MTS SENSORS

Temposonics®

Magnetostrictive Linear Position Sensors

Sensor Component EC Start/Stop
Data Sheet

– Completely embeddable in application
– Easy and flexible integration into machinery
– Small mechanical size

The Measurable Difference

MEASURING TECHNOLOGY

For position measurement, the absolute, linear Temposonics® position sensors make use of the properties offered by the specially designed magnetostrictive waveguide. Inside the sensor a torsional strain pulse is induced in the waveguide by momentary interaction of two magnetic fields. The interaction between these two magnetic fields produces a strain pulse, which is detected by the electronics at the head of the sensor. One field is produced by a moving position magnet, which travels along the sensor rod with the waveguide inside. The other field is generated by a current pulse applied to the waveguide. The position of the moving magnet is determined precisely by measuring the time elapsed between the application of the current pulse and the arrival of the strain pulse at the sensor electronics housing. The result is a reliable position measurement with high accuracy and repeatability.

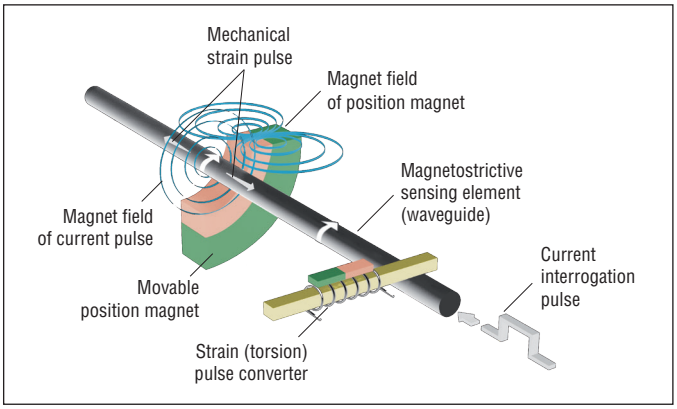


Fig. 1: Time-based magnetostrictive position sensing principle

EC SENSOR COMPONENT

NOTICE

Intended use:
The sensor component is exclusively designed for being fitted into a protective housing as part of equipment by the equipment manufacturer.

The complete electronic interface with active signal conditioning is accomodated in the sensor component's housing.

The sensor component is ideal for integrated level measurement in industrial machinery. Typical market segments and applications are:
– Food (filling machines, milk tanks)
– Industrial (hydraulic oil tanks, lubrications systems, waste water tanks)
– Medical (level measurement of liquids in medical devices)

Fig. 2: Typical application: e.g. filling machines

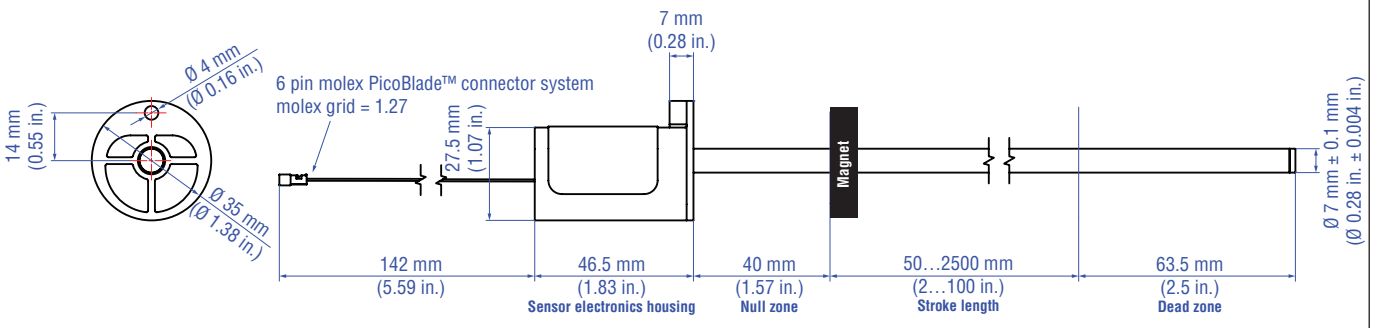
TECHNICAL DATA

Output	
Interface	Start/Stop
Data protocol	RS-422 differential signal, additionally available: serial parameter upload of stroke length, offset, gradient status and manufacturer number
Measured value	Position
Measurement parameters	
Resolution	Controller dependent
Cycle time	Controller dependent
Linearity [1]	≤ ±0.02 % F.S. (minimum ±60 µm)
Repeatability	≤ ±0.005 % F.S. (minimum ±20 µm)
Operating conditions	
Operating temperature	–20…+70 °C (–4…+158 °F) (see “mounting”)
Humidity	90 % rel. humidity, no condensation
Ingress protection	IP30
Shock test	According to installation conditions (see “mounting”)
Vibration test	According to installation conditions (see “mounting”)
EMC test	According to installation conditions (see “mounting”)
Magnet movement velocity	Any
Design/Material	
Sensor electronics housing	PA66 GF30
Sensor rod	PVC
Stroke length	50…2500 mm (2…100 in.)
Mechanical mounting	
Mounting position	Any
Mounting instructions	Please consult the technical drawings and the operation manual (document no.: 551414)
Electrical connection	
Connection type	6 pin molex PicoBlade™ connector system
Operating voltage	+24 VDC (–15 / +20 %)
Ripple	≤ 0.28 Vpp
Current consumption	50…100 mA
Polarity protection	Up to –30 VDC
Overvoltage protection	Up to 36 VDC

Mounting
The design allows easy fitting into an external protective housing provided by the machine builder. Electromagnetic compatibility (EMC), shock, vibration and ingress protection can meet the performance of industrial applications depending on external protective housing. The external housing ensures that the sensor rod is contained inside a guiding structure such as a metallic tube or profile ensuring mechanical stability. The component must be protected against EMC during handling.

1/ With position magnet # 251 416-2

TECHNICAL DRAWING



Controlling dimensions are millimeters
Unless otherwise stated, apply to the general tolerances according to DIN ISO 2768-m

CONNECTION WIRING

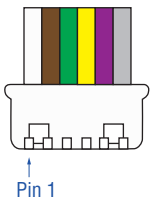
With mating connector cable 254 385

8 pin connector	M12	Start/Stop
	Pin 1	Start (+)
	Pin 2	Start (–)
	Pin 3	Stop (+)
	Pin 4	Stop (–)
	Pin 5	n.c.
	Pin 6	n.c.
	Pin 7	+24 VDC (–15 / +20 %)
	Pin 8	DC Ground (0 V)

NOTICE

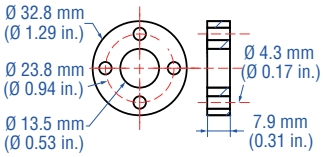
Cable shield should be soldered on connector housing and must be grounded in the control unit.

With mating connector cable 254 386

6 pin molex connector	Molex	Color	Start/Stop
	Pin 1	WH	DC Ground (0 V)
	Pin 2	BN	+24 VDC (–15 / +20 %)
	Pin 3	GN	Start (–)
	Pin 4	YE	Start (+)
	Pin 5	VT	Stop (+)
	Pin 6	GY	Stop (–)

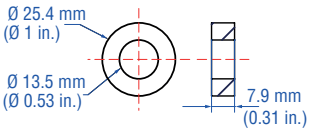
ACCESSORIES (More accessories see 551444)

Position magnets



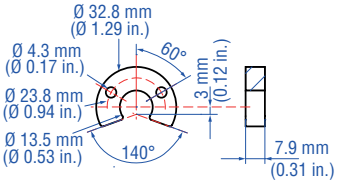
Standard ring magnet
Part no. 201 542-2

Material: PA ferrite GF20
Weight: ca. 14 g
Operating temperature:
–40…+105 °C (–40…+221 °F)
Surface pressure: max. 40 N/mm²
Fastening torque for M4 screws:
max. 1 Nm



Ring magnet OD25.4
Part no. 400 533

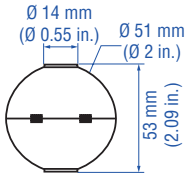
Material: PA ferrite
Weight: ca. 10 g
Operating temperature:
–40…+105 °C (–40…+221 °F)
Surface pressure: max. 40 N/mm²



U-magnet OD33
Part no. 251 416-2

Material: PA ferrite GF20
Weight: ca. 11 g
Operating temperature:
–40…+105 °C (–40…+221 °F)
Surface pressure: max. 40 N/mm²
Fastening torque for M4 screws:
max. 1 Nm

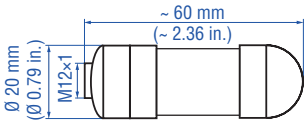
Magnet float



Magnet float
Part no. 251 447

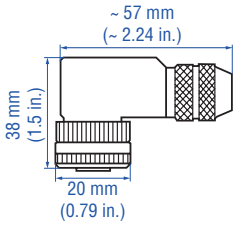
Material: stainless steel
Weight: ca. 42 ± 3 g
Density: 720 kg/m³
Pressure: max. 60 bar (870 psi)

Cable connectors



Female, straight, 8 pin M12
Part no. 370 694

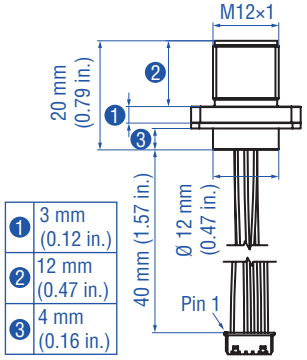
Housing: GD-ZnAL / IP67
Termination: screw; 0.75 mm²
Contact insert: CuZn
Cable Ø: 4…9 mm (0.16…0.35 in.)



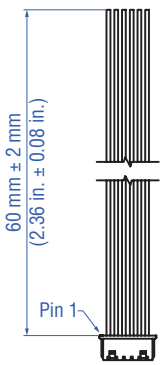
Female, angled, 8 pin M12
Part no. 370 699

Housing: GD-ZnAL / IP67
Termination: screw; max. 0.5 mm²
Contact insert: CuZn
Cable Ø: 6…8 mm (0.24…0.31 in.)

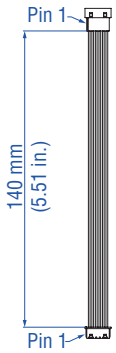
Mating connector cables



Mating connector cable M12 8 pin
Part no. 254 385



Mating connector cable pigtail
Part no. 254 386



Extension cable molex to molex
Part no. 254 243

Controlling dimensions are millimeters

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12	13	14
E	C	C						M	0	0	1	R	3
a		b	c					d			e	f	

a	Sensor model
E C	Sensor component

b	Design
C	Rod Ø 7 mm

c	Stroke length
X X X X M	0050…2500 mm
X X X X U	002.0…100.0 in.

Standard stroke length (mm)

Stroke length	Ordering steps
50 … 500 mm	5 mm
500 … 750 mm	10 mm
750…1000 mm	25 mm
1000…2500 mm	50 mm

Standard stroke length (in.)

Stroke length	Ordering steps
2 … 20 in.	0.2 in.
20 … 30 in.	0.5 in.
30 … 40 in.	1.0 in.
40…100 in.	2.0 in.

d	Connection type
M 0 0	6 pin molex PicoBlade™ connector system

e	Operating voltage
1	+24 VDC (–15 / +20 %)

f	Output
R 3	Start/Stop with sensor parameters upload function

DELIVERY

Sensor component

Accessories have to be ordered separately.

Operation manuals & software are available at:
www.mtssensors.com

MTS®
SENSORS

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LEGAL NOTICES

ISO 9001 CERTIFIED

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