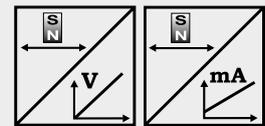




POSICHRON® rod-style position sensor

- For hydraulic cylinders, fluid level measurement
- Protection class up to IP67/IP69K
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Contactless
- Analog output



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	Sensor rod: stainless steel 1.4404, head: AlMgSi	
Mounting	Thread M18x1,5 / thread ¾ inch / plug-in mounting	
Operating pressure	400 bar, other values on request	
Protection class	IP67 (optional IP67/IP69K)	
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 PCST25
1 channel**

Model name ————— **PCST25** — [] — [] — [] — [] — [] — []

Mounting
 M18 = Thread M18 x 1,5
 Z3/4 = Thread ¾"-16UNF
 SV = Plug-in version

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 14)
 U2 = 0.5 ... 10 V signal conditioner
 U2/U; U2/H = U2 with Alarm_LOW; U2 with Alarm_HOLD (see page 14)
 U8 = 0.5 ... 4.5 V signal conditioner
 U8/U; U8/H = U8 with Alarm_LOW; U8 with Alarm_HOLD (see page 14)
 I1 = 4 ... 20 mA signal conditioner (3 wire)
 I1/U; I1/H = I1 with Alarm_LOW; I1 with Alarm_HOLD (see page 14)

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

PCST25

Rod-Style Design with Analog Output

Order code PCST25
2 channel, configurable

PCST25 - [] - [] - [] - [] - [] - [] - []

Model name

Mounting
M18 = Thread M18 x 1,5
Z3/4 = Thread 3/4"-16UNF
SV = Plug-in version

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 14)
U2 = 0.5 ... 10 V signal conditioner
U2/U; U2/H = U2 with Alarm_LOW; U2 with Alarm_HOLD (see page 14)
U8 = 0.5 ... 4.5 V signal conditioner
U8/U; U8/H = U8 with Alarm_LOW; U8 with Alarm_HOLD (see page 14)
I1 = 4 ... 20 mA signal conditioner (3 wire)
I1/U; I1/H = I1 with Alarm_LOW; I1 with Alarm_HOLD (see page 14)

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

Order example: PCST25 - M18 - 1000 - U2 - P1A - VZ1.0 - L10 - KAB2M
Rod-Style Design, 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)

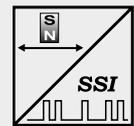
Order code position magnet (see page 7-11)

PCSTMAG ...



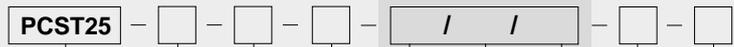
POSICHRON® rod-style position sensor

- For hydraulic cylinders, fluid level measurement
- Protection class up to IP67/IP69K
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Contactless
- 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 / plug-in mounting
	Working pressure	400 bar, other values on request
	Protection class	IP67 (optional IP67/IP69K)
	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 PCST25



Model name

Mounting

- M18 = Thread M18 x 1,5
- Z3/4 = Thread ¾" -16UNF
- SV = Plug-in version

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

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

Order code position magnet (see page 7-11)

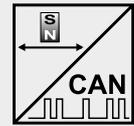
PCSTMAG ...

Order example: PCST25 - M18 - 1500 - 50 - SSI/G/24 - L02 - KAB2M



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
- CAN Output 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 / plug-in mounting
	Working pressure	400 bar, other values on request
	Protection class	IP67 (optional IP67/IP69K)
	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 (length 0.3 m) with 5-pin connector M12
EMC, temperature	Refer to output specification	

Order code PCST25



Model name

Mounting

- M18 = Thread M18 x 1,5
- Z3/4 = Thread ¾ "-16UNF
- SV = Plug-in version

Measurement range (in mm)

100 ... 5750 (in 10 mm increments)
other ranges on request

Output

- CANOP = CANopen bus
- CANOP/R = CANopen bus with integrated terminating resistor
- 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 connector M12

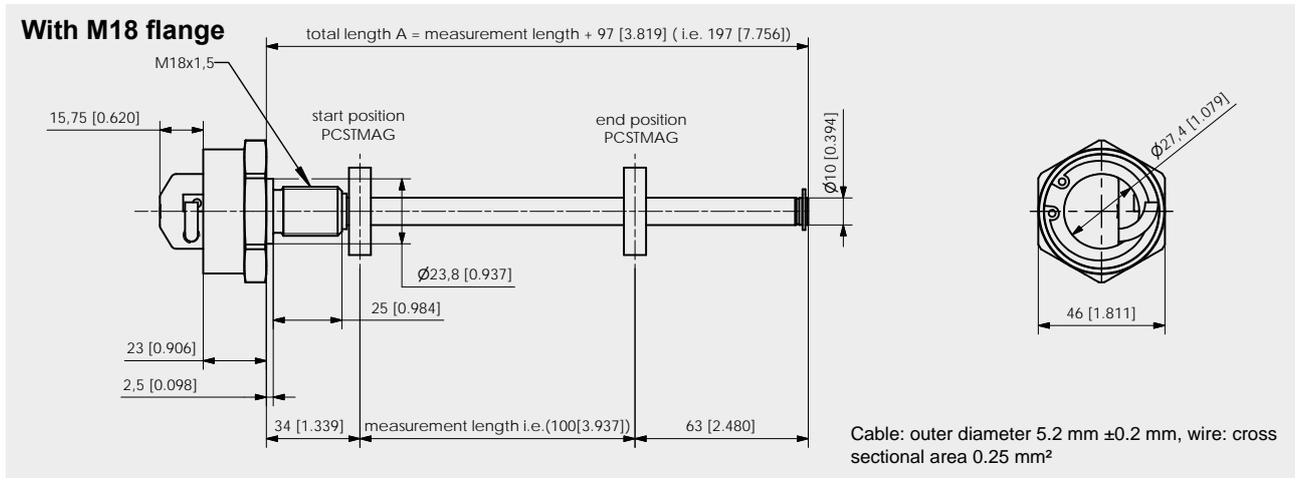
Order code position magnet (see page 7-11)

PCSTMAG ...

Order code bus cable (see page 19)

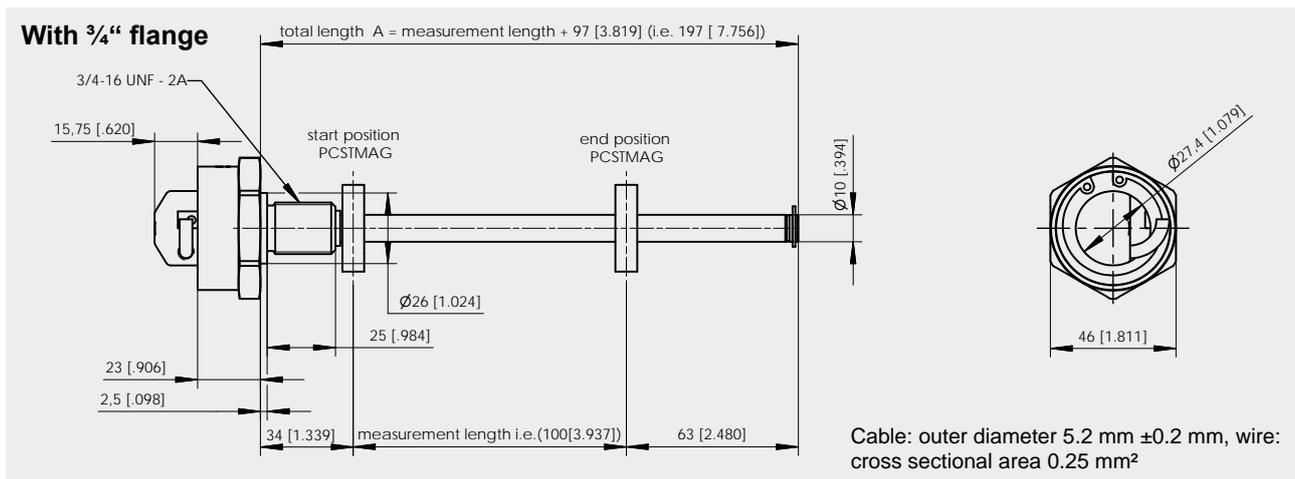
KAB- ...M-M12/5F/G-M12/5M/G - CAN

Order example: PCST25 - M18 - 2500 - CANOP - L10 - KAB0,3M-M12/CAN



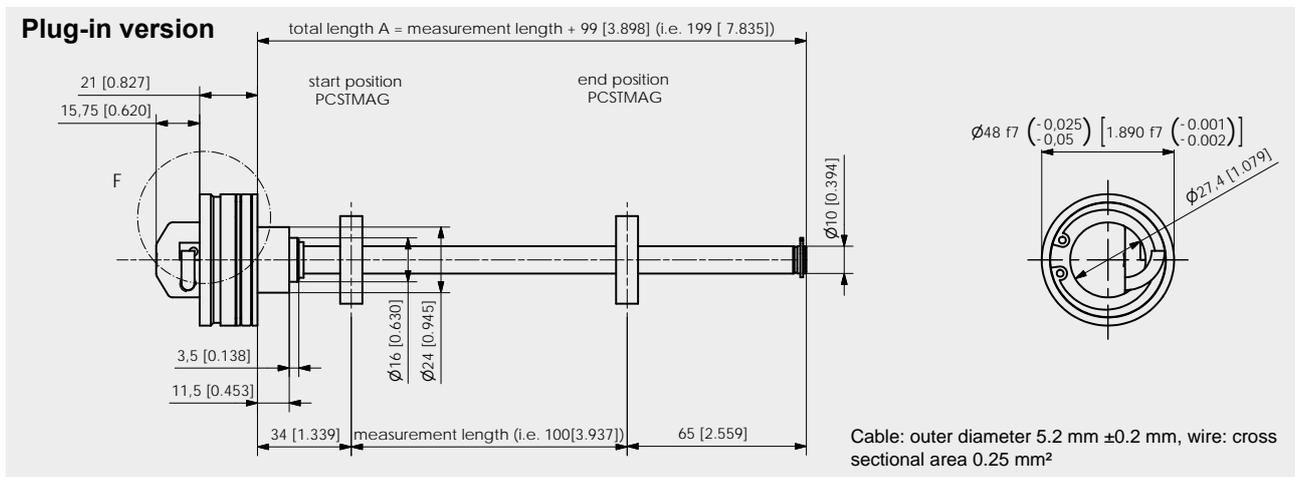
Dimensions in mm [inch]

Dimensions informative only. For guaranteed dimensions consult factory.



Dimensions in mm [inch]

Dimensions informative only. For guaranteed dimensions consult factory.



Dimensions in mm [inch]

Dimensions informative only. For guaranteed dimensions consult factory.

O-ring sealing (M18)

for:

PCST24-M18...

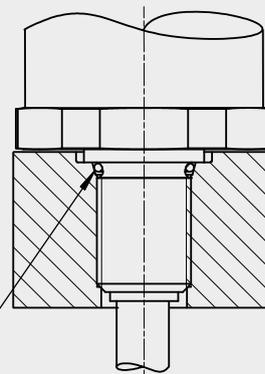
PCST25-M18...

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...

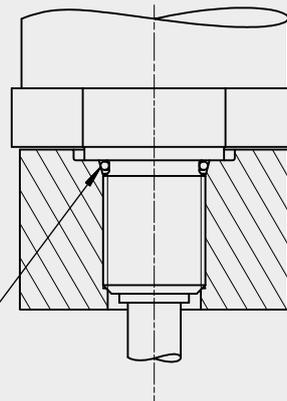
PCST25-Z3/4...

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

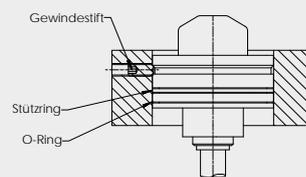
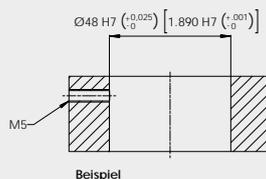
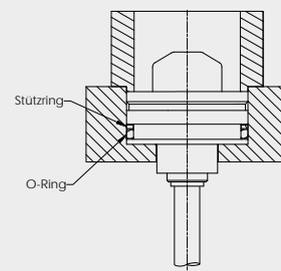
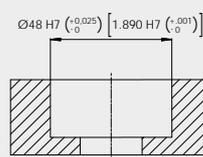
O-ring sealing (Plug-in version)

for:

PCST25-SV...

Dimensions in mm [inch]

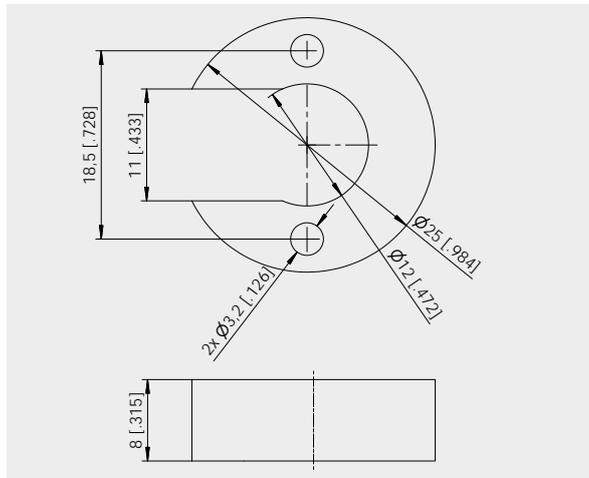
Dimensions informative only.
For guaranteed dimensions
consult factory.



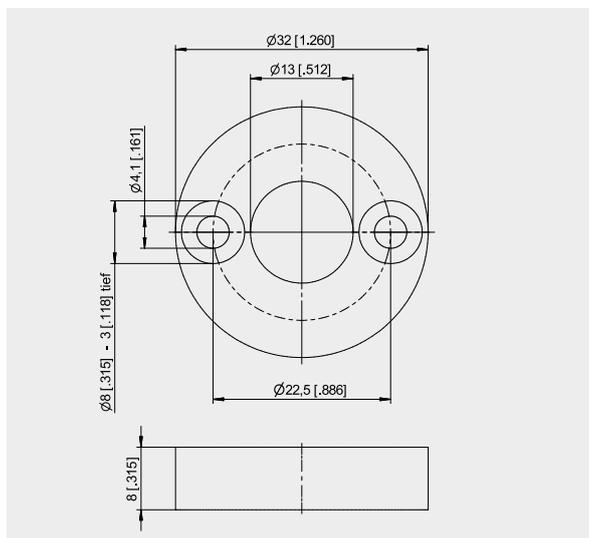
Order code O-ring Plug-in version

PCST-OR-SV

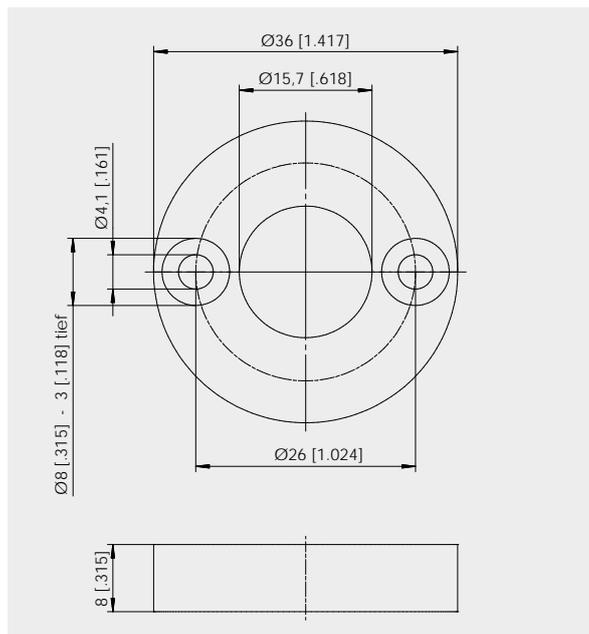
PCSTMAG1



PCSTMAG2
 (standard)



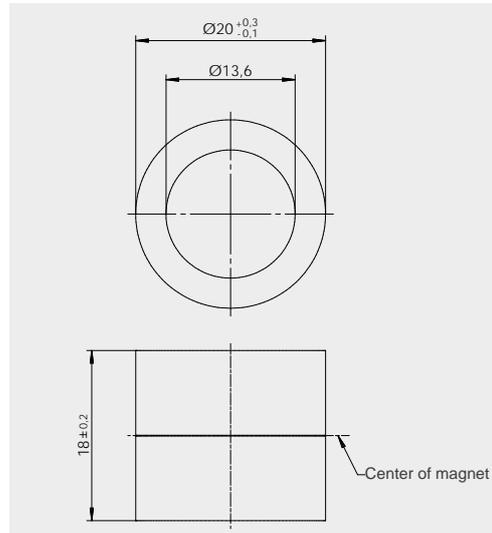
PCSTMAG5



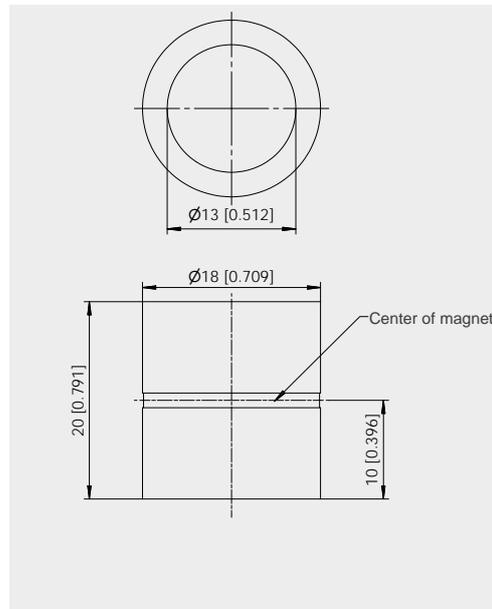
Dimensions in mm [inch]

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

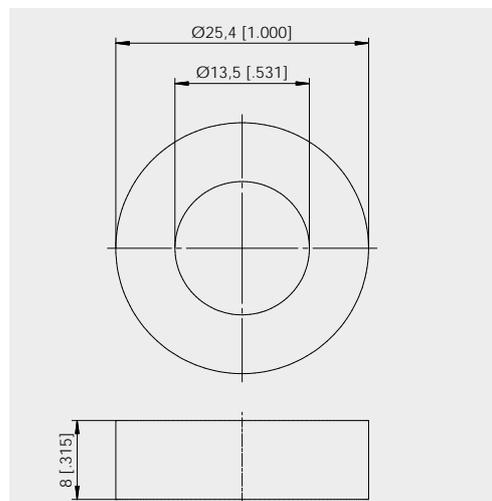
PCSTMAG2-MH1



PCSTMAG2-MH2



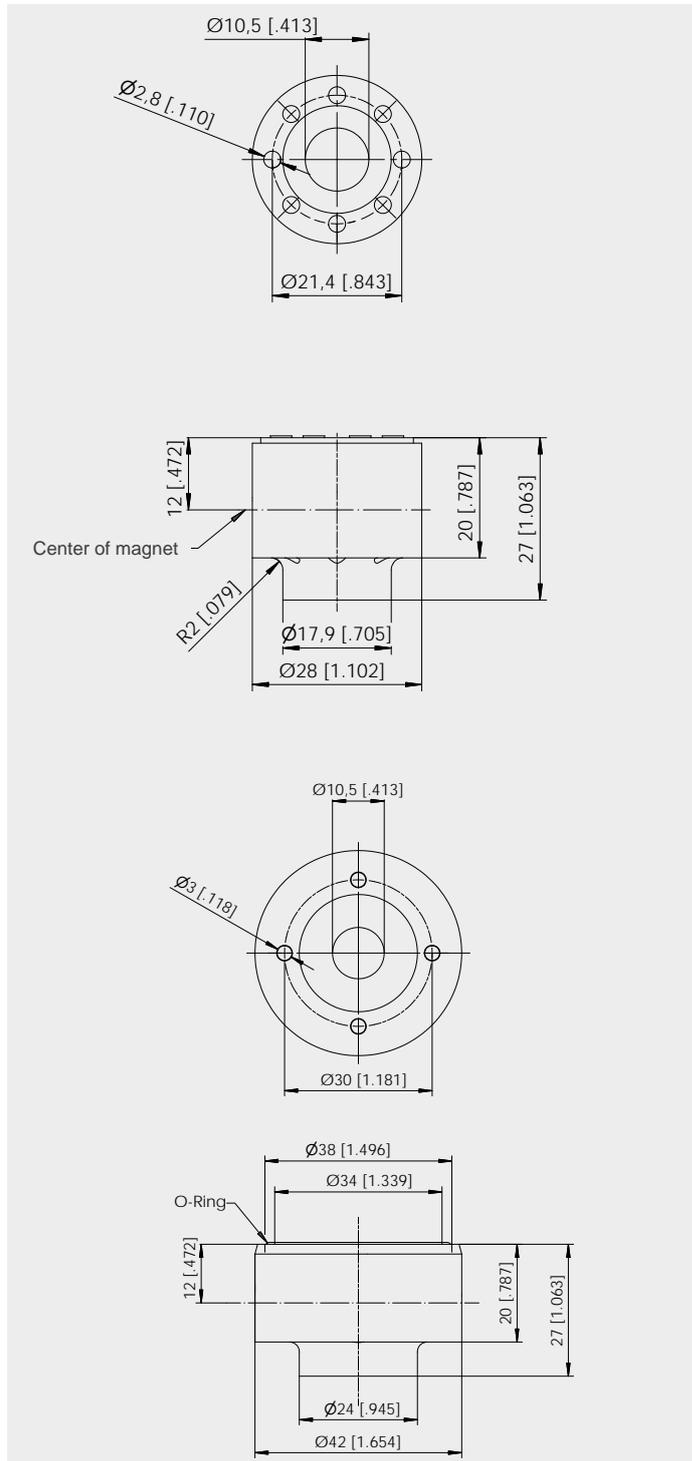
PCSTMAG2-MH3



Dimensions in mm [inch]

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

PCSTMAG2-G1



PCSTMAG2-G2

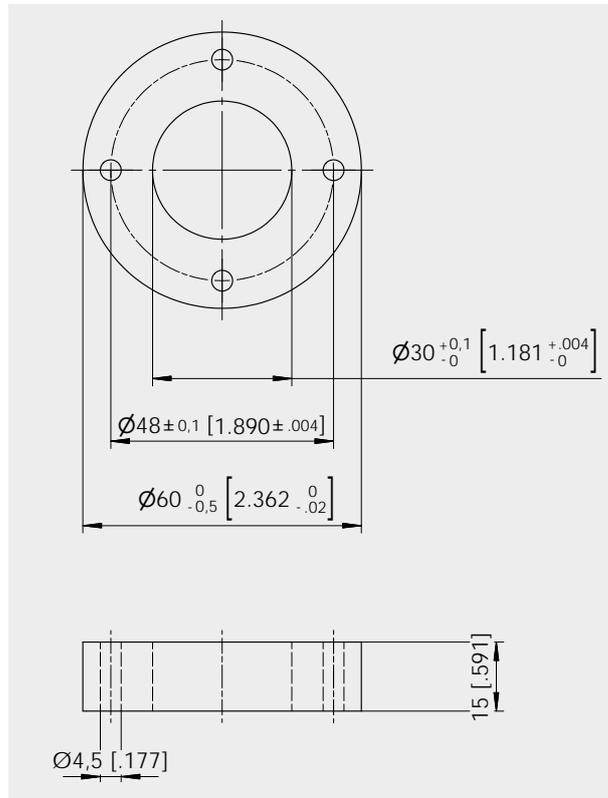
PCSTMAG2 - G1 / G2

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.

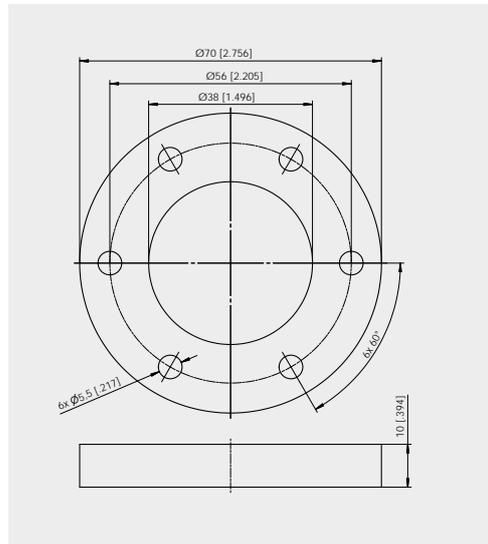
Dimensions in mm [inch]

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

PCSTMAG7



PCSTMAG4



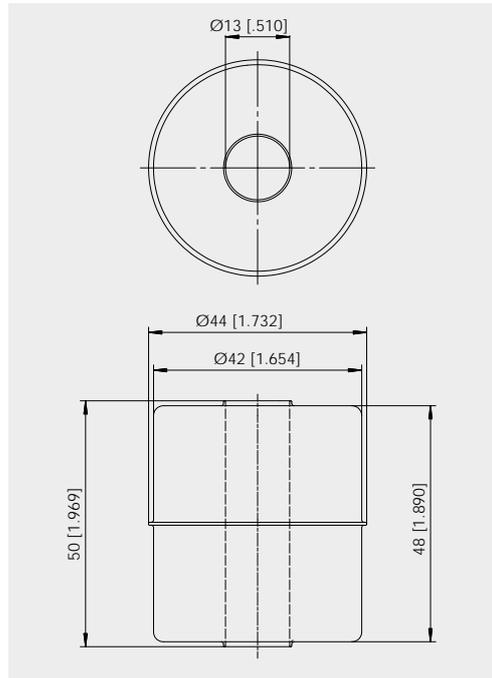
Dimensions in mm [inch]

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

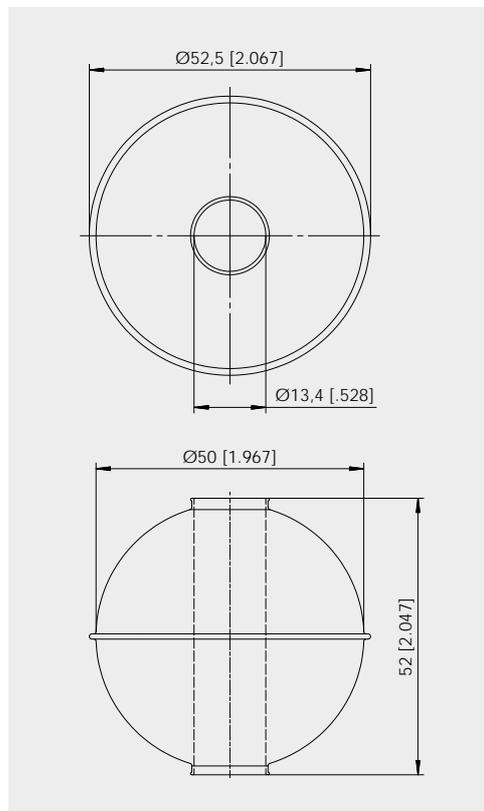


Note: Dependent on the design the available measurement range is reduced of 25 mm on both ends!

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



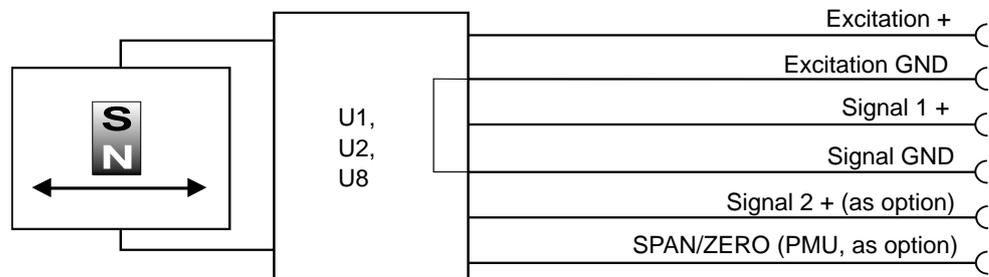
Note: Dependent on the design the available measurement range is reduced of 25 mm on both ends!

Dimensions in mm [inch]

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

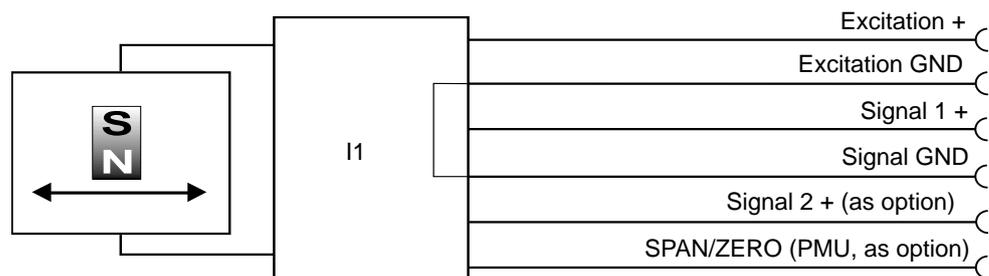
<p>U1, U2, U8 Voltage output</p>	Excitation voltage	U1: 18 ... 36 V DC; U2: 18 ... 36 V DC; U8: 10 ... 36 V
	Excitation current	Typ. 35 mA, 80 mA max.
	Output voltage	U1: 0 ... 10 V DC; U2: 0.5 ... 10 V DC; U8: 0.5 ... 4.5 V DC
	Output current	2 mA max.
	Output load	> 5 kΩ
	Resolution	16 bit f.s., min.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

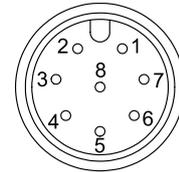


Connector M12, 8-pin

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



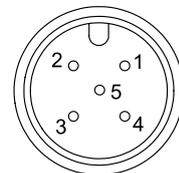
* When using multiple magnets the distance between two magnets must be min. 70 mm to identify the single magnets definitely. ** Description page 14

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



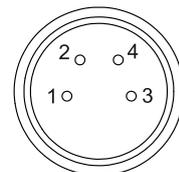
* When using multiple magnets the distance between two magnets must be min. 70 mm to identify the single magnets definitely. ** Description page 14

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 14

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)

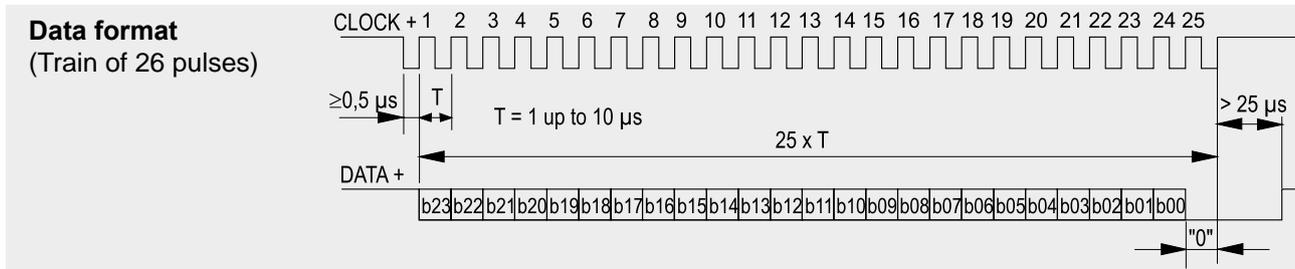
Error signal for SSI output

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

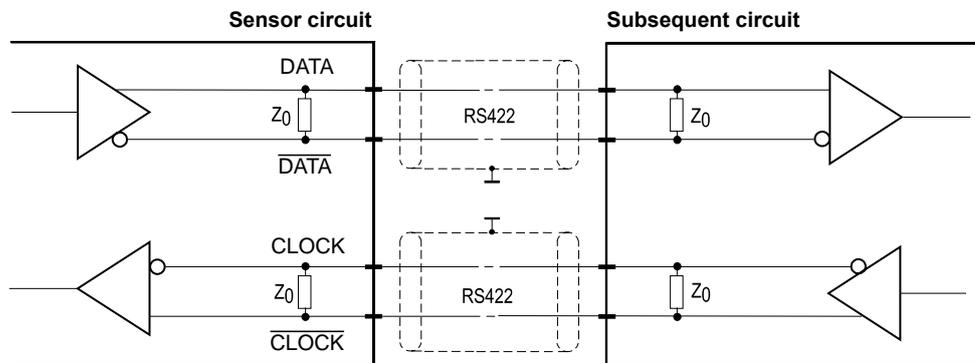
Synchronous serial interface SSI 	Output	RS422
	Excitation voltage	10 ... 36 V DC, residual ripple 10 mV _{SS}
	Excitation current	Typ. 80 mA, 150 mA max.
	Clock frequency	100 kHz ... 1 MHz
	Code	Gray code, dual code
	Resolution	≥ 5 μm
	Delay between pulse trains	>25 μs
	Stability (temperature)	±50 x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

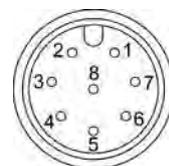


Cable length	Baud rate
50 m	100-1000 kHz
100 m	100-300 kHz

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
	DATA	6	pink

View to sensor connector

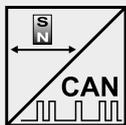


Error indication see page 14.

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

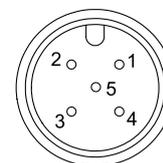
Excitation voltage	18 ... 36 V DC
Excitation current	Typ. 20 mA for 24 V, max. 80 mA
Number of position magnets	1 ... 4
Resolution	50 μm
Measuring rate	1 kHz (asynchronous)
Stability (temperature)	±50 x 10 ⁻⁶ / °C f.s.
Repeatability	1 LSB
Operating temperature	-40 ... +85 °C
Protection	Reverse polarity,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

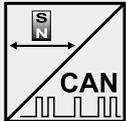
When using multiple magnets the distance between two magnets must be min. 70 mm to identify the single magnets definitely.

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

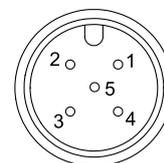
Parameter Group Numbers (PGN)	Configuration data	PGN EF00h	Proprietary-A (PDU1 peer-to-peer)
	Process data	PGN FFnnh	Proprietary-B (PDU2 broadcast); nn Group Extension (PS) configurable

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
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View to sensor connector



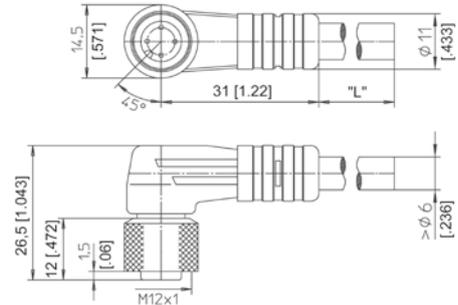
**Connector cable
M12, 5-pin
shielded**

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



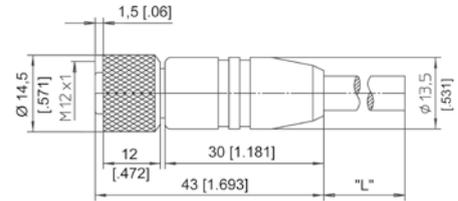
**Connector cable
M12, 5-pin
shielded**

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

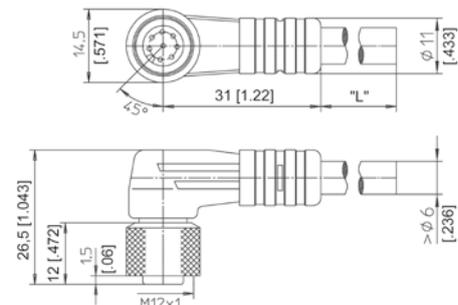
**Connector cable
M12, 8-pin
shielded**

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



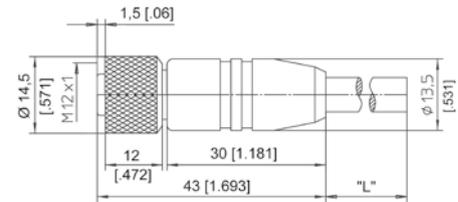
**Connector cable
M12, 8-pin
shielded**

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

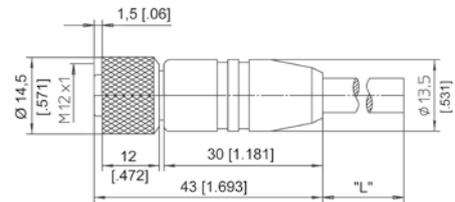
Length in m



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

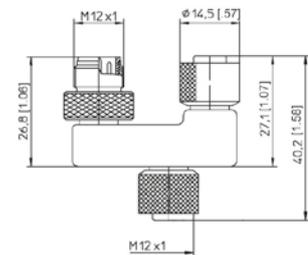
IP69K: KAB - XM - M12/5F/G/69K - M12/5M/G/69K - CAN

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

