

Miniature force transducer with center hole for press, screw and cable forces

Miniature force transducer XCM-171



Force washer up to 80 kN for static and dynamic loads

Models

Inner diameter M16	Inner diameter M20	Inner diameter M24
Ø 36 x 40 mm, 0...20 kN 0...40 kN	Ø 36 x 40 mm, 0...10 kN	Ø 38 x 40 mm, 0...25 kN
	Ø 48 x 50 mm, 0...60 kN	Ø 48 x 50 mm, 0...80 kN

Specific measurement range and inner diameter on request

Characteristics

- Force washer for measurement of clamping forces and press forces
- Internal diameters correspond to thread sizes and can therefore be used as force washers
- Stiff and compact steel housing with very small displacement
- High overload capacity
- Planparallel ring areas for uniform force introduction
- Specific measurement ranges available

Application

The XCM-171 miniature force washer are suitable for force measurement in applications where high accuracy and very stiff sensor housings are required. The stiff design and the option to integrate a second, redundant measuring bridge qualify this series for safety-related applications in buildings and plants.

The sensors are based on proven strain gauge technology and show a linear signal proportional to the applied force. Due to the extremely compact design and the high accuracy, these miniature pressure transducers are particularly suitable for the following applications:

- Monitoring of press and punch processes
- Laboratory and test equipment
- Preloading of screws and threaded rods

Ordering code

Description	Measuring range	Output signal	Dimensions in mm	DIN-rail mounting	Specification
XCM-171-10-D21.0-2.0m	0...10 kN	1 mV/V	Ø 36 x 40 mm	Inner diameter Ø 21 mm	page 3
XCM-171-20-D16.5-2.0m	0...20 kN	1 mV/V	Ø 36 x 40 mm	Inner diameter Ø 16.5 mm	page 3
XCM-171-40-D16.5-2.0m	0...40 kN	1 mV/V	Ø 36 x 40 mm	Inner diameter Ø 16.5 mm	page 4
XCM-171-60-D20.5-2.0m	0...60 kN	1 mV/V	Ø 48 x 50 mm	Inner diameter Ø 20.5 mm	page 4
XCM-171-25-D24.5-2.0m	0...25 kN	1 mV/V	Ø 38 x 40 mm	Inner diameter Ø 24.5 mm	page 5
XCM-171-80-D24.5-2.0m	0...80 kN	1 mV/V	Ø 48 x 50 mm	Inner diameter Ø 24.5 mm	page 5

Miniature force transducer XCM-171

Ø 36 x 40 mm / Ø 48 x 50 mm

Up to 80 kN



Specifications

Performance

Measuring range	0...10 kN 0...20 kN 0...40 kN 0...60 kN 0...80 kN
Sensitivity from full scale	+ 1 mV/V
Deviation sensitivity	< ± 0.02 mV/V
Zero signal unmounted	< ± 0.1 mV/V
Linearity	< ± 0.5 % from full-scale
Repeatability	< 0.2 % from full-scale
Full scale drift over temperature range	± 0.2 % FS /10°C
Zero drift over temperature range	± 0.2 % FS /10°C

Electrical data

Power supply	1...15 VDC
Output signal at full scale	+ 1.0 mV/V
DMS bridge resistance	700 Ohm

Material

Housing	Stainless steel
Sensor housing	Aluminium
Connection cable	PUR

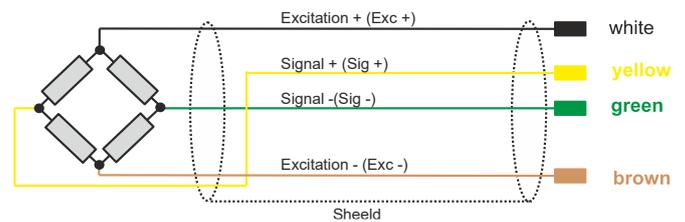
Mechanical data

Overload	200 % from full-scale
Life endurance alternating 50 % load	10 Mio cycles
Deflection at rated load	< 0.1 mm
Electrical connection	Connection cable
Cable length	2 m
Connector-type	Open leads, connector plug on request

Environmental data

Storage temperature	-40...70 °C
Ambient temperature	-40...85 °C
Protection rate	IP 62
Strength against vibration	EN60068-2

Pin assignment



Ordering code

XCM-171-□□□-D□□□

16.5 Innendurchmesser 16.5 mm
20.5 Innendurchmesser 20.5 mm
24.5 Innendurchmesser 24.5 mm

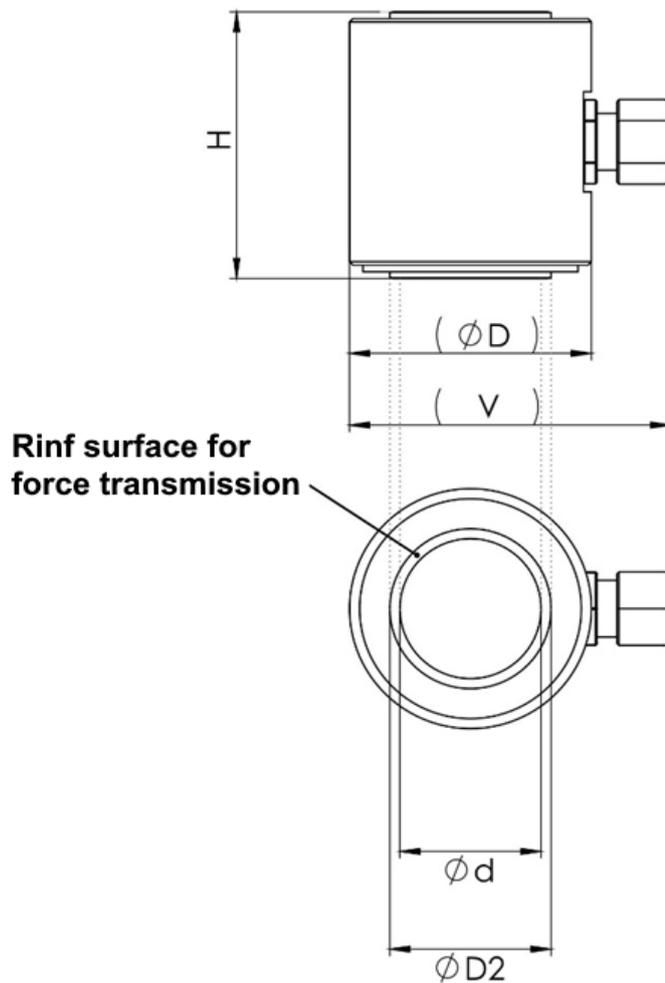
10 Messbereich 0...10 kN
20 Messbereich 0...20 kN
40 Messbereich 0...40 kN
60 Messbereich 0...60 kN
80 Messbereich 0...80 kN

For detailed ordering information, please see page 2.

Mechanical dimensions

TYP: XCM-171-10 XCM-171-20 XCM-171-40 XCM-171-60 XCM-171-80

Nominal force	10 kN	20 kN	40 kN	60 kN	80 kN
Thread size	M20	M16	M16	M20	M24
D	36	36	36	48	48
D2	24	20.5	23.4	28.8	33.5
d	21	16.5	16.5	20.5	24.5
H	40	40	40	50	50



Zero reset / adjustment

The zero adjustment at the force sensors with DMS bridge output signal (mV/V) is done at the subsequent amplifier. X-Sensors offers two different types of amplifiers: One for static applications and one for dynamic applications. For dynamic applications, a digital input for automatic zero-point adjustments is offered. For static applications, the zero point can be adjusted manually by DIP switches and by a potentiometer for fine tuning.

Further information concerning the zero-point adjustment can be found in the data sheet of the measurement amplifiers X-201 from X-Sensors.

Definition of accuracy

The accuracy includes the following parameters:

1. Linearity and hysteresis

The linearity and hysteresis specifies the measuring error in reference to the ideal BFSL curve. The maximum measuring error is stated in reference to the full scale value. This means that an accuracy of 0.5 % FS at a force sensor with a measuring range of 0...0.6 kN corresponds to a measuring error of only 0.003 kN.

2. Sensitivity

The DMS sensors have sensitivities which are specified in reference to the measuring range. The sensitivity can have a small deviation from sensor to sensor. For this reason, the deviation of sensitivity is specified for each sensor type.