









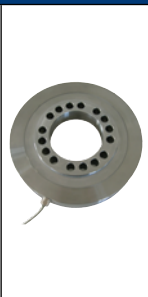















Highly Reliable  
Systems for  
Measuring and  
Monitoring  
Load, Force and  
Weight

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



LOAD-FORCE-WEIGHT

	LOAD MEASURING PINS					FORCE SENSORS			
<i>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: <a href="http://www.magtrol.com/datasheets.htm">http://www.magtrol.com/datasheets.htm</a></i>									
	Model	LB 210	LB 230	LE/LU 2XX	LE 3XX/5XX	MB-02	MD-01	DD-03	HC-03
Nominal Range	2.5 kN – 1250 kN	2.5 kN – 1250 kN	5 kN – 1250 kN	5 kN – 1250 kN + B.I.T.E.	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%	0.5%	1%	0.2%	0.25%	0.5% – 1%	0.5%
Admissible Overload	150%	150%	150%	150%	150%	150%	150%	150%	150%
Overload at Rupture	300% to 500%	300% to 500%	300% to 500%	300% to 500%	300%	300%	400%	300%	400%
Impedance	350 Ω	700 Ω	350 Ω (LU) 5000 Ω (LE)	350 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	-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)	1 or 2 4–20 mA	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	stainless steel	stainless steel	stainless steel	stainless steel
Protection Class	IP65	IP66	IP66	IP66	IP67	IP67	IP66	IP67	IP42 or IP66
Sensor Power Supply	5–10 VDC	5–10 VDC	12–32 VDC	12–32 VDC	5–10 VDC	0.5–10 VDC	< 20 VDC	0.5–20 VDC	5–10 VDC
Applications	cranes, lifting devices, ski lifts	cranes, lifting devices, ski lifts	cranes, lifting devices, ski lifts	cranes, lifting devices, ski lifts	hydraulic jacks, process control	weighing, dosing, harsh environments	load Measurement	load Measurement, ski lifts, hydraulic jacks	load Measurement

-  Traction
-  Compression
-  Traction and Compression
-  Traction and Compression Redundant

### Load Measuring Pins and Custom Sensors



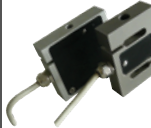




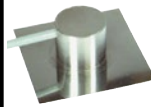

With our product flexibility and skilled engineering team, Magtrol can provide customized solutions and sensors. Cranes and other lifting devices can be upgraded or refurbished without heavy mechanical modification.



Shackles Load Pin










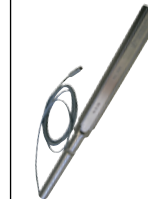










Wedge Socket

FORCE SENSORS				CABLE SENSORS			EXTENSOMETERS	
								
<b>ZF-01</b>	<b>ZB</b>	<b>ZS/ZP-S</b>	<b>ZM/ZM-S</b>	<b>SK-02/C</b>	<b>ZL-03</b>	<b>SG-01</b>	<b>KG-03</b>	<b>KG-04</b>
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	$\epsilon = \pm 600 \times 10^{-6}$	$\epsilon = \pm 600 \times 10^{-6}$
↕	↕	↕	↓	↑	↑	↓	↕	↕
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	stainless steel	stainless steel	stainless steel	stainless 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
$\epsilon = \pm 600 \times 10^{-6}$	$\epsilon = \pm 600 \times 10^{-6}$	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%	500% – 2000%	400%	300%
1000 $\Omega$	5000 $\Omega$	350 $\Omega$ or 1000 $\Omega$	750 $\Omega$	350 $\Omega$	350 $\Omega$	350 $\Omega$	3500 $\Omega$	700 $\Omega$
-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
stainless steel	aluminum (housing)	aluminum	aluminum	aluminum	aluminum	stainless steel	stainless 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.



<b>LOAD MONITORING UNITS</b>				
				
<b>Model</b>	<b>LMU 209</b>	<b>LMU 212</b>	<b>LMU 217</b>	<b>LMU 216</b>
<b>Transducer Inputs</b>	1	1	2	1
<b>Voltage Output</b>	1 × 0–10 V	1 × 0–10 V	2 × 0–10 V	3 × 0–10 V
<b>Current Output</b>	1 × 0/4–20 mA	1 × 0/4–20 mA	2 × 0/4–20 mA	1 × 0/4–20 mA
<b>Relays</b>	0	2	4	4
<b>Summation</b>	0	2	3	4
<b>Power Supply</b>	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
<b>Housing</b>	PC-F, UL 94V-0 polycarbonate Aluminum (option)	Aluminum	Aluminum	Aluminum
<b>Protection Class</b>	IP52 or IP65 (option)	IP65	IP65	IP65
<b>LOAD CONDITIONERS &amp; DISPLAYS</b>				
				
<b>Model</b>	<b>AN 1500M</b>	<b>GAD 4 OR 6 DIGITS</b>	<b>GM 80</b>	<b>SGS-350</b>
<b>Description</b>	Load Monitor, Signal Conditioner & Display	Large Remote Display	Portable Load Monitor & Display	Strain Gauge Simulator 350 Ω
<b>Display Height</b>	14 mm	57 mm to 400 mm	10 mm	---
<b>Display Figures</b>	±19999	-199999 to +999999	±9999	---
<b>Input Range</b>	strain gauges, 5–10 V, max 60 mA	0–10 VDC, 0–5 VDC 1–5 VDC 0/4–10/20 mA	strain gauges, 5 V, max 20 mA	Sensitivity from 0 to 2 mV/V
<b>Acquisitions per second</b>	20	10	5	---
<b>Transducer Inputs</b>	1 to 2	1	1	350 Ω
<b>Signal Outputs (option)</b>	0–10 VDC 4–20 mA RS-232C or RS-485	0–10 VDC 4–20 mA RS-232	RS-232 USB	mV
<b>Relays (option)</b>	2 or 4	---	---	---
<b>Functions</b>	Hold, Tare, Peak, Valley	Tare, Peak, Valley	Tare, Peak, Valley	Simulation
<b>Power Supply</b>	85–265 VAC (50–60 Hz) 22–53 VAC 100–300 VDC 10.5–70 VDC	100–240 VAC 48 VAC (option) 11–30 VDC	4 × (AA) cells or battery 1600 mAh	5–10 VDC
<b>Housing</b>	UL 94V-0 polycarbonate	polycarbonate	polycarbonate	Aluminium case
<b>Protection Class</b>	IP65 front panel IP45 housing	IP65	IP40	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.11/14



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.

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[www.magtrol.com](http://www.magtrol.com)