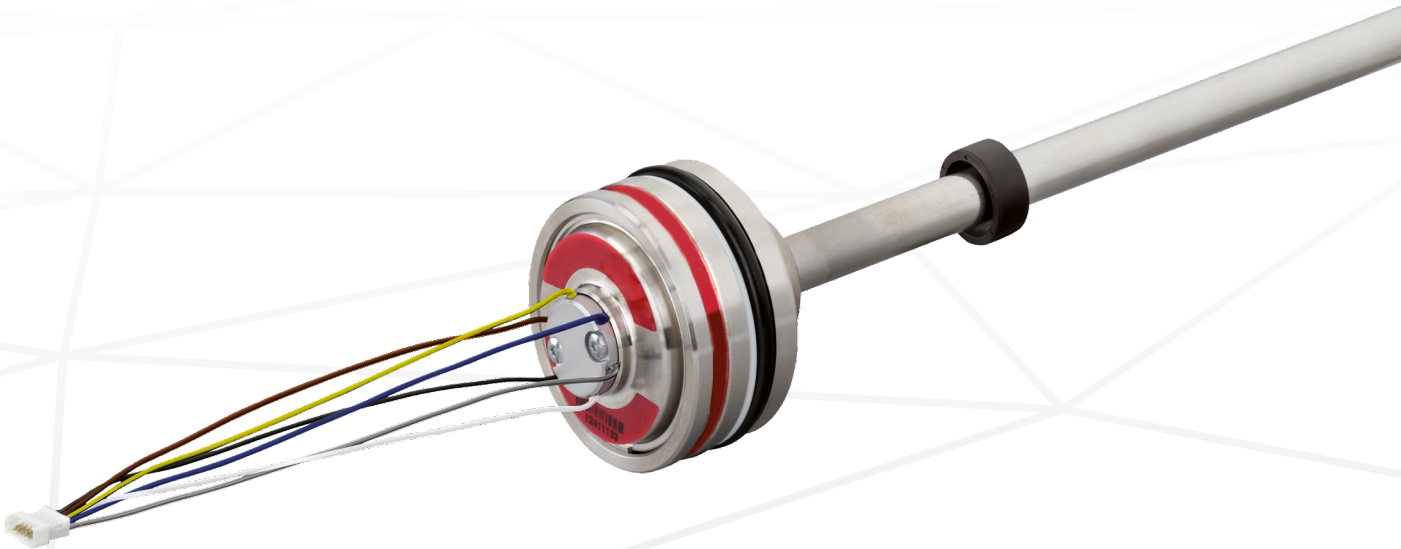


Data Sheet

E-Series EE Analog Magnetostrictive Linear Position Sensors

- Pressure-resistant sensor rod up to 450 bar
- High operating temperature
- Compact sensor housing



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 beginning 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.

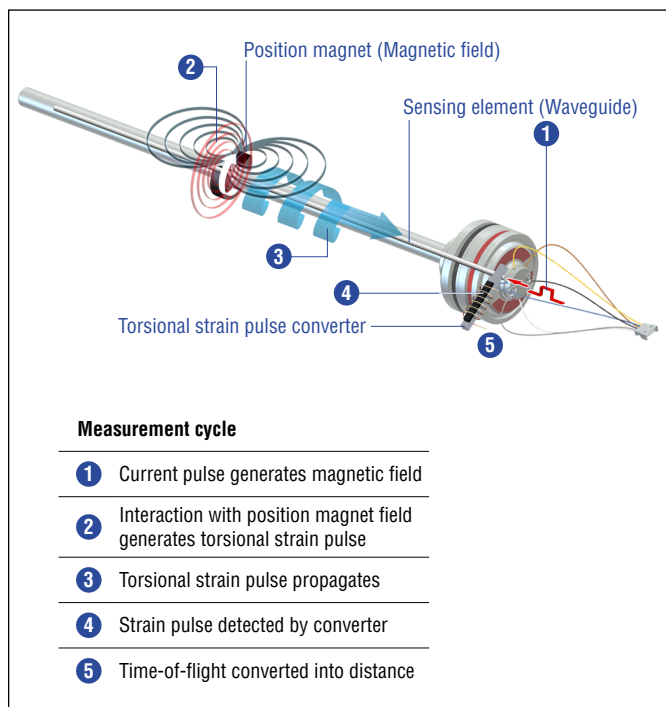
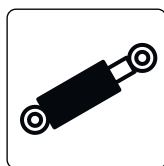


Fig. 1: Time-of-flight based magnetostrictive position sensing principle

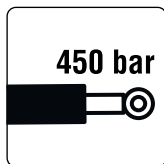
E-SERIES EMBEDDED (EE)

The Temposonics® E-Series combines efficient performance with a compact design. The E-Series Embedded is designed for full integration of the sensor into a hydraulic cylinder. The main advantages of the E-Series Embedded are:



Integrated into the cylinder

The compact sensor design enables full integration into the cylinder, requiring no additional installation space outside the cylinder.



450 bar

Direct measurement inside the cylinder

By integrating the sensor rod into the cylinder's pressure chamber, you can easily measure the piston's movement directly.



Efficient performance

With their performance, the sensors of the E-Series ensure reliable position measurement. Therefore, the sensors are very well suited for many different applications.

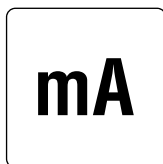


Robust and proven

The E-Series sensors are designed to be robust. The E-Series has proven in the industrial environment for many years.

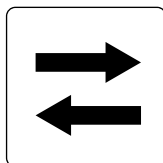
E-SERIES ANALOG

Analog output signals are a well-established and widely used signal type in measurement and control engineering.



Current output

The E-Series Analog offers a current output with 4...20 mA.



Forward and reverse position measurement

The E-Series Analog can measure position in the forward direction (values increasing from sensor electronics housing to rod end, 4...20 mA) or in the reverse direction (values decreasing from sensor electronics housing to rod end, 20...4 mA).

TECHNICAL DATA

Output	
Current	4...20 mA or 20...4 mA (minimum/maximum load: 0/500 Ω)
Measured value	Position
Measurement parameters	
Resolution	Infinite
Cycle time	< 3 ms
Linearity deviation ¹	< ± 0.02 % F.S. (minimum ± 60 μ m)
Repeatability	< ± 0.002 % F.S. (minimum ± 20 μ m)
Operating conditions	
Operating temperature	-40...+85 °C (-40...+185 °F)
Humidity	90 % relative humidity, no condensation
Ingress protection	IP67 (connectors correctly fitted) Sensor with flat connector: IP30
Shock test	100 g (single shock), IEC standard 60068-2-27
Vibration test	15 g/10...2000 Hz, IEC standard 60068-2-6 (resonance frequencies excluded)
EMC test	Electromagnetic emission according to EN 55011, cl. B:2009 + A1:2010 Electromagnetic immunity according to EN 61326-1:2006 The EE sensors fulfill the requirements of the EMC directives 2014/30/EU and UKSI 2016 No. 1091
Magnet movement velocity	Any
Design/Material	
Sensor electronics housing	Stainless steel 1.4305 (AISI 303)
Sensor rod	Stainless steel 1.4306 (AISI 304L)
RoHS compliance	The used materials are compliant with the requirements of EU directive 2011/65/EU and EU regulation 2015/863 as well as UKSI 2022 No. 622 with amendments
Stroke length	50...2540 mm (2...100 in.)
Operating pressure (EE-H)	Up to 450 bar (6527 psi)
Operating pressure (EE-S)	Up to 350 bar (5076 psi)
Mechanical mounting	
Mounting position	Any
Mounting instruction	Please consult the technical drawings on page 4 and the operation manual (document number: 551415)
Electrical connection	
Connection type	6 pin Molex PicoBlade™ connector system
Operating voltage	+24 VDC (-15/+20 %)
Ripple	≤ 0.28 Vpp
Current consumption	50...140 mA
Dielectric strength	500 VDC (0 V ground to machine ground)
Polarity protection	Up to -30 VDC
Overvoltage protection	Up to 36 VDC

1/ With position magnet # 201 542-2

TECHNICAL DRAWING

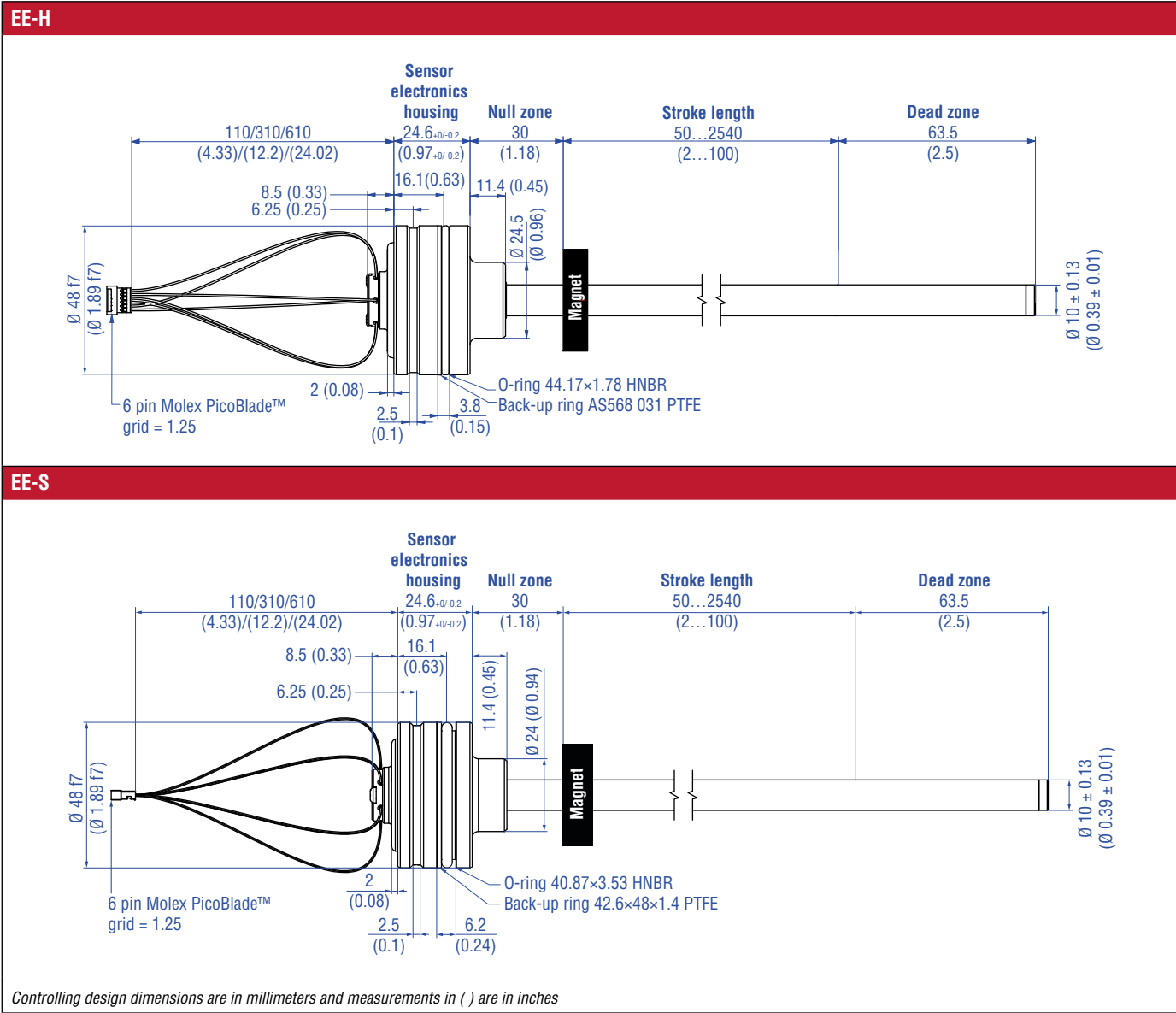


Fig. 2: Temposonics® EE with ring magnet

CONNECTOR WIRING

With mating connector cable 254 256 and 254 560		
5 pin connector	M12	Function
	Pin 1	+24 VDC (–15/+20 %)
	Pin 2	Output 1
	Pin 3	DC Ground (0 V)
	Pin 4	—
	Pin 5	DC Ground

Fig. 3: Connector wiring with mating connector cable 254 256 and 254 560

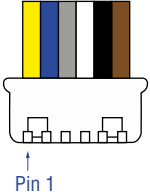
With extension cable 254 642-x			
6 pin Molex connector	Molex	Color	Function
	Pin 1	YE	—
	Pin 2	BL	—
	Pin 3	GY	Output 1
	Pin 4	WH	DC Ground (0 V)
	Pin 5	BK	DC Ground
	Pin 6	BN	+24 VDC (–15/+20 %)

Fig. 4: Connector wiring with extension cable 254 642-x

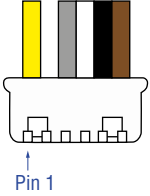
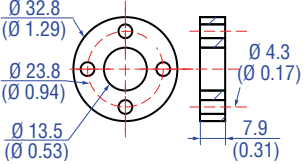
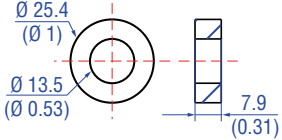
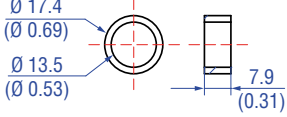
With mating connector cable 254 266			
6 pin Molex connector	Molex	Color	Function
	Pin 1	YE	—
	Pin 2	—	—
	Pin 3	GY	Output 1
	Pin 4	WH	DC Ground (0 V)
	Pin 5	BK	DC Ground
	Pin 6	BN	+24 VDC (–15/+20 %)

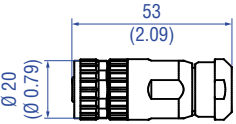
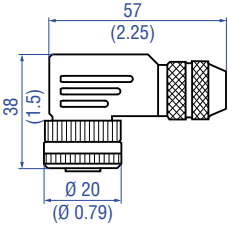
Fig. 5: Connector wiring with mating connector cable 254 266

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

Position magnets

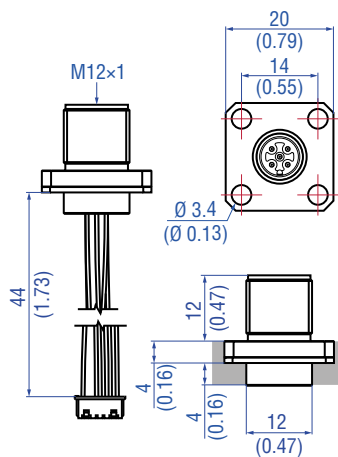
		
Ring magnet OD33 Part no. 201 542-2 Material: PA 66-GF33 Weight: Approx. 14 g Surface pressure: Max. 40 N/mm² Fastening torque for M4 screws: 1 Nm Operating temperature: –40...+120 °C (–40...+248 °F)	Ring magnet OD25.4 Part no. 400 533 Material: PA ferrite Weight: Approx. 10 g Surface pressure: Max. 40 N/mm² Operating temperature: –40...+120 °C (–40...+248 °F)	Ring magnet OD17.4 Part no. 401 032 Material: PA neobond Weight: Approx. 5 g Surface pressure: Max. 20 N/mm² Operating temperature: –40...+105 °C (–40...+221 °F)

Cable connectors *

	
M12 A-coded female connector (4 pin/5 pin), straight Part no. 370 677 Material: GD-Zn, Ni Termination: Screw Contact insert: CuZn Cable Ø: 4...8 mm (0.16...0.31 in.) Wire: Max. 1.5 mm² (16 AWG) Operating temperature: –30...+85 °C (–22...+185 °F) Ingress protection: IP67 (correctly fitted) Fastening torque: 0.6 Nm	M12 A-coded female connector (5 pin), angled Part no. 370 678 Material: GD-Zn, Ni Termination: Screw Contact insert: CuZn Cable Ø: 5...8 mm (0.2...0.31 in.) Wire: Max 0.75 mm² (18 AWG) Operating temperature: –25...+85 °C (–13...+185 °F) Ingress protection: IP67 (correctly fitted) Fastening torque: 0.4 Nm

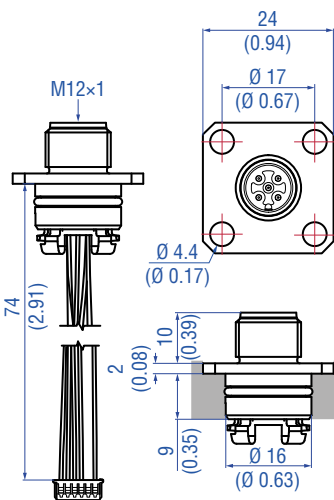
Controlling design dimensions are in millimeters and measurements in () are in inches
 */ Follow the manufacturer's mounting instructions

Cable sets (wiring see [Accessories Catalog 551444](#))



Cable with PicoBlade™ female connector (6 pin), straight – M12 A-coded male connector (5 pin) with flange
 Part no. 254 256

Operating temperature:
 –40...+80 °C (–40...+176 °F)



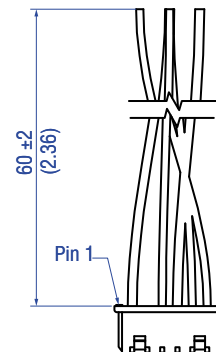
Cable with PicoBlade™ female connector (6 pin), straight – M12 A-coded male connector (5 pin) with flange
 Part no. 254 560

See technical bulletin “Connector system M12 for Sensor E-Series Embedded” (document part no.: [551758](#)) for further information



Extension cable, PicoBlade™ female connector (6 pin), straight – PicoBlade™ male connector (6 pin), straight
 140 mm Part no. 254 642-1
 340 mm Part no. 254 642-2
 640 mm Part no. 254 642-3

Operating temperature:
 –40...+80 °C (–40...+176 °F)



Extension cable, PicoBlade™ male connector (6 pin), straight – pigtail
 Part no. 254 266

Operating temperature:
 –40...+80 °C (–40...+176 °F)

Controlling design dimensions are in millimeters and measurements in () are in inches
 Color of connectors and cable jacket may change. Color codes for the individual wires and technical properties remain unchanged.

ORDER CODE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
E	E										1			
a		b	c					d			e	f		

a	Sensor model													
E	E	Rod												

b	Design													
H	Pressure fit flange, 10 mm rod-Ø (up to 450 bar (6527 psi))													
S	Pressure fit flange, 10 mm rod-Ø (up to 350 bar (5076 psi))													

c	Stroke length													
X	X	X	X	M	0050...2540 mm									
Standard stroke length (mm)					Ordering steps									
50 ... 500 mm					5 mm									
500 ... 750 mm					10 mm									
750...1000 mm					25 mm									
1000...2540 mm					50 mm									
X	X	X	X	U	002.0...100.0 in.									
Standard stroke length (in.)					Ordering steps									
2 ... 20 in.					0.2 in.									
20 ... 30 in.					0.5 in.									
30 ... 40 in.					1.0 in.									
40...100 in.					2.0 in.									
Non standard stroke lengths are available; must be encoded in 5 mm/0.1 in. increments														

d	Connection type													
M	1	1	6 pin Molex PicoBlade™ connector system Cable length 110 mm (4.33 in.)											
M	3	1	6 pin Molex PicoBlade™ connector system Cable length 310 mm (12.2 in.)											
M	6	1	6 pin Molex PicoBlade™ connector system Cable length 610 mm (24.02 in.)											

e	Operating voltage													
1	+24 VDC (–15/+20 %)													

f	Output													
A	0	1	4...20 mA											
A	1	1	20...4 mA											

DELIVERY



- Sensor
- O-ring
- Back-up ring

Accessories have to be ordered separately.

Manuals, Software & 3D Models available at:
www.temposonics.com



Temposonics

AN AMPHENOL COMPANY

Document Part Number:

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