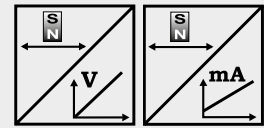




POSICHRON® position sensor
Only 12 mm height and 36 mm width

- Protection class IP64
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Ultra flat profile housing: only 12 mm high
- Easy installation with mounting brackets
- Contactless
- Analog output
- Redundant version: combination of 2 sensors side by side



Specifications	Output	Voltage Current
	Resolution	Refer to output specification
Sampling rate	Up to 1 kHz, depending on the measurement range	
Linearity	Ranges >500 mm: L10 = ±0.10 % f.s. L02 = ±0.02 % f.s. Ranges ≤500 mm: L10 = ±0.5 mm L02MM = ±0.2 mm	
Repeatability	±3 µm	
Housing material	AlMgSi1 / Zn / V4A	
Protection class	IP64	
Shock	EN 60068-2-27:2010, 50 g 11 ms, 100 shocks	
Vibration	EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles	
Connection	4 pin socket M8 / cable 2 m	
EMC, temperature	Refer to output specification	

Order code PCFP23
1 channel



Model name

Measurement range (in mm)

100 ... 5750 (in 10 mm increments)
 other lengths upon request

Output

- U1 = 0 ... 10 V signal conditioner
- U1/H = U1 with Alarm_HOLD (see page 10)
- U2 = 0.5 ... 10 V signal conditioner
- U2/U; U2/H = U2 with Alarm_LOW; U2 with Alarm_HOLD (see page 10)
- U8 = 0.5 ... 4.5 V signal conditioner
- U8/U; U8/H = U8 with Alarm_LOW; U8 with Alarm_HOLD (see page 10)
- I1 = 4 ... 20 mA signal conditioner (3 wire)
- I1/U; I1/H = I1 with Alarm_LOW; I1 with Alarm_HOLD (see page 10)

Function and characteristics output

- P1A = Position Magnet 1, increasing
- P1D = Position Magnet 1, decreasing
- PMU = Start value, direction & end value adjustable by the customer

Linearity

L02 / L02MM / L10 (for definition see "Specifications" above)

Connection

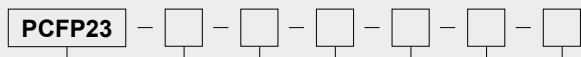
- M8 = Connector M8, 4 pin
- KAB2M = Cable, standard length 2 m, other lengths upon request

Order code mounting set (see page 7)

PCFP23-BFS1

Order Code PCFP23

**2 channel,
configurable**



Model name

Measurement range (in mm)

100 ... 5750 (in 10 mm increments)
other lengths upon request

Output

- U1 = 0 ... 10 V signal conditioner
- U1/H = U1 with Alarm_HOLD (see page 10)
- U2 = 0.5 ... 10 V signal conditioner
- U2/U; U2/H = U2 with Alarm_LOW; U2 with Alarm_HOLD (see page 10)
- U8 = 0.5 ... 4.5 V signal conditioner
- U8/U; U8/H = U8 with Alarm_LOW; U8 with Alarm_HOLD (see page 10)
- I1 = 4 ... 20 mA signal conditioner (3 wire)
- I1/U; I1/H = I1 with Alarm_LOW; I1 with Alarm_HOLD (see page 10)

Function and characteristics output 1

- P1A = Position magnet 1, increasing
- P1D = Position magnet 1, decreasing
- DA = Difference magnet 1/2, increasing (2 magnets required)
- DD = Difference magnet 1/2, decreasing (2 magnets required)

Function and characteristics output 2

- P2A = Position magnet 2, increasing
 - P2D = Position magnet 2, decreasing
 - DA = Difference magnet 1/2, increasing
 - DD = Difference magnet 1/2, decreasing
- } 2 magnets required

VZx.x = Velocity with direction detection (with 1 magnet only)

VZx.x = Velocity in steps of 0.1 m/s

Example: VZ1.5 towards start position towards end position

-1.5 m/s 0 +1.5 m/s

Output U2: 0.5 V 5.25 V 10 V

Output I1: 4 mA 12 mA 20 mA

VAx.x = Velocity without direction detection (with 1 magnet only)

VAx.x = Velocity in steps of 0.1 m/s

Example: VA1.5 towards start position towards end position

-1.5 m/s 0 +1.5 m/s

Output U2: 10 V 0.5 V 10 V

Output I1: 20 mA 4 mA 20 mA

Linearity

L02 / L02MM / L10 (for definition see "Specifications" above)

Connection

KAB2M = Cable, standard length 2 m, other lengths upon request

1. Order example: PCFP23 - 1000 - U2 - P1D - L10 - KAB2M

Flat profile, measurement range 1000 mm, 1 voltage output 0.5 ... 10 V (U2)

Output 1: Position magnet 1, decreasing signal (P1D)

Output 2: Not used

3. Order example: PCFP23 - 1000 - U2 - P1A - VZ1.0 - L10 - KAB2M

Flat profile, measurement range 1000 mm, 2 voltage outputs 0.5 ... 10 V (U2)

Output 1: Position magnet 1, increasing signal (P1A)

Output 2: Velocity magnet 1, -1 m/s ... 1 m/s for range 0.5 ... 10 V (VZ1.0)

Order code position magnet (see page 7)

PCMAG5

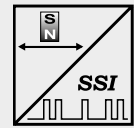
Order code connection cable (see page 14)

KAB-...M-M8/4F/G-LITZE



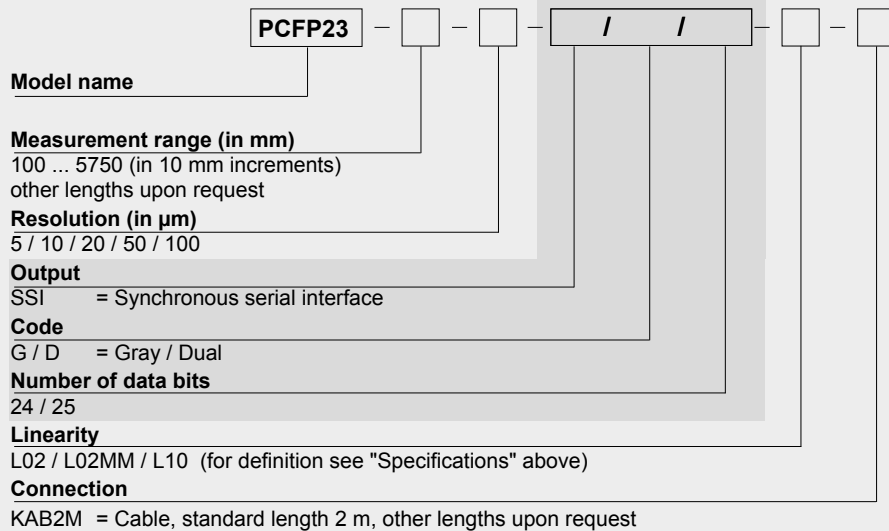
POSICHRON® position sensor with only 12 mm height and 43 mm width

- Protection class IP64
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Ultra flat profile housing: only 12 mm high
- Easy installation with mounting brackets
- Contactless
- Absolutely wear free and maintenance-free
- Synchronous serial interface (SSI)
- Redundant version: combination of 2 sensors side by side



Specifications	Output	Synchronous serial (SSI)
	Resolution	5, 10, 20, 50, 100 µm
	Sampling rate	Up to 1 kHz, depending on the measurement range
	Linearity	Ranges >500 mm: L10 = ±0.10 % f.s. L02 = ±0.02 % f.s. Ranges ≤500 mm: L10 = ±0.5 mm L02MM = ±0.2 mm
	Repeatability	±3 µm
	Housing material	AlMgSi1 / Zn / V4A
	Protection class	IP64
	Shock	EN 60068-2-27:2010, 50 g 11 ms, 100 shocks
	Vibration	EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
	Connection	Cable 2 m
EMC, temperature	Refer to output specification	

Order Code PCFP23



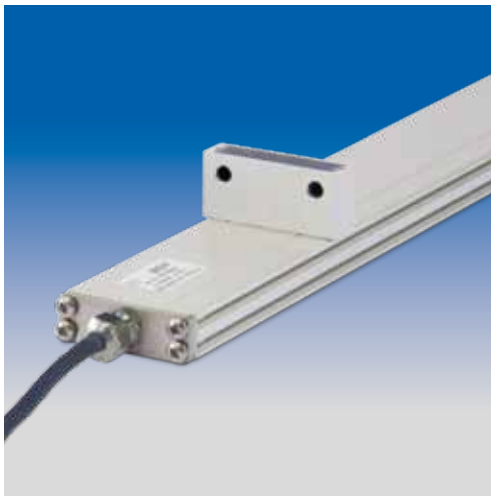
Order code mounting set (see page 7)

Order code position magnet (see page 7)

PCFP23-BFS1

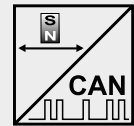
PCMAG5

Order example: PCFP23 - 2000 - 10 - SSI/G/24 - L02 - KAB2M



POSICHRON® position sensor with only 12 mm height and 43 mm width

- Protection class IP64
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Ultra flat profile housing: only 12 mm high
- Easy installation with mounting brackets
- Contactless
- Absolutely wear free and maintenance-free
- CANopen bus or CAN SAE J1939 output
- Redundant version: combination of 2 sensors side by side



Specifications	Output	CANopen bus; CAN SAE J1939
	Resolution	50 µm
	Sampling rate	Up to 1 kHz, depending on the measurement range
	Linearity	Ranges >500 mm: L10 = ±0.10 % f.s. L02 = ±0.02 % f.s. Ranges ≤500 mm: L10 = ±0.5 mm L02MM = ±0.2 mm
	Repeatability	±3 µm
	Housing material	AlMgSi1 / Zn / V4A
	Protection class	IP64
	Shock	EN 60068-2-27:2010, 50 g 11 ms, 100 shocks
	Vibration	EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles
	Connection	Cable 0,3 m with 5-pin connector M12
EMC, temperature	Refer to output specification	

Order Code PCFP23

Model name PCFP23 - - - -

Measurement range (in mm)
100 ... 5750 (in 10 mm increments)
other lengths upon request

Output
CANOP = CANopen bus
CANOP/R = CANopen-Bus with integrated terminating resistance
CANJ1939 = CAN SAE J1939

Linearity
L02 / L02MM / L10 (for definition see "Specifications" above)

Connection
KAB0,3M-M12/CAN = Cable (length 0.3 m) with 5-pin M12 connector

Order code mounting set (see page 7)

PCFP23-BFS1

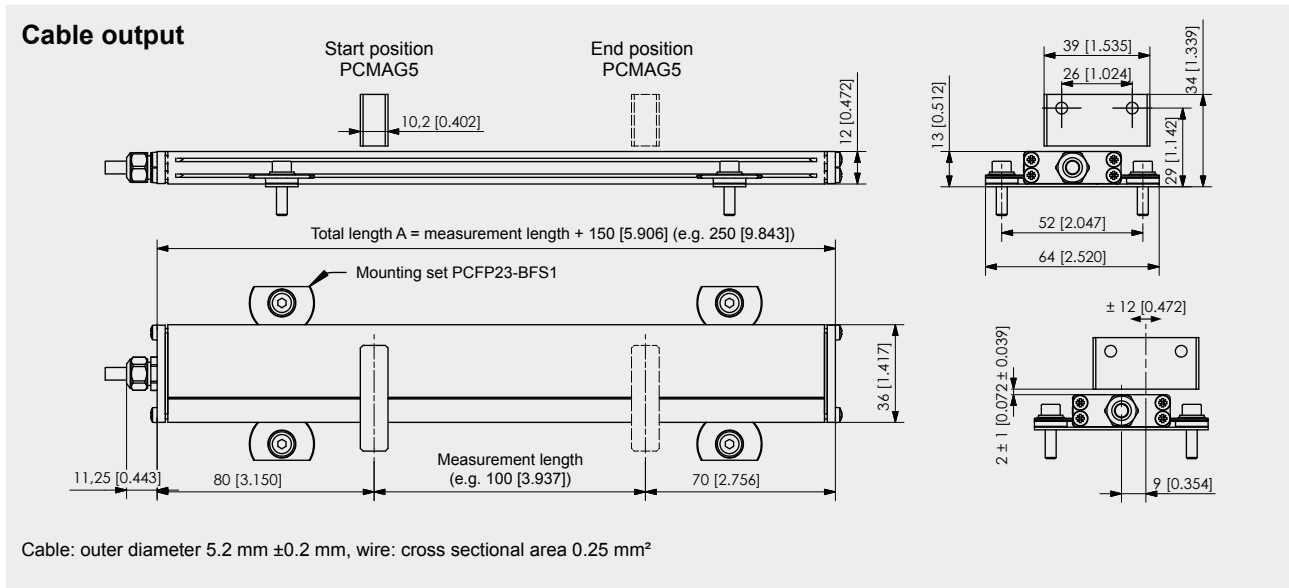
Order code position magnet (see page 7)

PCMAG ...

Order code bus cable (see page 14)

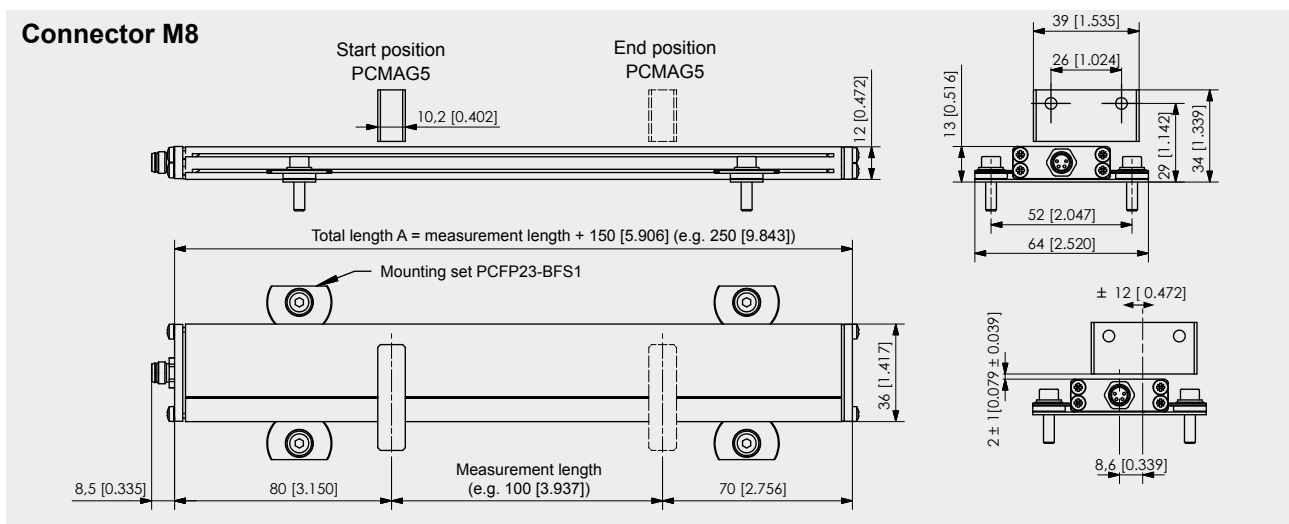
KAB-...M-M12/5F/G-M12/5M/G - CAN

Order example: PCFP23 - 1000 - CANOP - L10 - KAB0,3M-M12/CAN



Dimensions in mm [inch]

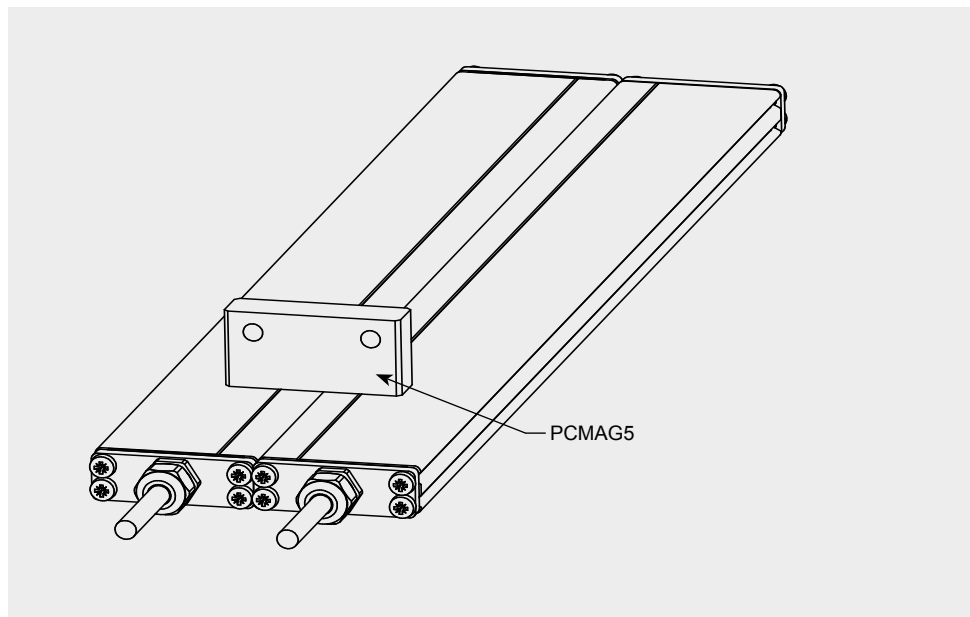
Dimensions informative only. For guaranteed dimensions consult factory.



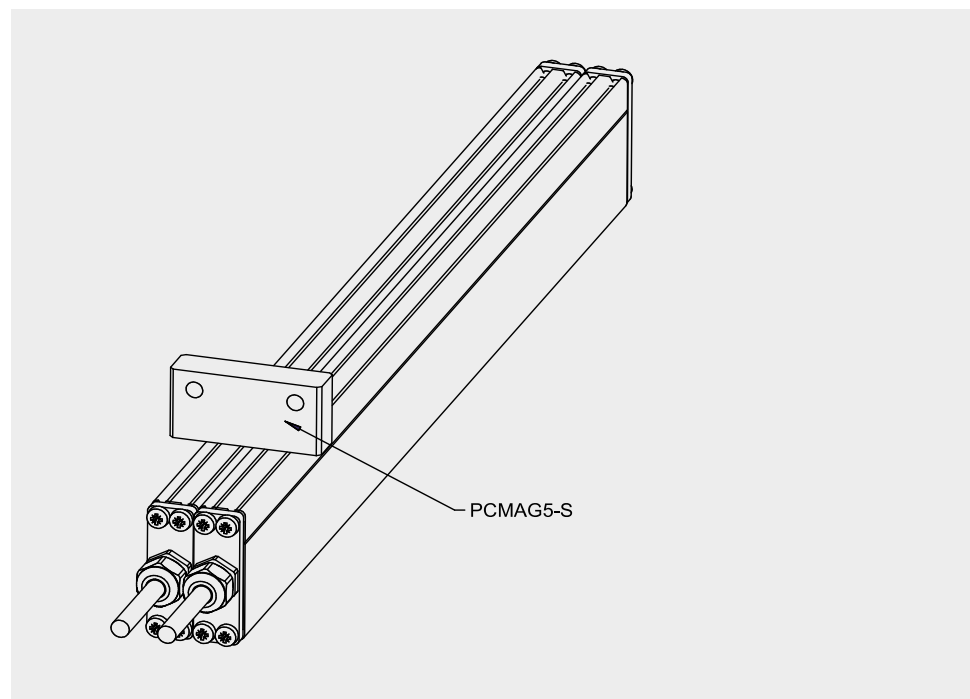
Dimensions in mm [inch]

Dimensions informative only. For guaranteed dimensions consult factory.

Horizontal arrangement

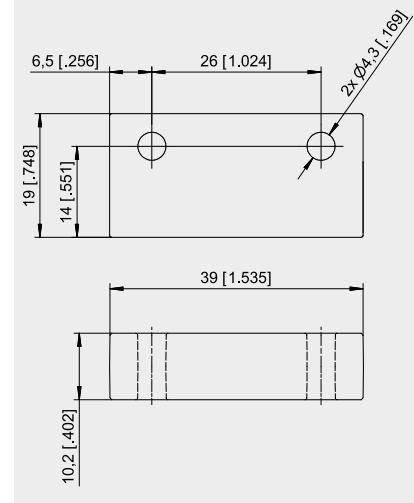
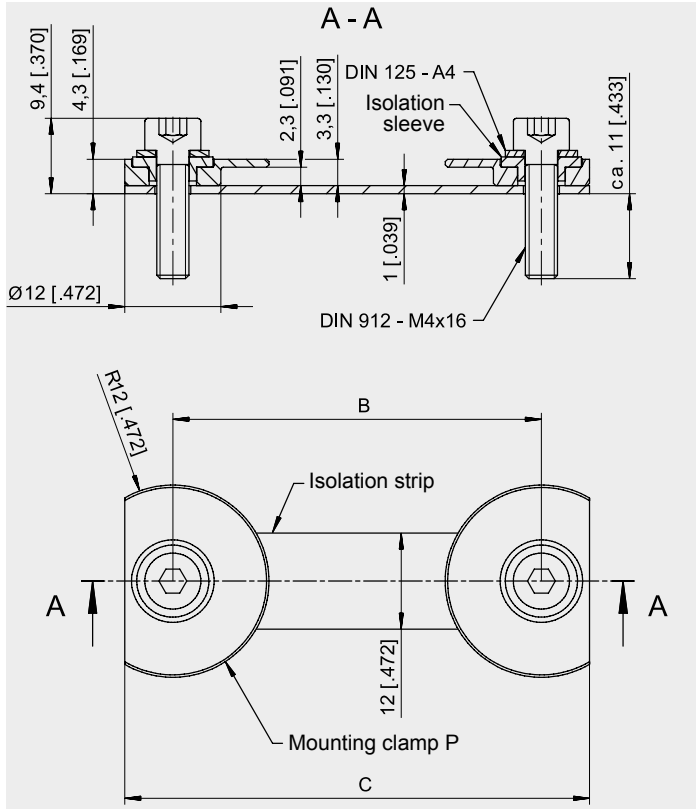


Vertical arrangement



PCFP23-BFS1 and PCFP24-BFS1
Mounting set for PCFP23, PCFP24

PCMAG5
Standard magnet

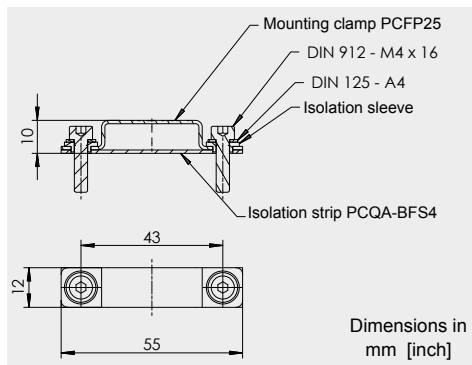


Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions consult factory.

Dimensions BFS1	POSICHRON Model	Dim. B [mm]	Dim. C [mm]
	PCFP23	52	64
PCFP24	59	71	

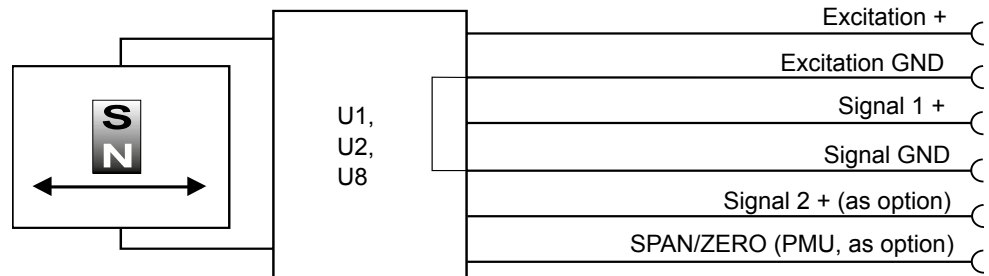
PCFP25-BFS1
Mounting set for
PCFP25



Dimensions in mm [inch]

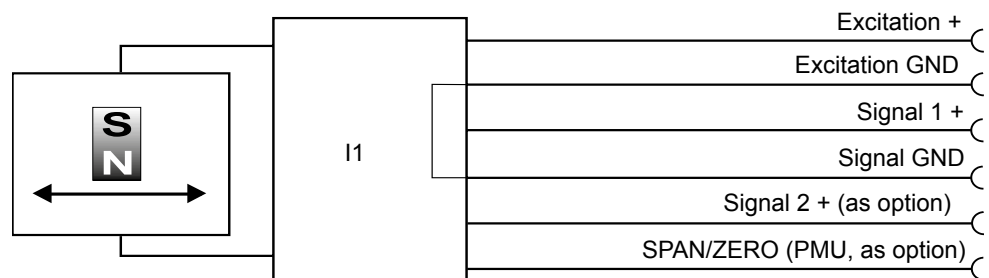
U1, U2, U8 Voltage output 	Excitation voltage	U1: 18 ... 36 V DC; U2: 18 ... 36 V DC; U8: 10 ... 36 V
	Excitation current	Typ. 35 mA, 80 mA max.
	Output voltage	U1: 0 ... 10 V DC; U2: 0.5 ... 10 V DC; U8: 0.5 ... 4.5 V DC
	Output current	2 mA max.
	Output load	> 5 kΩ
	Resolution	16 bit f.s., min. 10 μm
	Stability (temperature)	±50 x 10 ⁻⁶ / °C f.s.
	Protection	Reverse polarity, short circuit
	Output noise	0.5 mV _{RMS}
	Operating temperature	-40 ... +85 °C
EMC	EN 61326-1:2013	

Signal diagram



I1 Current output (3 wire) 	Excitation voltage	18 ... 36 V DC (10 ... 36 V for R _L ≤ 250Ω)
	Excitation current	Typ. 60 mA, 80 mA max.
	Load resistor	350 Ω max.
	Output current	4 ... 20 mA, 30 mA max (at failure)
	Resolution	16 bit f.s., min. 10 μm
	Stability (temperature)	±50 x 10 ⁻⁶ / °C f.s.
	Protection	Reverse polarity, short circuit
	Output noise	0.5 mV _{RMS}
	Operating temperature	-40 ... +85 °C
	EMC	EN 61326-1:2013

Signal diagram

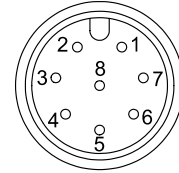


Connector M12, 8-pin

Signal wiring

Signal	Plug connection	Cable connection
Excitation +	1	white
Excitation GND	2	brown
Signal 1 +	3	green
Signal GND	4	yellow
Signal 2 + (optional*)	5	grey
SPAN/ZERO (PMU** only, optional)	6	pink

View to the sensor connector



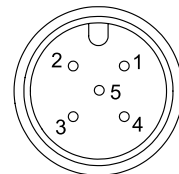
* When using multiple magnets the distance between two magnets must be min. 70 mm to identify the single magnets definitely. ** Description page 10

Connector M12, 5-pin

Signal wiring

Signal	Plug connection
Excitation +	1
Signal 1 +	2
GND	3
Signal 2 + (optional*)	4
PMU** (optional)	5

View to the sensor connector



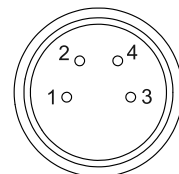
* When using multiple magnets the distance between two magnets must be min. 70 mm to identify the single magnets definitely. ** Description page 10

Connector M8, 4-pin

Signal wiring

Signal	Plug connection
Excitation +	1
Excitation GND	2
Signal +	3
PMU** (optional)	4

View to the sensor connector



* When using multiple magnets the distance between two magnets must be min. 70 mm to identify the single magnets definitely. ** Description page 10

Option - PMU for analog output U1, U2, U8 and I1

Programming of the start and end value by the customer:

The option PMU allows to program the start value and the end value of the output range by a programming signal SPAN/ZERO available at the connector. This Signal SPAN/ZERO must be connected with GND via a push button, then position magnet of the sensor must be moved to the start resp. end position. Pushing the button between 2 and 4 seconds sets the actual position as start position, pushing the button more than 5 seconds sets the actual position as end position. The values will be stored and are available after switching off the sensor.

To reset the sensor to the factory values the button must be pushed for longer than two seconds when the sensor is switched on.

Diagnostic on analog outputs

Behaviour of the analog signal output in case of error

In case of error (magnet missing or outside the measuring range) the analog output signal will assume a state according to the following options:

Alarm_HIGH

The output voltage resp. the output current is at HIGH level (overrange).

Alarm_LOW

The output voltage resp. the output current is at LOW level (underrange).

Alarm_HOLD

The output voltage resp. the output current will keep the last valid state.

	Alarm_HIGH (standard)	Alarm_LOW (.../U)	Alarm_HOLD (.../H)
U1	$U_{out} \geq 10,5 \text{ V}$	—	keeps last valid state (Order code U1/H)
U2	$U_{out} \geq 10,5 \text{ V}$	$U_{out} < 0,25 \text{ V}$ (Order code U2/U)	keeps last valid state (Order code U2/H)
U8	$U_{out} \geq 10 \text{ V}$	$U_{out} < 0,25 \text{ V}$ (Order code U8/U)	keeps last valid state (Order code U8/H)
I1	$I_{out} \geq 21 \text{ mA}$	1,5 ... 2 mA (Order code I1/U)	keeps last valid state (Order code I1/H)

Error signal for SSI output

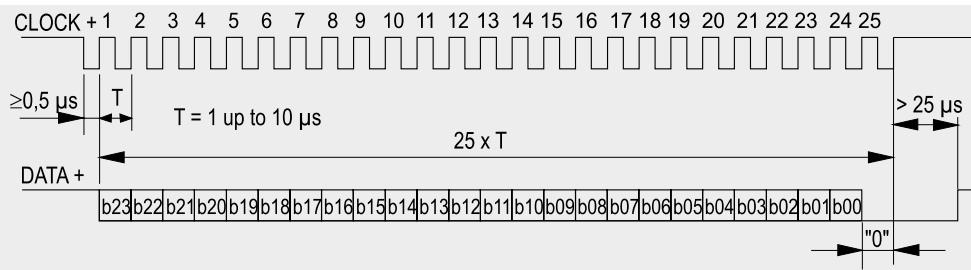
If the sensor cannot detect a magnet the position value will assume the maximum value (0xFFFFF).

Synchronous serial interface SSI 	Output	RS422
	Excitation voltage	10 ... 36 V DC, residual ripple 10 mV _{SS}
	Excitation current	Typ. 80 mA, 150 mA max.
	Clock frequency	100 kHz ... 1 MHz
	Code	Gray code, dual code
	Resolution	≥ 5 μm
	Delay between pulse trains	>25 μs
	Stability (temperature)	±50 x 10 ⁻⁶ / °C f.s.
	Operating temperature	-40 ... +85 °C
	EMC	EN 61326-1:2013

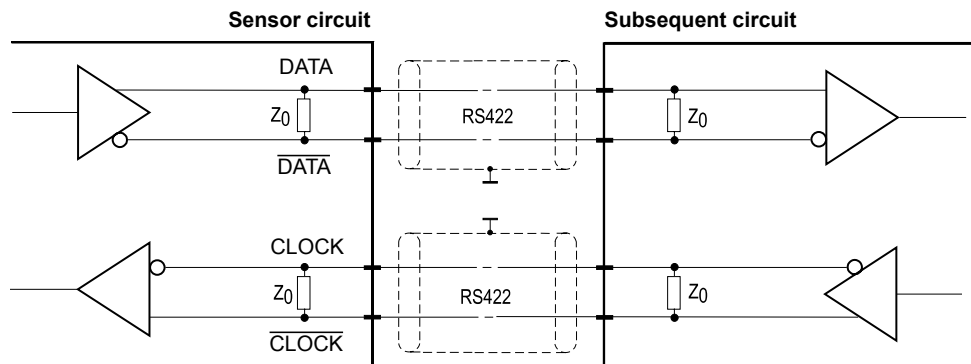
Description

The data transmission takes place by means of the two signals CLOCK and DATA. The processing unit (PLC, microcomputer) sends pulse sequences which clock the data transmission at the required transfer rate. With the first falling edge of the pulse sequence the position of the sensor is recorded and stored. The following rising edges control the bit-by-bit transfer of the data word. After a delay time the next new position information can be transmitted.

Data format
(Train of 26 pulses)



Signal diagram



Cable length	Baud rate
50 m	100-1000 kHz
100 m	100-300 kHz

Note:
Extension of the cable length will reduce the maximum transmission rate.
The signals CLOCK/CLOCK and DATA/DATA must be connected in a twisted pair cable, common shielded.


Signal wiring	Signal	Plug connection	Cable connection
	Excitation +	1	white
	Excitation GND	2	brown
	CLOCK	3	green
	CLOCK	4	yellow
	DATA	5	grey
	DATA	6	pink

View to sensor connector



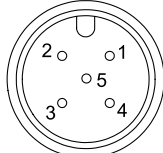
Error indication see page 10.

Description CANopen interface with process data for position and cam functions, programmable are preset, resolution, filtering and cam switching points.

Interface CANOP 	Communication profile	CANopen CiA 301 V 4.02, Slave
	Encoder profile	Encoder CiA 406 V 3.2
	Error Control	Node Guarding, Heartbeat, Emergency Message
	Node ID	Adjustable via LSS or via object dictionary
	PDO	4 TxPDO, 0 RxPDO, no linking, static mapping
	PDO Modes	Event-/Time triggered, Remote-request, Sync cyclic/acyclic
	SDO	1 server, 0 client
	CAM	8 cams
	Certified	Yes
	Transmission rates	50 kBaud to 1 MBaud, adjustable via LSS or via object dictionary
	Nodes	127 max.
	Bus connection	M12 connector, 5 pins
	Integrated bus terminating resistor	120 Ω (option)
Bus, galvanic isolated	No	

Specifications	Excitation voltage	18 ... 36 V DC
	Excitation current	Typ. 20 mA for 24 V, max. 80 mA
	Number of position magnets	1 ... 4
	Resolution	50 μm
	Measuring rate	1 kHz (asynchronous)
	Stability (temperature)	±50 x 10 ⁻⁶ / °C f.s.
	Repeatability	1 LSB
	Operating temperature	-40 ... +85 °C
	Protection	Reverse polarity, short circuit
	Dielectric strength	500 V (V AC, 50 Hz, 1 min.)
	EMC	EN 61326-1:2013

When using multiple magnets the distance between two magnets must be min. 70 mm to identify the single magnets definitely.

Signal wiring	Signal	Plug connection	View to sensor connector 
	Shield	1	
	Excitation +	2	
	GND	3	
	CAN-H	4	
	CAN-L	5	

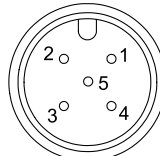
Interface J1939 	CAN specification	ISO 11898, Basic and Full CAN 2.0 B
	Transceiver	24V-compliant, not isolated
	Communication profile	SAE J1939
	Baud rate	250 kbit/s
	Internal termination resistor	120 Ω (option)
	Address	Default 247d, configurable

NAME Fields	Arbitrary address capable	0	No
	Industry group	0	Global
	Vehicle system	7Fh (127d)	Non specific
	Vehicle system instance	0	
	Function	FFh (255d)	Non specific
	Function instance	0	
	ECU instance	0	
	Manufacturer	145h (325d)	Manufacturer ID
	Identity number	0nnn	Serial number 21 bit

Parameter Group Numbers (PGN)	Configuration data	PGN EF00h	Proprietary-A (PDU1 peer-to-peer)
	Process data	PGN FFnnh	Proprietary-B (PDU2 broadcast); nn Group Extension (PS) configurable

Specifications	Excitation voltage	18 ... 36 V DC
	Excitation current	Typ. 20 mA for 24 V, max. 80 mA
	Measuring rate	1 kHz (asynchronous)
	Stability (temperature)	±50 x 10 ⁻⁶ / °C f.s.
	Repeatability	1 LSB
	Operating temperature	-40 ... +85 °C
	Protection	Reverse polarity, short circuit
	Dielectric strength	500 V (V AC, 50 Hz, 1 min.)
	EMC	EN 61326-1:2013

When using multiple magnets the distance between two magnets must be min. 70 mm to identify the single magnets definitely.

Signal wiring	Signal	Plug connection	View to sensor connector 
	Shield		
Excitation +		2	
GND		3	
CAN-H		4	
CAN-L		5	

Connector cable
M8, 4-pin
shielded

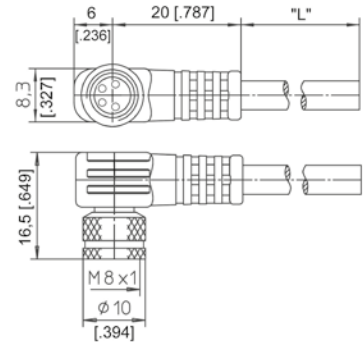
The 4-lead shielded cable is supplied with a mating 4-pin 90° M8 connector at one end and 4 wires at the other end. Available lengths are 2, 5 and 10 m. Wire: cross sectional area 0.14 mm².

Order code:

KAB - XM - M8/4F/W - LITZE

IP69K: KAB - XM - M8/4F/W/69K - LITZE

Length in m



Connector cable
M8, 4-pin
shielded

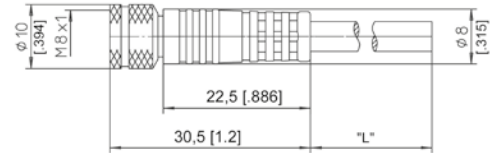
The 4-lead shielded cable is supplied with a mating 4-pin M8 connector at one end and 4 wires at the other end. Available lengths are 2, 5 and 10 m. Wire: cross sectional area 0.14 mm².

Order code:

KAB - XM - M8/4F/G - LITZE

IP69K: KAB - XM - M8/4F/G/69K - LITZE

Length in m



Signal wiring M8, 4-pin	Plug connection / Cable connection			
	1	2	3	4
	brown	white	blue	black

Connector/bus cable
M12, 5-pin
CAN bus
shielded

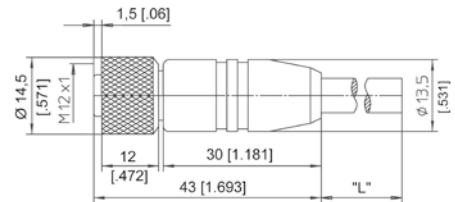
The 5-lead shielded cable is supplied with a female 5-pin M12 connector at one end and a male 5-pin M12 connector at the other end. Available lengths are 0.3 m, 2 m, 5 m and 10 m.

Order code:

KAB - XM - M12/5F/G - M12/5M/G - CAN

IP69K: KAB - XM - M12/5F/G/69K - M12/5M/G/69K - CAN

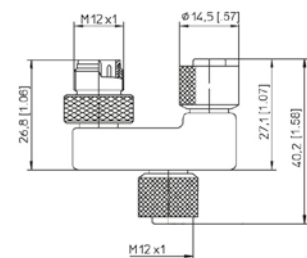
Length in m



T-piece for bus cable
M12, 5-pin
CAN bus

Order code:

KAB - TCONN - M12/5M - 2M12/5F - CAN



Terminating
resistance
M12, 5-pin
CAN bus

Order code:

KAB - RTERM - M12/5M/G - CAN

