Temposonics®

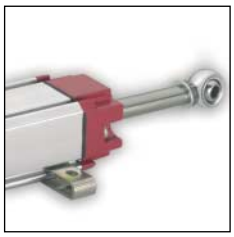
Magnetostrictive Position Sensors

MTS SENSORS

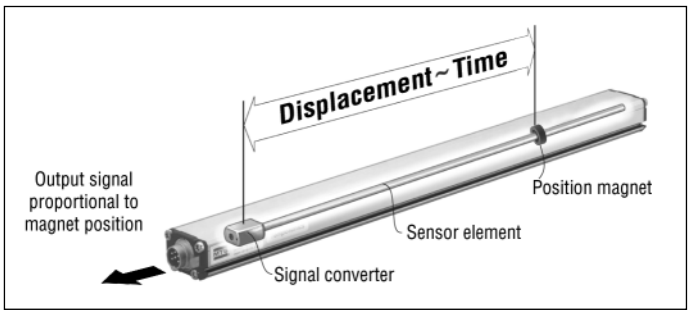
E-Series
Analog + Start / Stop

Temposonics ER
Measuring length 75 - 1500 mm

Rod and Piston Sensor



- **Linear, absolute Measurement**
- **Contactless Sensing with highest Durability**
- **Rigged Industrial Sensor, EMC shielded and CE certified**
- **Linearity Tolerance better 0,02 %**
- **Repeatability 0,001 %**
  - **Analog (V/mA)**
  - **Start / Stop + Sensor-Parameter Upload**
- **Measuring Range 75 - 1500 mm**



Magnetostriction **Form factor**

The absolute **Temposonics®** linear position sensors are based on the MTS developed magnetostrictive measurement principle. That combines various magneto-mechanical effects and uses the physical hight precise speed-measurement of an ultrasonic wave (torsion pulse in its sensor element) for position detecting. Sensor integrated signal processing transforms the measurements directly into market standard outputs. The contactless principle - a movable magnet marks the position - eliminates the wear, noise and erroneous signal problems and guarantees the best durability without any recalibration.

Temposonics ER linear displacement transducers are precise, durable and cost effective alternatives to linear potentiometers. The innovative concept of Temposonics ER transducers, combined with solid engineering and extremely rugged construction, provides proven reliability in the toughest industrial environments.
Temposonics ER models offer solutions to wear problems associated with linear potentiometers.

Wether your position sensing requirements are simple or complex, Temposonics ER transducers will provide a solution in his form factor and mounting configuration that fits to your application.

CE ISO 9001 CERTIFIED

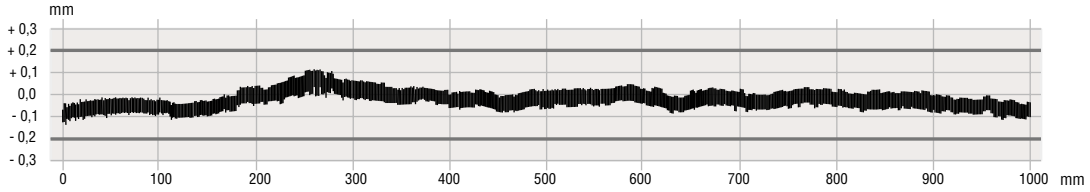
Temposonics-ER ... a rod and cylinder version

Temposonics® are extremely stable sensors, ideal for continous operation under harshest industrial conditions. The sensor is completely modular in mechanics and electronics design.
A robust aluminum cylinder profile offers flexible mounting configurations, and easy installation. Position measurement is contactless via a permanent magnet. The magnet is mounted at a stainless steel piston and moves inside the sensor housing. Connection with mobile machine part is via a rod. The sensor rod is constructed of large diameter for enhanced load-bearing, corrison resistance and exented life.
Using the rod ends the sensor can be mounted between two joints, it is possible to measure the distance between two independent moving points.

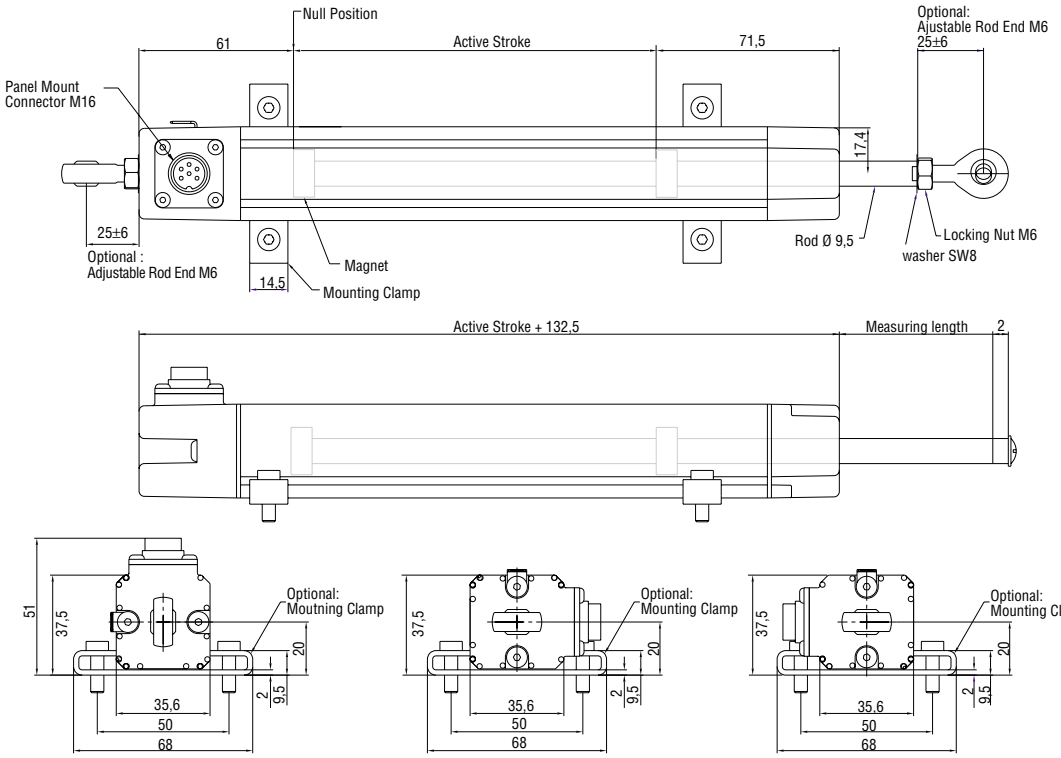
Technical Data

Input	
Measured variable	Displacement
Measuring range	75 - 1500 mm
Output	
1. Voltage	0 - 10 VDC and 10 - 0 VDC (Controller input resistance R_L > 5 kOhm)
2. Current	4 - 20 mA or 20 - 4(0) mA (Min/max. load: 0/500 Ohm)
3. Start / Stop	RS-422 differential signal, additional, available: Serial parameter upload of **Measuring range**, **Offset**, **Gradient** (Ultrasonic speed of sensing pulse), **status and manufacturer number**
Accuracy	
Resolution	- Analog: Infinite - Start / Stop: 0,1 / 0,01 / 0,005 mm (Controller dependent)
Linearity, uncorrected	< ± 0,02 % F.S. (Minimum ± 60 µm)
Repeatability	< ± 0,001 % F.S.
Update frequency	Analog: > 1,5 kHz / Digital: controller dependent
Ripple	< 0,01 % F.S. / Digital: controller dependent
Operating conditions	
Magnet speed	Any
Operating temperature	-40 °C ... +75 °C
Dew point, humidity	90% rel. humidity, no consation
Ingress protection	IP65 if mating cable connector is correctly fitted
Schock test	100 g (single hit) IEC-Standard 68-2-27
Vibration rating	10 g / 10 - 2000 Hz nach IEC-Standard 68-2-6
Standards, EMC test	Electromagnetic emission EN 50081-1 Electromagnetic susceptibility EN 50082-2 EN 61000-4-2/3/4/6, Level 3/4, Criteria A, CE qualified
Form factor, material	
Sensor housing	Aluminum
Rod	Stainless Steel Type 303 / 1.4305
Installation	
Mounting position	Any orientation
Mounting type	Adjustable mounting feet or rod ends
Electrical Connection	
Connection type	6 pin. Connector M16
Input voltage	24 VDC (-15 / +20 %)
- Polarity protection	up to -30 VDC
- Overvoltage protection	up to 36 VDC
Current consumtion	50 - 140 mA (Digital 50 - 100 mA), stroke length dependent
Ripple	< 1 % peak to peak
Electric strength	500 V (DC ground to machine ground)

Linearity protocol



Sensor Temposonics-ER, Measuring range 1000 mm
Tolerance allowed: ± 0,2 mm
Tolerance measured: typical ± 0,12 mm, uncorrected

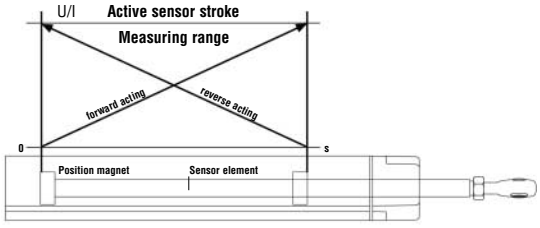


All meaurements in mm

Analog output

Temposonics-ER are provided with an integrated analog interface and can be connected to a control system or indicator directly without an interface. The microelectronics in the sensors head generates continous, strictly displacement proportional voltage and current outputs whose upscale or downscale output action can be selected when ordering. The output variables are factory-set. Recalibration is not necessary.

Analog
- **0 -10 V**
- **10 - 0 V**
- **4 - 20 mA**
- **20 - 4 mA**

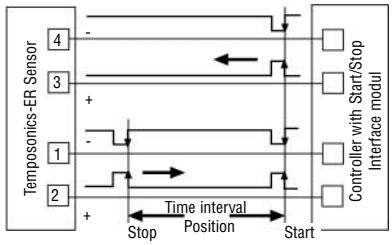


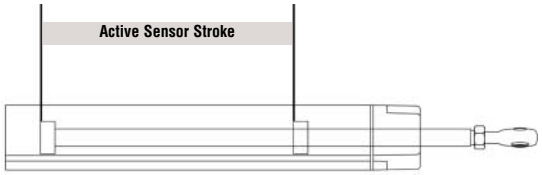
Start / Stop output

Digital Temposonics-ER equipped with a start / stop output. The sensor requires a start signal from an external indicator in the control system and returns a signal corresponding to the magnet position. The time elapsed between the two signals is proportional to the magnet position, i.e. to the displacement. Time measurement is by the indicator and used for calculating the position value. For easy adaption to user's control systems, following sensor parameters

- **Measuring range**
- **Offset**
- **Gradien**t (Speed of sensing pulse)
- **Status**
- **Manufacturer number**

can be read into controller without additional wiring. It can be done simply by using the standard signal outputs.

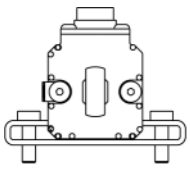


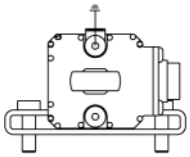


Mounting

ER type sensors are designed for external installation on machines. several mounting options, with mounting clamps slots on three sides of the sensor, to offer a simple, yet verstaile installation process. The entire sensor can be mounted to the machine using standard mounting clamp and screws that can be easily adjusted to the desired integral connector and extension cable orientation. Rod end mounting options help to simplify sensor installation design and facilitate articulated motion sensing.

ATTENTION!
The ER sensor is equipped with steel mounting clamp due to the anodic coating of the profile there is no connection to the machine ground via the mounting feets. it is necessary that you apply ground to the sensor housing. Connection is made with the flat pin terminal on the sensor head.





Sliding mounting clamp
Thightening torque for M5x20 machine screws: max 5 Nm

6 pin DIN male receptacle M16

Front face of sensor plug
or rear of cable connector

Connector wiring

1. Output: Voltage (V)

Pin	Function
1	0 .. 10 V
2	DC Ground
3	10 .. 0 V
4	DC Ground
5	+24 VDC (+20%/-15%)
6	DC Ground (0V)

2. Output: Current (mA)

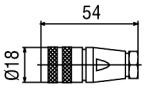
Pin	Function
1	4 - 20 mA*
2	DC Ground
3	20 - 4 mA*
4	DC Ground
5	+24 VDC (+20%/-15%)
6	DC Ground (0V)

3. Output: Start / Stop

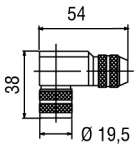
Pin	Function
1	Stop (-)
2	Stop (+)
3	Start (+)
4	Start (-)
5	+24 VDC (+20%/-15%)
6	DC Ground (0V)

*only the ordered output signal is provided.

Cable connectors
(Pls. order separately)



6 pin female connector M16, PG7
Part No. ST C0 9131 D



6 pin 90° female connector M16
Insert adjustable in 45° positions
Part No. ST C0 9131-6

Housing: Zinc, nickel plated
Termination: Solder
Contact insert: Silver plated
Cable clamp: Pg 7, M16
Cable-Ø: 6 mm (PG7), 8 mm (M16)

Temposonics **ER** **M** ☐☐☐☐ **M** ☐☐☐ **1** ☐☐

Rod Style
Inside thread M6

Measuring range
0075/0100/0150/0200/0300/0400/0500/0600/0750/1000/1250/1500 mm

Connection type
D60 - 6 pin male receptacle M16

Input voltage
1 - +24 VDC

Output
V0 - 0 - 10 V and 10 - 0 V
A0 - 4 - 20 mA
A1 - 20 - 4 mA
R0 - Start/Stop
R3 - Start/Stop with sensor parameters upload

Accessories

Description	Part No.
Mounting clamp	**400 802**
Rod End M6	**253 347**
6 pin female cable connector M16	**ST C0 9131 D**
6 pin 90° female cable connector M16	**ST C0 9131-6**
PVC cable 6x0,14 mm²	**K27**

Scope of Delivery:
- Sensor
- ordered accessories

Pls. order accessories separately!
Select the mounting device regarding your application:
- 1 or 2 Rod Ends M6
- or / and 2 mounting clamps up to 1250 mm, 3 mounting clamps for 1500 mm

Measuring Range:
See above List of range
Option: other length on request

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