

Button force sensor for measuring compressive forces



X-138-L

with force application button

Ø 80 x 44 mm,
0...2.5 kN
0...5 kN
0...10 kN
0...20 kN
0...30 kN
0...50 kN
0...100 kN

Ø 100 x 48 mm,
0...150 kN
0...200 kN

Ø 126 x 54 mm,
0...300 kN

Ø 165 x 80 mm,
0...500 kN
0...750 kN
0...1000 kN

Features

- 4x threaded holes on the underside for easy mounting
- With force application button for force application
- Encapsulated version IP65
- Measuring ranges from 2.5 kN to 1000 kN available

Application

The pressure load cell X-138-L is suitable for universal use in industrial force monitoring and can be used for static and dynamic applications. The force is applied centrally via the force application button. Four threaded holes are provided on the bottom for mounting the load cell.

The sensors are based on proven strain gauge technology and provide a linear signal, proportional to the centrally applied compression force. The solid steel housing and the tight design according to IP65 guarantee trouble-free operation, even under difficult environmental conditions.

For connection to a control system, the load cell is connected to a suitable strain gauge measuring amplifier. Depending on the version, X-Sensors offers strain gauge measuring amplifiers with 0-10 V and 4-20 mA output. In addition, variants with Profibus, EtherCat or Modbus TCP are also available.

Description	Measuring range	Output signal	Contact area in mm	Assembly	Specificati on
X-138-L-D-2.5kN-3.0m-2-U-M-0	0...2.5 kN	2.0 mV/V	Ø 80 x 44 mm	Button force introduction top / 4x M8 hole bottom	page 3
X-138-L-D-5kN-3.0m-2-U-M-0	0...5 kN	2.0 mV/V	Ø 80 x 44 mm	Button force introduction top / 4x M8 hole bottom	page 3
X-138-L-D-10kN-3.0m-2-U-M-0	0...10 kN	2.0 mV/V	Ø 80 x 44 mm	Button force introduction top / 4x M8 hole bottom	page 3
X-138-L-D-20kN-3.0m-2-U-M-0	0...20 kN	2.0 mV/V	Ø 80 x 44 mm	Button force introduction top / 4x M8 hole bottom	page 3
X-138-L-D-30kN-3.0m-2-U-M-0	0...30 kN	2.0 mV/V	Ø 80 x 44 mm	Button force introduction top / 4x M8 hole bottom	page 3
X-138-L-D-50kN-3.0m-2-U-M-0	0...50 kN	2.0 mV/V	Ø 80 x 44 mm	Button force introduction top / 4x M8 hole bottom	page 3
X-138-L-D-100kN-3.0m-2-U-M-0	0...100 kN	2.0 mV/V	Ø 80 x 44 mm	Button force introduction top / 4x M8 hole bottom	page 3
X-138-L-D-150kN-3.0m-2-U-M-0	0...150 kN	2.0 mV/V	Ø 100 x 48 mm	Button force introduction top / 4x M8 hole bottom	page 4
X-138-L-D-200kN-3.0m-2-U-M-0	0...200 kN	2.0 mV/V	Ø 100 x 48 mm	Button force introduction top / 4x M8 hole bottom	page 4
X-138-L-D-300kN-3.0m-2-U-N-0	0...300 kN	2.0 mV/V	Ø 126 x 54 mm	Button force introduction top / 4x M10 hole bottom	page 5
X-138-L-D-500kN-3.0m-2-U-P-0	0...500 kN	2.0 mV/V	Ø 165 x 80 mm	Button force introduction top / 4x M12 hole bottom	page 6
X-138-L-D-750kN-3.0m-2-U-P-0	0...750 kN	2.0 mV/V	Ø 165 x 80 mm	Button force introduction top / 4x M12 hole bottom	page 6
X-138-L-D-1000kN-3.0m-2-U-P-0	0...1000 kN	2.0 mV/V	Ø 165 x 80 mm	Button force introduction top / 4x M12 hole bottom	page 6

Button force sensor X-138-L

Ø 80 x 44 mm
From 2.5 till 100 kN



Specification

Performance

Measuring range / nominal force	0...2.5 kN 0...5 kN 0...10 kN 0...20 kN 0...30 kN 0...50 kN 0...100 kN
Zero point unmounted	± 0.5 %
Deviation Sensitivity	≤ ±10 % from fullscale
Nonlinearity	≤ 0.05 % from fullscale
Hysteresis	≤ 0.05 % from fullscale
Repeatability	≤ 0.05 % from fullscale
Temperature influence on full scale	±0.05 % FS /10°C
Temperature influence on zero point	±0.05 % FS /10°C

Electrical data

Output signal referred to final value	2.0 mV/V
Bridge resistance / sensor element strain gauge full bridge	700 Ohm
Supply voltage	5-10 VDC

Materials

Housing	Steel
Cable	PVC

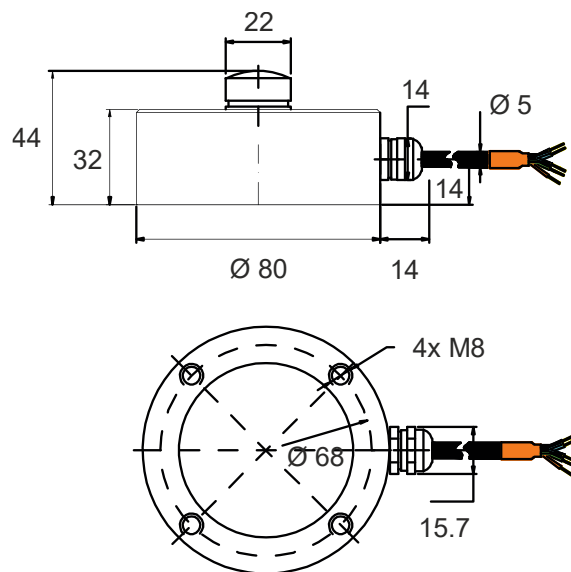
Mechanical data

Force application	Button / force application button
Overload	120 % from fullscale
Breaking load	150 % from fullscale
Electrical connection	Connection cable
Cable length	3 m
Plug type	Open stranded wires, connectors available on request

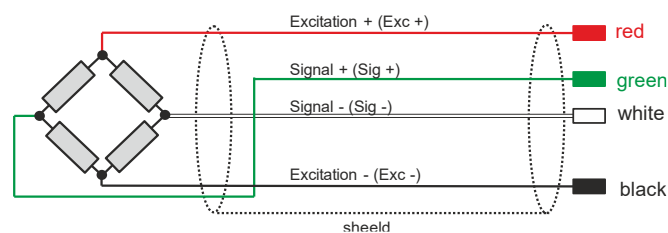
Environmental data

Ambient temperature	-20...80 °C
Compensated temperature range	-10...60 °C
Protection rate	IP 65

Mechanical dimensions



Wiring



Ordering code

The load cell is supplied without mounting screws and calibration certificate. Calibration certificate available on request.

For detailed ordering information, see page 2.

Button force sensor X-138-L

Ø 100 x 48 mm

From 150 till 200 kN



Specification

Performance

Measuring range / nominal force	0...150 kN 0...200 kN
Zero point unmounted	± 0.5 %
Deviation Sensitivity	≤ ±10 % vom Endwert
Nonlinearity	≤ 0.05 % vom Endwert
Hysteresis	≤ 0.05 % vom Endwert
Repeatability	≤ 0.05 % vom Endwert
Temperature influence on full scale	±0.05 % FS /10°C
Temperature influence on zero point	±0.05 % FS /10°C

Electrical data

Output signal referred to final value	2.0 mV/V
Bridge resistance / sensor element strain gauge full bridge	700 Ohm
Supply voltage	5-10 VDC

Materials

Housing	Steel
Cable	PVC

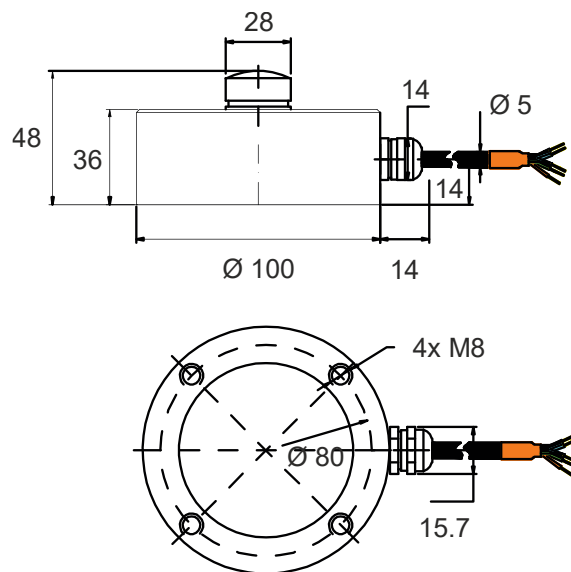
Mechanical data

Force application	Button / force application button
Overload	120 % from fullscale
Breaking load	150 % from fullscale
Electrical connection	Connection cable
Cable length	3 m
Plug type	Open stranded wires, connectors available on request

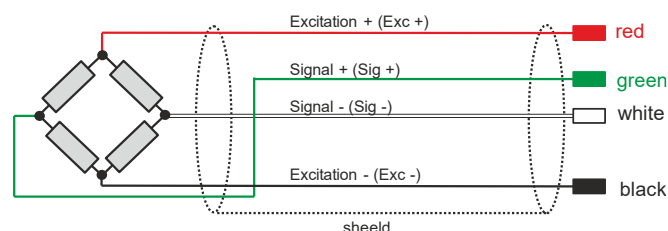
Environmental data

Ambient temperature	-20...80 °C
Compensated temperature range	-10...60 °C
Protection rate	IP 65

Mechanical dimensions



Wiring



Ordering code

The load cell is supplied without mounting screws and calibration certificate. Calibration certificate available on request.

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Button force sensor X-138-L

Ø 126 x 54 mm

300 kN



Specification

Performance

Measuring range / nominal force	0...300 kN
Zero point unmounted	± 0.5 %
Deviation Sensitivity	≤ ±10 % from fullscale
Nonlinearity	≤ 0.05 % from fullscale
Hysteresis	≤ 0.05 % from fullscale
Repeatability	≤ 0.05 % from fullscale
Temperature influence on full scale	±0.05 % FS /10°C
Temperature influence on zero point	±0.05 % FS /10°C

Electrical data

Output signal referred to final value	2.0 mV/V
Bridge resistance / sensor element strain gauge full bridge	700 Ohm
Supply voltage	5-10 VDC

Materials

Housing	Steel
Cable	PVC

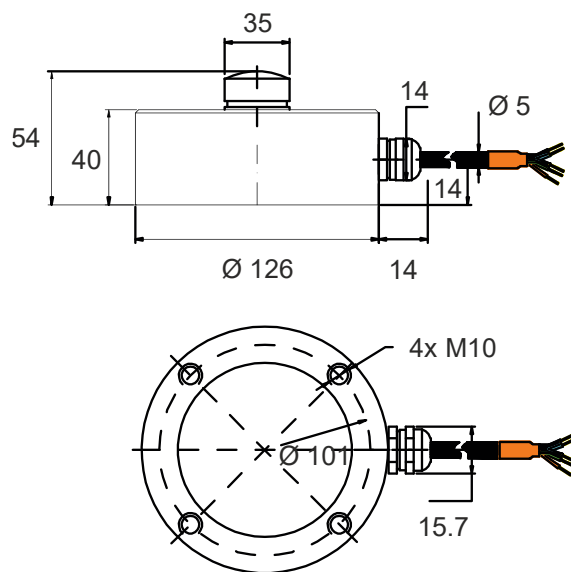
Mechanical data

Force application	Button / force application button
Overload	120 % from fullscale
Breaking load	150 % from fullscale
Electrical connection	Connection cable
Cable length	3 m
Plug type	Open stranded wires, connectors available on request

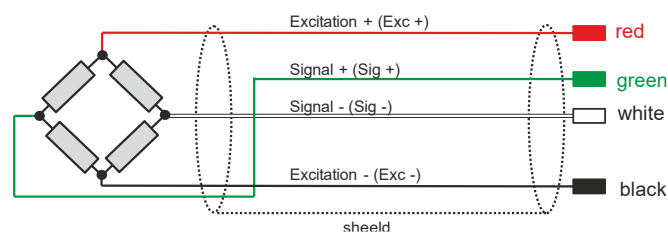
Environmental data

Ambient temperature	-20...80 °C
Compensated temperature range	-10...60 °C
Protection rate	IP 65

Mechanical dimensions



Wiring



Ordering code

The load cell is supplied without mounting screws and calibration certificate. Calibration certificate available on request.

For detailed ordering information, see page 2.

Button force sensor X-138-L

Ø 165 x 80 mm

From 500 kN till 1000 kN



Specification

Performance

Measuring range / nominal force	0...500 kN 0...750 kN 0...1000 kN
Zero point unmounted	± 0.5 %
Deviation Sensitivity	≤ ±10 % from fullscale
Nonlinearity	≤ 0.05 % from fullscale
Hysteresis	≤ 0.05 % from fullscale
Repeatability	≤ 0.05 % from fullscale
Temperature influence on full scale	±0.05 % FS /10°C
Temperature influence on zero point	±0.05 % FS /10°C

Electrical data

Output signal referred to final value	2.0 mV/V
Bridge resistance / sensor element strain gauge full bridge	700 Ohm
Supply voltage	5-10 VDC

Materials

Housing	Steel
Cable	PVC

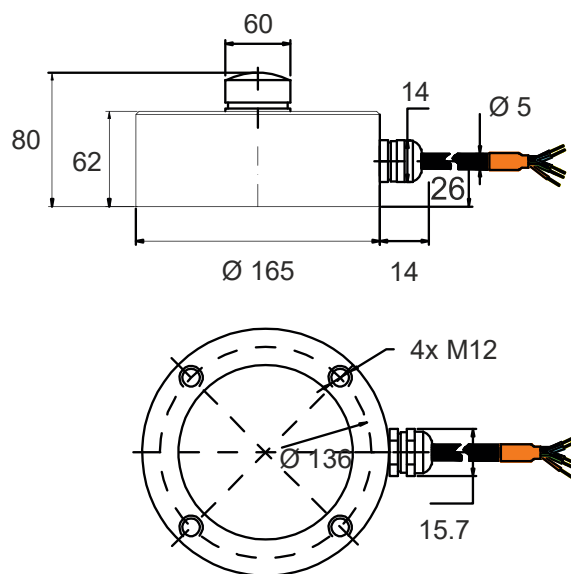
Mechanical data

Force application	Button / force application button
Overload	120 % from fullscale
Breaking load	150 % from fullscale
Electrical connection	Connection cable
Cable length	3 m
Plug type	Open stranded wires, connectors available on request

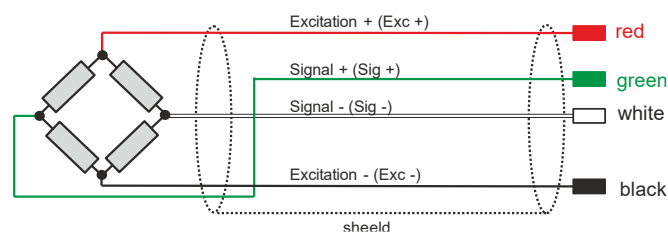
Environmental data

Ambient temperature	-20...80 °C
Compensated temperature range	-10...60 °C
Protection rate	IP 65

Mechanical dimensions



Wiring



Ordering code

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Definition of accuracy

For force sensors, there are the following points to consider regarding accuracy:

1. linearity, repeatability and hysteresis (combined error)

The linearity, repeatability and hysteresis specify the measurement deviation compared to the ideal characteristic curve. This maximum measurement deviation is specified in relation to the final value. I.e. for example an inaccuracy of 0.15 % FS corresponds to a maximum measurement deviation of 0.75 kN over the entire measurement range for a force sensor with a measurement range of 0...500 kN.

2. Sensitivity

The sensitivity of the sensors is specified in the data sheet. However, the sensitivity is not always exactly identical. For this reason, the deviation of the sensitivity is specified.