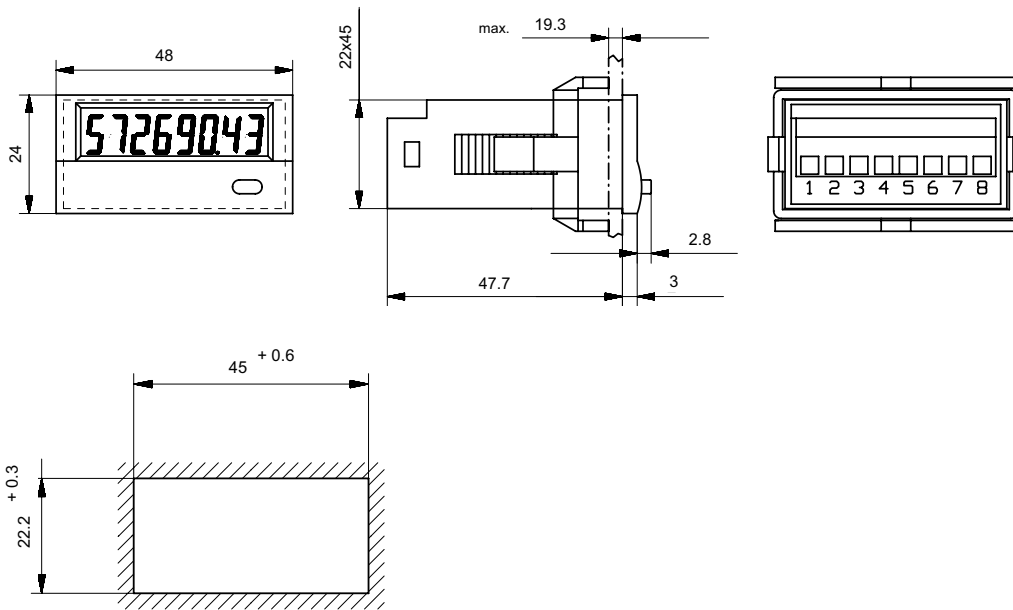
Contact input	Open collector NPN (switching after 0 V)
Switching level	NPN: Low 0...0.7 VDC, High 3...5 VDC

Type	Input type	Counting inputs							
		INP A				INP B			
CXL211...									
...VHN, ...VHL	Counting direction/ difference	0...0.7 VDC	counting	NPN	7 kHz	0...0.7 VDC	counting/ direction	NPN	7 kHz
...VJN, ...VJL	Counting direction/ difference	4...30 VDC	counting	PNP	12 kHz	4...30 VDC	counting/ direction	PNP	12 kHz
...VGN, ...VGL	Difference	10...260 VAC/DC	counting	AC/DC	30 Hz	10...260 VAC/DC	counting	AC/DC	30 Hz

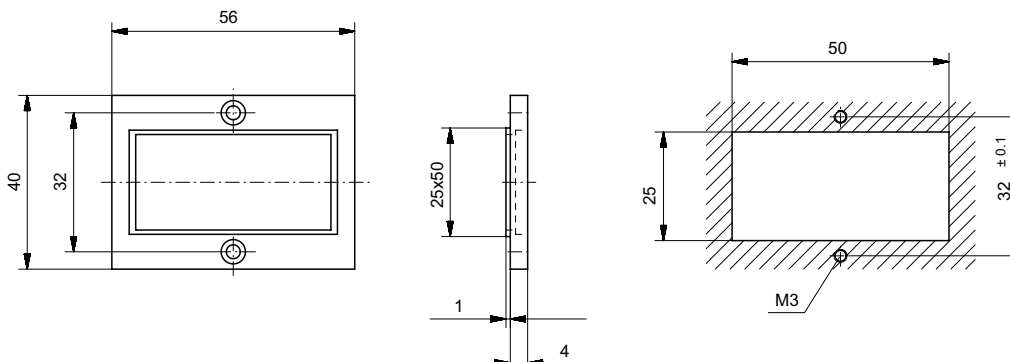
Type	Input type	Counting inputs							
		INP A				INP B			
CXL261...									
...VGN, ...VGL	Counting direction	10...260 VAC/DC	direction	AC/DC	30 Hz	10...260 VAC/DC	counting	AC/DC	30 Hz

Dimension diagrams

Dimensions



Dimensions for mounting frames (included in scope of delivery)



Scope of delivery

- Counters
- Clamping springs
- Front frames for screw mounting (56 × 40 mm), mounting diameter 50 × 25 mm
- Sealing
- Instruction manual

Technical data

Power supply	internal lithium battery: approx. 8 years at 20°C
Display backlight*	external voltage supply 24 VDC +/-20%, 50 mA
Display	LCD, 8-digit, 8 mm high
Operating modes	Phase discriminator, single or double analysis selectable
Counting display	-9 99 99 99...99 99 99 99, overflow is displayed
reset	manual, lockable and electrical
Standards	IEC 55011 class B, IEC 61 000-6-2 IEC 61010 part 1 (for AC versions only)
Housing	dark grey RAL 7021
Working temperature	-10°C to +55°C, no condensation
Operating temperature	-10°C to +60°C, no condensation
Storage temperature	-20°C to +70°C
Protection type	IP 65 front
Dimensions	Front dimensions and switchboard section see dimension diagram

* only for VHL and VJL types

Counting inputs

Counting input of the DC devices (max. 30 VDC)

Fast counting input	max. 6 kHz (PNP), 3 kHz (NPN)
Switching level	NPN: Low 0...0.7 VDC, High 3...30 VDC PNP: Low 0...0.7 VDC, High 4...30 VDC

Change-over

Single or double analysis

Contact input	Open collector (NPN switching after 0 V)
Switching level	NPN: Low 0...0.7 VDC, High 3...5 VDC

Reset input

Minimum pulse time	DC: 50 ms, high voltage 16 ms
DC contact input	NPN: Low 0...0.7 VDC, High 3...30 VDC

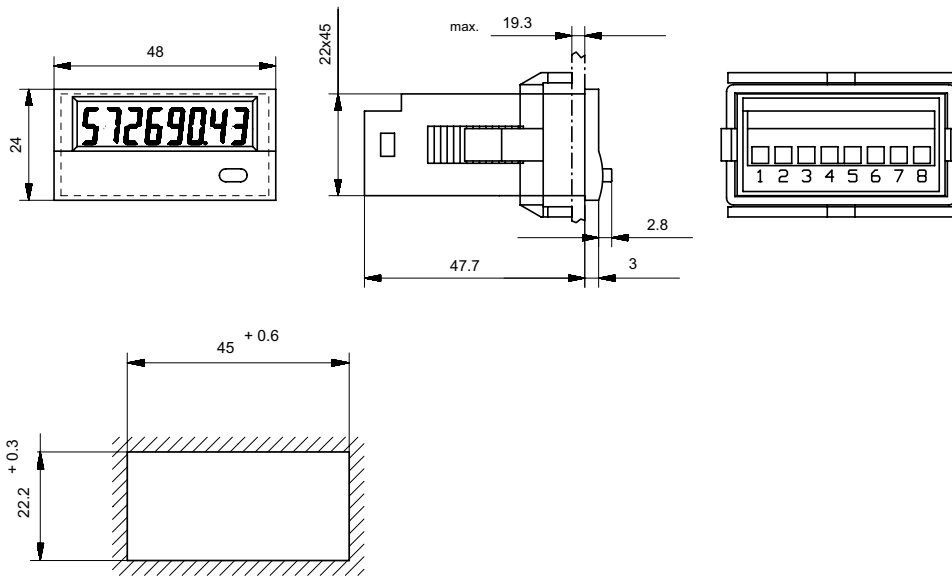
Electrical locking of the reset key (for DC and AC)

Contact input	Open collector NPN (switching after 0 V)
Switching level	NPN: Low 0...0.7 VDC, High 3...5 VDC

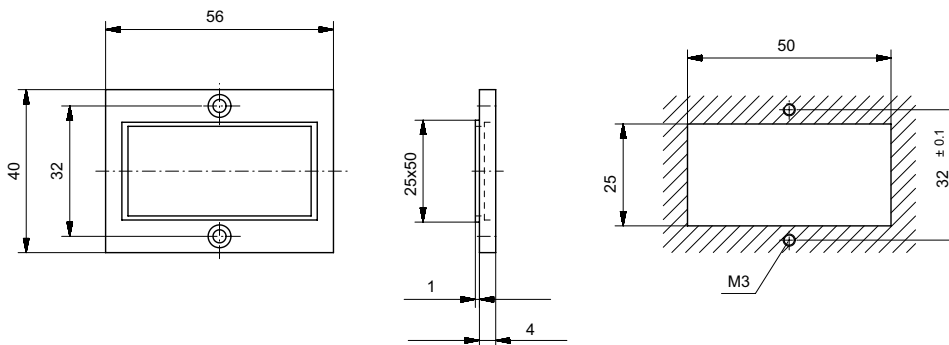
Type	Input type	Counting inputs							
		INP A				INP B			
...VHN, ...VHL	single or double analysis selectable	0...0.7 Vdc	Channel A	NPN	3 kHz	0...0.7 Vdc	Channel B	NPN	3 kHz
...VJN, ...VJL		4...30 Vdc	Channel A	PNP	6 kHz	4...30 Vdc	Channel B	PNP	6 kHz

Dimension diagrams

Dimensions



Dimensions for mounting frames (included in scope of delivery)



Scope of delivery

- Counters
- Clamping springs
- Front frames for screw mounting (56 × 40 mm), mounting diameter 50 × 25 mm
- Sealing
- Instruction manual

Technical data

Power supply	10...30 VDC with integrated reverse voltage protection
Current consumption	max. 50 mA
Display	6-digit red, 7-segment LED display, 8 mm high
Data protection	EEPROM
Counting display	see overview (display range)
reset	manual and electrical (lockable)
Standards	IEC 61000-6-4/IEC 55011 class B IEC 61000-6-2
EMC	CE-compliant with EU Directive 89/36/EC
Housing	dark grey RAL 7021
Ambient temperature	-20°C to +65°C for 10...26 VDC, -20°C to +55°C for 26...30 VDC, no condensation
Storage temperature	-25°C to +70°C
Protection type	IP 65 front
Dimensions	Front dimensions and switchboard section see dimension diagram

Counting inputs

Inputs

Polarity of inputs	NPN or PNP programmable for all inputs
Counting frequency	max.. 60 kHz, can be reduced to 30 Hz (position display max. 25 kHz)
Input resistance	approx. 5 k Ω
Switching level	Low: $0...0.2 \times U_B$ (VDC), High: $0.6 \times U_B...30$ VDC
Reset input	min. 5 ms

Outputs

Optocoupler	max. 30 VDC, 10 mA
-------------	--------------------

Pulse counter (CXG201)

Display range	0...999 999, decimal space 0.0...0.000
---------------	--

Pulse counter and position display (CXG211 U, CXG212)

Display range	-199 999...999 999, decimal space 0.0...0.000
Display scaling	Divisor: 0 - 99.9999, multiplier: 0 - 99.9999

Frequency display (CXG221)

Display range	0...999 999, decimal space 0.0...0.000
Display scaling	Divisor: 0 - 99.9999, multiplier: 0 - 99.9999
Display unit	1/min, 1/sec, period duration principle > 38 Hz, gate time measurement principle < 38 Hz

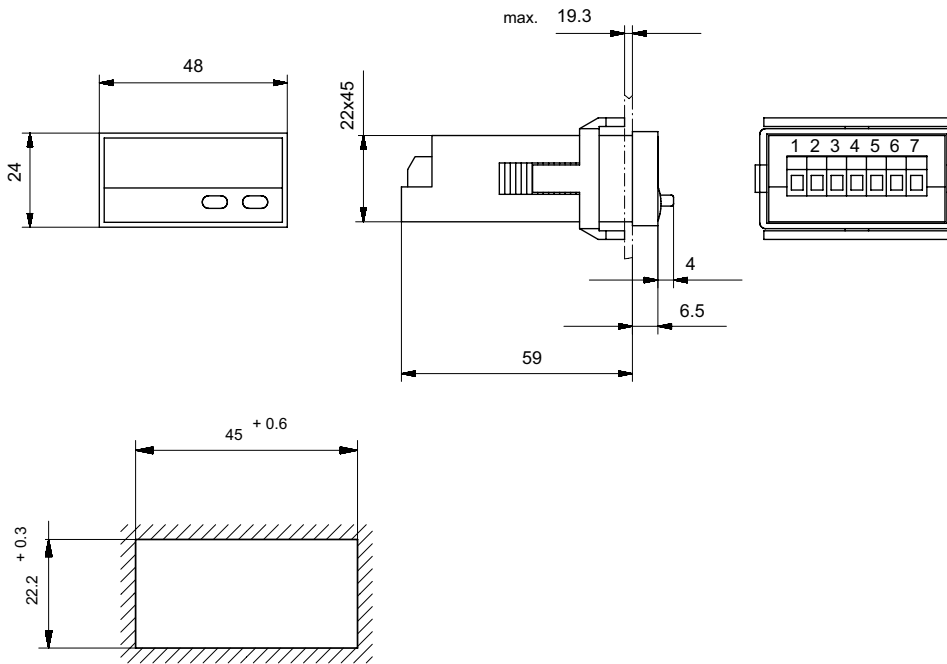
Hour meter (CXG213)

Display range	0...999 999, decimal space 0.0...0.000 (determines the resolution of the time range)
Time range	Hrs. mins or sec and hh.mm.ss
Resolution	1 ms

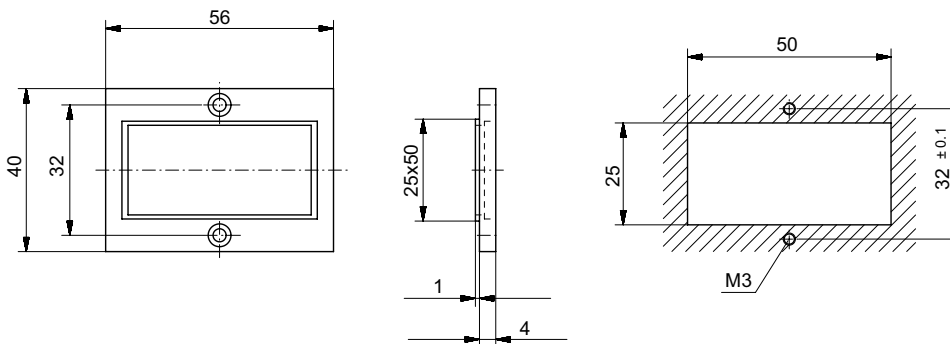
Various measurement types of timing (pulse widths and period duration)

Dimension diagrams

CXG 201, 211, 212, 221, 231



Dimensions for mounting frames (included in scope of delivery)



Scope of delivery

- Digital display
- Clamping springs
- Front frames for clamping spring mounting for mounting diameter 50 × 25 mm
- Sealing
- Instruction manual

Technical data

Power supply	internal lithium battery: approx. 8 years at 20°C
Display backlight*	external voltage supply 24 VDC +/-20%, 50 mA
Display	LCD, 8-digit, 8 mm high
Counting direction	adding
Display range	see table
reset	manual, lockable and electrical
Standards	IEC 55011 class B, IEC 61 000-6-2 IEC 61 010 part 1 (for AC versions only)
Housing	dark grey RAL 7021
Working temperature	-10°C to +55°C, no condensation
Operating temperature	-10°C to +60°C, no condensation
Storage temperature	-20°C to +70°C
Protection type	IP 65 front
Dimensions	Front dimensions and switchboard section see dimension diagram

* only for VGL, VHL and VJL types

Counting inputs

Start input of DC devices input B

Switching level	NPN: Low 0...0.7 VDC, High 3...30 VDC PNP: Low 0...0.7 VDC, High 4...30 VDC
Counting start	NPN: when low signal is on timer input PNP: when high signal is on timer input

Start input of high-voltage devices input A

	Optocoupling input Minimum pulse time: 16 ms
Switching level	Low 0...2 VDC/AC, High 10...260 VDC/AC
Counting start	when high signal is on timer input

Change-over of the counting ranges

Counting mode	see table
Contact input	Open collector (NPN switching after 0 V)
Switching level	NPN: Low 0...0.7 VDC, High 3...5 VDC

Reset input (for DC and high voltage)

Minimum pulse time	DC: 50 ms, high voltage 16 ms
DC contact input	NPN: Low 0...0.7 VDC, High 3...30 VDC
High-voltage input	10...260 VDC/AC

Electrical locking of the reset key (for DC and AC)

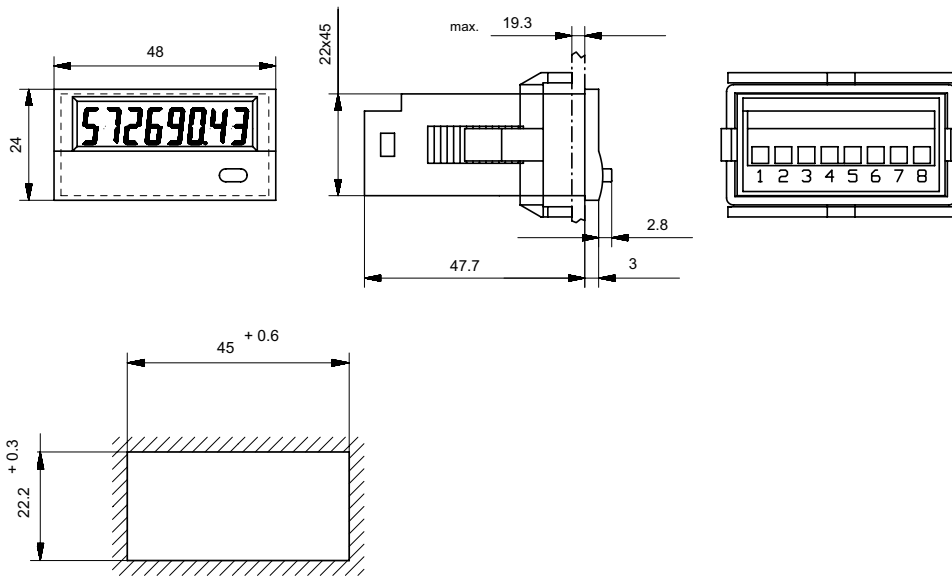
Contact input	pen collector (NPN switching after 0 V)
Switching level	NPN: Low 0...0.7 VDC, High 3...5 VDC

Type	Operating mode	Time range	Counting inputs					
			INP A			INP B		
...VHN, ...VHL	Timer	99999 h 59m/ 99999.99 h				0...0.7 VDC	Timing	NPN
...VJN, ...VJL	Timer					4...30 VDC	Timing	PNP
...VGN, ...VGL	Timer		10...260 VAC/DC	Timing	AC/DC	10...260 VAC/DC	reset	AC/DC

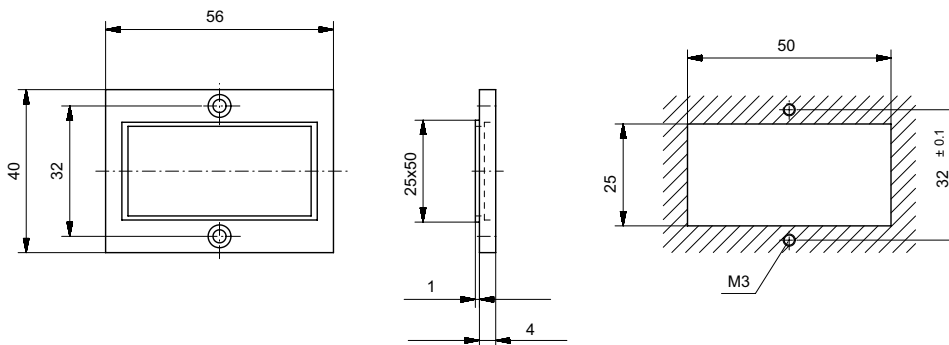
Type	Operating mode	Time range	Counting inputs					
			INP A			INP B		
...VHN, ...VHL	Timer	9999 h 59m 59s/ 9999999.9s				0...0.7 VDC	Timing	NPN
...VJN, ...VJL	Timer					4...30 VDC	Timing	PNP
...VGN, ...VGL	Timer		10...260 VAC/DC	Timing	AC/DC	10...260 VAC/DC	reset	AC/DC

Dimension diagrams

Dimensions



Dimensions for mounting frames (included in scope of delivery)



Scope of delivery

- Counters
- Clamping springs
- Front frames for screw mounting (56 × 40 mm), mounting diameter 50 × 25 mm
- Sealing
- Instruction manual

Technical data

Power supply	internal lithium battery: approx. 8 years at 20°C
Display backlight*	external voltage supply 24 VDC +/-20%, 50 mA
Display	LCD, 8-digit, 8 mm high
Resolution	1/sec (1 Hz)
Counting display	0...99999999
Standards	IEC 55011 class B, IEC 61 000-6-2 IEC 61 010 part 1 (for AC versions only)
Housing	dark grey RAL 7021
Working temperature	-10°C to +55°C, no condensation
Operating temperature	-10°C to +60°C, no condensation
Storage temperature	-20°C to +70°C
Protection type	IP 65 front
Dimensions	Front dimensions and switchboard section see dimension diagram

* only for VHL and VJL types

Counting inputs

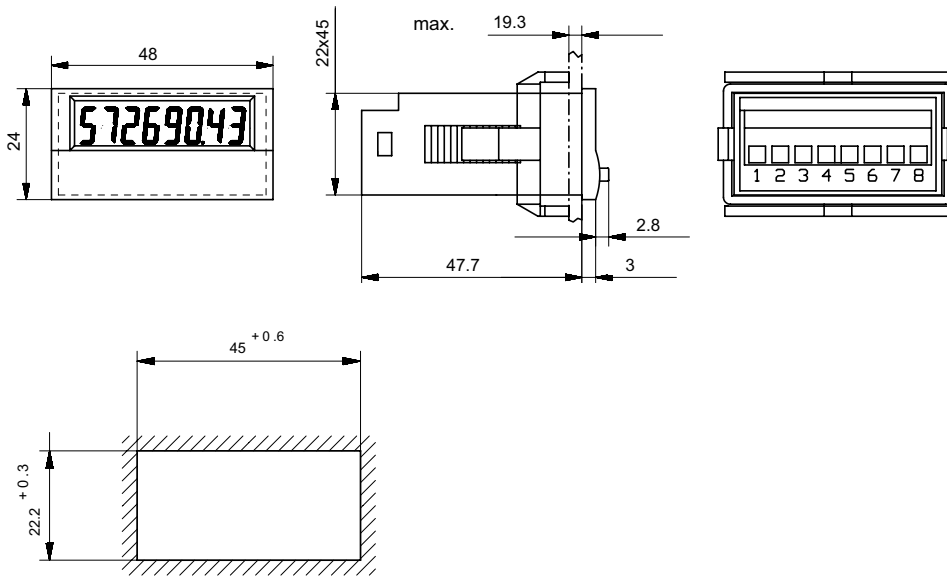
Counting input of the DC devices (max. 30 VDC)

Slowest counting input	max. 30 Hz (NPN or PNP)
Fast counting input	max. 12 kHz (PNP), 7 kHz (NPN)
Switching level	NPN: Low 0...0.7 VDC, High 3...30 VDC PNP: Low 0...0.7 VDC, High 4...30 VDC

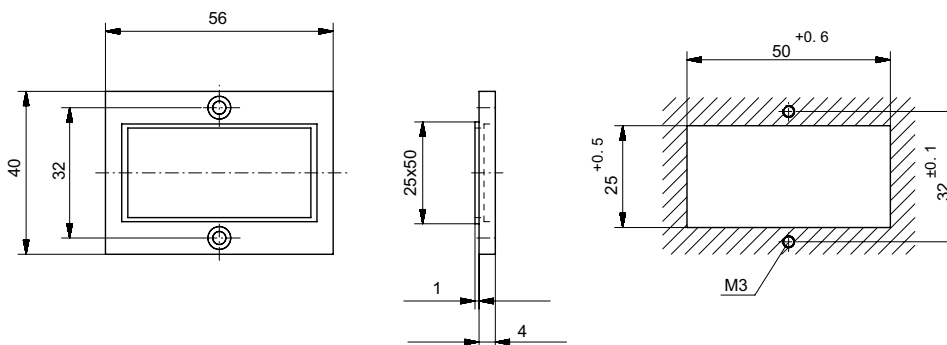
Type	Input type	Counting inputs							
		INP A				INP B			
...VHN, ...VHL	Tachometers	0...0.7 VDC	counting	NPN	7 kHz	0...0.7 VDC	counting	NPN	30 Hz
...VJN, ...VJL		4...30 VDC	counting	PNP	12 kHz	0...0.7 VDC	counting	PNP	30 Hz

Dimension diagrams

Dimensions



Dimensions for mounting frames (included in scope of delivery)



Scope of delivery

- Counters
- Clamping springs
- Front frames for screw mounting (56 × 40 mm), mounting diameter 50 × 25 mm
- Sealing
- Instruction manual

CXG 301

Double function counters for pulses, frequency and time

- Pulse counting with 2 areas or pulse and frequency counting or time and impulse counting or time meter with 2 areas
- Supply voltage 10...30 VDC
- Programmable using 2 large keys
- Multiplication and division factor for scalable display
- Max. counting frequency up to 60 kHz



		CXG 301
Mounting	Flush mounting	•
Function	Pulse and frequency display	•
	2 pulse displays for overall and partial quantities	•
	Pulse and time meters	•
	2 time meters for overall and partial quantities	•
Display range	0...999 999	•
Counting inputs	NPN	•
	PNP	•
Order no.		CXG301M4N

Applications

- Production data recording with overall number of items and production speed
- Throughput recording for current throughput and overall quantity
- Recording of the ordered and overall number of items or daily and overall quantity
- Order time and total time monitoring
- Recording of maintenance intervals and overall time
- Item and time counting, journey counting, operating timing of lifts

Settings



Reset key/
Location selection

Programming key

Technical data

Power supply	10...30 VDC with integrated reverse voltage protection.
Current consumption	max. 40 mA
Display	6-digit red, 7-segment LED display, 8 mm high
Data protection	EEPROM
Counting display	0...999 999
reset	manual, lockable and electrical
Standards	IEC 61 000-6-4/IEC 55011 class B IEC 61 000-6-2
EMC	CE-compliant with EU Directive 89/36/EC
Housing	dark grey RAL 7022
Ambient temperature	-20°C to +65°C for 10...26 VDC, -20°C to +55°C for 26...30 VDC, no condensation
Storage temperature	-25°C to +70°C
Protection type	IP 65 front
Dimensions	Front dimensions and switchboard section see dimension diagram

Counting inputs

Inputs

Polarity of inputs	NPN or PNP programmable for all inputs
Counting frequency	max.. 60 kHz, can be reduced to 30 Hz
Input resistance	approx. 5 k Ω
Switching level	Low: 0...0.2 \times U _B (VDC), High: 0.6 \times U _B ...30 VDC
Reset input	min 5 ms

Pulse counting

Display range	0...999 999, decimal space 0.0...0.000
Display scaling	Divisor: 0 - 99.9999, multiplier: 0 - 99.9999

Frequency counting

Display range	0...999 999, decimal space 0.0...0.000
Display scaling	Divisor: 0 - 99.9999, multiplier: 0 - 99.9999
Display unit	1/min, 1/sec, period duration measurement principle

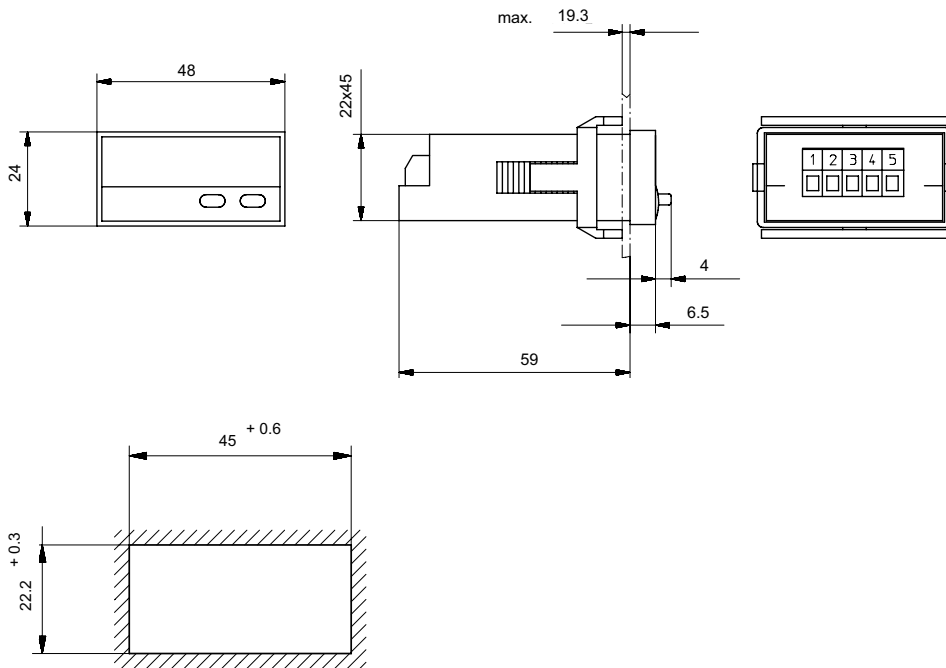
Operating hours counting

Display range	0...999 999, decimal space 0.0...0.000 (determines the resolution of the time range)
Time range	Hrs, mins or sec and hh.mm.ss
Resolution	1 ms

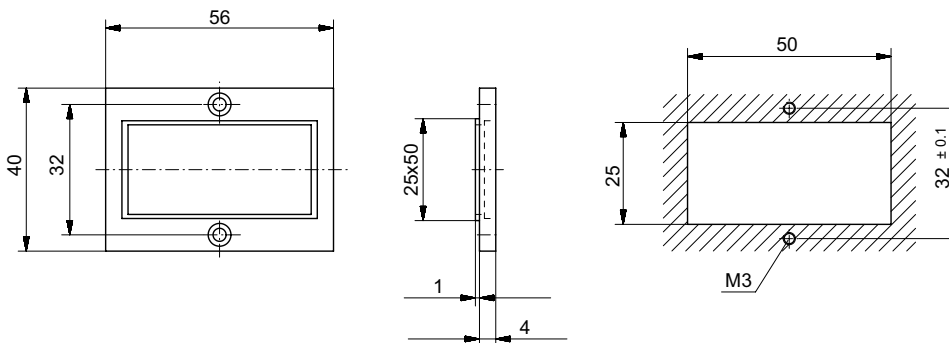
Various measurement types of timing (pulse widths and period duration)

Dimension diagrams

Dimensions



Dimensions for mounting frames (included in scope of delivery)



Scope of delivery

- Digital display
- Clamping springs
- Front frames for clamping spring mounting for mounting diameter 50 × 25 mm
- Sealing
- Instruction manual

CXG 291

Process display for standard analogue signals

- Galvanically separated current and voltage input
- Automatic min.-/max. recording
- Freely definable characteristic line ends
- Supply voltage 10...30 VDC, galvanically separated
- Input for 0/2...10 VDC and 0/4...20 mA
- Programmable using 2 large keys



		CXG 291
Mounting	Flush mounting	•
Function	Power entry 0...20 mA	•
	Power entry 4...20 mA	•
	Voltage entry 0...10 Vdc	•
	Voltage entry 2...20 Vdc	•
Display range	19.999...99 999 freely programmable	•
	Min/max value display	•
Order no.		CXG291M4N

Applications

- Display of standard signals, e.g. speeds, throughputs, voltages, currents, pressures, temperatures
- Positions of valve and exhaust throttle valve drive
- Volume display

Settings



Reset key/
Location selection

Programming key

Technical data

Power supply	10...30 VDC with integrated reverse voltage protection, galvanically separated
Current consumption	max. 50 mA
Display	5-digit red, 7-segment LED display, 8 mm high
Data protection	EEPROM
Counting display	-19,999...99 999
Standards	IEC 61000-6-4/IEC 55011 class B IEC 61000-6-2
EMC	CE-compliant with EU Directive 89/36/EC
Housing	dark grey RAL 7021
Ambient temperature	-10°C to +50°C, no condensation
Storage temperature	-25°C to +70°C
Protection type	IP 65 front
Dimensions	Front dimensions and switchboard section see dimension diagram

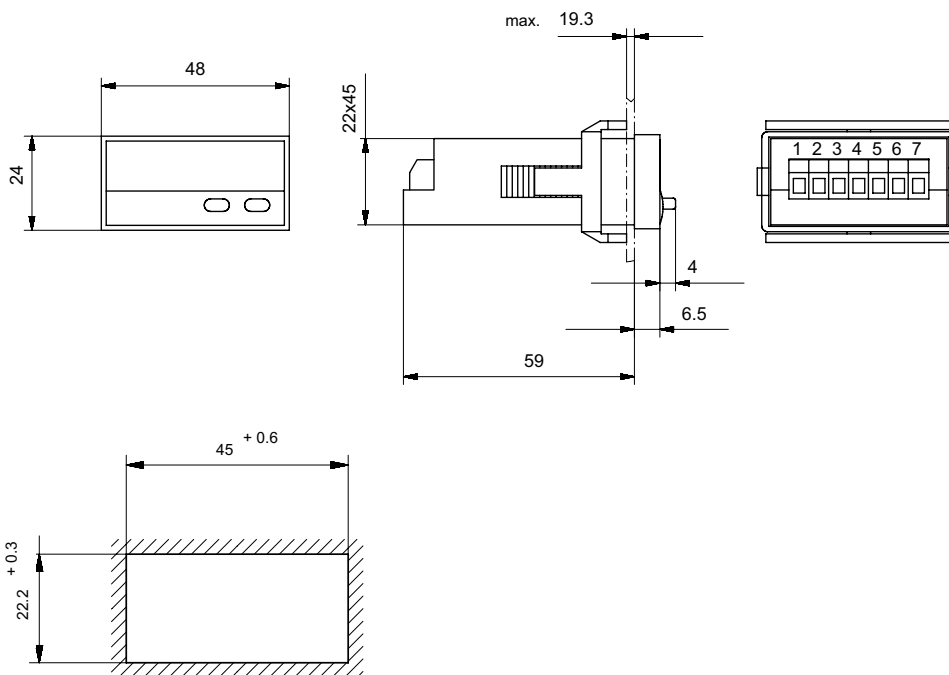
Counting inputs

Inputs

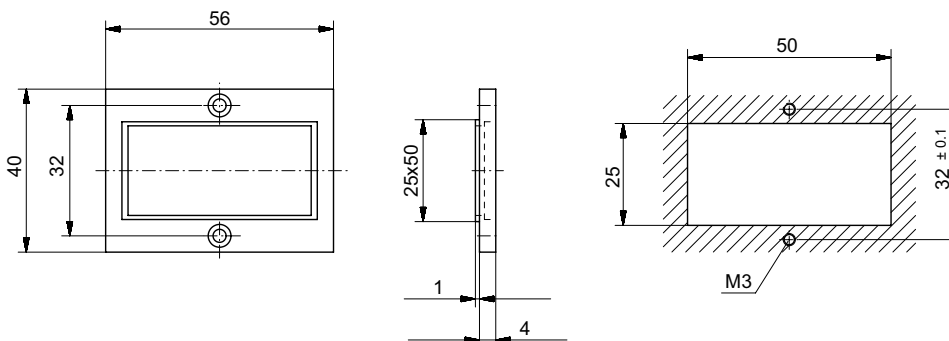
Input power measurement	0...20 mA, 4...20 mA, voltage loss max. 1,5 VDC
Input Voltage measurement	0...10 VDC, 2...10 VDC, input resistance approx. 1 M Ω max. input voltage 30 VDC
Control input	High: 4...30 VDC, Low: 0...2 VDC
Resolution	14 bit
Accuracy	>0.1% of the entire measurement range at an ambient temperature of 20°C
Temperature drift	<70 ppm/K _{environment}
Measurement rate	approx. 2 measurement per sec

Dimension diagrams

Dimensions



Dimensions for mounting frames (included in scope of delivery)



Scope of delivery

- Digital display
- Clamping springs
- Front frames for clamping spring mounting for mounting diameter 50×25 mm
- Sealing
- 1 set of self-adhesive symbols
- Instruction manual

CXM 201/211

Temperature display for Pt/Ni 100 and thermo elements J, K and N

- Input for Pt/Ni 100, galvanically separated (CXM 201)
- Input for J, K, N thermo elements, galvanically separated (CXM 211)
- Supply voltage 10...30 VDC, galvanically separated
- Programmable using 2 large keys
- Defined characteristic line
- Automatic minimum-/ maximum recording



		CXM 201	CXM 211
Mounting	Flush mounting	•	•
Function	Input for resistance thermometers Pt/Ni 100	•	
	Input for J, K, N thermo elements		•
	Correction over the entire measurement area	•	
	External/internal reference point compensation		•
Display range	Temperature display in °C or °F with 1 or 2 decimal spaces	•	•
	Min/max value display	•	•
	Order no.	CXM201M4N	CXM211M4N

Applications

- Temperature display and monitoring
 - Switching cabinet cooling
 - Bakery systems
 - Drying systems/Ovens
 - Packaging machines
 - Tool and plastic processing machines
 - Chemistry and pharmacy systems

Settings



Reset key/point selection

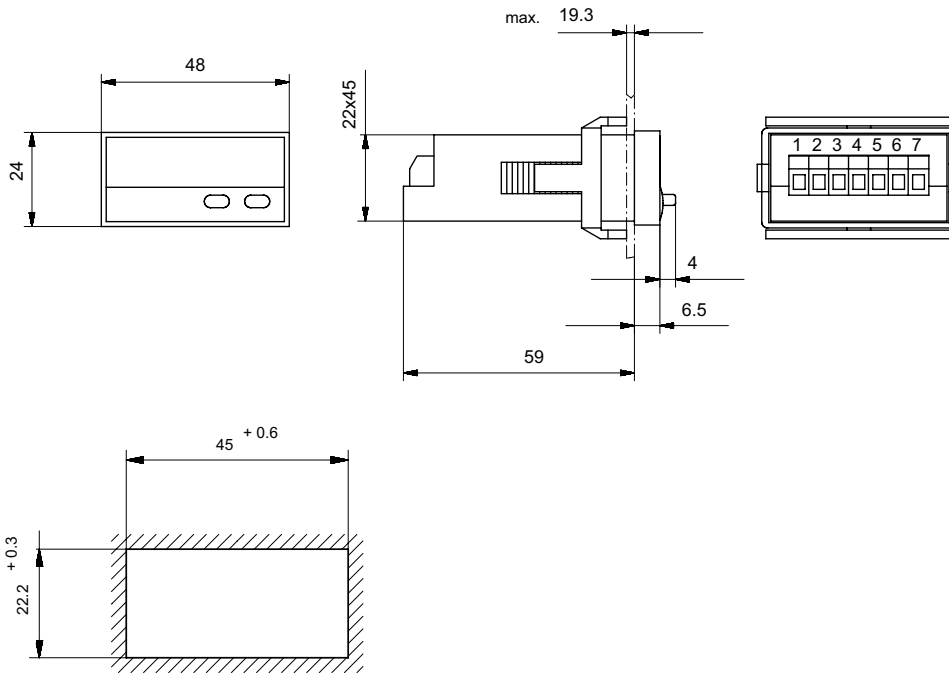
Programming key selection

Technical data

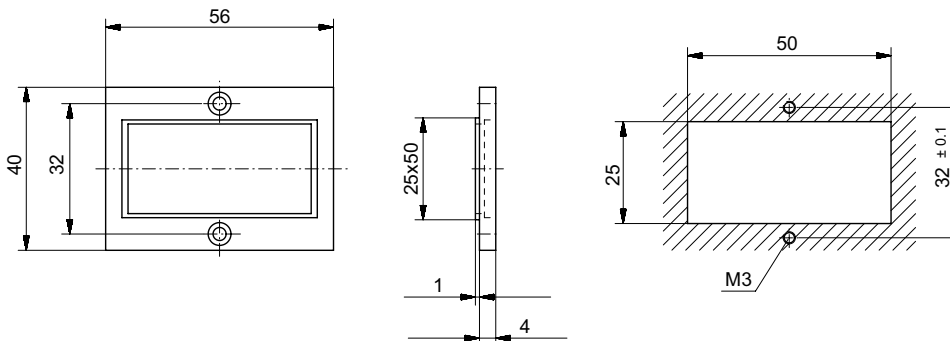
Power supply	10...30 VDC with integrated reverse voltage protection, galvanically separated	
Current consumption	max. 40 mA	
Display	5-digit red, 7-segment LED display, 8 mm high	
Data protection	EEPROM	
Temperature ranges	CXM 201	CXM 211 in accordance with DIN IEC 585
	PT 100 in accordance with DIN IEC 751: -199.9°C...+850.0°C (-327.8°F...+1562.0°F)	J (Fe-CuNi) -210.0°C...+1200.0°C (-376.0°F...+2192.0°F)
	Ni 100 in accordance with DIN 43760: -60.0°C...+250.0°C (-76.0°F...+482.0°F)	K (Ni-CrNi) -200.0°C...+1372.0°C (-328.0°F...+2501.6°F)
		N (NiCrSi-NiSi) -200°C...+1300.0°C (-328.0°F...+2370.0°F)
Inputs	Pt100 resistance thermometer	Thermo element sensor J (Fe-CuNi), K (Ni-CrNi), N (NiCrSi-NiSi) with sensor break monitoring
	Ni 100 resistance thermometer with sensor break monitoring	
Linearity error	Pt 100 <0.1% above the entire measurement range at an ambient temperature of 20°C Ni 100 <0.2% above the entire measurement range at an ambient temperature of 20°C	
Reference point error	±3.0°C (max.) ±1.0°C (typ.)	
Control input	High: 4...30 VDC, Low: 0...2 VDC	
Resolution	0.1°C (0.1°F) or 1.0°C (1.0°F)	
Accuracy	>0.1 % of the entire measurement range at an ambient temperature of 20°C	
Measurement rate	approx. 5 measurement per second	
Switching type	2-wire, 3-wire, 4-wire connection technology, programmable (CXM 201)	
Standards	IEC 61 000-6-4/IEC 55011 class B IEC 61 000-6-2	
EMC	CE-compliant with EU Directive 89/36/EC	
Housing	dark grey RAL 7021	
Ambient temperature	-20°C to +65°C, no condensation	
Storage temperature	-25°C to +70°C	
Protection type	IP 65 front	
Dimensions	Front dimensions and switchboard section see dimension diagram	

Dimension diagrams

Dimensions



Dimensions for mounting frames (included in scope of delivery)



Scope of delivery

- Digital display
- Clamping springs
- Front frames for clamping spring mounting for mounting diameter 50 × 25 mm
- Sealing
- 1 set of self-adhesive symbols
- Instruction manual

CXE 312/322

Multifunctional preset counters

- Preset, batch or totalising counter
- 1 or 2 presets
- Supply voltage 10...30 VDC or 90...260 VAC
- Programmable using 4 keys
- Scalable display via multiplication and division value
- max. counting frequency up to 10 kHz



		CXE 312		CXE 322	
Mounting	Flush mounting	•	•	•	•
Function	Add./subtr. preset counter with 1 preset	•	•		
	Add./subtr. preset counter with 2 presets or batch functions			•	•
	Programmable as pulse, frequency or operating hours preset counter with sign	•	•	•	•
	2-row LCD display	•	•	•	•
	1 relay output	•	•		
	2 relay output			•	•
Supply voltage	10...30 VDC	•		•	
	90...260 VAC		•		•
Display	Standard LCD display			•	•
	Display backlight	•	•	•	•
Order no.		CXE312M4L	CXE312 V3L	CXE322M4L	CXE322 V3L

Applications

- Quantity control, length control, time control
- Wire wound coil, filling processes, throughput monitoring
- Operating data recording, partial and overall quantity control, batch control (batch counting)

Settings



Technical data

Power supply	10...30 VDC with integrated reverse voltage protection or 90...260 VAC
Power consumption	1.1 W or 4 VA
Display	6-digit 7-segment LCD display (upper row 9 mm -actual-, lower row 7 mm -target-)
Data protection	EEPROM
Keyboard	4 keys (cursor keys)
reset	manual, lockable and electrical
Standards	IEC 61000-6-4/IEC 55011 class B IEC 61000-6-2
EMC	CE-compliant with EU Directive 89/36/EC
Housing	dark grey RAL 7021
Ambient temperature	0°C to +50°C, no condensation
Storage temperature	-25°C to +70°C
Protection type	IP 65 front
Dimensions	Front dimensions and switchboard section see dimension diagram

Counting inputs

Inputs

Polarity of inputs	Positive (PNP) or negative (NPN) switching, programmable for all inputs	
Counting frequency	via DIL switch for input. A and input B 30 Hz, 10 kHz can be set separately (details see instruction manual)	
Input resistance	approx. 10 kΩ	
Switching level	DC supply voltage Low: $0...0.2 \times U_B$ (VDC), High: $0.6 \times U_B...30$ VDC	AC supply voltage Low: 0...4 VDC, High: 12...30 VDC
Minimum pulse duration	5 ms	
Control input		

Outputs

	Output 1	Output 2
	programmable as break or make contact	programmable change-over contact
	Switching voltage max. 250 VAC/110 VDC	Switching voltage max. 250 VAC/150 VDC
	Switching current max. 3 A (with DC min. 30 mA)	Switching current max. 3 A (with DC min. 30 mA)
	Switching capacity with DC 90 W, with AC max. 750 VA	Switching capacity with DC 90 W, with AC max. 750 VA
Output signal type	approx. 7 ms active or inactive, programmable as monostable or bistable	approx. 7 ms

Pulse counter and position display

Display range	-199 999...999 999, decimal space 0.0...0.00000
Display scaling	Factor selection 0.0001...9.9999 Decimal place 0... 0.000

Frequency counter

Display range	-999 999...999 999, decimal space 0.0...0.000
Display scaling	Multiplicator: 0.0001...99.9999 Divisor: 0.0001...99.9999
Display unit	Gate time measurement principle can be set from 0.01 to 99.995

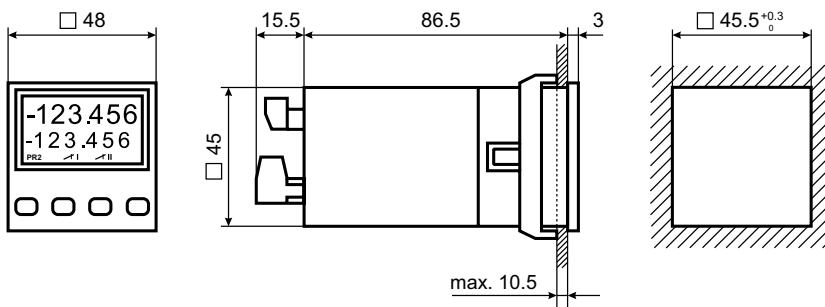
Hour meters

Display range	0...999 999, decimal space 0.0...0.000 (determines the resolution of the time range)
Time range	Hrs, mins or sec and hh.mm.ss
Resolution	1 ms

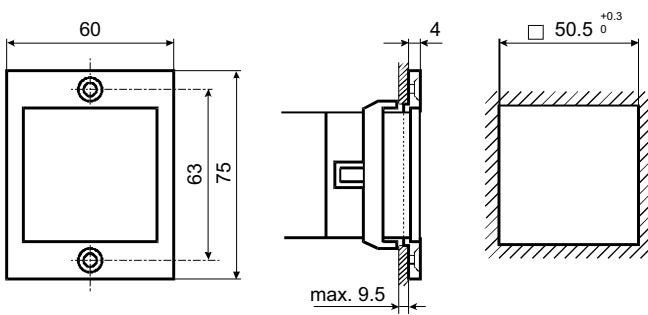
Various measurement types of timing (pulse widths and period duration)

Dimension diagrams

Dimensions



with front frames for screw mounting



Scope of delivery

- Counters
- Screw terminal 7-pole, RM 5.08
- Screw terminal 7-pole, RM 3.81
- Clamping springs
- Template for circuit board section
- Instruction manual

CXF 312/322

Multifunctional preset counters

- Pulse, frequency or time preset counter with sign
- 1 or 2 presets
- Supply voltage 10...30 VDC or 90...260 VAC
- Programmable using 4 keys
- Scalable display via multiplication value
- Optional with serial interface RS 232
- Max. counting frequency up to 20 kHz



		CXF 312				CXF 322			
Mounting	Flush mounting	•	•	•	•	•	•	•	•
Function	One-channel, adding counting method	•	•	•	•	•	•	•	•
	Two-channel counting method, counting direction, difference, phase discriminator (single, double, 4 times)	•	•	•	•	•	•	•	•
	Rotation display, frequency display, speed display (1/sec, 1/min)	•	•	•	•	•	•	•	•
	Operating hours/timer meters with resolution in msec	•	•	•	•	•	•	•	•
	1 relay output	•	•	•	•	•	•	•	•
	2 relay output					•	•	•	•
Supply voltage	10...30 VDC	•	•	•	•	•	•	•	•
	90...260 VAC			•	•			•	•
Interface	RS 232		•	•	•	•	•	•	•
	without	•	•	•	•	•	•	•	•
Order no.		CXF312M4N0	CXF312M4N1	CXF312 V3N0	CXF312 V3N1	CXF322M4N0	CXF322M4N1	CXF322 V3N0	CXF322 V3N1

Applications

- Quantity control, length control, time control
- Wire wound coil, filling processes, throughput monitoring

Interface

The counters can also be delivered with RS 232 interface. They can be used to programme the devices and to perform remote selection. Simple ESC sequences are used for controlling. The transfer rate is up to 4,800 Baud.

A control software can be supplied optionally. With it the counters can be easily programmed via a PC.

- Upload and download function
- Monitor and deadline programme for simple diagnosis
- Multilingual
- Online display of the measurement values in the monitor programme
- Simple parameterization software for the CXF 312, 322 counter types

Settings



Technical data

Power supply	10...30 VDC with integrated reverse voltage protection or 90...260 VAC
Power consumption	1.2 W or 5 VA
Display	6-digit red, 7-segment LED display, 8 mm high
Data protection	EEPROM
Keyboard	4 keys (cursor keyboard)
reset	manual and electrical (lockable)
Standards	IEC 61 000-6-4/IEC 55011 class B IEC 61 000-6-2
EMC	CE-compliant with EU Directive 89/36/EC
Housing	dark grey RAL 7021
Ambient temperature	-10°C to +50°C, no condensation
Storage temperature	-25°C to +70°C
Protection type	IP 65 front
Dimensions	Front dimensions and switchboard section see dimension diagram

Counting inputs

Inputs

Polarity of inputs	Positive (PNP) or negative (NPN) switching, programmable for all inputs	
Counting frequency	max. 20 kHz, can be reduced to 30 Hz	
Input resistance	approx. 10 kΩ	
Switching level	DC supply voltage Low: $0...0.2 \times U_B$ (VDC), High: $0.6 \times U_B...30$ VDC	AC supply voltage Low: 0...4 VDC, High: 12...30 VDC
Minimum pulse duration of Control inputs	min. 5 ms	

Outputs

	CXF 312, 322 output 2	CXF 322 output 1
	programmable change-over contact	programmable as break or make contact
	Switching voltage max. 250 VAC/125 VDC	Switching voltage max. 250 VAC/110 VDC
	Switching current max. 3 A (with DC min. 30 mA)	Switching current max. 3 A (with DC min. 30 mA)
	Switching capacity with DC 50 W, with AC max. 750 VA	Switching capacity at DC 90 W, with AC max. 750 VA
Output signal type	approx. 7 ms active or inactive, programmable as monostable or bistable	approx. 7 ms

Pulse counter and position display

Display range	-199 999...999 999, decimal space 0.0...0.000
Display scaling	Multiplicator: 0.0001 - 99.9999

Frequency counter

Display range	0...999 999, decimal space 0.0...0.000
Display scaling	Multiplicator: 0.0001 - 99.9999
Display unit	1/min, 1/sec, period duration measurement principle

Hour meters

Display range	0...999 999, decimal space 0.0...0.000 (determines the resolution of the time range)
Time range	Hrs, mins or sec and hh.mm.ss
Resolution	1 ms

Various measurement types of timing (pulse widths and period duration)

RS232 interface	simple ASCII log
-----------------	------------------

Accessories

Order no.

- CX-Control programming software

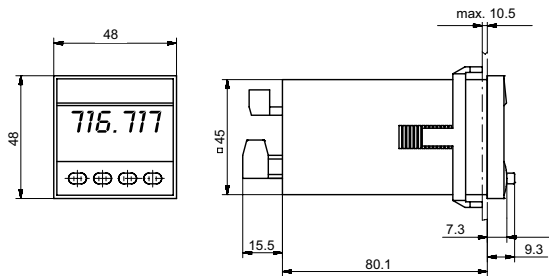
PCD8.CX1

- Cable RS232

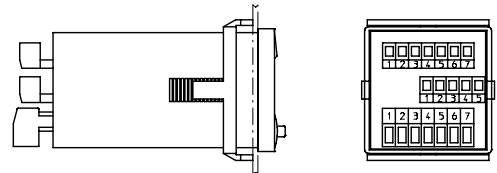
PCD8.KCX1

Dimension diagrams

Dimensions with front frames for clamping spring mounting

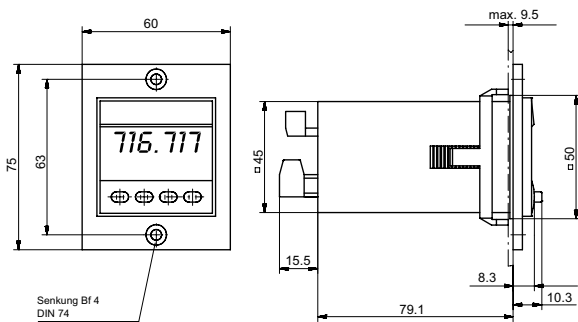


Model without serial interface

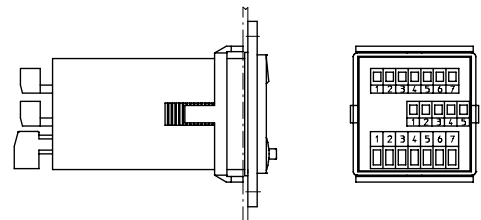


Model includes serial interface

Dimensions with front frames for screw mounting



Model without serial interface



Model includes serial interface

Scope of delivery

- Counters
- Screw terminal 7-pole, RM 5.08
- Screw terminal 7-pole, RM 3.81
- Front frames for screw mounting for mounting diameter 50 × 50 mm
- Clamping springs
- Template for circuit board section
- Instruction manual

CXP 362

Electronic preset counters

- Pulse preset counter, 1 preset
- Battery-powered (lithium batteries)
- Galvanically separated counter and reset input
- Input level 12...250 VAC/DC
- Easy-to-use decade keyboard
- 2-row LCD display for actual and target value
- Max. counting frequency up to 25 Hz

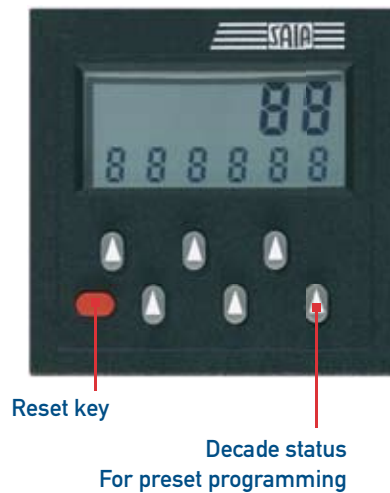


		CXP 362
Mounting	Flush mounting	•
Function	One-channel, adding or subtracting counting method	•
	With or without automatic. reset	•
	Galvanically separated inputs	•
	1 relay output, programmable as make or break contact	•
Counting pulse/reset impulse	12...250 VAC/DC	•
Order no.		CXP362 VGN0N0N00

Applications

- Quantity control, service interval monitoring

Settings



Technical data

Power supply	2 internal lithium batteries: approx. 8 years at 20°C
Display	LCD, 6-digit, actual value 7 mm, target value 4.5 mm
Data protection	via battery with lo-bat display (min. 8 years with 5 mio switching cycles of the output relay)
Keyboard	6-digit decade keyboard, 1 reset key
reset	manual, lockable and electrical
Standards	IEC 61000-6-4/IEC 55011 class B IEC 61000-6-2
EMC	CE-compliant with EU Directive 89/36/EC
Housing	dark grey RAL 7021
Ambient temperature	-10°C to +50°C, no condensation
Storage temperature	-25°C to +60°C
Protection type	IP 65 front
Dimensions	Front dimensions and switchboard section see dimension diagram

Counting inputs

Inputs

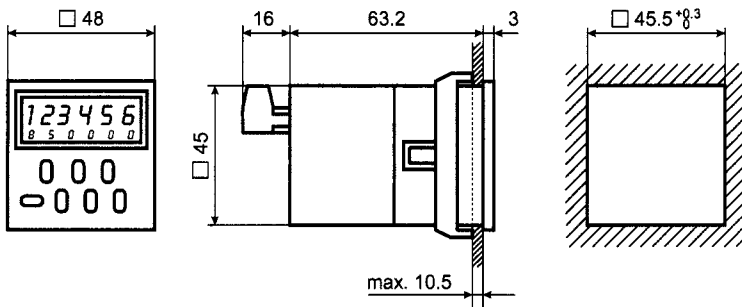
galvanically separated voltage inputs (bidirectional optocoupler inputs)	
Counter input	max. 25 Hz
Reset input	min. 50 ms
Input resistance	approx. 110 k Ω
Switching level	Low: <3 VAC/DC, High: 12...250 VAC/DC
Control inputs	potential-free keyboard locking input at least. 15 ms

Outputs

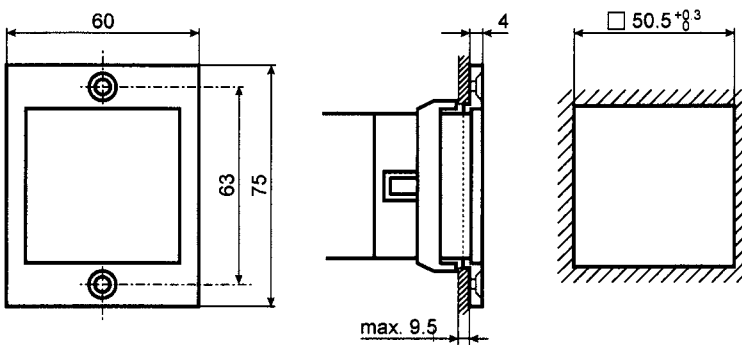
	programmable as break or make contact
	Switching voltage max. 250 VAC/150 VDC
	Switching current max. 3A
	Switching capacity with DC 90 W with AC max. 750 VA
Response time	<20 ms, max. 4 Hz
Display range	0...999 999

Dimension diagrams

Dimensions



Dimensions for mounting frames (included in scope of delivery)



Scope of delivery

- Counters
- 2 lithium batteries
- Screw terminal
- Front frames for clamping spring mounting for mounting diameter 50 × 50 mm
- Front frames for clamping spring mounting for mounting diameter 50 × 50 mm
- Clamping springs
- Template for switchboard section
- Instruction manual

CXQ 312/322

Multifunctional preset counters

- Preset, batch or totalising counter
- 1 or 2 presets
- Supply voltage 10...30 VDC or 90...260 VAC
- programmable via easy-to-use decade keyboard
- Scalable display via multiplication and division value
- max. Max. counting frequency up to 60 kHz

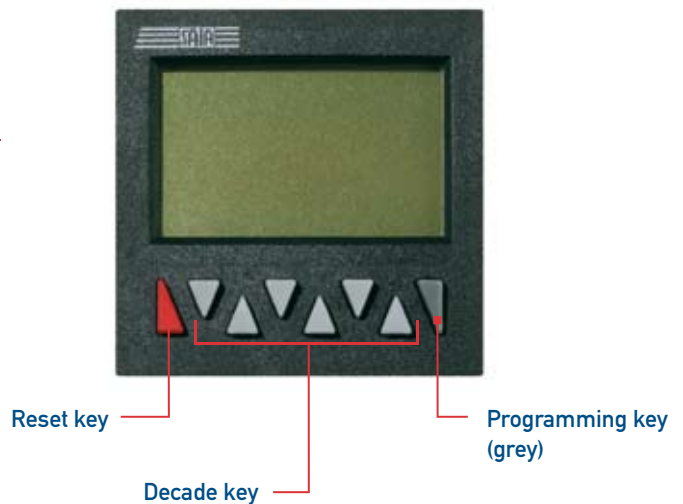


		CXQ 312				CXQ 322			
Mounting	Flush mounting	•	•	•	•	•	•	•	•
Function	One-channel, adding counting method	•	•	•	•	•	•	•	•
	Two-channel counting method, counting direction, difference, phase discriminator (single, double, 4 times)	•	•	•	•	•	•	•	•
	Rotation display, frequency display, speed display (1/sec, 1/min)	•	•	•	•	•	•	•	•
	Hour meters/timer meters with resolution in msec	•	•	•	•	•	•	•	•
	1 relay output	•	•	•	•	•	•	•	•
	2 relay output					•	•	•	•
Supply voltage	10...30 VDC	•	•			•	•		
	90...260 VAC			•	•			•	•
Display	Standard LCD display		•	•	•	•	•	•	•
	Display backlight	•		•		•		•	
Order no.		CXQ312M4L	CXQ312M4N	CXQ312 V3L	CXQ312 V3N	CXQ322M4L	CXQ322M4N	CXQ322 V3L	CXQ322 V3N

Applications

- Quantity control, length control, time control
- Wire wound coil, filling processes, throughput monitoring
- Operating data recording, partial and overall quantity control, batch control (batch counting)

Settings



Technical data

Power supply	10...30 VDC with integrated reverse voltage protection or 90...260 VAC
Power consumption	1.5 W or 8 VA
Display	6-digit 7-segment LCD display (upper row 9 mm -actual-, lower row 7 mm -target-)
Data protection	EEPROM
Keyboard	8 keys (decade keyboard)
reset	manual, lockable and electrical
Standards	IEC 61000-6-4/IEC 55011 class B IEC 61000-6-2
EMC	CE-compliant with EU Directive 89/36/EC
Housing	dark grey RAL 7021
Ambient temperature	-20°C to +60°C, no condensation
Storage temperature	-25°C to +70°C
Protection type	IP 65 front
Dimensions	Front dimensions and switchboard section see dimension diagram

Counting inputs

Inputs

Polarity of inputs	Positive (PNP) or negative (NPN) switching, programmable for all inputs	
Counting frequency	max. 60 kHz, can be reduced to 30 Hz (details see instruction manual)	
Input resistance	approx. 5 kΩ	
Switching level	DC supply voltage Low: $0...0.2 \times U_B$ (VDC), High: $0.6 \times U_B...30$ VDC	AC supply voltage Low: 0...4 VDC, High: 12...30 VDC
Control inputs and reset	min. 10 ms/1 s	

Outputs

	Output 1	Output 2
	programmable as break or make contact	programmable change-over contact
	Switching voltage max. 250 VAC/110 VDC	Switching voltage max. 250 VAC/150 VDC
	Switching current max. 3 A (with DC min. 30 mA)	Switching current max. 3 A (with DC min. 30 mA)
	Switching capacity with DC 90 W, with AC max. 750 VA	Switching capacity with DC 90 W, with AC max. 750 VA
Output signal type	approx. 7 ms active or inactive, programmable as monostable or bistable	approx. 7 ms

Pulse counter and position display

Display range	-999 999...999 999, decimal space 0.0...0.00000
Display scaling	Multiplicator: 0.0001...99.9999 Divisor: 0.0001...99.9999

Frequency counter

Display range	-999 999...999 999, decimal space 0.0...0.000
Display scaling	Multiplicator: 0.0001...99.9999 Divisor: 0.0001...99.9999
Display unit	1/min, 1/sec, period duration measurement principle ≥ 76.3 Hz gate time measurement principle ≥ 76.3 Hz

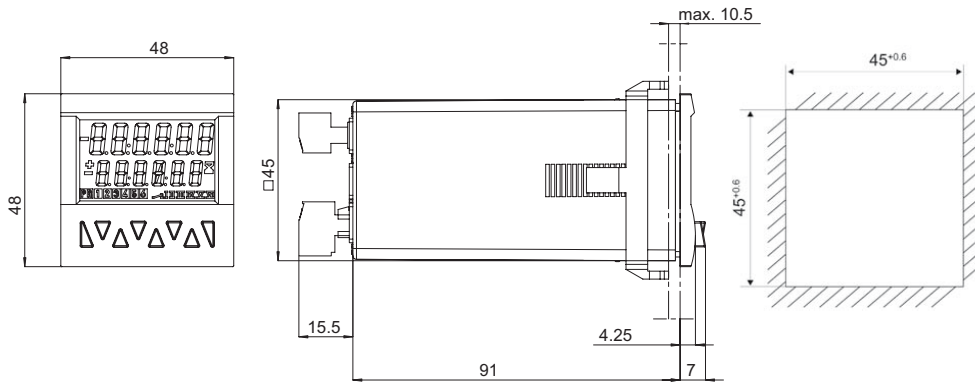
Hour meters

Display range	0...999 999, decimal space 0.0...0.000 (determines the resolution of the time range)
Time range	Hrs, mins or sec and hh.mm.ss
Resolution	1 ms

Various measurement types of timing (pulse widths and period duration)

Dimension diagrams

Dimensions



Scope of delivery

-
- Counters
 - Screw terminal 7-pole, RM 5.08
 - Screw terminal 7-pole, RM 3.81
 - Clamping springs
 - Template for circuit board section
 - Instruction manual
-

Control and building installation components

Item number / order directory

Item Catalogue	Weight [g]	page	Item Catalogue	Weight [g]	page	Item Catalogue	Weight [g]	page
AAD1D5D10KR2 A01	90	42	CMM152E1S4N0 V00	138	72	CXF322 V3N0	150	104
AAD1D5F10KR2 A00	90	42	CMM152M4S2N0 V00	141	72	CXF322 V3N1	150	104
AAD1D5F10KR3A00	90	42	CMM161B4N4N0S00	131	63	CXG201M4N	100	83
AAE1D5F10KR2 A00	114	42	CMM161D1N4N0S00	116	63	CXG211M4N	100	83
AAE1D5F10KR3A00	114	42	CMM161E1N4N0S00	108	63	CXG212M4N	100	83
AAE3D5F10PR2 A00	114	45	CMM161M4N2N0S00	108	63	CXG221M4N	100	83
AAE3D5F10PR3A00	114	45	CMM361E1N4N0S00	145	63	CXG231M4N	100	83
AAE3D5F11PR2 A00	114	45	CMM361M4N2N0S00	145	63	CXG291M4N	100	95
AAE3D5F11PR3A00	114	45	CMM362D1S4N0 V00	236	72	CXG301M4N	100	92
CMA062M4N0N0N00	56	58	CMM362E1S4N0 V00	236	72	CXL201VGL	50	74
CMA152E1N0N0N00	49	58	CMM362M4S2N0 V00	233	72	CXL201VGN	50	74
CMA152M1N0N0N00	100	58	CMT072E1N0L0N00	100	68	CXL201VHL	50	74
CMA152M4N0N0N00	58	58	CMT072G4N0L0N00	100	68	CXL201VHN	50	74
CMB062M1N2N0N00	23	60	CMT072T5N0L0N00	52	68	CXL201VKL	50	74
CMB072E1N1N0N00	24	60	CMU072B4N0L0N00	53	70	CXL201VKN	50	74
CMB072M1N1N0N00	23	60	CMU072E1N0L0N00	55	70	CXL211VGL	50	77
CMB072M4N1N0N00	23	60	CMU072J1N0L0N00	54	70	CXL211VGN	50	77
CMB079D1N1N0N00	58	60	CMU072T5N0L0N00	90	70	CXL211VHL	50	77
CMB079E1N1N0N00	63	60	CXE312M4L	197	101	CXL211VHN	50	77
CMB079M4N2N0N00	50	60	CXE312 V3L	247	101	CXL211VJL	50	77
CMB970M4N2N0N00	23	60	CXE322M4L	212	101	CXL211VJN	50	77
CMB976M1N1N0N00	23	60	CXE322 V3L	241	101	CXL221VHL	50	89
CMC072M4N0L0N00	24	66	CXF312M4N0	150	104	CXL221VHN	50	89
CMC079D1N0L0N00	58	66	CXF312M4N1	150	104	CXL221VJL	50	89
CMC079E1N0L0N00	78	66	CXF312 V3N0	150	104	CXL221VJN	50	89
CMC079M4N0L0N00	50	66	CXF312 V3N1	150	104	CXL231VGL	50	86
CMM081E1N4N0S00	125	63	CXF322M4N0	150	104	CXL231VGN	50	86
CMM081M4N2N0S00	125	63	CXF322M4N1	150	104	CXL231VHL	50	86

Item Catalogue	Weight [g]	page	Item Catalogue	Weight [g]	page	Item Catalogue	Weight [g]	page
CXL231VHN	50	86	KOE511A0MVB4N00	310	13	KOP111J7MWVPN00	130	23
CXL231VJL	50	86	KOE511A0MVD5N00	303	13	KOP112J7MWVPN00	113	23
CXL231VJN	50	86	KOE511A0MVD5N12	302	13	KOP119K7MWWAN00	114	26
CXL241VHL	50	80	KOE511E0MVB4N00	312	13	KOP160J7MWWAN00	129	23
CXL241VHN	50	80	KOE511E0MVD1N00	299	13	KOP160J7MWVPN00	113	23
CXL241VJL	50	80	KOE511E0MVD5N00	303	13	KOP170J7MWVPN00	115	23
CXL241VJN	50	80	KOE511E0MVD5N12	302	13	KOP219K7MWWAN00	135	26
CXL261VGL	50	77	KOE511F0MVB4N00	312	13	KOP260F0MWWAN00	147	20
CXL261VGN	50	77	KOE511F0MVD1N00	299	13	KOP511K7MWVPN00	157	26
CXL281VGL	50	86	KOE511F0MVD5N00	278	13	KOP512K7MWVPN00	148	26
CXL281VGN	50	86	KOE512 A0MVB4N00	310	13	KOP560K7MWWAN00	154	26
CXL281VHL	50	86	KOE512 A0MVD1N00	298	13	KOP560K7MWVPN00	149	26
CXL281VHN	50	86	KOE512 A0MVD5N00	300	13	PCD7.H104S	160	48
CXL281VJL	50	86	KOE512 A0MVD5N12	300	13	PCD8.CX1	125	105
CXL281VJN	50	86	KOE512E0MVB4N00	313	13	PCD8.KCX1	125	105
CXM201M4N	125	98	KOE512E0MVD1N00	302	13			
CXM211M4N	125	98	KOE512E0MVD5N00	302	13			
CXP362VGN0N0N00	168	107	KOE512E0MVD5N12	304	13	Accessories		
CXQ312M4N	125	110	KOE512F0MVB4N00	310	13	410474200	1	43
CXQ312M4L	125	110	KOE512F0MVD5N00	278	13	410474850	1	43/46
CXQ312 V3L	125	110	KOE512F0MVD5N12	280	13	CJ211	52	14/21
CXQ312 V3N	125	110	KOL111H7MNVMN00	73	16	CJ250	100	14/21
CXQ322M4L	125	110	KOL112H7MNVMN00	77	16	CJ260	9	17/24/27/37
CXQ322M4N	125	110	KOL121H7MNVMN00	72	16			
CXQ322 V3L	125	110	KOL142H7MNVMN00	100	16			
CXQ322 V3N	125	110	KOL160H7MNVMN00	77	16			
KFE102NE1N	210	32	KOL251H7MKVVPN00	76	16			
KFE103NE1N	208	32	KOL311H7MRVVPN00	72	16			
KFE300NE9N	187	32	KOL312H7MRVVPN00	74	16			
KFE302NE9N	185	32	KOL321H7MRVVPN00	72	16			
KFT100JE1N	148	36	KOL342H7MRVVPN00	64	16			
KFT200KE1N	148	36	KOL360H7MRVVPN00	74	16			

Contact addresses

Saia-Burgess Sales Companies



Saia-Burgess Controls AG

Bahnhofstrasse 18 | CH-3280 Murten | Switzerland
T +41 26 672 71 11 | F +41 26 672 74 99
www.start-controls.com | pcd@saia-burgess.com

Europe

Saia-Burgess Österreich GmbH

Linzer Bundesstrasse 101 | A-5023 Salzburg | Austria
T +43 662 88 4910 | F +43 662 88 4910 11
office@saia-burgess.at

Saia-Burgess Benelux B.V.

Hanzeweg 12 C | NL-2803 MC Gouda | Holland
T +31 182 54 31 54 | F +31 182 54 31 51
officent@saia-burgess.com

Saia-Burgess Benelux

Mechelsesteenweg 277 | B-1800 Vilvoorde | Belgium
T +32 2 456 06 20 | F +32 2 460 50 44
officebe@saia-burgess.com

Saia-Burgess Dreieich GmbH & Co. KG

Otto-Hahn-Strasse 31-33 | D-63303 Dreieich | Germany
T +49 (0) 6103 8906 -0 | F +49 (0) 6103 8906-65
sbc-info@saia-burgess.com

Saia-Burgess Paris Sarl

10 Bld. Louise Michel | F-92230 Gennevilliers | France
T +33 1 46 88 07 70 | F +33 1 46 88 07 99
pcdsupport.fr@saia-burgess.com

Saia-Burgess Controls Kft

Puskás Tivadar u. 12 | H-2040 Budaörs | Hungary
T +36 23 50 11 70 | F +36 23 50 11 80
office@saia-burgess.hu

Saia-Burgess Milano S.r.l.

Via Cadamosto 3 | I-20094 Corsico MI | Italy
T +39 02 48692.1 | F +39 02 48600692
saia-burgess.it@saia-burgess.com

Saia-Burgess Gateshead Ltd

Dukesway | Team Valley Trading Estate | Gateshead | Tyne&Wear NE11 0UB | United Kingdom
T +44 191 401 61 00 | F +44 191 401 63 24
simon.adams@saia-burgess.com



North America

Saia-Burgess USA Inc.

3115 North Wilke Road, Suite C | Arlington Heights, IL 60004 | USA
T +1 847 368 2146 | F +1 847 368 2152
kurt.luthi@saia-burgess.com

Asia

Saia-Burgess Controls Shenzhen Limited

Quishi Center E1513 | Zhuzilin | Futian District | Shenzhen | P R China
T +86 755 8831 6043 | F +86 755 8831 6041
kamkau.wu@saia-burgess.com.hk

Saia-Burgess (HK) Ltd.

Johnson Building | 6-22 Dai Shun Street | Tai Po Industrial Estate | N.T. | Hong Kong
T +86 852 2663 6858 | F +86 852 2976 0871
kamkau.wu@saia-burgess.com.hk

Other countries

Saia-Burgess Controls AG

Bahnhofstrasse 18 | CH-3280 Murten | Switzerland
T +41 26 672 71 11 | F +41 26 672 74 99
pcd@saia-burgess.com



Saia-Burgess Gateshead Ltd

Dukesway | Team Valley Trading Estate | Gateshead |
Tyne&Wear NE11 0UB | United Kingdom
T +44 191 401 61 00 | F +44 191 401 63 24
simon.adams@saia-burgess.com

Saia-Burgess USA Inc.

3115 North Wilke Road, Suite C | Arlington Heights, IL 60004 | USA
T +1 847 368 2146 | F +1 847 368 2152
kurt.luthi@saia-burgess.com

Sales partners

Saia-Burgess Controls Kft

Puskás Tivadar u. 12 | H-2040 Budaörs | Hungary
T +36 23 50 11 70 | F +36 23 50 11 80
office@saia-burgess.hu

Saia-Burgess Benelux B.V.

Hanzeweg 12 C | NL-2803 MC Gouda | Holland
T +31 182 54 31 54 | F +31 182 54 31 51
officenl@saia-burgess.com

Saia-Burgess Controls AG

Bahnhofstrasse 18 | CH-3280 Murten | Switzerland
T +41 26 672 71 11 | F +41 26 672 74 99
www.start-controls.ch | pcd@saia-burgess.com