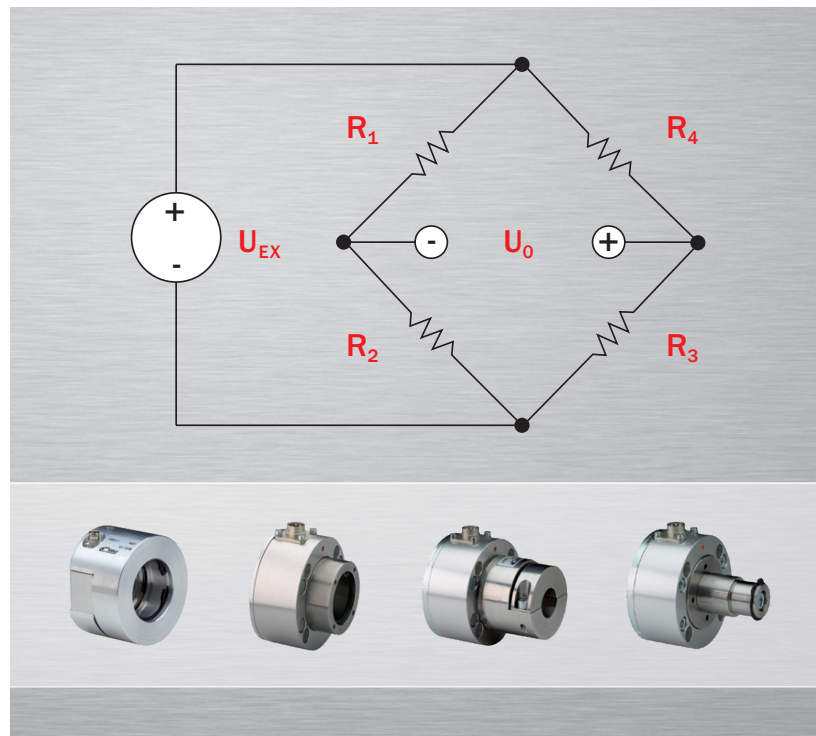


FMS Tension Control Force Sensors

- Highest sensitivity for precise measurement**
 Strain gauges in a full Wheatstone bridge circuit, reliable technology with compensation of ambient temperature changes
- Perfect fit for each installation and application**
 Various series, sizes and nominal forces for a wide range of material tension
- Long lifetime, maintenance-free operation**
 Sensor body and housing of stainless steel or high strength aluminum; mechanical overload protection, robust design with high repeatability
- Options for demanding applications**
 For increased temperatures, aggressive media, special installation requirements, vacuum and many more



FMS Force Sensors


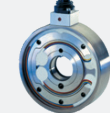

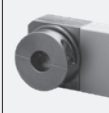


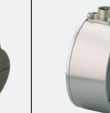
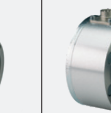
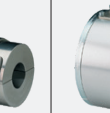
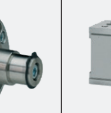


FMS manufactures force sensors since more than 25 years. Our innovations have created a second to none portfolio which enjoys one of the best reputations in regards of quality and lifetime. New developments and product improvements to a range of force sensors that offers highest efficiency and best performance for end users and machine builders.

The main design principles like the use of strain gauges in full Wheatstone bridge circuits and double bending-beams have stood the test of time and help us to fulfill the market requirements.

Functional description

The amplifier provides a highly stable excitation voltage of 5 VDC to the force sensors. When a load is applied to the bending-beam of the force sensors the strain gauges are either elongated or compressed. This change in length leads to a change of the overall resistance of the circuit. The downstream electronics (amplifier or tension controller) detect s these changes and calculates a force reading. The main advantage of the full Wheatstone bridge circuit is its simple and robust setup. Ambient temperature changes are fully compensated and contribute to precise measuring results and long lifetime. The integrated mechanical overload protection prevents damage from the force sensors from unpredictable overload situations.

All FMS tension control products can be combined freely with each other. So you have the possibility to configure the best solution for your specific application.

WEB / STRIP	LMGZ-Series	LMGZ.D-Series	F-Series	FA-Series	A-Series	AA-Series	C-Series	CA-Series	CZ-Series	UMGZ-Series	SMGZ-Series	PMGZ-Series
	Force measuring bearing	Double-range force measuring bearing	Ultra flat force measuring bearing	Ultra flat force measuring bearing with adapter	Aluminum force measuring bearing	Aluminum force measuring bearing with adapter	Compact force measuring bearing	Compact force measuring bearing with adapter	Compact force measuring bearing for rollers w/o shaft	Force measuring block	Force measuring block for strip tension measurement	Force measuring block for web tension measurement
												
Installation												
Mount options (see below right)	flange with shoulder	flange with shoulder	flange with dowel pin	flange with dowel pin	flange with shoulder, flat	flange with shoulder, flat	flange with shoulder, flat	flange with shoulder, flat	flange with shoulder, flat	pillow block	pillow block	pillow block
Shaft type	life shaft	life shaft	life shaft	dead shaft	life shaft	dead shaft	life shaft	dead shaft	no shaft	life shaft	life shaft	life shaft
Shaft diameter in mm (in.)	9 to 80	15 to 40	15	20, 25 (¾, 1)	17	(¾)	17	25, 30 (1, 1¼, 1½)		12 to 160	20 to 160	20 to 160
Nominal Force												
Minimum in N (lbf)	33 (7.5)	33 (7.5)	50 (11)	50 (11)	50 (11)	50 (11)	50 (11)	50 (11)	50 (11)	500 (110)	2'000 (440)	2'000 (440)
Maximum in N (lbf)	25'000 (5'620)	6'000 (1'350)	500 (110)	500 (110)	1'000 (220)	500 (110)	1'000 (220)	1'500 (330)	1'500 (330)	100'000 (22'500)	100'000 (22'500)	100'000 (22'500)
Measuring Accuracy												
Accuracy class (of nominal force)	±0.3 %	±0.3 %	±0.5 %	±0.5 %	±0.5 %	±0.5 %	±0.5 %	±0.5 %	±0.5 %	±0.5 %	±0.5 %	±0.5 %
Measuring range	50:1	200:1	30:1	30:1	20:1	20:1	20:1	20:1	20:1	20:1	20:1	20:1
Environmental												
IP protection rating	IP42	IP42	IP42	IP42	IP42	IP42	IP42	IP42	IP42	IP42	IP67	IP67
Options (see below)												
H13	•	•	–	–	–	–	–	–	–	–	–	–
H14	•	•	–	–	–	–	•	•	•	•	•	•
H15	•	standard	–	–	–	–	–	–	–	–	•	•
H16	•	•	–	–	–	–	•	•	•	•	–	–
H18	•	–	–	–	–	–	–	–	–	–	–	–
H19	•	•	–	–	–	–	–	–	–	–	–	–
H21	•	•	–	–	–	–	–	•	–	•	–	–
H29	•	•	–	–	–	–	–	–	–	–	–	–
H30	•	•	–	–	–	–	–	–	–	–	–	–
H31	•	•	–	–	–	–	•	•	–	•	•	•

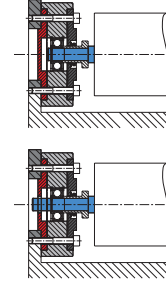
OPTIONS H11
RMGZ900 with connector M14x1, 5-pole instead of flange connector



OPTIONS H12
RMGZ900 with axial connector M14x1, 5-pole instead of radial flange connector



OPTIONS H13
LMGZ, open covers on both sides



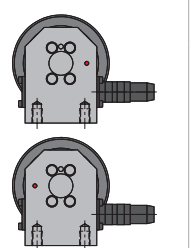
OPTIONS H14
with right-angle connector



OPTIONS H15
LMGZ: Connector rotated 90°



OPTIONS H15
RMGZ300: Red dot rotated 180°



OPTIONS H15
RMGZ900: Connector rotated 90°



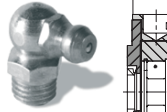
OPTIONS H16
for temperatures up to 120 °C



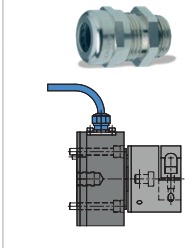
OPTIONS H18
with Watertight, straight connector



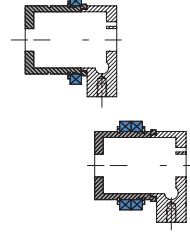
OPTIONS H19
with Grease nipple



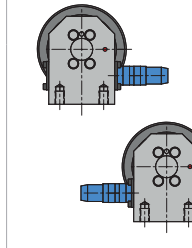
OPTIONS H21
PG gland instead of connector, 5 m cable



OPTIONS H23
RMGZ300: double bearing



OPTIONS H25
RMGZ200, RMGZ300: connector offset 180°



OPTIONS H29
for aggressive media (acids)



OPTIONS H30
for aggressive media (solvents, hydrocarbons), silicone free







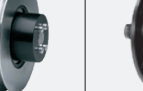




OPTIONS H31
for vacuum applications



GENERAL FEATURES:
Temperature range: -10 to 60 °C (14 to 140 °F)
Nominal excitation voltage: 5 VDC
Temperature coefficient: ±0.1%/10K

Red Point: indicates measuring direction with positive sensor signal
Mechanical overload protection: 10-times the nominal force
Repeatability error: < 0.1% of nominal force

CANTILEVER	RMGZ 900-Series	RMGZ 900 mini-Series
	Fully configurable force measuring roller	Economic force measuring roller
		
Installation		
Mount options (See below right)	flat	flat
Nominal Force		
Minimum in N (lbf)	50 (11)	20 (4.5)
Maximum in N (lbf)	1'000 (220)	500 (110)
Roller Dimensions		
Diameter in mm (in.)	69 (2.7) to 119 (4.7)	40 (1.6)
Length in mm (in.)	250 (9.8) to 900 (35.4)	100, 150, 200
Environmental		
IP protection rating	IP42	IP42
Options (See below)		
.E Aluminum roller, nat./silver and.	standard	standard
.D Aluminum roller, blank	•	–
.EB Aluminum roller, black anodized	•	–
.SS Stainless steel roller, blank	•	–
.A others (on request)	•	–
H11	•	–
H12	•	–
H15	•	–
H16	•	–
H18	•	–
H31	•	•

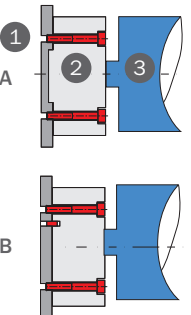
FILAMENT	RMGZ 100-Series	RMGZ 200-Series	RMGZ 300-Series	RMGZ 400-Series	RMGZ 600-Series	RMGZ 800-Series	CR-Series
	Small force measuring sensor for pulleys	Small force measuring sensor for pulleys (rotating)	Medium force measuring sensor for pulleys (rotating)	Medium measuring sensor for pulleys	Large measuring sensor for pulleys	Heavy duty measuring sensor for pulleys	Static force measuring sensor for pulleys (static)
							
Installation							
Centrifugal force limit (g-force, at minimum nominal force)	5	600	140	300	500	800	
Inner diameter bearing in mm (in.)	6 (0.24)	30 (1.18)	60 (2.36)	110 (4.33)	136 (5.35)	150 (5.91)	8 (0.31)
							10 (0.39)
							12 (0.47)
Nominal Force							
Minimum in N (lbf)	6 (1.3)	20 (4.5)	50 (11)	60 (13)	1'000 (220)	100 (22)	50 (11)
Maximum in N (lbf)	300 (67)	200 (45)	1'000 (220)	500 (110)	4'000 (880)	8'000 (1'760)	1'500 (330)
Environmental							
IP protection rating	IP42	IP42	IP42	IP42	IP42	IP42	IP42
Options (See below)							
H14	•	–	•	•	•	•	•
H15	–	•	•	–	–	–	–
H16	•	–	–	•	•	•	•
H18	–	–	–	–	–	•	–
H21	–	–	•	–	–	–	–
H23	–	–	•	–	–	–	–
H25	–	•	•	–	–	–	–

MOUNT OPTIONS

FLANGE

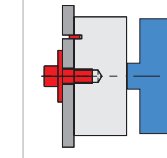
A: with shoulder for centering
B: with dowel pin

- Machine frame
- Force sensor
- Roller



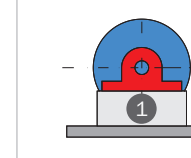
FLAT

with dowel pin

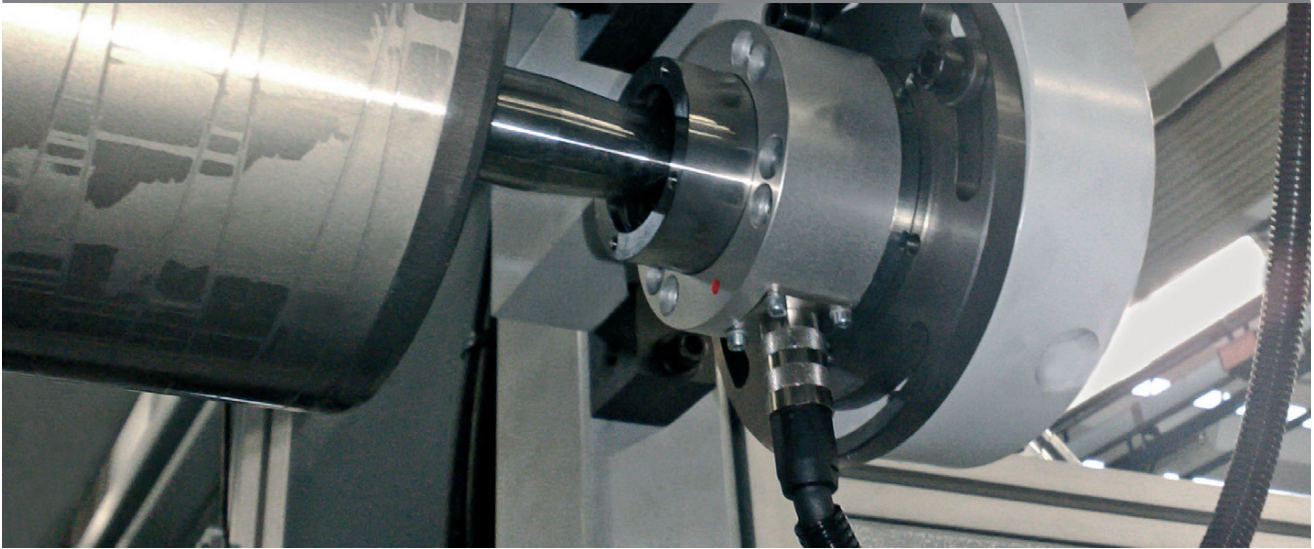


PILLOW BLOCK






1. Force sensor



Typical application | C-Series



Customized | Force Sensors and Special Solutions

<p>Stainless steel</p> 	<p>Integrated amplifier</p> 	
<p>Hermetically sealed IP67</p> 	<p>Ultra-compact</p> 	<p>„Integrated“ tension sensing roller</p> 
<p>Axial forces</p> 	<p>Sea water resistant</p> 	<p>Direct replacements</p> 

Other FMS Products | Tension Control

Measuring amplifiers



Tension controllers



ATEX-Intrinsically safe barriers



Force Measuring Systems AG | About us

Tension Control



Web Guiding



Telemetry Systems



FMS Force Measuring Systems AG is one of the worldwide market leaders in the fields of tension control and web guiding and the only manufacturer that covers a complete range of measurement, control and telemetry technologies. Its customized solutions are applied in the converting, metals, paper, textile and the cable & wire industry.

FMS Force Measuring Systems AG's leading technology, high quality components and a complementary service help customers around the world to maximize their product quality. Since 1993 its highly skilled workforce has crafted superior solutions and set the benchmark in the industry.

World Headquarters: FMS Force Measuring Systems AG

Aspstrasse 6 • 8154 Oberglatt (Switzerland) • Phone + 41 44 852 80 80 • Fax + 41 44 850 60 06
 info@fms-technology.com • www.fms-technology.com