LE SERIES
LOAD MEASURING PINS

MAGTROL offers a wide range of Load-Force-Weight Transducers with optional integrated electronics or Load Monitoring Units (LMU) with B.I.T.E. functions creating an ideal measurement system which continuously checks for overloads and short circuits. Idealy for use on Safety Applications according to **ECE-R10, ISO 13849-1 : CAT4** & **PLe** (LE 600 Series); **ISO 13849-1 : CAT2** & **PLd** (LE 400 Series).

FEATURES

- Temperature-compensated transducers with strain gauges in full-bridge configuration. On request, available with double bridge redundant.
- Available in several standard ranges: 2.5 kN ... 1 250 kN (0.28 tf ... 140.5 tf).
- Electronics for transmission over great distances:
  · 2 wires (LE 200) 4 ... 20 mA
  · 3 wires (LE 400) 4 ... 20 mA
  · 6 wires (LE 600) available with dual channels 4 ... 20 mA
- Built-In Test Equipment (B.I.T.E.) included on LE 400 Series & LE 600 Series.
- Complies with Safety Standards ISO 13849-1.
- EMC execution for reliable trouble-free operation.
- Rugged design corresponding to the quality characteristics of LB 200 Series.
- Insensitive to external mechanical and chemical effects.
- Ideal for use in hostile environments.
- Simple installation for cost-saving solutions to construction problems.
- Calibrated Output: 4 ... 20 mA.

Fig. 1: Load Measuring Pin models LE 621, LE 418 (back); LE 217 & LE 211 (front)

DESCRIPTION

Magtrol Load Measuring Pins LE Series 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 LE Series Load Measuring Pins are rugged with high resistance stainless steel and tight construction. Available in several standard ranges 2.5 kN ... 1 250 kN, their operation remains trouble-free and reliable even in electromagnetically difficult environmental conditions.

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. LE Series Load Measuring Pins are used for measuring loads and overload protection on cranes, hoisting gear, elevators and winches. The integrated electronics makes them ideal for applications in which separate signal conditioning is difficult to install and where the monitoring electronics are positioned at extended distances.

DESIGN

Magtrol's Load Measuring Pins have two 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).

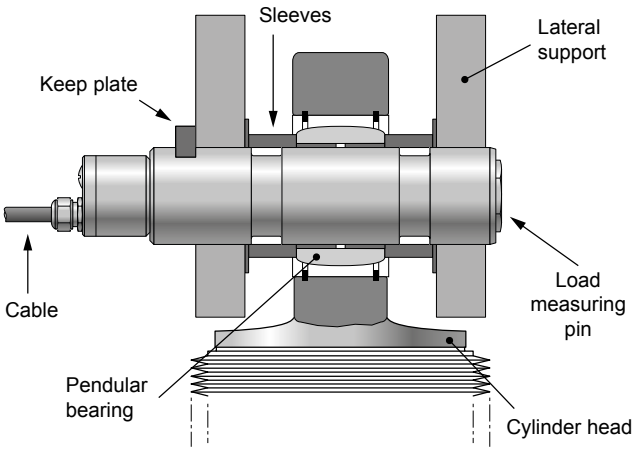


Fig. 2: Mounting example

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 signal is then converted by the integrated electronics to a standard 4 to 20 mA output. Based on SMD (Surface Mounted Device) technology, the electronics are well-protected against conducted and radiated electromagnetic fields.

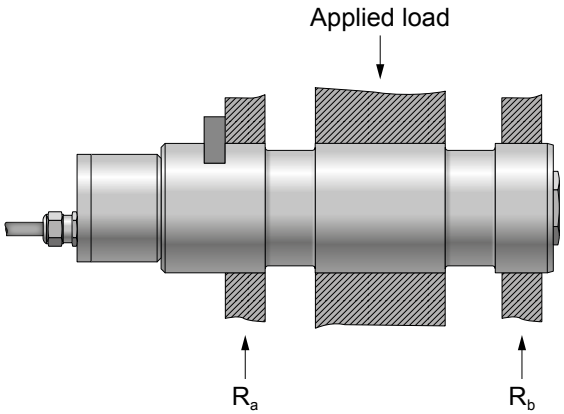
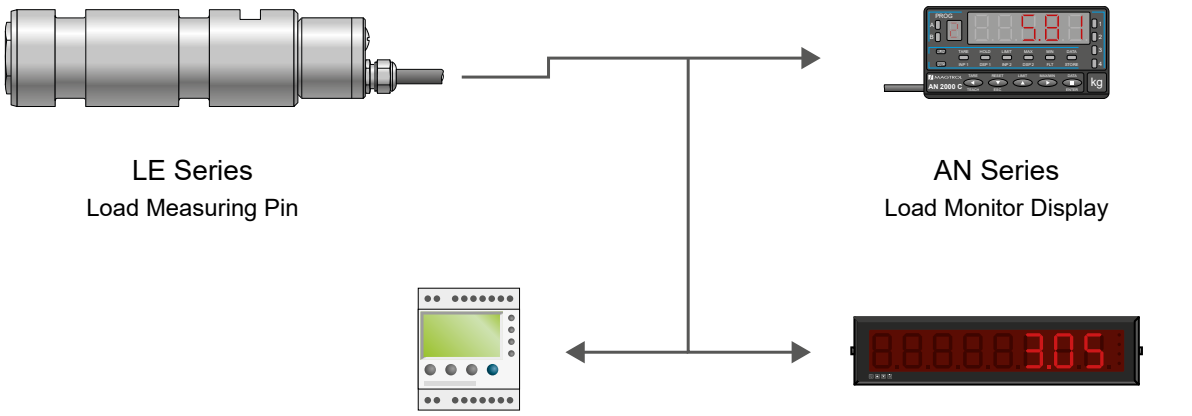


Fig. 3: R_a should equal R_b so that the force is evenly distributed

SYSTEM CONFIGURATION



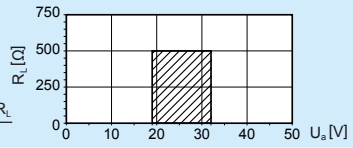
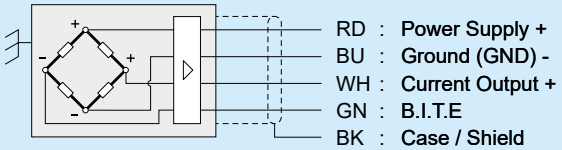
LE Series
Load Measuring Pin

AN Series
Load Monitor Display

PLC Programmable Logic Controller
(not provided by MAGTROL)

GAD Series
Large Digital Display

TECHNICAL DATA - LE 400 SERIES

STANDARD VERSION 1 CHANNEL [a]	LE 410	LE 411	LE 412	LE 413	LE 414	LE 416	LE 417	LE 418	LE 420	LE 421
LOAD MEASURING										
Nominal Load (Metric) [b]	2.5 kN	5 kN	10 kN	20 kN	50 kN	100 kN	200 kN	500 kN	1 000 kN	1 250 kN
Nominal Load (US) [b]	0.28 tf	0.56 tf	1.12 tf	2.25 tf	5.62 tf	11.24 tf	22.48 tf	56.2 tf	112.4 tf	140.5 tf
Overload Admissible (% of NL)	150 % (of rated load without influence on measurement)									
Overload at Rupture (% of NL)	≥ 500 %							400 %	300 %	
Non-linearity Error [b]	< 0.25 %							< 0.5 %		
Non-linearity + Hysteresis Error [b]	< 0.5 %							< 0.8 %		
Repeatability [b]	± 0.1 %									
Standard Calibration	0 kN = 4 mA ; Nominal Load in kN = 20 mA									
MECHANICAL CHARACTERISTICS & ENVIRONMENT										
Technology	Full-bridge strain gauge									
Material	Stainless steel 1.4057									
Lubrication	Not available					Oiler ø4 DIN 3405 D or M10 DIN 3405 A				
Operating Temperature	- 25 °C ... + 80 °C									
Storage Temperature	- 30 °C ... + 90 °C									
Temperature Influence on Zero [b]	± 0.02 % / K									
Temperature Influence on Sensitivity	± 0.02 % / K									
Long Term Stability of Zero [b]	< 1 % / year (not cumulative)									
Long Term Stability of Sensitivity	< 0.5 % / year (not cumulative)									
EMC | Vehicle approval Ⓔ	According to EN 61326-1, EN 61326-2-3 | ECE-R10									
Angle influence on signal output [c]	According to the cosine function									
Protection Class	IP 66 (connected) [e] according to EN 60529									
SAFETY STANDARDS & B.I.T.E.										
Safety Standards	ISO 13849-1 : CAT 2 and PLd									
Type of B.I.T.E. input	Active low, compatible with switch, relay, open collector or open drain, 1 B.I.T.E									
Effect on the output	Addition of 70 % (± 10 %) of the nominal load in standard (other % in option)									
ELECTRICAL CHARACTERISTICS & CONNECTIONS										
Strain Gauge Bridge Impedance	350 Ω									
Power Supply	19 ... 32 V DC (with protected polarity reversal)									
Output Signal	Rated 4 ... 20 mA (max. 0.5 ... 22 mA)									
Configuration	3-wires									
Load Resistance	Admissible resistance of 3-wire circuit at connection of LE 400 Series Hatched: Operating Domain = Load Resistance R_L / Supply Voltage U_a 									
Output Connection	Integrated 3 m, 6 m, 12 m or 20 m, polymer cable K-424 (standard) [d] or axial connector HUMMEL M16									
Connection cable assembly	For use with connector (see section «Cable Assembly»)									
Wiring Diagram										

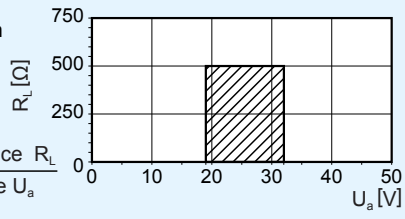
a) Rating apply to standard load pins only, special models available on request.
b) Full scale.
c) Variation of the measuring signal due to the angle positioning.
d) Other longer cables lenghts avaible on request.
e) When the counter-connector is connected

TECHNICAL DATA - LE 600 SERIES

STANDARD VERSION 2 CHANNELS [a]	LE 610	LE 611	LE 612	LE 613	LE 614	LE 616	LE 617	LE 618	LE 620	LE 621
LOAD MEASURING										
Nominal Load (NL) (Metric) [b]	2.5 kN	5 kN	10 kN	20 kN	50 kN	100 kN	200 kN	500 kN	1 000 kN	1 250 kN
Nominal Load (NL) (US) [b]	0.28 tf	0.56 tf	1.12 tf	2.25 tf	5.62 tf	11.24 tf	22.48 tf	56.2 tf	112.4 tf	140.5 tf
Overload Admissible (% of NL	150 % (of rated load without influence on measurement)									
Overload at Rupture (% of NL))	≥ 500 %							400 %	300 %	
Non-linearity Error [b]	< 0.25 %							< 0.5 %		
Non-linearity + Hysteresis Error [b]	< 0.5 %							< 0.8 %		
Repeatability [b]	± 0.1 %									
Standard Calibration	0 kN = 4 mA ; Nominal Load in kN = 20 mA									
MECHANICAL CHARACTERISTICS & ENVIRONMENT										
Technology	2x Full-bridge strain gauge									
Material	Stainless steel 1.4057									
Lubrication	Not available					Oiler ø4 DIN 3405 D or M10 DIN 3405 A				
Operating Temperature	- 25 °C ... + 80 °C									
Storage Temperature	- 30 °C ... + 90 °C									
Temperature Influence on Zero [b]	± 0.02 % / K									
Temperature Influence on Sensitivity	± 0.02 % / K									
Long Term Stability of Zero [b]	< 1 % / year (not cumulative)									
Long Term Stability of Sensitivity	< 0.5 % / year (not cumulative)									
EMC | Vehicle approval Ⓔ	According to EN 61326-1, EN 61326-2-3 | ECE-R10									
Angle influence on signal output [c]	According to the cosine function									
Protection Class	IP 66 (connected) [e] according to EN 60529									
SAFETY STANDARDS & DUAL B.I.T.E.										
Safety Standards	ISO 13849-1 : CAT4 and PLe									
Type of B.I.T.E. input.	Active low, compatible with switch, relay, open collector or open drain, 1 B.I.T.E. input for each channel									
Effect on the output	Addition of 70 % (± 10 %) of the nominal load in standard (other % in option)									
ELECTRICAL CHARACTERISTICS & CONNECTIONS										
Strain Gauge Bridge Impedance	2 x 350 Ω									
Power Supply	19 ... 32 V DC (with protected polarity reversal (1x or 2x))									
Output Signal 2 channels	Rated 4 ... 20 mA (max. 0.5 ... 22 mA) (2x)									
Configuration	6-wires									
Output Connection	Integrated 3 m, 6 m, 12 m or 20 m polymer cable K-824 (standard) [d] or axial connector HUMMEL M16									
Connection cable assembly	For use with connector (see section «Cable Assembly»)									

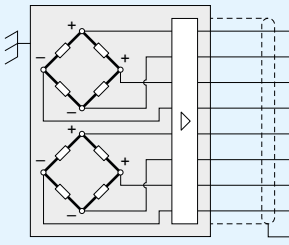
Load Resistance

Admissible resistance of 6-wire circuit at connection of LE 600 Series



Hatched: Operating Domain = Load Resistance R_L / Supply Voltage U_a

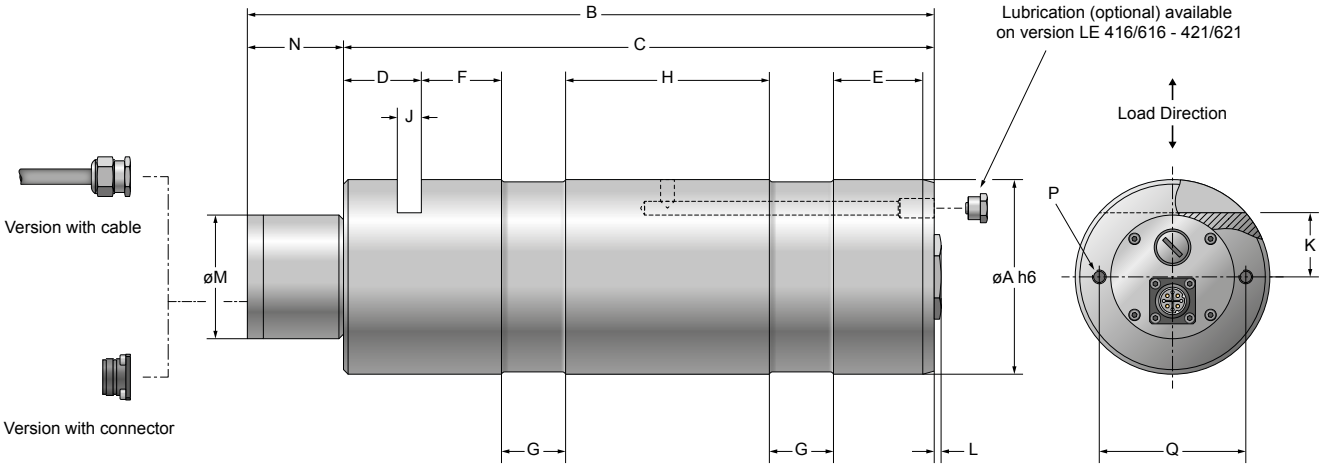
Wiring Diagram



RD	Power Supply +
BU	Ground (GND) -
WH	Current Output +
GN	B.I.T.E
BN	Power Supply +
BK	Ground (GND) -
GY	Current Output +
YE	B.I.T.E
YE / BK	Case / Shield

a) Rating apply to standard load pins only, special models available on request.
b) Full scale.
c) Variation of the measuring signal due to the angle positioning.
d) Other longer cables lenghts avaible on request.
e) When the counter-connector is connected

DIMENSIONS LE 400-600 SERIES



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

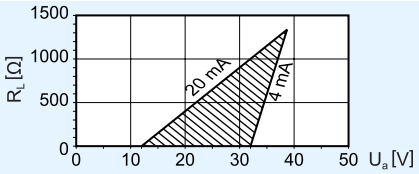
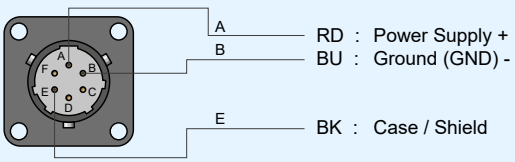
MODEL	units	øA	B	C	D	E	F	G	H	J	K	L	øM	N	WEIGHT
LE 410/610	mm	25 h6	137	84	18	16	10	7	24	5.2	9	3	54	57	0.6 kg
	in	0.984	5.394	3.307	0.709	0.63	0.394	0.276	0.945	0.205	0.354	0.118	2.126	2.244	1.323 lb
LE 411/611	mm	25 h6	137	84	18	16	10	7	24	5.2	9	3	54	57	0.6 kg
	in	0.984	5.394	3.307	0.709	0.63	0.394	0.276	0.945	0.205	0.354	0.118	2.126	2.086	1.323 lb
LE 412/612	mm	25 h6	137	84	18	16	10	7	24	5.2	9	3	54	57	0.6 kg
	in	0.984	5.394	3.307	0.709	0.63	0.394	0.276	0.945	0.205	0.354	0.118	2.126	2.086	1.323 lb
LE 413/613	mm	25 h6	137	84	18	16	10	7	24	5.2	9	3	54	57	0.6 kg
	in	0.984	5.394	3.307	0.709	0.63	0.394	0.276	0.945	0.205	0.354	0.118	2.126	2.086	1.323 lb
LE 414/614	mm	35 h6	165	112	25	14	12	12	35	6.3	11.5	3	54	42	1.05 kg
	in	1.378	6.496	4.409	0.984	0.551	0.472	0.472	1.378	0.248	0.453	0.118	2.126	1.654	2.315 lb
LE 416/616	mm	50 h6	214	161	32	24	18	18	48	10.5	20	3	54	42	2.4 kg
	in	1.969	8.425	6.339	1.26	0.945	0.709	0.709	1.89	0.413	0.787	0.118	2.126	1.654	5.291 lb
LE 417/617	mm	65 h6	249	196	32	26	20	25	65	10.5	22.5	3	54	42	4.8 kg
	in	2.559	9.803	7.717	1.26	1.024	0.787	0.984	2.559	0.413	0.886	0.118	2.126	1.654	10.582 lb
LE 418/618	mm	85 h6	311	258	34	39	35	28	89	10.5	28	3	54	42	11 kg
	in	3.347	12.244	10.158	1.339	1.535	1.378	1.102	3.504	0.413	1.102	0.118	2.126	1.654	24.251 lb
LE 420/620	mm	100 h6	400	347	36	61	55	35	120	10.5	36	3	54	42	19.6 kg
	in	3.937	15.748	13.661	1.417	2.402	2.165	1.378	4.724	0.413	1.417	0.118	2.126	1.654	43.211 lb
LE 421/621	mm	120 h6	400	347	36	61	55	35	120	12.5	40	3	54	42	28.8 kg
	in	4.724	15.748	13.661	1.417	2.402	2.165	1.378	4.724	0.492	1.575	0.118	2.126	1.654	63.493 lb

MODEL	units	P	Q	LUBRICATION
LE 410-414/610-614	N/A	N/A	N/A	N/A
LE 416/616				Optional lubrication [a]
LE 417/617				
LE 418/618	mm	M6	64	
	in		2.520	
LE 420/620	mm	M8	70	
	in		2.756	
LE 421/621	mm		70	
	in		2.756	

a) Oiler ø4 DIN 3405 D or M10 DIN 3405 A

NOTE: 3D STEP files of most of our products are available on our website: www.magtrol.com ; other files are available on request.

TECHNICAL DATA - LE 200 SERIES

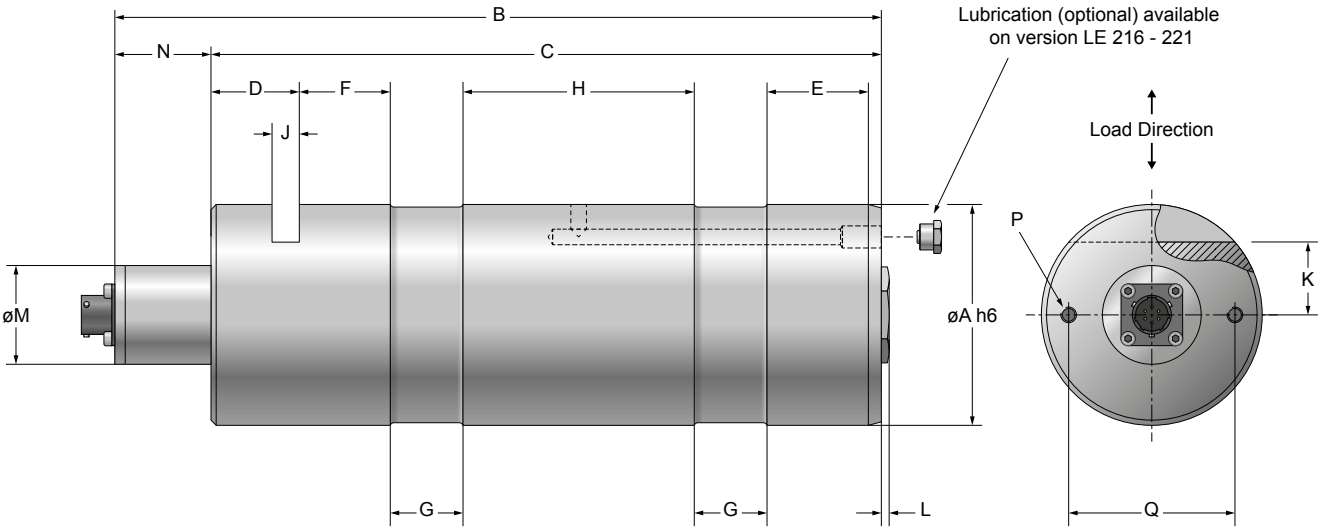
STANDARD VERSION[a]	LE 211	LE 212	LE 213	LE 214	LE 216	LE 217	LE 218	LE 220	LE 221
LOAD MEASURING									
Nominal Load (NL) (Metric)[b]	5 kN	10 kN	20 kN	50 kN	100 kN	200 kN	500 kN	1 000 kN	1 250 kN
Nominal Load (NL) (US)[b]	0.56 tf	1.12 tf	2.25 tf	5.62 tf	11.24 tf	22.48 tf	56.2 tf	112.4 tf	140.5 tf
Overload Admissible (% of NL)	150 % (without influence on measurement)								
Overload at Rupture (% of NL)	> 500 %						400 %	300 %	
Non-linearity Error[b]	< 0.25 %						< 0.5 %		
Non-linearity + Hysteresis Error[b]	< 0.5 %						< 0.8 %		
Repeatability[b]	± 0.1 %								
Standard Calibration	0 kN = 4 mA ; Nominal Load in kN = 20 mA								
MECHANICAL CHARACTERISTICS									
Technology	Full-bridge strain gauge								
Material	Stainless steel 1.4057								
Lubrication	Not available				Oiler ø4 DIN 3405 D or M10 DIN 3405 A				
ENVIRONMENT									
Operating Temperature	-25 °C ... +80 °C								
Storage Temperature	-30 °C ... +90 °C								
Temperature Influence on Zero[b]	± 0.02 % / K								
Temperature Influence on Sensitivity	± 0.02 % / K								
Long Term Stability on Zero[b]	< 1 % / year (not cumulative)								
Long Term Stability on Sensitivity	< 0.5 % / year (not cumulative)								
EMC	According to EN 61000-6-2 & EN 61326-1								
Influence α on Measurement Signal[c]	According to the cosine function								
Protection Class	IP 66 according to DIN 60529								
ELECTRICAL CHARACTERISTICS & CONNECTIONS									
Strain Gauge Bridge Impedance:	5 000 Ω								
Power Supply	12 ... 32 V DC (with protected polarity reversal < 35 mA)								
Output Signal	Rated 4 ... 20 mA (max. 3.5 ... 25 mA)								
Configuration	2-wires								
Load Resistance	Admissible resistance of the 2-wire circuit at the connection of the LE 200 Hatched: Operating Domain = Load Resistance R_L / Supply Voltage U_a 								
Output Connection	Axial connector, Souriau 851 02 E 10 6P50								
Connection cable assembly	See section «Cable Assembly»								
Wiring Diagram									

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

b) Full scale.

c) Variation of the measuring signal due to the angle positioning.

DIMENSIONS LE 200 SERIES



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

MODEL	units	øA	B	C	D	E	F	G	H	J	K	L	øM	N	Weight
LE 211	mm	25 h6	136	84	18	16	10	7	24	5.2	9	3	38	52	0.6 kg
	in	0.984	5.354	3.307	0.709	0.63	0.394	0.276	0.945	0.205	0.354	0.118	1.496	2.047	1.323 lb
LE 212	mm	25 h6	136	84	18	16	10	7	24	5.2	9	3	38	52	0.6 kg
	in	0.984	5.354	3.307	0.709	0.63	0.394	0.276	0.945	0.205	0.354	0.118	1.496	2.047	1.323 lb
LE 213	mm	25 h6	136	84	18	16	10	7	24	5.2	9	3	38	52	0.6 kg
	in	0.984	5.354	3.307	0.709	0.63	0.394	0.276	0.945	0.205	0.354	0.118	1.496	2.047	1.323 lb
LE 214	mm	35 h6	149	112	25	14	12	12	35	6.3	11.5	3	38	37	1.05 kg
	in	1.378	5.866	4.409	0.984	0.551	0.472	0.472	1.378	0.248	0.453	0.118	1.496	1.457	2.315 lb
LE 216	mm	50 h6	198	161	32	24	18	18	48	10.5	20	3	38	37	2.4 kg
	in	1.969	7.795	6.339	1.26	0.945	0.709	0.709	1.89	0.413	0.787	0.118	1.496	1.457	5.291 lb
LE 217	mm	65 h6	233	196	32	26	20	25	65	10.5	22.5	3	38	37	4.8 kg
	in	2.559	9.173	7.717	1.26	1.024	0.787	0.984	2.559	0.413	0.886	0.118	1.496	1.457	10.582 lb
LE 218	mm	85 h6	295	258	34	39	35	28	89	10.5	28	3	38	37	11 kg
	in	3.347	11.614	10.158	1.339	1.535	1.378	1.102	3.504	0.413	1.102	0.118	1.496	1.457	24.251 lb
LE 220	mm	100 h6	384	347	36	61	55	35	120	10.5	36	3	38	37	19.6 kg
	in	3.937	15.118	13.661	1.417	2.402	2.165	1.378	4.724	0.413	1.417	0.118	1.496	1.457	43.211 lb
LE 221	mm	120 h6	384	347	36	61	55	35	120	12.5	40	3	38	37	28.8 kg
	in	4.724	15.118	13.661	1.417	2.402	2.165	1.378	4.724	0.492	1.575	0.118	1.496	1.457	63.493 lb

MODEL	units	P	Q	LUBRICATION
LE 211-214	N/A	N/A	N/A	N/A
LE 216				Optional lubrication [a]
LE 217				
LE 218	mm	M6	64	
	in		2.520	
LE 220	mm	M8	70	
	in		2.756	
LE 221	mm		70	
	in		2.756	

a) Oiler ø4 DIN 3405 D or M10 DIN 3405 A

NOTE: 3D STEP files of most of our products are available on our website: www.magtrol.com ; other files are available on request.

ORDERING INFORMATION

LE 400 SERIES & LE 600 SERIES

ORDERING NUMBER	LE	_	_ _	/	_	_	X

4 : LE 400 Series
6 : LE 600 Series

10, 11, 12, ... , 21 : Model LE

0 : Without Lubrication (standard)
1 : With Lubrication [a)]

0 : Axial connector
1 : Cable length 3 m
2 : Cable length 6 m
3 : Cable length 12 m
4 : Cable length 20 m [b)]

a) Available only on Model LE 416 ... LE 421 and LE 616 ... LE 621
b) Other longer cables lenghts avaible on request.

LE 200 SERIES

ORDERING NUMBER	LE 2	_ _	/ 0	_	X

11, 12, ... , 21 : Model LE

1 : Without Lubrication (standard)
3 : With Lubrication (available only on LE 216 ... LE 221)

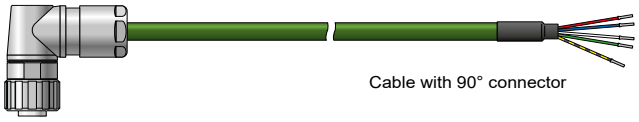
Example: LE 416 Load Measuring Pin with lubrication and 6 m cable would be ordered as **LE 416 / 12X**.

LE 618 Load Measuring Pin without lubrication and 12 m cable would be ordered as **LE 618 / 03X**.

LE 216 Load Measuring Pin with lubrication would be ordered as **LE 216 / 03X**.

CABLE ASSEMBLY LE 400 SERIES

Cable with axial connector



Cable with 90° connector

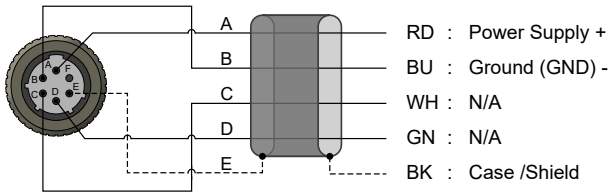
ORDERING NUMBER	EH 14	_	/ 0	_	X

8 : Axial connector
9 : 90° connector

1 : Cable length 3 m
2 : Cable length 6 m
3 : Cable length 12 m
4 : Cable length 20 m [a)]

a) Other longer cables lenghts avaible on request.

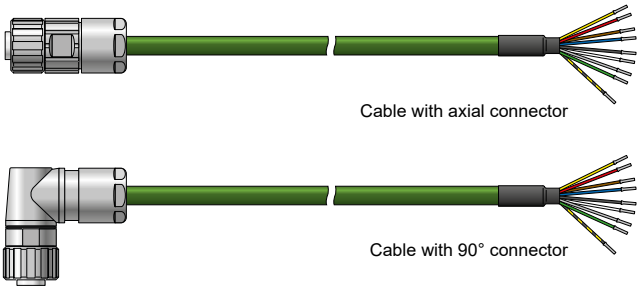
PIN CONFIGURATION



COUNTER CONNECTOR

Axial connector	PN 957-11-07-3101
90° connector	PN 957-11-07-3102

CABLE ASSEMBLY LE 600 SERIES



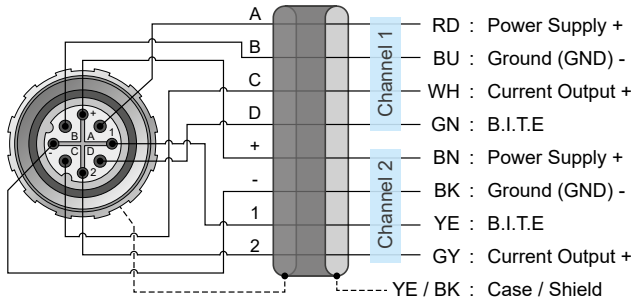
ORDERING NUMBER	ER 11	_	/ 0	_	X

8 : Axial connector
9 : 90° connector

1 : Cable length 3 m
2 : Cable length 6 m
3 : Cable length 12 m
4 : Cable length 20 m [a)]

a) Other longer cables lenghts avaible on request.

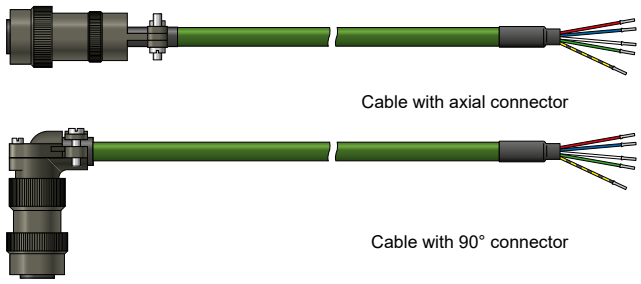
PIN CONFIGURATION



COUNTER CONNECTOR

Axial connector	PN 957-11-07-3111
90° connector	PN 957-11-07-3112

CABLE ASSEMBLY LE 200 SERIES



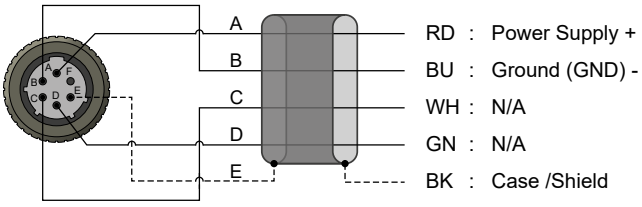
ORDERING NUMBER	EH 13	_	/ 0	_	X

8 : Axial connector
9 : 90° connector

1 : Cable length 3 m
2 : Cable length 6 m
3 : Cable length 12 m
4 : Cable length 20 m [a)]

a) Other longer cables lenghts avaible on request.

PIN CONFIGURATION



COUNTER CONNECTOR

Axial connector	PN 957-11-08-0030
90° connector	PN 957-11-08-0029

SYSTEM OPTIONS AND ACCESSORIES

LB 200 SERIES - LOAD MEASURING PINS

LB 200 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. Manufactured in Switzerland, Magtrol's Load Pins are rugged with high resistance stainless steel and tight construction, designed specifically for use in hostile industrial environments.

Fig. 4: **LB 210** & **LB 217**
Load Measuring Pins

LB 200 Series 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. Moreover it is an idealy transducer to detect and measure forces in harsh, tropical, offshore, marine and harbor environments.

LMU 210 SERIES - LOAD MONITORING UNIT

Fig. 5: **LMU 217** | Load Monitoring Unit

The Magtrol LMU 210 Series - Load Monitoring Unit is specially designed for strain gauge transducer applications. Specifically developed for use with Magtrol load measuring pins and load-force-weight sensors, the LMU 210 Series provides excitation current and amplifies the output signal of full-bridge strain gauges. Configurable relays and analog outputs are also available.

Its IP 65 aluminum housing allows the system to be used in harsh environments.

AN SERIES - LOAD MONITOR DISPLAY WITH INTEGRATED SIGNAL CONDITIONER

Fig. 6: **AN Series** | Load Monitor Display with integrated signal conditioner

The AN Series Load Monitor is designed to process and display signals coming from various types of transducers (weight, load, pressure, torque, etc.) that use standard strain-gauge bridges.

The basic instrument is a soldered assembly composed of a main board, a tri-color programmable display and a power circuit. Standard features include the reading of the input variable as well as remote hold, reading and memorization of max and min values (peak / valley), tare and reset function.

GAD SERIES - LARGE DIGITAL DISPLAYS

Fig. 7: **GAD 6** | Large Digital Display - digits height 102mm

These high quality, large character digital displays can be used for crane weight display, process weight display, and all other remote weighing applications. They use microprocessor based technology for high reliability and have a non-volatile memory to store all the calibration data.

Magtrol Large Digital Displays are used with Load Monitoring Units (LMUs) or signal conditioners (AN Series), as part of a complete measurement system. Magtrol load measuring pins, which measure load and force to provide overload protection, are available for a wide range of Load-Force-Weight, and in various executions and accuracy classes. Combined, these products constitute an ideal safe measurement system for continuous overload monitoring.

Further information on accessories are available in their specific data sheets. Please, visite our website: **www.magtrol.com**

MAGTROL INC
70 Gardenville Parkway
Buffalo NY 14224 | USA
phone +1 716 668 5555
fax +1 716 668 8705
e-mail magtrol@magtrol.com

MAGTROL SA
Route de Montena 77
1728 Rossens | Switzerland
phone +41 26 407 30 00
fax +41 26 407 30 01
e-mail magtrol@magtrol.ch

Offices in: Germany
France - China - India
Worldwide Distribution Network

ISO 9001 BUREAU VERITAS Certification
LE SERIES - EN 09/2023