

# ZM SERIES

## FORCE TRANSDUCERS

### FEATURES

- Nominal Force: 0.1 ... 100 kN
- Small size; ideal for space-saving applications
- Cost effective, high accuracy and long service reliability
- Damage-resistant (no mechanically sensitive parts)
- Construction with high-strength aluminum alloy or stainless steel
- Depending on the model, chemical resistant (suitable for moist environments and chemical plants)
- Protection Class: IP 65 or IP 67
- Special designs available upon request



Fig. 1: ZM / 20 kN / 0.2 - Force Transducer

### DESCRIPTION

Magtrol's ZM Series Force Transducers are designed to measure static and dynamic pressure forces. They are characterized by their small dimensions.

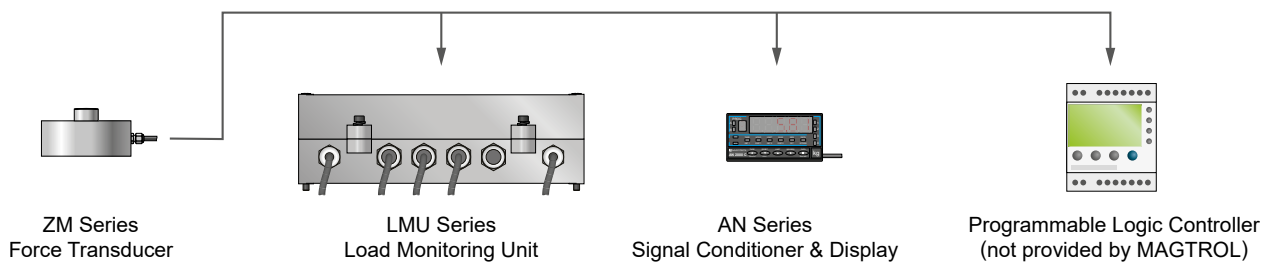
Manufactured in stainless steel or high-resistance aluminum, these transducers can be used in a wide variety of applications. In particular, the stainless steel versions with a high degree of protection can be used everywhere without restriction, even in harsh environments.

The sensor element consists of a diaphragm body equipped with metal foil strain gauges, which forms a hermetically sealed chamber filled with dry nitrogen. In standard mounting, the transducers are fixed with screws on a flat surface. The force is introduced vertically (without transverse force) via the universal ball joint, either directly or via a metal adapter interface.

All Magtrol ZM Series transducers are supplied with a 1.5 m long connection cable with loose ends.

Optionally, they can be supplied with a built-in amplifier (ZM-E). Then, an Output Signals of 0... 10 VDC or 4... 20 mA can be selected.

### SYSTEM CONFIGURATION



**TECHNICAL DATA - ZM**

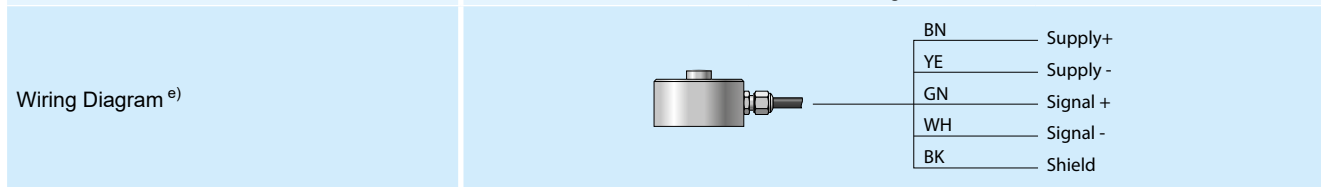
ACCURACY CLASS <sup>a)</sup>	0.5	0.2	0.1
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**MECHANICAL CHARACTERISTICS**

Nominal Force (F <sub>n</sub> )	0.5/1/2/5/10/20/50/100kN		20/50/100kN
Max. Permissible Force <sup>b)</sup>	150%		
Breaking Overload <sup>b)</sup>	>300%		
Max. Transverse Force <sup>b)</sup>	20%		
Combined Error (Linearity & Hysteresis) <sup>a,c)</sup>	≤0.5%	≤0.2%	0.1%
Temperature Influence on Zero or Sensitivity <sup>c)</sup>	≤0.5%/10K	≤0.2%/10K	0.1%/10K
Relative Creep (30 min) <sup>c)</sup>	≤0.5%	≤0.2%	0.1%
Material	Special Steel		

**ELECTRICAL CHARACTERISTICS**

Nominal Sensitivity (S)	1 mV/V ±0.5%
Relative Deviation of Zero Signal <sup>c)</sup>	≤3%
Max. Supply Voltage	10 VDC
Input Resistance	380 Ω ±30
Output Resistance	352 Ω ±1.5
Insulation Resistance	>5 x 10 <sup>9</sup> Ω
Connection Cable	Cable, length 1.5 m <sup>d)</sup>

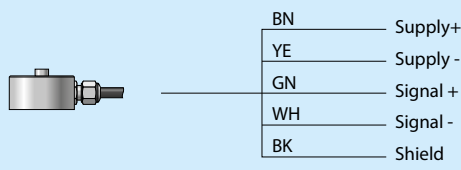

**ENVIRONMENT**

Reference Temperature	+23 °C
Nominal Temperature Range	-20 °C ... +60 °C
Storage Temperature Range	-30 °C ... +70 °C
Protection Class	IP67

- a) According to VDI 2637  
 b) % of Nominal Force (F<sub>n</sub>)  
 c) % of Nominal Sensitivity (S)

- d) Other length available on request.  
 e) In the ZM-E sensors, the values for "Supply -" and "Signal -" are inter-connected internally

**TECHNICAL DATA - ZM-S**

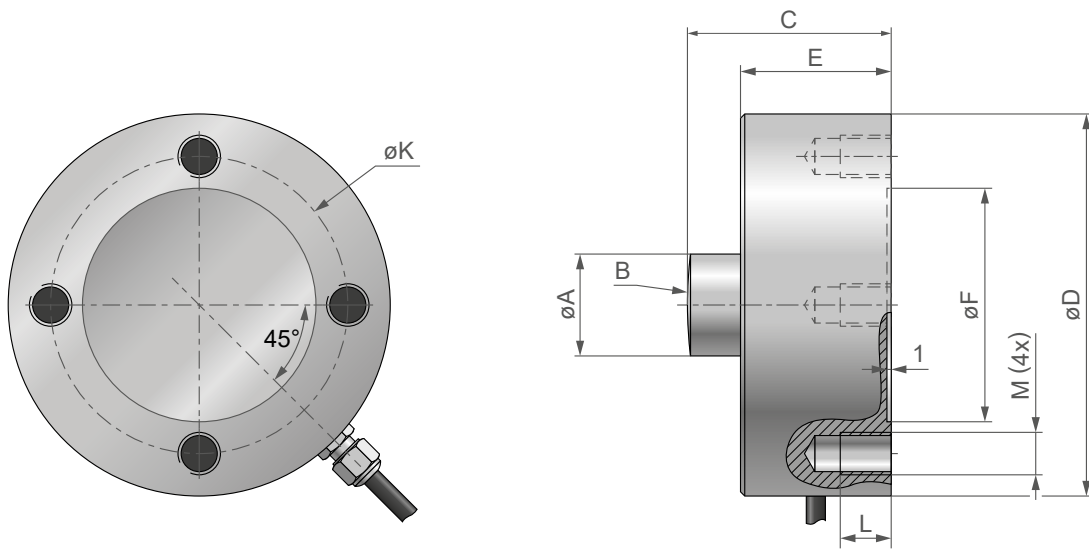
<b>ACCURACY CLASS</b>	<b>1</b>		
<b>MECHANICAL CHARACTERISTICS</b>			
Nominal Force ( $F_n$ )	0.1/0.2/0.5/1kN	5/10/20kN	50kN
Max. permissible Force <sup>a)</sup>	150%		
Breaking Overload <sup>a)</sup>	>300%		
Max. transverse Force <sup>a)</sup>	20%		
Combined Error (Linearity & Hysteresis) <sup>b)</sup>	1%		
Temperature Influence on Zero or Sensitivity <sup>b)</sup>	≤0.5% / 10K		
Relative Creep (30 min) <sup>b)</sup>	≤0.5%		
Material	High-strength Aluminum Alloy	Stainless Steel	
<b>ELECTRICAL CHARACTERISTICS</b>			
Nominal Sensitivity (S)	1 mV/V ±0.5%		
Zero Tolerance Band <sup>b)</sup>	≤3%		
Max. Supply Voltage	10VDC		
Input Resistance	380 Ω ±30	760 Ω ±50	
Output Resistance	352 Ω ±1.5	710 Ω ±10	
Insulation Resistance	>5 x 10 <sup>9</sup> Ω		
Connection Cable	Cable, length 1.5m <sup>c)</sup>		
Wiring diagram			
<b>ENVIRONMENT</b>			
Reference Temperature	+23 °C		
Nominal Temperature Range	-20 °C ... +60 °C		
Storage Temperature Range	-30 °C ... +70 °C		
Protection Class	IP65		

a) % of Nominal Force ( $F_n$ )

c) Other length available on request

b) % of Nominal Sensitivity (S)

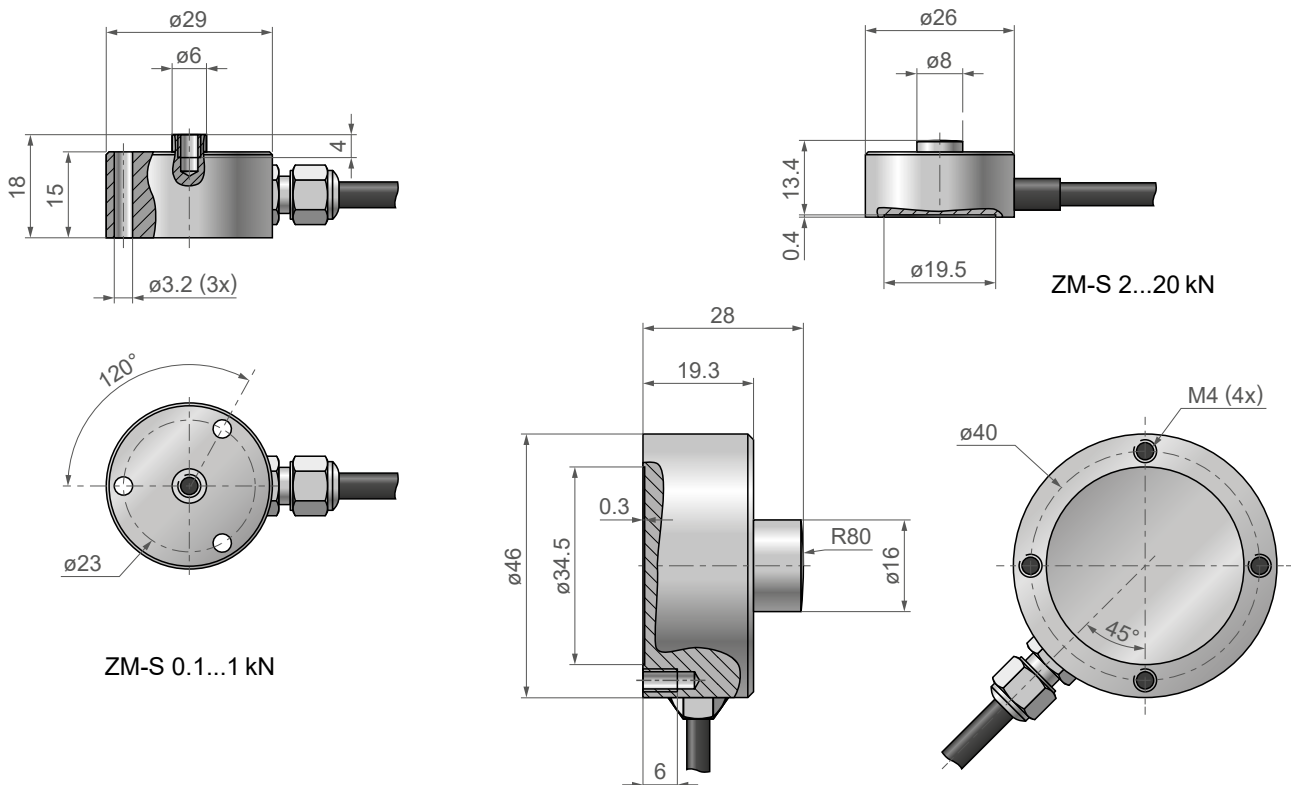
DIMENSION ZM



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

MODEL	øA	B	C	øD	E	øF	øK	L	M	Weight
ZM0.5 - ZM10	11 <sup>(0/-0.1)</sup>	R 50	25	40	21.0	N/A	30	12	M4	0.25 kg
ZM20, ZM50	24 <sup>(0/-0.1)</sup>	R 100	48	90	35.5	55 H8	70	12	M10	1.8 kg
ZM100	32 <sup>(0/-0.1)</sup>	R 160	60	115	47.5	68 H8	90	12	M12	3.2 kg

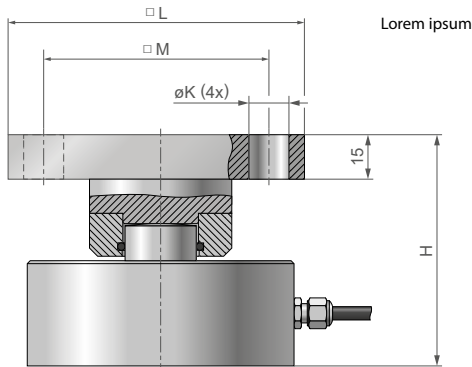
DIMENSION ZM-S



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.

SYSTEM OPTIONS AND ACCESSORIES

PENDULUM SUPPORT



As mechanical accessory, the AM Pendulum Support avoids side load introduction and deformation due to high surface pressure. These support are only compatible with ZM Series transducers.

MODEL	Transducers	H	øK	□L	□M
AM 072	ZM 0.5... 10 kN	55	6.6	50	37.5
AM 070	ZM 20... 50 kN	78	13.5	100	76
AM 071	ZM 100 kN	90	13.5	100	76

LMU SERIES - LOAD MONITORING UNIT



LMU 216 Load Monitoring Unit

Magtrol's Load Monitoring Units are used for measuring load, force and weight from signals generated by strain gauge transducers. Specifically designed for use with Magtrol's Load Measuring Pins and Load-Force-Weight Sensors, the LMU Series provides excitation voltage while conditioning the bridge output signal.

Each unit contains DIP-switches and jumpers for greater flexibility and complete adaptability. User-defined alarm limits can be configured into the unit, which when combined with our sensors, provides a safe and rugged measurement system that continuously monitors for short-circuits and interrupted signal lines. Magtrol LMUs are specially designed for use in harsh environments and are suitable for crane security systems.

AN SERIES - LOAD MONITOR DISPLAY WITH INTEGRATED SIGNAL CONDITIONER



AN 1500 M | Load Monitor Display

The AN 1500 M 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.

Further information on accessories are available in their specific data sheets. Please, visit our website: [www.magtrol.com](http://www.magtrol.com)

ORDERING INFORMATION

ZM - FORCE TRANSDUCERS

ORDERING NUMBER	ZM	__	/	___	kN	/	__
-E : Output signal (option)							
0.5... 100 : Nominal Force							
0.1, 0.2, 0.5 : Accuracy Class							

Example: ZM Force Transducer, Standard, Nominal Force 20 kN, Accuracy Class 0.2 would be ordered as **ZM / 20 kN / 0.2**.  
 ZM Force Transducer, Output Signal option, Nominal Force 1 kN, Accuracy Class 0.2 would be ordered as **ZM-E / 1 kN / 0.2**.

ZM-S - FORCE TRANSDUCERS

ORDERING NUMBER	ZM-S	/	___	kN	/	1
0.1 ... 50 : Nominal Force						

Example: ZM-S Force Transducer, Nominal Force 20 kN, would be ordered as **ZM-S / 20 kN / 1**.