

## 3-Axis Force Sensor K3A125 40kN/120kN

Item number: 10161



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.

The calibration document contains the individual calibration factors and crosstalk data of the sensor.

The crosstalk optionally can be minimized by application of an additional error compensation matrix.

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 Data

| Basic Data           |                       | Unit |
|----------------------|-----------------------|------|
| Type                 | 3-axis force sensor   |      |
| Force direction      | Tension/Compression   |      |
| Rated force Fx       | 40                    | kN   |
| Rated force Fy       | 40                    | kN   |
| Rated force Fz       | 120                   | kN   |
| Force introduction   | Internal thread       |      |
| Dimension 1          | 8xM12x1,75            |      |
| Sensor Fastening     | Internal thread       |      |
| Dimension 2          | 8xM12x1,75            |      |
| Operating force      | 150                   | %FS  |
| Material             | Stahl                 |      |
| Natural frequency fx | 2752                  | Hz   |
| Dimensions           | Ø125 x 90             | mm   |
| Height               | 90                    | mm   |
| Length or Diameter   | 125                   | mm   |
| Torque limit         | 6                     | kNm  |
| Bending moment limit | 2                     | kNm  |
| Variants             | 30kN/90kN, 40kN/120kN |      |

| Electrical Data                            |      | Unit      |
|--------------------------------------------|------|-----------|
| Rated output x-axis                        | 1.5  | 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 report

## 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.