



Magnetostrictive Linear Position Sensors

DATA SHEET GBS Analog

- High pressure resistant sensor rod
- High operating temperature up to 100 $^{\circ}\mathrm{C}$
- Flat & compact ideal for the valve market



MEASURING 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 head. The result is a reliable position measurement with high accuracy and repeatability.



Fig. 1: Measuring principle

GBS SENSOR

Robust, non-contact and wear free, the Temposonics[®] linear position transducers 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 MTS. The position magnet is mounted on the moving machine part and travels non-contact over the sensor rod with the built-in waveguide.

Temposonics[®] GBS is a rod-style sensor with backwards compatibility for installation into hydraulic cylinders, e.g. in power engineering. With its flat and compact sensor housing and the collateral signal connection the sensor is ideal for small spaces. Due to the pressure-resistant sensor rod and its high operating temperature the Temposonics[®] GBS sensor is perfectly suitable for use in fluid technology. For improved signal quality the sensor automatically adapts to the strength of the magnet used in the application.

The set points, zero and span position of the measurement, can be modified after installation of the Temposonics[®] GBS sensor. Programming can be carried out using the standard connection cable. Optionally the sensor offers *Bluetooth*[®] ¹ connectivity for programming. In case of *Bluetooth*[®] connectivity the set points can be modified even when the sensor is no longer accessible. In the case of a wireless *Bluetooth*[®] connection there is the possibility to program the sensor via cable connection.



Fig. 2: Bluetooth[®] wireless technology

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Fig. 2: Montage of MTS Sensors and © Tsiumpa - Fotolia.com For iOS operating system available in the future. Please take notice of delivery.

TECHNICAL DATA

Input	
Measured value	position
Stroke length	253250 mm
Output	
Voltage	010 VDC and 100 VDC (min. load controller: > 5 kOhms)
Current	4(0)20 mA or 204(0) mA (min./max. load: 0/500 Ohms)
Programming	programming of set points using optional accessories ²
Accuracy	
Resolution	16 bit (minimum 1 μm)
Linearity	< ±0.02 % F.S. (minimum ±60 µm)
Repeatability	≤ ±0.005 % F.S. (minimum ±20 μm)
Sample rate	up to 1200 mm: 0.5 ms up to 2400 mm: 1 ms > 2400 mm: 2 ms
Operating conditions	
Magnet movement velocity	any
Operating temperature	–40…+90 °C, Option –40…+100 °C
Operating pressure	350 bar, 700 bar peak (at 10×1 min)
Ingress protection	IP67 with proper mating connector IP68 for cable outlet
Shock test	100 g (single shock) / IEC-Standard 60068-2-27
Vibration test	15 g / 102000 Hz, IEC-Standard 60068-2-6 (resonance frequencies excluded)
EMC test	electromagnetic emission according to EN 61000-6-4 electromagnetic immunity according to EN 61000-6-2 The sensor meets the requirements of the EC directives and is marked with CE
Design/Material	
Sensor electronics housing	stainless steel 1.4305 / AISI 303 ³
Sensor rod with flange	stainless steel 1.4306; 1.4307 / AISI 304 L
Position magnet	ring magnet, PA ferrite
Installation	
Mounting position	any
Mounting	fitting flange Ø 18 f7, 6 bores for machine screws (ISO 4762)
Electrical connection	
Connection type	cable gland M12 a-code (5 pin) M16 (6 pin)
Operating voltage	+24 VDC (+20 % / -15 %)
Current consumption	100 mA typically dependent on stroke length
Ripple	≤ 0.28 Vpp
Dielectric strength	500 VDC (DC ground to machine ground)

 $\rm 2/$ Programming via Bluetooth wireless technology is only possible up to an operating temperature of 75 $^{\circ}\rm C$

3/ For option H (-40...+100 °C) and option w (programming via Bluetooth wireless technology) an aluminum cover plate is used

TECHNICAL DRAWING



CONNECTOR WIRING

M12 connector

D34	Pin	Voltage	Current
	1	+24 VDC (-15/+20 %)	+24 VDC (-15/+20 %)
	2	010 V	4(0)20 mA <i>or</i> 20 4(0) mA
	3	DC Ground (0 V)	DC Ground (0 V)
52	4	100 V	n.c.
	5	DC Ground	DC Ground

M16 connector

D60	Pin	Voltage	Current
	1	010 V	4(0)20 mA <i>or</i> 20 4(0) mA
	2	DC Ground	DC Ground
5 1	3	100 V	n.c.
	4	DC Ground	DC Ground
	5	+24 VDC (-15/+20 %)	+24 VDC (-15/+20 %)
	6	DC Ground (0 V)	DC Ground (0 V)

Cable outlet

Cable	Voltage	Current
GY	010 V	4(0)20 mA <i>or</i> 20 4(0) mA
PK	DC Ground	DC Ground
YE	100 V	n.c.
GN	DC Ground	DC Ground
BN	+24 VDC (-15/+20 %)	+24 VDC (-15/+20 %)
WH	DC Ground (0 V)	DC Ground (0 V)

ACCESSORIES



4/ All dimensions in imm5/ Max. fastening torque: 0.6 Nm

ORDER CODE

a	Ту	pe o	f flange	е	Outpu	ut
S	Rod with fitting flange Ø 18 mm, 10 mm rod		V	0 0	10 V and 100 V	
				Α	0 4	20 mA
b	Str	oke	length	Α	1 2	04 mA
Χ	X X X 253250 mm			Α	2 0	20 mA
				Α	3 2	00 mA
C	Co	nne	tor type			
D	3	4	5 pin M12 male connector	f	Oper	ating temperature
D	6	0	6 pin M16 male connector	S	-40	.+90 °C
Η	X	X	PUR cable (suitable for max. operation temperature of 80 °C)	Η	-40	.+100 °C
			H01H10 (110 m)			
Τ	X	X	Teflon cable T01T10 (110 m)	g	Prog	ramming
V	X	X	Silicone cable V01V10 (110 m)	C	Via ca	able
				W	Via B	luetooth wireless technology
d	Op	era	ing voltage			

STANDARD STROKE LENGTH GBS

1 +24 VDC, +20 %, -15 %

Stroke length	Ordering steps
< 500 mm	5 mm
500750 mm	10 mm
7501000 mm	25 mm
10002500 mm	50 mm
2500≤ 3250 mm	100 mm

DELIVERY

Sensor

Accessories have to be ordered separately.

Document Part Number:

GERMANY

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