

## K6D68 10kN/100Nm/CG



### Description

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

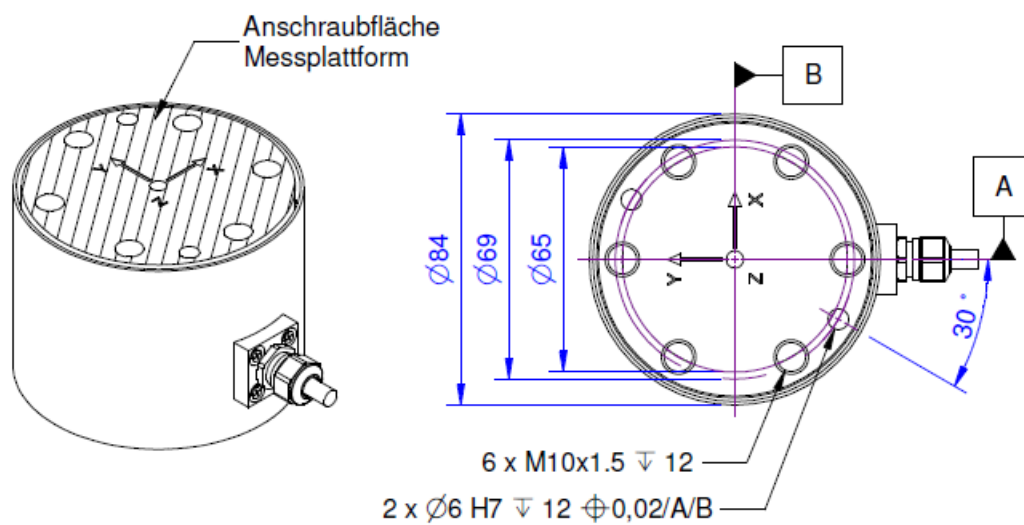
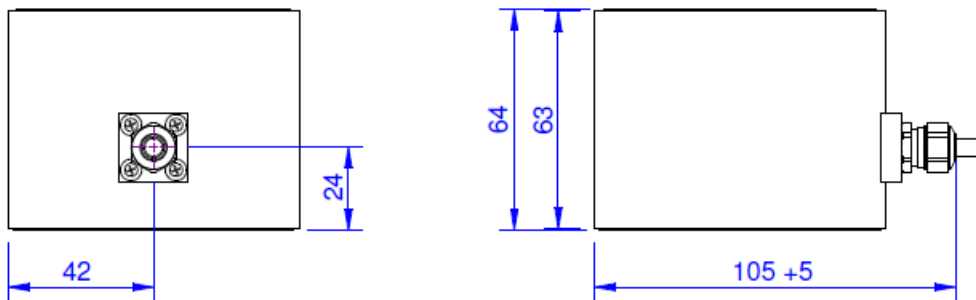
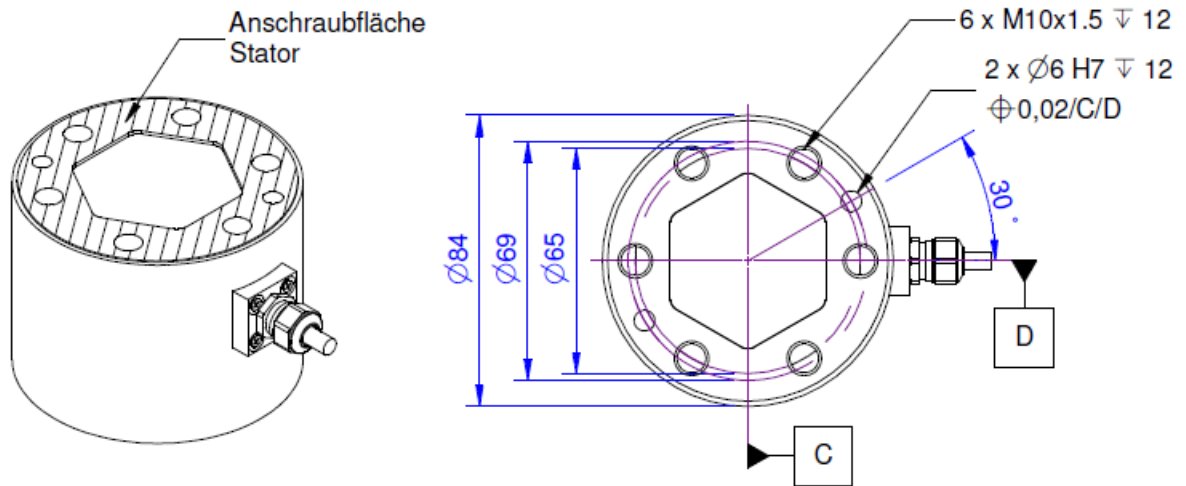
Owing to this sensor's very light weight of only 160 g (K6D40 200 N / 5 Nm) or 450 g (K6D40 500 N / 20 Nm), it is very well suited for use in robotics, e.g.

- 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
Rated force Fx	10 kN
Rated force Fy	10 kN
Rated force Fz	20 kN
Force introduction	Inner thread
Dimension 1	6x M10x1,5
Sensor Fastening	Inner thread
Dimension 2	6x M10x1,5
Operating force	200 %
Material	Stainless steel
Natural frequency	3.3 kHz
Dimensions	Ø83 x 64 mm
Height	64 mm
Length or Diameter	83 mm
Rated torque Mx	100 Nm
Rated torque My	100 Nm
Rated torque Mz	100 Nm
Torque limit	800 Nm
Bending moment limit	700 Nm

### 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
Zero signal to	-1.5 mV/V
Zero signal from	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 <sup>2</sup>



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	IP65

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
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	blue-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;*

## Manual

### Stiffness Matrix K6D68 10kN/100Nm

128.6 kN/mm	0.0	0.0	0.0	2572.6 kN	0.0	$u_x$
0.0	128.6 kN/mm	0.0	-2572.6 kN	0.0	0.0	$u_y$
0.0	0.0	658.6 kN/mm	0.0	0.0	0.0	$u_z$
0.0	-2572.6 kN	0.0	205.8 kNm	0.0	0.0	$\phi_{i_x}$
2572.6 kN	0.0	0.0	0.0	205.8 kNm	0.0	$\phi_{i_y}$
0.0	0.0	0.0	0.0	0.0	120.6 kNm	$\phi_{i_z}$

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
	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
	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

*Fx; Fy; Fz; Mx; My; Mz; Material*