

K6D68 1kN/20Nm, 2kN/50Nm, 5kN/50Nm, 10kN/100Nm, 10kN/500Nm



Description

The K6D40 multi-component sensor is designed to measure the forces and torques on three mutually perpendicular axes.

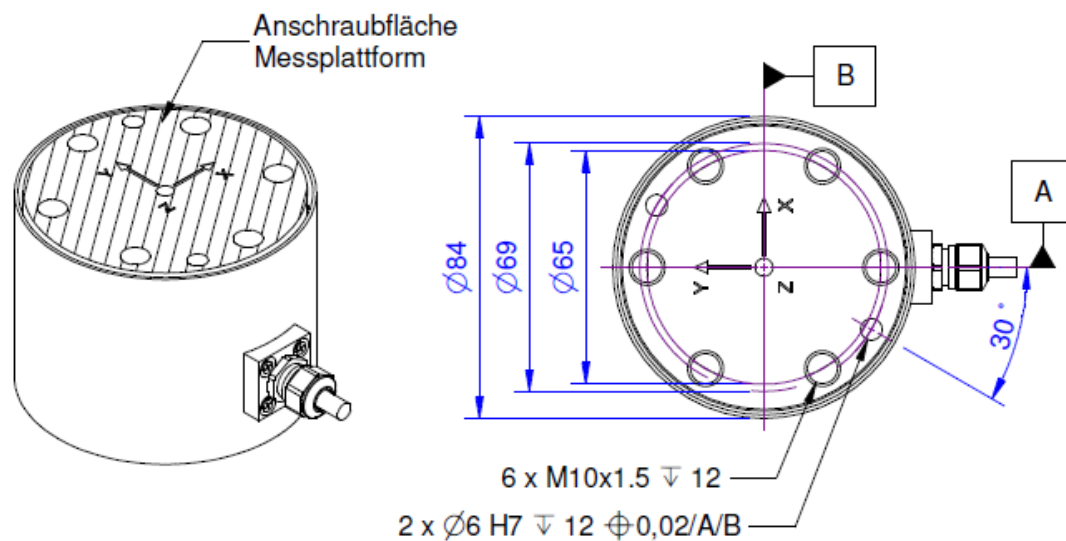
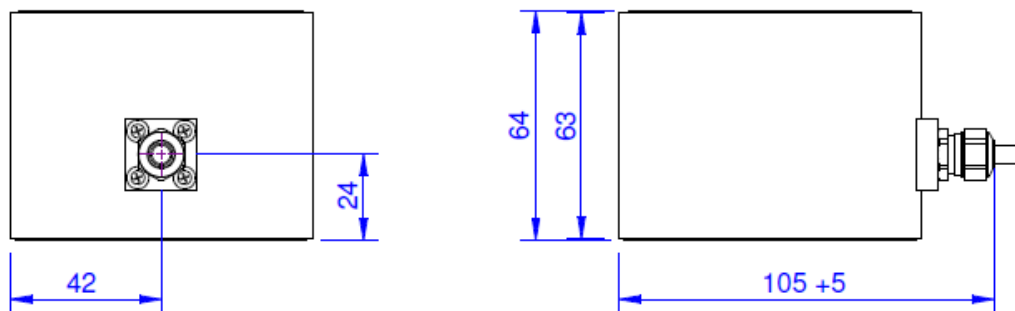
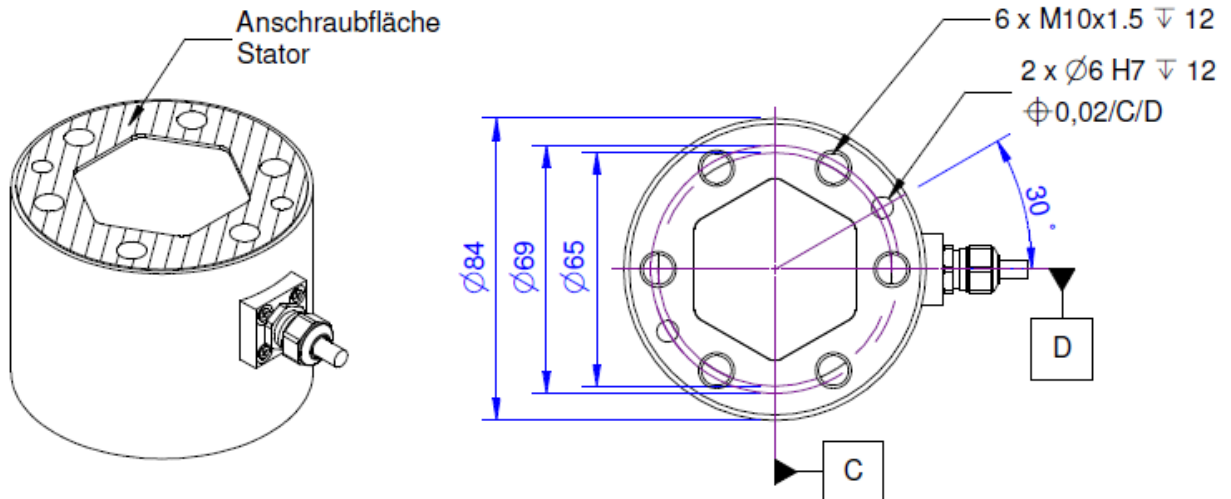
Owing to this sensor's very light weight of only 160 g (K6D40 200 N / 5 Nm) or 450 g (K6D40 500 N / 20 Nm), it is very well suited for use in robotics, e.g.

- 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
- Monitoring of joining and assembly processes

The force and torque loadings are evaluated e.g. using a GSV-8 measurement amplifier. With the Software GSVmulti, record and export the measurement results are possible. 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. Through the detailed documentation of the calculation rule is the use of 6 measuring amplifiers with analog output, for example, GSV-1H, possible with subsequent calculation on the measurement results.

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.

Dimensions





Technical Data

Kraftsensoren

| | |
|----------------------|-----------------------|
| Type | 6-Axis force sensor |
| Force direction | Tension / Compression |
| Force introduction | Inner thread |
| Dimension 1 | 6 x M10x1,5 |
| Sensor Fastening | Inner thread |
| Dimension 2 | 6 x M10x1,5 |
| Operating force | 200 % FS |
| Material | Stainless steel |
| Dimensions | Ø83 x 64 mm |
| Height | 64 mm |
| Length or Diameter | 83 mm |
| Torque limit | 300 % FS |
| Bending moment limit | 300 % FS |

Elektrische Daten

| | |
|---|---------------|
| 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 f | 2.5 ... 5 V |
| Operating range of excitation voltage f | 1 ... 5 V |
| nullsignalbereichMin | -1.5 mV/V |
| nullsignalbereichMax | 1.5 mV/V |
| Rated output | 0.4 mV/V / FS |

Precision

| | |
|--|-------------|
| 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 |



Connection Data

| | |
|------------------------|-----------------------------------|
| Connection type | 24 conductor open |
| Name of the connection | 33-24 PUR/24x0,03 mm ² |
| Cable length | 5 m |

Temperature

| | |
|-------------------------------|---------------|
| Rated temperature range f | -10 ... 70 °C |
| Operating temperature range f | -10 ... 85 °C |
| Storage temperature range f | -10 ... 85 °C |
| Environmental protection | IP67 |

Abbreviation : RD: „Reading“; FS: „Full Scale“;

The application of a calibration matrix is required for the determination of the forces F_x , F_y , F_z and moments M_x , M_y , and M_z 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 F_x , F_y , F_z , and moments M_x , M_y , M_z .



Pin Configuration

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

Shield: connected with sensor housing;



Manual

Stiffness Matrix K6D68 1kN/20Nm

| | | | | | | |
|------------|------------|-------------|-----------|----------|----------|----------|
| 23.6 kN/mm | 0.0 | 0.0 | 0.0 | 471.1 kN | 0.0 | u_x |
| 0.0 | 23.6 kN/mm | 0.0 | -471.1 kN | 0.0 | 0.0 | u_y |
| 0.0 | 0.0 | 120.6 kN/mm | 0.0 | 0.0 | 0.0 | u_z |
| 0.0 | -471.1 kN | 0.0 | 37.7 kNm | 0.0 | 0.0 | ϕ_x |
| 471.1 kN | 0.0 | 0.0 | 0.0 | 37.7 kNm | 0.0 | ϕ_y |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22.1 kNm | ϕ_z |

| Element | Description |
|---------|----------------------------------|
| [kN/mm] | Force - Shift |
| [kNm] | Torque - Twist |
| [kN] | Force - Twist and Torque - Shift |










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.

accessories

| | Description | Description |
|---|---------------------------------|---|
|  | K6D- CalibrationMatrix SL | |
|  | GSV-8DS | 8-channel amplifier with USB port, analog output, UART interface. Other versions GSV-8AS CAN with Canbus and GSV-8AS EC with EtherCAT fieldbus. |
|  | Configuration SubD44/m/HD | Connector Type SubD, 44 pins, male (male), with hood |
|  | GSV-8AS | 8-channel amplifier with USB port, analog output, UART interface. Other versions GSV-8AS CAN with Canbus and GSV-8AS EC with EtherCAT fieldbus. |
|  | Configuration 24p/m/M16 | Round plug, 24 pole, configured with sensor cable |
|  | K6D68-Adapter VA | |
|  | K6D-Adapter Development | Indicative offer for an adapter set, Consisting of e.g. 2 plates, For mounting a device / flange on K6D sensor; |



Orderoptions

| Type | Description |
|------------------|--|
| K6D68 1kN/20Nm | 1kN; 1kN; 2kN; 20Nm; 20Nm; 20Nm; Aluminium |
| K6D68 2kN/50Nm | 2kN; 2kN; 5kN; 50Nm; 50Nm; 50Nm; Aluminium |
| K6D68 5kN/50Nm | 5kN; 5kN; 10kN; 50Nm; 50Nm; 50Nm; Steel |
| K6D68 10kN/100Nm | 10kN; 10kN; 20kN; 100Nm; 100Nm; 100Nm; Steel |
| K6D68 10kN/500Nm | 10kN; 10kN; 20kN; 500Nm; 500Nm; 500Nm; Steel |

F_x; F_y; F_z; M_x; M_y; M_z; Material