

# MB 102 SERIES

## MINIATURE LOAD MEASURING PINS

### FEATURES

- Overload detection and load measurement: up to 12 kN (10 kN as standard)
- Admissible overload: 150 % of the nominal load
- High overload capacity
- Standard diameter available from  $\varnothing 10$  mm
- Small size for compact applications
- Strain gauges full bridge technology
- High reliability for strict safety requirements
- Special high strength steel
- Protection class IP 50 (IP 66 as option)
- Can be designed with special dimensions for adaptation to various construction conditions.



Fig. 1: MB 102 | Miniature Load Pin

### DESCRIPTION

Magtrol Miniature 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 MB 102 Series Miniature Load Pins are rugged with high resistance stainless steel and tight construction.

### 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.

### APPLICATIONS

The compact design as well as the high protection class give this sensor an excellent aptitude for the measurement and monitoring of forces and overloads on mechanical compact applications, as well as in harsh environments.

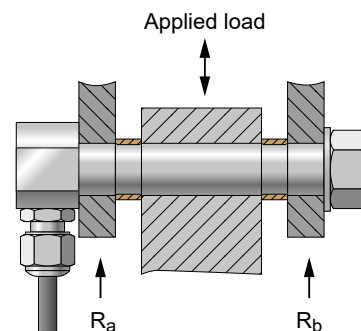
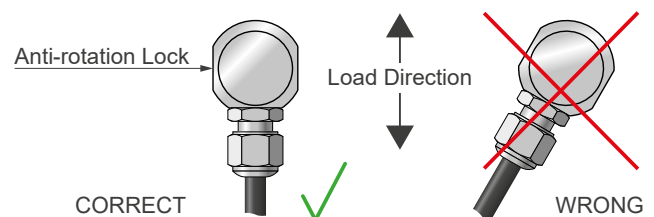


Fig. 2:  $R_a$  should equal  $R_b$  so that the force is evenly distributed

### SAFETY INSTRUCTION

**CAUTION:** the load cell must be positioned in the direction of the load. If this is not the case, the load cell may break (mechanical breakdown) below the breaking overload value. This is due to the mechanical construction of the load pin, for which mechanical resistance can only be guaranteed when the pin is correctly positioned in relation to the load axis.



**SPECIFICATIONS**

**LOAD MESURING**

Nominal Load (NL)	10 kN <sup>c)</sup>
Overload Admissible (% of NL)	150%
Overload at Rupture (% of NL) <sup>a)</sup>	300% <sup>a)</sup>
Non-linearity Error <sup>b)</sup>	≤ 1%
Zero Adjustment <sup>b)</sup>	± 1%

**MECHANICAL CHARACTERISTICS**

Operating Principle	Full-bridge strain gauge
Material	Special high strength Stainless Steel
Lubrication	Not available

**ENVIRONMENT**

Compensated Temperature Range	+20 °C ... +60 °C
Operating Temperature Range	-10 °C ... +80 °C

**ELECTRICAL CHARACTERISTICS**

Nominal Sensitivity	2 mV/V ±3%
Strain Gauge Bridge Impedance: Input	450 Ω
Strain Gauge Bridge Impedance: Output	350 Ω
Power Supply	5 ... 10VDC
Protection Class	IP 50 (IP 66 without connector)

**ELECTRICAL CONNECTION**

Connection Output	Integrated PTFE K422 cable; lenght 1.5m <sup>d)</sup> ; with connector LEMO FGG.1B.304.CLAD42 <sup>e)</sup>
Wiring Diagram	

a) This value is only reached if the load cell is correctly positioned (see «Safety Instruction»). If the force is applied in a direction other than the one defined, the load cell may break (mechanical destruction) below the nominal overload value at rupture.

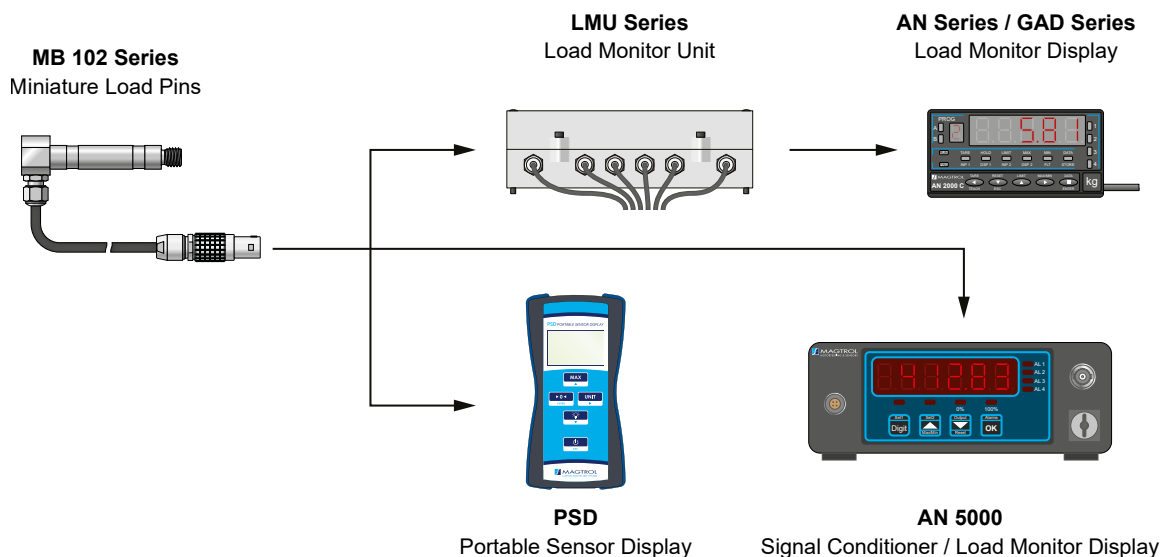
b) Of Full scale

c) Other nominal load and customised load are available on request

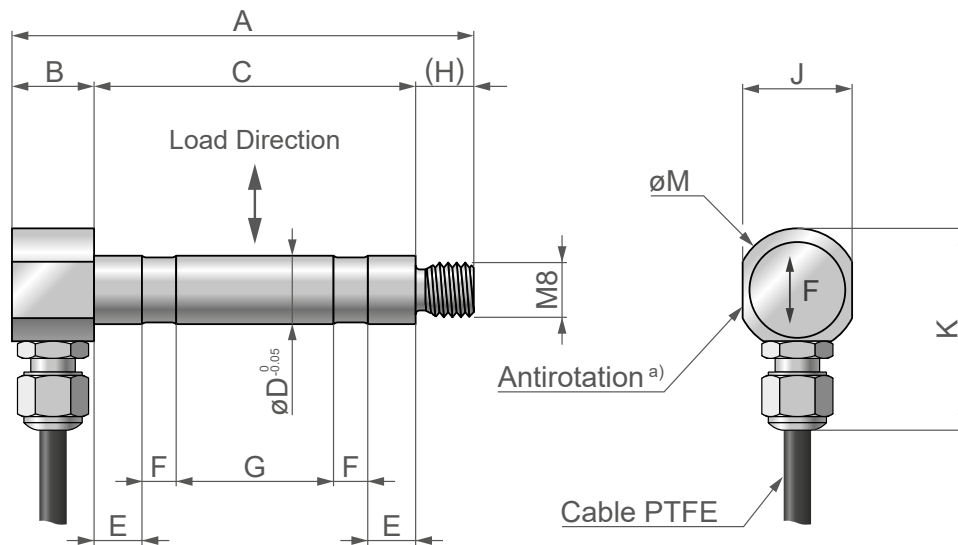
d) Other cable lengths available on request

e) Load pins are also available without connector (pigtail wires)

**SYSTEM CONFIGURATION**



DIMENSIONS



NOTE: All values are in SI units. Dimensions are in millimeters.

MODEL <sup>b)</sup>	A	B	C	$\varnothing D_{-0.05}$	E	F	G	H	J	K	$\varnothing M$
123-102-000-01X	46.0	12	25.7	10	6.0	4.7	4.3	8.3	16	29.5	18
123-102-000-02X	50.5		30.0		7.3		6.0				
123-102-000-03X	71.5		51.0		7.0	27.0	8.5				
123-102-000-04X	67.5		47.0		23.0						

a) Caution: the load pin must be positioned in the direction of the load. If this is not the case, the load pin may break (mechanical breakdown) below the nominal overload value at rupture.

b) Other standard models (and customized models) available on request. Customization concerns load ratings or dimensions.

NOTE: 3D STEP files of most of our products are available on our website: [www.magtrol.com](http://www.magtrol.com) ; other files are available on request.

RELATED PRODUCT

LB & LE SERIES - LOAD MEASURING PINS



Fig. 3: LB210 & LB217 Load Measuring Pins

LB & LE Series Load Measuring Pins are used to measure load and force and to 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.

Load Pins are used for load measuring devices and overload protection on cranes,

hoisting gear, elevators, winches, and force measurement for regulation processes in industrial installations and machinery production. More information : [www.magtrol.com](http://www.magtrol.com)

ORDERING INFORMATION

Please consider the Part Number listed in the dimension table as the ordering number (e.g. 123-102-000-03X).

In case you require another nominal load, dimensions, or a specific design, please indicate the requested nominal load (e.g. 1 kN, 5 kN, 12 kN, etc.), the diameter  $\varnothing$  and the specific dimensions according to the above drawing as well as the quantity required.

Our sales representatives will be pleased to contact you and provide you with a customized quote.