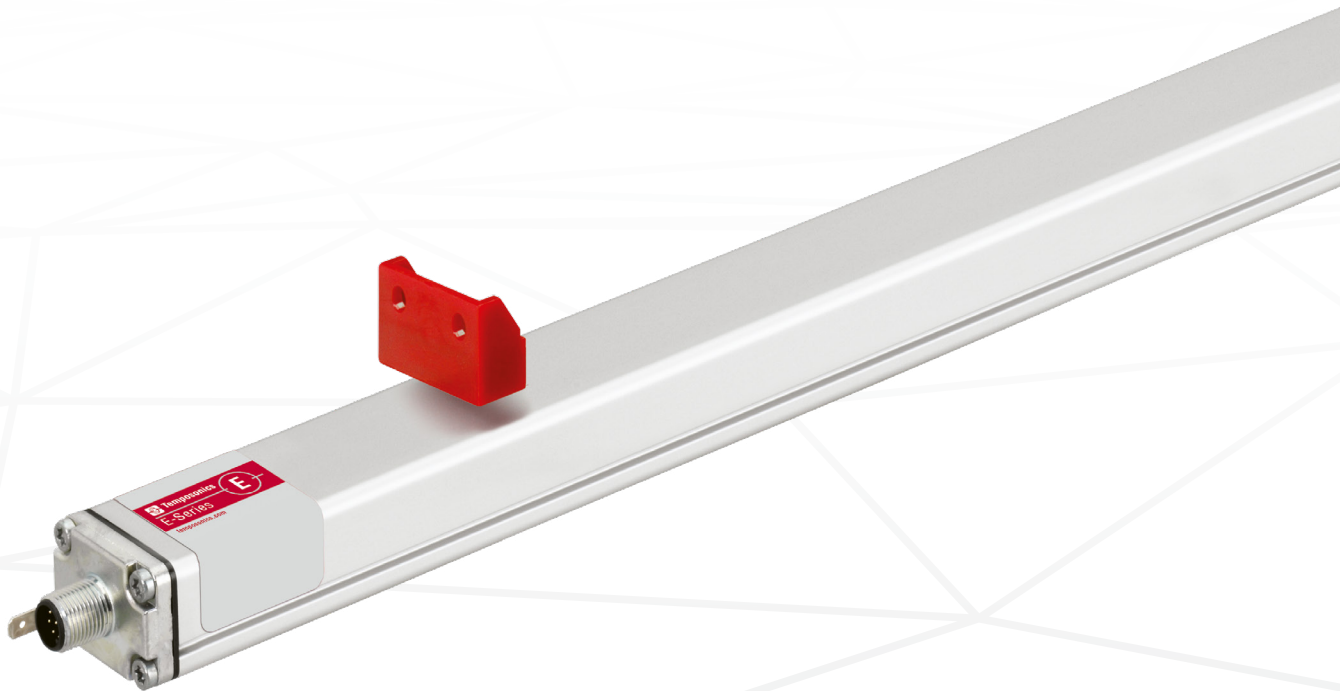


## Data Sheet

### EP2 Start/Stop

#### Magnetostrictive Linear Position Sensors

- Optimal price-/performance ratio
- Position measurement with more than one magnet
- Flat & compact



## MEASURING TECHNOLOGY

The absolute, linear position sensors provided by Temposonics rely on the company's proprietary 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.

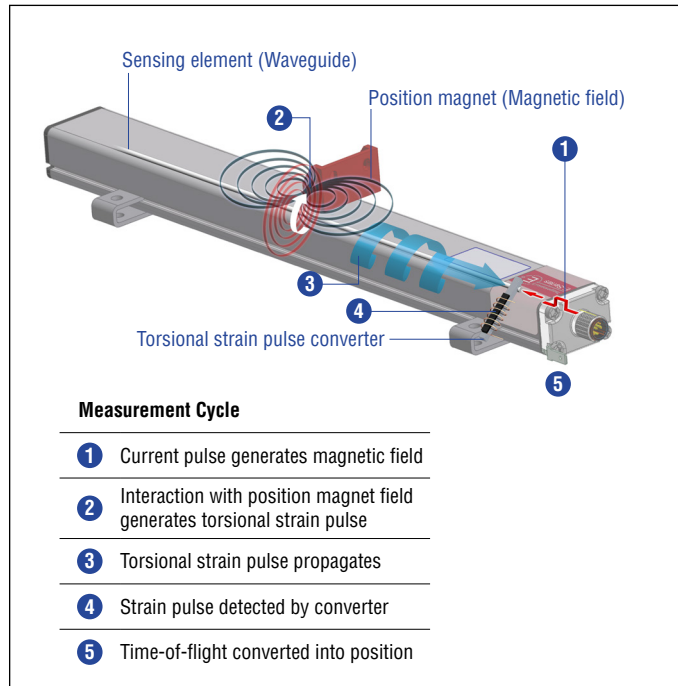


Fig. 1: Time-of-flight based magnetostrictive position sensing principle

## EP2 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 Temposonics.

The compact and flat aluminum profile offers flexible mounting options and easy installation. Moreover, the position magnet can travel along the entire flat housing profile. The EP2 has an attractive price-/performance ratio and is ideal for industrial applications including plastics molding and processing, factory automation and packaging.



Fig. 2: Plastic granulate for injection molding or extrusion

## TECHNICAL DATA

| Output                            |   |
|-----------------------------------|---|
| Start/Stop                        | RS-422 differential signal<br>Serial parameter upload available for: stroke length, offset, gradient, status, serial number and manufacturer number.  |
| Measured variable                 | Position, Option: Multi-position measurement with a maximum of 2 magnets  |
| Measurement parameters            |   |
| Resolution                        | Controller dependent  |
| Cycle time                        | Controller dependent  |
| Linearity                         | $\leq \pm 0.02\%$ F.S. (minimum $\pm 90\ \mu\text{m}$ )   |
| Repeatability                     | $\leq \pm 0.005\%$ F.S. (minimum $\pm 20\ \mu\text{m}$ )  |
| Operating conditions              |   |
| Operating temperature             | $-40\dots+75\ \text{°C}$ ( $-40\dots+167\ \text{°F}$ )  |
| Humidity                          | 90 % relative humidity, no condensation   |
| Ingress protection <sup>1,2</sup> | IP67 (if mating cable connector is correctly fitted)  |
| Shock test                        | 100 g (single shock) IEC standard 60068-2-27  |
| Vibration test                    | 8 g/10...2000 Hz IEC standard 60068-2-6 (resonance frequencies excluded)  |
| EMC test                          | Electromagnetic emission according to EN 61000-6-3<br>Electromagnetic immunity according to EN 61000-6-2<br>The sensor meets the requirements of the EU directives and is marked with  |
| Magnet movement velocity          | Any   |
| Design/Material                   |   |
| Sensor lid                        | Zinc die-cast   |
| Sensor profile                    | Aluminum  |
| Stroke length                     | 50...3000 mm (2...118 in.)  |
| Mechanical mounting               |   |
| Mounting position                 | Any   |
| Mounting instruction              | Please consult the technical drawings and the brief instructions (document number: <a href="#">551684</a> )   |
| Electrical connection             |   |
| Connection type                   | M12 (8 pin) male connector  |
| Operating voltage                 | +24 VDC ( $-15/+20\%$ ); 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.  |
| Ripple                            | $\leq 0.28\ V_{pp}$   |
| Current consumption               | 50...100 mA   |
| Dielectric strength               | 500 VDC (DC ground to machine ground)   |
| Polarity protection               | Up to $-30\ \text{VDC}$   |
| Overvoltage protection            | Up to 36 VDC  |

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

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

## TECHNICAL DRAWING

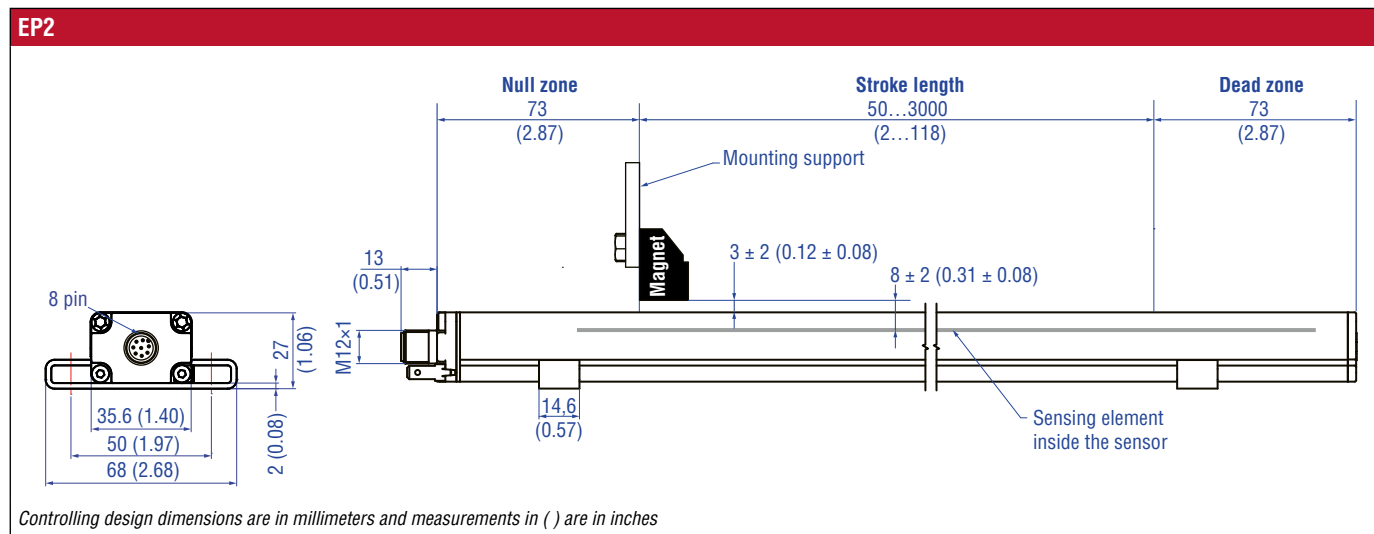


Fig. 3: E-Series EP2 with block magnet

## CONNECTOR WIRING

**D84**

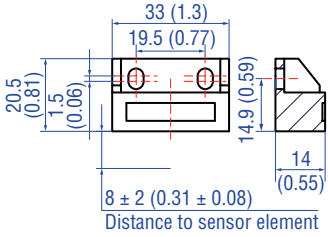
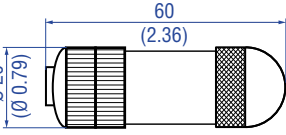
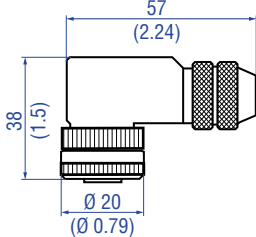
Signal + power supply

| M12 male connector (A-coded) | Pin | Function            |
|------------------------------|-----|---------------------|
| <p>View on sensor</p>        | 1   | Start (+)           |
|                              | 2   | Start (-)           |
|                              | 3   | Stop (+)            |
|                              | 4   | Stop (-)            |
|                              | 5   | Not connected       |
|                              | 6   | Not connected       |
|                              | 7   | +24 VDC (-15/+20 %) |
|                              | 8   | DC Ground (0 V)     |



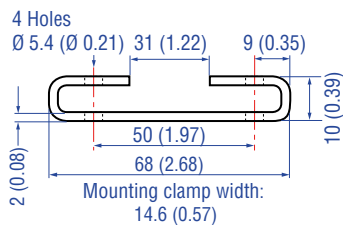
Fig. 4: Connector wiring D84 (M12 connector)

**FREQUENTLY ORDERED ACCESSORIES** – Additional options available in our [Accessories Guide](#)  [551444](#)

**Position magnet**      **Cable connectors \***

|   |  |   |
|---|--|---|
|    |   |   |
| <p><b>Block magnet L</b><br/>Part no. 403 448</p> <p>Material: Plastic carrier with hard ferrite magnet<br/>Weight: Approx. 20 g<br/>Fastening torque for M4 screws: 1 Nm<br/>Operating temperature: -40...+75 °C (-40...+167 °F)</p> <p>This magnet may influence the sensor performance specifications for some applications.</p> | <p><b>M12 A-coded female connector (8 pin), straight</b><br/>Part no. 370 694</p> <p>Housing: GD-ZnAL<br/>Termination: Screw<br/>Contact insert: CuZn<br/>Cable Ø: 4...9 mm (0.16...0.35 in.)<br/>Wire: 0.75 mm<sup>2</sup><br/>Operating temperature: -25...+90 °C (-13...+194 °F)<br/>Ingress protection: IP67 (correctly fitted)<br/>Fastening torque: 0.6 Nm</p> | <p><b>M12 A-coded female connector (8 pin), angled</b><br/>Part no. 370 699</p> <p>Housing: GD-ZnAL<br/>Termination: Screw<br/>Contact insert: CuZn<br/>Cable Ø: 6...8 mm (0.24...0.31 in.)<br/>Wire: 0.5 mm<sup>2</sup><br/>Operating temperature: -25...+85 °C (-13...+185 °F)<br/>Ingress protection: IP67 (correctly fitted)<br/>Fastening torque: 0.6 Nm</p> |

**Cable sets**      **Mounting clamp**

|   |  |   |
|---|--|---|
|    |   |                               |
| <p><b>Cable with M12 A-coded female connector (8 pin), straight – pigtail</b><br/>Part no. 370 674</p> <p>Consider cable 370 789.<br/>The additional feature "twisted pair" minimizes interference from external sources.</p> <p>Material: PUR jacket; black<br/>Features: Shielded<br/>Cable length: 5 m (16.4 ft)<br/>Ingress protection: IP67/IP69K (correctly fitted)<br/>Operating temperature: -25...+80 °C (-13...+176 °F)</p> | <p><b>Cable with M12 A-coded female connector (8 pin), angled – pigtail</b><br/>Part no. 370 676</p> <p>Consider cable 370 821.<br/>The additional feature "twisted pair" minimizes interference from external sources.</p> <p>Cable: Shielded<br/>Cable length: 5 m (16.4 ft)<br/>Ingress protection: IP67 (correctly fitted)</p> | <p><b>Montageklammer</b><br/>Artikelnr. 403 508</p> <p>Material: Stainless steel 1.4301/1.4305 (AISI 304/303)</p> |

Controlling design dimensions are in millimeters and measurements in ( ) are in inches  
\*/ Follow the manufacturer's mounting instructions when connecting the connectors

## ORDER CODE

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| E | P | 2 |   |   |   |   |   | D | 8  | 4  | 1  | R  | 3  |
| a |   |   | b |   |   |   |   | c |    |    | d  | e  |    |

|          |                     |   |                |
|----------|---------------------|---|----------------|
| <b>a</b> | <b>Sensor model</b> |   |                |
| E        | P                   | 2 | Smooth profile |

|  |                      |                       |   |   |                   |
|--|----------------------|-----------------------|---|---|-------------------|
| <b>b</b>   | <b>Stroke length</b> |                       |   |   |                   |
| X  | X                    | X                     | X | M | 0050...3000 mm    |
| <b>Standard stroke length (mm)</b>   |                      | <b>Ordering steps</b> |   |   |                   |
| 50... 500 mm   |                      | 25 mm                 |   |   |                   |
| 500... 3000 mm   |                      | 50 mm                 |   |   |                   |
| X  | X                    | X                     | X | U | 001.0...118.0 in. |
| <b>Standard stroke length (in.)</b>  |                      | <b>Ordering steps</b> |   |   |                   |
| 2... 20 in.  |                      | 1.0 in.               |   |   |                   |
| 20... 118 in.  |                      | 2.0 in.               |   |   |                   |
| Non-standard stroke lengths are available; must be encoded in 5 mm/0.1 in. increments. |                      |                       |   |   |                   |

|          |                        |   |                            |
|----------|------------------------|---|----------------------------|
| <b>c</b> | <b>Connection type</b> |   |                            |
| D        | 8                      | 4 | M12 (8 pin) male connector |

|          |                          |
|----------|--------------------------|
| <b>d</b> | <b>Operating voltage</b> |
| 1        | +24 VDC (-15/+20 %)      |

|          |               |   |
|----------|---------------|---|
| <b>e</b> | <b>Output</b> |   |
| R        | 3             | Start/Stop with sensor parameters upload function |

## DELIVERY



- Sensor
- 2 mounting clamps up to 1250 mm (50 in.) stroke length + 1 mounting clamp for each 500 mm (20 in.) additional stroke length

Accessories have to be ordered separately.

Manuals, Software & 3D Models available at:  
[www.temposonics.com](http://www.temposonics.com)

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