

Button force sensor for measuring compressive forces



X-138-P

with mounting plate

Ø 74 x 41 mm,
0...3 kN
0...5 kN
0...10 kN

Ø 90 x 53.5 mm,
0...20 kN
0...30 kN
0...50 kN
0...70 kN

Ø 116 x 82 mm,
0...100 kN
0...200 kN
0...250 kN

Ø 132 x 97 mm,
0...300 kN
0...500 kN

Features

- With mounting plate
- With force application button for force application
- Encapsulated version IP65
- Measuring ranges from 3 kN to 500 kN available

Application

The pressure load cell X-138-P 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. The load cell can be easily mounted via the mounting plate.

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.

Description	Measuring range	Output signal	Contact area in mm	Assembly	Specification
X-138-P-D-3kN-3.0m-3-U-R-0	0...3 kN	2.0 mV/V	Ø 74 x 41 mm	Button force introduction top / 4x M6 bore bottom	page 3
X-138-P-D-5kN-3.0m-3-U-R-0	0...5 kN	2.0 mV/V	Ø 74 x 41 mm	Button force introduction top / 4x M6 bore bottom	page 3
X-138-P-D-10kN-3.0m-3-U-R-0	0...10 kN	2.0 mV/V	Ø 74 x 41 mm	Button force introduction top / 4x M6 bore bottom	page 3
X-138-P-D-20kN-3.0m-3-U-M-0	0...20 kN	2.0 mV/V	Ø 90 x 53.5 mm	Button force introduction top / 4x M8 bore bottom	page 3
X-138-P-D-30kN-3.0m-3-U-M-0	0...30 kN	2.0 mV/V	Ø 90 x 53.5 mm	Button force introduction top / 4x M8 bore bottom	page 4
X-138-P-D-50kN-3.0m-3-U-M-0	0...50 kN	2.0 mV/V	Ø 90 x 53.5 mm	Button force introduction top / 4x M8 bore bottom	page 4
X-138-P-D-70kN-3.0m-3-U-M-0	0...70 kN	2.0 mV/V	Ø 90 x 53.5 mm	Button force introduction top / 4x M8 bore bottom	page 4
X-138-P-D-100kN-3.0m-3-U-N-0	0...100 kN	2.0 mV/V	Ø 116 x 82 mm	Button force introduction top / 4x M10 bore bottom	page 5
X-138-P-D-200kN-3.0m-3-U-N-0	0...200 kN	2.0 mV/V	Ø 116 x 82 mm	Button force introduction top / 4x M10 bore bottom	page 5
X-138-P-D-250kN-3.0m-3-U-N-0	0...250 kN	2.0 mV/V	Ø 116 x 82 mm	Button force introduction top / 4x M10 bore bottom	page 5
X-138-P-D-300kN-3.0m-3-U-P-0	0...300 kN	2.0 mV/V	Ø 132 x 97 mm	Button force introduction top / 4x M12 bore bottom	page 6
X-138-P-D-500kN-3.0m-3-U-P-0	0...500 kN	2.0 mV/V	Ø 132 x 97 mm	Button force introduction top / 4x M12 bore bottom	page 6

Button force sensor X-138-P

Ø 74 x 41 mm

From 3 till 10 kN

Specification

Performance

Measuring range / nominal force	0...3 kN 0...5 kN 0...10 kN
Zero point unmounted	± 1.0 %
Deviation Sensitivity	≤ ±2 % from fullscale
Nonlinearity	≤ 0.05 % from fullscale
Hysteresis	≤ 0.05 % from fullscale
Repeatability	≤ 0.05 % from fullscale
Creep (30 min)	±0.03 %
Temperature influence on final value	±0.03 % FS /10°C
Temperature influence on zero point	±0.03 % FS /10°C

Electrical data

Output signal referred to final value	2.0 mV/V
Bridge resistance / sensor element strain gauge full bridge	350 Ohm or 700 Ohm
Supply voltage	5-12 VDC

Materials

Housing	Steel
Cable	PVC

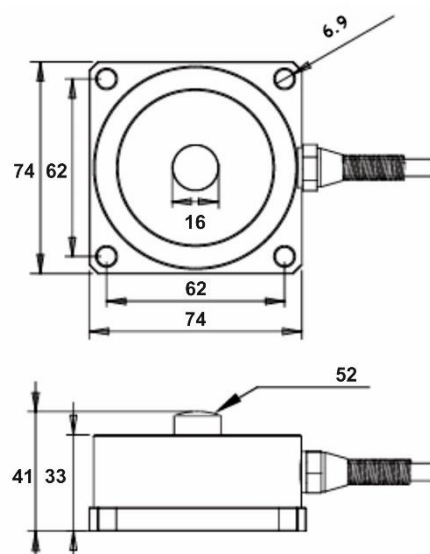
Mechanical data

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

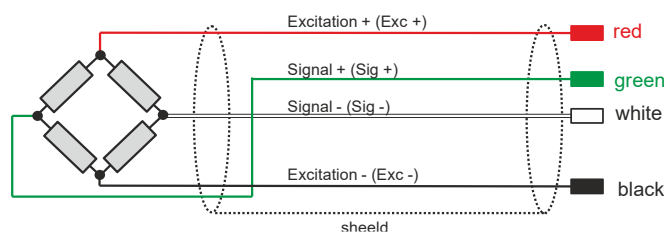
Environmental data

Ambient temperature	-20...80 °C
Compensated temperature range	-20...65 °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-P

Ø 90 x 53.5 mm

From 20 till 70 kN

Specification

Performance

Measuring range / nominal force	0...20 kN 0...30 kN 0...50 kN 0...70 kN
Zero point unmounted	± 1.0 %
Deviation Sensitivity	≤ ±2 % from fullscale
Nonlinearity	≤ 0.05 % from fullscale
Hysteresis	≤ 0.05 % from fullscale
Repeatability	≤ 0.05 % from fullscale
Creep (30 min)	±0.03 %
Temperature influence on final value	±0.03 % FS /10°C
Temperature influence on zero point	±0.03 % FS /10°C

Electrical data

Output signal referred to final value	2.0 mV/V
Bridge resistance / sensor element strain gauge full bridge	350 Ohm or 700 Ohm
Supply voltage	5-12 VDC

Materials

Housing	Steel
Cable	PVC

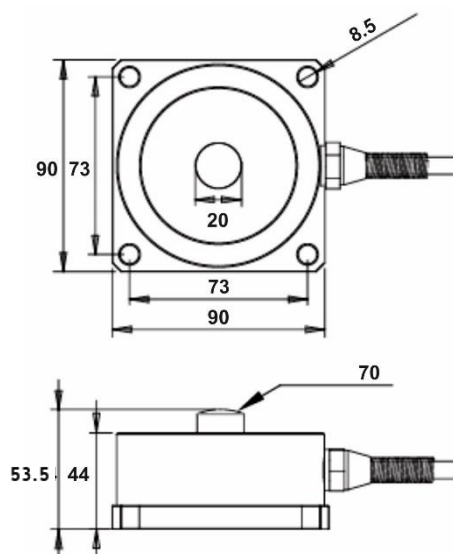
Mechanical data

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

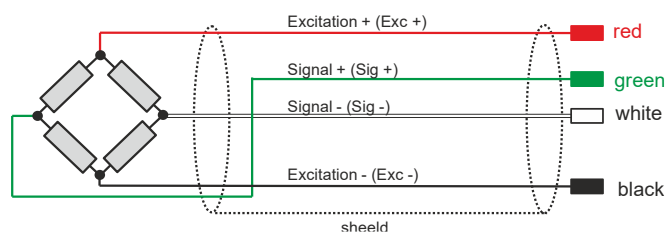
Environmental data

Ambient temperature	-20...80 °C
Compensated temperature range	-20...65 °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-P

Ø 116 x 82 mm,
From 100 till 250 kN

Specification

Performance

Measuring range / nominal force	0...100 kN 0...200 kN 0...250 kN
Zero point unmounted	± 1.0 %
Deviation Sensitivity	≤ ±2 % vom Endwert
Nonlinearity	≤ 0.05 % vom Endwert
Hysteresis	≤ 0.05 % vom Endwert
Repeatability	≤ 0.05 % vom Endwert
Creep (30 min)	±0.03 %
Temperature influence on final value	±0.03 % FS /10°C
Temperature influence on zero point	±0.03 % FS /10°C

Electrical data

Output signal referred to final value	2.0 mV/V
Bridge resistance / sensor element strain gauge full bridge	350 Ohm or 700 Ohm
Supply voltage	5-12 VDC

Materials

Housing	Steel
Cable	PVC

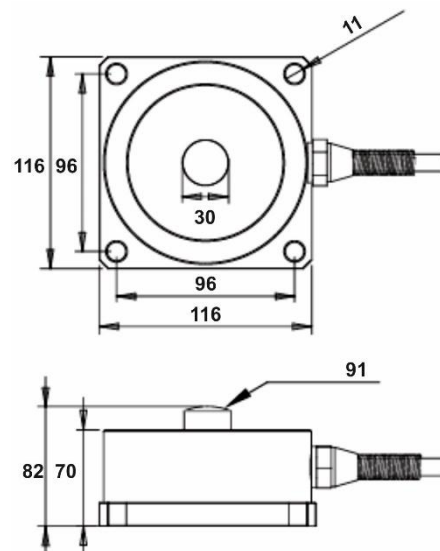
Mechanical data

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

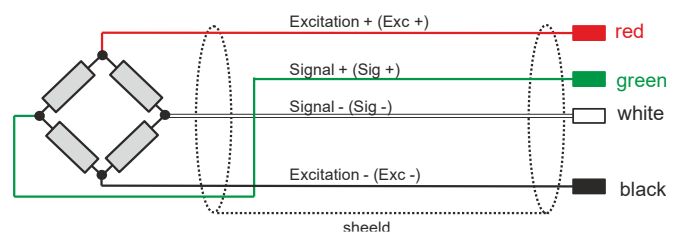
Environmental data

Ambient temperature	-20...80 °C
Compensated temperature range	-20...65 °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-Kraftsensor X-138-P

Ø 132 x 97 mm

From 300 till 500 kN

Specification

Performance

Measuring range / nominal force	0...300 kN 0...500 kN
Zero point unmounted	± 1.0 %
Deviation Sensitivity	≤ ±2 % vom Endwert
Nonlinearity	≤ 0.05 % vom Endwert
Hysteresis	≤ 0.05 % vom Endwert
Repeatability	≤ 0.05 % vom Endwert
Creep (30 min)	±0.03 %
Temperature influence on final value	±0.03 % FS /10°C
Temperature influence on zero point	±0.03 % FS /10°C

Electrical data

Output signal referred to final value	2.0 mV/V
Bridge resistance / sensor element strain gauge full bridge	350 Ohm or 700 Ohm
Supply voltage	5-12 VDC

Materials

Housing	Steel
Cable	PVC

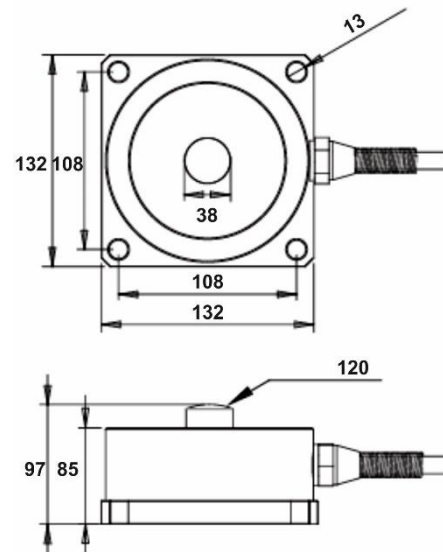
Mechanical data

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

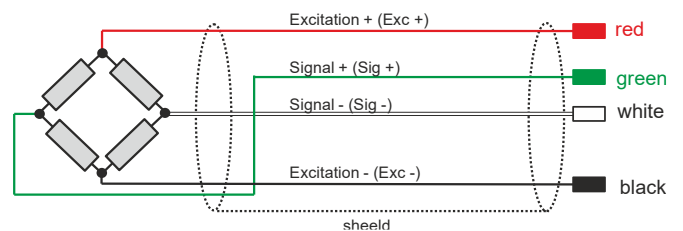
Environmental data

Ambient temperature	-20...80 °C
Compensated temperature range	-20...65 °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.

Definition of the 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 0.375 kN over the entire measurement range for a force sensor with a measurement range of 0...250 kN.

2. sensitivity

In the data sheet a sensitivity of the sensors is given. However, the sensitivity is not always exactly identical. For this reason, the deviation of the sensitivity is specified.