



LB 210 Series Load Measuring Pins

FEATURES

- For overload detection and load measurement from 2.5 kN to 1250 kN (0.28 tf to 140.5 tf).
- Admissible Overload: 150% of the nominal load.
- Overload at Rupture: up to 500% of the nominal load.
- Insensitive to external mechanical and chemical effects.
- Ideal for use in hostile environments.
- Temperature-compensated transducers with strain gauges in full-bridge configuration. On request, available with double bridge redundant.
- Simple installation for cost-saving solutions to measurement problems.
- High reliability for strict safety requirements.
- Many options may be added to the lower-cost standard load pin for greater flexibility.
- Can be designed with special dimensions for adaptation to various construction conditions.



DESCRIPTION

Magtrol Load Measuring Pins are used to measure load and force and provide overload protection. The pins are mounted into machines in place of normal shafts and fitted with strain gauges, allowing them to produce a signal proportional to the measured load. Manufactured in Switzerland, Magtrol's LB 210 Series Load Pins are rugged with high resistance stainless steel and tight construction, designed specifically for use in harsh industrial environments. Available in 10 standard ranges from 2.5 kN to 1250 kN, these highly ergonomic pins can be used for either new or refitted installations and are adaptable to various conditions.

Magtrol Load Measuring Pins can be used alone or as part of a complete measurement system. Magtrol offers a wide range of Load-Force-Weight Transducers in various executions and accuracy classes and our Load Monitoring Units (LMUs) constitute an ideal safe measurement system which continuously checks for overloads and short circuits.

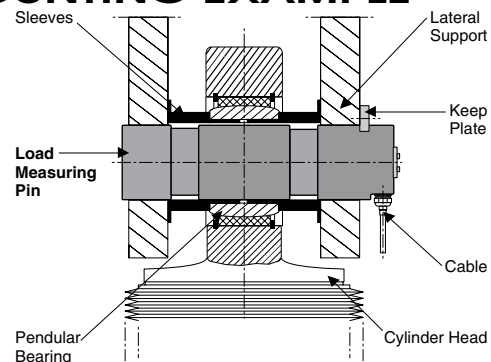
APPLICATIONS

When forces acting on mechanical constructions are measured, the additional equipment required can often be costly and difficult to install. Magtrol Load Measuring Pins offer an excellent solution since they act as a direct element in the assembly, replacing a non-instrumented pin or shaft. LB 210 Series Load Pins are used for load measuring devices and overload protection on cranes, hoisting gear, elevators and winches, and force measurement for regulation processes in industrial installations and machinery production.

DESIGN

The Magtrol Load Pin has 2 circular grooves and an axial bore. Inside the central bore, adjacent to the external grooves, the strain gauges are mounted in a full-bridge configuration. The positioning and orientation of the strain gauges have been optimized by means of the finite element method (FEM).

MOUNTING EXAMPLE

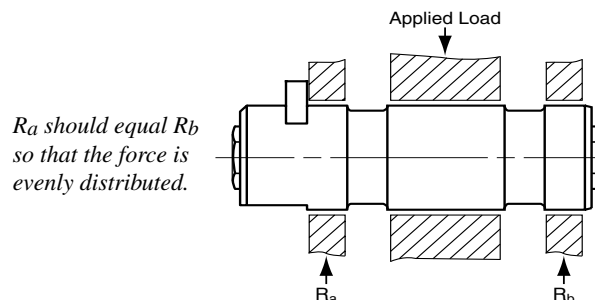


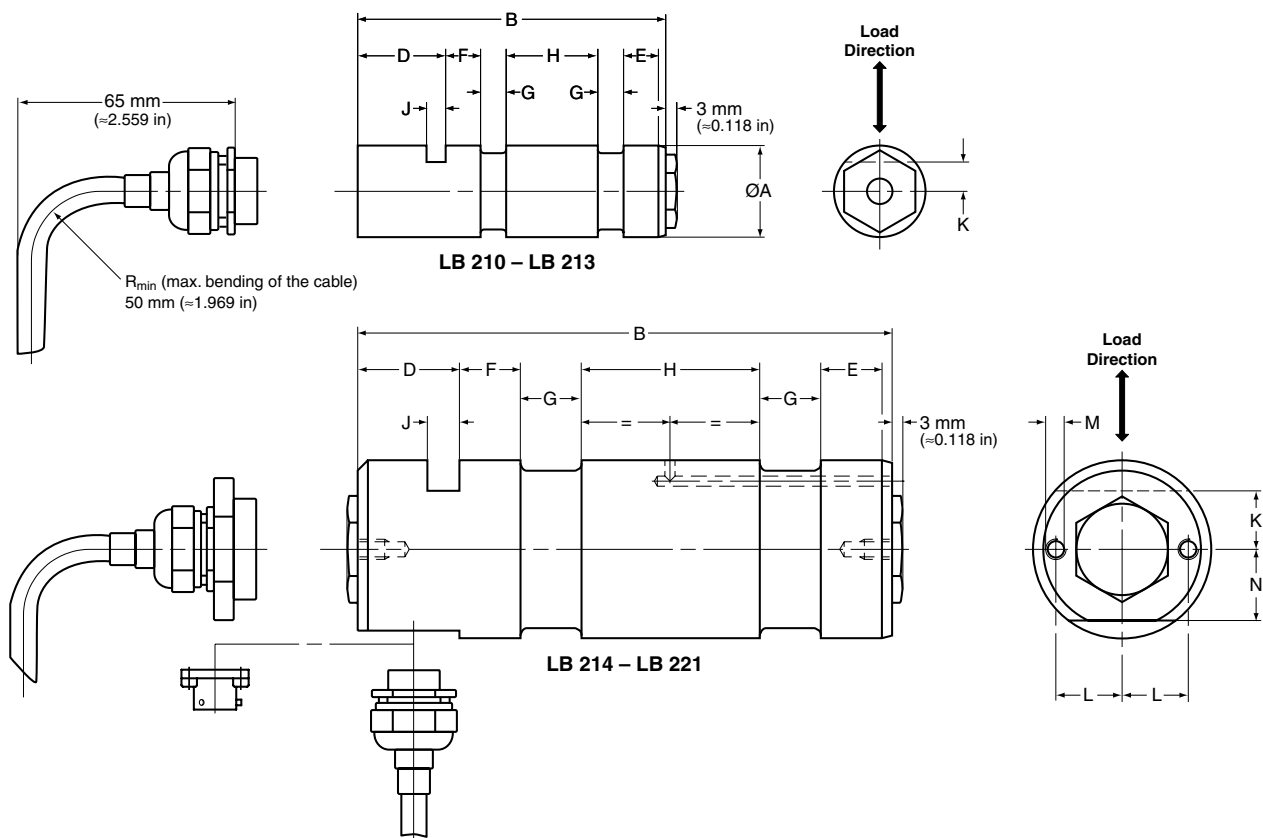
Standard Version*	LB 210	LB 211	LB 212	LB 213	LB 214	LB 216	LB 217	LB 218	LB 220	LB 221
MECHANICAL CHARACTERISTICS										
Nominal Load, fsd (Metric)	2.5 kN	5 kN	10 kN	20 kN	50 kN	100 kN	200 kN	500 kN	1000 kN	1250 kN
Nominal Load, fsd (US)	0.28 tf	0.56 tf	1.12 tf	2.25 tf	5.62 tf	11.24 tf	22.48 tf	56.20 tf	112.4 tf	140.5 tf
Overload Admissible	150% of rated load without influence on measurement									
Overload Limit	250% of rated load with new calibration									
Overload at Rupture (of rated load)	≥ 500%							400%	300%	
Material	Stainless steel 1.4057									
Protection Class	IP 66 according to DIN 40050									
Fit	G7 / h6									
Lubrication	not available					Oiler ø4 DIN 3405 D or M10 DIN 3405 A according to the LB model				
ELECTRICAL CHARACTERISTICS										
Operating Principle	Full-bridge strain gauge									
Bridge Impedance: • Input • Output	400 Ω 350 Ω									
Power Supply	5 to 12 VDC / AC									
Zero Adjustment	± 1% of fsd									
Transducer Sensitivities	0.5 mV/V ± 3%				1 mV/V ± 3%				1.8 mV/V ± 3%	
Non-linearity Error	< 0.25% of fsd				< 0.25% of fsd				< 0.5% of fsd	
Non-linearity + Hysteresis Error	< 0.5% of fsd				< 0.5% of fsd				< 0.8% of fsd	
Repeatability	± 0.1% of fsd									
Operating Temperature	-25 °C to +80 °C									
Storage Temperature	-55 °C to +125 °C									
Temperature Influence: • On Zero • On Sensitivity	± 0.02% of fsd / K ± 0.02% / K									
Influence on Measurement Signal (Shift of Force Angle with Respect to Measurement Axis)	According to the cosine function									
ELECTRICAL CONNECTION										
Cable Type	K-414									
Cable Length	3 m (standard); 6 m, 12 m, 20 m (optional)									
PG Output	Axial, with heat-shrinkable sleeve				Radial, with heat-shrinkable sleeve (standard); Axial, with heat-shrinkable sleeve (optional)					
Optional Output Connector	not available				Radial, MS 3112 E 10-6P					
Optional Connection Cable Assembly	not available				3 m, 6 m, 12 m or 20 m Cable with: Straight Connector, MS 3116 J10 6S or 90° Connector, Souriau 851 08 EC 10 6S50					

* Ratings apply to standard load pins only, special models are available by contacting Magtrol.

OPERATING PRINCIPLE

When force is applied to the Load Measuring Pin along its sensitive axis, the effect on the strain gauge bridge results in an output signal proportional to the applied force. The powering of the strain gauge bridge, as well as the amplification of its output signal voltage, is performed by an external amplifier. Depending on the execution, the latter allows the monitoring of several levels.



DIMENSIONS


NOTE: Original dimensions are in Metric units. Dimensions converted to English units have been rounded up to 3 decimal places.

Model	units	Ø A	B	D	E	F	G	H	J	K	L	M	N	Weight
LB 210	mm	25h6	84	18	16	10	7	24	5.2	9	---	---	---	0.2 kg
	in	0.984	3.307	0.709	0.630	0.394	0.276	0.945	0.205	0.354	---	---	---	0.441 lb
LB 211	mm	25h6	84	18	16	10	7	24	5.2	9	---	---	---	0.2 kg
	in	0.984	3.307	0.709	0.630	0.394	0.276	0.945	0.205	0.354	---	---	---	0.441 lb
LB 212	mm	25h6	84	18	16	10	7	24	5.2	9	---	---	---	0.2 kg
	in	0.984	3.307	0.709	0.630	0.394	0.276	0.945	0.205	0.354	---	---	---	0.441 lb
LB 213	mm	25h6	84	18	16	10	7	24	5.2	9	---	---	---	0.2 kg
	in	0.984	3.307	0.709	0.630	0.394	0.276	0.945	0.205	0.354	---	---	---	0.441 lb
LB 214	mm	35h6	112	25	14	12	12	35	6.3	11.5	---	---	16	0.65 kg
	in	1.378	4.409	0.984	0.551	0.472	0.472	1.378	0.248	0.453	---	---	0.630	1.433 lb
LB 216	mm	50h6	161	32	24	18	18	48	10.5	20	---	---	21.5	2.0 kg
	in	1.967	6.339	1.260	0.945	0.709	0.709	1.890	0.413	0.787	---	---	0.847	4.409 lb
LB 217	mm	65h6	196	32	26	20	25	65	10.5	22.5	---	---	28.5	4.4 kg
	in	2.559	7.717	1.260	1.024	0.787	0.984	2.559	0.413	0.886	---	---	1.122	9.700 lb
LB 218	mm	85h6	258	34	39	35	28	89	10.5	28	32	M6	35	10.6 kg
	in	3.347	10.158	1.339	1.535	1.378	1.102	3.504	0.413	1.102	1.260	---	1.378	23.369 lb
LB 220	mm	100h6	347	36	61	55	35	120	10.5	36	35	M8	45	19.2 kg
	in	3.937	13.661	1.417	2.402	2.165	1.378	4.724	0.413	1.417	1.378	---	1.772	42.328 lb
LB 221	mm	120h6	347	36	61	55	35	120	12.5	40	35	M8	45	28.4 kg
	in	4.724	13.661	1.417	2.402	2.165	1.378	4.724	0.492	1.575	1.378	---	1.772	62.611 lb

OPTIONS AND ORDERING INFORMATION

STANDARD MODELS

- Model LB 210 – 213 Electrical Connection: PG Axial
- Model LB 214 – 221 Electrical Connection: PG Radial

OPTIONS FOR MODELS LB 214 – LB 221

- Model LB 214 – 221
- Lubrication (LB 214–221): Without (standard) 0
(LB 216–221): With 1
- Electrical Connection: PG Radial (standard) 0
PG Axial 1
Radial Connector 2 0

CONNECTION CABLE ASSEMBLY

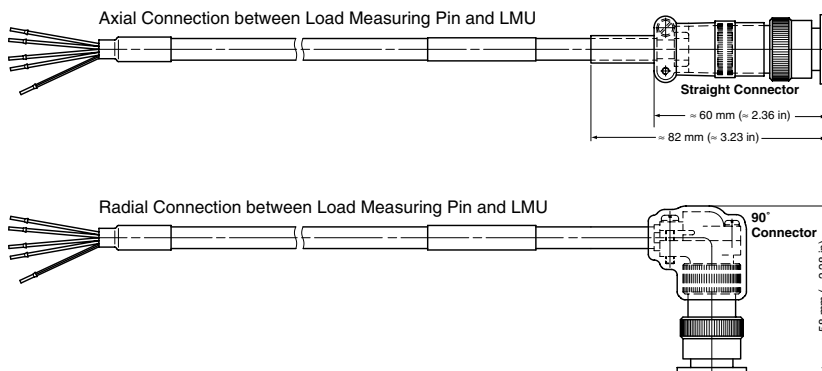
- Cable Length: 3 m 1
6 m 2
12 m 3
20 m 4

Example

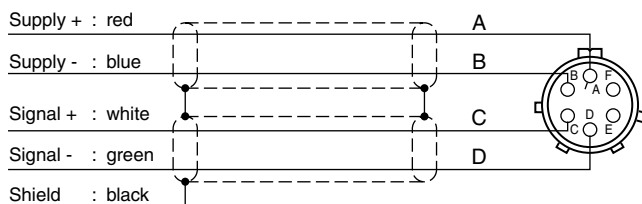
An LB 216 Load Measuring Pin with lubrication, PG axial electrical connection and 20 m cable would be ordered as LB 216-111/114.

ACCESSORIES

Cable Assemblies



Pin Configuration



Accessory Ordering Information

COUNTER-CONNECTOR

- Straight Connector P/N 957.11.08.0030
- 90° Connector P/N 957.11.08.0029

CONNECTION CABLE ASSEMBLY

- Part Number EH 13 / 0 1
- Straight Connector 8
- 90° Connector 9

CONNECTION CABLE ASSEMBLY

- Cable Length: 3 m 1
6 m 2
12 m 3
20 m 4