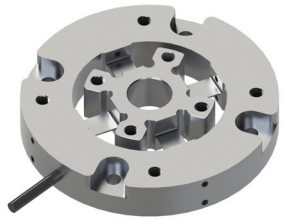
3-Axis Force Sensor K3R70 20N/200mNm

Item number: 8146



The force sensor K3R70 is suitable for inspection tasks in quality assurance as well as in materials testing because of its compact design.
This precision force sensor is characterized by flat design of only 12 mm thickness.

The axial force Fz and the bending moments Mx and My are calculated from the strain gage signals of the 4 cantilever springs.

With the aid of a simple calibration matrix the forces and distances can be calculated as well.

A key characteristic of 3D force sensors is crosstalk: The application of a force also results in a reading in the two unloaded axes. Due to multiple compensation (mechanical + electrical), crosstalk is typically less than 3% of the nominal load. The crosstalk is reproducible and proportional to the applied force amplitude. By applying an additional compensation matrix, crosstalk can be reduced to typically less than 1% in all axes.

Optional special version

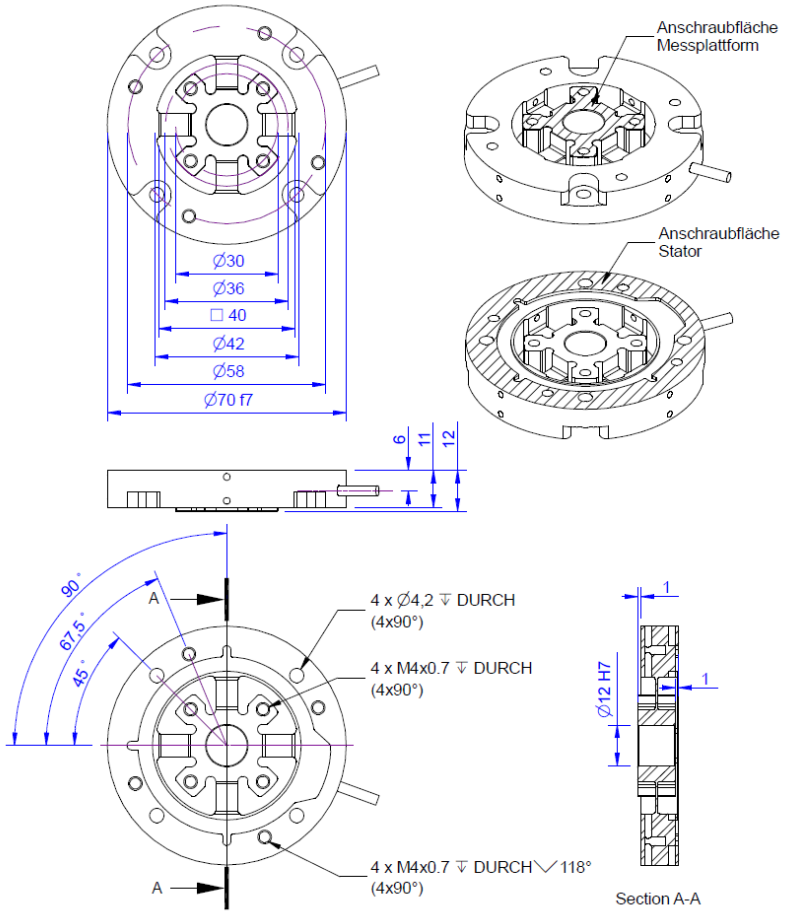
- Protection class IP68: from rated force 200 N
- Temperature range: -40°C to 180°C
- Vacuum version from 10^{-5} mbar
- Pressure range up to 8 bar
- Suitable for cleanrooms

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Stand: 20.03.2026

Technical Drawing



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Technical Data

Basic Data		Unit
Type	3-axis force sensor	
Force direction	Tension/Compression	
Rated force Fx	20	N
Force introduction	Internal thread	
Dimension 1	4x M4x0,7	
Sensor Fastening	Internal thread	
Dimension 2	4x M4x0,7	
Operating force	150	%FS
Rated displacement	0.1	mm
Material	alluminum-alloy	
Dimensions	Ø 70 x 12	mm x mm
Height	12	mm
Length or Diameter	70	mm
Rated torque Mx	200	mNm
Rated torque My	200	mNm
Torque limit	200	%
Variants	20N... 100N	

Electrical Data	Unit

Eccentricity and Crosstalk		Unit
Influence of eccentric load to FS	1	%FS/ 10mm
Crosstalk from x to y at rated load	1	%FS
Crosstalk from y to x at rated load	1	%FS
Crosstalk from z to x/y at rated load	1	%FS
Crosstalk from x/y to z at rated load	1	%FS

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Accuracy Data		Unit
Accuracy class	0,1	
Relative linearity error	0.1	%FS
Relative zero signal hysteresis	0.1	%FS
Temperature effect on zero signal	0.01	%FS/K
Temperature effect on characteristic value	0.01	%RD/K
Relative creep	0.1	%FS

Environmental Data		Unit
Rated temperature range from	-10	°C
Rated temperature range to	70	°C
Operating temperature range from	-10	°C
Operating temperature range to	85	°C
Storage temperature range from	-10	°C
Storage temperature range to	85	°C
Environmental protection	IP66	

Abbreviation : RD: „Reading"; FS: „Full Scale";1) The exact rated output is reported in the test report .Crosstalk is less than 1% when using the compensation matrix (type s).
Without using the compensation matrix, crosstalk is less than 3% (matrix type cv).

Pin Assignment

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Channel	Symbol	Description	Wire color	PIN
1	+Us	positive bridge supply	brown, orange	
	-Us	negative bridge supply	white, transparent	
	+Ud	positive bridge output	green	
	-Ud	negative bridge output	yellow	
2	+Us	positive bridge supply	brown, orange	
	-Us	negative bridge supply	white, transparent	
	+Ud	positive bridge output	grey	
	-Ud	negative bridge output	pink	
3	+Us	positive bridge supply	brown, orange	
	-Us	negative bridge supply	white, transparent	
	+Ud	positive bridge output	blue	
	-Ud	negative bridge output	red	
4	+Us	positive bridge supply	brown, orange	
	-Us	negative bridge supply	white, transparent	
	+Ud	positive bridge output	black	
	-Ud	negative bridge output	purple	

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