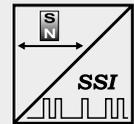




POSICHRON® rod-style position sensor

- For hydraulic cylinders, fluid level measurement
- Protection class up to IP67/IP69K
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Contactless
- Replaceable electronics without leakage
- Synchronous serial interface (SSI)



Specifications	Output	Synchronous serial interface (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	Sensor rod: stainless steel 1.4404, head: AlMgSi
	Mounting	Thread M18x1,5 / thread ¾ inch
	Working pressure of sensor rod	400 bar, other values on request
	Protection class	IP67 (optional IP67/IP69K; connector version: with mating connector only)
	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	8 pin socket M12, cable 2 m
	EMC, temperature	Refer to output specification

Order code PCST24

PCST24 - [] - [] - [] - [/] [/] - [] - []

Model name
Mounting
 M18 = Thread M18 x 1,5
 Z3/4 = Thread ¾ "-16UNF
Measurement range (in mm)
 100 ... 5750 (in 10 mm increments)
 other lengths upon request
Resolution [in µm]
 5 / 10 / 20 / 50 / 100
Output
 SSI = Synchronous serial interface
Code
 G / D = Gray / Dual
Number of data bits
 24 / 25
Linearity
 L02 / L02MM / L10 (for definition see "Specifications" above)
Connection
 M12 = Connector M12, 8 pin
 KAB2M = KAB2M = Cable, standard length 2 m, other lengths upon request

Order code position magnet (see page 9-13)

PCSTMAG ...

Order code mating connecting cable (see page 20)

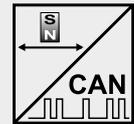
KAB- ...M-M12/8F/G-LITZE

Order example: PCQA24 - M18 - 2500 - 10 - SSI/G/24 - L10 - M12



POSICHRON® rod-style position sensor

- Replaceable electronics without leakage
- Protection class up to IP67/IP69K
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Contactless
- For hydraulic cylinders, fluid level measurement
- CANopen bus or CAN SAE J1939 output



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	Sensor rod: stainless steel 1.4404, head: AlMgSi
	Mounting	Thread M18x1,5 / thread ¾ inch
	Working pressure of sensor rod	400 bar, other values on request
	Protection class	IP67 (optional IP67/IP69K; connector version: with mating connector only)
	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	5 pin socket M12
	EMC, temperature	Refer to output specification

Order code PCST24



Model name

Mounting

- M18 = Thread M18 x 1,5
- Z3/4 = Thread ¾ "-16UNF

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

- M12/CAN = Connector M12, 5 pin

Order code position magnet (see page 9-13)

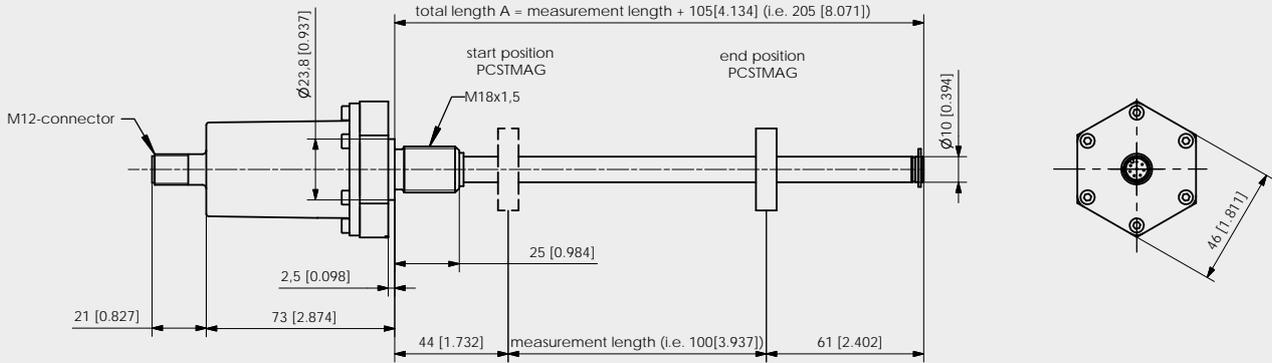
PCSTMAG ...

Order code mating connecting cable (see page 21)

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

Order example: PCST24 - M18 - 2000 - CANOP - L10 - M12/CAN

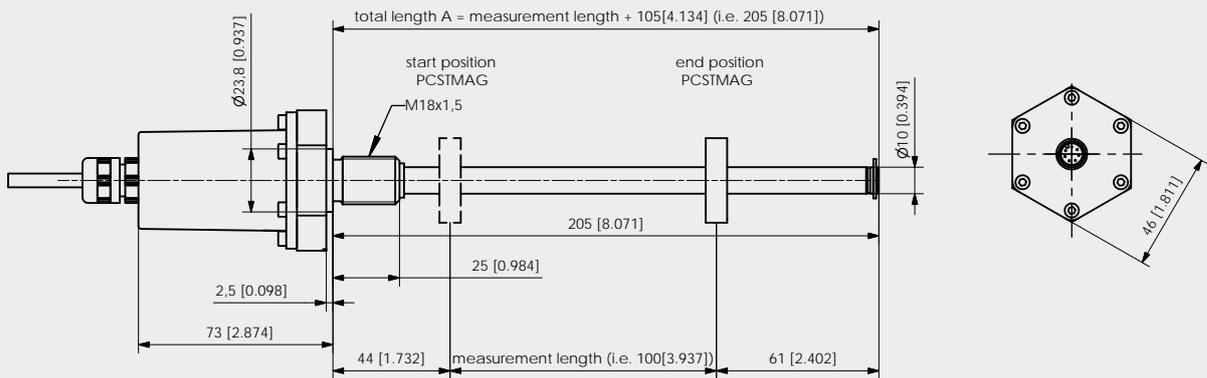
Connector M12



Dimensions in mm [inch]

Dimensions informative only. For guaranteed dimensions consult factory.

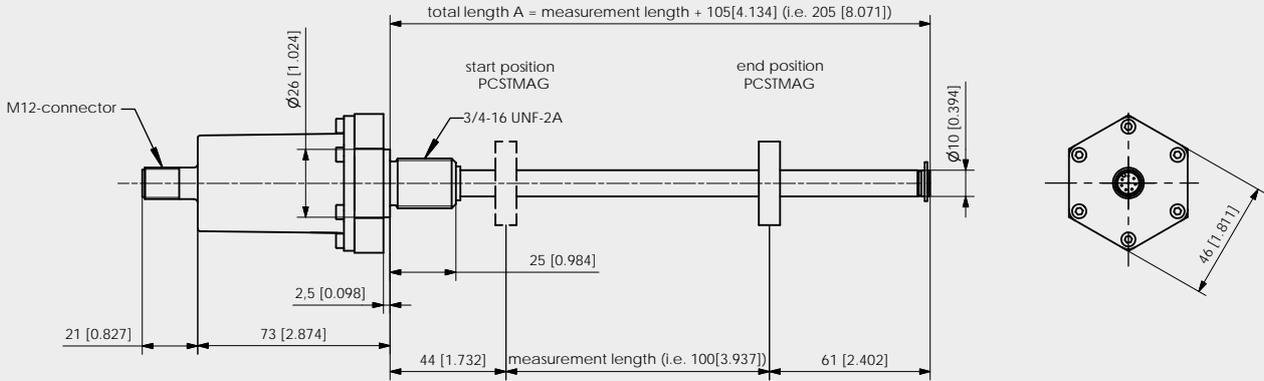
Cable output



Dimensions in mm [inch]

Dimensions informative only. For guaranteed dimensions consult factory.

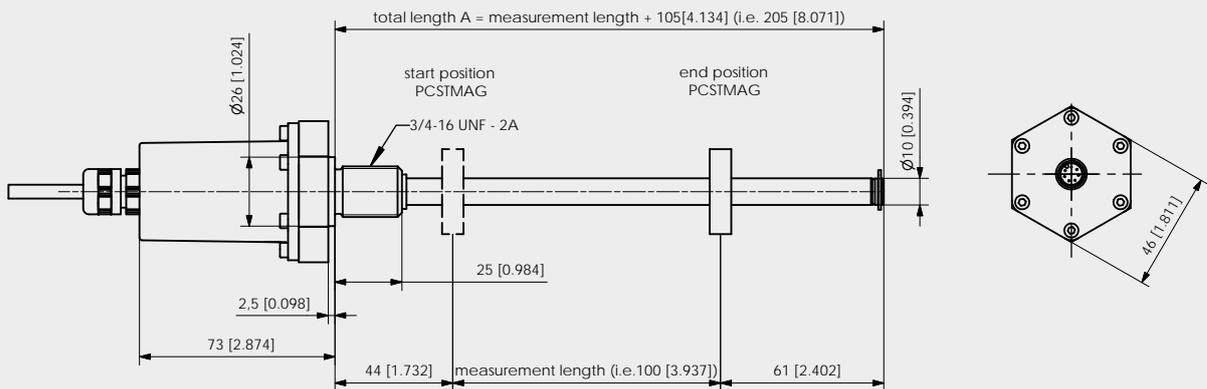
Connector M12



Dimensions in mm [inch]

Dimensions informative only. For guaranteed dimensions consult factory.

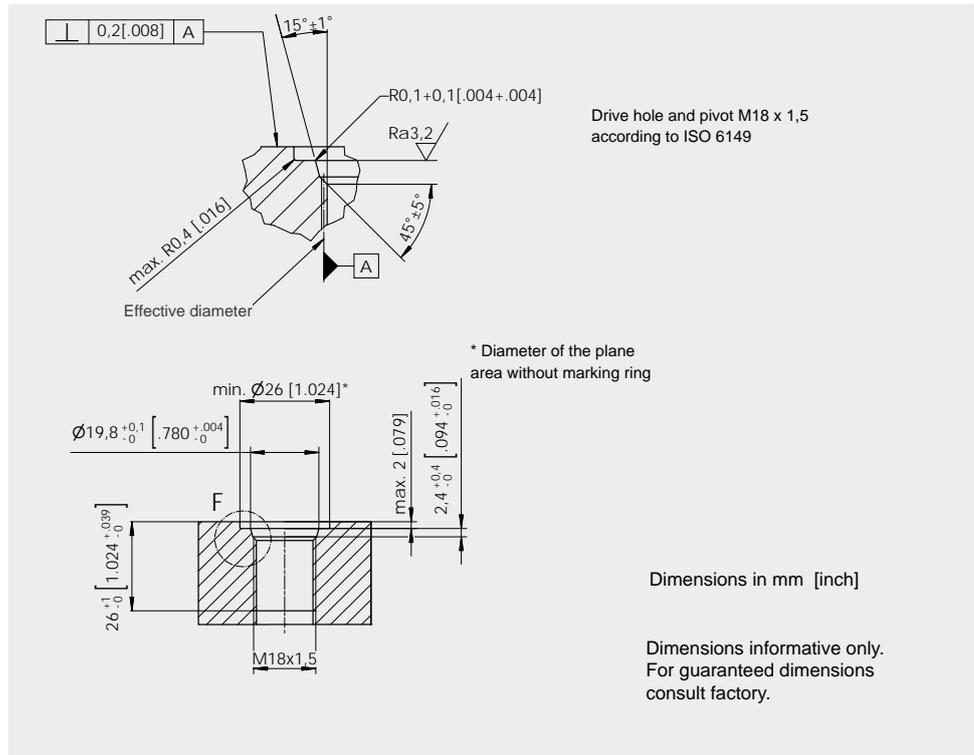
Cable output



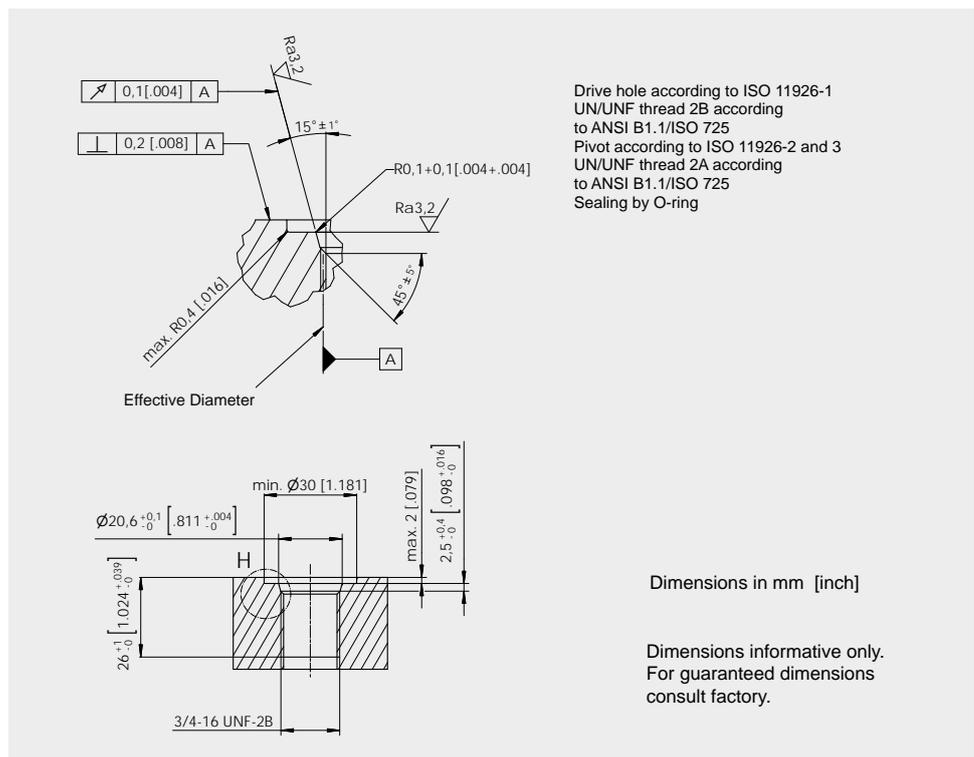
Dimensions in mm [inch]

Dimensions informative only. For guaranteed dimensions consult factory.

Mounting hole
M18



Mounting hole
¾ Zoll



O-ring sealing (M18)

for:

PCST24-M18...

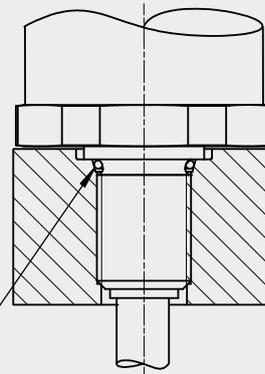
PCST25-M18...

PCST27-M18...

Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions
consult factory.

O-Ring 15,3 x 2,2
[.602 x .087]



Order code O-ring M18

PCST-OR-M18

O-ring sealing (¾ Zoll)

for:

PCST24-Z3/4...

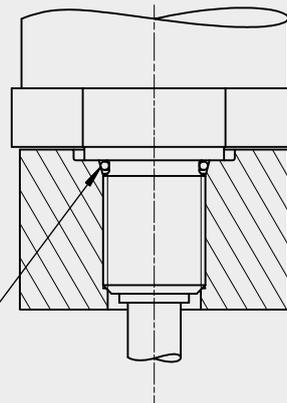
PCST25-Z3/4...

PCST27-Z3/4...

Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions
consult factory.

O-Ring 16,36 x 2,2
[.644 x .087]



Order code O-ring ¾ inch

PCST-OR-Z3/4

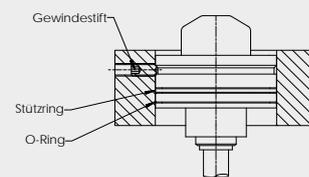
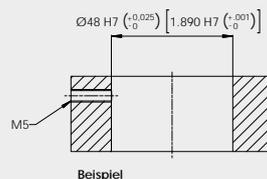
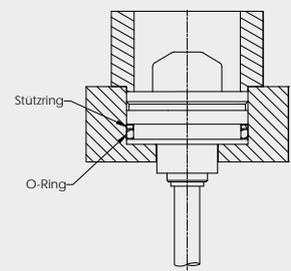
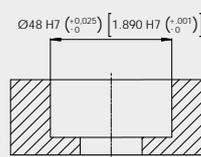
O-ring sealing (Plug-in version)

for:

PCST25-SV...

Dimensions in mm [inch]

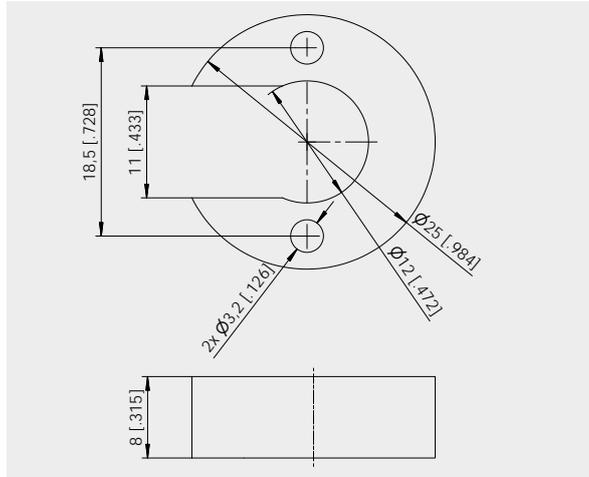
Dimensions informative only.
For guaranteed dimensions
consult factory.



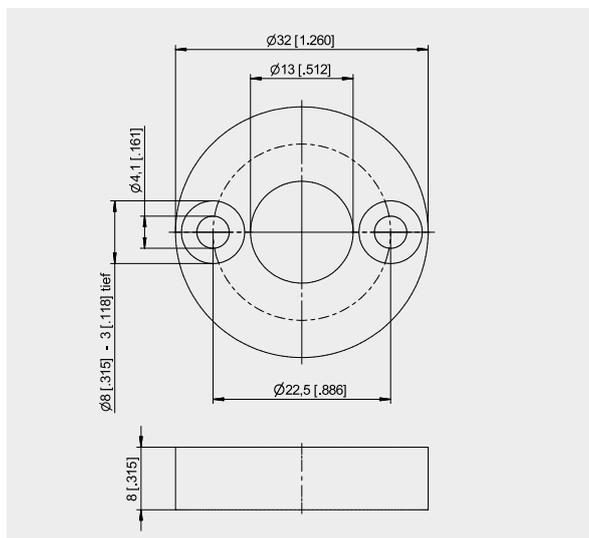
Order code O-ring Plug-in version

PCST-OR-SV

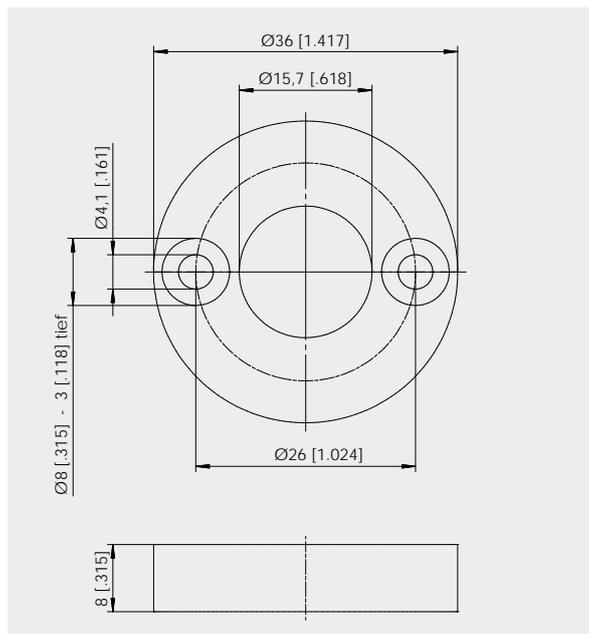
PCSTMAG1



PCSTMAG2
(standard)



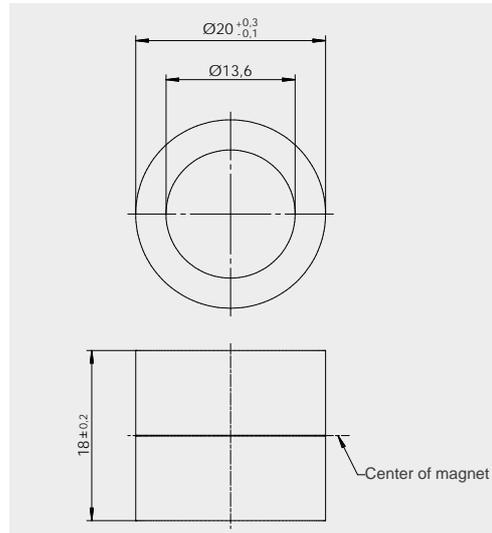
PCSTMAG5



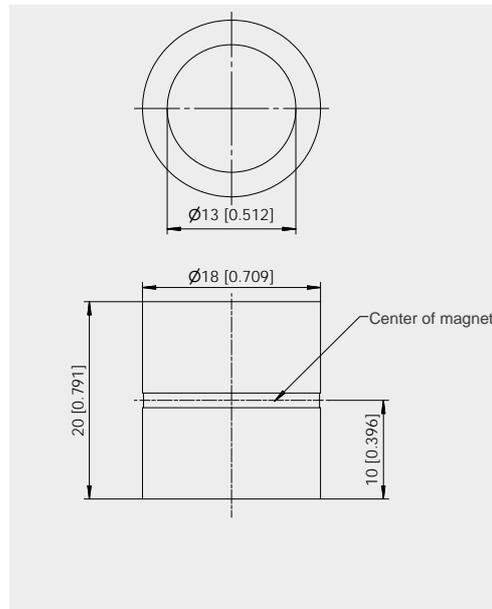
Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions
consult factory.
Other designs can be realized
on request.

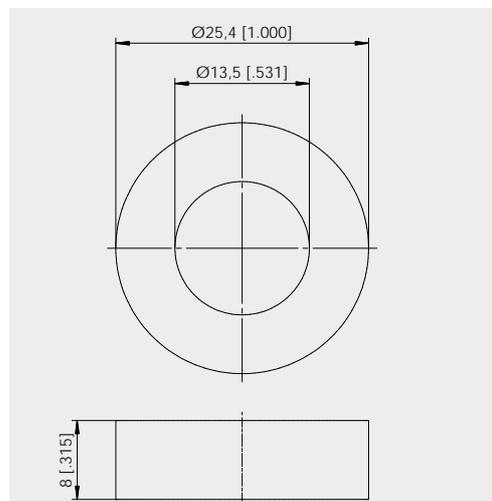
PCSTMAG2-MH1



PCSTMAG2-MH2



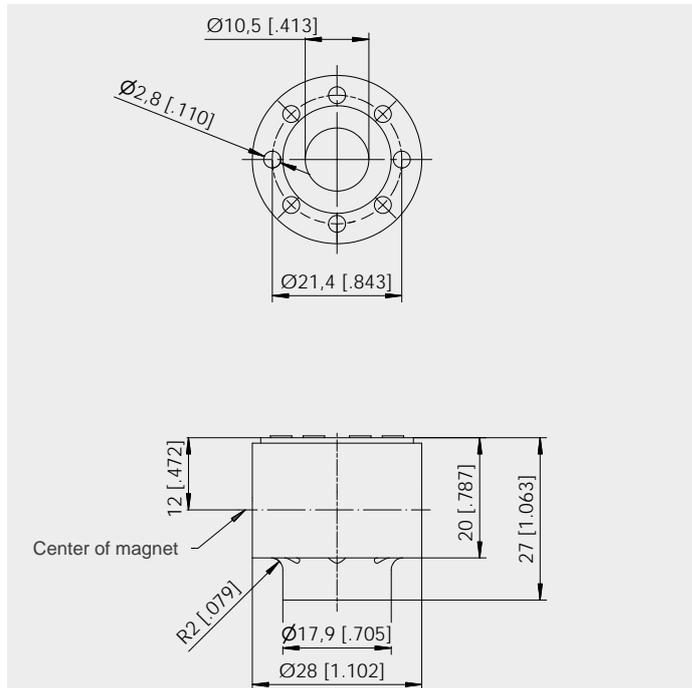
PCSTMAG2-MH3



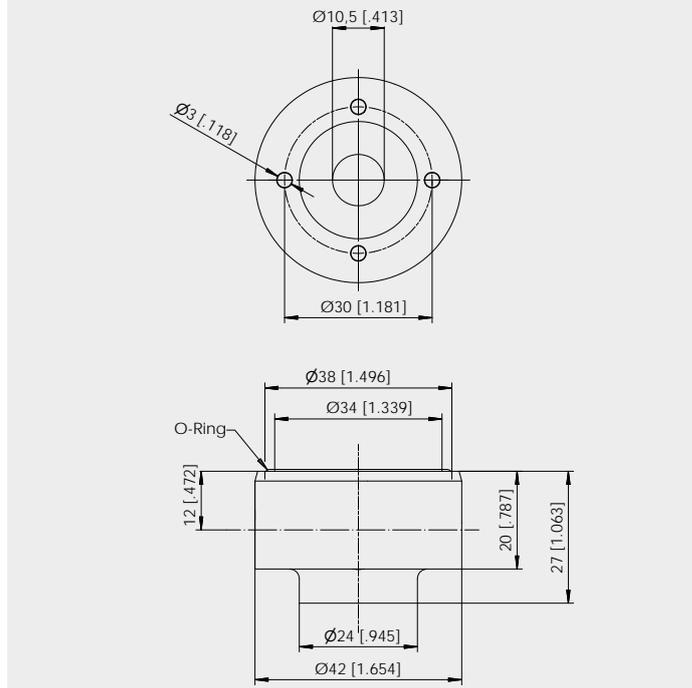
Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions consult factory.
Other designs can be realized on request

PCSTMAG2-G1



PCSTMAG2-G2



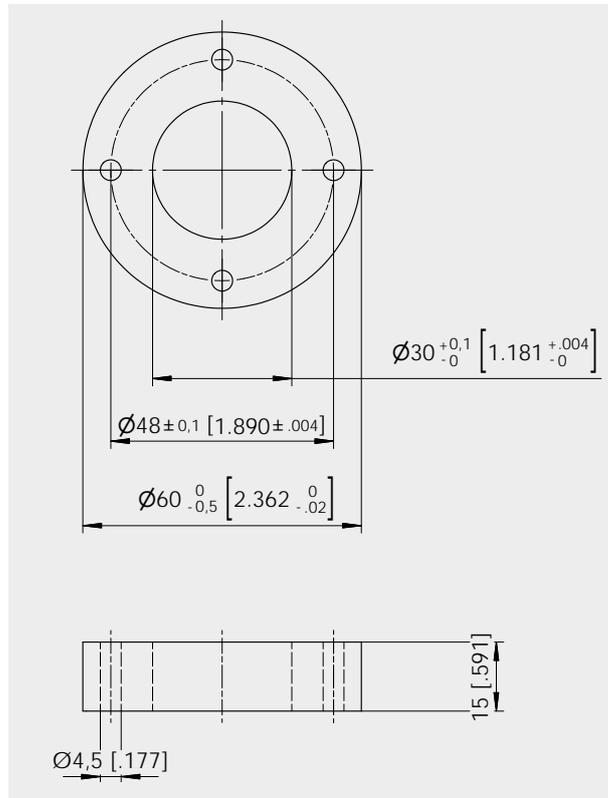
PCSTMAG2 - G1 / G2

Sliding magnet with special self-lubricating and abrasion-resistant material. To be used if sensor is mounted in horizontal position and a mechanical support of the rod is not possible for measurement ranges >1000 mm.

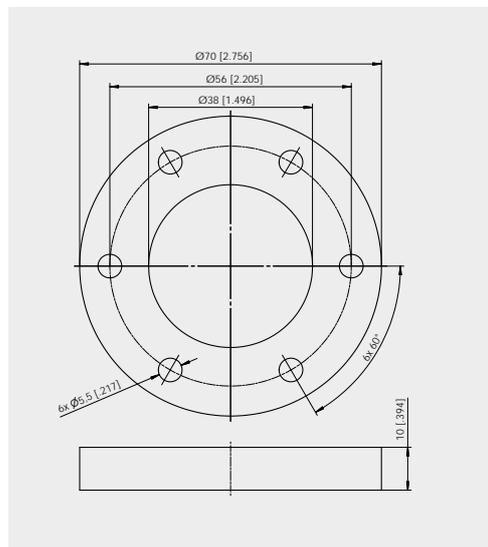
Dimensions in mm [inch]

Dimensions informative only.
 For guaranteed dimensions consult factory.
 Other designs can be realized on request

PCSTMAG7



PCSTMAG4



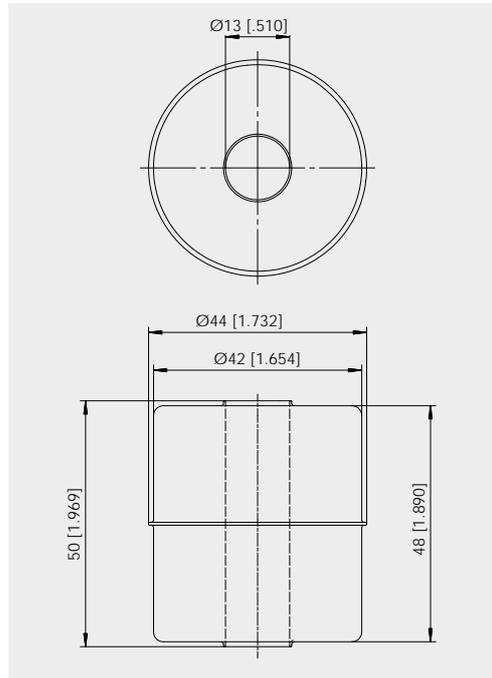
Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions consult factory.
Other designs can be realized on request

PCSTMAG3

(float, continuous pressure up to 9 bar, for media with a specific gravity of $\geq 0,75 \text{ g/cm}^3$)

Material: 1.4404

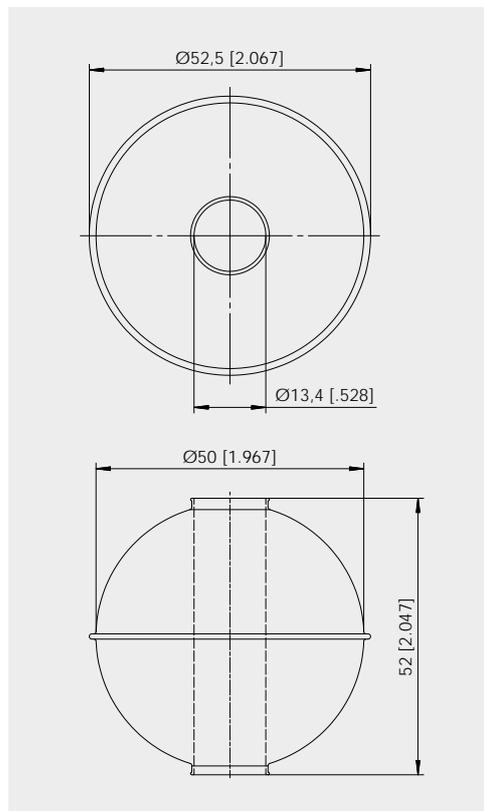


Note: Dependent on the design the available measurement range is reduced of 25 mm on both ends!

PCSTMAG6

(float, continuous pressure up to 30 bar, for media with a specific gravity of $\geq 0,7 \text{ g/cm}^3$)

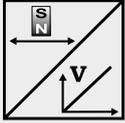
Material: 1.4571



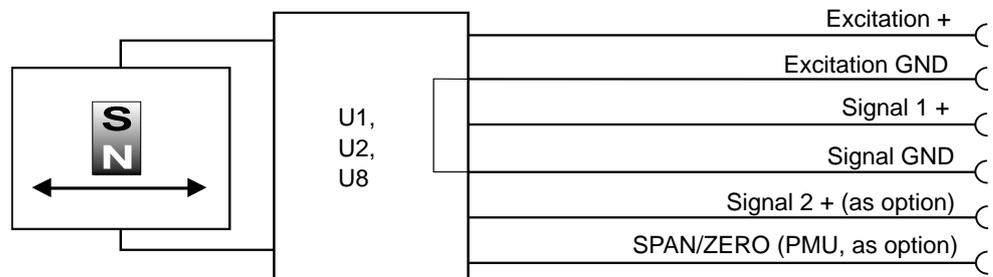
Note: Dependent on the design the available measurement range is reduced of 25 mm on both ends!

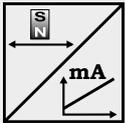
Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions consult factory.
Other designs can be realized on request

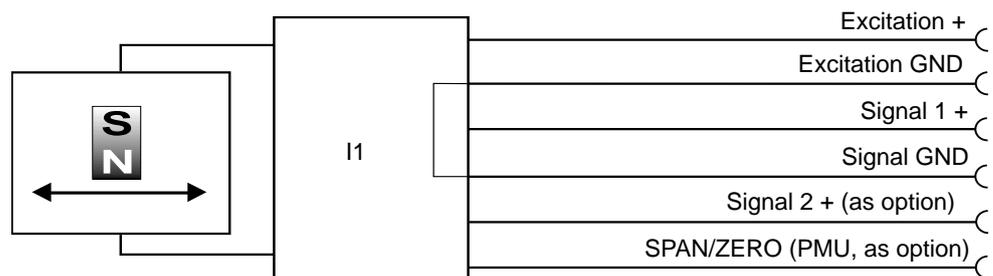
<p>U1, U2, U8 Voltage output</p> 	Excitation voltage	U1: 18 ... 36 V DC; U2: 18 ... 36 V DC; U8: 10 ... 36 V
	Excitation current	Typ. 35 mA, 80 mA max.
	Output voltage	U1: 0 ... 10 V DC; U2: 0.5 ... 10 V DC; U8: 0.5 ... 4.5 V DC
	Output current	2 mA max.
	Output load	> 5 kΩ
	Resolution	16 bit f.s., min. 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



<p>I1 Current output (3 wire)</p> 	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

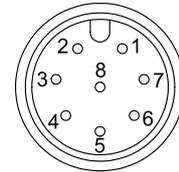


Connector M12, 8-pin

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



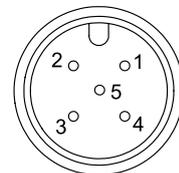
* When using multiple magnets the distance between two magnets must be min. 70 mm to identify the single magnets definitely. ** Description page 16

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



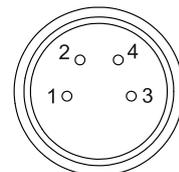
* When using multiple magnets the distance between two magnets must be min. 70 mm to identify the single magnets definitely. ** Description page 16

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 16

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)

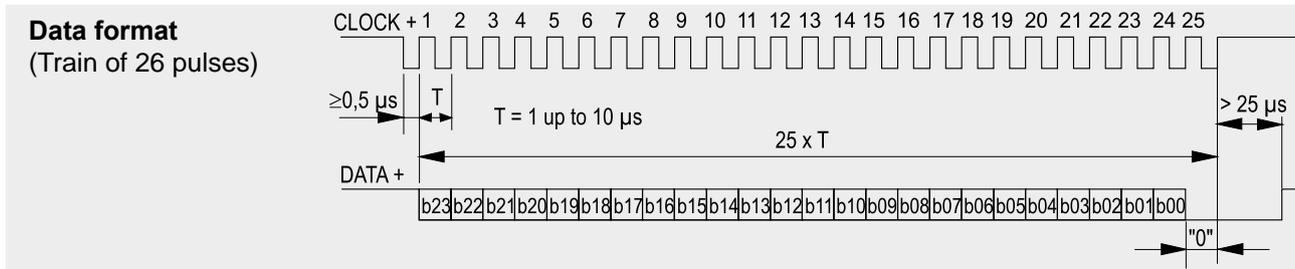
Error signal for SSI output

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

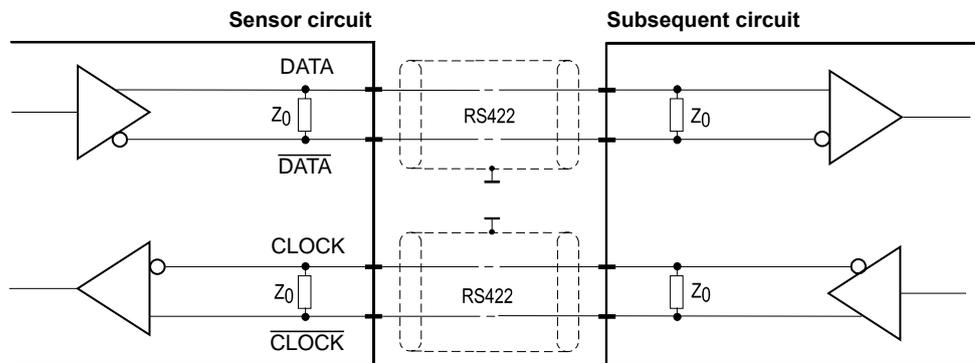
Synchronous serial interface SSI 	Output	RS422
	Excitation voltage	10 ... 36 V DC, residual ripple 10 mV _{SS}
	Excitation current	Typ. 80 mA, 150 mA max.
	Clock frequency	100 kHz ... 1 MHz
	Code	Gray code, dual code
	Resolution	≥ 5 μm
	Delay between pulse trains	>25 μs
	Stability (temperature)	±50 x 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.



Signal diagram

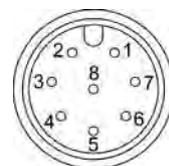


Cable length	Baud rate
50 m	100-1000 kHz
100 m	100-300 kHz

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
	DAT	6	pink

View to sensor connector



Error indication see page 16.

Description

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

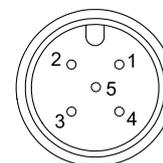
Interface CANOP 	Communication profile	CANopen CiA 301 V 4.02, Slave
	Encoder profile	Encoder CiA 406 V 3.2
	Error Control	Node Guarding, Heartbeat, Emergency Message
	Node ID	Adjustable via LSS or via object dictionary
	PDO	4 TxPDO, 0 RxPDO, no linking, static mapping
	PDO Modes	Event-/Time triggered, 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

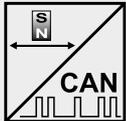
Specifications	Excitation voltage	18 ... 36 V DC
	Excitation current	Typ. 20 mA for 24 V, max. 80 mA
	Number of position magnets	1 ... 4
	Resolution	50 μm
	Measuring rate	1 kHz (asynchronous)
	Stability (temperature)	±50 x 10 ⁻⁶ / °C f.s.
	Repeatability	1 LSB
	Operating temperature	-40 ... +85 °C
	Protection	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
	Shield	1
	Excitation +	2
	GND	3
	CAN-H	4
	CAN-L	5

View to sensor connector



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

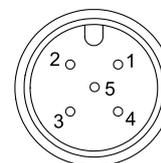
Parameter Group Numbers (PGN)	Configuration data	PGN EF00h	Proprietary-A (PDU1 peer-to-peer)
	Process data	PGN FFnnh	Proprietary-B (PDU2 broadcast); nn Group Extension (PS) configurable

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
	Shield	1
	Excitation +	2
	GND	3
	CAN-H	4
	CAN-L	5

View to sensor connector



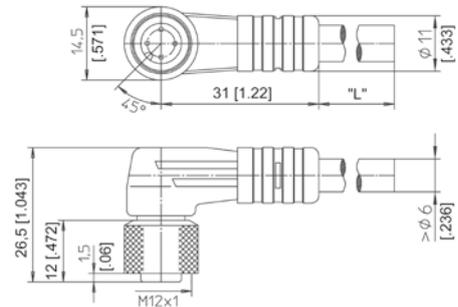
**Connector cable
M12, 5-pin
shielded**

The 5-lead shielded cable is supplied with a mating 5-pin 90° M12 connector at one end and 5 wires at the other end. Available lengths are 2 m, 5 m and 10 m. Wire: cross sectional area 0.34 mm².

Order code:

KAB - XM - M12/5F/W - LITZE
IP69K: KAB - XM - M12/5F/W/69K - LITZE

Length in m



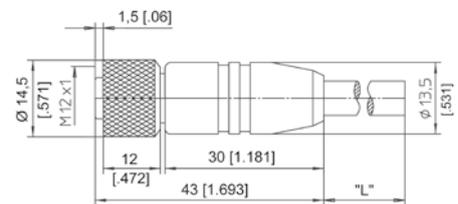
**Connector cable
M12, 5-pin
shielded**

The 5-lead shielded cable is supplied with a mating 5-pin M12 connector at one end and 5 wires at the other end. Available lengths are 2 m, 5 m and 10 m. Wire: cross sectional area 0.34 mm².

Order code:

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

Length in m



Signal wiring M12, 5-pin	Plug connection / Cable connection				
	1	2	3	4	5
	brown	white	blue	black	grey

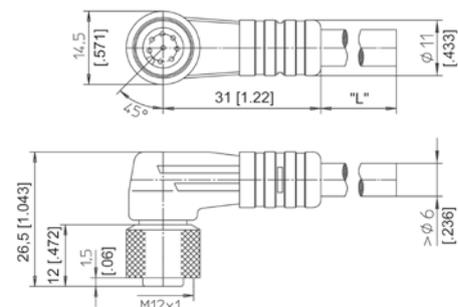
**Connector cable
M12, 8-pin
shielded**

The 8-lead shielded cable is supplied with a mating 8-pin 90° M12 connector at one end and 8 wires at the other end. Available lengths are 2, 5 and 10 m. Wire: cross sectional area 0.25 mm².

Order code:

KAB - XM - M12/8F/W - LITZE
IP69K: KAB - XM - M12/8F/W/69K - LITZE

Length in m



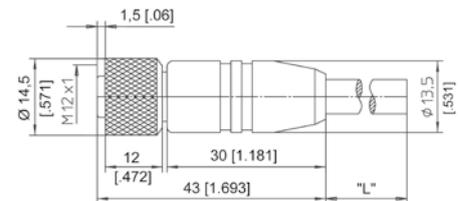
**Connector cable
M12, 8-pin
shielded**

The 8-lead shielded cable is supplied with a mating 8-pin M12 connector at one end and 8 wires at the other end. Available lengths are 2, 5 and 10 m. Wire: cross sectional area 0.25 mm².

Order code:

KAB - XM - M12/8F/G - LITZE
IP69K: KAB - XM - M12/8F/G/69K - LITZE

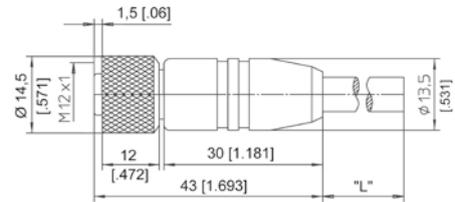
Length in m



Signal wiring M12, 8-pin	Plug connection / Cable connection							
	1	2	3	4	5	6	7	8
	white	brown	green	yellow	grey	pink	blue	red

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

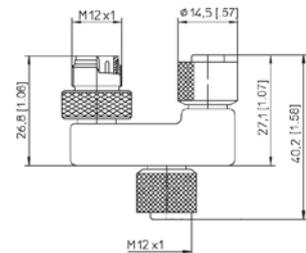
IP69K: KAB - XM - M12/5F/G/69K - M12/5M/G/69K - CAN

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

