

FMS Tension Control / Force Sensors

## UMGZ-Series Standard force measuring block

- **Robust and durable**  
Overload protection up to 10-times nominal force, measuring body from stainless steel
- **For a wide range of applications**  
8 sizes with nominal force from 0.25 to 100 kN (56 to 22'500 lbf.)
- **Wide measuring range with highest resolution**  
Measuring range 30:1  
Accuracy class  $\pm 0.5\%$



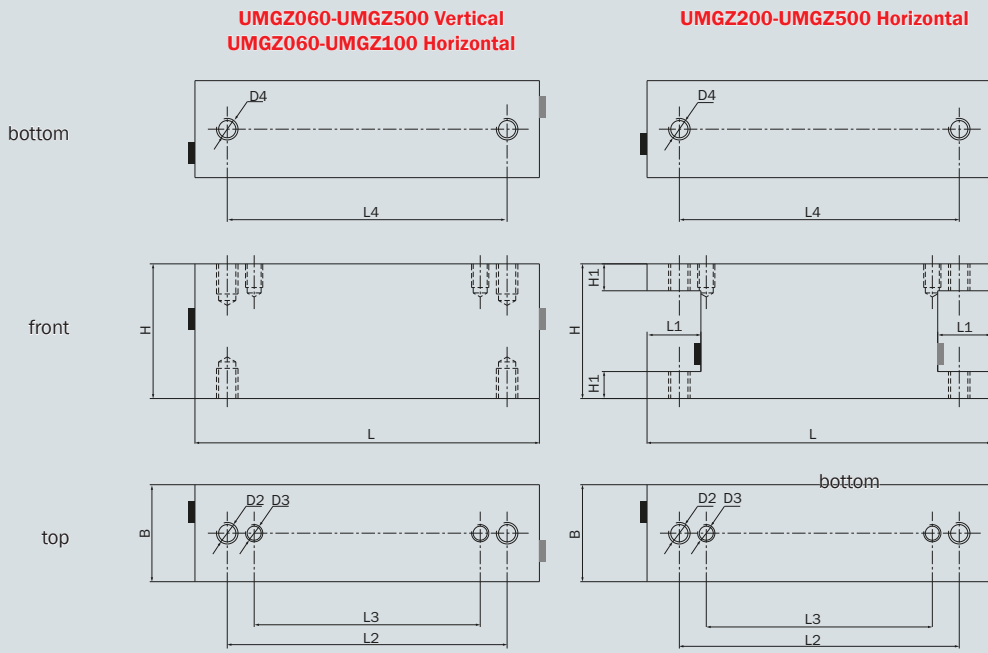
### UMGZ-Series

The force sensors of the UMGZ-Series, designed for the measurement of material tension on continuous processing lines, are used in combination with standard pillow blocks. Block mounting is simple utilizing four fasteners into the bottom surface. Force measuring blocks of the UMGZ-Series feature longevity, precision and reliability. The UMGZ-Series is available in two versions, horizontal and vertical, and thus can be specified for use in any mounting orientation and strip wrap configuration. With the superior performance of the UMGZ-Series, accurate tension readings are obtained even with low web wrap angles and high roll weights.

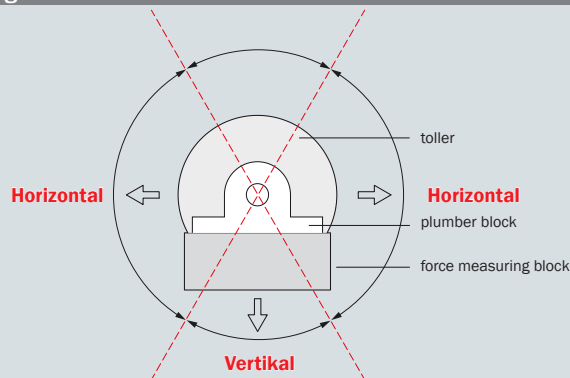
### Functional description

Standard pillow blocks are installed on the force measuring blocks of the UMGZ-Series. This design combines force sensor and bearing seat and allows for easy maintenance or exchange of the blocks, bearings and roll. The UMGZ-Series is available in two measuring versions, horizontal and vertical, and thus can be specified for use in any mounting orientation and material wrap configuration. The UMGZ-Series design, incorporating dual bending beams, eliminates the load-specific influences of torque. The movement of the bending beams is detected by a set of strain gages arranged in a full bridge circuit. The resulting electrical signal, which is proportional to the applied force, is then amplified for use in monitoring or controlling web tension. With the superior performance of the UMGZ-Series, accurate tension readings are obtained even with low web wrap angles and high roll weights.

**UMGZ-Series : Design and Dimensions**

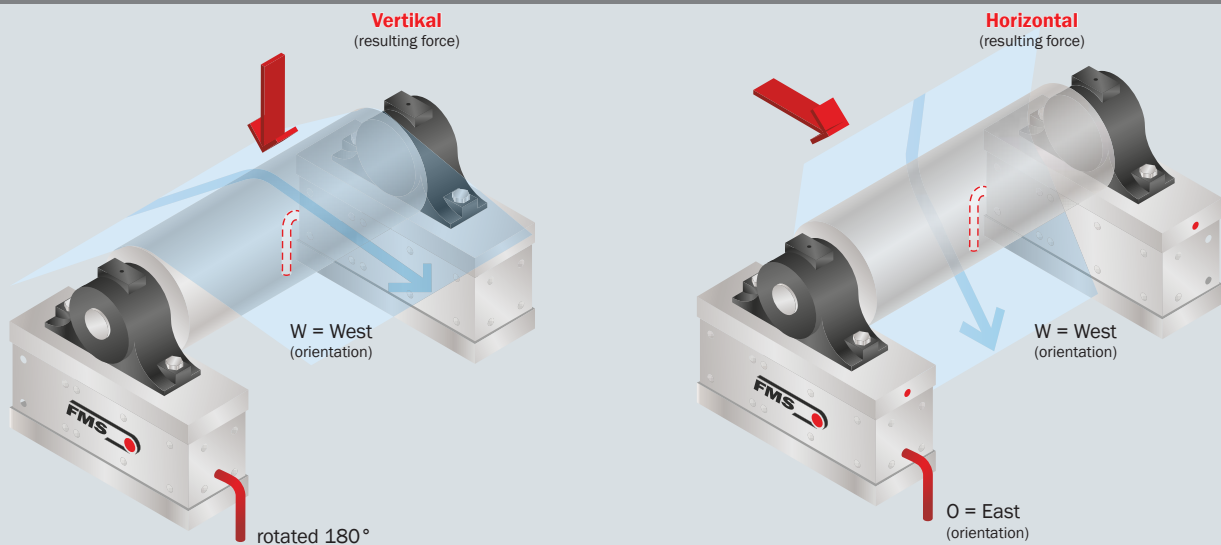


**Horizontal or vertical force measuring block**



Depending on the resulting measuring force direction, a horizontally or vertically measuring UMGZ force measuring block is selected.

**Orientation of the electrical connection**



There is no electrical connection O for this version available. Simply rotate a block with W connection with 180° for the opposite side.

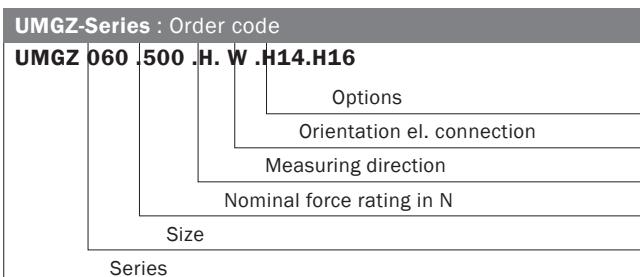
Illustration with one force sensor with W = West oriented and one with O = East oriented electrical connection.

UMGZ-Series : Nominal forces, Shaft diameter, Deflection						
Size Type	Nominal force kN (lbf.)		Shaft diameter d $\phi$ mm (in.)		Deflection mm (in.)	
<b>UMGZ060</b>	0.25, 0.5, 1, 2	(56, 112, 224, 449)	12 – 25	(0.47 – 0.98)	0,2	(0.0079)
<b>UMGZ080</b>	0.5, 1, 2, 5	(112, 224, 449, 1124)	30 – 40	(1.18 – 1.57)	0,2	(0.0079)
<b>UMGZ100</b>	0.5, 1, 2, 5, 10, 20	(112, 224, 449, 1124, 2248, 4496)	20 – 50	(0.49 – 1.97)	0,5	(0.0197)
<b>UMGZ200</b>	2, 5, 10, 20, 30, 40	(449, 1124, 2248, 4496, 6744, 8992)	40 – 85	(1.57 – 3.35)	0,5	(0.0197)
<b>UMGZ300</b>	5, 10, 20, 50	(1124, 2248, 4496, 11240)	75 – 100	(2.95 – 3.94)	0,5	(0.0197)
<b>UMGZ435</b>	10, 20, 50, 100	(2248, 4496, 11240, 22480)	85 – 120	(3.35 – 4.72)	0,5	(0.0197)
<b>UMGZ439</b>	10, 20, 50, 100	(2248, 4496, 11240, 22480)	100 – 110	(3.94 – 4.33)	0,5	(0.0197)
<b>UMGZ500</b>	10, 20, 50, 100	(2248, 4496, 11240, 22480)	110 – 160	(4.33 – 6.30)	0,5	(0.0197)

UMGZ-Series : Dimensions, Installation bores, Weight							
Size Type	Dimensions mm (in.)			Installation bores top		Installation bores bottom L4 x D4	Weight max. kg (lbs.)
	L	B	H	L2 x D2	L3 x D3		
<b>UMGZ060</b>	140 (5.51)	60 (2.36)	90 (3.54)	100 (3.94) x M10		100 (3.94) x M10	5 (11.02)
<b>UMGZ080</b>	190 (7.48)	60 (2.36)	90 (3.54)	131 (5.16) x M12		131 (5.16) x M12	6.5 (14.33)
<b>UMGZ100</b>	230 (9.06)	90 (3.54)	125 (4.92)	170 (6.69) x M12	130 (5.12) x M12	170 (6.69) x M16	15.5 (34.17)
<b>UMGZ200</b>	320 (12.60)	90 (3.54)	125 (4.92)	260 (10.24) x M20	210 (8.27) x M16	260 (10.24) x M20	21 (46.30)
<b>UMGZ300</b>	380 (14.96)	110 (4.33)	125 (4.92)	320 (12.60) x M24		320 (12.60) x M24	31 (68.34)
<b>UMGZ435</b>	450 (17.72)	130 (5.12)	125 (4.92)	350 (13.78) x M24		390 (15.35) x M24	35 (77.16)
<b>UMGZ439</b>	450 (17.72)	130 (5.12)	125 (4.92)	390 (15.35) x M24		390 (15.35) x M24	35 (77.16)
<b>UMGZ500</b>	560 (22.05)	170 (6.69)	150 (5.91)	470 (15.50) x M30		470 (15.50) x M30	75 (165.35)

UMGZ-Series : Technical data	
<b>Sensitivity</b>	1.8 mV/V
<b>Tolerance of sensitivity</b>	< $\pm 0.2\%$
<b>Accuracy class</b>	$\pm 0.5\%$ (F <sub>Nom</sub> )
<b>Temperature coefficient</b>	$\pm 0.1\%$ / 10 K
<b>Temperature range</b>	-10 °C to +60 °C (14 F to 140 F)
<b>Input resistance</b>	350 $\Omega$
<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

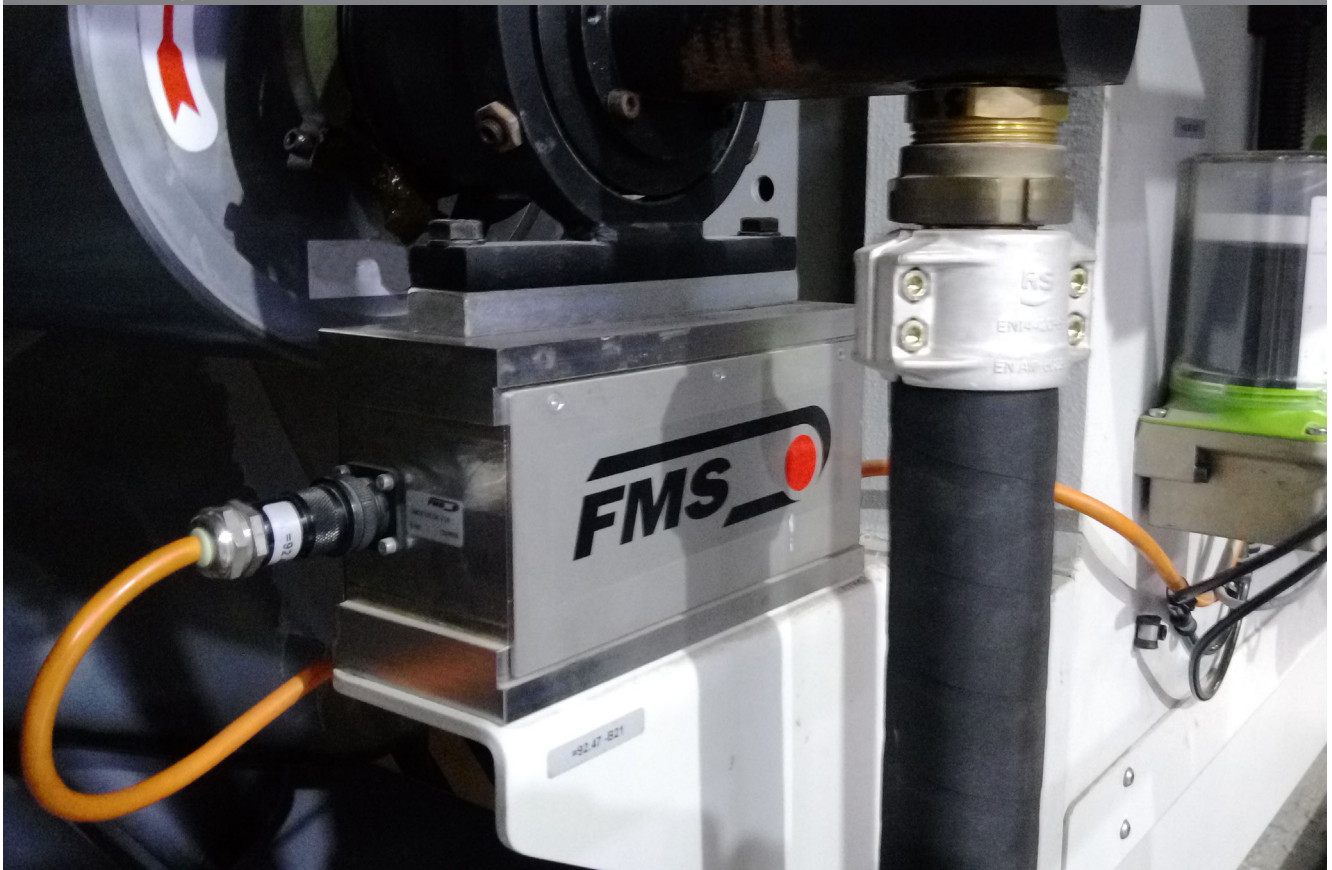
UMGZ-Series : Options	
<b>H</b>	horizontal measuring direction, appr. $\pm 60$ deg. from the horizontal
<b>V</b>	vertical measuring direction
<b>O</b>	electrical connection East in direction of the moving web/strip
<b>W</b>	electrical connection West in direction of the moving web/strip
<b>H14</b>	right-angle connector in scope of supply, replaces straight connector (angle adjustable by customer)
<b>H16</b>	temperature range up to 120 °C (248 °F)
<b>H21</b>	electrical connection with PG gland with 5 m (16.4 ft.) cable, replaces connector
<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)
<b>H33</b>	temperature range up to 150 °C (302 °F), with pg-gland and 5 m (16.4 ft.) cable



UMGZ-Series : Scope of supply	
● force sensor	● straight, waterproof connector (female)

UMGZ-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	● male flange connector, amphenol, straight	● connector, amphenol, right angle

**UMGZ-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.