

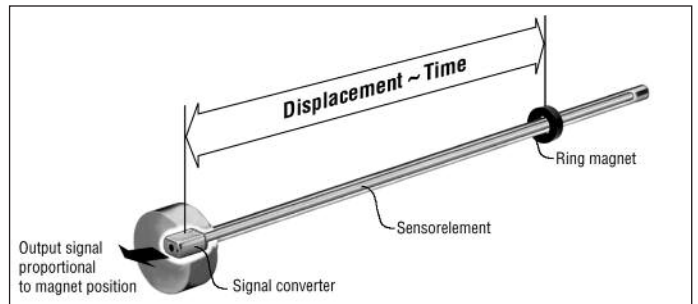
## G-Series SSI

**Temposonics®-GB**  
Measuring length 50 - 3250 mm



Perfect data transmission  
**5 µm**

- Absolute Sensor for Hydraulic Cylinders, without re-homing
- Stainless Steel Rod Sensor
- Contactless Sensing with Highest Durability
- Rugged Industrial Sensor, EMC shielded and CE certified
- Superior Accuracy: Linearity Tolerance better 0,02 %
- Repeatability 0,001 %
- Resolution up to 5 µm
- Direct 25/24 bit SSI output (Gray or Binary)



### 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 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.

### Form factor

These compact stainless steel position sensors are designed for installation into standard hydrocylinders, specifically for use with clevis head or any space limited cylinder applications.

#### Simple mechanics

- The sensor head accommodates the electronics with active signal conditioning
- The pressure-proof sensor pipe with fitting flange protects the internal sensor element. It fits into the bored piston rod.
- The position magnet - fixed at the piston bottom - drives wearfree over the sensor's stroke and starts the measurement signal through sensor rod wall.

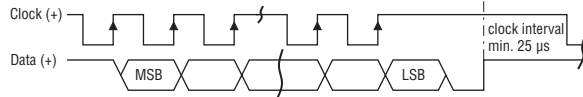
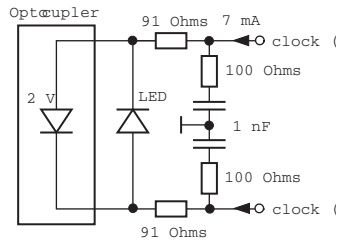
### Temposonics®-GB Pressure Proof Sensor for Standard Hydrocylinders

The interface of Temposonics®-GB linear sensors fulfil all requirements of the SSI standard for absolute rotary transducers.

Its displacement value is encoded in a **25- or 24-bit Binary or Gray** code format and transmitted at very high speed via a serial type interface in **RS 422** standard to the control device. SSI provides effective synchronization in a closed-loop control system. A clock pulse train from a controller is used to gate out sensor data.

#### Measuring range

The output of position values are corresponding with the selected resolution scale. The start position of electrical stroke is here factory set at **40 mm**.



#### Measuring frequency

|                      |     |     |      |      |         |
|----------------------|-----|-----|------|------|---------|
| Measuring range:     | 300 | 750 | 1000 | 2000 | 3250 mm |
| Measurements/second: | 3,7 | 3,0 | 2,3  | 1,2  | 0,8 kHz |

#### Data transfer speed: 70 kBaud ... 1,5 MBaud

Depending on controller selected baud rate, following maximum cable length is permitted.

|               |         |           |           |           |          |
|---------------|---------|-----------|-----------|-----------|----------|
| Cable length: | < 3     | < 50      | < 100     | < 200     | < 400 m  |
| Baud rate:    | 1,5 MBd | < 400 kBd | < 300 kBd | < 200 kBd | < 100kBd |

#### Example:

Resolution: 0,01 mm  
Mounting zone: 40 mm  
Measuring length: 300 mm  
Measuring direction: forward

#### Measuring range

Start position = mm  
Middle = 150 mm  
End position = 300 mm  
Start position, underflow  
End position, small overflow  
End position exceeded or position magnet error

#### Position value

4000 = 40 mm  
19000 = 190 mm  
34000 = 340 mm  
< 4000 = < 40 mm  
> 34000 = > 340 mm  
Alarm value = 000000

### Technical Data

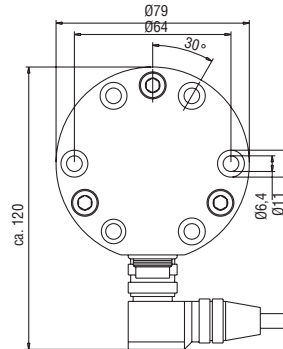
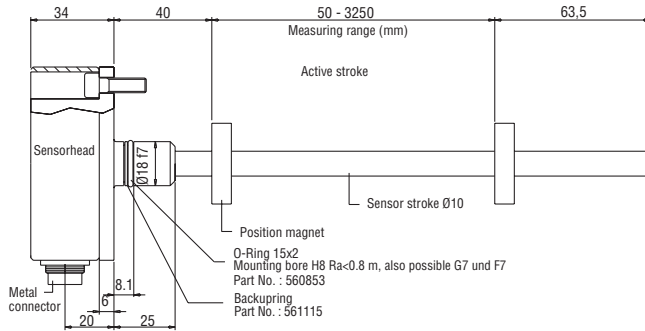
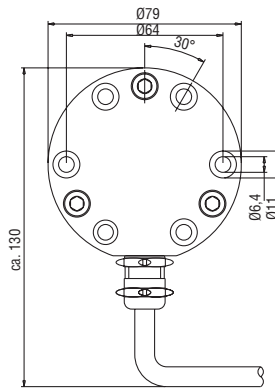
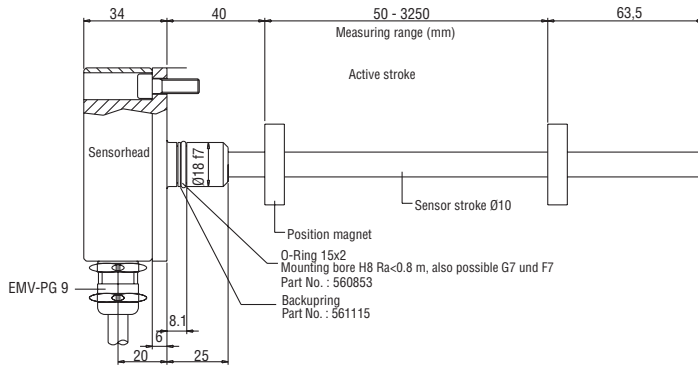
|                               |  |
|-------------------------------|--|
| <b>Input</b>                  |  |
| Measuring Variable            | Displacement   |
| Measuring Range               | 50 - 3250 mm   |
| <b>Output</b>                 |  |
| Interface                     | SSI (Synchronous Serial Interface), RS 422 standard  |
| Data format                   | Binary or Gray encodes   |
| Data length                   | 25 or 24 bit (upon request)  |
| <b>Accuracy</b>               |  |
| Resolution                    | 5/10/20/50/100 µm  |
| Linearity                     | < ± 0,02 % F.S. (Minimum ± 60 µm)  |
| Repeatability                 | < ± 0,001 % F.S.   |
| Temperature coefficient       | < 15 ppm/°C  |
| <b>Operating conditions</b>   |  |
| Magnet speed                  | any  |
| Operating temperature         | -40° C ... +75° C  |
| Pressure rating               | 350 bar, 700 bar peak  |
| Enclosure                     | IP 67 if cable connector is correctly fitted   |
| Shock rating                  | 100 g (Single hit) / IEC-Standard 68-2-27  |
| Vibration rating              | 5g / 10-150 Hz, IEC-Standard 68-2-6  |
| EMC Test                      | Electromagnetic emission EN 61000-6-3<br>Electromagnetic immunity EN 61000-6-2 (EN 61326/A1)<br>EN 61000-4, Criteria A, CE qualified<br>EN 61000-4-2/3/4/6, Criterion A CE qualified |
| <b>Form factor / Material</b> |  |
| Sensor head                   | Stainless steel 1.4305 / AISI 303  |
| Rod with flange               | Stainless steel 1.4301 / AISI 304  |
| Magnet Type                   | Ring magnet, PA-Ferrit   |
| <b>Installation</b>           |  |
| Mounting                      | Any orientation  |
| Sensor mounting               | Flange Ø18h 6, 6 screws (ISO 4762)   |
| <b>Electrical Connection</b>  |  |
| Connection Type               | 7 pin connector M16 x 0,75 or cable outlet (PUR cable 3x2x0,25 mm², Ø 7,9 mm)  |
| Input voltage                 | 24 VDC (+20 % / -15 %)   |
| - Polarity protection         | Up to 30 VDC   |
| - Overvoltage protection      | Up to 36 VDC   |
| Current consumption           | 50 - mA, stroke length dependent   |
| Ripple                        | < 1 % peak to peak   |
| Electric strength             | 500VDC (DC ground to machine ground)   |

### Any fitting position Simple mounting Small installation dimensions

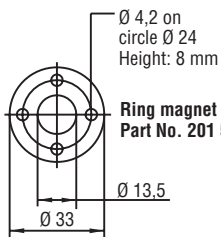
The sensor's high-pressure, stainless steel tube with fitting flange will be fixed via 6 machine screws M6 x 16 x A2-70 (ISO 4762) through the bores in the sensor head. The hydraulic sealing requires the use of a supplied O-Ring 15 x 2. Using ferromagnetic supports, note that the magnet must be mounted with non-ferrous spacer and screws.

### Position magnet

For accurate position measurements mount the magnet with non-ferrous fastening material (screws, supports ect.). Using ferromagnetic supports, note that the magnet must be mounted with non-ferrous spacer of 5 mm minimum and screws. Note the minimum mounting dimensions as illustrated right.

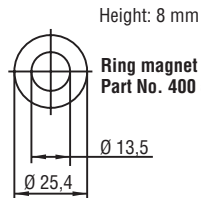


### Position magnets



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

Composite PA-Ferrite-GF20  
Weight ca. 14 g  
Operating temperature:  
-40 ... +100°C  
Surface pressure max. 40 N/mm<sup>2</sup>  
Fastening Torque for M4 screws max. 1 Nm



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

Composite: PA-Ferrite  
Weight ca. 10g  
Operating temperature:  
-40 ... +100°C  
Surface pressure max. 40 N/mm<sup>2</sup>

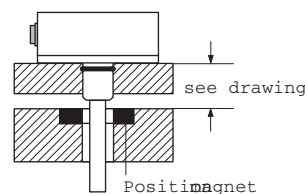
### Cylinder installation

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 ect. The minimum drilling must be 13 mm. Do not exceed the 700 bar peak pressure.

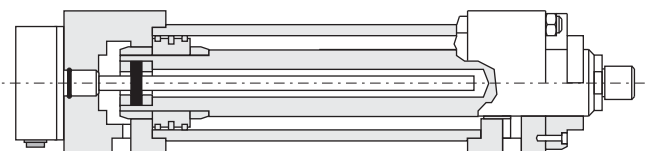
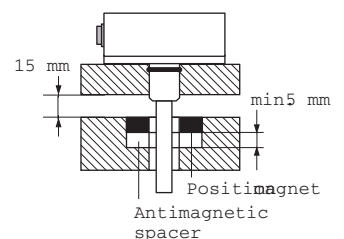
| Wiring | Pin | Cable          | Function  |
|--------|-----|----------------|-----------|
|        | 1   | Gray           | Data (-)  |
|        | 2   | Pink           | Data (+)  |
|        | 3   | Yellow         | Clock (+) |
|        | 4   | Green          | Clock (-) |
|        | 5   | Brown          | +24 VDC   |
|        | 6   | White          | 0 V (GND) |
|        | 7   | do not connect |           |

**Note:**  
Application that can damage the integral cable, please take connector output version. Sensor electronics and integral cable are encapsulated completely. Repairing electronic module is impossible.

### Antimagnetic Support



### Magnetizable support



# Temposonics-GB

SSI

Temposonics®

**GB**

**F**

**M**

**1**

**S**

**Sensor Model**

**Form Factor**

F - Fitting flange Ø18h6

**Measuring length**

0050 - 3250 in 50 mm steps

Options upon request

**Connection Type**

D70 - 7 pin male receptacle M16

U02 - 2 m PUR cable w/o connector

U05 - 5 m PUR cable w/o connector

U10 - 10 m PUR cable w/o connector

**Input voltage**

1 - +24 VDC

**Signal Output**

**S (1)(2)(3)(4)(5)(6)** SSI (Synchronous Serial Interface)

(1) Data length: 1 - 25 bit • 2 - 24 bit

(2) Output format: B - Binary • G - Gray

(3) Resolution (mm): 1 - 0,005 • 2 - 0,01 • 3 - 0,05 • 4 - 0,1 • 5 - 0,02

(4) Performance: 1 - Standard

(5)(6) Options: 00 - Forward measurement • 01 - Reverse measurement

02 - Forward, synchronous measurement

**On Delivery**

Sensor with O-Ring,

Magnet (below) must be ordered separately

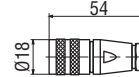
**Accessories (selected)**

| Description   | Part No.  |
|---|-----------|
| Position magnet OD33  | 201 542-2 |
| Position magnet OD25,4  | 400 533   |
| 7 pin female cable connector M16  | 370 624   |
| 7 pin 90° female cable connector M16  | 560 779   |
| PUR cable 3x2x0,25 mm <sup>2</sup>  | 530115    |
| O-Ring 15 x 2 Fluorelastomer FPM 75   | 560 853   |
| Backup ring   | 561 115   |
| <b>MTS-Service tools:</b>   |           |
| PC-Programmer R-SSI incl. power supply (100-240 VAC/24 VDC), connection cable and programming software (CD) | 253 135   |
| SSI display and control unit (96x48x150 mm)   | IX 340    |

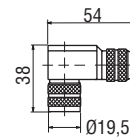
| Stroke length Standard |                |
|------------------------|----------------|
| Stroke                 | Ordering steps |
| < 500 mm               | 5 mm           |
| 500 - 750              | 10 mm          |
| 750 - 1000             | 25 mm          |
| 1000 - 2500            | 50 mm          |
| > 2500                 | 100 mm         |

**Cable connector**

(recommended, not on delivery)



7 pin female cable connector M16  
Part No. 370 624



7 pin 90° female cable connector M16  
Part No. 560 779

Housing: Zinc, nickle plated

Termination: Solder

Contact Insert: Silver plated

Cable clamp: PG9

Cable-Ø: 8 mm

**Document Part Number: 25052012 (EN)**

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