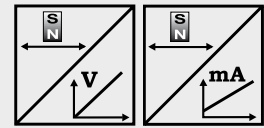


POSICHRON® PCST24 Rod-Style Design with Analog Output



POSICHRON® rod-style position sensor

- For hydraulic cylinders, fluid level measurement
- Protection class IP67/69K
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Contact-free
- Replaceable electronics without leakage
- 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	
Working pressure of sensor rod	400 bar, other values on request	
Protection class	IP67/69K (with mating connector IP67/69K only)	
Shock	EN 60068-2-27:1993, 50 g 11 ms, 100 shocks	
Vibration	EN 60068-2-6:1995, 20 g 10 Hz-2 kHz, 10 cycles	
Connection	8 pin socket M12	
EMC, temperature	Refer to output specification	

Order Code PCST24
1 channel,
industry standard

Model Name

Mounting

M18 = Thread M18x1,5

Z3/4 = Thread ¾"-16 UNF

Measurement Range (in mm)

100 ... 5750 in 10 mm increments

Other ranges on request

Output

420T = 4 ... 20 mA signal conditioner (3 wire)

Linearity

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

Connection

M12 = Connector M12, 8 pin



Order code position magnet (see page 65)

PCSTMAG ...

Order code mating connecting cable (see page 77)

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

Order example: PCST24 - M18 - 2000 - 420T - L10 - M12

POSICHRON® PCST24 Rod-Style Design with Analog Output



Order Code PCST24

1 or 2 channel,
configurable



Model name

Mounting

- M18 = Thread M18 x 1,5
- Z3/4 = Thread 3/4"-16UNF

Measurement range (in mm)

100 ... 5750 in 10 mm increments

Output

- U2 = 0.5 ... 10 V signal conditioner
- U3 = 0 ... 5 V signal conditioner
- I1 = 4 ... 20 mA signal conditioner (3-wire)

Function and characteristics output 1

- P1A = Position magnet 1, increasing
- P1D = Position magnet 1, decreasing
- PMU = Start value, direction and end value adjustable by the customer (1 channel only)
- DA = Difference magnet 1/2, increasing (2 magnets required)
- DD = Difference magnet 1/2, decreasing (2 magnets required)

Function and characteristics output 2 (option)

- 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 (only with one magnet)

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 (only with one magnet)

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 previous page, "Specifications")

Connection

M12 = Connector M12, 8 pin

Custom outputs are available upon request.

1. Order example: PCST24 - M18 - 1000 - U2 - P1D - L10 - M12

Rod-style design, measurement range 1000 mm, 1 voltage output 0.5 ... 10 V (U2)
Output 1: Position magnet 1, decreasing signal (P1D)
Output 2: Not used

2. Order example: PCST24 - M18 - 1000 - I1 - P1A - P2D - L10 - M12

Rod-Style Design, measurement range 1000 mm, 2 current outputs 4 ... 20 mA (I1)
Output 1: Position magnet 1, increasing signal (P1A)
Output 2: Position magnet 2, decreasing signal (P2D)

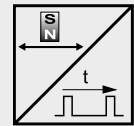
3. Order example: PCST24 - M18 - 1000 - U2 - P1A - VZ1.0 - L10 - M12

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)



POSICHRON® rod-style position sensor

- For hydraulic cylinders, fluid level measurement
- Protection class IP67/69K
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Contact-free
- Replaceable electronics without leakage
- Multi-magnet operation
- Pulse output (start/stop)



Specifications	Output	Pulse output (start/stop)
	Resolution	Essentially infinite
	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	IP67/69K (with mating connector IP67/69K only)
	Shock	EN 60068-2-27:1993, 50 g 11 ms, 100 shocks
Vibration	EN 60068-2-6:1995, 20 g 10 Hz-2 kHz, 10 cycles	
Connection	8 pin socket M12	
EMC, temperature	Refer to output specification	

Order Code PCST24



Model Name

Mounting

- M18 = Thread M18x1,5
- Z3/4 = Thread ¾ "-16 UNF

Measurement Range (in mm)

- 100 ... 5750 in 10 mm increments
- Other ranges on request

Output

- STSP = Pulse output (start/stop)

Linearity

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

Connection

- M12 = Connector M12, 8 pin

Order code position magnet (see page 65)

PCSTMAG ...

Order code mating connecting cable (see page 77)

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

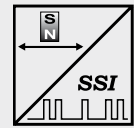
Order example: PCST24 - M18 - 2000 - STSP - M12

POSICHRON® PCST24 Rod-Style Design with SSI Output



POSICHRON® rod-style position sensor

- For hydraulic cylinders, fluid level measurement
- Protection class IP67/69K
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Contact-free
- 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	IP67/69K (with mating connector IP67/69K only)
	Shock	EN 60068-2-27:1993, 50 g/11 ms, 100 shocks
	Vibration	EN 60068-2-6:1995, 20 g 10 Hz-2 kHz, 10 cycles
	Connection	8 pin socket M12
EMC, temperature	Refer to output specification	

Order Code PCST24



Model name

Mounting

M18 = Thread M18x1,5
Z3/4 = Thread ¾"-16 UNF

Measurement range (in mm)

100 ... 5750

Resolution (in µm)

5 / 10 / 20 / 50 / 100

Output

SSI = Synchronous serial interface

Average determination (filter, number of measurements)

F1 / F2 / F4 / F8

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

Order code position magnet (see page 65)

PCSTMAG ...

Order code mating connecting cable (see page 77)

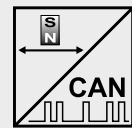
KAB- ...M-M12/8F/G-LITZE

Order example: PCQA24 - M18 - 2500 - 10 - SSI/F8/G/24 - L10 - M12



POSICHRON® rod-style position sensor

- Replaceable electronics without leakage
- Protection class IP67/69K
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Contact-free
- For hydraulic cylinders, fluid level measurement
- CANopen bus



Specifications	Output	CANopen bus
	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 (with mating connector IP67/69K only)
	Shock	EN 60068-2-27:1993, 50 g 11 ms, 100 shocks
	Vibration	EN 60068-2-6:1995, 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 M18x1,5
- Z3/4 = Thread ¾"-16 UNF

Measurement Range (in mm)

100 ... 5750 in 10 mm increments
Other ranges on request

Output

CANOP = CANopen bus

Linearity

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

Connection

M12A5 = Connector M12, 5 pin

Order code position magnet (see page 65)

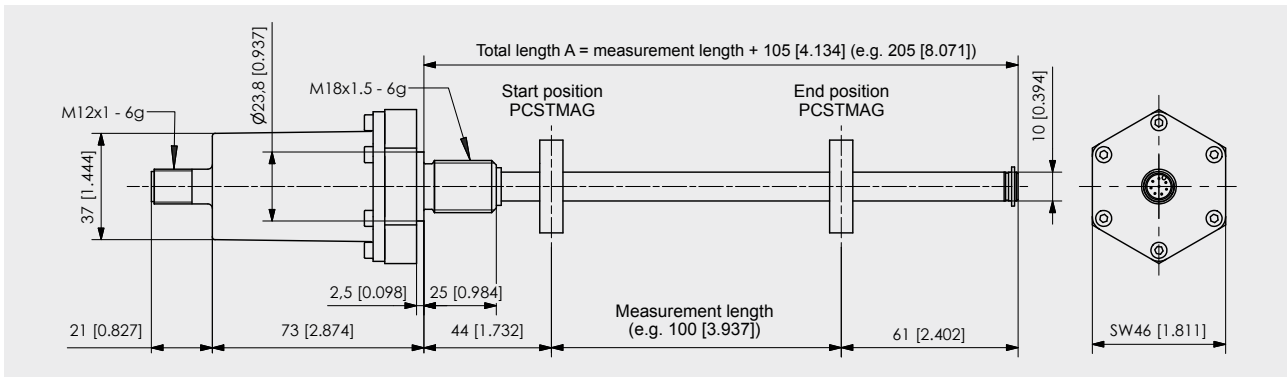
PCSTMAG ...

Order code mating connecting cable (see page 79)

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

Order example: PCST24 - M18 - 2000 - CANOP - L10 - M12A5

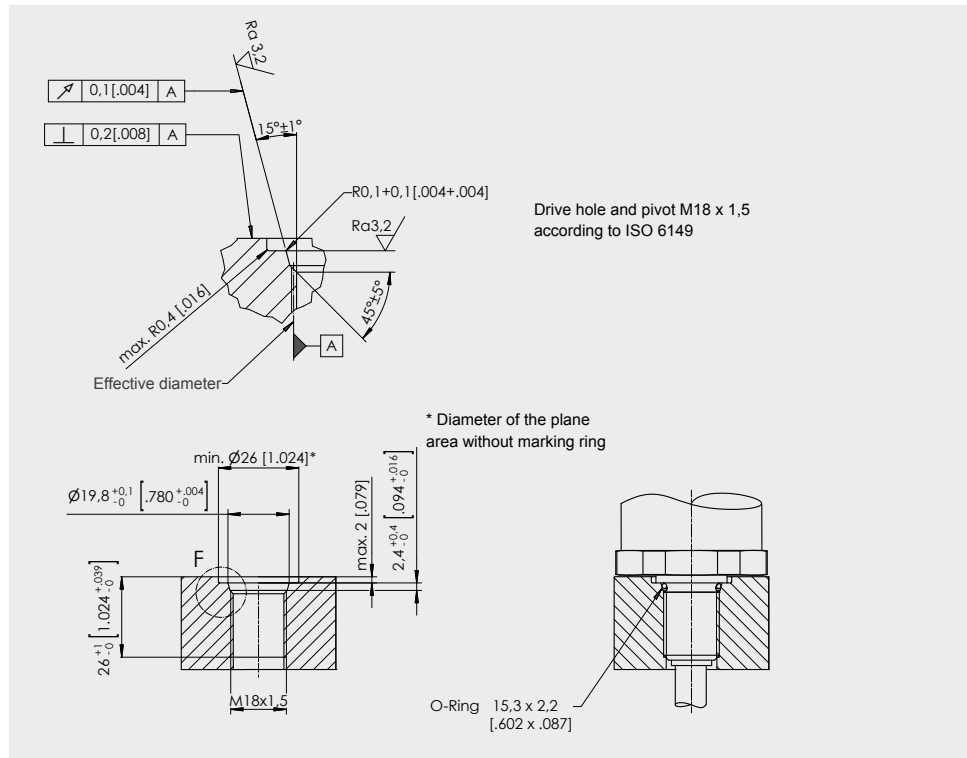
POSICHRON®
PCST24
Rod-Style Design



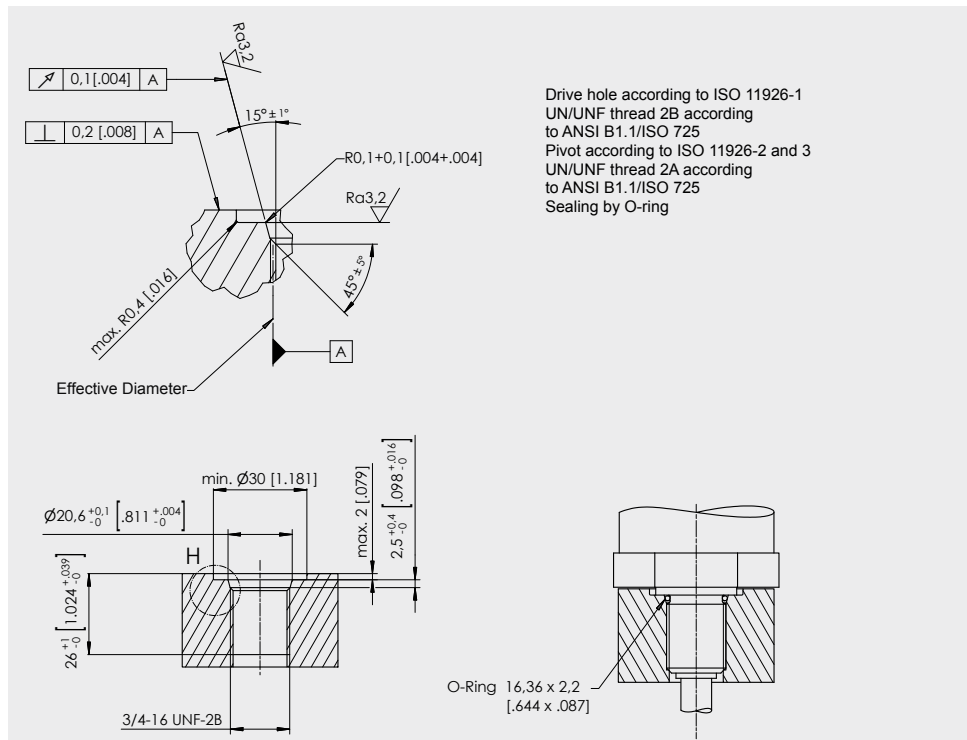
Dimensions in mm [inch]

Dimensions informative only.
 For guaranteed dimensions consult factory.

Mounting hole
M18



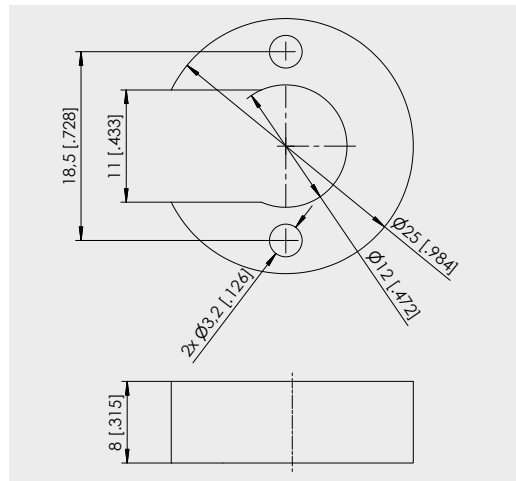
Mounting hole
3/4 inch



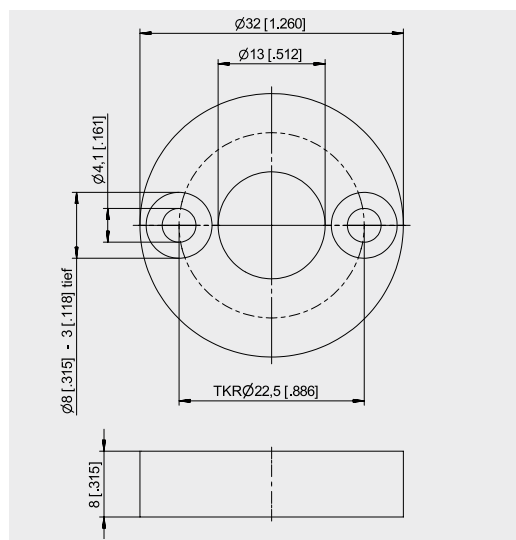
Dimensions in mm [inch]

Dimensions informative only.
 For guaranteed dimensions consult factory.

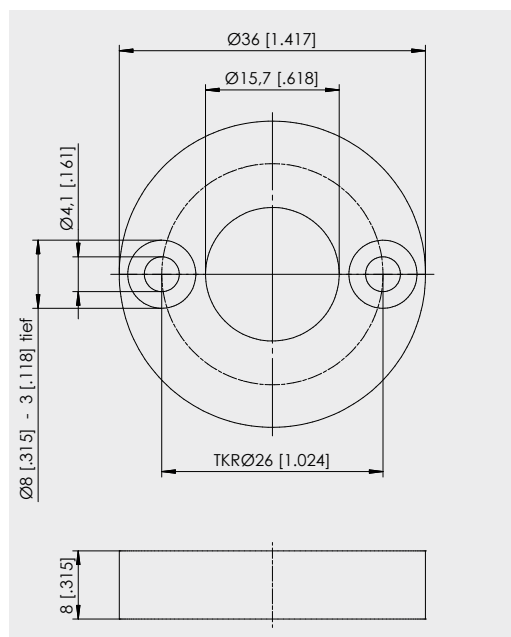
PCSTMAG1



PCSTMAG2
 (standard)



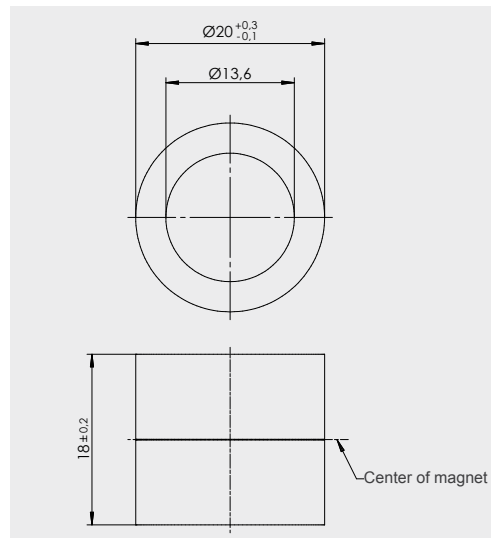
PCSTMAG5



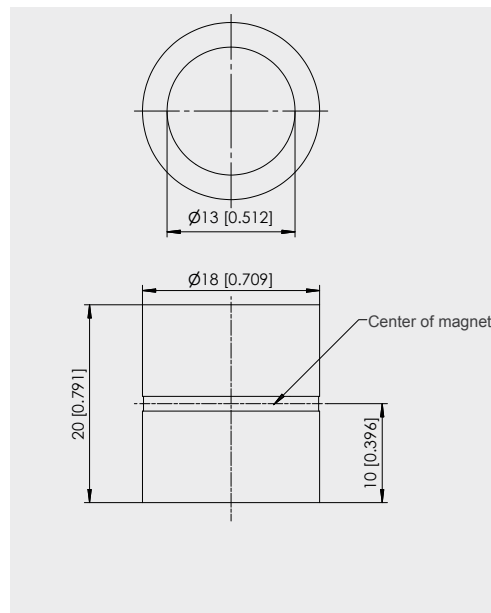
Dimensions in mm [inch]

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

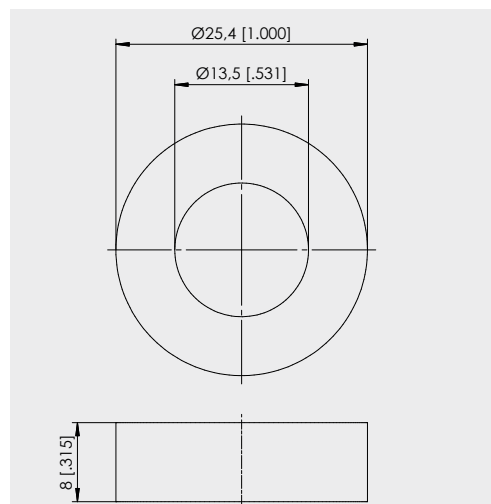
PCSTMAG2-MH1



PCSTMAG2-MH2



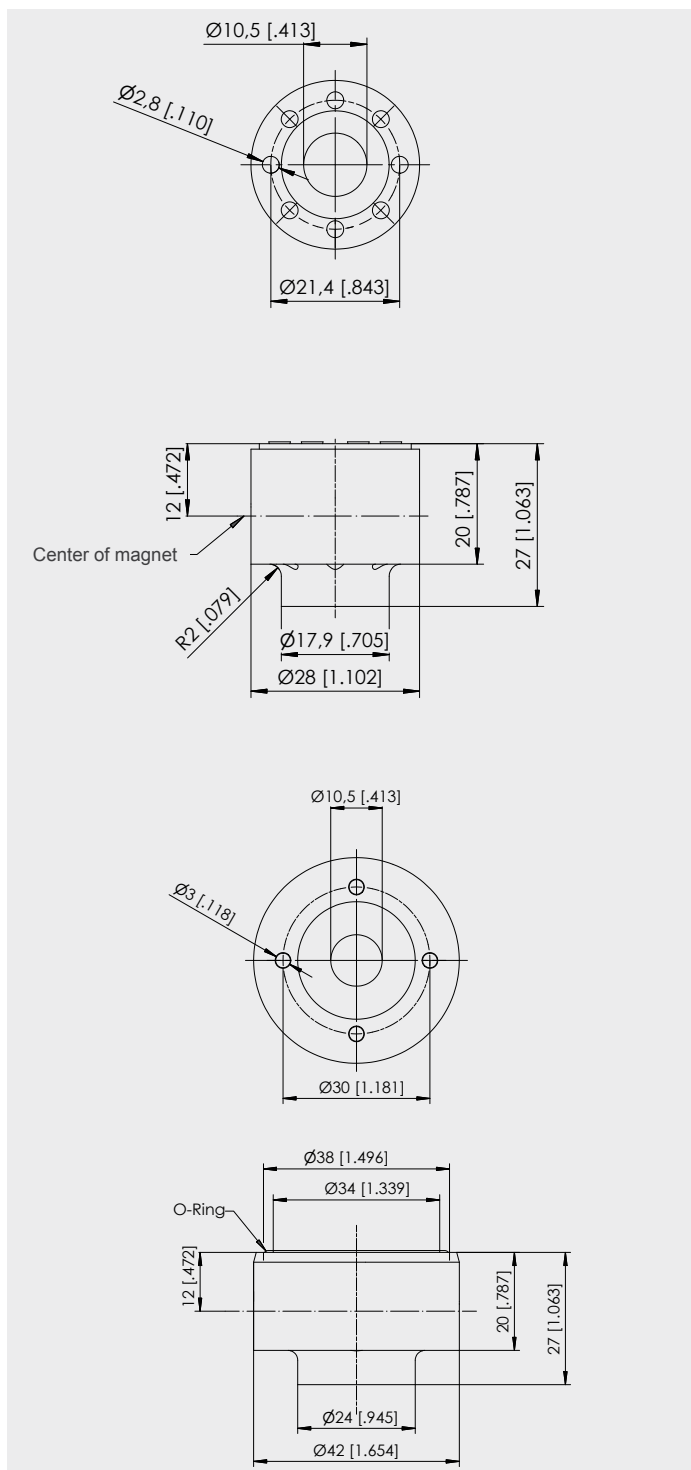
PCSTMAG2-MH3



Dimensions in mm [inch]

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

PCSTMAG2-G1



PCSTMAG2-G2

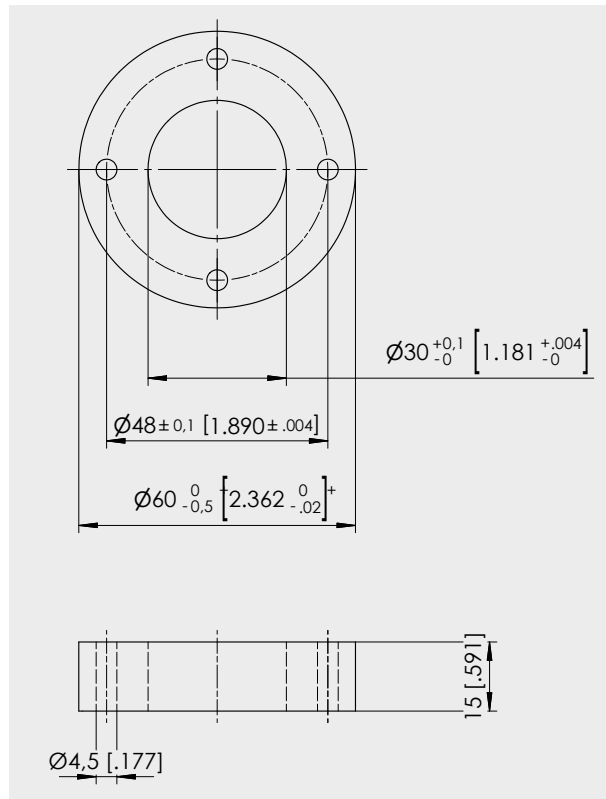
PCSTMAG2 - G1 / G2

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.

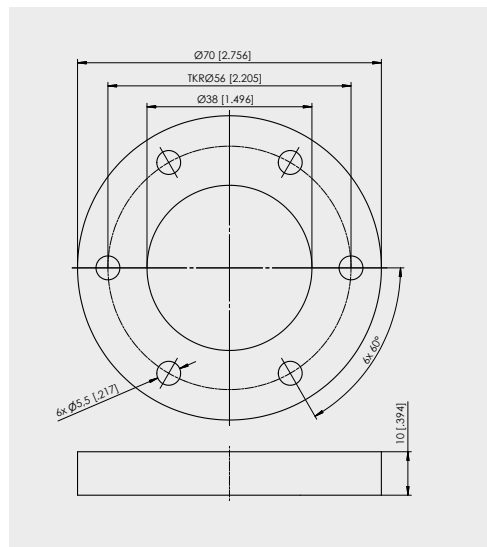
Dimensions in mm [inch]

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

PCSTMAG7



PCSTMAG4



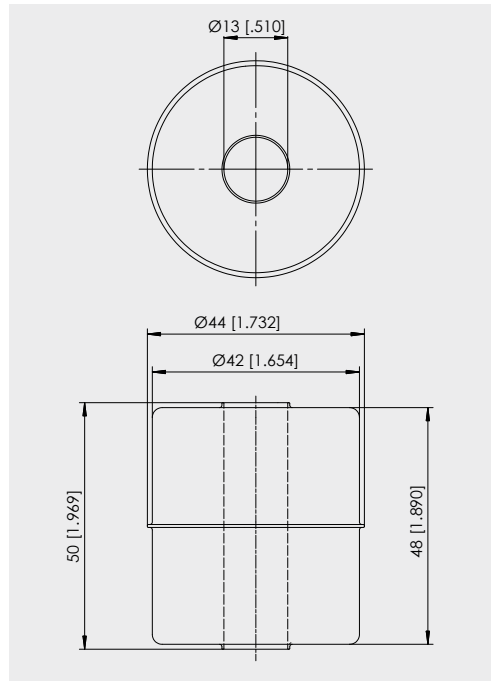
Dimensions in mm [inch]

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

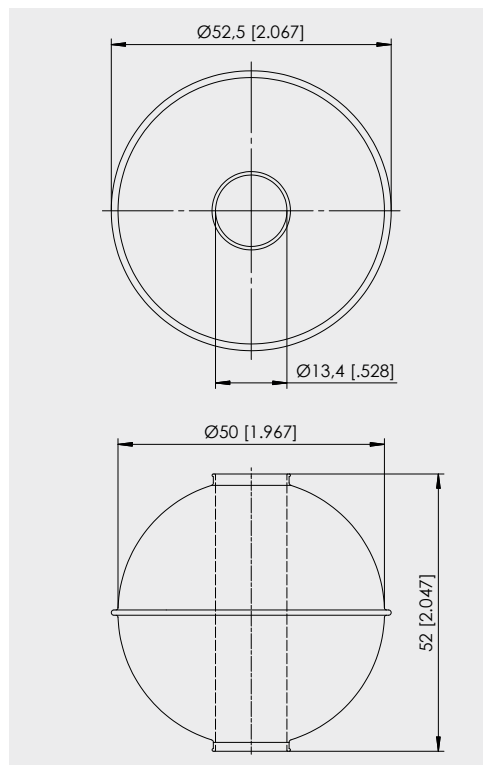


Note: Dependent on the design the available measurement range is reduced of 25 mm on both ends!

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!

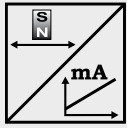
Dimensions in mm [inch]

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

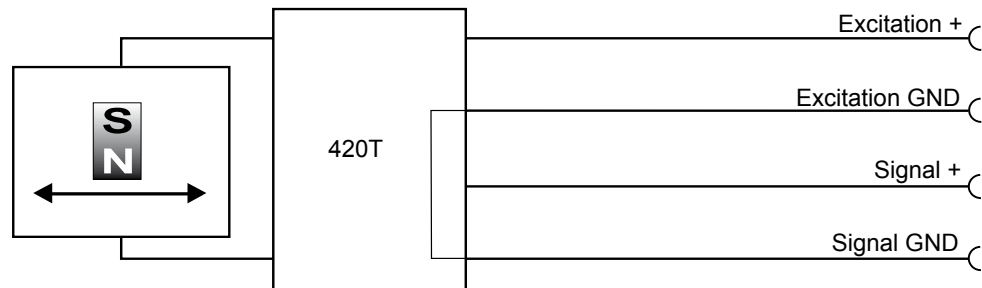
POSICHRON® Output Specification 420T Industry Standard



Signal conditioner 420T Current output (3 wire)	Excitation voltage	18 ... 27 V DC (18 ... 36 V DC as option)
	Excitation current	Typ. 70 mA, 80 mA max.
	Load resistor	350 Ω max.
	Output current	4 ... 20 mA, 30 mA max. (at failure)
	Resolution	Essentially infinite
	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
	Immunity to interference (EMC)	According to EN 61326:2004



Signal diagram

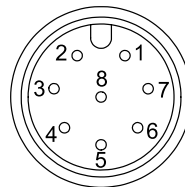


Signal wiring	Output signals 420T	Connector pin	Cable output color * (not for PCST27 and PCRP32)
	Excitation +	1	white
	Excitation GND	2	brown
	Signal +	3	green
	Signal GND	4	yellow

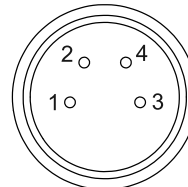
Connection

Mating connector

View to
sensor
connector



CONN-M12-8M



CONN-M8-4M

*** Please note the different colors of the assembled accessory cable!**

POSICHRON®

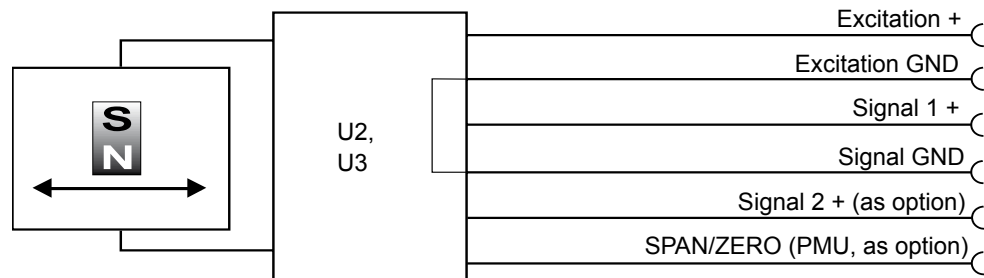
Output Specification U2, U3 and I1

Configurable, 1 or 2 channels



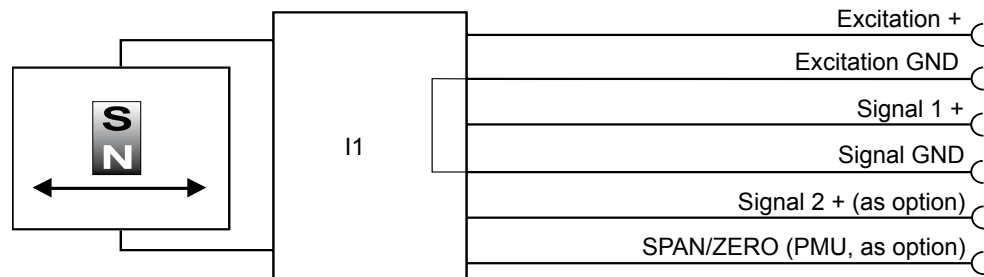
Signal conditioner U2, U3 Voltage output 	Excitation voltage	18 ... 27 V DC
	Excitation current	Typ. 35 mA, 80 mA max.
	Output voltage	U2: 0.5 ... 10 V; U3: 0 ... 5 V
	Output current	2 mA max.
	Output load	> 5 kΩ
	Resolution	16 bit
	Stability (temperature)	$\pm 50 \times 10^{-6} / ^\circ\text{C}$ f.s.
	Protection	Reverse polarity, short circuit
	Output noise	0.5 mV _{RMS}
	Operating temperature	-40 ... +85 °C
Immunity to interference (EMC)	According to EN 61326:2004	

Signal diagram



Signal conditioner I1 Current output (3 wire) 	Excitation voltage	18 ... 27 V DC
	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
	Stability (temperature)	$\pm 50 \times 10^{-6} / ^\circ\text{C}$ f.s.
	Protection	Reverse polarity, short circuit
	Output noise	0.5 mV _{RMS}
	Operating temperature	-40 ... +85 °C
	Immunity to interference (EMC)	According to EN 61326:2004

Signal diagram



Signal wiring	Output sigals U2, U3, I1	Connector pin	Cable output, wire color (not for PCST27 and PCR32)
	Excitation +	1	white
	Excitation GND	2	brown
	Signal 1 +	3	green
	Signal GND	4	yellow
	Signal 2 + (as option *)	5	grey
	SPAN/ZERO (PMU **, as option)	6	pink

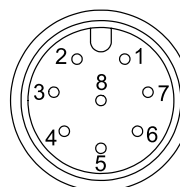
* When using multiple magnets the distance between two magnets must be min. 70 mm to identify the single magnets definitely.

** Description page 59

Connection

Mating connector

View to
sensor
connector

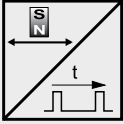


CONN-M12-8M

POSICHRON® Output Specification Pulse Interface STSP

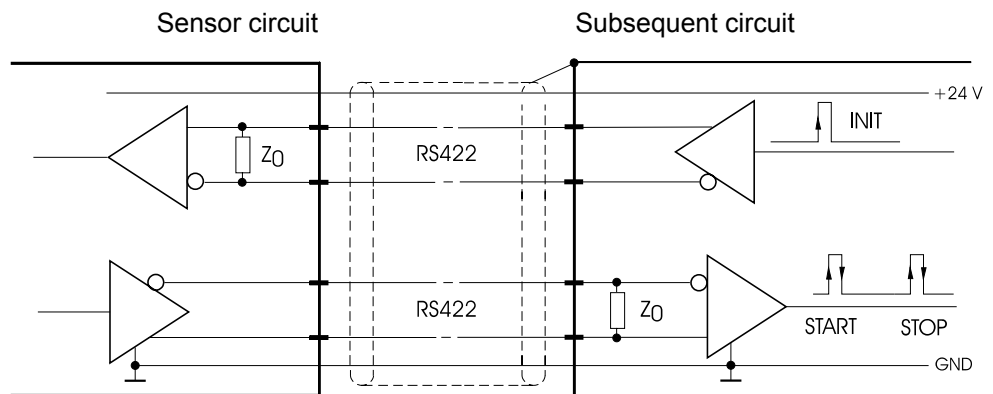


Pulse interface STSP

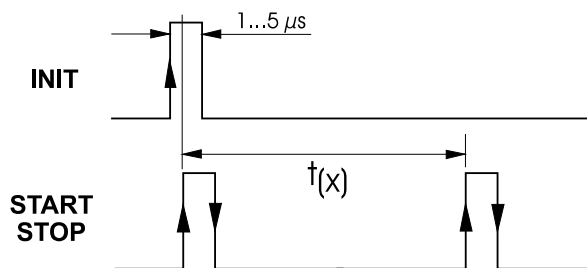


Excitation voltage	18 ... 27 V DC, residual ripple 10 mV _{SS}
Excitation current	Typ. 60 mA, 150 mA max.
Stability (temperature)	±50 x 10 ⁻⁶ / °C f.s.
Wave velocity v _s	2600 ... 2900 m/s
Level INIT and START/STOP	RS422
Protection	Reverse polarity, short circuit
Operating temperature	-40 ... +85 °C
EMC	According to EN 61326:2004

Signal diagram



The subsequent circuit generates a request pulse via the INIT line. The position sensor responds with a START and a STOP signal.



To calculate the position value the time interval $t_{(x)}$ must be multiplied with the conversion factor v_s specified on the type label.

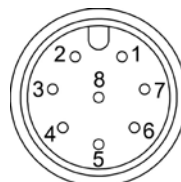
$$\text{Position value } x = t_{(x)} \cdot v_s$$

When using multiple magnets every single magnet generates its own STOP signal. To identify the single magnets definitely the distance between two magnets must be min. 70 mm.

Signal wiring	Pulse interface	Connector pin	Cable output color (not for PCST27 and PCRP32)
Excitation +		1	white
Excitation GND		2	brown
INIT		3	green
INIT		4	yellow
STSP		5	grey
STSP		6	pink

Connection Mating connector

View to sensor
connector



CONN-M12-8M

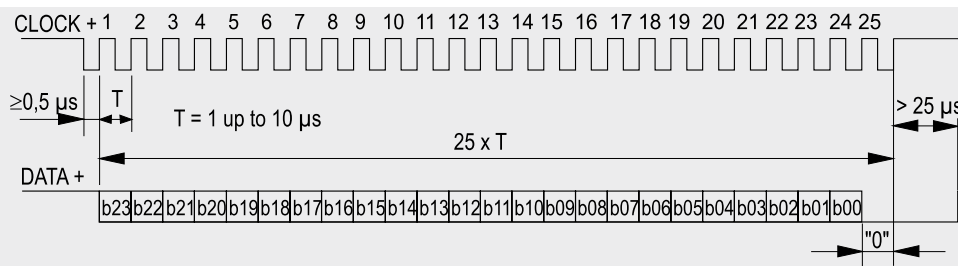
POSICHRON® Output Specification SSI



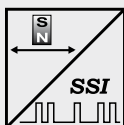
Description

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)

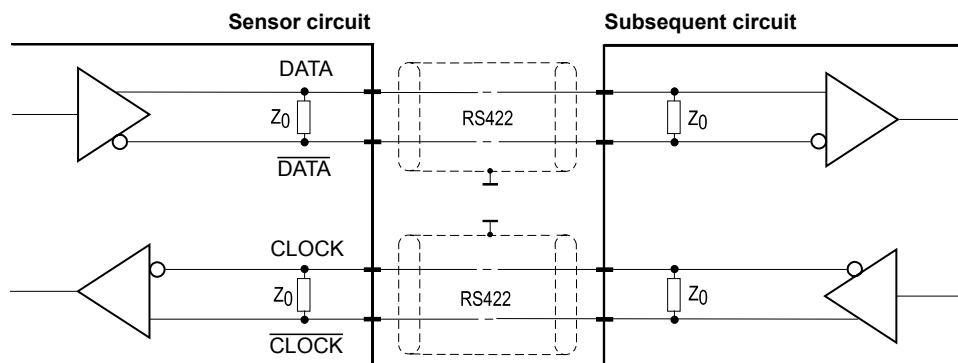


Synchronous serial interface SSI



Output	RS422
Excitation voltage	18 ... 27 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
Filter	Average determination, see page 59
Stability (temperature)	±50 x 10 ⁻⁶ / °C f.s.
Operating temperature	-40 ... +85 °C
Immunity to interference EMC	According to EN 61326:2004

Signal diagram



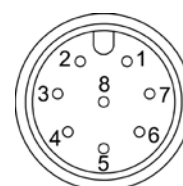
Cable length	Baud rate
50 m	100-1000 kHz
100 m	100-300 kHz

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 name	Connector pin	Cable output color (not for PCST27 and PCR32)
Excitation +	1	white
Excitation GND	2	brown
CLOCK	3	green
CLOCK	4	yellow
DATA	5	grey
DATA	6	pink

View to sensor connector




CONN-M12-8M

POSICHRON® Output Specification CANopen



Description

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

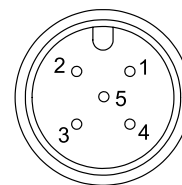
Interface CANOP 	Communication profile	CANopen CiA 301 V 4.02, Slave
	Encoder profile	Encoder CiA 406 V 3.2
	Error Control	Node Guarding, Heartbeat, Emergency Message
	Node ID	Adjustable via LSS or via object dictionary
	PDO	4 TxPDO, 0 RxPDO, no linking, static mapping
	PDO Modes	Event-/Time triggered, Remote-request, Sync cyclic/acyclic
	SDO	1 server, 0 client
	CAM	2 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	As option (output CANOP/RT)
Bus, galvanic isolated	No	

Specifications	Excitation voltage	8 ... 36 V DC
	Excitation current	Typ. 30 mA for 24 V, max. 100 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	1 kV (V AC, 50 Hz, 1 min.)
	Environment - EMC Automation	EN 61326:2004

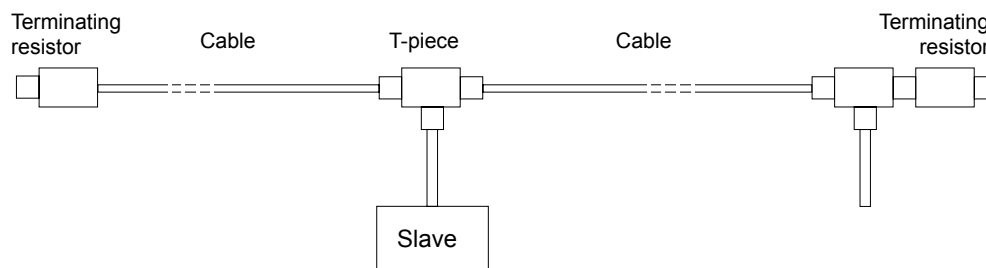
When using multiple magnets the distance between two magnets must be min. 70 mm to identify the single magnets definitely.

Signal wiring / connection	Signal name	Connector pin (color)
	Shield	1 (grey)
	Excitation +	2 (white)
	GND	3 (brown)
	CAN-H	4 (green)
	CAN-L	5 (yellow)

View to sensor connector



CAN bus wiring



POSICHRON® Accessories Connector Cables



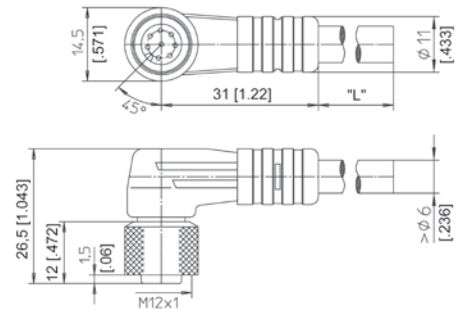
Connector cable for POSICHRON® position sensors 8 pin M12

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



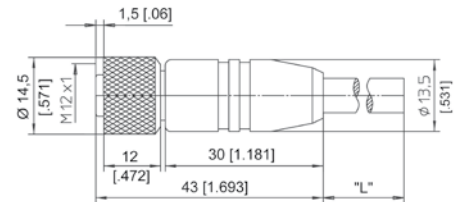
Connector cable for POSICHRON® position sensors 8 pin M12

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



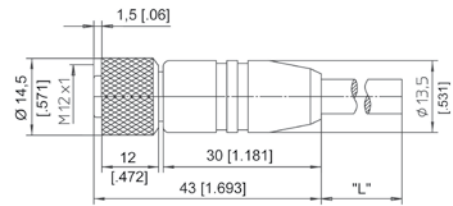
Connector cable wiring - M12, 8 pin	Connector pin / cable color							
	1	2	3	4	5	6	7	8
	White	Brown	Green	Yellow	Grey	Pink	Blue	Red

POSICHRON® Accessories Connector Cables



Connector/bus cable for POSICHRON® position sensors
5 pin M12
CAN bus/DeviceNet

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, 2, 5 and 10 m.

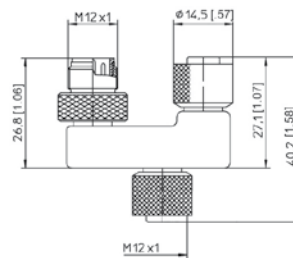


Order code:

KAB - XM - M12/5F/G - M12/5M/G
IP69K: KAB - XM - M12/5F/G/69K - M12/5M/G/69K
 Length in m ↑

T-piece for bus cable
5 pin M12
CAN bus/DeviceNet

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



Terminating resistance
5 pin M12
CAN bus/DeviceNet

KAB - RTERM - M12/5M/G



Cable set for POSICHRON® position sensors PROFIBUS

The cable set consists of one cable each of the following type :

- Cable set 1: Bus input, bus output, sensor excitation
- Cable set 2: Bus input, terminating resistor, sensor excitation

Available lengths are 2, 5 and 10 m

Order Code:

KABS1-PCQA23-PROF-XM-LITZE
 Length in m ↑

KABS2-PCQA23-PROF-XM-LITZE
 Length in m ↑

Separate cables on request.