

POSICHRON®

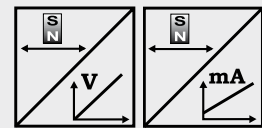
PCRP21

Round Profile Housing with Analog Output



POSICHRON® position sensor in round profile

- Protection class IP64
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Contact-free
- Large guiding tolerance for the positioning magnet
- 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 μ m
	Housing material	AlMgSi1 / Zn / V4A
	Protection class	IP64 (with mating connector 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 / cable 2 m
	EMC, temperature	Refer to output specification

Order Code PCRP21

1 channel,
industry standard

Model name

Measurement range (in mm)

100 ... 5750 in 10 mm increments

Other ranges on request

Output

10V = 0 ... 10 V signal conditioner

420T = 4 ... 20 mA signal conditioner, 3 wire

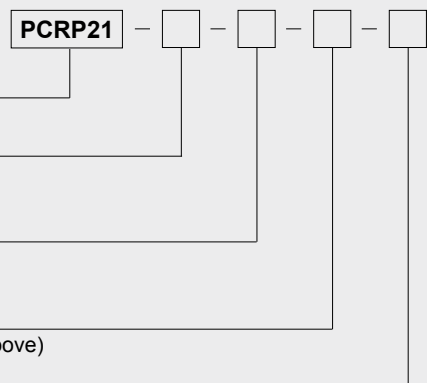
Linearity

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

Connection

M12 = Connector M12, 8 pin

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



Order code mounting set (see page 47)

PCRP21-BFS4

Order code position magnets (see page 47)

PCMAG ...

Order code mating connecting cable (see page 77)

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

Order example: PCRP21 - 1000 - 420T - L10 - M12

Order Code PCRP21

**1 or 2 channel,
configurable**

Model name

Measurement range (in mm)

100 ... 5750 in 10 mm increments

Output

U1 = 0 ... 10 V signal conditioner
 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 & 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 (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 U1: 0 V 5 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 U1: 10 V 0 V 10 V

Output I1: 20 mA 4 mA 20 mA

Linearity

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

Connection

M12 = Connector M12, 8 pin

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

Custom outputs are available upon request.

1. Order example: PCRP21 - 1000 - U1 - P1D - L10 - M12

Round profile, measurement range 1000 mm, 1 voltage output 0 ... 10 V (U1)

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

Output 2: Not used

2. Order example: PCRP21 - 1000 - I1 - P1A - P2D - L10 - M12

Round Profile, 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: PCRP21 - 1000 - U1 - P1A - VZ1.0 - L10 - M12

Round Profile, measurement range 1000 mm, 2 voltage outputs 0 ... 10 V (U1)

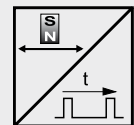
Output 1: Position magnet 1, increasing signal (P1A)

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



POSICHRON® position sensor in round profile

- Protection class IP64
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Contact-free
- Large guiding tolerance for the positioning magnet
- 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	AlMgSi1 / Zn / V4A
Protection class	IP64 (with mating connector 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 / cable 2 m
EMC, temperature	Refer to output specification

Order Code PCRP21

Model name	PCRP21	-		-		-		-	
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									
KAB2M = Cable, standard length 2 m, other lengths upon request									

Order code mounting set (see page 47)

PCRP21-BFS4

Order code position magnets (see page 47)

PCMAG ...

Order code mating connecting cable (see page 77)

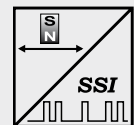
KAB-...M-M12/8F/G-LITZE

Order example: PCRP21 - 1000 - STSP - L10 - M12



POSICHRON® position sensor in round profile

- Protection class IP64
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Wear- and maintenance-free
- Superior shock and vibration resistance
- Large guiding tolerance for the positioning magnet
- 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	AlMgSi1 / Zn / V4A
Protection class	IP64 (with mating connector 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 / cable 2 m
EMC, temperature	Refer to output specification

Order Code PCRP21

PCRP21 - [] - [] - [/ / /] - [] - []

Model name

Measurement range (in mm)

100 ... 5750 in 10 mm increments

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 = 8 pin socket M12

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

Order code mounting set (see page 47)

PCRP21-BFS4

Order code position magnets (see page 47)

PCMAG ...

Order code mating connecting cable (see page 77)

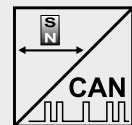
KAB-...M-M12/8F/G-LITZE

Order example: PCRP21 - 1000 - 5 - SSI/F8/G/24 - L10 - M12



POSICHRON® position sensor in round profile

- Protection class up to IP65
- Measurement range 0 ... 100 to 0 ... 5750 mm
- Absolute position measurement
- Contact-free
- Large guiding tolerance for the positioning magnet
- 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	AlMgSi1 / Zn / V4A
Protection class	Up to IP65 (with mating connector 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 PCRP21

Model name

Measurement range (in mm)

100 ... 5750 in 10 mm increments

Other ranges on request

Output

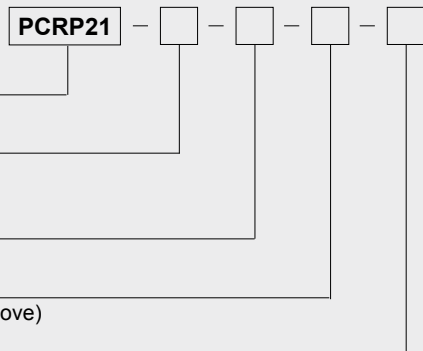
CANOP = CANopen bus

Linearity

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

Connection

M12A5 = Connector M12, 5 pin



Order code mounting set (see page 47)

PCRP21-BFS4

Order code position magnet (see page 47)

PCMAG ...

Order code bus cable (see page 79)

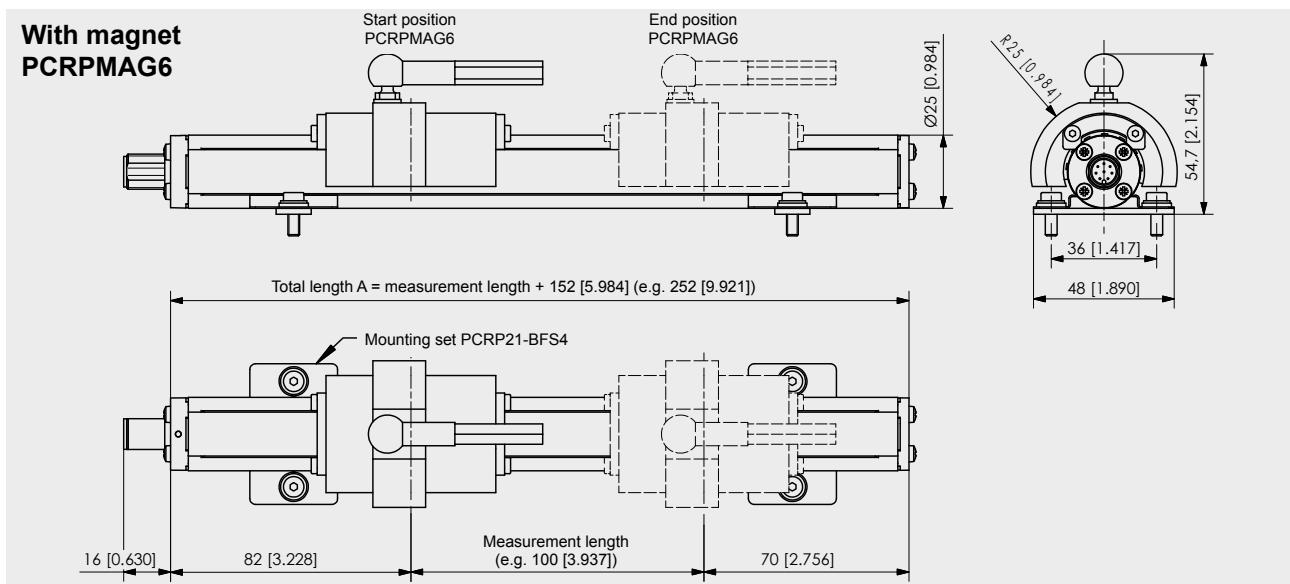
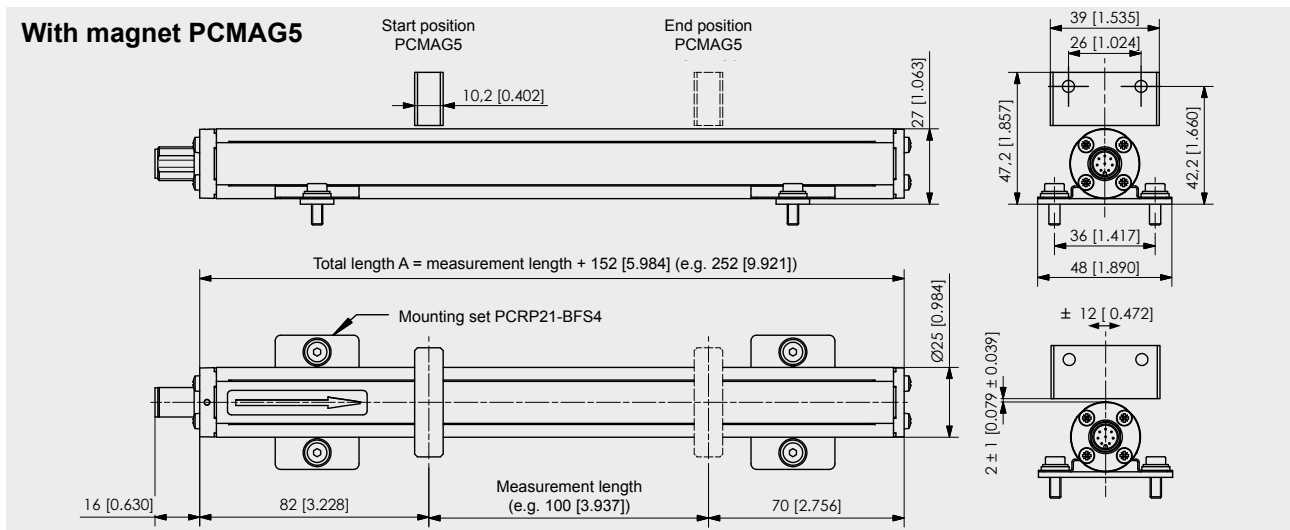
KAB-...M-M12/5F/G-M12/5M/G

Order example: PCRP21 - 1000 - CANOP - L10 - M12A5

POSICHRON®

PCRP21

Round Profile Housing



Dimensions in mm [inch]

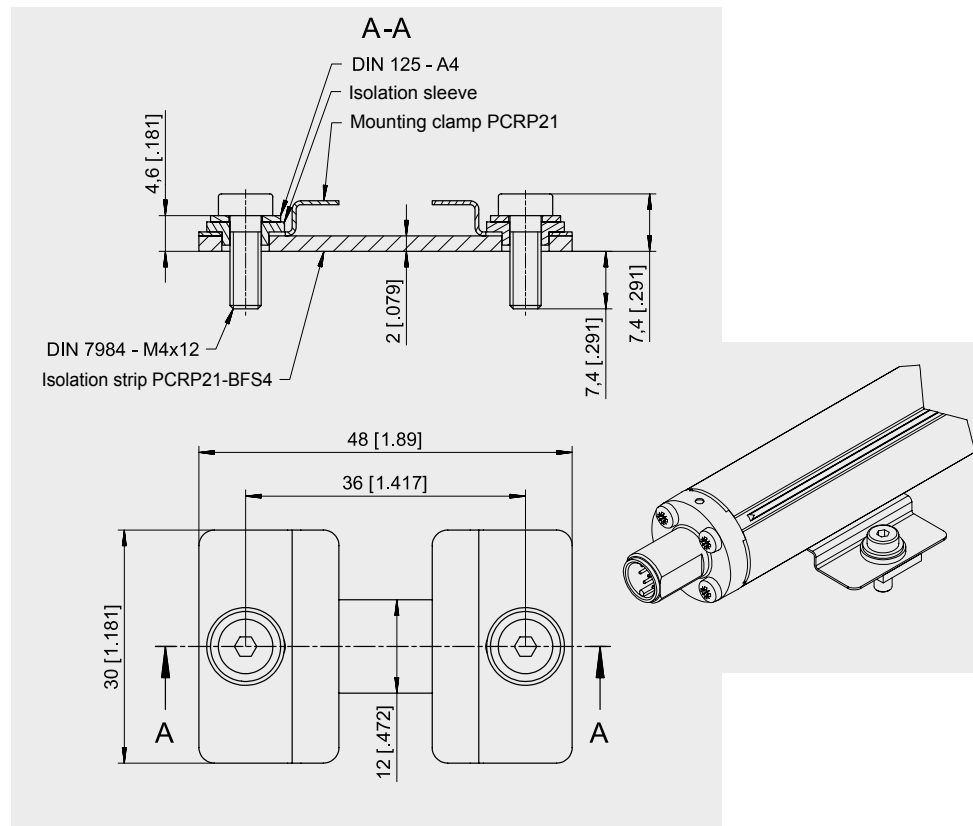
Dimensions informative only.

For guaranteed dimensions consult factory.

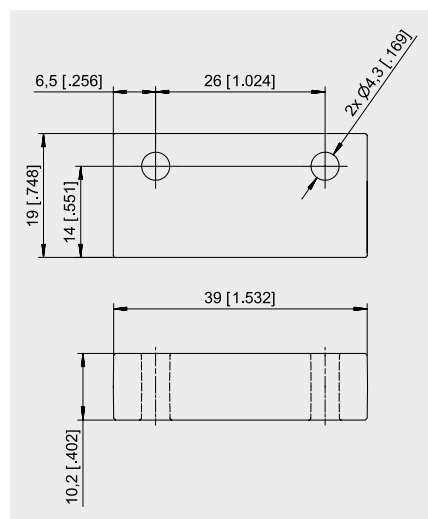
POSICHRON® PCRP Mounting set - Magnets



PCRP21-BFS4 Mounting set



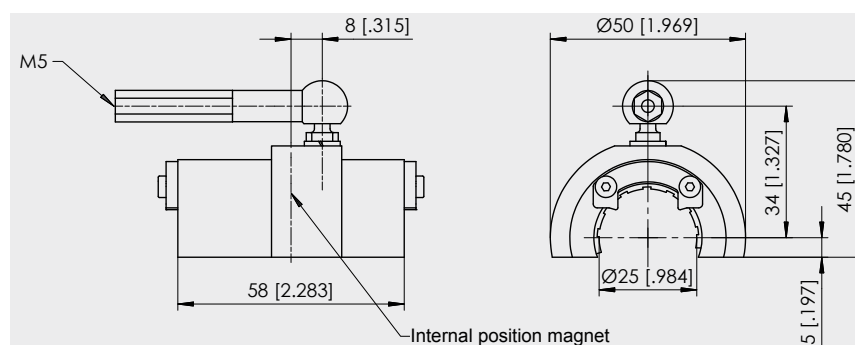
PCMAG5 Standard magnet



Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions consult factory.

PCRPMAG6 Guided magnet slider for PCRP21 with internal position magnet



Not to be used for a large number of operation cycles!

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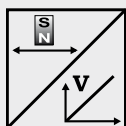
Output Specification 10V and 420T

Industry Standard



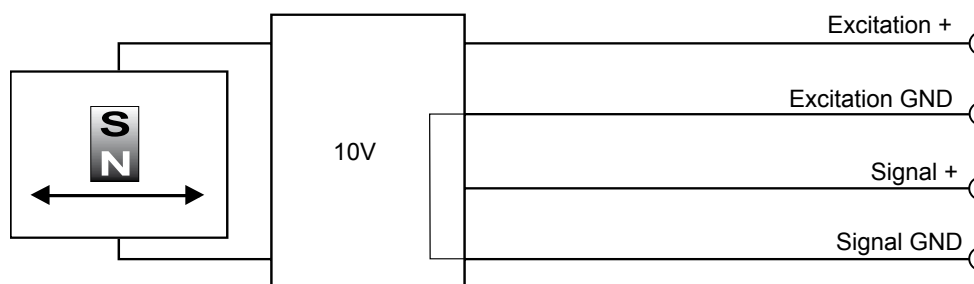
Signal conditioner 10V

Voltage output



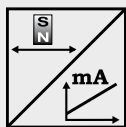
Excitation voltage	18 ... 27 V DC (18 ... 36 V DC as option)
Excitation current	Typ. 50 mA, 80 mA max.
Output voltage	0 ... 10 V DC
Output current	2 mA max.
Output load	> 5 kΩ
Resolution	Essentially infinite
Stability (temperature)	$\pm 50 \times 10^{-6} / ^\circ\text{C f.s.}$
Protection	Reverse polarity, short circuit
Output noise	0.5 mV _{RMS}
Operating temperature	-40 ... +85 °C
Immunity to interference (EMC)	According to EN 61326:2004

Signal diagram



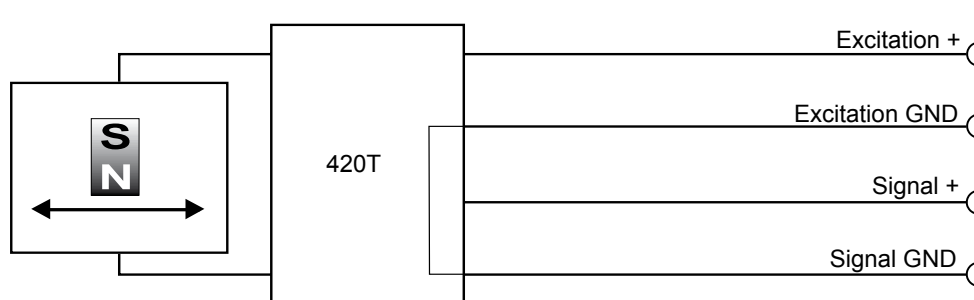
Signal conditioner 420T

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)	$\pm 50 \times 10^{-6} / ^\circ\text{C f.s.}$
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



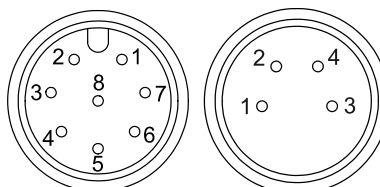
Signal wiring

Output signals 10V, 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



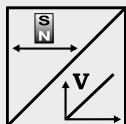
CONN-M12-8M

CONN-M8-4M

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

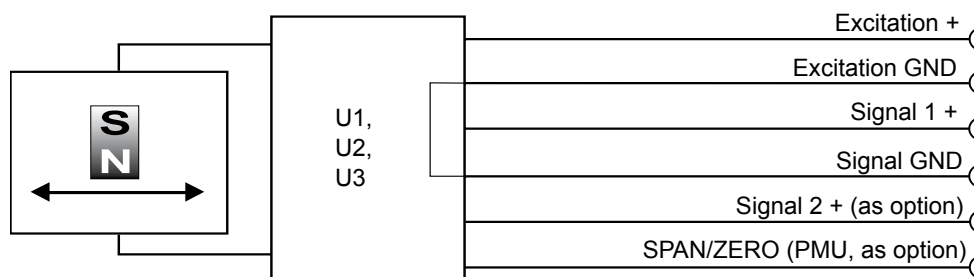
Output Specification U1, U2, U3 and I1 Configurable, 1 or 2 channels

Signal conditioner U1, U2, U3 Voltage output

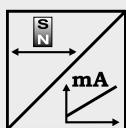


Excitation voltage	18 ... 27 V DC
Excitation current	Typ. 35 mA, 80 mA max.
Output voltage	U1: 0 ... 10 V; U2: 0.5 ... 10 V; U3: 0 ... 5 V
Output current	2 mA max.
Output load	> 5 kΩ
Resolution	16 bit
Stability (temperature)	$\pm 50 \times 10^{-6} / ^\circ\text{C f.s.}$
Protection	Reverse polarity, short circuit
Output noise	0.5 mV _{RMS}
Operating temperature	-40 ... +85 °C
Immunity to interference (EMC)	According to EN 61326:2004

Signal diagram

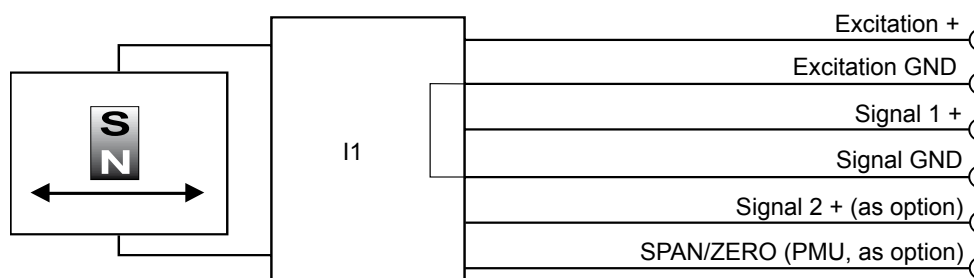


Signal conditioner I1 Current output (3 wire)



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 signals U1, U2, U3, I1	Connector pin	Cable output, wire color (not for PCST27 and PCRP32)
	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

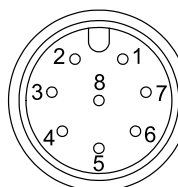
* When using multiple magnets the distance between two magnets must be min. 70 mm to identify the single magnets definitely.

** Description page 59

Connection

Mating connector

View to
sensor
connector



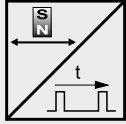
CONN-M12-8M

POSICHRON®

Output Specification Pulse Interface STSP

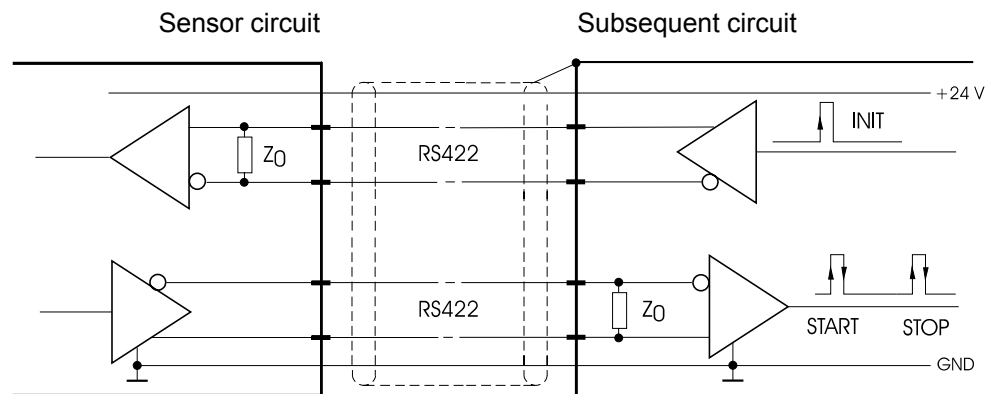


Pulse interface STSP

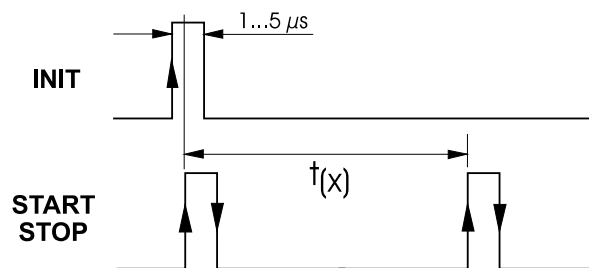


Excitation voltage	18 ... 27 V DC, residual ripple 10 mV _{SS}
Excitation current	Typ. 60 mA, 150 mA max.
Stability (temperature)	±50 x 10 ⁻⁶ / °C f.s.
Wave velocity v _s	2600 ... 2900 m/s
Level INIT and START/STOP	RS422
Protection	Reverse polarity, short circuit
Operating temperature	-40 ... +85 °C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

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

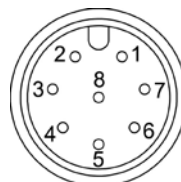
When using multiple magnets every single magnet generates its own STOP signal. To identify the single magnets definitely the distance between two magnets must be min. 70 mm.

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

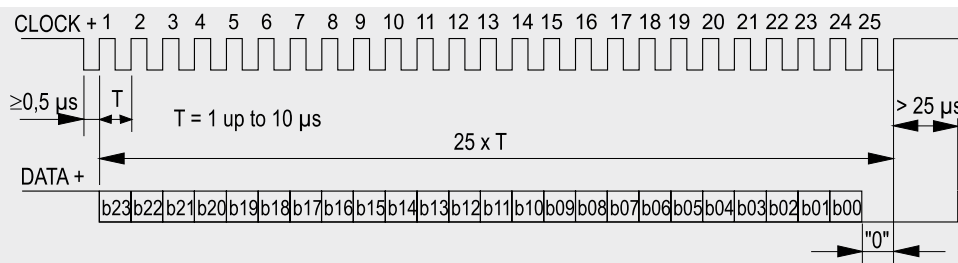
POSICHRON® Output Specification SSI



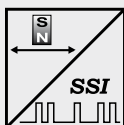
Description

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)

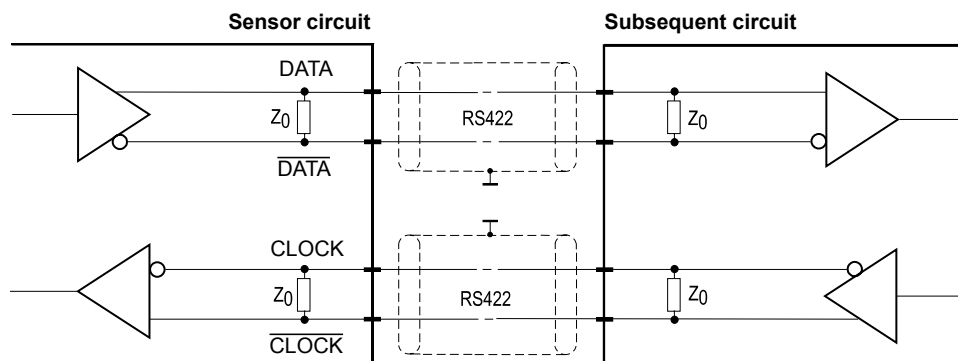


Synchronous serial interface SSI



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



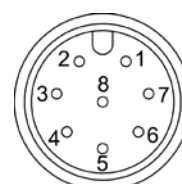
Cable length	Baud rate
50 m	100-1000 kHz
100 m	100-300 kHz

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 PCRP32)
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

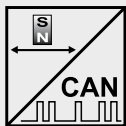


PRELIMINARY

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

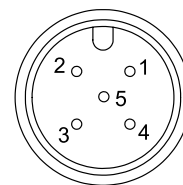
Excitation voltage	18 ... 36 V DC
Excitation current	Max. 100 mA
Number of position magnets	1 ... 4
Resolution	50 µm
Measuring rate	1 kHz (asynchronous)
Stability (temperature)	$\pm 50 \times 10^{-6}$ / °C f.s.
Repeatability	1 LSB
Operating temperature	-40 ... +85 °C
Protection	Reverse polarity, short 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.

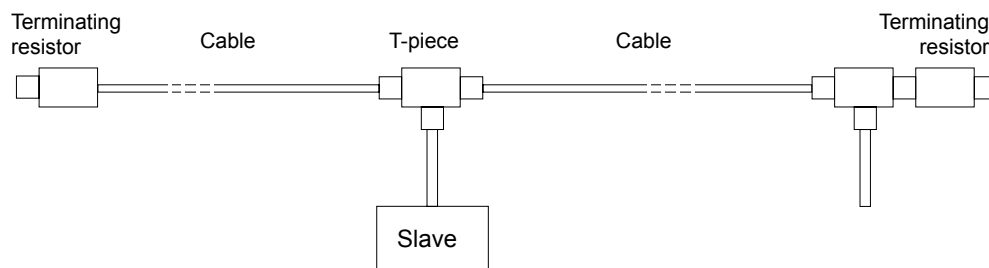
Signal wiring / connection

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

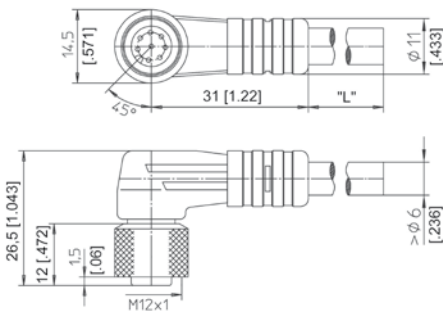
The 8-lead shielded cable is supplied with a
 mating 8-pin 90° M12 connector at one end
 and 8 wires at the other end. Available lengths
 are 2, 5 and 10 m. Wire: cross sectional area
 0.14 mm².

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

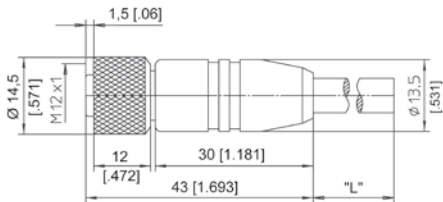
The 8-lead shielded cable is supplied with a
 mating 8-pin M12 connector at one end and
 8 wires at the other end. Available lengths
 are 2, 5 and 10 m. Wire: cross sectional area
 0.14 mm².

Order code:

KAB - XM - M12/8F/G - LITZE

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

Length in m



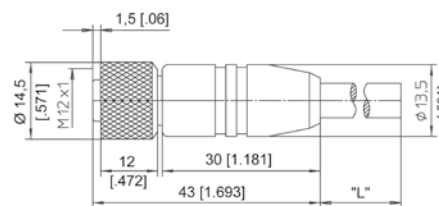
Connector cable wiring - M12, 8 pin	Connector pin / cable color							
	1	2	3	4	5	6	7	8
	White	Brown	Green	Yellow	Grey	Pink	Blue	Red

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.

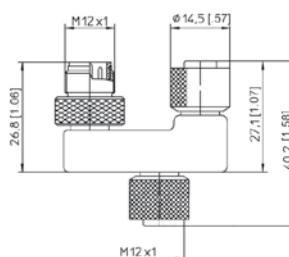


Order code:

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.