6-Axis Force Sensor K6D154 50N/5Nm

Item number: 11290

The K6D154 multi-axis sensor is designed for measuring force and torque in three mutually perpendicular axes.
The K6D154 was developed specifically for measurements in flow channels. Its particular features are

- high stiffness,
- low crosstalk,
- high precision.

Because of its large diameter, this multi-axis sensor can compensate for torque from an eccentric application of force particularly well.
The force and torque loadings are evaluated e.g. using a GSV-8DS measurement amplifier. The 6 load values can be calculated using a Windows DLL or using LabVIEW with the aid of a digital calibration document provided.
The calibration document contains the individual calibration factors and error corrections for the sensor.

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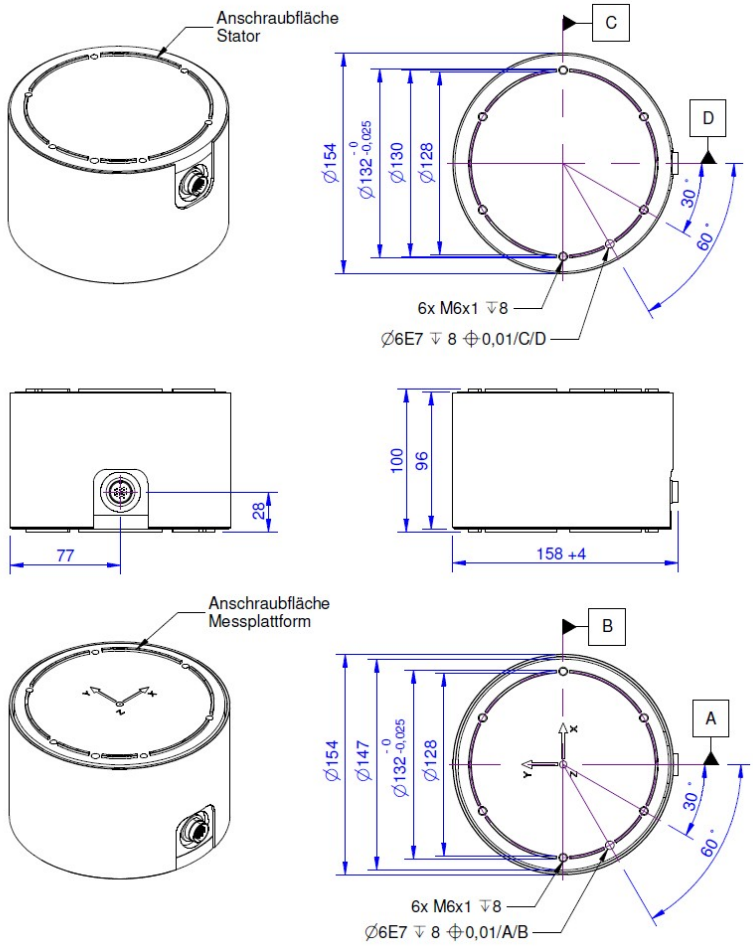
Stand: 06.05.2026

Technical Drawing



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Technical Data

Basic Data		Unit
Type	6-axis force sensor	
Force direction	Tension/Compression	
Rated force Fx	50	N
Rated force Fy	50	N
Rated force Fz	100	N
Force introduction	Innengewinde	
Dimension 1	6x M6x1	
Sensor Fastening	Internal thread	
Dimension 2	6x M6x1	
Operating force	400	%FS
Material	alluminum-alloy	
Height	100	mm
Length or Diameter	150	mm
Rated torque Mx	5	Nm
Rated torque My	5	Nm
Rated torque Mz	5	Nm
Torque limit	200	%FS
Bending moment limit	200	%FS

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Electrical Data		Unit
Input resistance	1000	Ohm
Tolerance input resistance	10	Ohm
Output resistance	1000	Ohm
Tolerance output resistance	10	Ohm
Insulation resistance	2	GOhm
Rated range of excitation voltage from	2.5	V
Rated range of excitation voltage to	5	V
Operating range of excitation voltage from	1	V
Operating range of excitation voltage to	5	V
Zero signal from	-0.05	mV/V
Zero signal to	0.05	mV/V
Characteristic value range from	0.3	mV/V
Characteristic value range to	0.56	mV/V

Eccentricity and Crosstalk		Unit
Crosstalk	1	%FS

Accuracy Data		Unit
Accuracy class	0,2	
Relative linearity error	0.1	%FS
Relative zero signal hysteresis	0.1	%FS
Temperature effect on zero signal	0.2	%FS/K
Temperature effect on characteristic value	0.05	%RD/K
Relative creep	0.1	%FS
Relative repeatability error	0.2	%FS

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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	IP65	

Abbreviation : RD: „Reading"; FS: „Full Scale";The application of a calibration matrix is required for the determination of the forces Fx, Fy, Fz and moments Mx, My, and Mz from the 6 measurement channels, and to compensate for the crosstalk.
The calibration data are individually determined and documented for the sensor.
The measurement error is expressed individually by the specification of the extended measurement uncertainty (k = 2) for the forces Fx, Fy, Fz, and moments Mx, My, Mz.

PIN Assignment

Channel	Symbol	Designation	Color	PIN
1	+Us	positive bridge supply	green	4
	-Us	negative bridge supply	yellow	3
	+Ud	positive bridge output	white	9
	-Ud	negative bridge output	brown	8
2	+Us	positive bridge supply	blue	10
	-Us	negative bridge supply	red	11
	+Ud	positive bridge output	gray	2
	-Ud	negative bridge output	pink	1
3	+Us	positive bridge supply	gray-pink	6
	-Us	negative bridge supply	red-blue	5
	+Ud	positive bridge output	black	12
	-Ud	negative bridge output	purple	7
4	+Us	positive bridge supply	white-yellow	23
	-Us	negative bridge supply	yellow-brown	18
	+Ud	positive bridge output	white-green	21
	-Ud	negative bridge output	brown-green	22
5	+Us	positive bridge supply	white-pink	15
	-Us	negative bridge supply	brown-pink	14
	+Ud	positive bridge output	white-gray	17
	-Ud	negative bridge output	gray-brown	16
6	+Us	positive bridge supply	white-red	20
	-Us	negative bridge supply	brown-red	24
	+Ud	positive bridge output	white-blue	13
	-Ud	negative bridge output	brown-blue	19
-	shield		transparent	

Shield: connected with sensor housing;

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Mounting

The sensor features a force-sensitive ring on both top and bottom with a centring collar. The mount for the sensor should be designed such that the mount and the sensor touch only over the surface of the force-sensitive ring. If you are making an adaptor plate, please be sure to note that the groove is not deeper than 1.5 mm. This ensures that contact is solely via the force-sensitive ring.

Mounting plate

The sensor features a fitting ring on top and bottom. Mounting plates to suit can be supplied on request. The mounting plate is pre-drilled with holes 3 mm in diameter. These holes can be drilled out to wider diameters or tapped with appropriate threads. (See next page for a drawing of the mounting plate)

Mounting plates are not included as standard and must be ordered separately.

Stiffness Matrix

1.3 kN/mm	0.0	0.0	0.0	62 kN	0.0
0.0	1.3 kN/mm	0.0	-62 kN	0.0	0.0
0.0	0.0	5.7 kN/mm	0.0	0.0	0.0
0.0	-62 kN	0.0	12.5 kNm	0.0	0.0
62 kN	0.0	0.0	0.0	12.5 kNm	0.0
0.0	0.0	0.0	0.0	0.0	8.7 kNm

- The elements with the unit kN/mm describe the relationship between force and path.
- The elements with the unit kNm describe the relationship between torque and twist.
- The elements with the unit kN describe the relationship between torque and path (columns 1 to 3) or the relationship between force and twist (columns 4 to 6)

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