

Clamping force sensor

Type 5413-1952/..

For coefficient of friction testing of bolts and nuts

The clamping force sensors operate according to the strain gauge principle and supply an analog output signal in mV/V.

- Measuring range of 5 kN to 300 kN
- SCHATZ AUTOCODE identification
- Connection socket for measuring cables
- Adapter for thread sizes M4 to M24

Description

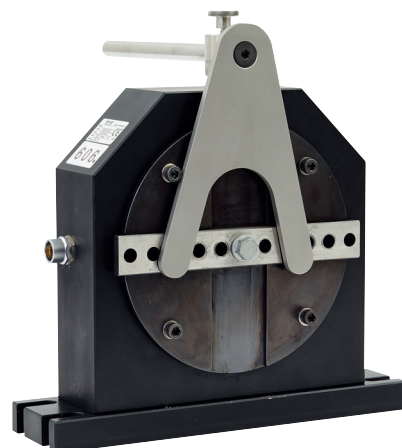
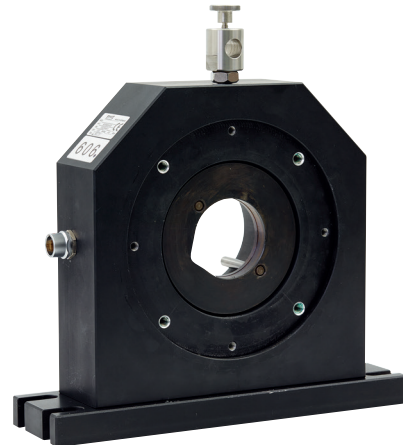
The measuring bodies of the clamping force sensor Type 5413-1952/.. are equipped with strain gauges and protected by an aluminum housing.

The test items are adapted by means of mechanical adaptations in the corresponding thread sizes (optional) on the clamping force sensor, whereby mechanical adaptations via integrated centering aids ensure a centric force application of the test items in the measuring body.

The bearing area required for the tests according to DIN EN ISO 16047 can be realized via optional type HH washer sledges, which are captively secured to the retaining plate by an optional holder to prevent rotation.

The integrated SCHATZ AUTOCODE system enables the sensor to be automatically detected and calibrated when it is connected to appropriately equipped measuring systems.

The clamping force sensors are delivered with a quality certificate. Upon request, the clamping force sensors are calibrated in our calibration lab.



Application

Particularly in combination with the Analysis wrench and the measuring and evaluation unit INSPECTpro, the clamping force sensors are suitable for determining the total coefficient of friction μ_{tot} of bolts and nuts in accordance with DIN EN ISO 16047.

The most important variable in the assembly process for a bolted connection is the clamping force, that is, the force with which the bolt holds the assembled parts together.

Only a sufficiently high clamping force ensures that the bolted parts do not move against one another and the bolted connection does not come loose, even under operating loads.

However, the clamping force is not measured directly during production, but indirectly via the torque. The friction between the connection partners has considerable influence on the interplay between torque and clamping force. This relationship is called the coefficient of friction.

When assembly problems occur during production, there must be a way to quickly and easily test the coefficient of friction of the connection partners in order to take appropriate measures.

Application areas for the sensors:

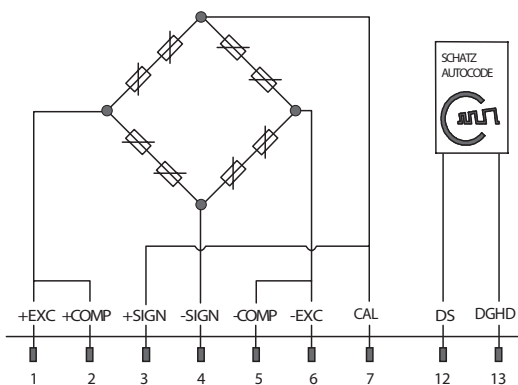
- Coefficient of friction determination of bolts and nuts
- Determining the clamping force

Technical data

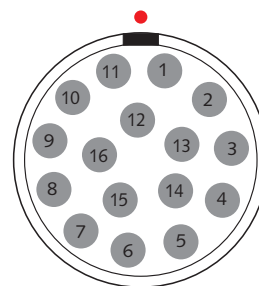
Basic mechanical / electrical data for the sensors

Maximum service force	1.2 x nominal force (20 % overload)
Maximum permissible force	1.5 x nominal force (50 % overload)
Bridge resistance	333 Ω
Calibration resistance	87.15 k Ω or 40 k Ω (+/- 0.1 %) depending on type
Nominal characteristic value	1 mV/V or 2 mV/V depending on type
Nominal supply voltage	5 V
Supply voltage operating range	2.5 ... 10 V
Operating temp. range (Nominal temp. range)	10 ... 40 °C
Service temp. range	0 ... 50 °C
Storage temp. range	-20 ... 70 °C
Relative humidity	max. 70 %, non-bedewing / non-condensing
Housing material	Aluminum
Level of protection	IP 40
Weight	12 kg
Electrical connection	
Connection socket	ODU: Type GH2 LOC-P16PFG9

Force measuring bridge of clamping force sensors

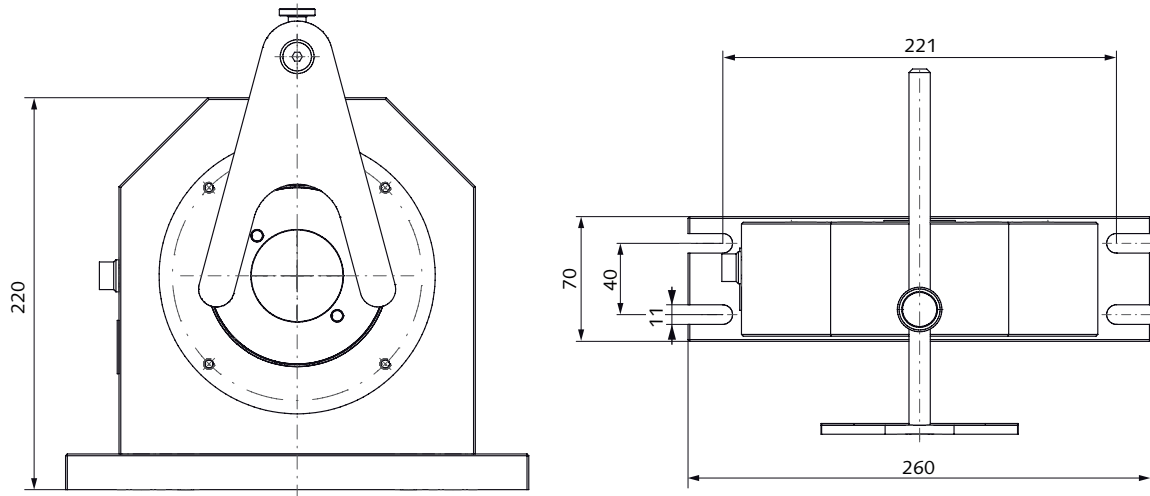


ODU connection socket assignment



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Technical data and dimensions



Type 5413-1952/..	../25	../100	../300
Nominal value	25 kN	100 kN	300 kN
Achievable meas. uncertainty acc. to DIN EN ISO 51309	≤ 2 %	≤ 2 %	≤ 2 %
Calibration resistance	87.15 kΩ +/- 0.1 %	40 kΩ +/- 0.1 %	40 kΩ +/- 0.1 %
Nominal characteristic value	1 mV/V	2 mV/V	2 mV/V

Optional accessories

	Type
Sensor cable, 2 m	18033153
Sensor cable, 5 m	18033154
Holder for washer sledge	18033152
Mechanical adaptations for different thread sizes	

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