

FMS Tension Control / Force Sensors

## ZMGZ-Series Force sensor rolls without shaft

- **For a wide range of applications**  
Nominal force ratings from 100 to 3'000 N  
(22 to 674 lbf.)
- **No need to change a standard machine design for special applications**  
25 or 35 mm shaft journal for standard bearings
- **Easy installation of standard bearings**  
Options include high temperature and vacuum chamber (to 1E-7 hPa) construction
- **Precise measuring results**  
Measuring range 30:1  
Accuracy class  $\pm 0.5\%$



### ZMGZ-Series

The ZMGZ-Series force sensor offers flexible installation options, and are designed for the measurement of tension on continuous material processing lines where idler rolls with integrated bearings without shaft are utilized. The product is available in two sizes. The shaft journals of 25 or 35 mm diameter accept standard bearings.

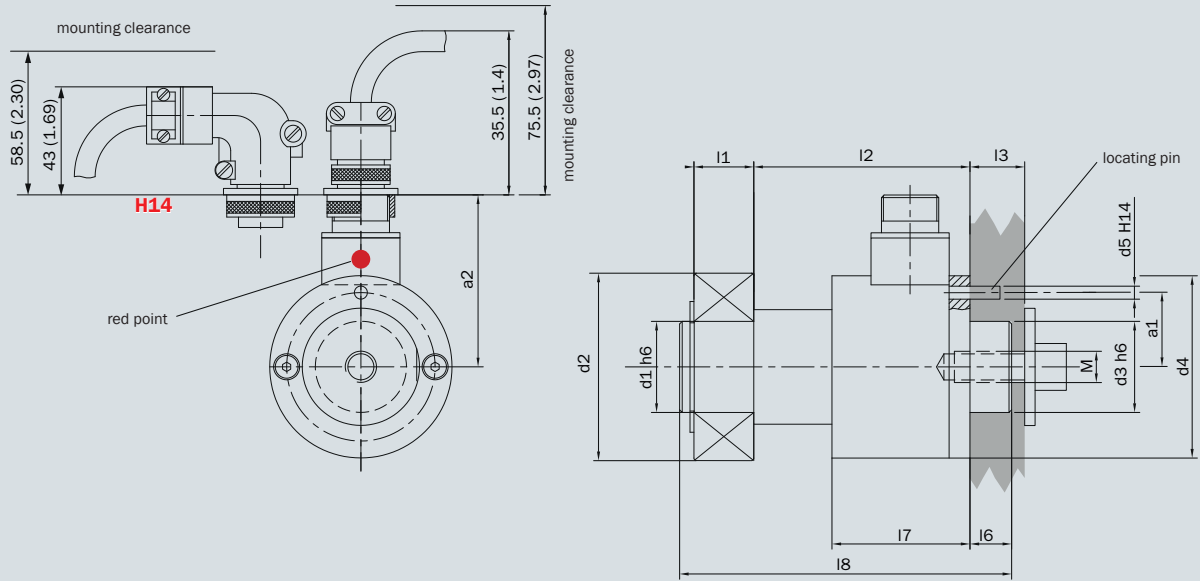
### Functional description

The ZMGZ-Series force measuring sensor combines the bearing seat and the force sensor within the same housing, thus minimizing the required installation space. The substantial overload protection translates to eliminated/minimized calibration issues due to machine upset conditions. The movement of the bending beam, which is proportional to the applied force, is detected by strain gauges arranged in a full bridge circuit and then converted into an electrical signal. This simple measurement principle delivers precise results even with low material tension and small web wrap angles. The Red Point, as located on the sensor body, should be aligned with the direction of the resultant force due to web tension.

DATA SHEET

FMS Tension Control | Force Sensors | **ZMGZ-Series**

**ZMGZ-Series** : Dimensions



Bearing types for ZMGZ205: 2205 or 62205; Bearing types for ZMGZ307: 2207 or 62207

**ZMGZ-Series** : Specifications in mm (in.)

Size	d1	d2	d3	d4	d5	M	a1	a2
<b>ZMGZ205</b>	25 (0.98)	52 (2.05)	30 (1.18)	50 (1.97)	4 (0.16)	M10	20 (0.79)	54.5 (2.15)
<b>ZMGZ307</b>	35 (1.38)	72 (2.84)	35 (1.38)	70 (2.76)	5 (0.20)	M12	28.5 (1.12)	66 (2.60)

**ZMGZ-Series** : Specifications in mm (in.)

Size	l1	l2	l3	l6	l7	l8
<b>ZMGZ205</b>	18 (0.71)	68.5 (2.70)	12-18 (0.47-0.71)	10 (0.40)	43.5 (1.71)	100 (3.94)
<b>ZMGZ307</b>	23 (0.91)	83 (3.27)	18-28 (0.71-1.10)	16 (0.63)	53 (2.09)	127.5 (5.02)

**ZMGZ-Series** : Nominal forces, Deflection, Weight

Size Typ	Nominal force N, kN (lbf.)	Deflection mm (in.)	Weight kg (.lbs)
<b>ZMGZ205</b>	100, 200, 375, 750, 1500 (22, 45, 84, 169, 337)	0.15 (0.0059)	1.0 (2.20)
<b>ZMGZ307</b>	100, 200, 375, 750, 1500, 3000 (22, 45, 84, 169, 337, 674)	0.15 (0.0059)	2.2 (4.85)

ZMGZ-Series : Technical data	
<b>Sensitivity</b>	1.8 mV/V
<b>Tolerance of sensitivity</b>	< ± 0.2%
<b>Accuracy class</b>	± 0.5% (F <sub>Nom</sub> )
<b>Temperature coefficient</b>	± 0.1% / 10 K
<b>Temperature range</b>	-10 °C to +60 °C (14 F to 140 F)
<b>Input resistance</b>	350 Ω
<b>Power supply</b>	1 to 10 VDC
<b>Overload protection</b>	10 times nominal force F <sub>Nom</sub>
<b>Material main body</b>	Stainless steel
<b>Protection class</b>	IP 42
<b>Electrical connection</b>	Male flange connector, amphenol, 4-pole
<b>Repeatability error</b>	0.05%
<b>Measuring range</b>	30:1

ZMGZ-Series : Order code	
<b>ZMGZ 205 .100 .25 .H14.H16</b>	
	Options
	Journal diameter in mm
	Nominal force rating in N
	Size
	Series

ZMGZ-Series : Options	
<b>H14</b>	right-angle connector in scope of supply, replaces straight connector
<b>H16</b>	temperature range up to 120 °C (248 °F)
<b>H18</b>	with water tight, straight connector, replaces original connector
<b>H21</b>	electrical connection with PG gland with 5 m (16.4 ft.) cable, replaces connector
<b>H28</b>	red point offset 180°
<b>H29</b>	resistant against aggressive media, especially acids (please specify), up to 120 °C (248 °F)
<b>H30</b>	resistant against aggressive media, especially hydrocarbons (please specify) up to 120 °C (248 °F)
<b>H31</b>	for vacuum applications to 1E-7 hPa 1E-5 Torr, temperature range up to 120 °C (248 °F)

ZMGZ-Series : Scope of supply	
● force sensor ● straight connector (female) ● clip ring ● installation screw with washer	

ZMGZ-Series : Accessories	
● cable, 1 m (3.25 ft.) without connector ● cable, 10 m (32.8 ft.) without connector ● cable, 5 m (16.4 ft.) without connector ● cable, 2 m (6.5 ft.) without connector ● connector amphenol, 4-pole, straight ● connector amphenol, 4-pole, right angle	

**ZMGZ-Series** : Typical application



**Other products** : Tension Control

Measuring Amplifiers	Tension Controllers	Intrinsically Safe Barrier
		

**About us**

FMS Force Measuring Systems AG is the market leader in the field of web tension measurement, control and specialist for web guiding solutions. For the wire industry we are the only manufacturer offering a complete range of technologies for force measurement, data processing and radio transmission of signals.

Our in house developed products are used in the manufacturing industry, converting, metals, paper, textiles, as well as in cable and wire rope production. Utilising the latest technology, high quality components and a firm understanding of customer applications, FMS supports customers worldwide in the effort to maximize the productivity of their machines. Since 1993, our highly qualified employees have been creating high-end solutions for machine builders and plant operators. As an owner-managed company, we pride ourselves on being personal and approachable with the ability to make decisive moves fast.

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