

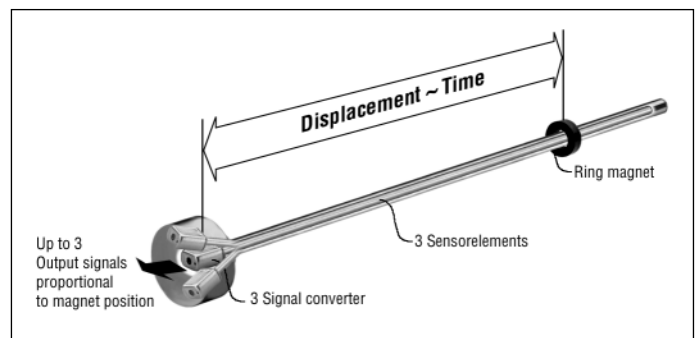
G-Series Analog Redundant

Temposonics GT2 and GT3
Measuring length 25 - 1500 mm



Redundancy for enhanced safety

- Up to 3 totally separated, independent measuring systems in 1 housing
- Linear Absolute Measurement
- Contactless Sensing with Highest Durability
- Superior Accuracy: Linearity better 0,02 %
- Repeatability 0,001 %
- Direct Analog Output
- Compact design with a 10 mm measuring rod and standard mounting



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 detecting. Sensor integrated signal processing transforms the measurements directly into market standard outputs. The contactless principle - an external movable magnet marks the position - eliminates the wear, noise and erroneous signal problems and guarantees the best durability without any recalibration.

Form factor

The extremely robust sensor, ideal for continuous operation under harshest industrial conditions is completely modular in mechanic and electronic design.

- A profile or rod-shaped sensor housing protects the sensing element in which gives rise to the measurement signal.
- The sensor head accommodates the complete modular electronic interface with active signal conditioning. Double encapsulation ensures high operating safety and optimum EMC protection.
- The position transmitter, a permanent magnet - fixed at the mobile machine part - drives contactlessly over the sensor's stroke and starts measuring through the housing wall.

Temposonics G-Series Redundant

The G-Series Redundant sensor is designed for applications with high safety requirements.

Two or three measuring systems, which work totally independent, are installed inside the compact sensor housing. Each measuring system contains its own canal with sensor element, evaluation electronics, output signal, separated power supply, connector and cable.

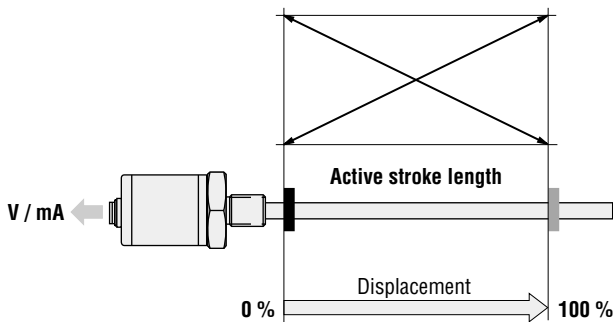
All sensor elements are integrated in one pressure proofed high-grade steel rod. Rod and fixing flange feature the approved standard dimensions with 10 mm diameter and M18x 1,5 winding. That qualifies the redundant sensor for measuring linear movements of control valves, linear drives, fluid cylinders and machines.

In particular applications with safety relevant functions benefit from a redundant position measurement:

- Valves and drives at power plants
- Pitch settings at water- or wind turbines or at marine propellers
- Ship control systems and floodgates.

Analog output

Temposonics G-Series with analog outputs provide direct analog outputs including voltage and current, forward or reverse acting. All outputs allow full adjustment of Null and Span setpoints (minimum range 25 mm between setpoints) inside the **active electrical stroke** length. Since the outputs are direct, no signal conditioning electronics are needed when interfacing with controllers or meters.



Sensor field programming

Temposonics G-Series sensors are preconfigured at the factory by model code designation. If needed, MTS offers different external service tools for modifying sensor parameters inside the **active electrical stroke** (minimum 25 mm between setpoints) via the standard connection cable. There is no need to open the sensors electronics. Following tools are available:

1. Hand-Programmer G-Analog

for setups of measuring length inside the ordered output by pushing an up/down-button.

2. PC-Programmer G-Analog

This hardware converter is required to communicate via serial port of Window PC to the sensor. Customized settings are possible by using a MTS programming software (CD-ROM) for:

- Analog:** 1. Null and Span; 2. Forward and reverse acting;
3. Output: Voltage/Current and output values

Technical Data

Input

Measured variables	Position
Measuring range	25 - 1500 mm

Output

Sensor model GT2	Two output channels
Sensor model GT3	Three output channels
Voltage	0...10 / 10...0 / -10...+10 / +10...-10 VDC (min. load controller: > 5 kOhms)
Current	4(0)...20 mA / 20...4(0) mA (min/max. load: 0/500 Ohms)
Null/Span adjustment	100 % of electrical stroke (Min. range 50 mm)

Accuracy

Position measurement:	
- Resolution	Analog: Infinite
- Linearity	< ± 0,02 % F.S. (Minimum ± 50 µm)
- Repeatability	< ± 0,001 % F.S. (Minimum ± 2,5 µm)
- Hysteresis	< 4 µm
- Update time (ms)	Analog: < 1 ms typical
- Ripple	< 0,01 % F.S.

Operating conditions

Magnet speed	any
Operating temperature electronic housing	-40 °C ... +75 °C
Dew point, humidity	90% rel. humidity, no condensation
Protection	IP 67
Shock test	100 g single hit, IEC-Standard 68-2-27
Vibration test	15g / 10 - 2000 Hz, IEC-Standard 68-2-6
Standards, EMC test	Electromagnetic emission EN 50081-1 Electromagnetic immunity EN 50082-2 EN 61000-4-2/3/4/6, Level 3/4, Criterium A, CE-qualified

Form factor, material

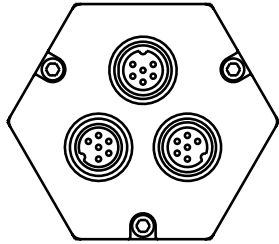
Sensor head	Aluminum
Rod with flange	Stainless steel 1.4301 / AISI 304
-Pressure rating	350 bar, 700 bar peak
Position magnet	Ring magnets, U-magnets

Installation

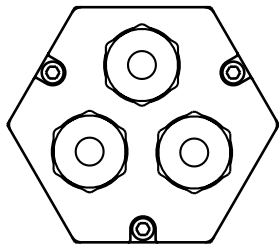
Mounting position	any orientation
Rod	Threaded flange M18 x 1,5, nut M18
Position magnet	Mounting plate and screws from antimagnetical material

Electrical connection

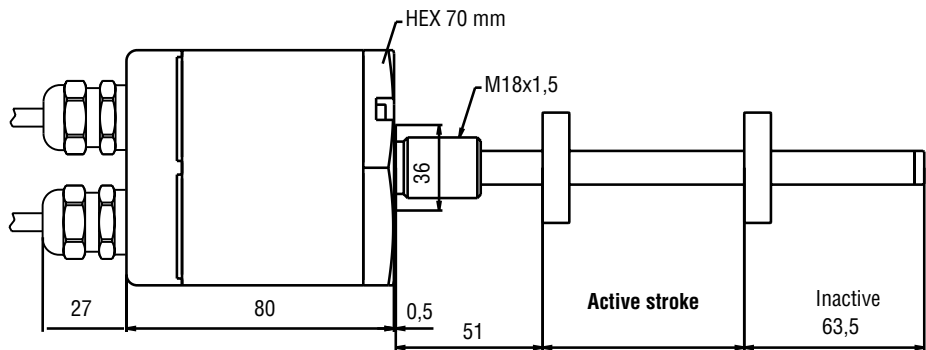
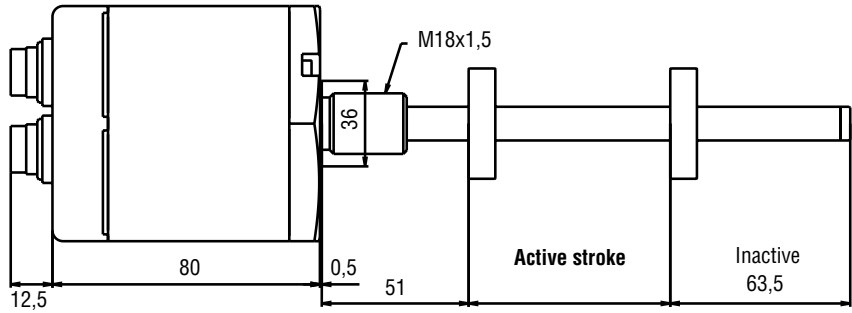
Connection type	6 pin connector M16 or integral PUR-cable with open ends
Input voltage	24 VDC (-15 / +20 %)
- Polarity protection	up to -30 VDC
- Overvoltage protection	up to 36 VDC
Current drain	100 mA typical
Ripple	< 1 % S-S
Electric strength	500 V (DC ground to machine ground)



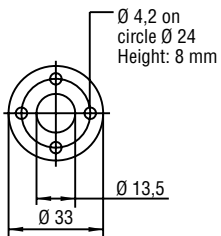
Connector outlet D60



Cable outlet H02

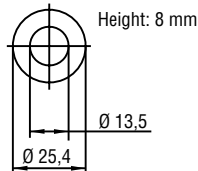


Selection of position magnet (not on delivery)



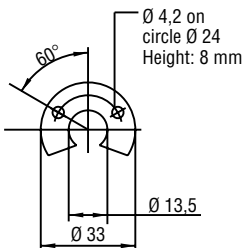
Ring magnet OD33
Part No. 201 542-2

Composite PA-Ferrite-GF20
Weigh ca. 14g
Operating temperature:
-40 ... +100°C



Ring magnet OD25,4
Part No. 400 533

Composite: PA-Ferrite
Weigh ca. 10g
Operating temperature:
-40 ... +100°C



U-magnet M OD33
Part No. 251 416-2

Composite PA-Ferrite-GF20
Weigh ca. 11g
Operating temperature:
-40 ... +100°C

High Pressure Rod Design

Temposonics-GH with a pressure-resistant stainless steel flange and sensing rod is suitable for use in hydraulic cylinders and externally in all applications where space is a problem. Position measurement is via ring or U-magnets travelling along the sensing rod without any mechanical contact.

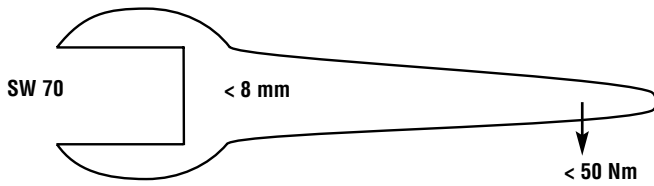
Connection types

1. Connector outlet D60
6 pin Male receptacle M16

2. Cable outlet H02
2 m PUR cable 3 x 2 x 0,25 mm²
Cable Ø 6,8 mm

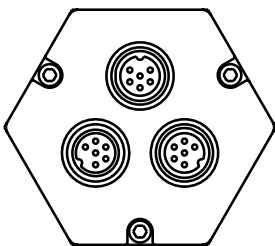
*Screened unshielded twisted pair
50 mm bending radius at fixed
installation*

Flexible installation in any position



When mounting the sensor a basic tool with max. 8 mm dimension has to be used. Thereby attention must be paid, that the tool is placed at the flange exclusively.

Using the twice redundant version GT2 a protective cap covers the third port.



Connector outlet D60

Connector	Pin	Cable	Analog
<p>Male insert connector rear of cable connector</p>	1	grey	V/mA
	2	pink	DC Ground
	3	yellow	PC-Programming
	4	green	PC-Programming
	5	brown	+ 24 VDC (-15 / +20 %)
	6	white	DC Ground

Rod model

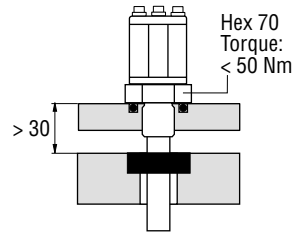
Mount the sensor via flange thread or a hex nut. If possible, non-magnetizable material should be used for mounting support (dimensions as shown). With horizontal mounting, longer sensors (from 1 meter) must be provided with mechanical support.

Hydraulic sealing

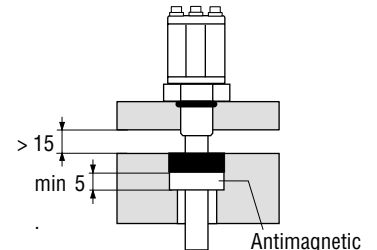
Recommended is sealing of the flange facing with O-Ring (e.g. 22,4 x 2,65) in a cylinder cover nut or an O-Ring 15,3 x 2,2 in undercut.

Minimum assembly distance

1. Non-magnetizable material
2. Magnetizable material



Recommended hydraulic sealing

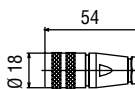


Alternative sealing O-Ring 15,3 x 2,2

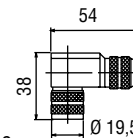
Cylinder installation

When used for direct stroke measurement in fluid cylinders, the sensor's high pressure, stainless steel rod installs into a bore in the piston head/rod assembly as illustrated. That guarantees a longlife and trouble-free operation - independent of used hydraulic fluid.

Cable connector (recommended, not on delivery)



6 pin female connector M16, PG9
Part No. ST C0 9131 D06 PG9



6 pin 90° female connector M16
insert adjustable in 45° positions
Part No. ST C0 9131-6

Housing: Zinc nickel plated
Termination: Solder
Contact insert: Silver plated
Cable clamp: PG7
Max. Cable-Ø 6mm
Cable clamp: PG9, M16
Max. Cable-Ø 8 mm

Temposonics-GT2+GT3

Analog

Temposonics

Sensor model

GT2 = Dual redundant
GT3 = Triple redundant

Form factor

M = Flange M18 x 1,5 (Standard)

Measuring length

0050 ... 1500 mm

Connection type

D60 = 6 pin male receptacle M16
H02 = 2m PUR-cable w/o connector, option H01-H10 (1-10m)

Input voltage

1 = +24 VDC

Output

V0 = Voltage 0 to +10 VDC
V1 = Voltage +10 to 0 VDC
V2 = Voltage -10 to +10 VDC
V3 = Voltage +10 to -10 VDC
A0 = Current 4 to 20 mA
A1 = Current 20 to 4 mA
A2 = Current 0 to 20 mA
A3 = Current 20 to 0 mA

On delivery rod model: Sensor, hex nut, pls. order magnet sparately.

Accessories (selection)

Ring magnet OD33, Standard

Ring magnet OD25,4

U-magnet OD33

O-Ring 15,3 x 2,2 Fluorelastomer FPM 75

6 pin female cable connector M16, PG9

6 pin 90°-female cable connector M16,

PUR-cable 3 x 2 x 0,25 mm²

MTS-Servicetools

Analog Hand-Programmer G

Analog PC-Programmer G, incl. power supply

(100-240 VAC / 24VDC)

Connection cable and programming software (CD)

Part No.

201 542-2

400 533

251 416-2

401 133

STC 09131 D06 PG9

STC 09131-6

K59

253 294

253 145

www.mtssensor.de
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