

THE COMPANY

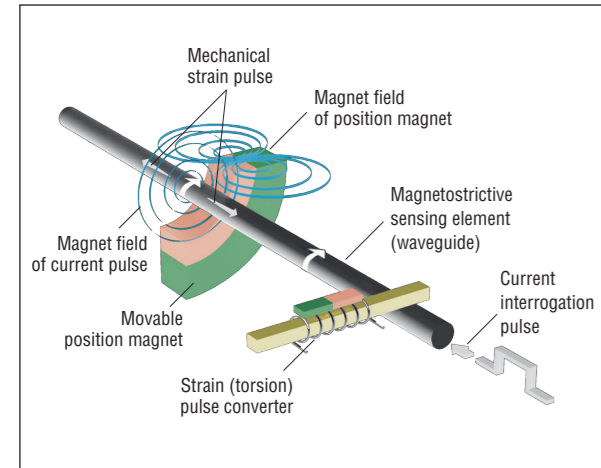
The World of MTS –
Tradition, Experience, Innovation

Following the founding of MTS Systems Corporation in 1951, the company rapidly developed into a leading supplier of intelligent hardware and software products in the fields of test and simulation systems and in measuring and automation technology. Today MTS has over 2300 employees worldwide – 400 of whom are employed by MTS Sensors at three sites in the **USA (Cary, N.C.)**, **Germany (Lüdenscheid)** and **Japan (Tokyo)**. At MTS, intensive basic research is efficiently merged with a consistent focus on practical requirements. The results are innovative solutions for a wide range of potential industrial and non-industrial applications.

THE PRINCIPLE

Magnetostriction –
A Milestone in Measurement Technology

For position measurement, the absolute, linear Temposonics® position sensors make use of the properties offered by the specially designed magnetostrictive waveguide. Inside the sensor a torsional strain pulse is induced in the waveguide by momentary interaction of two magnetic fields. The interaction between these two magnetic fields produces a strain pulse, which is detected by the electronics at the head of the sensor. One field is produced by a moving position magnet, which travels along the sensor rod with the waveguide inside. The other field is generated by a current pulse applied to the waveguide. The position of the moving magnet is determined precisely by measuring the time elapsed between the application of the current pulse and the arrival of the strain pulse at the sensor electronics housing. The result is a reliable position measurement with high accuracy and repeatability.



THE APPLICATIONS

Temposonics® Sensors can be installed
in Applications across many Industries:

- Packaging industry
- Beverage bottling plants
- Plastic industry
- Steel rollers
- Wind power
- Paper industry
- Wood industry and many more

THE ADVANTAGES

Sensors from the Market Leader
MTS Sensors offer:

- a large variety of mechanical options, interfaces and performances
- programming tools which can be flexibly adapted to your applications
- specialized and application-oriented pre- & after-sales support
- continuous development of new sensor solutions by a large team of highly qualified engineers
- 100 % quality control in each product phase

ADDITIONAL SENSOR TYPES

MTS Sensors offers further innovative sensor models based on the magnetostrictive technology. These include sensors that have been developed especially for applications of the OEM market and mobile machinery as well as the MTS Level Plus® product line.

For more information about the products of MTS Sensors please visit: www.mtssensors.com



Temposonics®
Our core competence for absolute
reliable measurement results



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Temposonics®

Magnetostrictive Linear Position Sensors

PRODUCT OVERVIEW INDUSTRIAL SENSORS



The Measurable Difference

R-SERIES



RH Rod-style designed for use in hydraulic /pneumatic cylinders
RP Profile-style easily mounts on machine surface
RF Flexible rod-style for installation along an arc or for limited space
RD4 Rod-style with detached electronics
RS Robust position sensor with IP69K protective housing

Input					
Stroke length	25...7600 mm	25...5000 mm	100...20000 mm	25...5000 mm	50...7600 mm
Output ²					
Voltage	0...10 VDC; 10...0 VDC; -10...+10 VDC	0...10 VDC; 10...0 VDC; -10...+10 VDC	0...10 VDC; 10...0 VDC; -10...+10 VDC	0...10 VDC; 10...0 VDC; -10...+10 VDC	0...10 VDC; 10...0 VDC; -10...+10 VDC
Current	4(0)...20 mA; 20...4(0) mA	4(0)...20 mA; 20...4(0) mA	4(0)...20 mA; 20...4(0) mA	4(0)...20 mA; 20...4(0) mA	4(0)...20 mA; 20...4(0) mA
SSI	Gray/binary coding; data length selectable; synchr./asynchr. measurement; opt. parity- and error bit.	Gray/binary coding; data length selectable; synchr./asynchr. measurement; opt. parity- and error bit.	Gray/binary coding; data length selectable; synchr./asynchr. measurement; opt. parity- and error bit.	Gray/binary coding; data length selectable; synchr./asynchr. measurement; opt. parity- and error bit.	Gray/binary coding; data length selectable; synchr./asynchr. measurement; opt. parity- and error bit.
Fieldbus	CANopen; Profibus; EtherCAT; EtherNet/IP; Profinet; Powerlink	CANopen; Profibus; EtherCAT; EtherNet/IP; Profinet; Powerlink	CANopen; Profibus; EtherCAT; EtherNet/IP; Profinet; Powerlink	CANopen; Profibus; EtherCAT; EtherNet/IP; Profinet; Powerlink	CANopen; Profibus; EtherCAT
Start/Stop	—	—	—	—	—
Accuracy					
Linearity	< ±0.01 % F.S.	< ±0.01 % F.S.	< ±0.02 % F.S.	< ±0.02 % F.S.	< ±0.01 % F.S.
Resolution analog	16 bit; 0.0015 %	16 bit; 0.0015 %	16 bit; 0.0015 %	16 bit; 0.0015 %	16 bit; 0.0015 %
Resolution digital	CAN: 2 µm; Profibus, Profinet, Powerlink, EtherCAT & EtherNet/IP: 1 µm; SSI: 0.5 µm	CAN: 2 µm; Profibus, Profinet, Powerlink, EtherCAT & EtherNet/IP: 1 µm; SSI: 0.5 µm	CAN: 2 µm; Profibus, Profinet, Powerlink, EtherCAT & EtherNet/IP: 1 µm; SSI: 0.5 µm	CAN: 2 µm; Profibus, Profinet, Powerlink, EtherCAT & EtherNet/IP: 1 µm; SSI: 0.5 µm	CAN: 2 µm; Profibus & EtherNet/IP: 1 µm; SSI: 0.5 µm
Electrical connection					
Operating voltage	24 VDC (-15 / +20 %)	24 VDC (-15 / +20 %)	24 VDC (-15 / +20 %)	24 VDC (-15 / +20 %)	24 VDC (-15 / +20 %)
Certification					
ATEX	Ⓜ II 3G Ex nA IIC T4 Gc Ⓜ II 3D Ex tc IIIB T100°C Dc IP65/67	Ⓜ II 3G Ex nA IIC T4 Gc Ⓜ II 3D Ex tc IIIB T100°C Dc IP65/67	—	—	Ⓜ II 3G Ex nA IIC T4 Gc Ⓜ II 3D Ex tc IIIB T100°C Dc IP65/67
Features					
Velocity measurement	✓	✓	✓	✓	✓
Simultaneous multi magnet measurement ³	✓	✓	✓	✓	✓
Parameter upload for start/stop	—	—	—	—	—
Stroke length / sensor parameters programmable	✓	✓	✓	✓	✓
Diagnostic LEDs	✓	✓	✓	✓	—

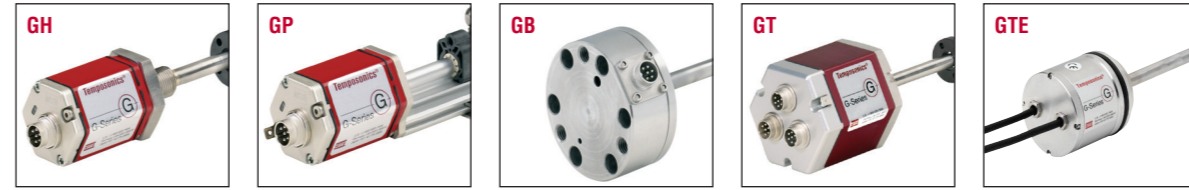
E-SERIES



EH Rod-style designed for use in hydraulic/ pneumatic cylinders
EP Profile-style easily mounts on machine surface
EL Ultra low height profile-style mounts on machine
ER Rod-&-cylinder housing with strong piston for flexible mounting
EE Compact rod-style for embedded cylinder applications

Input					
Stroke length	50...2500 mm	50...2500 mm ⁽¹⁾	50...2500 mm ⁽¹⁾	50...1500 mm	50...2500 mm
Output					
Voltage	0...10 VDC and/or 10...0 VDC	0...10 VDC and/or 10...0 VDC	0...10 VDC and/or 10...0 VDC	0...10 VDC and/or 10...0 VDC	—
Current	4...20 mA; 20...4 mA	4...20 mA; 20...4 mA	4...20 mA; 20...4 mA	4...20 mA; 20...4 mA	4...20 mA; 20...4 mA
SSI	Gray or binary coding; data length selectable	Gray or binary coding; data length selectable	Gray or binary coding; data length selectable	Gray or binary coding; data length selectable	—
Fieldbus	CANopen	CANopen	CANopen	—	—
Start/Stop	Impuls RS 422	Impuls RS 422	Impuls RS 422	Impuls RS 422	—
Accuracy					
Linearity	≤ ±0.02 % F.S.	≤ ±0.02 % F.S.	≤ ±0.02 % F.S.	≤ ±0.02 % F.S.	≤ ±0.02 % F.S.
Resolution analog	infinite	infinite	infinite	infinite	infinite
Resolution digital	SSI: 20 µm CANopen: 10 µm Start/Stop: controller dependent	SSI: 20 µm CANopen: 10 µm Start/Stop: controller dependent	SSI: 20 µm CANopen: 10 µm Start/Stop: controller dependent	SSI: 20 µm Start/Stop: controller dependent	—
Electrical connection					
Operating voltage	24 VDC (-15 / +20 %)	24 VDC (-15 / +20 %)	24 VDC (-15 / +20 %)	24 VDC (-15 / +20 %)	24 VDC (-15 / +20 %)
Certification					
ATEX	—	—	—	—	—
Features					
Velocity measurement	—	—	—	—	—
Simultaneous multi magnet measurement ³	✓	✓	✓	—	—
Parameter upload for start/stop	✓	✓	✓	✓	—
Stroke length / sensor parameters programmable	—	—	—	—	—
Diagnostic LEDs	—	—	—	—	—

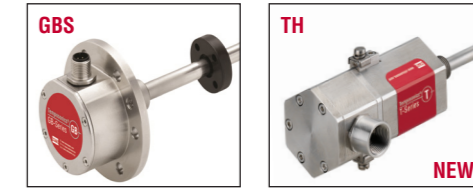
G-SERIES



GH Rod-style designed for use in hydraulic /pneumatic cylinders
GP Profile-style easily mounts on machine surface
GB Robust & compact rod-style
GT Rod-style with dual or triple redundant measurement
GTE Rod-style with redundant measurement for high operating temperatures

Input					
Stroke length	50...7600 mm ⁽¹⁾	50...5000 mm ⁽¹⁾	50...3250 mm ⁽¹⁾	50...2900 mm	50...2540 mm
Output ²					
Voltage	0...10 VDC; 10...0 VDC; -10...+10 VDC	0...10 VDC; 10...0 VDC; -10...+10 VDC	0...10 VDC and 10...0 VDC	0...10 VDC; 10...0 VDC; -10...+10 VDC	0...10 VDC; 10...0 VDC; -10...+10 VDC
Current	4(0)...20 mA; 20...4(0) mA	4(0)...20 mA; 20...4(0) mA	4...20 mA; 20...4 mA	4(0)...20 mA; 20...4(0) mA	4(0)...20 mA; 20...4(0) mA
SSI	—	—	Gray/binary coding; data length selectable; synchr./ asynchr. measurement	—	—
Fieldbus	—	—	—	—	—
Start/Stop	Impuls RS 422	Impuls RS 422	—	—	—
Accuracy					
Linearity	< ±0.02 % F.S.	< ±0.02 % F.S.	< ±0.02 % F.S.	< ±0.02 % F.S.	< ±0.02 % F.S.
Resolution analog	infinite	infinite	infinite	infinite	infinite
Resolution digital	5 µm	5 µm	5 µm	—	—
Electrical connection					
Operating voltage	24 VDC (-15 / +20 %)	24 VDC (-15 / +20 %)	24 VDC (-15 / +20 %)	24 VDC (-15 / +20 %)	24 VDC (-15 / +20 %)
Certification					
ATEX	Ⓜ II 3G Ex nA IIC T4 Gc Ⓜ II 3D Ex tc IIIB T100°C Dc IP65/67	Ⓜ II 3G Ex nA IIC T4 Gc Ⓜ II 3D Ex tc IIIB T100°C Dc IP65/67	—	—	Ⓜ II 3G Ex nA IIC T4 Gc IP54
Features					
Velocity measurement	—	—	—	—	—
Simultaneous multi magnet measurement ⁴	✓	✓	—	—	—
Parameter upload for start/stop	—	—	—	—	—
Stroke length / sensor parameters programmable	✓	✓	—	✓	✓
Diagnostic LEDs	✓	✓	—	—	—

GB-SERIES T-SERIES



GBS High pressure rod-style for high operating temperature
TH ATEX & IECEx certified and SIL 2 capable rod-style for maximum safety

Input		
Stroke length	25...3250 mm	25...7600 mm (SIL 2: 25...1500 mm)
Output ²		
Voltage	0...10 VDC and 10...0 VDC	—
Current	4(0)...20 mA; 20...4(0) mA	4(0)...20 mA; (SIL 2: 4...20 mA) 20...4(0) mA (SIL 2: 20...4 mA)
SSI	Gray/binary coding; data length selectable; synchr./ asynchr. measurement	—
Fieldbus	—	—
Start/Stop	—	—
Accuracy		
Linearity	< ±0.02 % F.S.	< ±0.01 % F.S.
Resolution analog	16 bit	16 bit
Resolution digital	5 µm	—
Electrical connection		
Operating voltage	24 VDC (-15 / +20 %)	24 VDC (-15 / +20 %)
Certification		
ATEX/SIL 2	—	Flameproof housing (protection type D) Ⓜ II 1/2G Ex db IIC T4 Ga/Gb Ⓜ II 1G/2D Ex tb IIIC T130°C Ga/Dc IP66 / IP67 Increased safety (protection type E) Ⓜ II 1/2G Ex db e IIC T4 Ga/Gb Ⓜ II 1G/2D Ex tb IIIC T130°C Ga/Dc IP66 / IP67
Features		
Velocity measurement	—	—
Simultaneous multi magnet measurement	—	—
Parameter upload for start/stop	—	—
Stroke length / sensor parameters programmable	✓	✓ (SIL 2: —)
Diagnostic LEDs	—	—

Note:
The following sensor models are marked with UL/cUL:
RP, RH,
GP, GH,
EP, EH, EL, ER

Note:
The following series are GOST certified:
R-Series



Please note the current data sheets.

¹/ Depending on output
²/ Further outputs on request
³/ Besides SSI
⁴/ Only digital