



### Description

The 3-axis sensor K3D40 is suitable for measuring force on three mutually perpendicular axes.

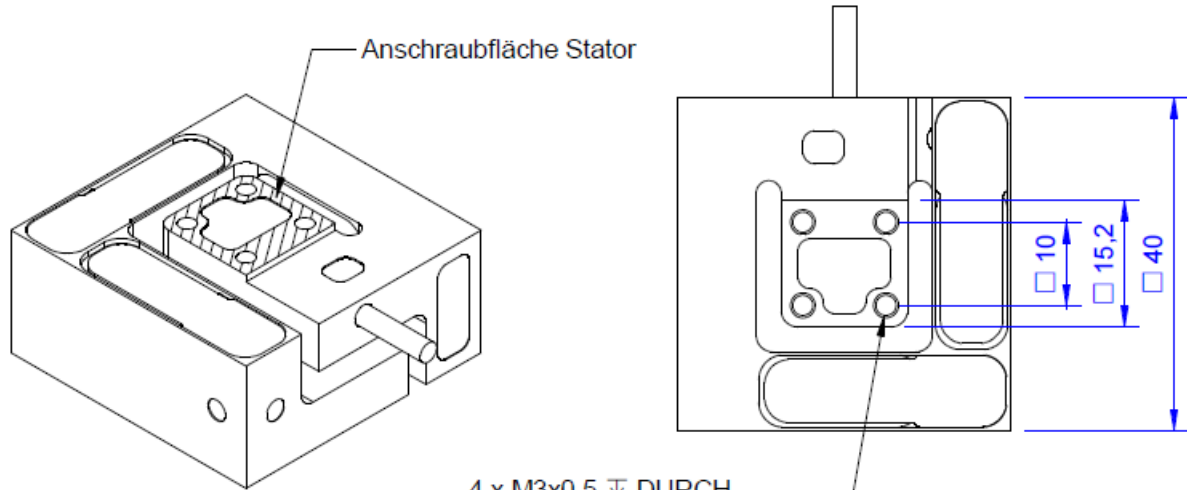
It is available for  $\pm 2$  N or  $\pm 10$  N in all three axes, and can optionally be manufactured for other measurement ranges.

This model stands out for its particularly compact size with a footprint of only 40 mm x 40 mm and a low overall height of only 20 mm.

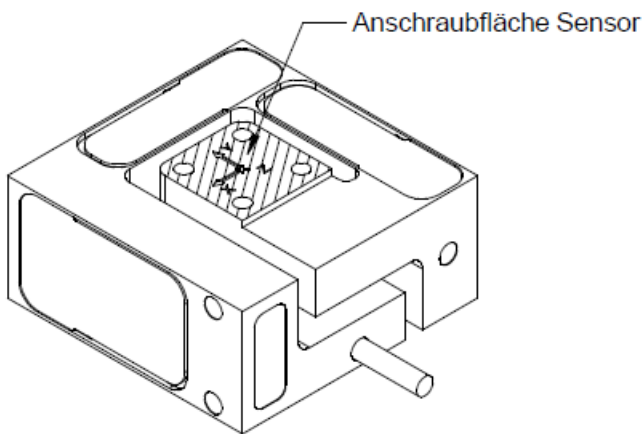
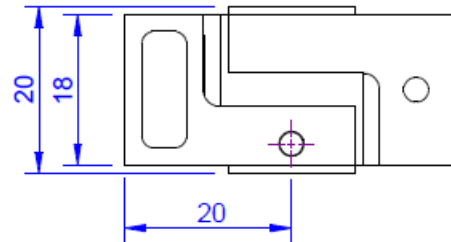
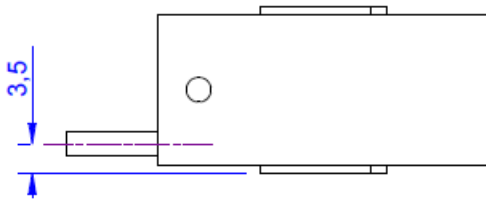
### Technical characteristics

| Modèles     | K3D40 ( $\pm 2$ N)     | K3D40 ( $\pm 10$ N)    | K3D40 ( $\pm 20$ N)    | K3D40 ( $\pm 50$ N)    |
|-------------|------------------------|------------------------|------------------------|------------------------|
| Fx [N]      | 2                      | 10                     | 20                     | 50                     |
| Fy [N]      | 2                      | 10                     | 20                     | 50                     |
| Fz [N]      | 2                      | 10                     | 20                     | 50                     |
| Connectique | 12 conducteurs ouverts | 12 conducteurs ouverts | 12 conducteurs ouverts | 12 conducteurs ouverts |
| Page        | 3-4                    | 5-6                    | 7-8                    | 9-10                   |

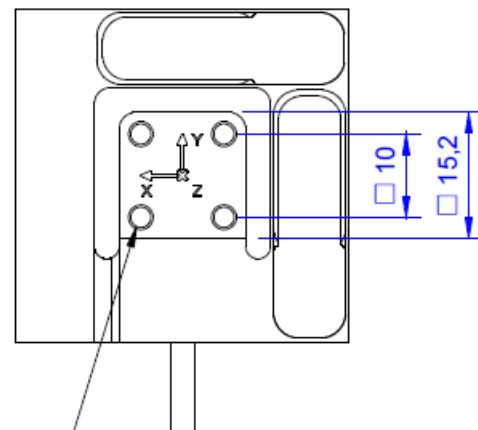
Dimensions



4 x M3x0.5 ∇ DURCH  
(max. Einschraubtiefe 8mm)



4 x M3x0.5 ∇ DURCH  
(max. Einschraubtiefe 8mm)



Specification : Model K3D40 -  $\pm 2N$

| Force sensor         |                       |
|----------------------|-----------------------|
| Type                 | 3-axis force sensor   |
| Force direction      | Tension / Compression |
| Rated force Fx       | 2 N                   |
| Rated force Fy       | 2 N                   |
| Rated force Fz       | 2 N                   |
| Force introduction   | Inner thread          |
| Dimension 1          | M3x0,5                |
| Sensor Fastening     | Inner thread          |
| Dimension 2          | M3x0,5                |
| Operating force      | 200 %FS               |
| Rated displacement   | 0.15 mm               |
| Material             | Aluminium alloy       |
| Natural frequency    | 500 Hz                |
| Height               | 20 mm                 |
| Length or Diameter   | 40 mm                 |
| Torque limit         | 5 Nm                  |
| Bending moment limit | 5 Nm                  |
| Breaking force       | 600 %                 |

| Precision                                  |            |
|--|------------|
| Accuracy class                             | 0,5%       |
| Relative linearity error                   | 0.2 %FS    |
| Relative zero signal hysteresis            | 0.1 %FS    |
| Temperature effect on zero signal          | 0.05 %FS/K |
| Temperature effect on characteristic value | 0.05 %RD/K |
| Relative creep                             | 0.05 %FS   |

| Connection Data        |                   |
|------------------------|-------------------|
| Connection type        | 12 conductor open |
| Name of the connection | STC-32T-12        |
| Cable length           | 3 m               |

| Eccentricity and Crosstalk            |               |
|---------------------------------------|---------------|
| Influence of eccentric load to FS     | 0.5 %FS / 2Nm |
| Crosstalk from x to y at rated load   | 0.5 %FS       |
| Crosstalk from y to x at rated load   | 0.5 %FS       |
| Crosstalk from z to x/y at rated load | 1 %FS         |
| Crosstalk from x/y to z at rated load | 1             |

| Temperature                   |               |
|-------------------------------|---------------|
| Rated temperature range f     | -20 ... 60 °C |
| Operating temperature range f | -20 ... 70 °C |
| Storage temperature range f   | -20 ... 70 °C |

Specification : Model K3D40 -  $\pm 2N$

|   |               |
|---|---------------|
| Environmental protection                | IP65          |
| <b>Electrical Data</b>                  |               |
| Rated output x-axis                     | 0.5 mV/V / FS |
| Rated output y-axis                     | 0.5 mV/V / FS |
| Rated output z-axis                     | 0.5 mV/V / FS |
| Zero signal                             | 0.1 mV/V      |
| Rated range of excitation voltage f     | 2.5 ... 5 V   |
| Operating range of excitation voltage f | 1 ... 10 V    |
| Input resistance x-axis                 | 350 Ohm       |
| Output resistance x-axis                | 350 Ohm       |
| Input resistance y-axis                 | 350 Ohm       |
| Output resistance y-axis                | 350 Ohm       |
| Input resistance z-axis                 | 350 Ohm       |
| Output resistance z-axis                | 350 Ohm       |
| Insulation resistance                   | 5 GOhm        |
| Tolerance input resistance              | 5 Ohm         |
| Tolerance output resistance             | 5 Ohm         |

<sup>1)</sup> The exact nominal sensitivity is indicated in the test report.

Specification : Model K3D40 - ±10N

**Force sensor**

|                      |                       |
|----------------------|-----------------------|
| Type                 | 3-axis force sensor   |
| Force direction      | Tension / Compression |
| Rated force Fx       | 10 N                  |
| Rated force Fy       | 10 N                  |
| Rated force Fz       | 10 N                  |
| Force introduction   | Inner thread          |
| Dimension 1          | M3x0,5                |
| Sensor Fastening     | Inner thread          |
| Dimension 2          | M3x0,5                |
| Operating force      | 200 %FS               |
| Rated displacement   | 0.15 mm               |
| Material             | Aluminium alloy       |
| Natural frequency    | 1 kHz                 |
| Height               | 20 mm                 |
| Length or Diameter   | 40 mm                 |
| Torque limit         | 5 Nm                  |
| Bending moment limit | 5 Nm                  |
| Breaking force       | 600 %                 |

**Precision**

|  |            |
|--|------------|
| Accuracy class                             | 0,5%       |
| Relative linearity error                   | 0.2 %FS    |
| Relative zero signal hysteresis            | 0.1 %FS    |
| Temperature effect on zero signal          | 0.05 %FS/K |
| Temperature effect on characteristic value | 0.05 %RD/K |
| Relative creep                             | 0.05 %FS   |

**Connection Data**

|                        |                   |
|------------------------|-------------------|
| Connection type        | 12 conductor open |
| Name of the connection | STC-32T-12        |
| Cable length           | 3 m               |

**Eccentricity and Crosstalk**

|                                       |               |
|---------------------------------------|---------------|
| Influence of eccentric load to FS     | 0.5 %FS / 2Nm |
| Crosstalk from x to y at rated load   | 0.5 %FS       |
| Crosstalk from y to x at rated load   | 0.5 %FS       |
| Crosstalk from z to x/y at rated load | 1 %FS         |
| Crosstalk from x/y to z at rated load | 1             |

**Temperature**

|                               |               |
|-------------------------------|---------------|
| Rated temperature range f     | -20 ... 60 °C |
| Operating temperature range f | -20 ... 70 °C |
| Storage temperature range f   | -20 ... 70 °C |

Specification : Model K3D40 -  $\pm 10\text{N}$

|   |               |
|---|---------------|
| Environmental protection                | IP65          |
| <b>Electrical Data</b>                  |               |
| Rated output x-axis                     | 0.5 mV/V / FS |
| Rated output y-axis                     | 0.5 mV/V / FS |
| Rated output z-axis                     | 0.5 mV/V / FS |
| Zero signal                             | 0.1 mV/V      |
| Rated range of excitation voltage f     | 2.5 ... 5 V   |
| Operating range of excitation voltage f | 1 ... 10 V    |
| Input resistance x-axis                 | 350 Ohm       |
| Output resistance x-axis                | 350 Ohm       |
| Input resistance y-axis                 | 350 Ohm       |
| Output resistance y-axis                | 350 Ohm       |
| Input resistance z-axis                 | 350 Ohm       |
| Output resistance z-axis                | 350 Ohm       |
| Insulation resistance                   | 5 GOhm        |
| Tolerance input resistance              | 5 Ohm         |
| Tolerance output resistance             | 5 Ohm         |

<sup>1)</sup> The exact nominal sensitivity is indicated in the test report.

Specification : Model K3D40 -  $\pm 20\text{N}$

**Force sensor**

|                      |                       |
|----------------------|-----------------------|
| Type                 | 3-axis force sensor   |
| Force direction      | Tension / Compression |
| Rated force Fx       | 20 N                  |
| Rated force Fy       | 20 N                  |
| Rated force Fz       | 20 N                  |
| Force introduction   | Inner thread          |
| Dimension 1          | M3x0,5                |
| Sensor Fastening     | Inner thread          |
| Dimension 2          | M3x0,5                |
| Operating force      | 200 %FS               |
| Rated displacement   | 0.15 mm               |
| Material             | Aluminium alloy       |
| Natural frequency    | 1.5 kHz               |
| Height               | 20 mm                 |
| Length or Diameter   | 40 mm                 |
| Torque limit         | 5 Nm                  |
| Bending moment limit | 5 Nm                  |
| Breaking force       | 600 %                 |

**Precision**

|  |            |
|--|------------|
| Accuracy class                             | 0,5%       |
| Relative linearity error                   | 0.2 %FS    |
| Relative zero signal hysteresis            | 0.1 %FS    |
| Temperature effect on zero signal          | 0.05 %FS/K |
| Temperature effect on characteristic value | 0.05 %RD/K |
| Relative creep                             | 0.05 %FS   |

**Connection Data**

|                        |                   |
|------------------------|-------------------|
| Connection type        | 12 conductor open |
| Name of the connection | STC-32T-12        |
| Cable length           | 3 m               |

**Eccentricity and Crosstalk**

|                                       |               |
|---------------------------------------|---------------|
| Influence of eccentric load to FS     | 0.5 %FS / 2Nm |
| Crosstalk from x to y at rated load   | 0.5 %FS       |
| Crosstalk from y to x at rated load   | 0.5 %FS       |
| Crosstalk from z to x/y at rated load | 1 %FS         |
| Crosstalk from x/y to z at rated load | 1             |

**Temperature**

|                               |               |
|-------------------------------|---------------|
| Rated temperature range f     | -20 ... 60 °C |
| Operating temperature range f | -20 ... 70 °C |
| Storage temperature range f   | -20 ... 70 °C |

Specification : Model K3D40 -  $\pm 20\text{N}$

|   |               |
|---|---------------|
| Environmental protection                | IP65          |
| <b>Electrical Data</b>                  |               |
| Rated output x-axis                     | 0.5 mV/V / FS |
| Rated output y-axis                     | 0.5 mV/V / FS |
| Rated output z-axis                     | 0.5 mV/V / FS |
| Zero signal                             | 0.1 mV/V      |
| Rated range of excitation voltage f     | 2.5 ... 5 V   |
| Operating range of excitation voltage f | 1 ... 10 V    |
| Input resistance x-axis                 | 350 Ohm       |
| Output resistance x-axis                | 350 Ohm       |
| Input resistance y-axis                 | 350 Ohm       |
| Output resistance y-axis                | 350 Ohm       |
| Input resistance z-axis                 | 350 Ohm       |
| Output resistance z-axis                | 350 Ohm       |
| Insulation resistance                   | 5 GOhm        |
| Tolerance input resistance              | 5 Ohm         |
| Tolerance output resistance             | 5 Ohm         |

<sup>1)</sup> The exact nominal sensitivity is indicated in the test report.



Specification : Model K3D40 - ±50N

**Force sensor**

|                      |                       |
|----------------------|-----------------------|
| Type                 | 3-axis force sensor   |
| Force direction      | Tension / Compression |
| Rated force Fx       | 50 N                  |
| Rated force Fy       | 50 N                  |
| Rated force Fz       | 50 N                  |
| Force introduction   | Inner thread          |
| Dimension 1          | M3x0,5                |
| Sensor Fastening     | Inner thread          |
| Dimension 2          | M3x0,5                |
| Operating force      | 200 %FS               |
| Rated displacement   | 0.15 mm               |
| Material             | Aluminium alloy       |
| Natural frequency    | 2 kHz                 |
| Height               | 20 mm                 |
| Length or Diameter   | 40 mm                 |
| Torque limit         | 5 Nm                  |
| Bending moment limit | 5 Nm                  |
| Breaking force       | 600 %                 |

**Precision**

|  |            |
|--|------------|
| Accuracy class                             | 0,5%       |
| Relative linearity error                   | 0.2 %FS    |
| Relative zero signal hysteresis            | 0.1 %FS    |
| Temperature effect on zero signal          | 0.05 %FS/K |
| Temperature effect on characteristic value | 0.05 %RD/K |
| Relative creep                             | 0.05 %FS   |

**Connection Data**

|                        |                   |
|------------------------|-------------------|
| Connection type        | 12 conductor open |
| Name of the connection | STC-32T-12        |
| Cable length           | 3 m               |

**Eccentricity and Crosstalk**

|                                       |               |
|---------------------------------------|---------------|
| Influence of eccentric load to FS     | 0.5 %FS / 2Nm |
| Crosstalk from x to y at rated load   | 0.5 %FS       |
| Crosstalk from y to x at rated load   | 0.5 %FS       |
| Crosstalk from z to x/y at rated load | 1 %FS         |
| Crosstalk from x/y to z at rated load | 1             |

**Temperature**

|                               |               |
|-------------------------------|---------------|
| Rated temperature range f     | -20 ... 60 °C |
| Operating temperature range f | -20 ... 70 °C |
| Storage temperature range f   | -20 ... 70 °C |

Specification : Model K3D40 -  $\pm 50\text{N}$

|   |               |
|---|---------------|
| Environmental protection                | IP65          |
| <b>Electrical Data</b>                  |               |
| Rated output x-axis                     | 0.5 mV/V / FS |
| Rated output y-axis                     | 0.5 mV/V / FS |
| Rated output z-axis                     | 0.5 mV/V / FS |
| Zero signal                             | 0.1 mV/V      |
| Rated range of excitation voltage f     | 2.5 ... 5 V   |
| Operating range of excitation voltage f | 1 ... 10 V    |
| Input resistance x-axis                 | 350 Ohm       |
| Output resistance x-axis                | 350 Ohm       |
| Input resistance y-axis                 | 350 Ohm       |
| Output resistance y-axis                | 350 Ohm       |
| Input resistance z-axis                 | 350 Ohm       |
| Output resistance z-axis                | 350 Ohm       |
| Insulation resistance                   | 5 GOhm        |
| Tolerance input resistance              | 5 Ohm         |
| Tolerance output resistance             | 5 Ohm         |

<sup>1)</sup> The exact nominal sensitivity is indicated in the test report.




### Pin Configuration

| Channel | Symbol | Description            | Wire colour |
|---------|--------|------------------------|-------------|
| 1       | +Us    | positive bridge supply | brown       |
|         | -Us    | negative bridge supply | white       |
|         | +Ud    | positive bridge output | green       |
|         | -Ud    | negative bridge output | yellow      |
| 2       | +Us    | positive bridge supply | pink        |
|         | -Us    | negative bridge supply | grey        |
|         | +Ud    | positive bridge output | blue        |
|         | -Ud    | negative bridge output | red         |
| 3       | +Us    | positive bridge supply | purple      |
|         | -Us    | negative bridge supply | black       |
|         | +Ud    | positive bridge output | orange      |
|         | -Ud    | negative bridge output | transparent |

Pressure load: positive output signal.

Shield- transparent.

### Accessories

|   | Description                            | Description  |
|---|--|--|
|  | Calibration Certificate<br>kn/20/5/K3D | Factory calibration certificate for force to 20 kN in accordance with DIN EN ISO / IEC 17025 for test materials monitoring according to DIN ISO 9001: 2008 with 5 load levels and 3 series of measurements.                      |
|  | GSV-1A4 SubD37/2                       | 4-channel strain gauge measuring amplifier for sensors with strain gauges. Adaptation of the sensor via <a href="#">Sub-D-37 connector</a> . Output $\pm 10V$ and 4 ... 20mA via 15-pin SUB-D (female); Input sensitivity 2mV/V; |
|  | GSV-4USB SubD37                        | 4-channel strain measurement amplifier with USB port with configurable input for strain gauges, temperature sensors, active sensors, displacement sensors and other sensors. Sensor connection via 1 piece Sub D37 connector     |