



Precise deviation measurement for numerous industries

INCLINATION SENSORS

Many applications require precise position control as well as continuous guiding and monitoring of rotary movements. Inclination sensors from Balluff measure the deviation from horizontal or vertical axes up to 360°. The sensors are available with two different measuring principles, making them ideal for numerous industries and applications.

The most important benefits

- Contactless and absolute
- Capacitive measuring principle and MEMS
- Direct inclination measurement without costly special constructions
- Interfaces: 4...20 mA, 0...10 V and Modbus
- Appropriate for use in harsh conditions with high protection class IP67
- Measuring range up to 360°
- Simple mounting and integration in your facility
- For use in many industries: factory automation, energy, hydraulics, packaging, plastics, rubber, tires, life sciences





| | BSI000M BSI Q41K0-XA-MXS015-S92 | BSI000N BSI Q41K0-XA-MXS030-S92 | BSI000T BSI Q41K0-XA-MXS045-S92 | |
|-------------------------|--|--|--|--|
| Measuring principle | MEMS | MEMS | MEMS | |
| Measuring axes | 1 | 1 | 1 | |
| Measuring range | -15...15° | -30...30° | -45...45° | |
| Operating voltage U_b | 12...30 VDC | 12...30 VDC | 12...30 VDC | |
| Interface | Analog, voltage 0...10 V | Analog, voltage 0...10 V | Analog, voltage 0...10 V | |
| Resolution | $\leq 0.09^\circ$ | $\leq 0.09^\circ$ | $\leq 0.09^\circ$ | |
| Accuracy | $\pm 0.6^\circ$ | $\pm 0.6^\circ$ | $\pm 0.8^\circ$ | |
| Connection | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 | |
| Housing material | Plastic | Plastic | Plastic | |
| Ambient temperature | -25...85 °C | -25...85 °C | -25...85 °C | |
| Protection degree | IP67 | IP67 | IP67 | |
| Approval/Conformity | CE, cULus | CE, cULus | CE, cULus | |
| Additional text | Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position | |
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| BS1000U BSI Q41K0-XA-MXS090-S92 | BS1000L BSI Q41K0-XA-MXP360-S92 | BS1000J BSI Q41K0-XB-MXS015-S92 | BS1000K BSI Q41K0-XB-MXS030-S92 | BS1000P BSI Q41K0-XB-MXS045-S92 |
|--|--|--|--|--|
| MEMS | MEMS | MEMS | MEMS | MEMS |
| 1 | 1 | 1 | 1 | 1 |
| -90...90° | 0...360° | -15...15° | -30...30° | -45...45° |
| 12...30 VDC | 12...30 VDC | 10...30 VDC | 10...30 VDC | 10...30 VDC |
| Analog, voltage 0...10 V | Analog, voltage 0...10 V | Analog, current 4...20 mA | Analog, current 4...20 mA | Analog, current 4...20 mA |
| ≤ 0.09 ° | ≤ 0.09 ° | ≤ 0.09 ° | ≤ 0.09 ° | ≤ 0.09 ° |
| ±0.8° | ±1.0° | ±0.6° | ±0.6° | ±0.8° |
| Connector, M12x1 | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 |
| Plastic | Plastic | Plastic | Plastic | Plastic |
| -25...85 °C | -25...85 °C | -25...85 °C | -25...85 °C | -25...85 °C |
| IP67 | IP67 | IP67 | IP67 | IP67 |
| CE, cULus | CE, cULus | CE, cULus | CE, cULus | CE, cULus |
| Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position |
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| | BSI000R BSI Q41K0-XB-MXS090-S92 | BSI000H BSI Q41K0-XB-MXP360-S92 | BSI0002 BSI R11A0-XB-CXS045-S75G | |
|----------------------------------|--|--|--|--|
| Measuring principle | MEMS | MEMS | Fluid | |
| Measuring axes | 1 | 1 | 1 | |
| Measuring range | -90...90° | 0...360° | -45...45° | |
| Operating voltage U _b | 10...30 VDC | 10...30 VDC | 10...30 VDC | |
| Interface | Analog, current 4...20 mA | Analog, current 4...20 mA | Analog, current 4...20 mA | |
| Resolution | ≤ 0.09 ° | ≤ 0.09 ° | ≤ 0.01 ° | |
| Accuracy | ±0.8° | ±1.0° | ±0.1 % FS min. 0.1 ° | |
| Connection | Connector, M12x1 | Connector, M12x1 | Connector, M8x1 | |
| Housing material | Plastic | Plastic | Aluminum | |
| Ambient temperature | -25...85 °C | -25...85 °C | -40...85 °C | |
| Protection degree | IP67 | IP67 | IP67 | |
| Approval/Conformity | CE, cULus | CE, cULus | CE | |
| Additional text | Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position | — | |
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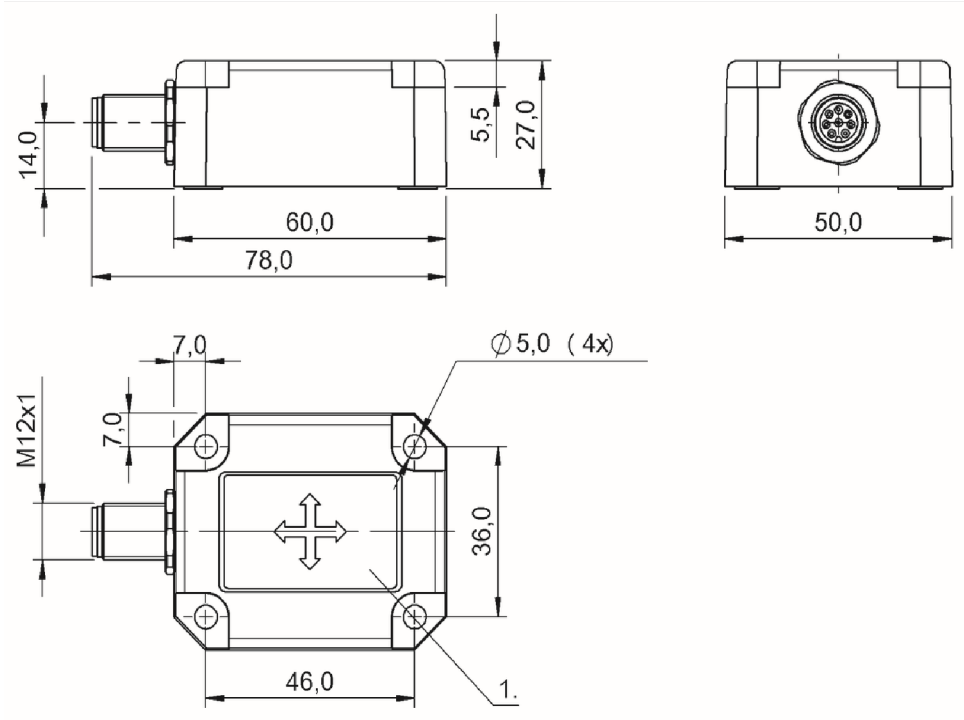
| BSI0004 BSI R11A0-XB-CXP360-S75G | BSI0003 BSI R11A0-XXR-CXP360-S75G | BSI001C BSI R65K0-XA-MXS015-S115 | BSI0017 BSI R65K0-XA-MXS030-S115 | BSI001F BSI R65K0-XA-MXS045-S115 |
|-------------------------------------|---|--|--|--|
| Fluid | Fluid | MEMS | MEMS | MEMS |
| 1 | 1 | 1 | 1 | 1 |
| 0...360° | 0...360° | -15...15° | -30...30° | -45...45° |
| 10...30 VDC | 10...30 VDC | 12...30 VDC | 12...30 VDC | 12...30 VDC |
| Analog, current 4...20 mA | Modbus RTU | Analog, voltage 0...10 V | Analog, voltage 0...10 V | Analog, voltage 0...10 V |
| ≤ 0.01 ° | ≤ 0.01 ° | ≤ 0.01 ° | ≤ 0.01 ° | ≤ 0.01 ° |
| ±0.1 % FS min. 0.1 ° | ±0.1° (+10...+40 °C), ±0.15° (-40...+10 °C)/+40...80 °C) | ±0.2° | ±0.2° | ±0.2° |
| Connector, M8x1 | Connector, M8x1 | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 |
| Aluminum | Aluminum | Plastic | Plastic | Plastic |
| -40...85 °C | -40...85 °C | -40...85 °C | -40...85 °C | -40...85 °C |
| IP67 | IP67 | IP67 | IP67 | IP67 |
| CE | CE | CE, cULus | CE, cULus | CE, cULus |
| — | — | Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position |
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| | BSI0005 BSI R65K0-XA-MXS090-S115 | BSI0016 BSI R65K0-XA-MXP360-S115 | BSI001E BSI R65K0-XB-MXS015-S115 | |
|----------------------------------|--|--|--|--|
| Measuring principle | MEMS | MEMS | MEMS | |
| Measuring axes | 1 | 1 | 1 | |
| Measuring range | -90...90° | 0...360° | -15...15° | |
| Operating voltage U _b | 12...30 VDC | 12...30 VDC | 10...30 VDC | |
| Interface | Analog, voltage 0...10 V | Analog, voltage 0...10 V | Analog, current 4...20 mA | |
| Resolution | ≤ 0.01 ° | ≤ 0.01 ° | ≤ 0.01 ° | |
| Accuracy | ±0.2° | ±0.25° | ±0.2° | |
| Connection | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 | |
| Housing material | Plastic | Plastic | Plastic | |
| Ambient temperature | -40...85 °C | -40...85 °C | -40...85 °C | |
| Protection degree | IP67 | IP67 | IP67 | |
| Approval/Conformity | CE, cULus | CE, cULus | CE, cULus | |
| Additional text | Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position | |
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| BSI0018 BSI R65K0-XB-MXS030-S115 | BSI0019 BSI R65K0-XB-MXS045-S115 | BSI001A BSI R65K0-XB-MXS090-S115 | BSI0015 BSI R65K0-XB-MXP360-S115 | |
|--|--|--|--|--|
| MEMS | MEMS | MEMS | MEMS | |
| 1 | 1 | 1 | 1 | |
| -30...30° | -45...45° | -90...90° | 0...360° | |
| 10...30 VDC | 10...30 VDC | 10...30 VDC | 10...30 VDC | |
| Analog, current 4...20 mA | Analog, current 4...20 mA | Analog, current 4...20 mA | Analog, current 4...20 mA | |
| ≤ 0.01 ° | ≤ 0.01 ° | ≤ 0.01 ° | ≤ 0.01 ° | |
| ±0.2° | ±0.2° | ±0.2° | ±0.25° | |
| Connector, M12x1 | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 | |
| Plastic | Plastic | Plastic | Plastic | |
| -40...85 °C | -40...85 °C | -40...85 °C | -40...85 °C | |
| IP67 | IP67 | IP67 | IP67 | |
| CE, cULus | CE, cULus | CE, cULus | CE, cULus | |
| Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position | Can be centered over 360° in the vertical position | |
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BSI001C, BSI0017, BSI001F, BSI0005, BSI0016, BSI001E, BSI0018, BSI0019, BSI001A, BSI0015



| | BSI000Z BSI Q41K0-XA-MYS015-S92 | BSI0010 BSI Q41K0-XA-MYS030-S92 | BSI0013 BSI Q41K0-XA-MYS045-S92 | |
|-------------------------|---|---|---|--|
| Measuring principle | MEMS | MEMS | MEMS | |
| Measuring axes | 2 | 2 | 2 | |
| Measuring range | -15...15° | -30...30° | -45...45° | |
| Operating voltage U_b | 12...30 VDC | 12...30 VDC | 12...30 VDC | |
| Interface | 2x Analog, voltage 0...10 V | 2x Analog, voltage 0...10 V | 2x Analog, voltage 0...10 V | |
| Resolution | $\leq 0.09^\circ$ | $\leq 0.09^\circ$ | $\leq 0.09^\circ$ | |
| Accuracy | $\pm 0.6^\circ$ | $\pm 0.6^\circ$ | $\pm 0.8^\circ$ | |
| Connection | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 | |
| Housing material | Plastic | Plastic | Plastic | |
| Ambient temperature | -25...85 °C | -25...85 °C | -25...85 °C | |
| Protection degree | IP67 | IP67 | IP67 | |
| Approval/Conformity | CE, cULus | CE, cULus | CE, cULus | |
| Additional text | Centering in a range of $\pm 5^\circ$ from horizontal is possible | Centering in a range of $\pm 5^\circ$ from horizontal is possible | Centering in a range of $\pm 5^\circ$ from horizontal is possible | |
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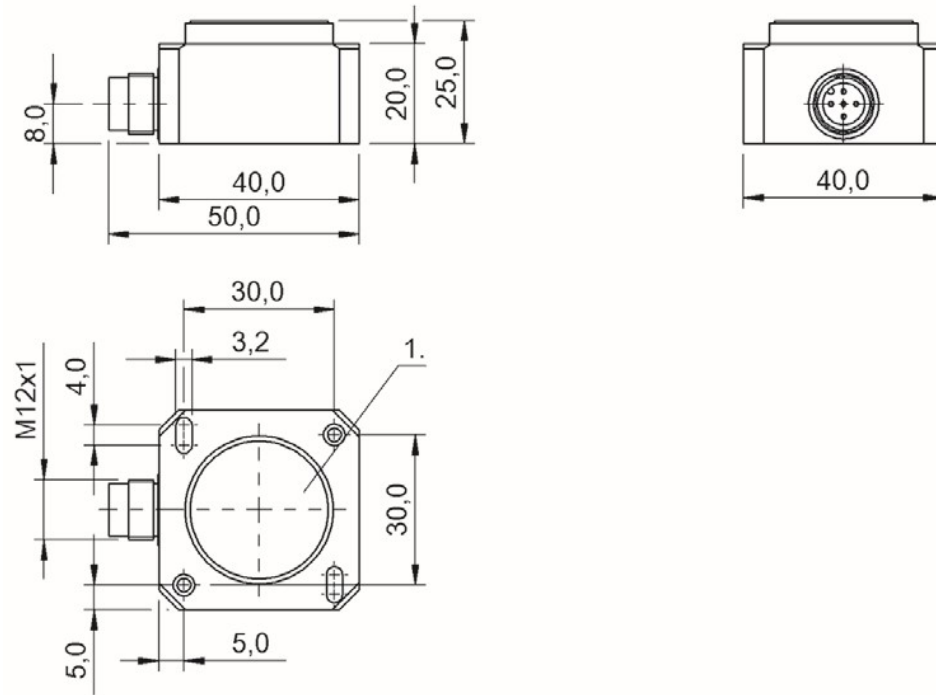
| | BSI0014 BSI Q41K0-XA-MYS090-S92 | BSI000W BSI Q41K0-XB-MYS015-S92 | BSI000Y BSI Q41K0-XB-MYS030-S92 | BSI0011 BSI Q41K0-XB-MYS045-S92 | BSI0012 BSI Q41K0-XB-MYS090-S92 |
|--|---|---|---|---|---|
| | MEMS | MEMS | MEMS | MEMS | MEMS |
| | 2 | 2 | 2 | 2 | 2 |
| | -90...90° | -15...15° | -30...30° | -45...45° | -90...90° |
| | 12...30 VDC | 10...30 VDC | 10...30 VDC | 10...30 VDC | 10...30 VDC |
| | 2x Analog, voltage 0...10 V | 2x Analog, current 4...20 mA | 2x Analog, current 4...20 mA | 2x Analog, current 4...20 mA | 2x Analog, current 4...20 mA |
| | ≤ 0.09 ° | ≤ 0.09 ° | ≤ 0.09 ° | ≤ 0.09 ° | ≤ 0.09 ° |
| | ±0.8° | ±0.6° | ±0.6° | ±0.8° | ±0.8° |
| | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 |
| | Plastic | Plastic | Plastic | Plastic | Plastic |
| | -25...85 °C | -25...85 °C | -25...85 °C | -25...85 °C | -25...85 °C |
| | IP67 | IP67 | IP67 | IP67 | IP67 |
| | CE, cULus | CE, cULus | CE, cULus | CE, cULus | CE, cULus |
| | Centering in a range of ±5° from horizontal is possible | Centering in a range of ±5° from horizontal is possible | Centering in a range of ±5° from horizontal is possible | Centering in a range of ±5° from horizontal is possible | Centering in a range of ±5° from horizontal is possible |
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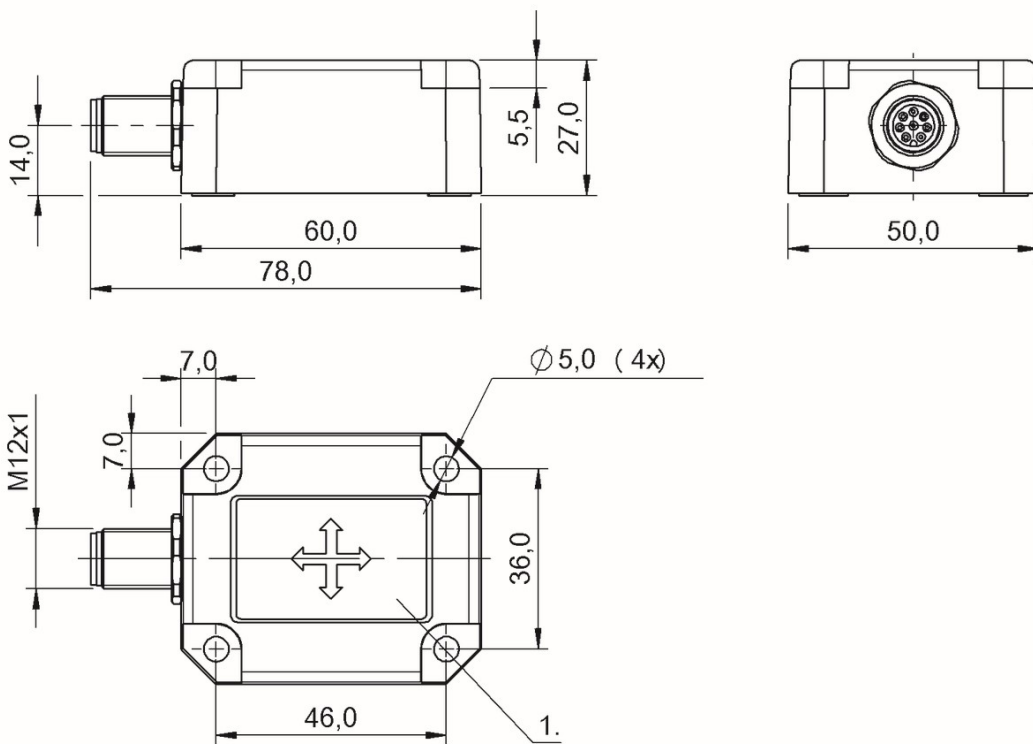
| | BSI000A BSI R65K0-XA-MYS015-S115 | BSI000C BSI R65K0-XA-MYS030-S115 | BSI000E BSI R65K0-XA-MYS045-S115 | |
|-------------------------|---|---|---|--|
| Measuring principle | MEMS | MEMS | MEMS | |
| Measuring axes | 2 | 2 | 2 | |
| Measuring range | -15...15° | -30...30° | -45...45° | |
| Operating voltage U_b | 12...30 VDC | 12...30 VDC | 12...30 VDC | |
| Interface | 2x Analog, voltage 0...10 V | 2x Analog, voltage 0...10 V | 2x Analog, voltage 0...10 V | |
| Resolution | $\leq 0.01^\circ$ | $\leq 0.01^\circ$ | $\leq 0.01^\circ$ | |
| Accuracy | $\pm 0.08^\circ$ | $\pm 0.12^\circ$ | $\pm 0.2^\circ$ | |
| Connection | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 | |
| Housing material | Plastic | Plastic | Plastic | |
| Ambient temperature | -40...85 °C | -40...85 °C | -40...85 °C | |
| Protection degree | IP67 | IP67 | IP67 | |
| Approval/Conformity | CE, cULus | CE, cULus | CE, cULus | |
| Additional text | Centering in a range of $\pm 5^\circ$ from horizontal is possible | Centering in a range of $\pm 5^\circ$ from horizontal is possible | Centering in a range of $\pm 5^\circ$ from horizontal is possible | |
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| | BSI000F BSI R65K0-XA-MYS090-S115 | BSI0006 BSI R65K0-XB-MYS015-S115 | BSI0007 BSI R65K0-XB-MYS030-S115 | BSI0008 BSI R65K0-XB-MYS045-S115 | BSI0009 BSI R65K0-XB-MYS090-S115 |
|--|---|---|---|---|---|
| | MEMS | MEMS | MEMS | MEMS | MEMS |
| | 2 | 2 | 2 | 2 | 2 |
| | -90...90° | -15...15° | -30...30° | -45...45° | -90...90° |
| | 12...30 VDC | 10...30 VDC | 10...30 VDC | 10...30 VDC | 10...30 VDC |
| | 2x Analog, voltage 0...10 V | 2x Analog, current 4...20 mA | 2x Analog, current 4...20 mA | 2x Analog, current 4...20 mA | 2x Analog, current 4...20 mA |
| | ≤ 0.01 ° | ≤ 0.01 ° | ≤ 0.01 ° | ≤ 0.01 ° | ≤ 0.01 ° |
| | ±0.2° | ±0.08° | ±0.12° | ±0.2° | ±0.2° |
| | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 | Connector, M12x1 |
| | Plastic | Plastic | Plastic | Plastic | Plastic |
| | -40...85 °C | -40...85 °C | -40...85 °C | -40...85 °C | -40...85 °C |
| | IP67 | IP67 | IP67 | IP67 | IP67 |
| | CE, cULus | CE, cULus | CE, cULus | CE, cULus | CE, cULus |
| | Centering in a range of ±5° from horizontal is possible | Centering in a range of ±5° from horizontal is possible | Centering in a range of ±5° from horizontal is possible | Centering in a range of ±5° from horizontal is possible | Centering in a range of ±5° from horizontal is possible |
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BSI000Z, BSI0010, BSI0013, BSI0014, BSI000W, BSI000Y, BSI0011, BSI0012



BSI000A, BSI000C, BSI000E, BSI000F, BSI0006, BSI0007, BSI0008, BSI0009

