# 6-Axis Force Sensor K6D68 10kN/500Nm/CG

Item number: 4288



The K6D68 multi-component sensor is suitable for measuring force and torque in three mutually perpendicular axes.

The K6D68 force / torque sensor is characterized by compact dimensions at high forces and moments. It is eminently suitable for applications in robotics, e.g.

- collision detection
- "Teach-In"
- Presence or error detection
- Force- or torque-controlled operation
- Stress measurement in medical technology / prosthetics / orthopedic technology / gait analysis
- Measurements in sports medicine
- Comfort measurements / Ergonomic measurements
- Monitoring of joining and assembly processes

The evaluation of the load of force and torque takes place e.g. with a measuring amplifier GSV-8. With the freely available software GSVmulti the display, recording and export of the measurement results are possible. The calculation of the 6 load sizes is e.g. via a Windows DLL or via Labview using a provided digital calibration document. The calibration document contains the individual calibration factors and error corrections of the sensor. Due to the detailed documentation of the calculation instructions, the use of 6 measuring amplifiers with analogue output, e.g. GSV-1H, with subsequent billing of the measurement results possible.

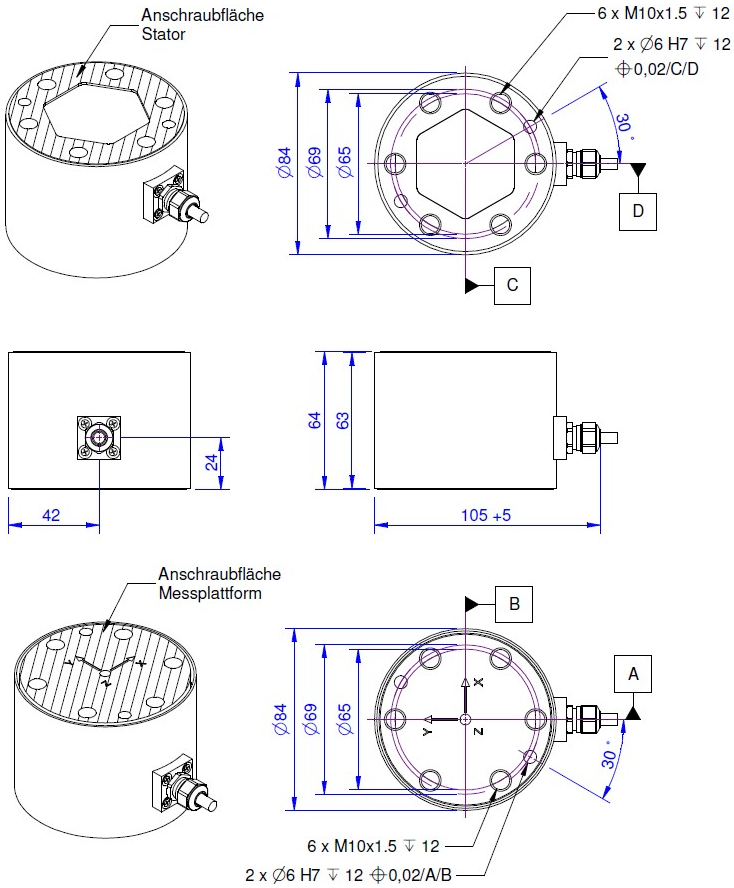
The sensors K6D68 1kN / 20Nm and 2kN / 50Nm are made of an aluminum alloy with a stainless steel housing. The sensors from 5kN / 50Nm are made entirely of stainless steel.

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Stand: 20.03.2026

## Technical Drawing




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## Technical Data

| Basic Data | | Unit |
|---|---|---|
| Type | 6-axis force sensor | |
| Force direction | Tension/Compression | |
| Rated force Fx | 10 | kN |
| Rated force Fy | 10 | kN |
| Rated force Fz | 20 | kN |
| Force introduction | Innengewinde | |
| Dimension 1 | 6x M10x1,5 | |
| Sensor Fastening | Internal thread | |
| Dimension 2 | 6x M10x1,5 | |
| Operating force | 400 | % |
| Material | Stainless steel | |
| Natural frequency fx | 4.4 | kHz |
| Height | 64 | mm |
| Length or Diameter | 83 | mm |
| Rated torque Mx | 500 | Nm |
| Rated torque My | 500 | Nm |
| Rated torque Mz | 500 | Nm |
| Torque limit | 1500 | Nm |
| Bending moment limit | 1500 | Nm |

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| Electrical Data | | Unit |
|---|---|---|
| Input resistance | 350 | Ohm |
| Tolerance input resistance | 10 | Ohm |
| Output resistance | 350 | 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 | 1 | 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 | 0.1 | %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 | 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 | red | |
| | -Us | negative bridge supply | black | |
| | +Ud | positive bridge output | green | |
| | -Ud | negative bridge output | white | |
| 2 | +Us | positive bridge supply | blue | |
| | -Us | negative bridge supply | yellow | |
| | +Ud | positive bridge output | purple | |
| | -Ud | negative bridge output | grey | |
| 3 | +Us | positive bridge supply | orange | |
| | -Us | negative bridge supply | brown | |
| | +Ud | positive bridge output | pink | |
| | -Ud | negative bridge output | transparent | |
| 4 | +Us | positive bridge supply | green-black | |
| | -Us | negative bridge supply | black-white | |
| | +Ud | positive bridge output | red-black | |
| | -Ud | negative bridge output | white-black | |
| 5 | +Us | positive bridge supply | purple-black | |
| | -Us | negative bridge supply | yellow-black | |
| | +Ud | positive bridge output | bue-black | |
| | -Ud | negative bridge output | gray-black | |
| 6 | +Us | positive bridge supply | pink-black | |
| | -Us | negative bridge supply | brown-black | |
| | +Ud | positive bridge output | orange-black | |
| | -Ud | negative bridge output | transparent-black | |

Shield: connected with sensor housing;

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## Mounting

The forces is applied to an annulus (80 - 50 mm in diameter) on the end faces of the sensor. No force is applied to the area inside the ring.

A centring hole is provided to secure the angular position.

## Stiffness Matrix

| | | | | | |
|---|---|---|---|---|---|
| 228.7 kN/mm | 0.0 | 0.0 | 0.0 | 4753.5 kN | 0.0 |
| 0.0 | 228.7 kN/mm | 0.0 | -4573.5 kN | 0.0 | 0.0 |
| 0.0 | 0.0 | 1170.8 kN/mm | 0.0 | 0.0 | 0.0 |
| 0.0 | -4573.5 kN | 0.0 | 365.9 kNm | 0.0 | 0.0 |
| 4573.5 kN | 0.0 | 0.0 | 0.0 | 365.9 kNm | 0.0 |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 214.4 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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