

## LMGZ.D Series Double Range Force Measuring Bearing

---

**200:1 force measuring range**  
**Extremely wide tension range capability**

---

**10 times overload protection**  
**No recalibration required**

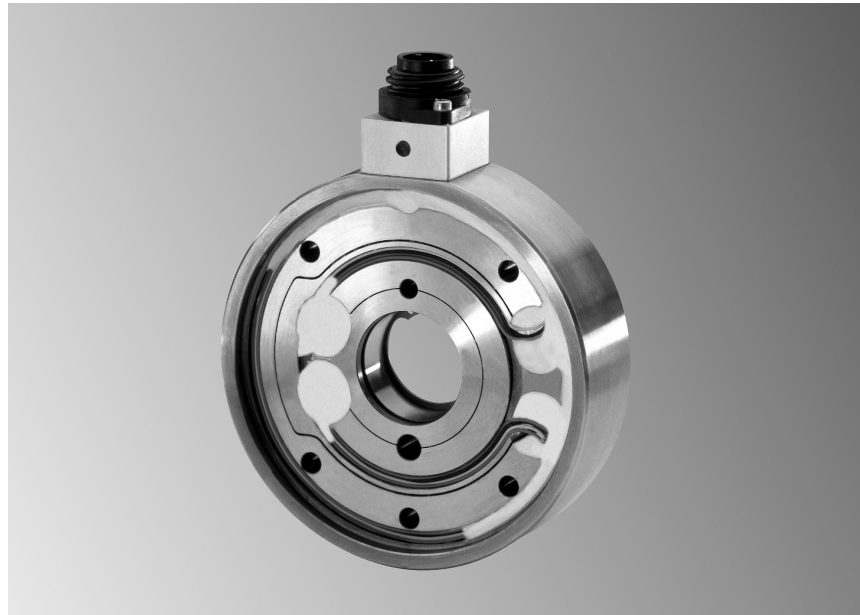
---

**Nominal forces from 33 – 6000 N**  
**Sizes available for every application**

---

**Stainless steel sensor**  
**Corrosion resistant, ultra durable**

---



### ● LMGZ.D Series

The LMGZ.D double range force measuring bearing sensors offer the highest accuracy, reliability, and durability in the industry. Especially when processing widest kinds and widths of materials. Tension ranges up to 200:1 can be accurately measured at high resolution. Utilising a combination of stainless steel construction, a built in mechanical hard stop, and individual sensor performance verification, the LMGZ.D double range force measuring bearings are perfect for all high performance running web applications, where a very wide range of material tensions are present.

### ● Functional description

LMGZ.D double range force measuring bearings are design to combine the live shaft bearing with the tension sensor to minimise machine space requirements. They can be mounted in any orientation directly to the machine frame or with supports. The red point on the connector part of the sensor indicates the positive measuring direction. The high accuracy design ensures that tension can still be measured accurately even with low material wrap angles and different material types and widths.

**Measuring principle**

Foil type strain gauges mounted in two independent full Wheatstone Bridge configurations in each sensor perform the actual tension measurement. The live shaft bearing applies the force to the two measuring webs in a parallel plane as opposed to a typical bending beam, thus ensuring maximum accuracy and measuring sensitivity.

A mechanical hardstop for each measuring range, which operates in both directions, ensures the high overload protection and makes the sensor virtually indestructible. The two individual measuring signals are sent to the amplifier. When the maximum limit of the low nominal force range is reached, a mechanical hardstop prevent the sensor from

overloading. Over this limit the high measuring range is used. This combination guarantees the highest accuracy and reliability without the need for recalibration.

To ensure the best possible tension reading at the low measuring range the roller weight should be as low as possible.

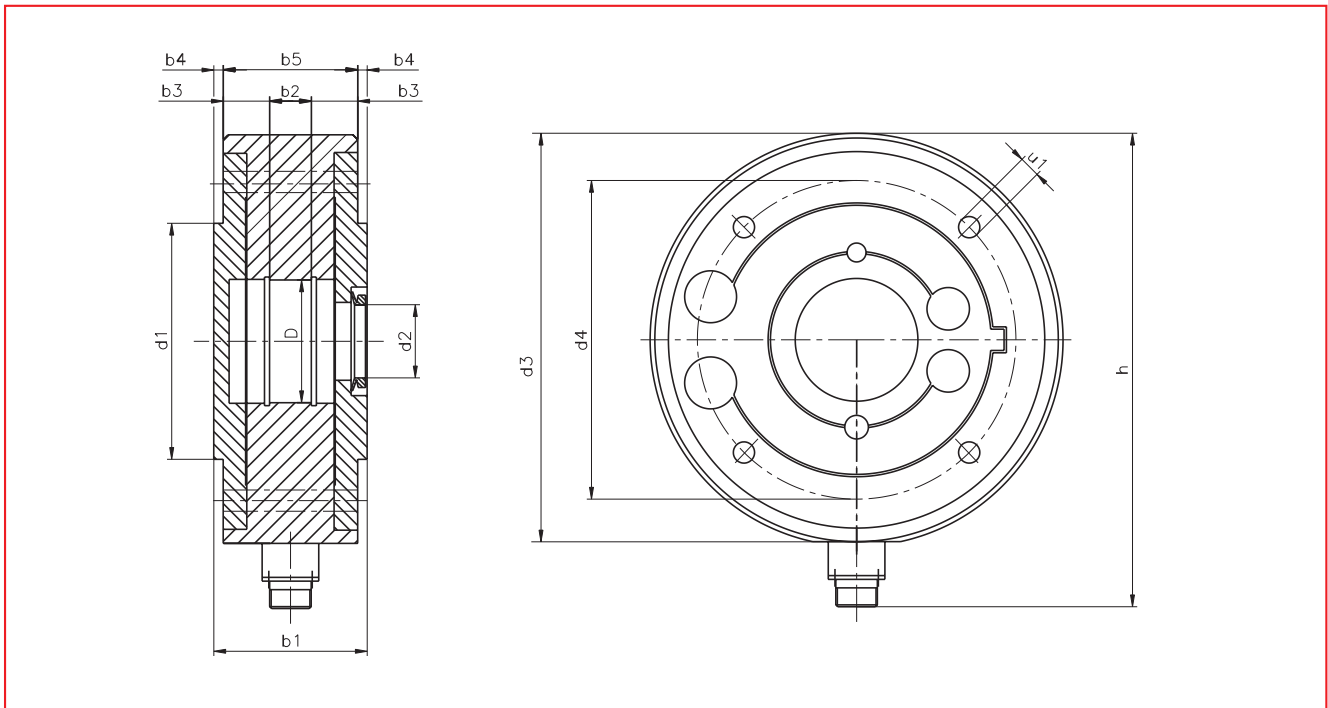
**LMGZ.D Series ● Nominal forces**

Sensor Type	High nominal force N	Low nominal force N
<b>LMGZ202.D.RF.H15</b>	200	33
	375	33
	375	63
	500	50
	750	125
	1000	100
	1500	250
	1500	375
<b>LMGZ305.D.RF.H15</b>	375	100
	500	100
	750	125
	750	250
	1000	250
	1000	500
	1500	250
	1500	750
	3000	500
	3000	750
<b>LMGZ317.D.RF.H15</b>	3000	500
	6000	1000

**LMGZ.D Series ● Technical data**

<b>Sensitivity</b>	1.8 mV/V
<b>Tolerance of sensitivity</b>	< ± 0.2 %
<b>Accuracy class</b>	± 0.3 % (F <sub>nominal</sub> )
<b>Temperature coefficient</b>	± 0.1 % / 10 K
<b>Temperature range</b>	- 10...120 °C, H 16 = 120 °C
<b>Input resistance</b>	2 x 350 Ω
<b>Supply voltage</b>	1...12 VDC
<b>Maximum overload</b>	10 times the rated high nominal force
<b>Axial load</b>	20 % Nominal force
<b>Sensor material</b>	Stainless steel

**LMGZ.D Series ● Dimensions**



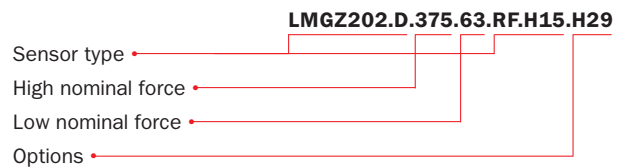
**LMGZ.D Series ● Dimensions**

Journal diameter ø d	Sensor Type	Dimensions in mm												Weight kg
		D H7	d1 g6	d2	d3	d4	b1	b2	b3 ±0.1	b4	b5	h	u1	
15	LMGZ202.D.RF.H15	35	70	20	125	95	43.5	14	10.25	4	34.5	157	6.6	2.8
25	LMGZ305.D.RF.H15	52	100	31	175	135	66	18	19.5	4	57	207	9	9.3
40	LMGZ317.D.RF.H15	80	130	44	225	175	76	23	22	4	67	258	11	17.6

**Options:**

- H13** = Open covers on both sides
- H14** = Right angle connector
- H16** = Temperature range of sensor with PG-gland  
up to 150 °C. Connectors up to 120 °C
- H18** = Straight waterproof plug
- H19** = Grease nipple
- H29** = Modified wiring and sealing for use in  
aggressive media (mostly acids)
- H30** = Modified wiring and sealing for use in  
hydrocarbon media (mostly oils and fuels)

**Order code (example):**



**Scope of delivery:**

Covers for both sides, 1 V ring seal and waterproof connection plug  
Special versions for specific applications are available on request

**Bearings**

Various types of bearings can be utilised with an LMGZ Series sensor. FMS recommends the use of self-aligning versions to compensate for shaft alignment errors and to avoid measuring inconsistencies.

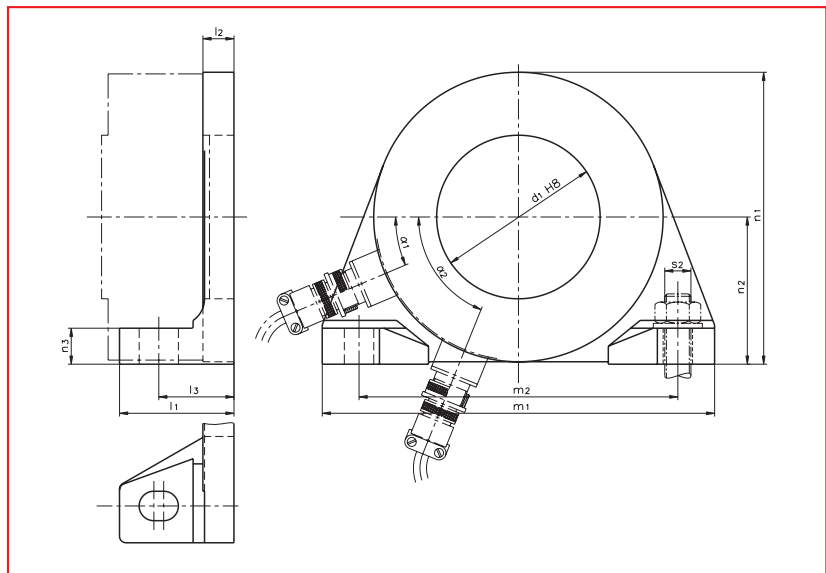
**LMGZ.D Series ● Bearings**

Sensor Type	Suitable bearings Type	Dimensions in mm		
		d	D	B
<b>LMGZ202.D</b>	2202	15	35	14
<b>LMGZ305.D</b>	2205	25	52	18
	22205	25	52	18
<b>LMGZ317.D</b>	2208	40	80	23
	22208	40	80	23

**GMGZ Series supports for LMGZ.D Series sensors**

When it is not possible to mount the sensors directly onto the machine frame, the GMGZ Series supports are available for all sizes of LMGZ.D sensors. They are made of durable cast iron and can either be supplied blank (customer drills the sensor mounting holes in them to optimise the positioning of the sensor) or with a 360° clock-wise pattern of pre-drilled mounting holes. Mounting positions between  $\alpha 1$  and  $\alpha 2$  are not possible as the support foot interferes with the sensor connector.

**GMGZ Series supports ● Dimensions**



**GMGZ Series supports ● Mounting dimensions**

Sensor Type	Support Type	Dimensions in mm											Weight kg
		d1 H8	l1	l2	l3	m1	m2	n1	n2	n3	s2	$\alpha 1 \dots \alpha 2$	
<b>LMGZ202.D</b>	GMGZ205 GMGZ205-15GRAD-12 x M6 <sup>1)</sup>	70	45	13	32.75	170	140	130	67	16	M10	20...69°	1.62
<b>LMGZ305.D</b>	GMGZ307 GMGZ307-15GRAD-12 x M8 <sup>1)</sup>	100	70	19	47.5	240	195	178	90	22	M16	22...60°	6.41
<b>LMGZ317.D</b>	GMGZ310 GMGZ310-15GRAD-12 x M10 <sup>1)</sup>	130	90	24	57.5	290	240	232	118	28	M20	28...65°	8.27

<sup>1)</sup> Part number for support with pre-drilled mounting hole

**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

**FMS USA, Inc.**  
 2155 Stonington Avenue  
 Suite 119  
 Hoffman Estates, IL 60169  
 Phone + 1 847 519 4400  
 Fax + 1 847 519 4401  
 fmsusa@fms-technology.com

**FMS UK**  
 Highfield, Atch Lench Road  
 Church Lench  
 Evesham WR 11 4UG  
 Phone + 44 1386 871023  
 Fax + 44 1386 871021  
 fmsuk@fms-technology.com

**FMS Italy**  
 Via Baranzate 67  
 20026 Novate Milanese  
 Phone + 39 02 39487035  
 Fax + 39 02 39487035  
 fmsit@fms-technology.com