6-Axis Force Sensor F6D45 20N/1Nm/CG

Item number: 11324



Highlights

- smallest forces Fx, Fy: 20 N, Fz: 50 N
- and torque Mx, My, Mz: 1 Nm
- light-weight construction
- integrated overload protection
- robust connection cable

The multi-component sensor F6D45 is used for force and torque measurement in three mutually perpendicular axes.

The multi-component sensor F6D45 is equipped with fastening flanges according to DIN EN ISO 9409-1 for industrial robots. The measuring flange of the sensor contains tapped holes M3 on the same pitch circle. The F6D force / torque sensor can be mounted to the robot flange without additional adapters, making it particularly flat and light compared to the K6D series sensors.

The 24-signal line is divided into two cables with 12 wires each.

The evaluation of the force and moment load is carried out with an external measuring amplifier GSV-8DS SubD44HD or GSV-8AS.

The sensors are made of an aluminum alloy.

Our robotics partner IPR offers solutions for applications of force / torque sensors.

Optional special version

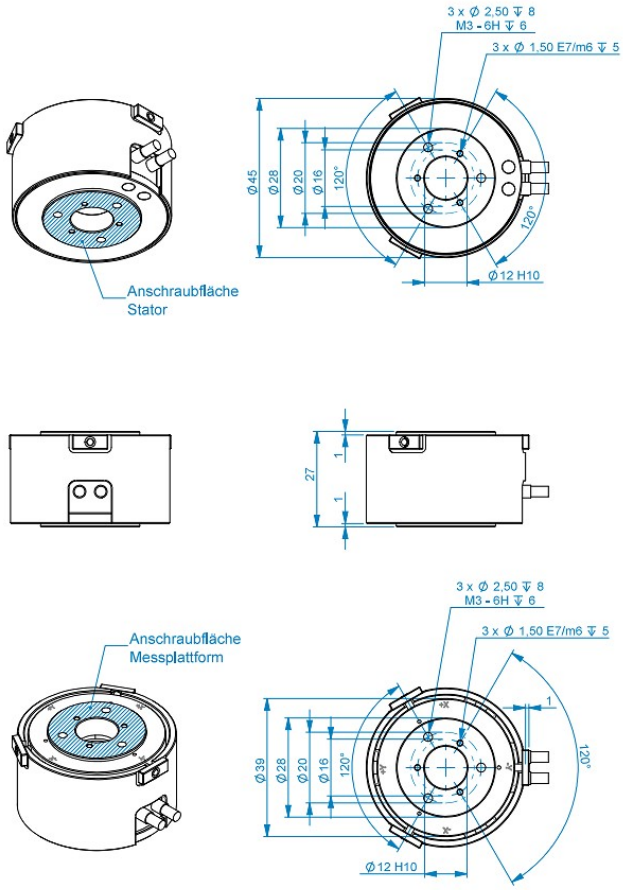
- Protection class IP68: from rated force 200 N
- Temperature range -40°C to 180°C
- Vacuum version from 10^{-5} mbar
- Pressure range up to 8 bar

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Stand: 27.08.2026

Technical Drawing



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Technical Data

Basic Data		Unit
Type	6-axis force sensor	
Force direction	Tension/Compression	
Rated force Fx	20	N
Rated force Fy	20	N
Rated force Fz	50	N
Force introduction	Internal thread	
Dimension 1	3xM3	
Sensor Fastening	Internal thread	
Operating force	300	%FS
Rated displacement	0.05	mm
Twist	0.04	rad
Material	alluminum-alloy	
Height	27	mm
Length or Diameter	45	mm
Rated torque Mx	1	Nm
Rated torque My	1	Nm
Rated torque Mz	1	Nm
Torque limit	150	%FS
Bending moment limit	150	%FS
Breaking force	600	%FS

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Electrical Data		Unit
Input resistance	100	Ohm
Tolerance input resistance	50	Ohm
Output resistance	1000	Ohm
Tolerance output resistance	50	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	10	V
Zero signal	1	mV/V
Characteristic value range from	0.5	mV/V
Characteristic value range to	1.5	mV/V

Eccentricity and Crosstalk	Unit

Accuracy Data		Unit
Accuracy class	1	
Relative linearity error	0.1	%FS
Relative zero signal hysteresis	0.1	%FS
Temperature effect on zero signal	0.1	%FS/K
Temperature effect on characteristic value	0.05	%RD/K
Relative creep	0.1	%FS
Relative repeatability error	0.5	%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	IP64	

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.

Mounting

Calibration matrix

The calibration matrix contains 36 calibration factors for calculating the forces and torques from the 6 output signals of the force sensor. A Labview vi is available for processing the calibration matrix

Measuring amplifier

The measuring amplifier GSV-8DS or GSV-8AS has 24-pole plug connector to connect the 6-axis froce/torque sensor. The mechanical forces and torques are calculated from 6 output voltages of each measuring channel with the calibration matrix.

Software

The GSVmulti software is included in delivery with measuring amplifiers GSV-8. The software allows the application of the calibration matrix and the displacement of the coordinate system to represent the torques around a freely selectable reference point.

To create your own software, a Labview VI is available.

Mounting instruction

The force is applied to a circular ring (Ø80-Ø40) on the live end of the sensor. The area inside the circular ring remains unloaded.

3 centering hole Ø1,5 serves to secure the angular position.

3x M3 internal thread for mounting the tool (this flange corresponds again to the robot flange);

Robotics solutions from IPR

Our robotics partner IPR offers solutions for applications of force / torque sensors in the areas of

- Mounting and handling technology
- Machine loading
- Foundry and blacksmith
- Cavity preservation
- Sealing and damping
- Lack and paint
- Services

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Stiffness Matrix
