

Data Sheet

GT2/GT3 Analog Redundant Magnetostrictive Linear Position Sensors

- Double or triple redundant
- For enhanced safety applications
- Pressure-resistant high-grade steel rod



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.

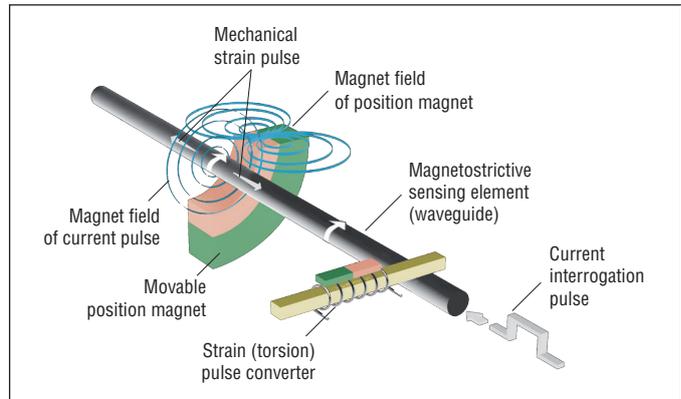


Fig. 1: Time-based magnetostrictive position sensing principle

GT2/GT3 SENSOR

Robust, non-contact and wear-free, the Temposonics linear position sensors provide best durability and accurate position measurement solutions in harsh industrial environments. The position measurement accuracy is tightly controlled by the quality of the waveguide which is manufactured by Temposonics. The position magnet is mounted on the moving machine part and travels contactlessly over the sensor rod with the built-in waveguide.

Temposonics® GT is a sensor with double or triple redundancy. Two or three independent measuring systems are integrated in one sensor housing. In particular the sensor is suitable for enhanced safety applications. The waveguide is installed in a pressure-resistant high-grade steel rod. That qualifies the sensor for measuring linear movements of control valves, fluid cylinders and drives in power plants for pitch settings at water- or wind turbines or for ship control systems and floodgates.



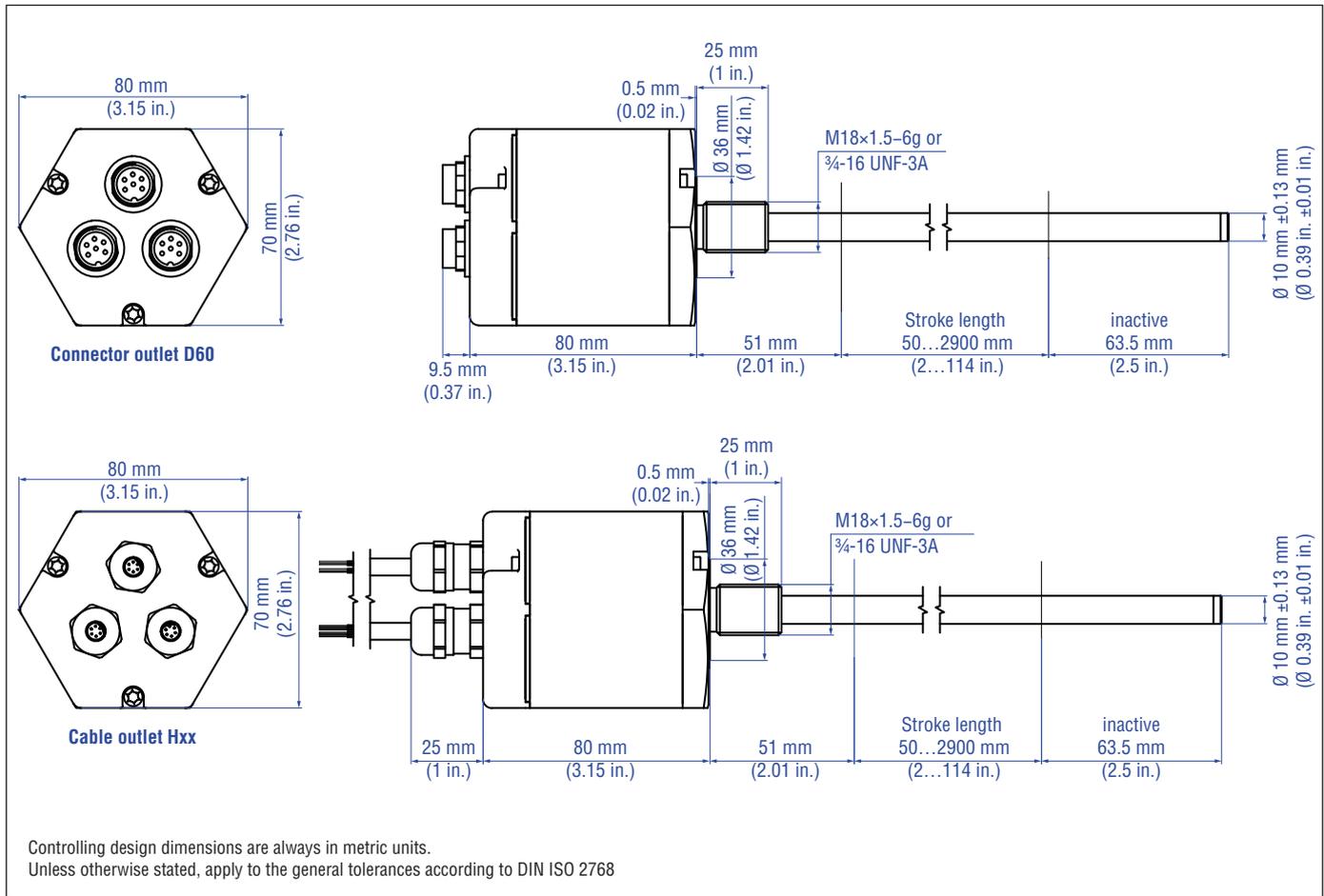
Fig. 2: Typical application: floodgate

TECHNICAL DATA

Output	
Voltage	0...10 / 10...0 / -10...+10 / +10...-10 VDC (min. load controller: > 5 k Ω)
Current	4(0)...20 mA / 20...4(0) mA (min./max. load: 0 / 500 Ω)
Measured value	Position, the position is measured separately by two or three position measuring systems
Measurement parameters	
Resolution	Analog
Cycle time	< 2.5 ms
Linearity ¹	< ± 0.02 % F.S. (minimum ± 50 μm)
Repeatability	< ± 0.001 % F.S. (minimum ± 2.5 μm)
Operating conditions	
Operating temperature	-40...+75 °C (-40...+167 °F)
Humidity	90 % rel. humidity, no condensation
Ingress protection	IP67
Shock test	100 g (single shock) IEC standard 60068-2-27
Vibration test	5 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	Aluminum
Sensor rod	Stainless steel 1.4306 / AISI 304L, option 1.4404 / AISI 316L
Stroke length	50...2900 mm (2...114 in.)
Operating pressure	350 bar (5076 psi), 690 bar (10 007 psi) peak
Mechanical mounting	
Mounting position	Any orientation
Mounting instruction	Please consult the technical drawings
Electrical connection	
Connection type	6 pin connector M16 or integral PUR cable
Operating voltage	+24 VDC (-15 / +20 %)
Ripple	≤ 0.28 Vpp
Current consumption	100 mA typical (each channel)
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

TECHNICAL DRAWING



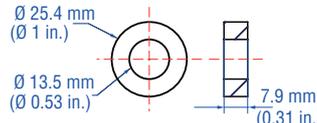
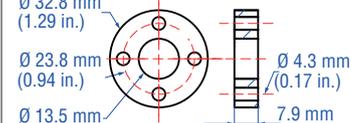
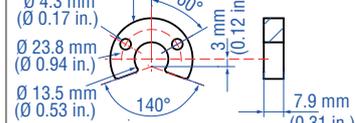
CONNECTOR WIRING

	Pin	Cable	Analog
	1	GY	V/mA
	2	PK	DC Ground
	3	YE	Only PC programming tool
	4	GN	Only PC programming tool
	5	BN	+24 VDC (-15 / +20 %)
	6	WH	DC Ground

ACCESSORIES

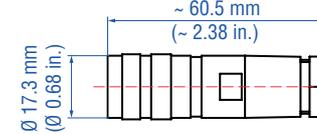
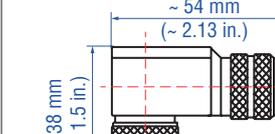
More accessories see  551444

Position magnets

 <p> \varnothing 25.4 mm (\varnothing 1 in.) \varnothing 13.5 mm (\varnothing 0.53 in.) 7.9 mm (0.31 in.) </p>	 <p> \varnothing 32.8 mm (1.29 in.) \varnothing 23.8 mm (0.94 in.) \varnothing 13.5 mm (0.53 in.) \varnothing 4.3 mm (0.17 in.) 7.9 mm (0.31 in.) </p>	 <p> \varnothing 32.8 mm (\varnothing 1.29 in.) \varnothing 4.3 mm (\varnothing 0.17 in.) \varnothing 23.8 mm (\varnothing 0.94 in.) \varnothing 13.5 mm (\varnothing 0.53 in.) 7.9 mm (0.31 in.) 60° 140° 3 mm (0.12 in.) </p>
<p>Ring magnet OD25.4 Part no. 400 533</p>	<p>Standard ring magnet Part no. 201 542-2</p>	<p>U-magnet OD33 Part no. 251 416-2</p>
<p>Material: PA ferrite Weight: ca. 10 g Operating temperature: -40...+105 °C (-40...221 °F) Surface pressure: max. 40 N/mm²</p>	<p>Material: PA ferrite GF20 Weight: ca. 14 g Operating temperature: -40...+105 °C (-40...221 °F) Surface pressure: max. 40 N/mm² Fastening torque for M4 screws: max. 1 Nm</p>	<p>Material: PA ferrite GF20 Weight: ca. 11 g Operating temperature: -40...+105 °C (-40...221 °F) Surface pressure: max. 40 N/mm² Fastening torque for M4 screws: max. 1 Nm</p>

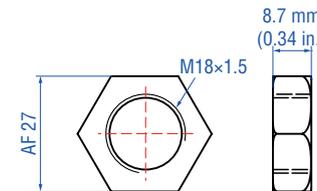
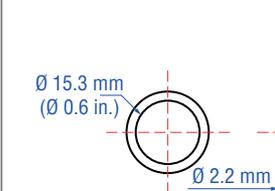
Connectors

Cable

 <p> \sim 60.5 mm (\sim 2.38 in.) \varnothing 17.3 mm (\varnothing 0.68 in.) </p>	 <p> \sim 54 mm (\sim 2.13 in.) \sim 38 mm (\sim 1.5 in.) 19.5 mm (0.77 in.) </p>	
<p>Female, straight, 6 pin Part no. 370 423</p>	<p>Female, angled, 6 pin Part no. 370 460</p>	<p>Cable Part no. 530 052</p>
<p>Housing: zinc nickel plated Termination: solder Contact insert: silver plated Cable clamp: PG9 Cable \varnothing: 6...8 mm (0.24...0.32 in.)</p>	<p>Housing: zinc nickel plated Termination: solder Contact insert: silver plated Cable \varnothing: 6...8 mm (0.24...0.32 in.)</p>	<p>Dimensions: 3 × 2 × 0.25 mm² Cable \varnothing: 6.4 mm (0.25 in.) Material: PUR jacket; orange Operating temperature: -30...+80 °C (-22...176 °F) Twisted pair shielded</p>

Optional installation hardware

Programming tools

 <p> 8.7 mm (0.34 in.) M18×1.5 AF 27 </p>	 <p> \varnothing 15.3 mm (\varnothing 0.6 in.) \varnothing 2.2 mm (\varnothing 0.09 in.) </p>		
<p>Hex-jam nut M18 Part no. 500 018</p>	<p>O-ring Part no. 401 133</p>	<p>Analog handheld programmer – G-Series; Part no. 253 853</p>	<p>Programming kit – G-Series Analog; Part no. 253 145-1</p>
<p>Type: M18×1.5 threads Material: steel, 2 zinc, plated Application: M-style housings</p>	<p>Material: Fluoroelastomer 75 ± 5 durometer Application: M-style housings</p>	<p>Programming for G-Series analog output sensor models</p>	<p>Kit includes: interface converter box, power supply, cable Software is available at: www.temposonics.com</p>

ORDER CODE

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

a	Sensor model													
G	T	2	Dual redundant											
G	T	3	Triple redundant											

b	Specification													
F	¾"-16 UNF-3A, sensor rod 1.4404 (AISI 316L)													
M	Flange M18×1.5, sensor rod 1.4306 (AISI 304L)													
S	¾"-16 UNF-3A, sensor rod 1.4306 (AISI 304L)													
W	Flange M18×1.5, sensor rod 1.4404 (AISI 316L)													

c	Stroke length													
X	X	X	X	M	0050...2900 mm									
X	X	X	X	U	002.0...114.0 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...2500 mm	50 mm
2500...2900 mm	100 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.
100...114 in.	4.0 in.

d	Connection type													
D	6	0	6 pin male connector M16											
H	0	2	2 m PUR-cable w/o connector, option H01...H10 (1...10 m; 3...33 ft)											

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

f	Output													
Voltage														
V	0	0...+10 VDC												
V	1	+10...0 VDC												
V	2	-10...+10 VDC												
V	3	+10...-10 VDC												
Current														
A	0	4...20 mA												
A	1	20...4 mA												
A	2	0...20 mA												
A	3	20...0 mA												

DELIVERY



Sensor, O-ring

Accessories have to be ordered separately.

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

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