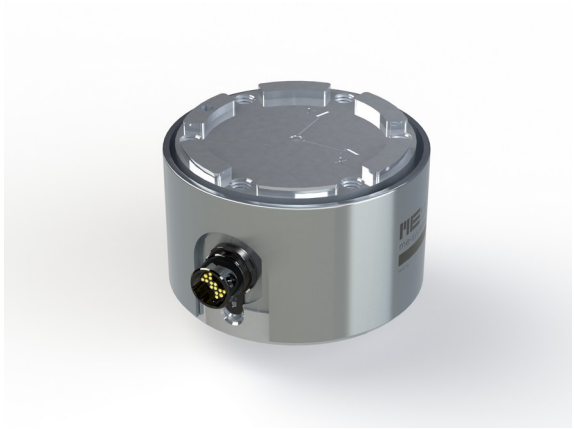
6-Axis Force Sensor K6D40 50N/5Nm/MP11

Item number: 9722



Highlights

- Miniature force/torque sensor, Ø60 x 40 mm²
- Resolution of forces from 50 mN,
- Resolution of torques from 10 mNm
- Overload safety > 400%
- Version with robust connector

The K6D40 multi-component sensor is designed to measure the forces and torques on three mutually perpendicular axes.
Owing to this sensor's very light weight of only 160 g (K6D40 200 N / 5 Nm) or 450 g (K6D40 500 N / 20 Nm), it is very well suited for use in robotics, e.g.

- For collision detection
- "Teach-In"
- Presence detection and error detection
- Force or torque-controlled operation
- Load measurement in medicine, prosthetics, orthopaedic engineering or gait analysis
- Measurement in sports medicine
- Comfort / ergonomics measurements

The force and torque loadings are evaluated e.g. using a GSV-1A8USB 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.
The K6D40 200 N / 5 Nm sensor is made from aluminium alloy with a stainless steel housing. The K6D40 500N/20Nm sensor is made entirely of stainless steel.

Optional special version

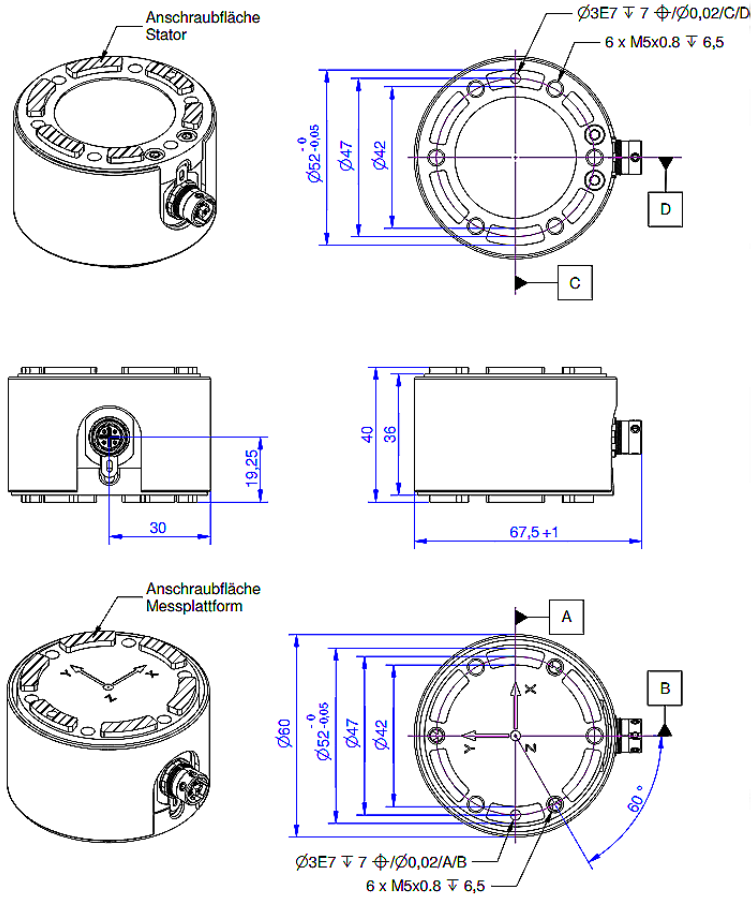
- Temperature range -40°C to 180°C
- Vacuum version from 10^{-5} mbar
- Pressure range up to 8 bar

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Stand: 01.09.2026

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	200	N
Force introduction	Innengewinde	
Dimension 1	6x M5x0,8	
Sensor Fastening	Internal thread	
Dimension 2	6x M5x0,8	
Operating force	400	% FS
Material	Stainless steel	
Height	40	mm
Length or Diameter	60	mm
Rated torque Mx	5	Nm
Rated torque My	5	Nm
Rated torque Mz	5	Nm
Torque limit	300	% FS
Bending moment limit	500	% 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	-1.5	mV/V
Zero signal to	1.5	mV/V
Characteristic value range from	0.2	mV/V
Characteristic value range to	0.45	mV/V

Eccentricity and Crosstalk		Unit
Crosstalk	1	%FS

Accuracy Data		Unit
Accuracy class	0,2	
Relative linearity error	0.2	%FS
Relative zero signal hysteresis	0.2	%FS
Temperature effect on zero signal	0.2	%FS/K
Temperature effect on characteristic value	0.05	%RD/K
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	yellow	14
	-Us	negative bridge supply	green	13
	+Ud	positive bridge output	white	1
	-Ud	negative bridge output	brown	5
2	+Us	positive bridge supply	gray	15
	-Us	negative bridge supply	black	16
	+Ud	positive bridge output	red	7
	-Ud	negative bridge output	pink	6
3	+Us	positive bridge supply	brown-blue	23
	-Us	negative bridge supply	white-red	24
	+Ud	positive bridge output	brown-red	12
	-Ud	negative bridge output	white-pink	4
4	+Us	positive bridge supply	white-yellow	19
	-Us	negative bridge supply	yellow-brown	20
	+Ud	positive bridge output	brown-green	9
	-Ud	negative bridge output	white-green	3
5	+Us	positive bridge supply	white-gray	21
	-Us	negative bridge supply	white-blue	22
	+Ud	positive bridge output	gray-brown	10
	-Ud	negative bridge output	pink-brown	11
6	+Us	positive bridge supply	gray-pink	18
	-Us	negative bridge supply	purple	17
	+Ud	positive bridge output	red-blue	8
	-Ud	negative bridge output	blue	2
-	shield		transparent	

Shield: connected with sensor housing;

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Mounting

The force is applied to an annulus / to 6 segments of a circle, 52 mm – 42mm in diameter, on the end faces of the sensor. No force is applied to the area inside the ring with a diameter of 42 mm.The areas outside the annuli can be used for centring purposes. A centring hole is provided to secure the angular position.

Stiffness Matrix

2.9 kN/mm	0.0	0.0	0.0	58.4 kN	0.0
0.0	2.9 kN/mm	0.0	-58,4 kN	0.0	0.0
0.0	0.0	16.2 kN/mm	0.0	0.0	0.0
0.0	-58.4 kN	0.0	4.7 kNm	0.0	0.0
58.4 kN	0.0	0.0	0.0	4.7 kNm	0.0
0.0	0.0	0.0	0.0	0.0	2,5 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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