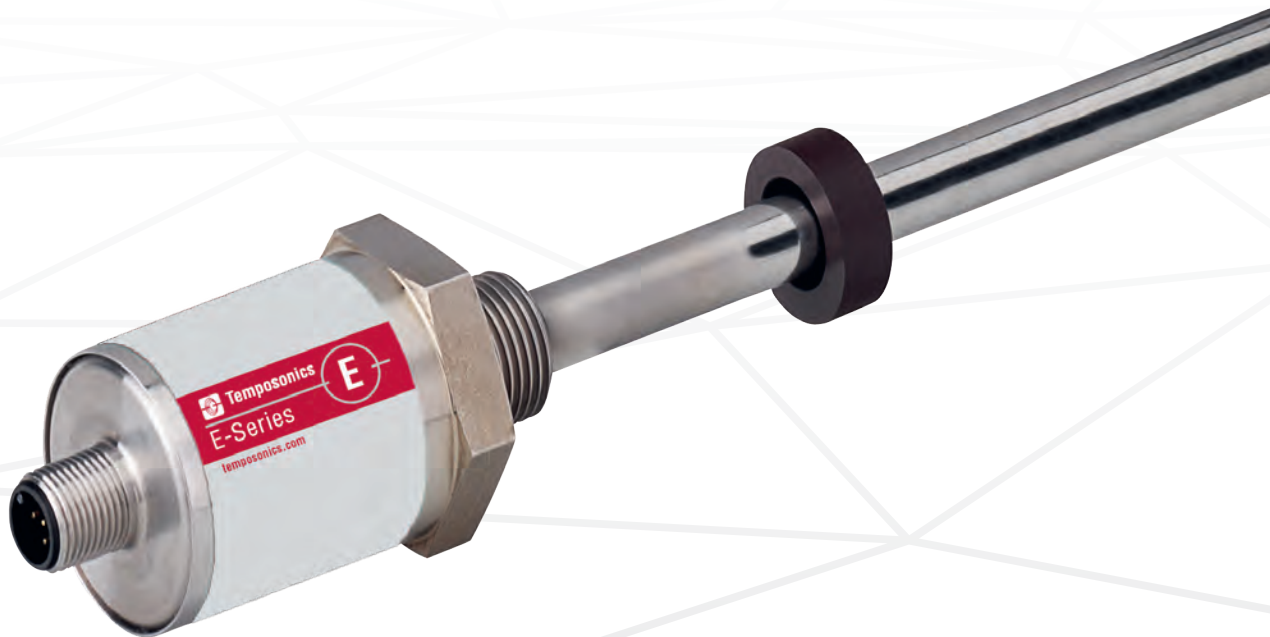


Data Sheet

EH Analog

Magnetostrictive Linear Position Sensors

- High pressure resistant sensor rod
- Position measurement with more than one magnet
- Small & compact – Ideal for standard hydraulic cylinders



MEASURING TECHNOLOGY

Temposonics가 제공하는 절대 선형 위치 센서는 높은 수준의 정밀도와 견고성으로 위치를 결정할 수 있는 회사의 독점 자기변형 기술을 사용합니다. 각 Temposonics 위치 센서는 강자성 도파관, 위치 자석, 스트레인 펄스 변환기 및 지원 전자 장치로 구성됩니다. 애플리케이션에서 움직이는 물체에 연결된 자석은 도파관의 해당 위치에 자기장을 생성합니다. 짧은 전류 펄스가 도파관에 적용됩니다. 이는 도파관에 순간적인 방사형 자기장과 비틀림 변형을 생성합니다. 자기장의 순간적인 상호 작용은 도파관의 길이를 전파하는 비틀림 변형 펄스를 방출합니다. 초음파가 도파관 끝에 도달하면 전기 신호로 변환됩니다. 도파관의 초음파 속도가 정확하게 알려져 있으므로 반한 신호를 수신하는 데 필요한 시간을 높은 정확도와 반복성을 통해 선형 위치 측정으로 변환할 수 있습니다.

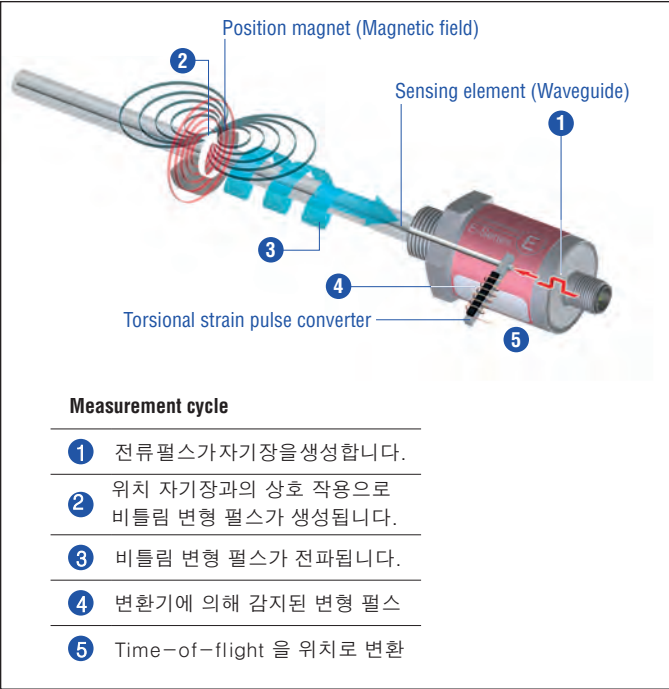


Fig. 1: Time-of-flight 기반 자기왜곡 위치 감지 원리

EH SENSOR

견고하고 비접촉식이며 마모가 없는 Temposonics 선형 위치 센서는 열악한 산업 환경에서 최고의 내구성과 정밀한 위치 측정 피드백을 제공합니다. 측정 정확도는 Temposonics에서 독점 제작한 도파관의 품질에 따라 엄격하게 제어됩니다.

Temposonics® EH는 소형 막대형 센서이며 소형 유압 실린더의 직접 스트로크 측정에 이상적인 솔루션입니다. 유압 실린더의 피스톤 헤드에 장착된 위치 자석은 내장된 도파관이 있는 센서 로드 위로 이동하여 정확한 비접촉 위치 측정을 제공합니다. EH는 유체 동력, 식품 산업, 플라스틱 산업, 유리 및 세라믹, 에너지 부문, 공장 기계 및 테스트 기계를 포함한 다양한 응용 분야에 이상적입니다.



Fig. 2: Typical application: Plastics processing

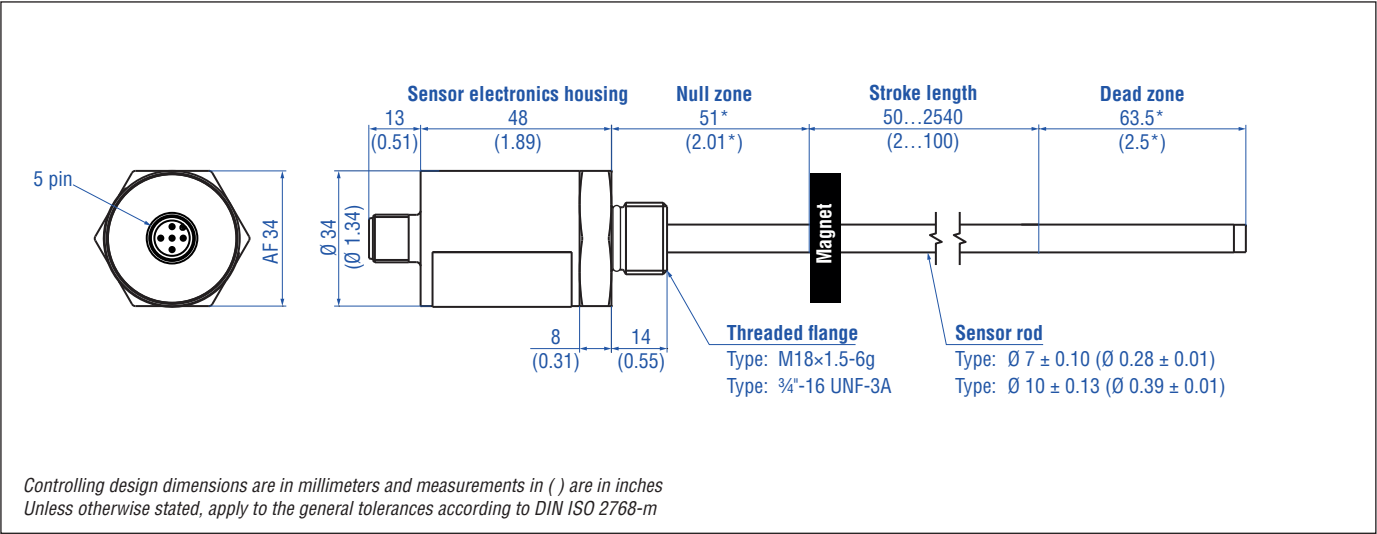
TECHNICAL DATA

Output	
Voltage	0...10 VDC or 10...0 VDC, 0...10 VDC and 10...0 VDC (controller input resistance $R_L > 5 \text{ k}\Omega$)
Current	4...20 mA or 20...4 mA (minimum / maximum load: 0 / 500 Ω)
Measured value	Position, option: Multi-position measurement with maximum 2 magnets
Measurement parameters	
Resolution	Infinite
Cycle time	Typ. 0.3 ms < t < 2 ms (depending on stroke lengths)
Linearity ¹	$\leq \pm 0.02 \text{ \% F.S.}$ (minimum $\pm 60 \text{ }\mu\text{m}$)
Repeatability	$\leq \pm 0.005 \text{ \% F.S.}$ (minimum $\pm 20 \text{ }\mu\text{m}$)
Operating conditions	
Operating temperature	-40...+75 °C (-40...+167 °F)
Humidity	90 % rel. humidity, no condensation
Ingress protection ²	IP67 / IP69K if mating cable connector is correctly fitted
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 61000-6-3 Electromagnetic immunity according to EN 61000-6-2 The sensor meets the requirements of the EC directives and is marked with CE .
Magnet movement velocity	Any
Design / Material	
Sensor electronics housing	Stainless steel 1.4305 (AISI 303); option: Stainless steel 1.4404 (AISI 316L)
Sensor rod	7 mm (0.28 in.) rod-Ø: Stainless steel 1.4301 (AISI 304) 10 mm (0.39 in.) rod-Ø: Stainless steel 1.4306 (AISI 304L); option: Stainless steel 1.4404 (AISI 316L)
Stroke length	50...2540 mm (2...100 in.)
Operating pressure	7 mm (0.28 in.) rod-Ø: 300 bar (4351 psi), 450 bar (6527 psi) peak 10 mm (0.39 in.) rod-Ø: 350 bar (5076 psi), 530 bar (7687 psi) peak
Mechanical mounting	
Mounting position	Any
Mounting instruction	Please consult the technical drawings and the brief instructions (document number: 551684)
Electrical connection	
Connection type	M12 (5 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	$\leq 0.28 \text{ V}_{pp}$
Current consumption	50...140 mA
Dielectric strength	500 VDC (DC ground to machine ground)
Polarity protection	Up to -30 VDC
Overvoltage protection	Up to 36 VDC

1/ With position magnet # 251 416-2. Not applied for customized version (CP11009)

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

TECHNICAL DRAWING



CONNECTOR WIRING

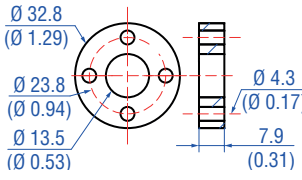
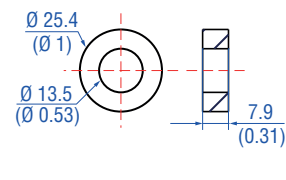
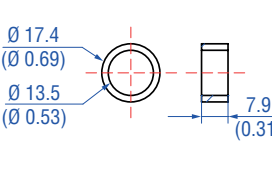
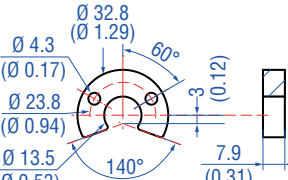
D34

M12 A-coded	Pin	Function
	1	+24 VDC (-15 / +20 %)
	2	Output 1
	3	DC Ground (0 V)
	4	Output 2
	5	DC Ground

*Use prefix CP11009 to the order code for start position of 30 mm (1.18 inch) and 60 mm (2.36 inch) dead zone.

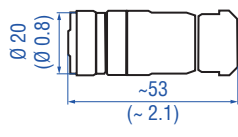
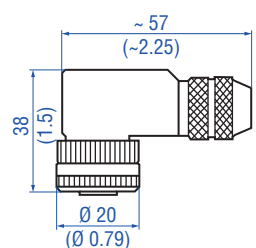
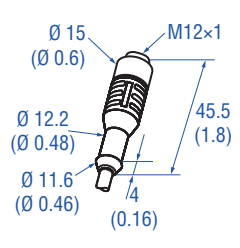
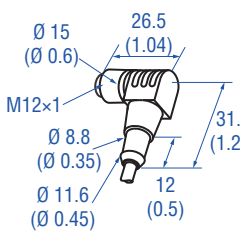
FREQUENTLY ORDERED ACCESSORIES – Additional options available in our [Accessories Guide](#) 551444

Position magnets

			
Standard ring magnet Part no. 201 542-2	Ring magnet OD25.4 Part no. 400 533	Ring magnet OD17.4 Part no. 401 032	U-magnet OD33 Part no. 251 416-2
Material: PA ferrite GF20 Weight: Ca. 14 g Operating temperature: –40...+105 °C (–40...+221 °F) Surface pressure: Max. 40 N/mm ² Fastening torque for M4 screws: 1 Nm	Material: PA ferrite Weight: Ca. 10 g Operating temperature: –40...+105 °C (–40...+221 °F) Surface pressure: Max. 40 N/mm ²	Material: PA neobind Weight: Ca. 5 g Operating temperature: –40...+105 °C (–40...+221 °F) Surface pressure: Max. 20 N/mm ²	Material: PA ferrite GF20 Weight: Ca. 11 g Operating temperature: –40...+105 °C (–40...+221 °F) Surface pressure: Max. 40 N/mm ² Fastening torque for M4 screws: 1 Nm

Cable connectors³

Cord sets

			
M12 (5 pin) female, straight Part no. 370 677	M12 (5 pin) female, angled Part no. 370 678	M12 (5 pin) female, straight Part no. 370 673	M12 (5 pin) female, angled Part no. 370 675
Housing: GD-Zn, Ni / IP67 Termination: Screw; max. 0.75 mm ² Contact insert: CuZn Cable Ø: 4...8 mm (0.16...0.31 in.) Fastening torque: 0.6 Nm	Housing: GD-Zn, Ni / IP67 Termination: Screw; max. 0.75 mm ² Contact insert: CuZn Cable Ø: 5...8 mm (0.2...0.31 in.) Fastening torque: 0.6 Nm	Ingress protection: IP67 Cable: Shielded, pigtail end Cable length: 5 m (16.4 ft.)	Ingress protection: IP67 Cable: Shielded, pigtail end Cable length: 5 m (16.4 ft.)

³/ Follow the manufacturer's mounting instructions when connecting the connectors
Controlling design dimensions are in millimeters and measurements in () are in inches

ORDER CODE

1

2

E

H

a

3

b

4

5

6

7

8

c

9

10

11

D

3

4

d

12

1

e

13

14

15

f

a	Sensor model
E H	Rod
b	Design
	EH rod-style sensor with housing material 1.4305 (AISI 303) and rod material 1.4301 (AISI 304)
K	Flange M18×1.5-6g, 7 mm rod-Ø
L	Flange ¾"-16 UNF-3A, 7 mm rod-Ø
	EH rod-style sensor with housing material 1.4305 (AISI 303) and rod material 1.4306 (AISI 304L)
M	Flange M18×1.5-6g, 10 mm rod-Ø
S	Flange ¾"-16 UNF-3A, 10 mm rod-Ø
	EH rod-style sensor with housing material 1.4404 (AISI 316L) and rod material 1.4404 (AISI 316L)
F	Flange ¾"-16 UNF-3A, 10 mm rod-Ø
W	Flange M18×1.5-6g, 10 mm rod-Ø

c	Stroke length
X X X X M	0050...2540 mm
X X X X U	002.0...100.0 in.

Standard stroke length (mm)*

Stroke length	Ordering steps
50 ... 500 mm	5 mm
500 ... 750 mm	10 mm
750...1000 mm	25 mm
1000...2540 mm	50 mm

Standard stroke length (in.)*

Stroke length	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.

d	Connection type
D 3 4	M12 (5 pin) male connector

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

f	Output			
Voltage				
V	0	1	0...10 VDC (1 output channel with 1 position magnet)	
V	1	1	10...0 VDC (1 output channel with 1 position magnet)	
V	0	2	0...10 VDC (2 output channels with 2 position magnets)	
V	1	2	10...0 VDC (2 output channels with 2 position magnets)	
V	0	3	0...10 VDC and 10...0 VDC (2 output channels with 1 position magnet)	
Current				
A	0	1	4...20 mA (1 output channel with 1 position magnet)	
A	1	1	20...4 mA (1 output channel with 1 position magnet)	
A	0	2	4...20 mA (2 output channels with 2 position magnets)	
A	1	2	20...4 mA (2 output channels with 2 position magnets)	

DELIVERY



Sensor, O-ring

Accessories have to be ordered separately.

Operation manuals & software are available at:
www.temposonics.com

* / Non standard stroke lengths are available; must be encoded in 5 mm / 0.1 in. increments



Temposonics

AN AMPHENOL COMPANY

UNITED STATES
Temposonics, LLC
Americas & APAC Region
3001 Sheldon Drive
Cary, N.C. 27513
Phone: +1 919 677-0100
E-mail: info.us@temposonics.com

GERMANY
Temposonics
GmbH & Co. KG
EMEA Region & India
Auf dem Schüffel 9
58513 Lüdenscheid
Phone: +49 2351 9587-0
E-mail: info.de@temposonics.com

ITALY
Branch Office
Phone: +39 030 988 3819
E-mail: info.it@temposonics.com

FRANCE
Branch Office
Phone: +33 6 14 060 728
E-mail: info.fr@temposonics.com

UK
Branch Office
Phone: +44 79 44 15 03 00
E-mail: info.uk@temposonics.com

SCANDINAVIA
Branch Office
Phone: +46 70 29 91 281
E-mail: info.sca@temposonics.com

CHINA
Branch Office
Phone: +86 21 2415 1000 / 2415 1001
E-mail: info.cn@temposonics.com

JAPAN
Branch Office
Phone: +81 3 6416 1063
E-mail: info.jp@temposonics.com

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