



MP11

Description

The multi-component sensor K6D150 allows force and torque measurement in three mutually perpendicular axes.

The multi-component sensor K6D150 is characterized by a big measuring range for forces and torques.

With this multi-component sensor of the „second generation“ is used rod construction, which absorbs forces and torques directly on the pitch circle of the fastening thread.

The force transmission is applied on the 1 mm raised segments. The inner diameter of segments is used for the centering. Due to segmented, ring-shaped front surface, the optimal force transmission and therefore the best possible reproducibility in the range of about 0,1 % will be obtained.

The multi-component force sensor is very well suited for use in robotics, e.g.

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

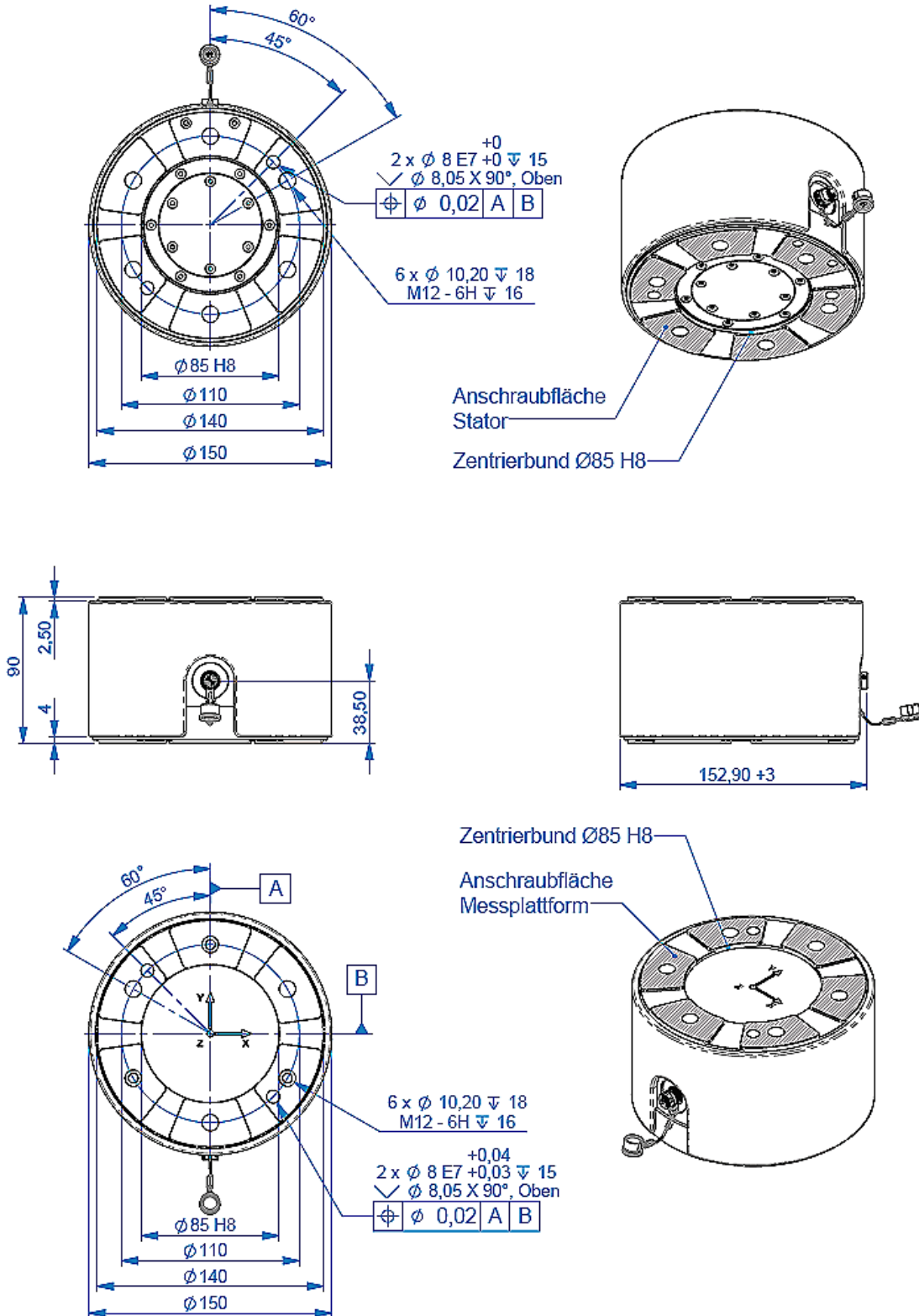
The force and torque loadings are evaluated e.g. using a GSV-8DS measurement amplifier.

The sensor K6D150 2kN/200Nm and 10kN/1kNm is made of aluminium alloy, the sensor K6D150 30kN/3kNm is made of high-strength stainless steel 1.4542.

Technical characteristics

Modèles	K6D150 (2kN/200Nm/MP11)	K6D150 (4kN/500Nm/MP11)	K6D150 (10kN/1kNm/MP11)	K6D150 (30kN/3kNm/MP11)
Fx [kN]	2	4	10	30
Fy [kN]	2	4	10	30
Fz [kN]	5	10	25	90
Mx [Nm]	200	500	1000	3000
My [Nm]	200	500	1000	3000
Mz [Nm]	200	500	1000	3000
Connectique	Connecteur	Connecteur	Connecteur	Connecteur
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Dimensions (MP11)



Specification : Model K6D150 - 2kN/200Nm/MP11

Force sensor

Type	6-Axis force sensor
Force direction	Tension / Compression
Rated force Fx	2 kN
Rated force Fy	2 kN
Rated force Fz	5 kN
Force introduction	Inner thread
Dimension 1	6xM12x1,75
Sensor Fastening	Inner thread
Dimension 2	6xM12x1,75
Operating force	300 %FS
Material	Aluminium alloy
Dimensions	Ø150 x 90 mm
Height	90 mm
Length or Diameter	150 mm
Rated torque Mx	200 Nm
Rated torque My	200 Nm
Rated torque Mz	200 Nm
Torque limit	300 %FS
Bending moment limit	200 %FS

Electrical Data

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	-0.05 mV/V
Zero signal from	0.05 mV/V

Precision

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	0.01 %RD/K
Relative creep	0.1 %FS
Relative repeatability error	0.5 %FS

Connection Data

Connection type	Connector
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Specification : Model K6D150 - 2kN/200Nm/MP11

Name of the connection	round plug connector MP11, 24-pole, male
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Eccentricity and Crosstalk	
Crosstalk	1 %FS

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 .

Specification : Model K6D150 - 4kN/500Nm/MP11

Force sensor	
Type	6-Axis force sensor
Force direction	Tension / Compression
Rated force Fx	4 kN
Rated force Fy	4 kN
Rated force Fz	10 kN
Force introduction	Inner thread
Dimension 1	6xM12x1,75
Sensor Fastening	Inner thread
Dimension 2	6xM12x1,75
Operating force	300 %FS
Material	Aluminium alloy
Dimensions	Ø150 x 90 mm
Height	90 mm
Length or Diameter	150 mm
Rated torque Mx	500 Nm
Rated torque My	500 Nm
Rated torque Mz	500 Nm
Torque limit	300 %FS
Bending moment limit	200 %FS

Electrical Data	
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	-0.05 mV/V
Zero signal from	0.05 mV/V

Precision	
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	0.01 %RD/K
Relative creep	0.1 %FS
Relative repeatability error	0.5 %FS

Connection Data	
Connection type	Connector

Specification : Model K6D150 - 4kN/500Nm/MP11

Name of the connection	round plug connector MP11, 24-pole, male
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Eccentricity and Crosstalk	
Crosstalk	1 %FS

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

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The calibration data are individually determined and documented for the sensor.

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Specification : Model K6D150 - 10kN/1kNm/MP11

Force sensor

Type	6-Axis force sensor
Force direction	Tension / Compression
Rated force Fx	10 kN
Rated force Fy	10 kN
Rated force Fz	25 kN
Force introduction	Inner thread
Dimension 1	6xM12x1,75
Sensor Fastening	Inner thread
Dimension 2	6xM12x1,75
Operating force	300 %FS
Dimensions	Ø150 x 90 mm
Height	90 mm
Length or Diameter	150 mm
Rated torque Mx	1 kNm
Rated torque My	1 kNm
Rated torque Mz	1 kNm
Torque limit	300 %FS
Bending moment limit	200 %FS

Electrical Data

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	-0.05 mV/V
Zero signal from	0.05 mV/V

Precision

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	0.01 %RD/K
Relative creep	0.1 %FS
Relative repeatability error	0.5 %FS

Connection Data

Connection type	Connector
Name of the connection	round plug connector MP11, 24-pole, male

Specification : Model K6D150 - 10kN/1kNm/MP11

Eccentricity and Crosstalk

Crosstalk	1 %FS
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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

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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 .

Specification : Model K6D150 - 30kN/3kNm/MP11

Force sensor	
Type	6-Axis force sensor
Force direction	Tension / Compression
Rated force Fx	30 kN
Rated force Fy	30 kN
Rated force Fz	90 kN
Force introduction	Inner thread
Dimension 1	6xM12x1,75
Sensor Fastening	Inner thread
Dimension 2	6xM12x1,75
Operating force	300 %FS
Dimensions	Ø150 x 90 mm
Height	90 mm
Length or Diameter	150 mm
Rated torque Mx	3 kNm
Rated torque My	3 kNm
Rated torque Mz	3 kNm
Torque limit	300 %FS
Bending moment limit	200 %FS

Electrical Data	
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	-0.05 mV/V
Zero signal from	0.05 mV/V

Precision	
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	0.01 %RD/K
Relative creep	0.1 %FS
Relative repeatability error	0.5 %FS

Connection Data	
Connection type	Connector
Name of the connection	round plug connector MP11, 24-pole, male

Specification : Model K6D150 - 30kN/3kNm/MP11

Eccentricity and Crosstalk

Crosstalk	1 %FS
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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.

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Accessories

Description	Description
 K6D-CalibrationMatrix SL	Standard calibration matrix "Small load" for the sensors with small measuring ranges
 K6D-CalibrationMatrix SL/Plus	High accuracy calibration matrix for 6-axis force/torque sensors;
 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 D-Sub44/m/HD	Assembling the connector to sensor cable; 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
 Connection cable MP11/f-D-Sub44HD/m	Connection cable for connecting the K6D sensor to an 8-channel measuring amplifier GSV-8DS SubD44HD
 Connection cable MP11/f-D-Sub44HD/m/straight	Straight connection cable for connecting the K6D sensor to an 8-channel measuring amplifier GSV-8DS SubD44HD
 Connection cable MP11/f-D-Sub44HD/m/angled	Angled connection cable for connecting the K6D sensor to an 8-channel measuring amplifier GSV-8DS SubD44HD
 Connection cable MP11/f-M16/24p/m	Connection cable for the K6D sensor to 8-channel measuring amplifier GSV-8AS
 Connection cable MP11/f-M16/24p/m/angled	Angled connection cable for the K6D sensor to 8-channel measuring amplifier GSV-8AS