



Magnetostrictive Linear Position Sensors



- Compact sensor model
- Operating temperature up to +75 °C (+167 °F)
- Ideal for flexible mounting



MEASURING TECHNOLOGY

The absolute, linear position sensors provided by MTS Sensors rely on the company's proprietary Temposonics® magnetostrictive technology, which can determine position with a high level of precision and robustness. Each Temposonics® position sensor consists of a ferromagnetic waveguide, a position magnet, a strain pulse converter and supporting electronics. The magnet, connected to the object in motion in the application, generates a magnetic field at its location on the waveguide. A short current pulse is applied to the waveguide. This creates a momentary radial magnetic field and torsional strain on the waveguide. The momentary interaction of the magnetic fields releases a torsional strain pulse that propagates the length of the waveguide. When the ultrasonic wave reaches the end of the waveguide it is converted into an electrical signal. Since the speed of the ultrasonic wave in the waveguide is precisely known, the time required to receive the return signal can be converted into a linear position measurement with both high accuracy and repeatability.

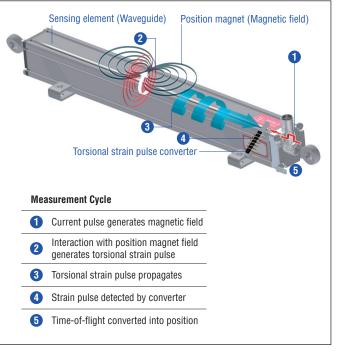


Fig. 1: Time-of-flight based magnetostrictive position sensing principle

ER SENSOR

Robust, non-contact and wear free, the Temposonics[®] linear position sensor provide high durability and precise position measurement feedback in harsh industrial environments. Measurement accuracy is tightly controlled by the quality of the waveguide manufactured exclusively by MTS Sensors.

Temposonics® ER has the shape of an aluminum cylinder with a guided driving rod and contains both the sensor element and the electronics. The position is detected via the solid extractable driving rod, which contains the position magnet and is mounted to the moveable machine part. The sensor can be installed in any orientation. Typical fields of application are printing and paper industry, machine tools and plastics industry as well as control systems. Temposonics® ER with IO-Link allows customers to adjust parameters including measuring direction, resolution or offset. In addition, a switching state can be outputted in parallel to the transfer of the position value. The switching points as well as the switching logic can be parameterized. IO-Link is an open standard according to IEC 61131-9. It is a serial, bi-directional point-topoint connection for signal transmission and energy supply. The bidirectional communication enables consistent communication between sensors and the controller as well as consistent diagnostic information down to the sensor level.



Fig. 2: Typical application: Paper industry

TECHNICAL DATA

InterfaceDigitalTransmission protocolID-Link VI.1Data format32 bit signed (oosition in µm)Data format32 bit signed (oosition in µm)Data transmission rateCOM3 (230.4 kBaud)Process data device - master4 bytesProcess data master - device0 bytesError value0Measured valuePositionMeasured valuePositionMeasured value5 µm, 10 µm, 20 µm, 50 µm or 100 µmCycle timeminimum 1 ms (master dependent)Linearty ≤ 4.002 % F.S. (minimum ± 60 µm)Repeatability ≤ 4.002 % F.S. (minimum ± 20 µm)Operating conflicts $=$ Operating conflicts $=$ Operating temperature -40475 °C (-404167 °F)Humidify90 % relative humidity, no condensationIngress protecton 31967 (connectors correctly fitted)Shock test100 g (single shock) IEC standard 60068-2-27Vibration test $5 g ./102000$ Hz IEC standard 60068-2-47Vibration test $5 g ./102000$ Hz IEC standard 60068-2-47<	Output	
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Polarity protection Up to -30 VDC		500 VDC (DC ground to machine ground)
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		•

1/ Selectable via IO-Link master

2/ The IP rating IP67 is only valid for the sensors electronics housing, as water and dust can get inside the profile.

TECHNICAL DRAWING

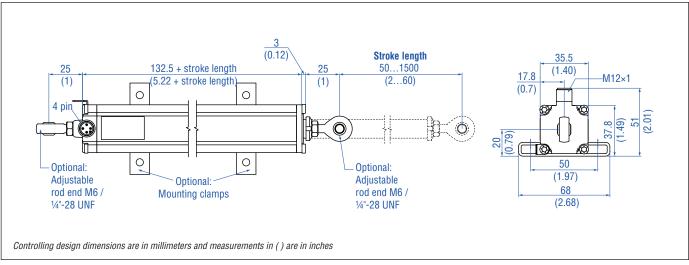


Fig. 3: Temposonics® ER

CONNECTOR WIRING

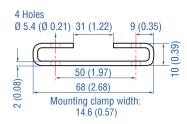
D44				
Signal + power supply				
M12 male connector (A-coded)	Pin	Function		
	1	+24 VDC (+25 %)		
(4 2)	2	DI / DQ		
	3	DC Ground (0 V)		
View on sensor	4	C / Q		

Fig. 4: Connector wiring D44

Cord sets		Rod ends	
Ø 15 Ø 12,2 Ø 11,6 Ø 12,4 Ø 11,6	$ \begin{array}{c} \emptyset \ 15 & 26.5 \\ (\emptyset \ 0.6) & (1.04) \\ M12 & & 31.5 \\ (\emptyset \ 0.35) & & (1.24) \\ \emptyset \ 11.6 & & 12 \\ (\emptyset \ 0.45) & (0.5) \end{array} $	26,5 36,5	26.5 (1.04) 36.5 (1.44)
		© © © 0 14 30° 14 Tilt angle (0.55)	Tilt angle
Cable with M12 A-coded female connector (5 pin), straight – pigtail Part no. 370 673	Cable with M12 A-coded female connector (5 pin), angled – pigtail Part no. 370 675	Rod end with M6 thread Part no. 254 210	Rod end with ¼"-28 UNF thread Part no. 254 235
Material: PUR jacket; black Features: Shielded Cable length: 5 m (16.4 ft) Ingress protection: IP67 (correctly fitted) Operating temperature: -25+80 °C (-13+176 °F)	Material: PUR jacket Features: Shielded Cable length: 5 m (16.4 ft) Ingress protection: IP67 (correctly fitted Operating temperature: -25+80 °C (-13+176 °F)	Material: Galvanized steel	Material: Galvanized steel

FREQUENTLY ORDERED ACCESSORIES – Additional options available in our Accessories Guide 🗍 551444

Mounting clamp

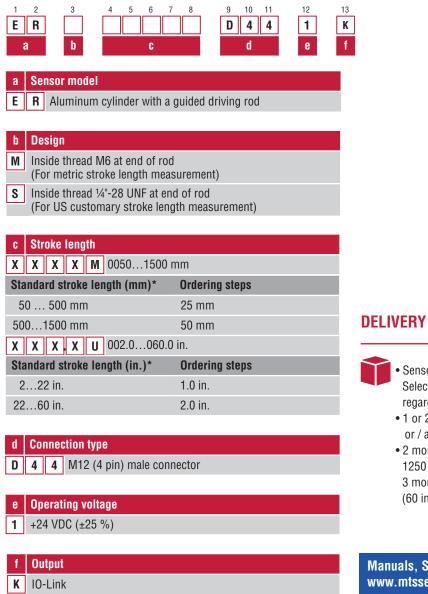


Mounting clamp Part no. 403 508

Material: Stainless steel 1.4301/1.4305 (AISI 304/303)

Controlling design dimensions are in millimeters and measurements in () are in inches

ORDER CODE



 Sensor Select mounting accessories regarding your application:

- 1 or 2 rod ends M6 / 1/4"-28 UNF or / and
- 2 mounting clamps up to 1250 mm (50 in.) stroke length, 3 mounting clamps for 1500 mm (60 in.) stroke length

Accessories have to be ordered separately.

Manuals, Software & 3D models available at: www.mtssensors.com

*/ Non standard stroke lengths are available; must be encoded in 5 mm / 0.1 in. increments.

Some preferred stroke lengths may be available with faster lead time. Contact MTS Sensors for details.



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GERMANY MTS Sensor Technologie GmbH & Co. KG	Auf dem Schüffel 9 58513 Lüdenscheid Phone: +49 2351 9587-0 E-mail: info.de@mtssensors.com	
ITALY Branch Office	Phone: +39 030 988 3819 E-mail: info.it@mtssensors.com	
FRANCE Branch Office	Phone: +33 1 58 4390-28 E-mail: info.fr@mtssensors.com	
UK Branch Office	Phone: +44 79 44 15 03 00 E-mail: info.uk@mtssensors.com	
CHINA Branch Office	Phone: +86 21 2415 1000 / 2415 1001 E-mail: info.cn@mtssensors.com	
JAPAN Branch Office	Phone: +81 3 6416 1063 E-mail: info.jp@mtssensors.com	

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