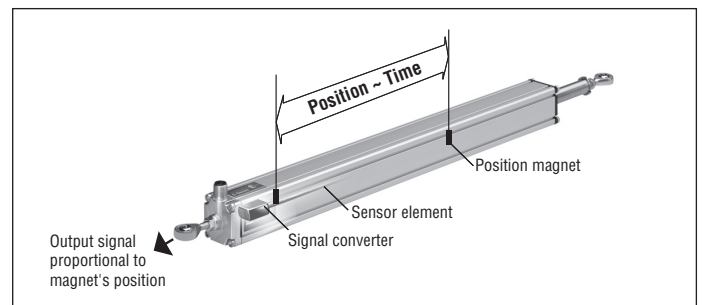
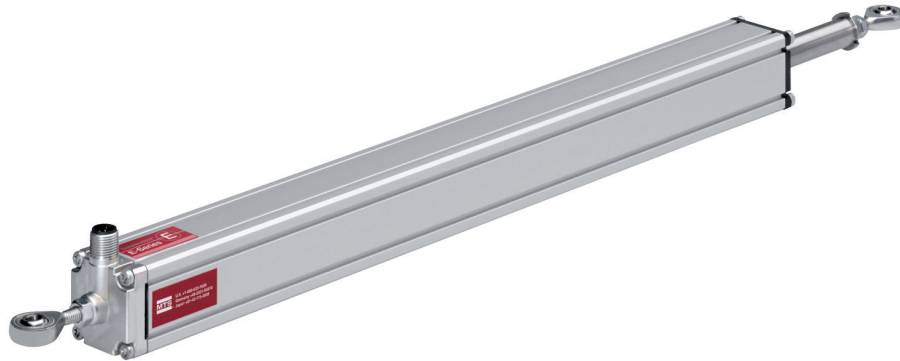


## E-Series SSI

**Temposonics® ER**  
Stroke length 50...1500 mm

**Document Part Number**  
**551342 Revision B**



### 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 head. The result is a reliable position measurement with high accuracy and repeatability.

### The sensor

Inherently robust, non-contact and wear free, the Temposonics® linear position transducers provide best durability and accurate position measurement solutions in harsh industrial environments. The position measurement accuracy is tightly controlled by the quality of the waveguide which is manufactured by MTS. The position magnet is mounted on the moving machine part and travels contactlessly over the sensor rod with the built-in waveguide.

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. Due to the enhanced sealing of the sensor, the ER offers protection to IP67. The sensor can be installed in any orientation and is ideal for long-term operation. Typical fields of application are printing and paper industry, machine tools, rolling mills and plastics industry as well as control systems.

### Technical Data

#### Input

Measured value	Position
Stroke length	50...1500 mm

#### Output

Interface	SSI (Synchronous Serial Interface)					
Coding	Binary or Gray					
Data length	24; 25 bit					
Sample rate	100 Hz < f < 3.7 kHz, depending on stroke lengths					
	70 kBaud...1 MBaud, depending on cable length					
Data transmission rate	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	≤ ±0.02 % F.S. (minimum ±60 µm)
Repeatability	≤ ±0.005 % F.S. (minimum ±20 µm)

#### Operating conditions

Mounting position	Any
Magnet movement velocity	≤ 5 m/s
Operating temperature	-25 °C...+75 °C
Dew point, humidity	90 % rel. humidity, no condensation
Electronic ingress protection <sup>1</sup>	IP67 if mating cable connector is correctly fitted
Shock test	100 g (single shock) / IEC-Standard 60068-2-27
Vibration test	< 5 g / 10...2000 Hz IEC-Standard 60068-2-6 (resonance frequencies excluded)
EMC test	Electromagnetic emission according to EN 61000-6-4/3
	Electromagnetic immunity according to EN 61000-6-2
	The sensor meets the requirements of the EC directives and is marked with CE.

#### Design / Material

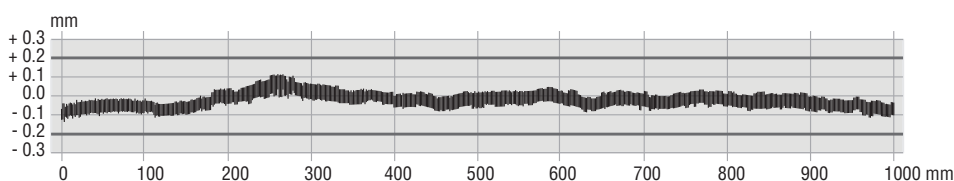
Sensor housing	Aluminum
Guided driving rod	Aluminum

#### Installation

Mounting type	Adjustable mounting clamps
---------------	----------------------------

#### Electrical connection

Connection type	8 pin connector M12 male
Operating voltage	24 VDC (+20 % / -15 %); UL Recognition requires an approved power supply with energy limitation (UL 61010-1), or Class 2 rating according to the National Electrical Code (USA) / Canadian Electrical Code.
Current consumption	typically < 90 mA
Ripple	≤ 0.28 Vpp
Dielectric strength	500 VDC (DC ground to machine ground)
Polarity protection	Up to -30 VDC
Overvoltage protection	Up to 36 VDC



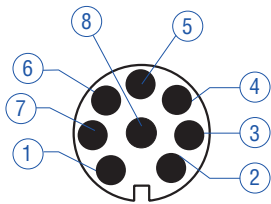
#### Linearity protocol

Sensor Temposonics® ER, Stroke length 1000 mm  
 Tolerance allowed: ±0.2 mm  
 Tolerance measured: typical ±0.09 mm

<sup>1</sup> The IP rating is not part of the UL recognition



### Connector wiring

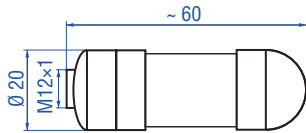


Front face of sensor plug  
or rear of cable connector

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	+24 VDC
Pin 8	0 V (GND)

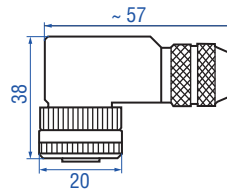
**Connectors** (not included in delivery, please order separately)

#### 8 pin female connector M12 × 1\*



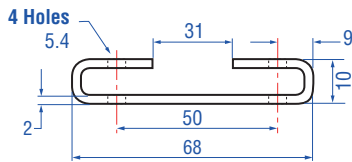
Housing: GD-ZnAL / IP67  
Termination: screw terminals  
Contact insert: CuZn  
Max. cable: Ø 4...9 mm  
**Part no. : 370 694**

#### 8 pin 90° female connector M12 × 1\*



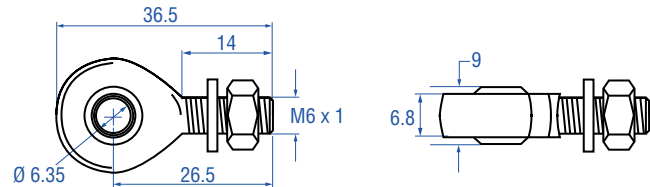
Housing: GD-ZnAL / IP67  
Termination: screw terminals  
Contact insert: CuZn  
Max. cable: Ø 6...8 mm  
**Part no. : 370 699**

**Mounting clamp** (not included in delivery, please order separately)  
**Part no. 403 508**



Mounting clamp width: 14.6

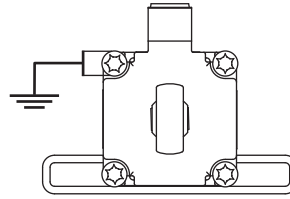
**Rod end M6** (not included in delivery, please order separately)  
**Part no. 254 210**



## Mounting

Temposonics® ER sensors are designed for external installation on machines. They are featuring several mounting options, with mounting clamp slots on three sides of the sensor, to offer a simple and versatile installation process. The connector can be adjusted in an optimal direction and simplifies the cabling to the machine. The clamps should be distributed evenly along the profile. We recommend M5 × 20 (DIN 6912) screws for attachment to be tightened with a torque of max. 5 Nm. The mounting clamps are not included and can be ordered separately.

Separate available rod end kits help to simplify the sensor's installation and facilitate articulated motion sensing. Please note that only 90 % of the guided driving rod can be used as stroke length, when the stroke length of the sensor is more than 750 mm.



**Necessarilly ground sensor as shown!**

Mounting clamp using M5 × 20  
cylinder screws.

**Fastening torque: max 5 Nm.**

Temposonics® order code



**Specification**  
Inside thread M6

**Stroke length**  
0050...1500 mm

**Connection type**  
D84 – 8 pin cable connector M12 male

**Operating voltage**  
1 – +24 VDC

**Output**

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

- [1] Data length: 1 - 25 Bit • 2 - 24 Bit
- [2] Coding: B - binary • G - gray
- [3] Resolution (mm): 3 - 0.05 mm • 4 - 0.1 mm • 5 - 0.02 mm
- [4] Performance: 1 - Standard
- [5] [6] Options: 00 - Measuring direction forward

**Stroke length standard:**

Stroke	Ordering steps
≤ 500 mm	25 mm
> 500 mm...≤ 1500 mm	50 mm

**Delivery includes:**

- Sensor  
Please order separately: accessories (see below)

**Accessories**

Description	Part no.
1 × mounting clamp	403 508
8 pin female connector M12	370 694
8 pin 90° female connector M12	370 699
1 × standardized adjustable rod end M6	254 210



**Document Part Number: 551342 Revision B (EN) 06/2014**

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