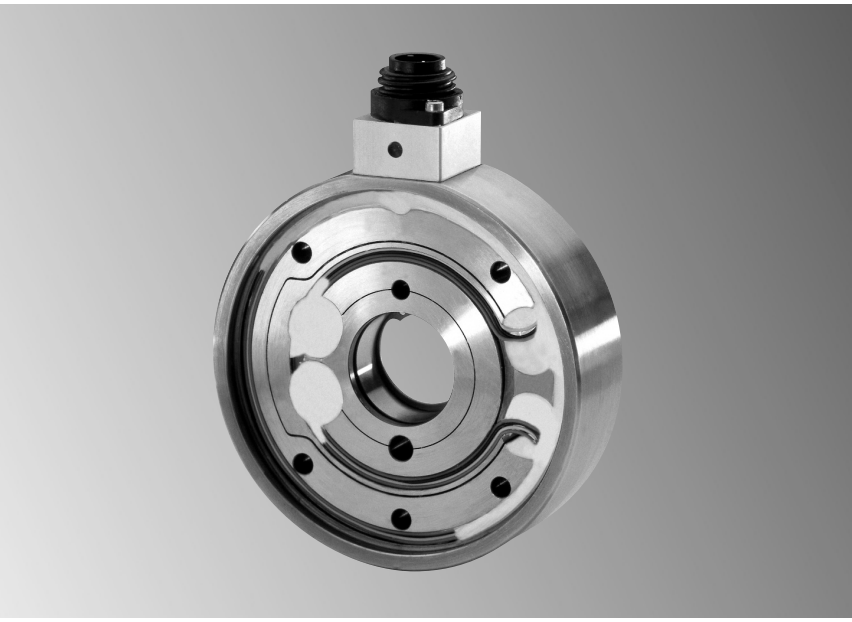
LMGZ.D Series Double Range Force Measuring Bearing

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.

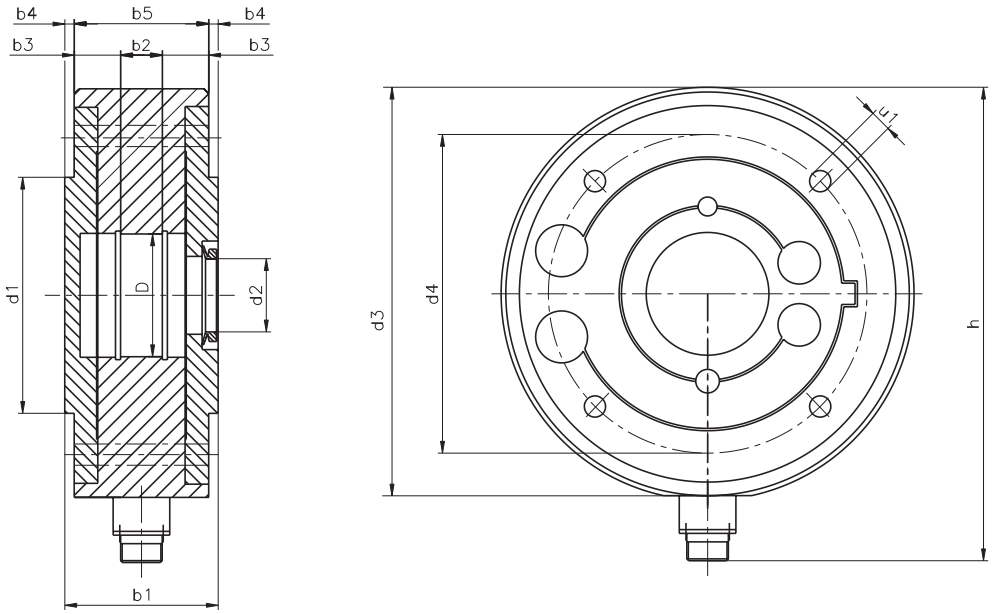
LMGZ.D Series ● Nominal forces

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

LMGZ.D Series ● Technical data

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

LMGZ.D Series ● Dimensions



LMGZ.D Series ● Dimensions

Journal diameter	Sensor	Dimensions in mm												Weight
ø d	Type	D H7	d1 g6	d2	d3	d4	b1	b2	b3 ±0.1	b4	b5	h	u1	kg
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):

LMGZ202.D.375.63.RF.H15.H29

Sensor type
High nominal force
Low nominal force
Options

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.

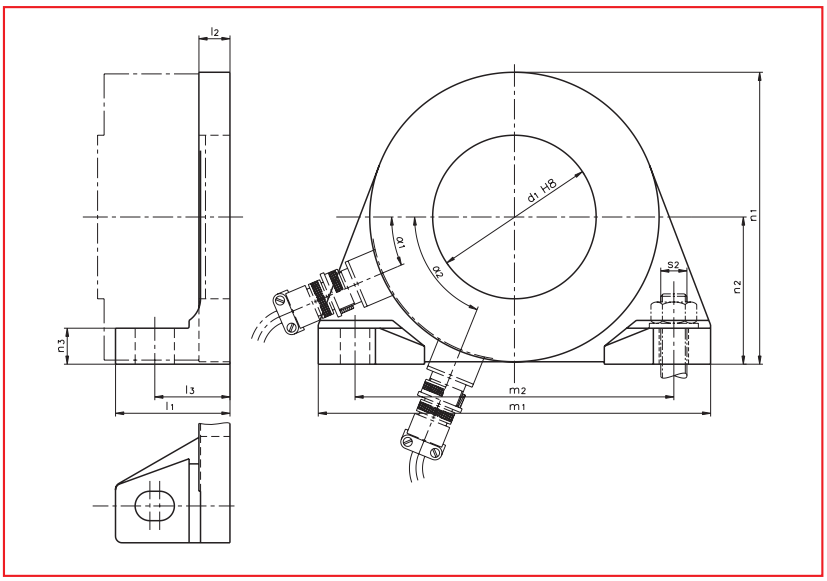
LMGZ.D Series ● Bearings

Sensor	Suitable bearings	Dimensions in mm		
Type	Type	d	D	B
LMGZ202.D	2202	15	35	14
LMGZ305.D	2205	25	52	18
	22205	25	52	18
LMGZ317.D	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	Support	Dimensions in mm											Weight
Type	Type	d_1 H8	l_1	l_2	l_3	m_1	m_2	n_1	n_2	n_3	s_2	$\alpha_1 \ldots \alpha_2$	kg
LMGZ202.D	GMGZ205 GMGZ205-15GRAD-12 x M6 [1)]	70	45	13	32.75	170	140	130	67	16	M10	20...69°	1.62
LMGZ305.D	GMGZ307 GMGZ307-15GRAD- 12 x M8 [1)]	100	70	19	47.5	240	195	178	90	22	M16	22...60°	6.41
LMGZ317.D	GMGZ310 GMGZ310-15GRAD-12 x M10 [1)]	130	90	24	57.5	290	240	232	118	28	M20	28...65°	8.27

[1)] *Part number for support with pre-drilled mounting hole*

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