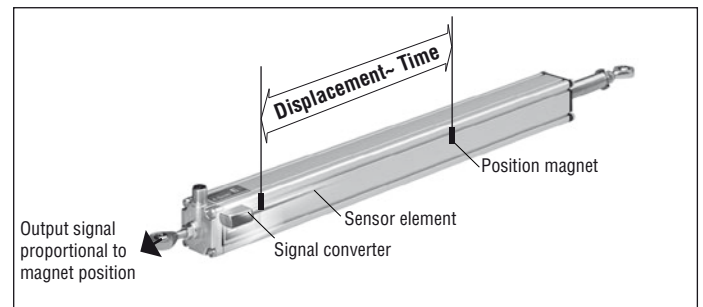


E-Series Analog + Start / Stop

Temposonics® ER
Stroke length 50 - 1500 mm



- Aluminum Cylinder with strong Rod
- Linear, absolute Measurement
- Contactless Sensing with highest Durability
- Rugged Industrial Sensor
- EMC shielded and CE certified
- Linearity Deviation less than 0,02 % F.S.
- Repeatability 0,001 % F.S.
- Direct signal output for displacement
 - Analog (V/mA)
 - Start / Stop + Sensor-Parameter Upload



Magnetostriction

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 high precise speed-measurement of an ultrasonic wave (torsion pulse in its sensor element) for position measurement. 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.

Form factor

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. Whether 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.

Temposonics-ER

Analog + Start / Stop

Temposonics®-ER

A cylinder version with strong rod - Stroke length 50 - 1500 mm.

Temposonics® are extremely stable sensors, ideal for continuous 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, corrosion resistance and extended 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.

Technische Daten

Input

Measured variable	Displacement
Stroke length	50 - 1500 mm

Output

1. Voltage	0 - 10 VDC or 10-0 VDC, 0 - 10 VDC und 10 - 0 VDC, Controller input resistance RL: > 5 kOhm
2. Current	4 - 20 mA or 20-4 mA, Min/max. load: 0...500 Ohm
3. Start/Stop	RS-422 differential signal, additional, available: Serial parameter upload of stroke length, Offset, Gradient (Ultrasonic speed of sensing pulse), status and manufacturer number

Accuracy

Resolution	Analog: Infinite Start / Stop: 0,1 / 0,01 / 0,005 mm
Linearity, deviation	< ± 0,02 % F.S. (Minimum ± 60 µm)
Repeatability	< ± 0,001 % F.S.
Update frequency, stroke dependent	Analog: < 3 kHz / Digital: Controller dependent
Ripple	< 0,01 % F.S. / Digital: Controller dependent

Operating conditions

Mounting position	Any
Magnet speed	Any
Operating temperature	-40° C ... +75° C
Dew point, humidity	90 % rel. humidity, no condensation
Ingress protection	IP67 if mating cable connector is correctly fitted
Shock test	100 g (single shock) IEC-Standard 68-2-27
Vibration test	10 g / 10 - 2000 Hz IEC-Standard 68-2-6 (resonance frequency excluded)
EMV-Test	Electromagnetic emission EN 61000-6-4, CISPR 16 Electromagnetic susceptibility EN 61000-6-2 EN 61000-4-2/3/4/6, CE qualified

Form factor / Material

Sensor housing	Aluminum
Rod	Aluminum

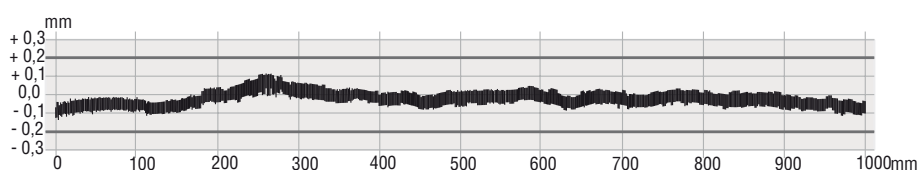
Installation

Mounting type	Adjustable mounting feet or rod ends M6
Mounting position	Any

Electrical Connection

Connection type	5 pin connector M12 (Analog) ; 8 pin M12 (Start / Stop)
Input voltage	24 VDC (+20 % / -15 %)
Current consumption	50 - 140 mA (Digital 50 - 100 mA)
Ripple	< 1 % S-S
Electric strength	500 VDC (0V ground to machine ground)
Polarity protection	up to -30 VDC
Overvoltage protection	upt to 36 VDC

Linearity protocol

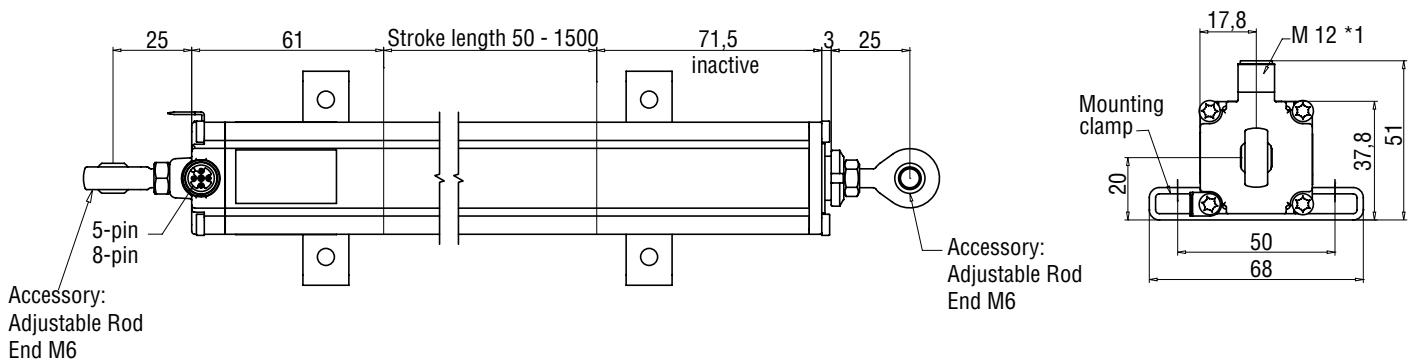


Sensor Temposonics®-ER, stroke length 1000 mm

Tolerance allowed: ± 0,2 mm

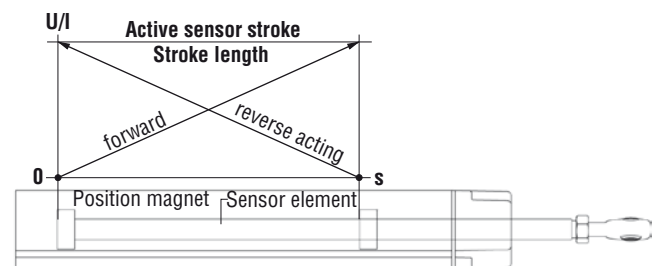
Tolerance measured: typical ± 0,12 mm

Temposonics® ER



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 continuous, 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.

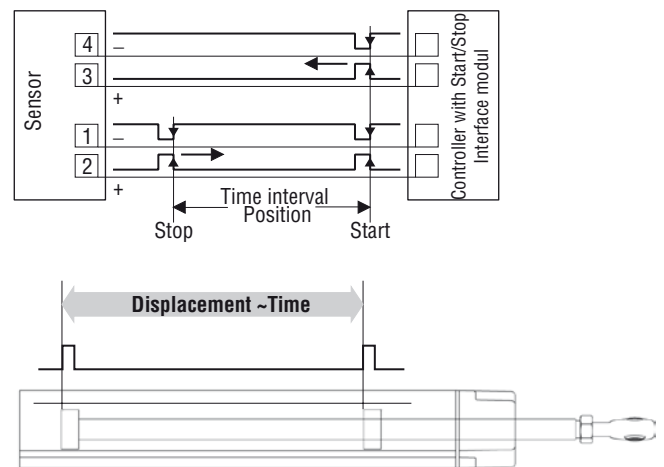


Start / Stop output

Digital Temposonics®-ER is 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

- **Stroke length**
- **Offset**
- **Gradient** (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

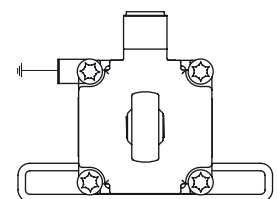
ER type sensors are designed for external installation on machines. They feature several mounting options, with mounting clamps slots on three sides of the sensor, to offer a simple, yet versatile installation process. The entire sensor can be mounted to the machine using standard mounting clamp and 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. Please note that only 90% of the Stroke length can be used in articulated sensor applications, when the Stroke length of the sensor is more than 750 mm.

ATTENTION!

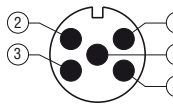
The ER sensor is equipped with steel mounting clamp. Due to the anodic coating of the profile there is no connection to the machine ground via the mounting feet. It is necessary that you apply ground to the sensor housing. Connection is made with the flat pin terminal on the sensor head.

Necessarilly ground sensor this way!

Mounting clamp M5 x 20 cylinder screw **Fastening torque max 5 Nm**

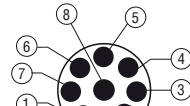


Connector wiring



Front face of sensor plug
or rear of cable connector

Connector D34	Cable*	Analog (V)
Pin 1	bn	+24 VDC
Pin 2	wh	Signal
Pin 3	bu	GND (PWR)
Pin 4	bk	2. Signal
Pin5	gr	GND (Signal)



Front face of sensor plug
or rear of cable connector

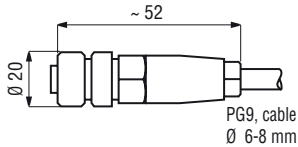
Connector D84	Start / Stop
Pin 1	Start +
Pin 2	Start -
Pin 3	Stop +
Pin 4	Stop -
Pin 5	n.c.
Pin 6	n.c.
Pin 7	+24 DC
Pin 8	GND

* Accessory: Cable assembly with cable connector, female

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

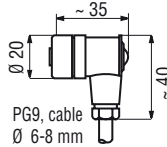
Connectors (please order separately)

Female connector M12



Housing: PA
Termination: Screw terminals
Contact insert: (CuZn/Sn)
Max. Cable-Ø 6-8 mm
Part No.: 5 pol. 370 618
8 pol. 370 671

90° female connector M12



Housing: PA
Termination: Screw terminals
Contact insert: (CuZn/Sn)
Max. Cable-Ø 6-8 mm
Part No.: 5 pol. 370 619
8 pol. 370 672

Temposonics® Order



Specification

Inside thread M6

Stroke length

0050 - 1500 mm

Connection type

D34 - 5 pin cable connector M12 (Analog)
D84 - 8 pin cable connector M12 (Start / Stop)

Output

Analog voltage

V01 = 0 to 10 VDC (1 output channel with 1 magnet)
V11 = 10 to 0 VDC (1 output channel with 1 magnet)
V03 = 0 to 10 VDC and 10 to 0 VDC (2 output channels with 1 magnet)

Analog current

A01 = 4 to 20 mA (1 output channel with 1 magnet)
A11 = 20 to 4 mA (1 output channel with 1 magnet)

Start/Stop

R3 = Start/Stop with sensor parameters upload function.

Accessories

Description	Part No.
Mounting clamp	403 508
Rod End M6	254 210
5 pin female connector M12	370 618
5 pin 90° female connector M12	370 619
8 pin female connector M12	370 671
8 pin 90° female connector M12	370 672
5 pin M12 cordset, 5 m PUR shielded cable	370 673
8 pin M12 cordset, 5 m PUR shielded cable	370 674
5 pin 90° M12 cordset, 5 m PUR shielded cable	370 675
8 pin 90° M12 cordset, 5 m PUR shielded cable	370 676
5 pin M12 adapter cable to 6 pin M16	254 206
8 pin M12 adapter cable to 6 pin M16	254 207

On delivery:

- Sensor

Please order 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

Stroke length standard:

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

All measurements in mm

www.mtssensor.com
www.temposonics-shop.de

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MTS Sensor Technologie
GmbH & Co. KG
Auf dem Schüffel 9
58513 Lüdenscheid, Deutschland
Tel. + 49-23 51-95 87 0
Fax + 49-23 51-5 64 91
E-Mail: info@mtssensor.de
www.mtssensor.de

MTS Systems Corporation
Sensors Division
3001 Sheldon Drive
Cary, N.C. 27513, USA
Tel. + 1-919-677-0100
Tel. + 1-919-677-0200
E-Mail: sensorsinfo@mts.com
www.mtssensors.com

MTS Sensors Technology Corp.
737 Aihara-cho,
Machida-shi, Japan
Tel. + 81-42-775-3838
Fax + 81-42-775-5516
E-Mail: info@mtssensor.co.jp
www.mtssensor.co.jp