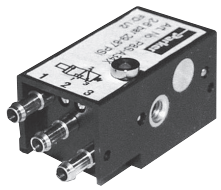


P8S Sensors

P8S Electronic and Reed Sensors

The P8S Series magnetic cylinder sensor enables quick, precise and contactless sensing of the piston's position in cylinders. It is easy to mount, can be used in numerous applications and offers an outstanding price-performance ratio.

Product Overview

As the term magnetic switch suggests, these are operated by magnetic fields; another description widely used is magnetic "SENSOR". As our eyes sense change of light, our ears sense the change of sound, magnetic sensors / switches sense the change of magnetic flux in pneumatic and hydraulic cylinders. When magnetic sensors sense a magnetic field it will give a switching signal, through a control circuit, allowing sensing or control operation to be achieved.

Because of the characteristics of magnetic sensors they can sense a change of magnetic field relative to the position of the magnet, such as in a pneumatic or hydraulic cylinder, whereby the magnet is attached to a moving piston and thus the position of the moving part (ie Piston) can be detected.

The magnet is mounted on the piston of the cylinder and thus moves with the piston.

The magnetic sensor (switch) is fixed either directly to the cylinder or with an additional mounting bracket. When the piston (magnet) moves to the position under a magnetic sensor, the switch will operate due to the change of the magnetic field and give a switching signal.

Thus the position of the piston can be identified and a resulting signal generated to continue the sequence of a circuit.

Magnetic sensors available can be classified into two different groups, they are sensors with contacts which are called mechanically operated or reed sensors and the other type is sensors without contacts and are called solid state type or electronic.

Parker P8S Series sensors are suitable for use with a large range of actuators. They can either be inserted directly into the cylinder tube extrusion or mounted using additional brackets. For direct mounting the sensor is positioned within the cylinder sensor groove, offering mechanical protection, then securely clamped into position by a simple turn of a screw. For other cylinder versions there are a number of optional sensors brackets that clamp to the cylinder and offer other mounting positions.

For easy installation there are several cable lengths available with either M8 connector or flying lead. The electronic sensors are "Solid State", i.e. they have no moving parts. They are provided with short-circuit protection and transient protection as standard. The built-in electronics make the sensors suitable for applications with high on and off switching frequency where long service life is required.

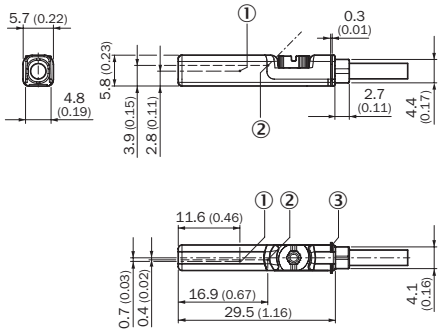
Please note that for low temperature applications sensors are normally specified for full performance down to -30°C only. High temperature cylinders do not have a magnetic piston and therefore cannot be used with sensors.

Technical Data - Square body design, insert straight in T-slot, screw 1/4 turn

	Electronic PNP | NPN	Electric Reed
Cylinder type:	Profile with T-slot	
Cylinder type with adapter:	Profile with S-slot (dovetail) | Tie rods | Round cylinders	
Installation:	Quarter turn, fixed by allen key 2.5 mm or flathead screwdriver	
Housing length:	29.5 mm	29.5 mm 5 - 30 V AC/DC
	24 mm (NAMUR ATEX)	29.5 mm 5 -120 V AC/DC
		32.5 mm 5 - 230 V AC/DC
Output Type:	PNP | NPN	Reed
Switching (on/off) switching frequency:	± 1,000 Hz	± 400 Hz
Output Function:	Normally Open (NO) | Normally Closed (NC) 3-wire	Normally Open (NO) | Normally Closed (NC) 2-wire Normally Open (NO) 3-wire
Enclosure rating:	IP67	
	IP67 (NAMUR ATEX)	
Supply Voltage:	10 to 30 V DC	
	8.2 to 20 V DC (NAMUR 1GD)| 10 to 26 V DC (ATEX 3GD)	5 to 30 | 5 to 120 | 5 to 230 V AC/DC 2-wire, 3-wire depending on type
Power consumption:	<= 8 mA	-
	<= 10 mA (NAMUR, ATEX)	-
Voltage drop:	<= 2 V	<= 3.5 V 2-wire | <= 0.1 V 3-wire
	<= 2.2 V (NAMUR, ATEX)	-
Continuous output current Ia:	<= 100 mA	<= 100 mA 3-wire
	<= 60 mA (NAMUR) | <= 50 mA (ATEX)	<= 500 mA (DC) | <= 300 mA (AC)
Switching capacity:	-	<= 6 W
Protection class:	III	III | II 2-wire depending on type
		III 3-wire
Response sensitivity:	2.6 to 3.3 mT	2.1 to 3.4 mT
	2.8 mT (NAMUR, ATEX)	-
Overrun distance:	10 mm	
	9 mm (NAMUR, ATEX)	-
Hysteresis:	<= 0.8 mT	-
	<= 0.5 mT (NAMUR, ATEX)	-
Repeatability:	<= 0.1 mT	
Reverse polarity protection:	Yes	No 2-wire
	-	Yes 3-wire
Short circuit protection:	Yes	-
Power-up pulse protection:	Yes (NAMUR, ATEX)	-
Ambient operating temperature range:	-30 to +80 °C (PUR cable) | -30 to +70°C (PVC cable)	
	-25 to +80 °C (NAMUR 1GD) | -20 to +50°C (ATEX 3GD)	
Shock and vibration resistance:	30 g 11 ms / 10 … 55 Hz, 1 mm	
EMC:	According to EN 60947-5-2	
International standard:	CE | C UL US | RoHs | Ex | IEC | IEC Ex	
Housing material:	Plastic polyamid PA12	
Screw material:	Stainless steel	
Cable material:	PUR (Polyurethane) | PVC (Polyvinyl Chloride)	
Conductor cross-section:	0.14 mm² | 0,12 mm² depending on type 0.14 mm² (NAMUR, ATEX)	
Indication LED color:	Yellow, no LED reed NC	
Connector:	M8R (knurled nuts) | None (Flying lead)	

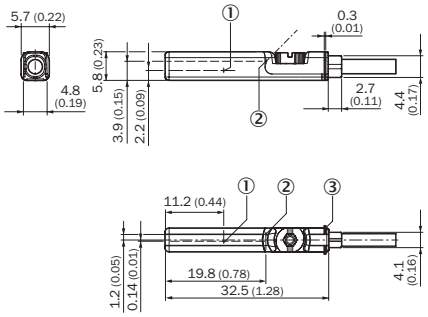
Dimensions, mm (inch)

PNP, NPN Output 10 to 30 V DC



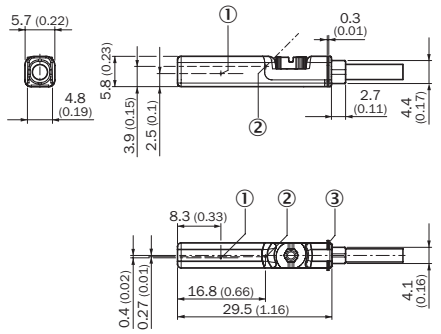
① Position sensor element
② Indication LED
③ Retaining ribs

Reed Output 5 to 230 V AC/DC



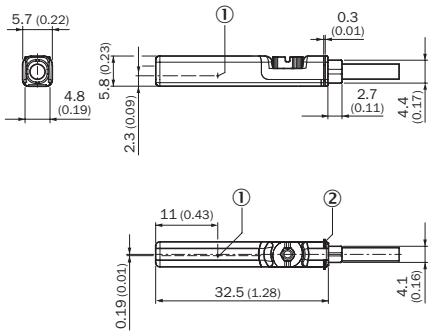
① Position sensor element
② Indication LED
③ Retaining ribs

Reed Output 5 to 30 V AC/DC



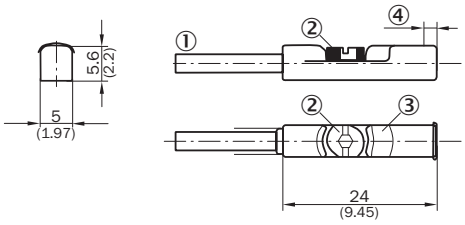
① Position sensor element
② Indication LED
③ Retaining ribs

Reed Output 5 to 120 V AC/DC



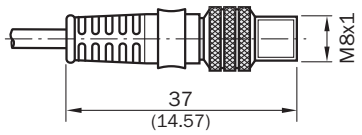
① Position sensor element
② Retaining ribs

NAMUR ATEX 1G, 1D, ATEX 3G, 3D



① Connection
② Fixing screw
③ Indication LED
④ Position of sensor element; short overrun distance: 2 mm;
long overrun distance: 1.7 mm

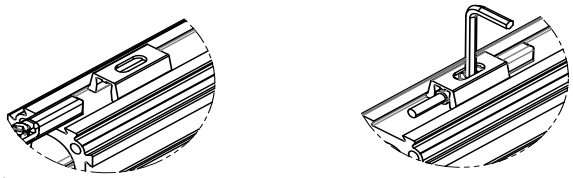
Connector M8R



Installation

Square body design, Insert straight in T-slot, screw 1/4 turn

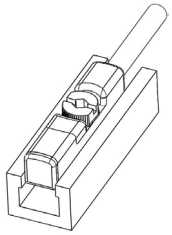
With Adapter in S-Dovetail Slot



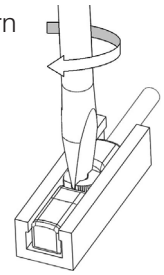
Note:
The adapter is delivered with each sensor.

Without Adapter directly in T-Slot

Put-in straight

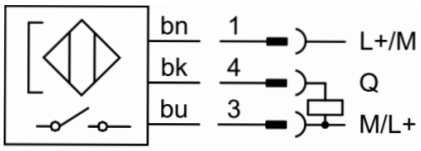


Screw 1/4 turn

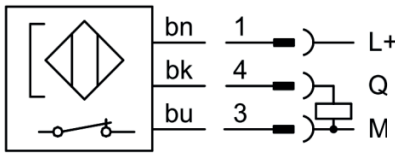


Connection Type and Diagram

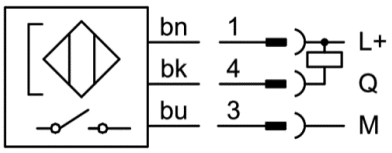
PNP NO



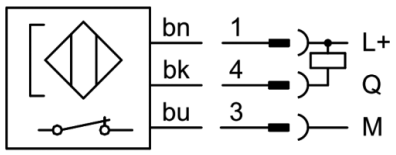
PNP NC



NPN NO

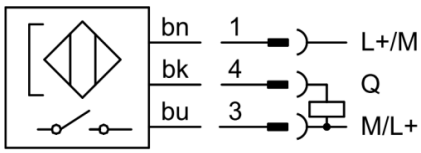


NPN NC

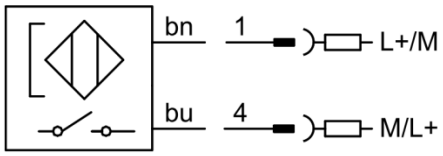


bn: brown
bk: black
bu: blue
Q: load
M: Mass
L+: Power

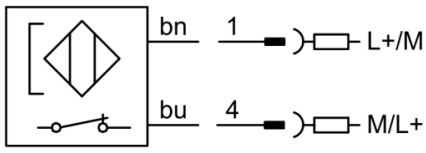
Reed NO 3-wire



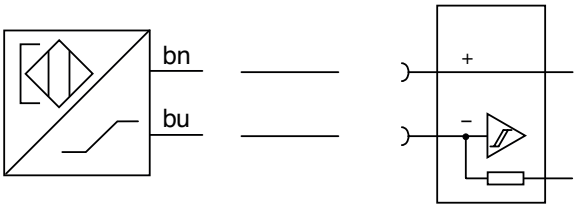
Reed NO 2-wire



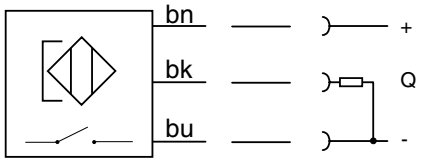
Reed NC 2-wire



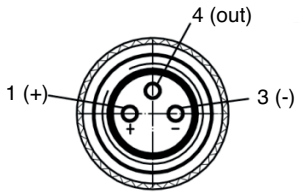
NAMUR NO ATEX 1G, 1D



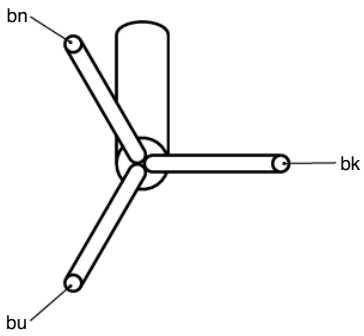
PNP NO ATEX 3G, 3D



Pin assignment, M8 with knurled nut



Flying leads



Square body design, insert straight in T-slot, screw 1/4 turn

NPN NORMALLY CLOSED	VOLTAGE	CONNECTION	CABLE	Part Number
NPN-NC, with LED, 3-wire	10-30 V DC	3 m Flying Lead	PUR IP67	P8SAGMFAX
NPN-NC, with LED, 3-wire	10-30 V DC	10 m Flying Lead	PUR IP67	P8SAGMFDX
NPN-NC, with LED, 3-wire	10-30 V DC	0.3 m M8	PUR IP67	P8SAGMCHX

NPN NORMALLY OPEN	VOLTAGE	CONNECTION	CABLE	Part Number
NPN-NO, with LED, 3-wire	10-30 V DC	3 m Flying Lead	PUR IP67	P8SAGNFAX
NPN-NO, with LED, 3-wire	10-30 V DC	10 m Flying Lead	PUR IP67	P8SAGNFDX
NPN-NO, with LED, 3-wire	10-30 V DC	0.3 m M8	PUR IP67	P8SAGNCHX

PNP NORMALLY CLOSED	VOLTAGE	CONNECTION	CABLE	Part Number
PNP-NC, with LED, 3-wire	10-30 V DC	3 m Flying Lead	PUR IP67	P8SAGQFAX
PNP-NC, with LED, 3-wire	10-30 V DC	3 m Flying Lead	PVC IP67	P8SAGQFLX
PNP-NC, with LED, 3-wire	10-30 V DC	10 m Flying Lead	PUR IP67	P8SAGQFDX
PNP-NC, with LED, 3-wire	10-30 V DC	0.3 m M8	PUR IP67	P8SAGQCHX

PNP NORMALLY OPEN	VOLTAGE	CONNECTION	CABLE	Part Number
PNP-NO, with LED, 3-wire	10-30 V DC	3 m Flying Lead	PUR IP67	P8SAGPFAX
PNP-NO, with LED, 3-wire	10-30 V DC	3 m Flying Lead	PVC IP67	P8SAGPFLX
PNP-NO, with LED, 3-wire	10-30 V DC	10 m Flying Lead	PUR IP67	P8SAGPFDX
PNP-NO, with LED, 3-wire	10-30 V DC	10 m Flying Lead	PVC IP67	P8SAGPFTX
PNP-NO, with LED, 3-wire	10-30 V DC	0.3 m M8	PUR IP67	P8SAGPCHX

REED NORMALLY CLOSED	VOLTAGE	CONNECTION	CABLE	Part Number
Reed-NC, No LED, 2 wire	10-30 V AC/DC	10 m Flying Lead	PUR IP67	P8SAGEFRX
Reed-NC, No LED, 2-wire	10-120 V AC/DC	10 m Flying Lead	PUR IP67	P8SAGEFRX1
Reed-NC, No LED, 2-wire	10-30 V AC/DC	0.3 m M8	PUR IP67	P8SAGECNX

REED NORMALLY OPEN	VOLTAGE	CONNECTION	CABLE	Part Number
Reed-NO, with LED, 2-wire	10-30 V AC/DC	3 m Flying Lead	PUR IP67	P8SAGRFAX
Reed-NO, with LED, 2-wire	10-120 V AC/DC	3 m Flying Lead	PVC IP67	P8SAGRFLX1
Reed-NO, with LED, 2-wire	10-240 V AC/DC	3 m Flying Lead	PVC IP67	P8SAGRFLX2
Reed-NO, with LED, 2-wire	10-240 V AC/DC	10 m Flying Lead	PUR IP67	P8SAGRFDX2
Reed-NO, with LED, 2-wire	10-120 V AC/DC	10 m Flying Lead	PVC IP67	P8SAGRFTX1
Reed-NO, with LED, 2-wire	10-30 V AC/DC	0.3 m M8	PUR IP67	P8SAGRCHX

REED NORMALLY OPEN	VOLTAGE	CONNECTION	CABLE	Part Number
Reed-NO, with LED, 3-wire	10-30 V AC/DC	3 m Flying Lead	PUR IP67	P8SAGSFAX
Reed-NO, with LED, 3-wire	10-30 V AC/DC	3 m Flying Lead	PVC IP67	P8SAGSFLX
Reed-NO, with LED, 3-wire	10-30 V AC/DC	10 m Flying Lead	PUR IP67	P8SAGSFDX
Reed-NO, with LED, 3-wire	10-30 V AC/DC	10 m Flying Lead	PVC IP67	P8SAGSFTX
Reed-NO, with LED, 3-wire	10-30 V AC/DC	0.3 m M8	PUR IP67	P8SAGSCHX

ATEX IP67	VOLTAGE	CONNECTION	CABLE	Order Code
PNP-NO, with LED, 3-wire	10-26 V DC	3 m Flying lead	PUR IP67	P8SAGPFAXS
NAMUR-NO, with LED, 2-wire	8.2-20 V DC	5 m Flying Lead	PVC IP67	P8SAGDFMXW *
NAMUR-NO, with LED, 2-wire	8.2-20 V DC	10 m Flying Lead	PVC IP67	P8SAGDFTXW *

Note:
-30 to +80 °C (PUR cable) I -30 to + 70 °C (PVC cable) I -25 to +80 °C (NAMUR 1GD I -20 to +50 °C (ATEX 3GD)
All sensors come with an adapter for S-dovetail Parker type OSP grooves.
* with an aluminium adapter

P8S Continuous Position Sensors

Many applications require more than just end of stroke sensing of an actuator, but traditional methods of continuous sensing are expensive to implement. Parker's CPS (Continuous Position Sensor) enables quick, precise and contactless continuous position sensing of a magnetic piston.

CPS sensors continuously supply data via analog outputs or IO-Link. Analog position sensors have a voltage output of 0 V ... 10 V as well as a current output of 4 mA ... 20 mA. CPS enables flexible machine concepts, making it possible to solve tasks in areas such as quality monitoring and process control in conjunction with pneumatic cylinders. This continuous transfer of position data upgrades the functionality of the pneumatic cylinders by making them more intelligent, and as a result, more versatile. CPS settings can be adjusted during or after installation using a teach button or using IO-Link.

CPS can be mounted directly in standard T-slots without the need for additional accessories. Mounting on other cylinder types, (round, tie rod) is possible with adapters.

- Continuous position sensing
- IO-Link communication with M12 connector
- No modification to the actuator
- Analog version with M8 connector
- 5 sizes with sensing ranges from 32 mm to 256 mm
- IP67 design suitable for any industrial application
- Yellow teach button for easy set-up

Technical specification:

1 ms sampling rate
0.03% full scale resolution
0.06% full scale repeatability
0.3 mm Linearity error

How it works:

The CPS product detects the position of an actuator via the magnet on the piston. The sensor settings can easily be adjusted during installation using the yellow teach button or during operation over the IO-Link communication. This upgrades the functionality of the pneumatic actuator by making it more intelligent and versatile in support of the Industry 4.0 initiative.

How it connects:

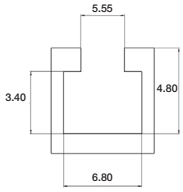
Analog version has a M8 connector and a voltage output of 0-10V as well as a current output of 4-20mA. IO-Link version has a M12 connector and transmits position via 2 bytes of process input data and also allows for parameter control of measuring range and locking of the teach button.
It can be controlled by Class A or Class B IO-Link Masters.

How it installs:

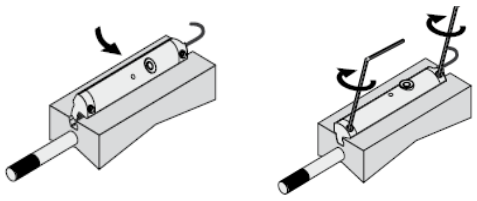
The Parker CPS requires the use of a magnetic piston. The product will ft T-slot cylinders without any additional mounting hardware.

Without Adapter:

Direct drop-in T-slot
T-slot dimensions [mm ± 0.1]



1) Pivot sensor into the slot
2) Teach the CPS unit the desired measuring range
3) Tighten set screws

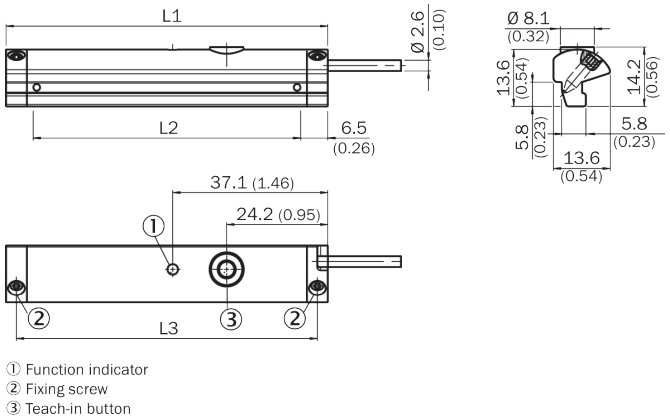


Technical Data

Cylinder type:	Profile with T-slot
Installation:	Drop in, fixed by allen key 1.5 mm
Measuring range:	32 to 256 mm depending on type [1]
Housing length:	45 to 269 mm depending on type
Output Function:	Analog | IO-Link
Analog output (voltage):	0 to 10 V | -
Analog output (current):	4 to 20 mA | -
Teach-in:	Yes
Enclosure rating:	IP 67 (according to EN 60529)
Supply Voltage: [2]	15 to 30 V DC
Power consumption: [3]	<= 22 mA (analog) | <= 25 ma (IO-Link)
Max load resistance: [4]	<= 500 Ω
Min load resistance: [5]	<= 2 kΩ
Protection class:	III
Time delay before availability:	1.5 s
Required magnetic field sensitivity:	3 mT / 2 mT (analog) | 3 mT (IO-Link)
Resolution: [6]	0.03% full scale range (max >=0.05 mm)
Linearity error: [7]	0.3 mm
Repeat accuracy: [8]	0.06% full scale range (>= 0.1 mm)
Sampling rate: [9]	1 ms
Indication LED color:	Yellow (analog)
Reserve polarity protection:	Yes (analog)
Short circuit protection:	Yes (analog)
Ambient operating temperature range:	-20 to +70 °C (PUR cable)
Shock and vibration resistance:	30 g 11 ms / 10 … 55 Hz, 1 mm
EMC: [10]	According to EN 60947-5-2
International standard:	CE | C UL US | CCC (not applicable) | RoHs | IO-Link
UL file No:	On request
Housing material:	Plastic polyamid PA12
Screw material:	Stainless steel
Cable material:	PUR (Polyurethane)
Conductor cross-section:	0.08 mm²
Connector:	M12 (IO-Link) or M8 (analog)

[1] ± 1 mm
[2] Reverse-polarity protected, operation in short-circuit protected network: max. 8 A.
[3] Without load
[4] Power output, at 24 V
[5] Voltage output
[6] FSR: Full Scale Range; max. measuring range.
[7] At 25°C, linearity error (maximum deviation) depending on response curve and minimal deviation function.
[8] At 25°C, repeatability magnet movement in one direction.
[9] Only in standard mode, not in IO-Link mode.
[10] The analogue measured value can deviate under transient conditions.

Dimensions, mm (inch)



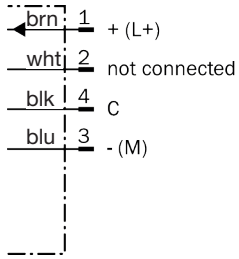
Part Number				
L1	L2 *	L3	Analog	IO-Link
45	32	40	**P8SAGACHA**	**P8SAGHMHA**
77	64	72	**P8SAGACHB**	**P8SAGHMHB**
141	128	136	**P8SAGACHD**	**P8SAGHMHD**
205	192	200	**P8SAGACHF**	**P8SAGHMHF**
269	256	264	**P8SAGACHH**	**P8SAGHMHH**

*L2 equal to the measuring range.

Note:
PUR cable with M12 (IO-Link) or M8 (Analog) male connector knurled nut, 4-pin, 0,3 meter length.
Please consult for measuring range 96, 160 & 224 mm.

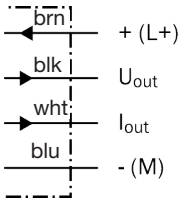
Connection Type and Diagram

IO Link version



PUR 0.3 meter length
with M12 male connector
knurled nut, 4-pin

Analog version



PUR 0.3 meter length
with M8 male connector
knurled nut, 4-pin

Ordering Information, Drop-in T-slot

Output	Measuring Length	Configuration Option	Part Number	Weight [g]	For Product Series
Analog	32 mm	Teach Button	**P8SAGACHA**	16	With T-slot groove *
	64 mm		**P8SAGACHB**	26	
	128 mm		**P8SAGACHD**	46	
	192 mm		**P8SAGACHF**	66	
	256 mm		**P8SAGACHH**	86	
IO-Link	32 mm	Teach Button or IO-Link parameter	**P8SAGHMHA**	20	With T-slot groove *
	64 mm		**P8SAGHMHB**	30	
	128 mm		**P8SAGHMHD**	50	
	192 mm		**P8SAGHMHF**	70	
	256 mm		**P8SAGHMHH**	90	

***** Required magnetic field sensitivity: 3mT / -2 mT (Analog) / 3mT (IO-Link)

Note:
PUR cable with M12 (IO-Link) or M8 (Analog) male connector knurled nut, 4-pin, 0,3 meter length.
Please consult for measuring range 96, 160 & 224 mm.

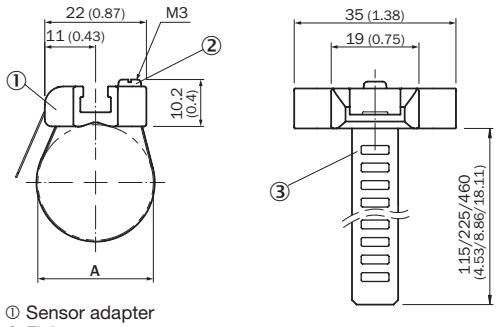
Mountings and Brackets

For Products Series	Part Number	Weight [g]
Tie rods, 4MA, P1F, P1D, PTR, 2MNR	**P8S-TMAOX**	65
Tie rods, P1F-T Ø 32-100	**P8S-TMA07**	10
Tie rods, P1F-T Ø 125-320	**P8S-TMA08**	32
T-Slot OSP Ø 10	**8872FIL**	3
T-Slot 2002 Series Ø 16	**8865FIL**	4
T-Slot 2002/P120 Series Ø 25-80	**8866FIL**	5
Round cylinder Ø10-25	**P8S-TMC01**	27
Round cylinder Ø 32-63	**P8S-TMC02**	29
Round cylinder Ø 80-125	**P8S-TMC03**	32
S-Dovetail OSP, pack of 10	**P8S-TMA09**	10
Ambient temperature -30 to +80 °C		

All mountings can be moved on the cylinder body before screwing in place and then putting sensors in the slots.

Dimensions, mm (inch)

P8S-TMC01, 02 & 03

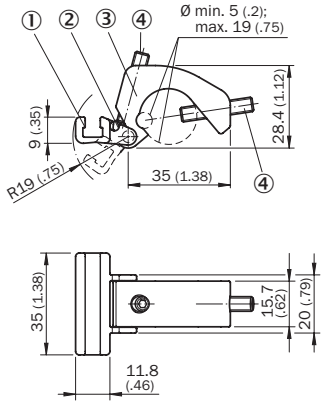


① Sensor adapter
② Fixing screw
③ Strap

Part number	D [mm]	
P8S-TMC01	8 to 25	Clamping ring in nickel silver, screw in stainless steel, sensor mounting zinc diecast
P8S-TMC02	32 to 63	
P8S-TMC03	80 to 130	

P8S-TMAOX

(Zinc diecast, zinc plated screws.)



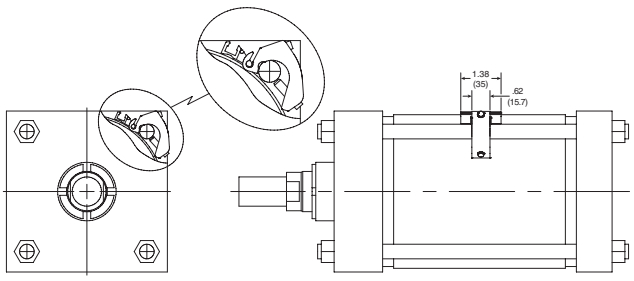
① Sensor adapter with T-Slot
② Fixing for cable < Ø 3.2 mm (0.126 inch)
③ Cylinder adapter
④ Mounting screws M5

Tie Rod Bracket Assembly

Tie Rod Bracket Assembly is necessary for Global and Mini-Global Sensor installation on all tie rod construction cylinders. This includes all Intermediate Trunnion mounts (Style DD or MT4); and all 6"-8" bore Sensors and bracket assemblies must be ordered separately.

Part number P8S-TMAOX fits 1-1/2" to 8" bores and 32-200mm bores for Global Sensors

P8S-TMAOX



Male Connectors for Connecting Cables

Cable connectors for producting your own connecting cables.
The conncectors can be quickly attached to the cable without special tools. Only the outer sheath of the cable is removed.
The connectors are available for M8 screw connector and meet protection class IP65.

Technical Data

Operating voltage:	max. 32 V AC/DC
Opertaing current per contact:	max. 4 A
Connection cross section:	0.25... 0.5 mm² (conductor diameter min 0.1 mm)
Protection class:	IP65 and IP67 when plugged and screwed down (EN 60529)
Temperature range:	- 25... + 85°C

Connector	Weight [kg]	Part number
M8 screw connector		**P8CS0803J**
M12 screw connector	0.022	**P8CS1204J**

Cables to extend cable sensor lengths with M8*

Description	Part Number	Weight [g]	For Product Series
Cable flex PVC 3 meter with 8mm snap-in connector / flying leads	**9126344341**	70	P8S Sensors with M8
Cable flex PVC 10 meter with 8mm snap-in connector / flying leads	**9126344342**	210	P8S Sensors with M8
Cable PUR 3 meter with 8mm snap-in female connector / flying leads	**9126344345**	70	P8S Sensors with M8
Cable flex PUR 10 meter with 8mm snap-in connector / flying leads	**9126344346**	210	P8S Sensors with M8
Cable PVC 5 meter with M8 screw female connector / flying leads	**KC3104**	120	P8S Sensors with knurled M8

*Note: not applicable for P8S CPS Sensors as no cable available

Pneumatic Sensor for Tie-Rods Cylinders

An ideal solution where a direct pneumatic signal is wanted from a cylinder sensor to a pneumatic control system, for example. This could be a machine or device in which only compressed air is available, and an electricity supply to normal cylinder sensors would involve serious problems or considerable expense.

Function:

Non-contacting sensing of a pneumatic cylinder, triggering an output signal (conn. 2) from the integrated 3/2 NC valve, which is activated by a magnetic field or iron core and has a return spring.

If more than one sensor is used with a cylinder there must be a distance of at least 20 mm between sensors to prevent them influencing each other.

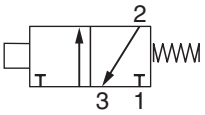
To avoid interference, there must be a minimum spacing of 15 mm to steel details.

The outlet (conn. 3) must not be blocked or restricted as this can impair the function of the sensor.

The sensor is fastened to the cylinder using the special sensor fixing.

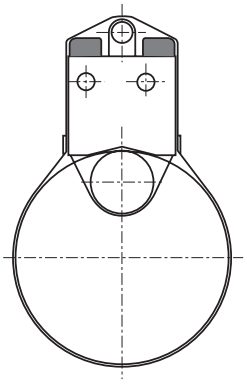
Technical data:

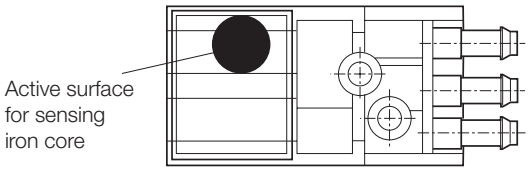
Working pressure:	min 2 to max 6 bar
Temperature:	-15 to +60 °C
Air quality:	3.4.3 to ISO 8573-1 (must be oil free)
Function:	3/2 NC valve
Flow:	40 Nl per minute
Connection:	for plastic pipe with 2,5-3 mm internal diameter
Activation distance:	for magnet: min 9 mm
Activation distance:	for Fe: approx. 2 mm
Repetition accuracy:	+/- 0.2 mm
Cylinder velocity:	max 1 m/s (depends on magnetic field, interference from steel in environment, signal length requirement from control system….)
Distance between sensors:	min 20 mm
Distance from sensor to steel details:	min 15 mm
Fixing:	with sensor fixing or with an M4 thread in case
Sensing:	non-contacting (also through a wall of non-magnetic material)



Description	Weight (kg)	Part Number
Pneumatic sensor	0.02	**P8S-A34X**
Cylinder fixing bore Ø32 to Ø125 mm	0.01	**P8S-AMA1**

Cylinder fixing - Tie-Rod Cylinders Ø 32 to 100 mm





Dimensions (mm)