



Highly Reliable
Systems for
Measuring and
Monitoring
Load, Force and
Weight

- Load Measuring Pins
- Load-Force-Weight Sensors
- Cable Sensors
- Extensometers
- Load Monitoring Units
- Load Conditioners and Displays
















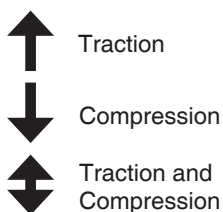
LOAD-FORCE-WEIGHT

The corresponding data sheets give full technical details of most of the products described in this brochure. They are available on our web site at: <http://www.magtrol.com/datasheets.htm>

LOAD MEASURING PINS

FORCE SENSORS










								
Model	LB 210	LB 230	LE/LU	MB-02	MD-01	DD-03	HC-03	FD-01
Nominal Range	2.5 kN – 1250 kN	2.5 kN – 1250 kN	5 kN – 1250 kN	10 kN others on request	0.2 kN – 5 kN	20 kN – 1000 kN	300 kN 600 kN	400 kN others on request
Force Direction								
Combined Error	0.5 %	0.4 %	0.5 %	1 %	0.2 %	0.25 %	0.5 % – 1 %	0.5 %
Admissible Overload	150 %	150 %	150 %	150 %	150 %	150 %	150 %	150 %
Overload at Rupture	350 % to 500 %	350 % to 500 %	350 % to 500 %	300 %	300 %	400 %	300 %	400 %
Impedance	350 Ω	700 Ω	350 Ω or 5000 Ω	350 Ω	350 Ω	240 Ω	700 Ω	700 Ω
Operating Temperature	-25 °C to +80 °C	-25 °C to +80 °C	-25 °C to +80 °C	-10 °C to +40 °C	-40 °C to +80 °C	-10 °C to +60 °C	-40 °C to +80 °C	-30 °C to +100 °C
Output Signal	0.5 to 1.8 mV/V	0.5 to 1.8 mV/V	4–20 mA (LE) 0–10 V (LU)	2 mV/V	2 mV/V	2 mV/V	1.5 mV/V	1.5 mV/V
Material	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel	high-resistance steel	high-resistance steel	stainless steel
Protection Class	IP65	IP66	IP66	IP67	IP67	IP66	IP67	IP42 or IP66
Sensor Power Supply	5–10 VDC	5–10 VDC	12–32 VDC	5–10 VDC	0.5–10 VDC	< 20 VDC	0.5–20 VDC	5–10 VDC



Load Measuring Pins and Custom Sensors

With our product flexibility and skilled engineering team, Magtrol can provide customized solutions and sensors. Cranes and other lifting devices can be upgraded or refurbished without heavy mechanical modification.











FORCE SENSORS				CABLE SENSORS			EXTENSOMETERS	
								
ZF-01	ZB	ZS/ZP-S	ZM/ZM-S	SK-02/C	ZL-03	SG-01	KG-03	KG-04
0.1 kN – 200 kN	0.1 kN – 10 kN 10 kg – 1000 kg	10 N – 200 N 0.5 kN – 50 kN 0.5 / 1 / 2 / 5 t	0.1 kN – 100 kN	cable Ø: 8 mm–22 mm 23 mm–28 mm (version C) (The force will depend on the type of cable used.)	10 kN – 100 kN 1 t – 10 t	160 kN others on request	$\varepsilon = \pm 600 \times 10^{-6}$	$\varepsilon = \pm 600 \times 10^{-6}$
↕	↕	↕	↓	↑	↑	↓	↕	↕
0.5 %	0.1 % / 0.5 % C1 / C2 / C3	0.1 % / 0.5 % C1 / C2 / C3	0.2 % – 1 %	1 % – 2 %	0.5 %	1 %	1 % – 2 %	1 % – 2 %
150 %	150 %	150 %	150 %	150 %	150 %	150 %	150 %	150 %
500 %	500 %	300 %	300 %	---	500 %	350 %	300 %	500 %
350 Ω	350 Ω	350 Ω	350 Ω	350 Ω	350 Ω	700 Ω	350 Ω	350 Ω
-30 °C to +100 °C	-30 °C to +70 °C	-20 °C to +60 °C	-20 °C to +60 °C	-10 °C to +60 °C -40 °C (option)	-10 °C to +60 °C	+10 °C to +60 °C	-40 °C to +80 °C	-30 °C to +70 °C
1 to 2 mV/V	2 mV/V	2 mV/V	1 mV/V	1 mV/V	1 mV/V	1.2 mV/V	---	1 mV/V
stainless steel	stainless steel	aluminum	stainless steel	stainless steel	high-resistance steel	high-resistance steel	stainless steel	high-resistance steel
IP42 or IP66	IP66	IP67	IP65	IP65	IP65	IP67	IP67	IP66
5–10 VDC	5–10 VDC	5–10 VDC	5–10 VDC	5–10 VDC	5–10 VDC	5–10 VDC	5–10 VDC	5–10 VDC
load measurement	load measurement	load measurement	load measurement	cranes, lifting devices, ski lifts	cranes, lifting devices, ski lifts	cable traction control	strain measurement, railways	strain measurement

Special Sensors and Available Options

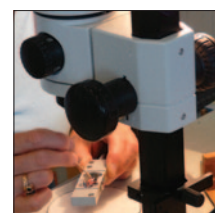
- Load pins up to 300 mm in diameter; length up to 600 mm
- Measuring range up to 5 MN (500 tons)
- Extended operating temperature range from -40 °C to +200 °C
- Double signal, redundant or 2/3 axis sensors
- Special materials (e.g., for operating low temperature)
- Special tests: ultrasonic, magnetoscopic, impact strength, material certificate, OIML, Ex area



EXTENSOMETERS		SPECIAL SENSORS						
								
KG-05	SD-101	MBB-0.1	MBB-0.2	CC-01	DB-11	DB-DA/ DB-DC	SK-01	HRL
$\varepsilon = \pm 600 \times 10^{-6}$	$\varepsilon = \pm 600 \times 10^{-6}$	0.5 N – 20 N	0.01 N 5 N	500 N 20 kN	20 N 30 N 50 N 75 N 100 N	50 N – 750 N (DB-DA) 1200 N (DB-DC)	300 kN 400 kN	600 kN – 1000 kN 1700 kN – 2700 kN
								
1 % – 2 %	1 % – 2 %	0.05 % – 0.1 %	0.1 % – 0.2 %	0.5 %	0.5 %	0.1 % – 0.2 %	1 %	2 %
150 %	150 %	1000 % (min)	200 % – 2500 %	150 %	150 %	1000 % (min)	150 %	120 %
500 %	500 %	up to 2500 %	1500 % – 15,000 %	300 %	300 %		400 %	300 %
1000 Ω	5000 Ω	350 Ω or 1000 Ω	750 Ω	350 Ω	350 Ω	350 Ω	3500 Ω	700 Ω
-30 °C to +70 °C	-40 °C to +80 °C	+15 °C to +30 °C	+15 °C to +30 °C	+10 °C to +80 °C	-10 °C to +40 °C	60 °C or 100 °C or 160 °C	+5 °C to +60 °C	-25 °C to +70 °C
1.5 mV/V	0.7 mV/V	1 mV/V	4 to 40 mV/V	0.5 mV/V	2 mV/V	1 mV/V	0.7 mV/V	1.5 mV/V
high-resistance steel	aluminum (housing)	aluminum	aluminum	aluminum	aluminum	high-resistance steel	high-resistance steel	stainless steel
IP66	IP65	IP42	IP42	IP65	IP67	IP67	IP66	IP66
5–10 VDC	5–10 VDC	5–12 V DC	5 VDC	5–10 VDC	5–10 VDC	5–10 VDC	5–20 VDC	5–10 VDC
strain measurement	strain measurement	small force measurement, micro-engineering, watchmaking	small force measurement, micro-engineering, watchmaking	load measurement, presses	weighing, dosing	bearing force control, textile machines, printing presses	cables, lift clamp control	cable tension control, weigh bridges

Extensometer Applications

Magtrol offers special strain gauge bonding services on customer devices. Contact customer service for a quote.



LOAD MONITORING UNITS				
				
Model	LMU 209	LMU 212	LMU 217	LMU 216
Transducer Inputs	1	1	2	1
Voltage Output	1 × 0–10 V	1 × 0–10 V	2 × 0–10 V	3 × 0–10 V
Current Output	1 × 0/4–20 mA	1 × 0/4–20 mA	2 × 0/4–20 mA	1 × 0/4–20 mA
Relays	0	2	4	4
Summation	0	2	3	4
Power Supply	18...28 VDC / 70 mA	115–230 VAC (50–60 Hz) 20–32 VDC 48 VAC	115–230 VAC (50–60 Hz) 20–32 VDC 48 VAC	115–230 VAC (50–60 Hz) 20–32 VDC 48 VAC
Housing	PC-F, UL 94V-0 polycarbonate Aluminum (option)	Aluminum	Aluminum	Aluminum
Protection Class	IP52 or IP65 (option)	IP65	IP65	IP65
LOAD CONDITIONERS & DISPLAYS				
				
Model	AN 1500M	AN 2000C	GAD	GM 80
Description	Load Monitor, Signal Conditioner & Display	Load Monitor, Signal Conditioner & Display	Large Remote Display	Portable Load Monitor & Display
Display Height	14 mm	14 mm	57 mm to 400 mm	10 mm
Display Figures	±19999	±32000	-199999 to +999999	±9999
Input Range	strain gauges, 5–10 V, max 60 mA	strain gauges, 5–10 V, max 120 mA	0–10 VDC, 0–5 VDC 1–5 VDC 0/4–10/20 mA	strain gauges, 5 V, max 20 mA
Acquisitions per second	20	16	10	5
Transducer Inputs	1 to 2	1 to 4	0-10 VDC	1
Signal Outputs (option)	0–10 VDC 4–20 mA RS-232C or RS-485	0–10 VDC 4–20 mA RS-232C or RS-485	0–10 VDC 4–20 mA RS-232	RS-232
Relays (option)	2 or 4	2 or 4	---	---
Functions	Hold, Tare, Peak, Valley	Hold, Tare, Peak, Valley	Tare	Tare, Peak, Valley
Power Supply	85–265 VAC (50–60 Hz) 22–53 VAC 100–300 VDC 10.5–70 VDC	115–230 VAC (50–60 Hz) 10–30 VDC 48/24 VAC	100–240 VAC 48 VAC (option) 11–30 VDC	4 × (AA) cells or battery 1600 mAh
Housing	UL 94V-0 polycarbonate	UL 94V-0 polycarbonate	polycarbonate	polycarbonate
Protection Class	IP65 front panel IP45 housing	IP65 front panel IP45 housing	IP65	IP40

OTHER PRODUCTS



Motor Testing Equipment

Magtrol provides customized solutions and turnkey systems for testing all types of electric and pneumatic motors, gas engines and gearheads, as well as servo drives and inverters. Products include:

- Dynamometers:
 - Torque: 2 mN·m to 1200 N·m
 - Speed: up to 100,000 rpm
 - Power: 2 W to 140 kW
- Power Analyzers
- Software
- Motor Fixtures
- Tables and Cabinets
- Dynamometer Controllers



Torque Transducers

For torque measurement from 0.1 N·m to 200,000 N·m for speeds up to 50,000 rpm. Products include:

- In-line Torque Transducers
- Torque Flange Sensors
- Couplings
- Displays
- Software



Hysteresis Brakes and Clutches

Convection powder brakes

Used to provide precise tension and torque control in many types of applications such as textile, coil winding, EDM, wire and fiber optic cable, printing and packaging.

- Torque: 0.02 N·m to 50 N·m
- Speed: up to 25,000 rpm
- Power: up to 5300 W



Displacement Transducers

Provides contactless measurement of absolute piston position in hydraulic and pneumatic cylinders, and other applications.

- Range from 50 mm to 1 m
- Ability to withstand pressure up to 450 bar
- Operating temperature of -40 °C to +80 °C (high temperature version up to 200 °C available)
- High shock and vibration resistance



Rotary Transmitters

Used for signal transmission of transducers on a rotating part (e.g. engine shaft) to a stationary system (measuring instrument or PC). Common applications include thermocouples and strain gauges, as well as piezo electric transducers to measure oscillation, acceleration, force and pressure.

- 1, 4, 8 or 12 channels
- Speed: up to 40,000 rpm

Due to the continual development of our products, we reserve the right to modify specifications without forewarning.

For more information, contact your local sales agent:



LFW-US www.01/13

For over 60 years, Magtrol has been providing customers with high quality products to test, measure and control torque-speed-power, load-force-weight, tension and displacement. Magtrol Inc, headquartered in the USA, is a leading manufacturer of motor test equipment and hysteresis brakes and clutches. Magtrol SA, located in Switzerland, also offers motor test equipment as well as transducers to measure, monitor and control load, force, weight and displacement. Magtrol offers customers a wide array of test and measurement solutions, combined with excellent worldwide sales and service.

MAGTROL INC

70 Gardenville Parkway
Buffalo, New York 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/Fribourg, Switzerland

Phone: +41 (0)26 407 3000

Fax: +41 (0)26 407 3001

E-mail: magtrol@magtrol.ch

Subsidiaries in:

- Germany • France
- China and India

For worldwide network of sales agents, visit our web site:

www.magtrol.com