

LMGZ.D Double Range Force Measuring Sensor

200:1 force measuring range
Extremely wide tension range capability

10 times overload protection
No recalibration required

Accuracy class 0.5%
Very accurate over entire range

Nominal forces from 7 lbs. - 1350 lbs.
Sizes available for every application

Stainless steel sensor
Corrosion resistant, ultra durable



● **LMGZ.D Series**

The LMGZ.D Double Range Force Measuring Sensors offer the highest accuracy, reliability, and durability in the industry. Tension ranges up to 200:1 can be accurately measured at high resolution. Utilizing a combination of stainless steel construction, a built in mechanical hard stop, and individual sensor performance verification, the LMGZ.D Double Range Force Measuring Sensors 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 Sensors are designed to combine the live shaft bearing with the tension sensor to minimize machine space requirements. They can be mounted in any orientation directly to the machine frame or with supports. The red point on the sensor's electrical connector 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 operates in both directions. This ensures high overload protection and makes the sensor virtually indestructible. Two separate measuring signals are sent to the amplifier. When the maximum limit of the low nominal force range is reached, the mechanical hardstop prevents this portion of the sensor from overloading.

Over this limit the high nominal force range is used. This guarantees the highest accuracy and reliability without the need for frequent recalibration. To ensure the best possible tension reading at the low measuring range the roller weight should be as low as possible.

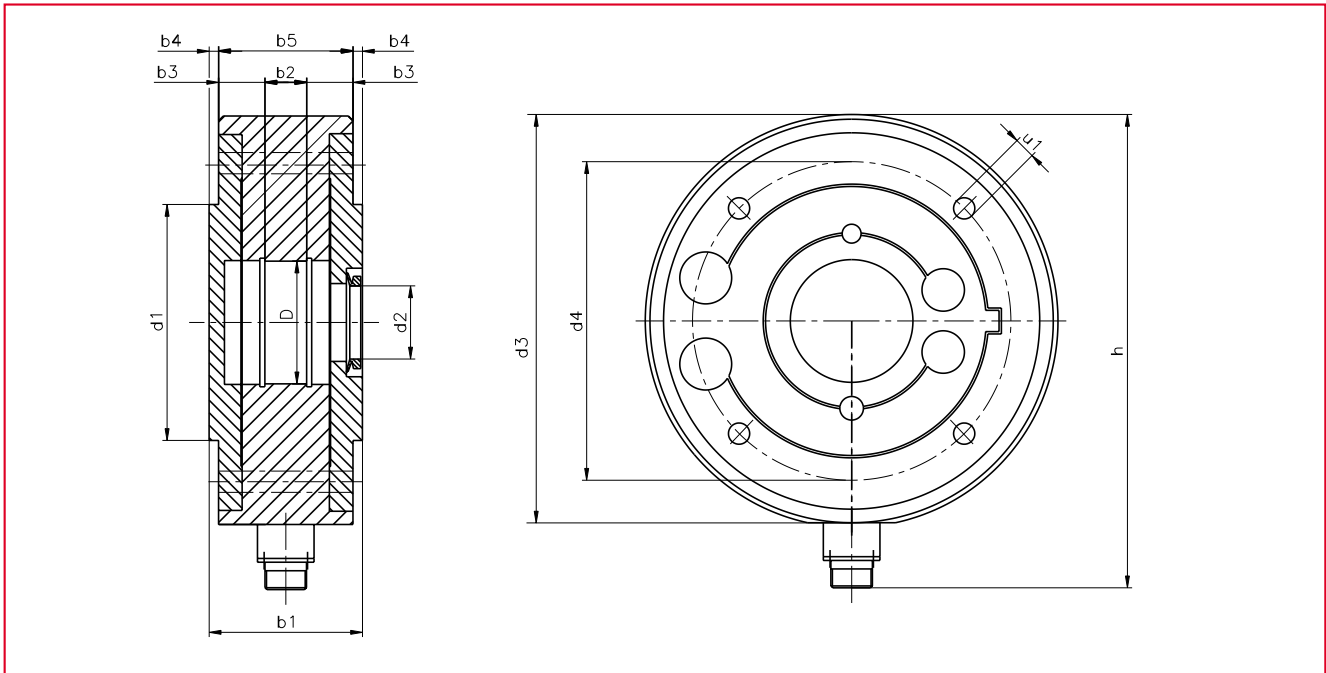
LMGZ.D Series ● Technical Data

Sensitivity	1.8 mV/V
Tolerance of sensitivity	< ±0.2 %
Accuracy class	±0.5 %
Temperature coefficient	±0.1 % / 10K [0.0055 %/°F]
Temperature range	-10...+ 60 °C [14 °F...140 °F]
Input resistance	2 x 350 Ω
Supply voltage	1...12 VDC
Overload protection	10 times the rated high nominal force
Axial load	20 % nominal force
Sensor material	Stainless steel

LMGZ.D Series ● Nominal Forces

FMS Order Code	High nominal force		Low nominal force	
	N	lbs	N	lbs
LMGZ202.D.H15	200	45	33	7.4
	375	84	33	7.4
	375	84	63	14
	500	112	50	11
	750	168	125	28
	1500	337	250	56
	1500	337	375	84
LMGZ305.D.H15	375	84	100	22
	500	112	100	22
	750	168	125	28
	750	168	250	56
	1000	224	250	56
	1000	224	500	112
	1500	337	250	56
	1500	337	750	168
	3000	675	500	112
	3000	675	750	112
LMGZ317.D.H15	3000	675	500	112
	6000	1350	1000	225

LMGZ.D Series • Dimensions



LMGZ.D Series • Dimensions

FMS Order Code	Journal Diameter ø d	Dimensions in mm [inch]											Weight kg [lbs]	
		D ^a	d1 ^b	d2	d3	d4	b1	b2	b3	b4 ±0.1	b5	h		u1
LMGZ202.D.H15	15 [0.590]	35 [1.378]	70 [2.756]	20 [0.787]	125 [4.92]	95 [3.74]	43.5 [1.71]	14 [0.55]	10.25 [0.41]	4 [0.16]	34.5 [1.36]	157 [6.2]	6.6 [0.26]	2.8 [6.2]
LMGZ305.D.H15	25 [0.984]	52 [2.047]	100 [3.937]	31 [1.220]	175 [6.89]	135 [5.31]	66 [2.60]	18 [0.71]	19.5 [0.77]	4 [0.16]	57 [2.24]	207 [8.2]	9 [0.35]	9.3 [20.5]
LMGZ317.D.H15	40 [1.575]	80 [3.150]	130 [5.118]	44 [1.732]	225 [8.86]	175 [6.89]	76 [2.99]	23 [0.91]	22 [0.87]	4 [0.16]	67 [2.64]	258 [10.0]	11 [0.43]	17.6 [38.8]

^a Tolerances for D: 35 mm [1.378 inch] = +0.009/-0 inch; 52 mm [2.047 inch] = +0.0011/-0 inch; 80 mm [3.150 inch] = +0.0011/-0 inch

^b Tolerances for d1: 70 mm [2.756 inch] = +0.0004/-0.0011 inch; 100 mm [3.937 inch] = +0.0005/-0.0013 inch; 130 mm [5.118 inch] = +0.0006/-0.0015 inch

LMGZ.D Options:

- H13** = open covers on both sides
- H14** = waterproof right angle connector
- H16** = temperature range up to 150°C [300°F]
- H19** = grease nipple
- H29** = modified wiring and sealing for use in aggressive media
- H30** = modified wiring and sealing for oil based environments

Order code:

LMGZ202.D.375.63.H15.H29



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 utilized with an LMGZ Series Sensor. FMS recommends the use of self-aligning versions to compensate for shaft alignment errors and to avoid measuring inconsistencies.

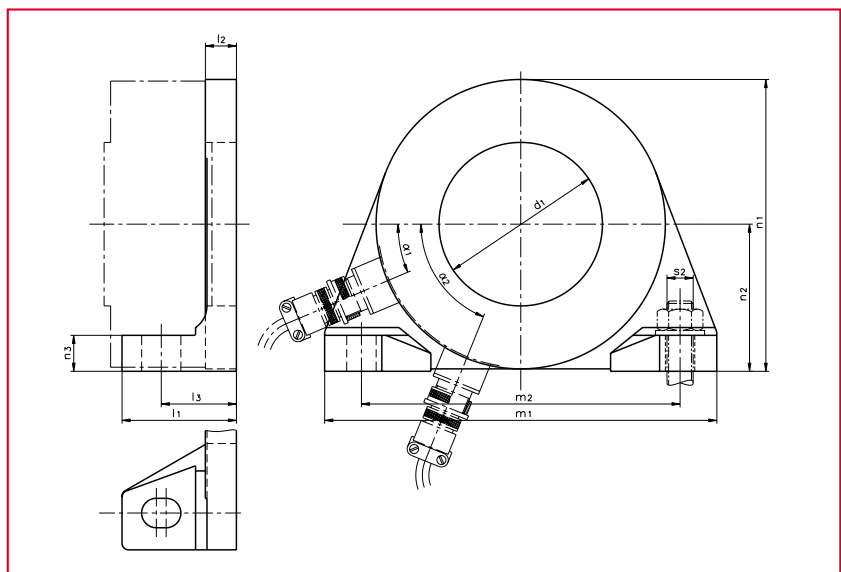
LMGZ.D Series ● Bearings

FMS Sensor Series	Bearings Type	Dimensions					
		d		D		B	
		mm	inch	mm	inch	mm	inch
LMGZ202.D	2202	15	0.591	35	1.378	14	0.551
LMGZ305.D	2205	25	0.984	52	2.047	18	0.709
	22205	25	0.984	52	2.047	18	0.709
LMGZ317.D	2208	40	1.575	80	3.150	23	0.906
	22208	40	1.575	80	3.150	23	0.906

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 optimize 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

FMS Sensor Series	Support Order Code	Dimensions in mm [inch]											Weight kg [lbs]
		d1 ^a	l1	l2	l3	m1	m2	n1	n2	n3	s2	$\alpha 1 \dots \alpha 2$	
LMGZ202.D	GMGZ205	70	45	13	32.75	170	140	130	67	16	M10	20...69°	1.62
	GMGZ205-15GRAD-12xM6¹	[2.756]	[1.77]	[0.51]	[1.29]	[6.7]	[5.51]	[5.1]	[2.64]	[0.6]			[3.6]
LMGZ305.D	GMGZ307	100	70	19	47.5	240	195	178	90	22	M16	22...60°	6.41
	GMGZ307-15GRAD-12xM8¹	[3.937]	[2.75]	[0.75]	[1.87]	[9.5]	[7.68]	[7.0]	[3.54]	[0.8]			[14.1]
LMGZ317.D	GMGZ310	130	90	24	57.5	290	240	232	118	28	M20	28...65°	8.27
	GMGZ310-15GRAD-12xM10¹	[5.118]	[3.54]	[0.94]	[2.26]	[11.4]	[9.45]	[9.1]	[4.65]	[1.1]			[18.2]

¹ part number for support with pre-drilled mounting holes

^a Tolerances for d1: 70 mm [2.756 inch] = +0.0018/-0 inch; 100 mm [3.937 inch] = +0.0021/-0 inch; 130 mm [5.118 inch] = +0.0024/-0 inch

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