

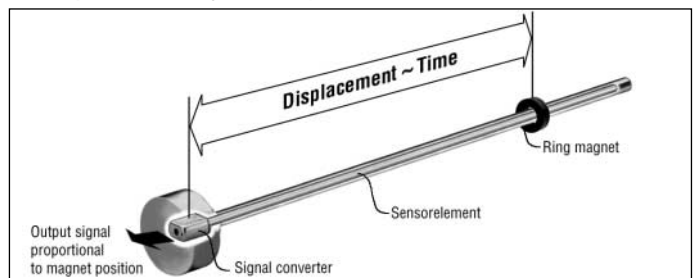
## M-Series Analog

**Temposonics MH**  
Measuring length 50 - 2500 mm



Compact Sensor for Mobile Hydraulics

- Linear, Absolute Measurement in Hydraulic Cylinders
- Contactless Sensing with Highest Durability
- Minor Dimensions for Compact Mobile Hydrocylinders
- Replacing Potentiometers and Inductive Position Sensors
- Superior Accuracy: Linearity Tolerance better 0,04 %
- Repeatability 0,005 %
- Direct Analog Displacement Output: Current and Voltage
- Power Supply: 12 / 24 VDC
- EMC: Immunity against electromagnetic HF-fields up to 200 V/m
- Independent from Hydraulic Liquid



### Magnetostriction

### Form factor

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 height 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.

**Temposonics® MH**, the compact stainless steel position sensor is designed for installation into hydraulic cylinders, specifically for use in clevis head mobile cylinders or any space limited cylinder applications.

1. The sensor head, a robust housing with built-in electronics.
2. The pressure-proof sensor pipe with flange protects the internal sensing element, the waveguide system. It fits into the bored piston rod.
3. The position magnet, only moving part is mounted on the piston bottom. This permanent magnet travels wearfree and contactless along the stationary sensor tube. Its magnetic field starts the measurement signal through the sensor's rod wall.

# Temposonics-MH

## Analog

### Analog Output

Temposonics-MH sensors provide analog output of 0 -5 V. The analog output signal is proportional to the magnet position along the active measuring sensor stroke. The measuring range is factory set and does not need recalibration. Since the outputs are direct, no signal-conditioning electronics are needed when interfacing with controllers or meters.

### Technical Data

<b>Input</b>	
Measured Variables:	Displacement
Measuring Range:	50 - 2500 mm in 5 mm steps
<b>Output</b>	
Voltage:	0 - 5 VDC / 0,25... 4,75 / 0,5 ... 4,5 VDC; (Controller input resistance $R_L \geq 10$ kohm, short circuit-proof, electric strength up to 28 Vdc)
Strom:	4 - 20 mA (apparent power of the voltage transformer $\leq 250$ Ohm with 12 V power supply, apparent power of the voltage transformer $\leq 500$ Ohm with 24 V power supply)
<b>Accuracy</b>	
Resolution:	Infinite, restricted by output ripple
Linearity, uncorrected:	$< \pm 0,04$ % F.S. (Minimum $\pm 0,100$ mm)
Repeatability:	$< \pm 0,005$ % F.S.
Update Frequency:	$> 1,25$ kHz
Ripple:	$< 0,02$ % F.S.
<b>Operating conditions</b>	
Mounting Position, Sensor:	Any orientation
Magnet Speed:	Any
Operating Temperature:	$-40^\circ\text{C} \dots +85^\circ\text{C}$ (optimal $105^\circ\text{C}$ )
Dew Point, Humidity:	90 % rel. humidity, no condensation
Sealing:	IP 65
Rod Pressure Rating:	300 bar, 450 bar peak pressure for 7 mm rod diameter 350 bar, 530 bar peak pressure for 10 mm rod diameter
Shock Rating:	100 g (single hit) / IEC-Standard 68-2-27
Vibration Rating:	25 g / 5 kHz / IEC-Standard 68-2-6
EMC-Test:	ISO 14982 Agricultural- and forest machines ISO 7637-1/2/3 Road vehicles Immunity belong to ISO 11452-5: electromagnetic HF-fields up to 200 V/m CE certified EMC for railway vehicles DIN EN 50121-3-2
<b>Form factor, Material</b>	
Material Sensor:	Stainless steel 1.4305 / AISI 304
Magnet Type:	Ring magnet
<b>Installation</b>	
Mounting:	Clearance fit flange $\varnothing 48$ mm
<b>Electrical connections</b>	
Connection Type:	pigtails PUR cable, 3 wires
Input Voltage:	12 / 24 VDC (10 - 32 V)
Ripple:	$< 1$ % peak to peak
Current Drain:	$< 60$ mA
Electric Strength:	500 V ( 0 V ground to machine ground)
Polarity Protection:	Up to -30 VDC
Overvoltage Protection:	Up to 36 VDC

## Temposonics-MH - High Pressure Compact Sensor Measuring Range 50 - 2500 mm.

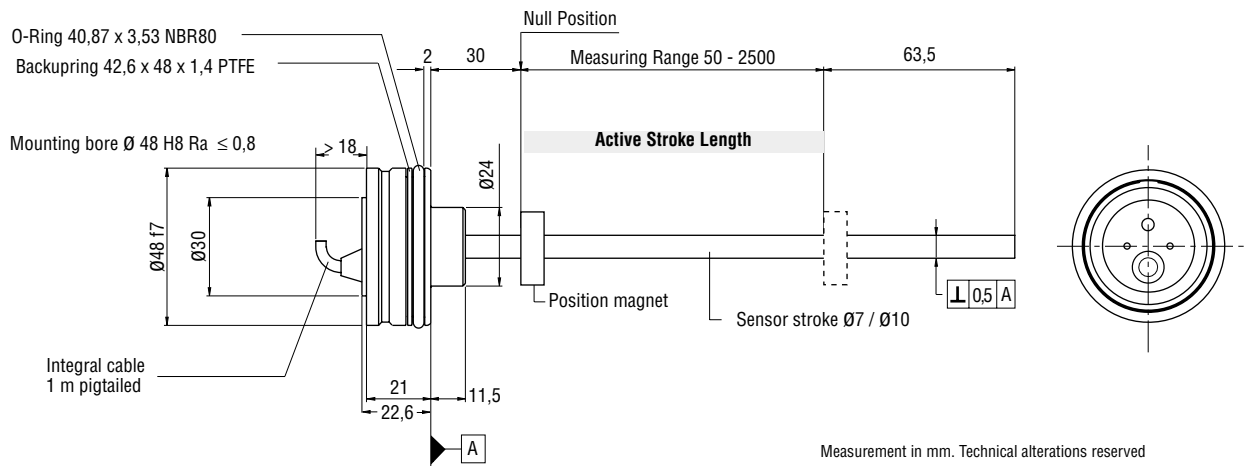
Temposonics-MH, the new compact stainless steel position sensor is designed for installation into hydraulic cylinders, specifically for use in clevis head mobile cylinders or any space limited cylinder applications.

MH type sensors are ideal choices for a wide range of standard hydraulic cylinders. Magnetostrictive displacement sensors, high quality cylinders and precise control valves form ideal driving systems for technically demanding of mobile hydraulics.

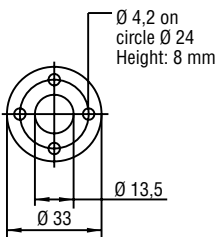
## Simple mechanics

The extremely rugged sensor consist of 3 main parts

- The sensor head, a robust housing with built-in electronics.
- The pressure-proof sensor pipe (up to 350 bar) with flange protects the internal sensing element, the waveguide system. It fits into the bored piston rod.
- The position magnet, only moving part is mounted on the piston bottom. This permanent magnet travels wearfree and contactless along the stationary sensor tube. Its magnetic field starts the measurement signal through the sensors rod wall.

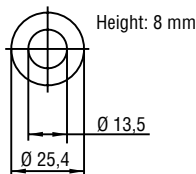


## Position Magnets



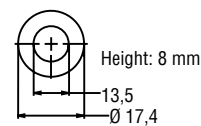
**Ring magnet OD33**  
Part No. 201 542-2

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



**Ring magnet OD25,4**  
Part No. 400 533

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



**Ringmagnet OD17,4**  
Part No. 401 032

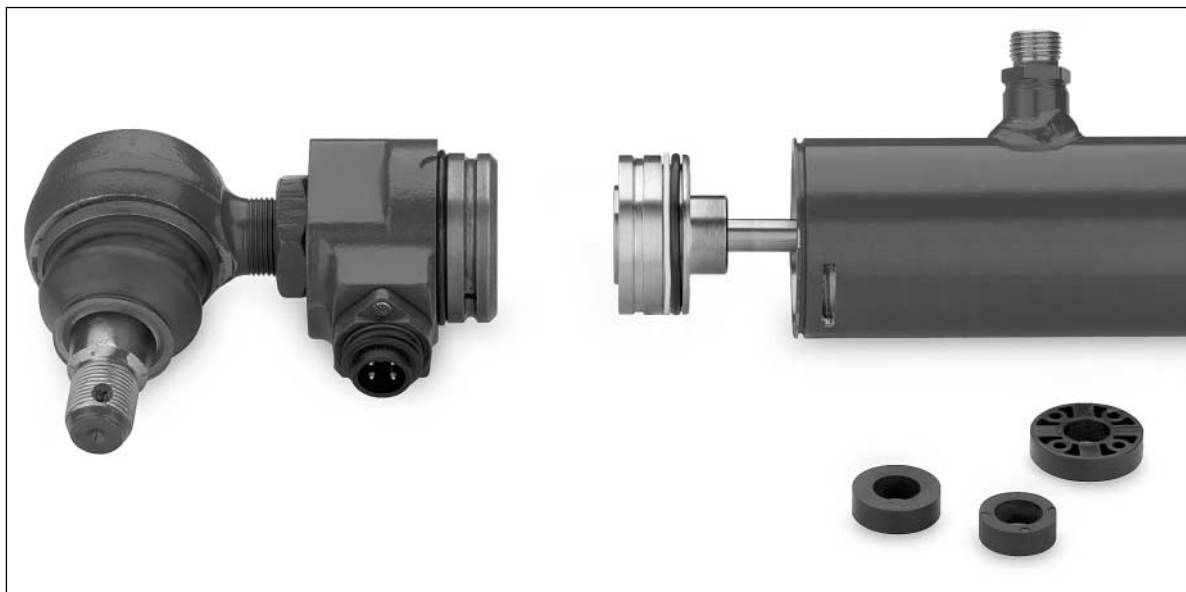
Composite PA-Ferrite  
Weigth ca. 10g  
Operating temperature:  
-40 ... +100°C

# Temposonics-MH

Analog



Mobile hydraulic cylinder with built-in TEMPOSONICS-MH



## Installation

The robust Temposonics-MH sensor is due to its form factor, excellently suited for direct stroke measurement in standard compact fluid-cylinders.

The position magnet, mounted on the piston bottom, drives contactlessly along the measuring stroke and marks exactly the position through the rod wall - independent of the used hydraulic fluid - that guarantees a longlife and trouble-free operation.

## Sensor

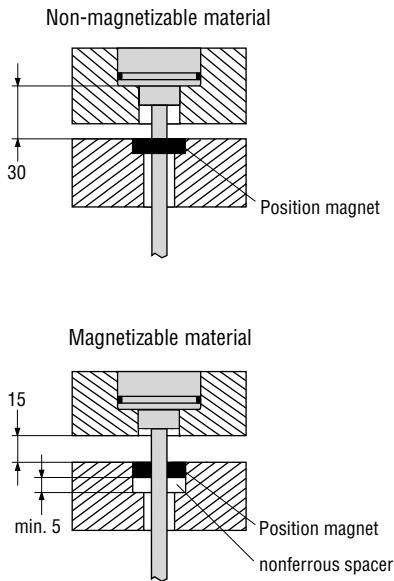
The stainless steel rod model sensor can be mounted in any position via the clearance fit flange  $\varnothing$  48 mm.

Hydraulic sealing is by using an O-Ring and Backup-Ring in housing channel. Non-magnetizable material should be used for the sensor mounting component. Taking the mounting dimensions shown below into account is indispensable.

## Position Magnet

To have a neat magnetic field for measuring, non-magnetizable material must be used for the position magnet mounting components (screws, spacers, retaining ring etc.).

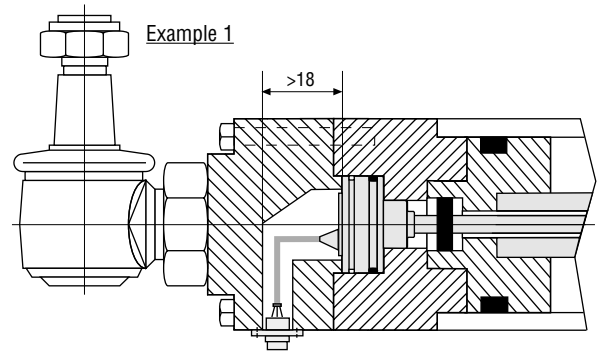
For further details according to cylinder design please contact directly MTS.



## Installation Notes

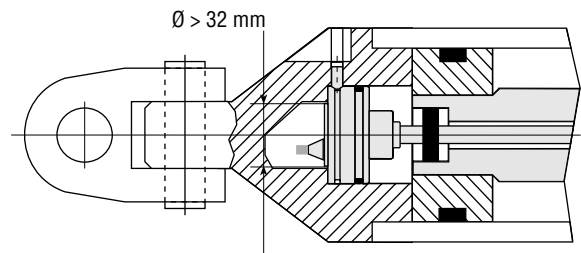
- Use a rod bush (e.g. teflon) to prevent wear on the magnet and the sensor pipe.
- The bore in the piston rod is dependent on hydraulic pressure and piston velocity etc. The minimum drilling must be 10 (7 mm rod) or 13 mm (10 mm rod).
- Do not exceed the peak pressure.

## Installation Versions

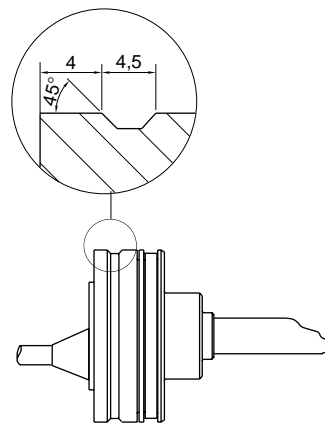


## Example 2

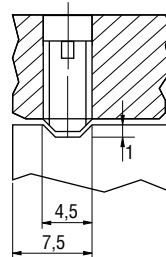
The sensor will be fixed with setscrew



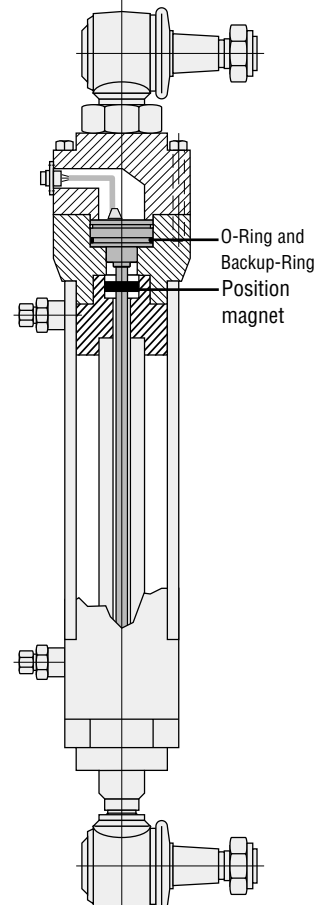
## Detail Flange housing



e.g. retaining with set screw DIN 913 M5x10 maximum torque 0,5 Nm



## Mounting example: Mobile hydraulic cylinder with built-in TEMPOSONICS-MH

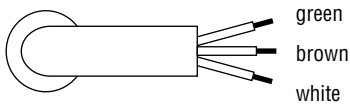


# Temposonics-MH

## Analog

### Cable outlet

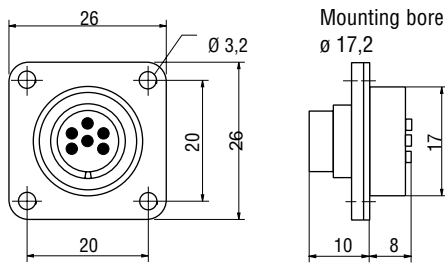
PUR-cable, 3 x 0,34 mm<sup>2</sup>, Ø 4,5 - 6 mm, flexible, oil resisting



### Wiring

Wire color	Signal
green	Output: Voltage range
brown	+12/24 VDC
white	DC Ground (0V)

### Male connector (Accessories)



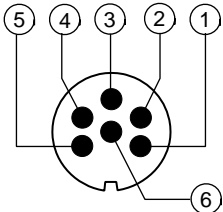
### Wiring

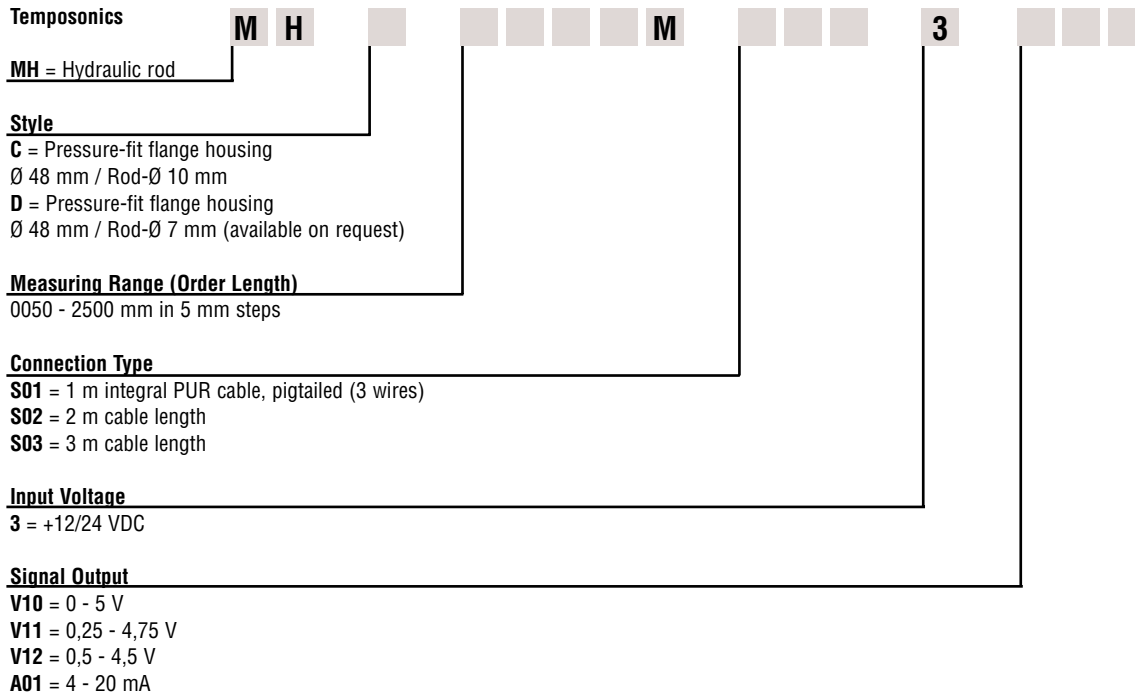
Pin	Wire color	Signal
1	green	Output: Voltage range
2	-----	NC
3	-----	NC
4	-----	NC
5	brown	+12/24 VDC
6	white	DC Ground (0V)

6 pin DIN wall mount flange receptacle for installation in customized cylinder end-cap

Part No. ST C0 9131 S06

Front face of pin insert  
or rear of female insert





**Scope of Delivery**

- Position Sensor
- O-Ring
- Backup-Ring

Pls. order magnets separately.  
 Accessories see below.

**Asseccories (selection)**

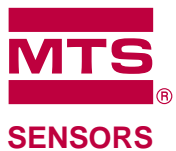
- Ring magnet OD33
- Ring magnet OD25,4
- Ring magnet OD17,4
- 6 pin wall mount receptacle, male

**Part No.**

- 201 542-2
- 400 533
- 401 032
- St C0 9131 S06

**[www.mtssensor.de](http://www.mtssensor.de)**  
**[www.temposonics-shop.de](http://www.temposonics-shop.de)**  
**Service Hotline: 01805 - mtssensor**

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**Germany**  
MTS Sensor Technologie  
GmbH & Co. KG  
Auf dem Schüffel 9  
D-58513 Lüdenscheid  
Tel.: +49-2351-9587-0  
Fax: +49-2351-56491  
[info@mtssensor.de](mailto:info@mtssensor.de)  
[www.mtssensor.de](http://www.mtssensor.de)

**USA**  
MTS Systems Corporation  
Sensors Division  
3001 Sheldon Drive  
Cary, NC 27513, USA  
Tel.: +1-919-677-0100  
Fax: +1-919-677-0200  
[info@mtssensors.com](mailto:info@mtssensors.com)  
[www.mtssensors.com](http://www.mtssensors.com)

**Japan**  
MTS Sensors Technology Corp.  
Ushikubo Bldg.  
737 Aihara-cho, Machida-shi  
Tokyo 194-0211, Japan  
Tel.: +81-42-775-3838  
Fax: +81-42-775-5516  
[info@mtssensor.co.jp](mailto:info@mtssensor.co.jp)  
[www.mtssensor.co.jp](http://www.mtssensor.co.jp)