

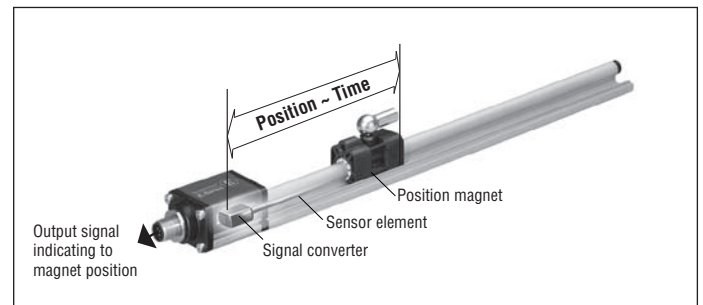
## E-Series SSI

**Temposonics® EP and EL**  
Stroke length 50 - 2500 mm

**Document Part Number**  
**551306 Revision A**



- Linear, absolute measurement
- Contactless sensing with highest durability
- Rugged industrial sensor
- EMC tested and CE marked
- Linearity deviation less than 0.02 % F.S.
- Repeatability 0.005 % F.S.
- Direct signal output for position  
- SSI
- Stroke length 50 - 2500 mm



### Magnetostriction

### Design

The Temposonics® linear position transducers are based on magnetostriction technology. Magnetostriction is a ferromagnetic material phenomenon which relates a dimensional change of the material to its magnetization properties. It is the product of a general coupling between the magnetic and elastic transport properties of the materials crystal lattice. This affect is typically on the scale of a few parts per million. It is quasi linear with the material's magnetization, may be positive or negative, and reaches a maximum at magnetic saturation. It is reversible, but exhibits a hysteric affect if the magnetization does so. Magnetostriction was characterized in the late 19th century, the longitudinal version is called the „Joule“ effect, the torsional version is called the „Wiedemann“ effect, and the reciprocal effect where mechanical stress changes the magnetic properties is referred to as the „Villari“ effect.

Inherently robust, non-contact and wear free, the Temposonics® linear positions transducers provide the best durability and accurate position measurement solutions in harsh industrial environments. The position measurement technique is similar to the radar principle but using magnetostrictive effects. The position measurement accuracy is tightly controlled by the quality of our waveguide which is manufactured by MTS. The sensors are completely modular in electrical and mechanical design. They provide flexibility of use in many different applications. In EP and EL sensors, an aluminium profile housing protects the sensor element and provides guidance for the magnet. The environmentally sealed sensor head houses the modular electronics which provides the measurement and the choice of various different signal output interfaces. The external position measurement target is a permanent magnet. It is attached to the moving part of the machinery while the transducer itself can be stationary.

Temposonics®-EP and EL

Robust aluminium profile-style housing- Stroke length 50 - 2500 mm

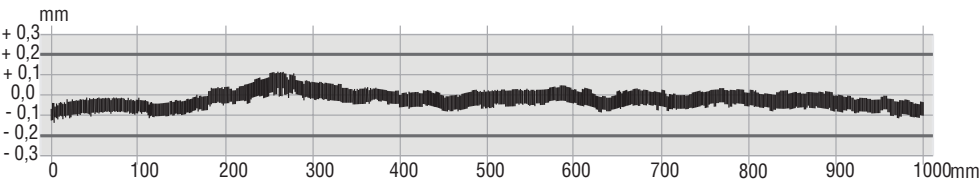
MTS Sensors continues to establish new performance standards for low-cost, fully-industrial, durable position sensors based on the magnetostrictive technology. This principle for accurate and non-contact measurement of linear-position sensing was developed 30 years ago by MTS and is used with outstanding success in a large variety of industrial applications.

The Temposonics® EP and EL Sensors consist of robust aluminum profile-style housings that offer flexible mounting configurations and easy installation. Sensors EP and EL are ideal for demanding industrial applications where simple, reliable non-contact feedback is essential.

Technical Data

Input	
Measured variable	Position
Stroke length	50 - 2500 mm
Output	
Interface	SSI (Synchronous Serial Interface) - Differential signal in SSI standard
Data format	Binary or Gray
Data length	24; 25 bit
Update time	Up to 3.7 kHz, depending on stroke lengths
Data speed	70 kBaud ... 1 MBaud, depending on cable length
	Cable length <3 <50 <100 <200 <400 m
	Baud rate 1.0 MBd <400 kBd <300 kBd <200 kBd <100 kBd
Accuracy	
Resolution	20 µm, 50 µm or 100 µm
Linearity, deviation	< ± 0.02 % F.S. (Minimum ± 60 µm)
Repeatability	< ± 0.005 % F.S. (Minimum ± 20 µm)
Temperature coefficient	≤ 15 ppm/°C
Operating Condition	
Mounting position	Any
Magnet speed	Any
Operating temperature	-40° C ... +75° C
Dew point, humidity	90 % rel. humidity, no condensation
Ingress protection	IP67 with proper mating corrector
Shock rating	100 g (Single hit) / IEC-Standard 60068-2-27
Vibration test	10 g / 10 - 2000 Hz IEC-Standard 60068-2-6 (resonance frequencies excluded)
EMC-Test	Electromagnetic emission EN 61000-6-3
	Electromagnetic immunity EN 61000-6-2
	The sensor meets the requirements of the EC directives and is marked with CE
Design / Material	
Sensor enclosure	Aluminum
Sensor housing	Aluminum
Position magnet type	Magnet slider hard ferrite, block magnet plastic, ring magnet PA-Ferrite

Installation	
Mounting type	Adjustable mounting clamps
Electrical connection	
Connection type	8 pin M12
Input voltage	24 VDC (+20 % / -15 %)
Current consumption	typically 90 mA
Ripple	≤ 0.288 Vpp
Electric strength	500 VDC (DC ground to machine ground)
Polarity protection	≥ -30 VDC
Overvoltage protection	≤ 36 VDC



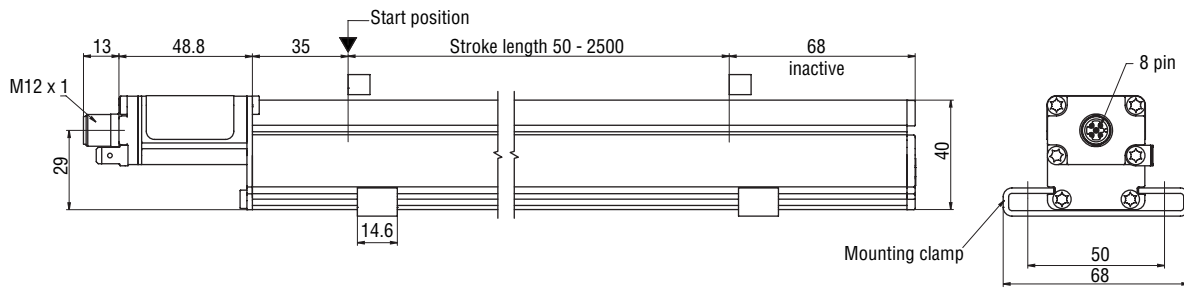
Linearity protocol

Sensor Temposonics®-EP EL, Stroke length 1000 mm

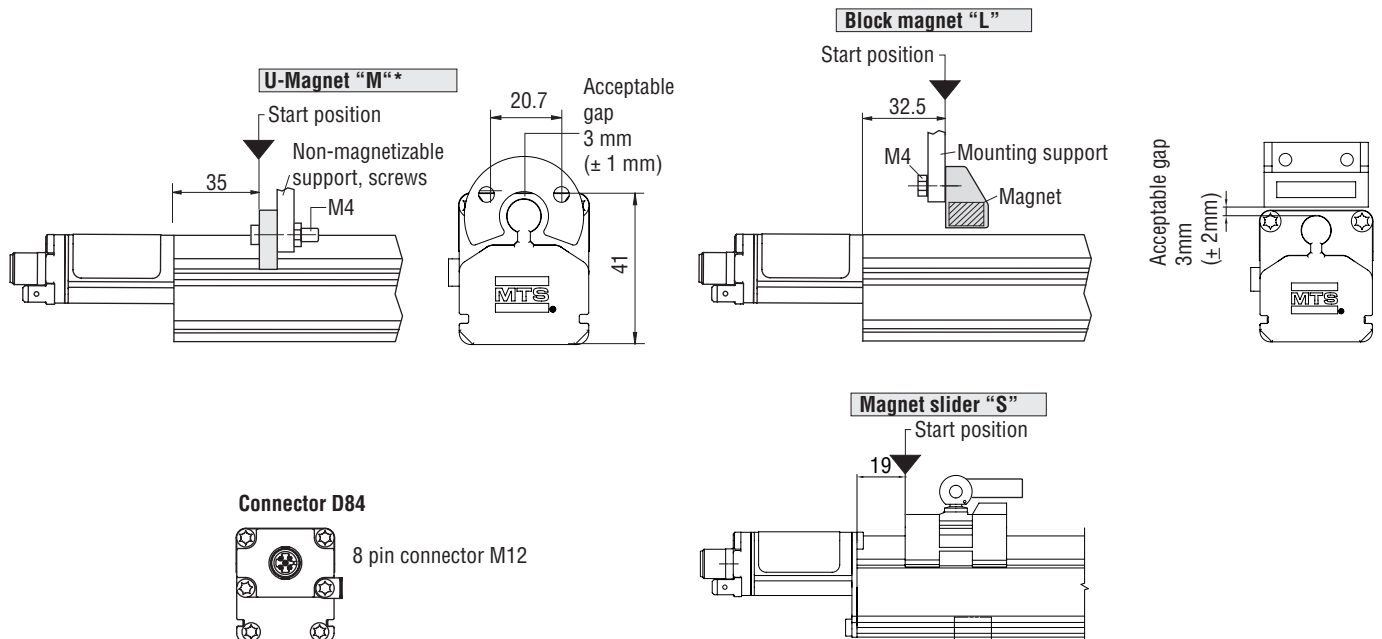
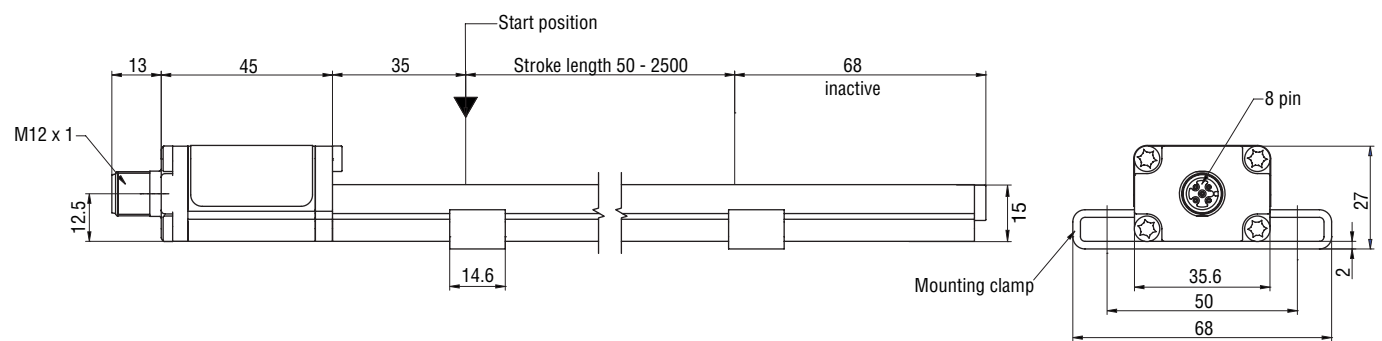
Tolerance allowed: ± 0.2 mm

Tolerance measured: typical ± 0.09 mm

**Temposonics® EP**



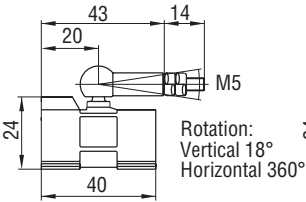
**Temposonics® EL**



\* only for EP transducers

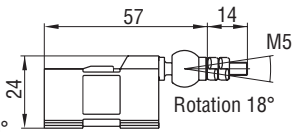
Position magnets (not included in delivery, please order separately)

Magnet slider S  
 Part No.: 252 182



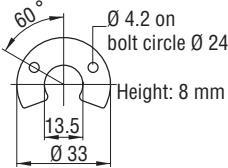
GRP, magnet hard ferrite  
 Joint CuZn39Pb3 nickel-plated  
 Operating temperature:  
 -40 ... +75°C

Magnet slider V  
 Part No.: 252 184



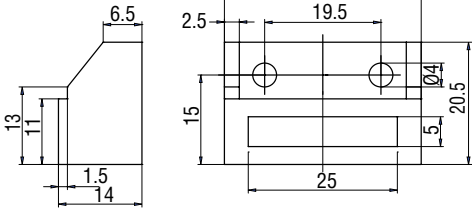
GRP, magnet hard ferrite  
 Joint CuZn39Pb3 nickel-plated  
 Operating temperature:  
 -40 ... +75°C

U-Magnet OD33\*  
 Part No.: 251 416-2



PA-Ferrite-GF20  
 Joint CuZn39Pb3  
 Weight ca. 11g  
 Operating temperature:  
 -40 ... +75°

Block magnet L  
 Part No.: 403 448

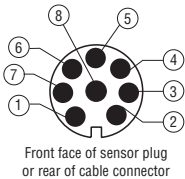


Magnet support: plastic  
 Magnet: hard ferrite  
 Operating temperature:  
 -40 ... +75°

\*only for EP transducers

Other Position magnets upon request

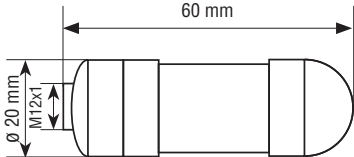
Connector wiring



Connector D84	SSI
Pin 1	Clock (+)
Pin 2	Clock (-)
Pin 3	Data (+)
Pin 4	Data (-)
Pin 5	n.c.
Pin 6	n.c.
Pin 7	+24VDC
Pin 8	OV (GND)

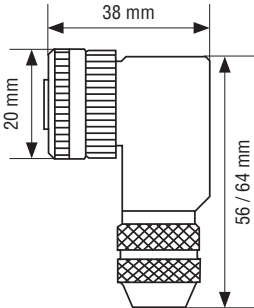
Connectors (not included in delivery, please order separately)

8 pin Female Connector M12 x 1\*



Housing: GD-ZnAL / IP67  
 Termination: screw terminals  
 Contact insert: CuZn  
 Max. cable: Ø 4...9 mm  
 Part No.: 370 694

8 pin 90° Female Connector M12 x 1\*



Housing: GD-ZnAL / IP67  
 Termination: screw terminals  
 Contact insert: CuZn  
 Max. cable: Ø 6...8 mm  
 Part No.: 370 699

\* Maximum recommended torque: 0,6 Nm

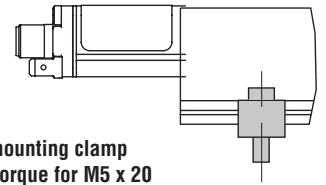
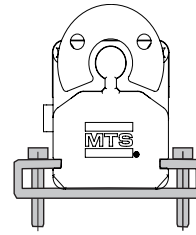
All dimensions in mm

## Profile

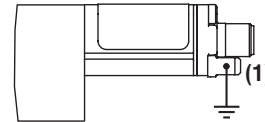
The sensor is fixed on a flat surface of the machine with the mounting clamps. The number of clamps is dependent on the length of the sensor. The clamps should be distributed evenly along the profile. We recommend M5 x 20 (DIN 6912) screws for attachment to be tightened with a torque of max. **5 Nm**.

### Caution!

The mounting clamps isolate the sensor housing from the machine ground. In order to use the sensor correctly the sensor housing must therefore be grounded with a flat pin terminal (6.3 x 0.8 mm) on the sensor head (1).



**Sliding mounting clamp**  
Tightening torque for M5 x 20  
Machine screws: max. 5 Nm

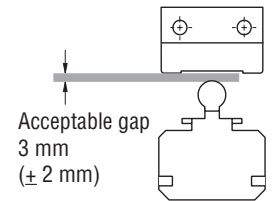
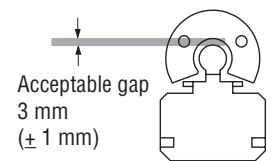
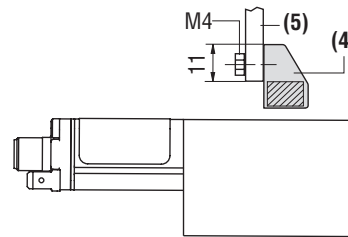
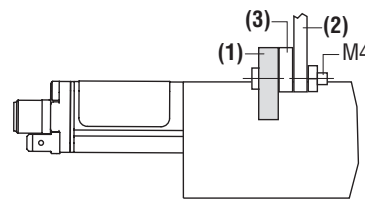


## Position transmitter

**U-Magnet:** For accurate position measurements mount the magnet (1) with non-magnetizable fastening material (2) (screws, supports etc.). Using magnetizable supports, note that the magnet must be mounted with non-ferrous support (3) of 5 mm minimum and screws.  
**Block magnet:** The magnet (4) can be fixed with standard material and screws (5) Note the clearance, as shown here in the diagram on the right.

### Caution!

**Do not exceed the maximum permitted gap.**



Temposonics®-EP / EL
 

SSI

Temposonics®

E

0

M

1

S

1

0

0

Specification

P = Temposonics® EP Sensor

L = Temposonics® EL Sensor

Stroke length

0050 - 2500 mm

Connection type

D84 - 8 pin cable connector M12

Output

S [1] [2] [3] [4] [5] [6] = Synchronous Serial Interface

[1] Data length: 1 - 25 Bit • 2 - 24 Bit

[2] Output format: B - Binary • G - Gray

[3] Resolution (mm): 3 - 0,05 • 4 - 0,1 • 5 - 0,02

[4] Performance: 1 - Standard

[5] [6] Options: 00 - Measuring direction forward

Delivery includes:

- Sensor

- 2 Mounting clamps up to 1250 mm stroke

+ 1 Mounting clamp for 500 mm each

Please order seperately: accessories (see below)

Stroke length standard:

Stroke	Ordering steps
≤ 500 mm	25 mm
> 500 - ≤ 2500 mm	50 mm

Accessories

Description	Part No.
Magnet slider S	252 182
Magnet slider V	252 184
U-Magnet OD33	251 416-2
Block magnet L	403 448
Mounting clamp	403 508
8 pin M12 female connector	370 694
8 pin M12 90° female connector	370 699
8 pin M12 cordset, 5 m PUR shielded cable	370 674
8 pin M12 90° cordset, 5 m PUR shielded cable	370 676
Adapter cable to retrofit old series	on request

| 6 |

## Notes

[illegible]

**www.mtssensor.com**  
**www.temposonics-shop.de**  
**Temposonics® Hotline: +49 2351-9587-6000**

**Mo-Fr 8 am-19 pm / Sa 8 am-12 pm**

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