3-Axis Force Sensor K3A100 2kN/10kN

Item number: 14996

The K3A 3-axis sensor is designed for measuring force in three mutually perpendicular axes. This product group has a wide measurement ranges for the forces.
The K3A S3-Axis Force Sensors are developed for the following applications:

1. Robotics,
2. Medical technology,
3. Measurements in automation technology,
4. Mounting and Assembling of Parts in Production Lines,
5. 6-Axis Force/Torque Platforms consisting of 4x K3A Sensors,
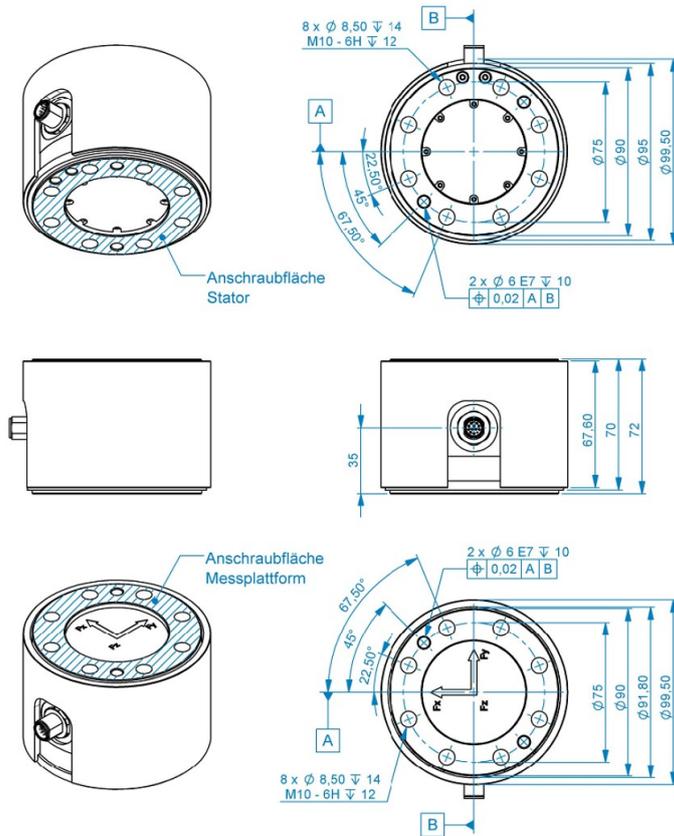6. Research and Testing.

A key characteristic of 3D force sensors is crosstalk: The application of a force also results in a reading in the two unloaded axes. Due to multiple compensation (mechanical + electrical), crosstalk is typically less than 3% of the nominal load. The crosstalk is reproducible and proportional to the applied force amplitude. By applying an additional compensation matrix, crosstalk can be reduced to typically less than 1% in all axes.

ME-Meßsysteme therefore supplies two calibration certificates: without a compensation matrix (type "cv") and with a compensation matrix (type "s").

The K3A sensors can be operated without additional compensation matrix. During the application, please take care to ensure that the maximum bending moments are not exceeded.
The lever arms are calculated from the sensor origin, which is in the center of the mounting surface (on the top surface).

Technical Drawing

Anschraubfläche Stator

8 x Ø 8,50 ⍯ 14
M10 - 6H ⍯ 12

2 x Ø 6 E7 ⍯ 10
⌖ 0,02 A B

Ø75
Ø90
Ø95
Ø99,50

22,50°
45°
67,50°

35
67,60
70
72

Anschraubfläche Messplattform

2 x Ø 6 E7 ⍯ 10
⌖ 0,02 A B

8 x Ø 8,50 ⍯ 14
M10 - 6H ⍯ 12

67,50°
45°
22,50°

Ø75
Ø90
Ø91,80
Ø99,50

Technical Data

Basic Data		Unit
Type	3-axis force sensor	
Force direction	Tension/Compression	
Rated force Fx	2	kN
Rated force Fy	2	kN
Rated force Fz	10	kN
Force introduction	Internal thread	
Dimension 1	8xM10x1.5	
Sensor Fastening	Internal thread	
Dimension 2	8xM10x1.5	
Operating force	150	%FS
Material	alluminum-alloy	
Dimensions	Ø100 x 72	mm
Height	72	mm
Length or Diameter	100	mm
Variants	5kN/20kN, 10kN/30kN, 20kN/60kN	

Electrical Data		Unit
Rated output x-axis	2	mV/V / FS
Rated output y-axis	1.5	mV/V / FS
Rated output z-axis	0.8	mV/V / FS
Zero signal	0.05	mV/V
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
Input resistance x-axis	700	Ohm
Output resistance x-axis	700	Ohm
Input resistance y-axis	700	Ohm
Output resistance y-axis	700	Ohm
Input resistance z-axis	1400	Ohm
Output resistance z-axis	1400	Ohm
Insulation resistance	5	GOhm

Eccentricity and Crosstalk		Unit
Crosstalk from x to y at rated load	2	%FS
Crosstalk from y to x at rated load	2	%FS
Crosstalk from z to x/y at rated load	1	%FS
Crosstalk from x/y to z at rated load	1	%FS

Accuracy Data		Unit
Accuracy class	0,2	
Relative linearity error	0.2	%FS
Temperature effect on zero signal	0.01	%FS/K
Temperature effect on characteristic value	0.01	%RD/K
Relative creep	0.01	%FS

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
Environmental protection	IP65	

Abbreviation: RD: „Reading"; FS: „Full Scale"The exact nominal sensitivity is indicated in the test reportCrosstalk is less than 2% when using the compensation matrix (type s).
Without using the compensation matrix, crosstalk is less than 3% (matrix type cv).

Pin Assignment

Channel	Symbol	Description	Wire color	PIN
x-axis	+Us	positive bridge supply	blue	2
	-Us	negative bridge supply	brown	1
	+Ud	positive bridge output	white	3
	-Ud	negative bridge output	green	4
y-axis	+Us	positive bridge supply	yellow	6
	-Us	negative bridge supply	pink	5
	+Ud	positive bridge output	black	7
	-Ud	negative bridge output	grey	8
z-axis	+Us	positive bridge supply	purple	10
	-Us	negative bridge supply	red	9
	+Ud	positive bridge output	grey / pink	11
	-Ud	negative bridge output	red / blue	12

Compressive load: positive output signal. Shield- transparent.