

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	0.1°	0.1°	0.1°	
Accuracy	1.0°	1.0°	1.0°	
Connection	Connector, M12x1	Connector, M12x1	Connector, M12x1	
Housing material	Plastic	Plastic	Plastic	
Ambient temperature	-40...80 °C	-40...80 °C	-40...80 °C	
Protection degree	IP67, IP69	IP67, IP69	IP67, IP69	
Approval/Conformity	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	
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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	BSI000U BSI Q41K0-XA-MXS090-S92	BSI000L BSI Q41K0-XA-MXP360-S92	BSI000J BSI Q41K0-XB-MXS015-S92	BSI000K BSI Q41K0-XB-MXS030-S92	BSI000P 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
	0.1°	0.1°	0.1°	0.1°	0.1°
	1.0°	1.0°	1.0°	1.0°	1.0°
	Connector, M12x1	Connector, M12x1	Connector, M12x1	Connector, M12x1	Connector, M12x1
	Plastic	Plastic	Plastic	Plastic	Plastic
	-40...80 °C	-40...80 °C	-40...80 °C	-40...80 °C	-40...80 °C
	IP67, IP69	IP67, IP69	IP67, IP69	IP67, IP69	IP67, IP69
	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE
	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	0.1°	0.1°	≤ 0.01 °	
Accuracy	1.0°	1.0°	±0.1 % FS min. 0.1 °	
Connection	Connector, M12x1	Connector, M12x1	Connector, M8x1	
Housing material	Plastic	Plastic	Aluminum	
Ambient temperature	-40...80 °C	-40...80 °C	-40...85 °C	
Protection degree	IP67, IP69	IP67, IP69	IP67	
Approval/Conformity	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, EAC, WEEE	
Additional text	Can be centered over 360° in the vertical position	Can be centered over 360° in the vertical position	—	
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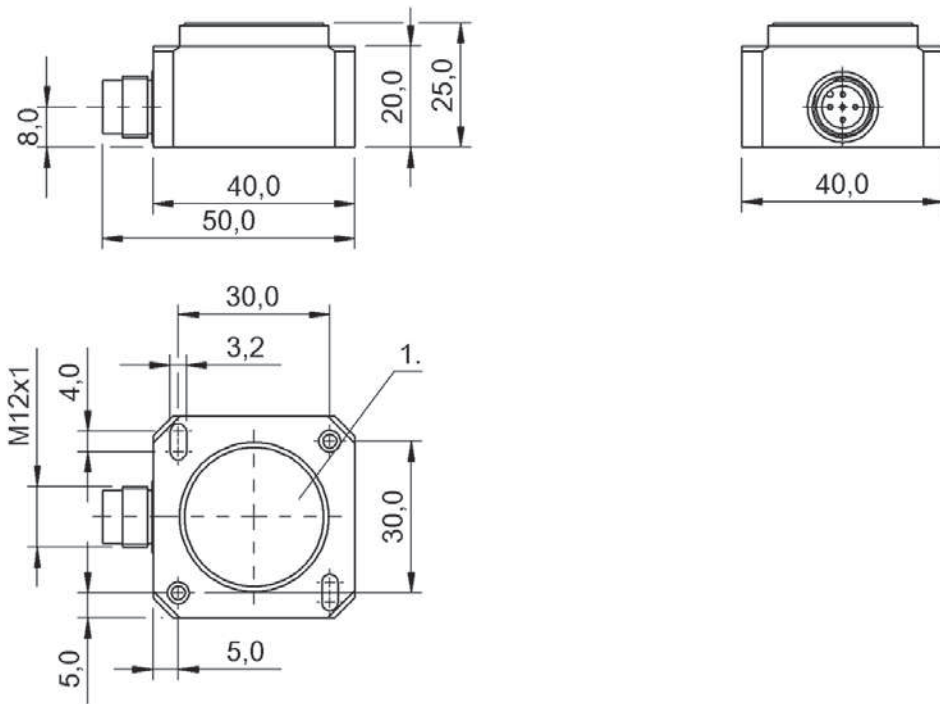
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	Fluid	Fluid	MEMS	MEMS	MEMS
	1	1	1	1	1
	0...360°	0...360°	-15...15°	-30...30°	-45...45°
	10...30 VDC	10...30 VDC	12...30 VDC	12...30 VDC	12...30 VDC
	Analog, current 4...20 mA	Modbus RTU	Analog, voltage 0...10 V	Analog, voltage 0...10 V	Analog, voltage 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...80 °C	-40...80 °C	-40...80 °C
	IP67	IP67	IP67	IP67	IP67
	CE, EAC, WEEE	CE, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE
	—	—	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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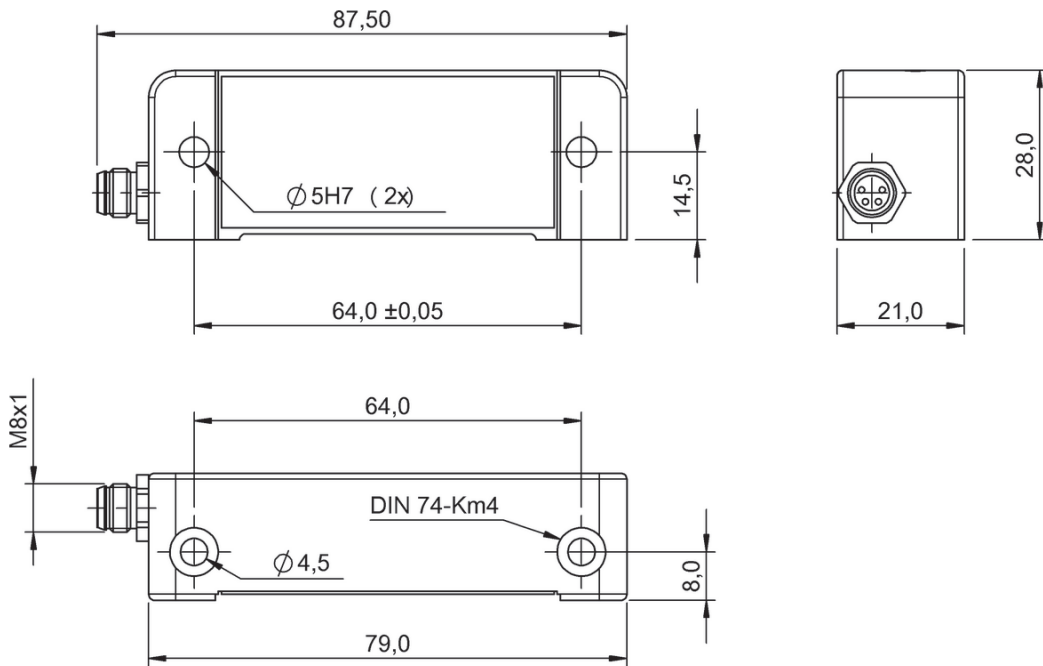
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Measuring principle	MEMS	MEMS	MEMS	
Measuring axes	1	1	1	
Measuring range	-90...90°	0...360°	-15...15°	
Operating voltage U_b	12...30 VDC	12...30 VDC	10...30 VDC	
Interface	Analog, voltage 0...10 V	Analog, voltage 0...10 V	Analog, current 4...20 mA	
Resolution	$\leq 0.01^\circ$	$\leq 0.01^\circ$	$\leq 0.01^\circ$	
Accuracy	$\pm 0.2^\circ$	$\pm 0.25^\circ$	$\pm 0.2^\circ$	
Connection	Connector, M12x1	Connector, M12x1	Connector, M12x1	
Housing material	Plastic	Plastic	Plastic	
Ambient temperature	-40...80 °C	-40...80 °C	-40...80 °C	
Protection degree	IP67	IP67	IP67	
Approval/Conformity	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	
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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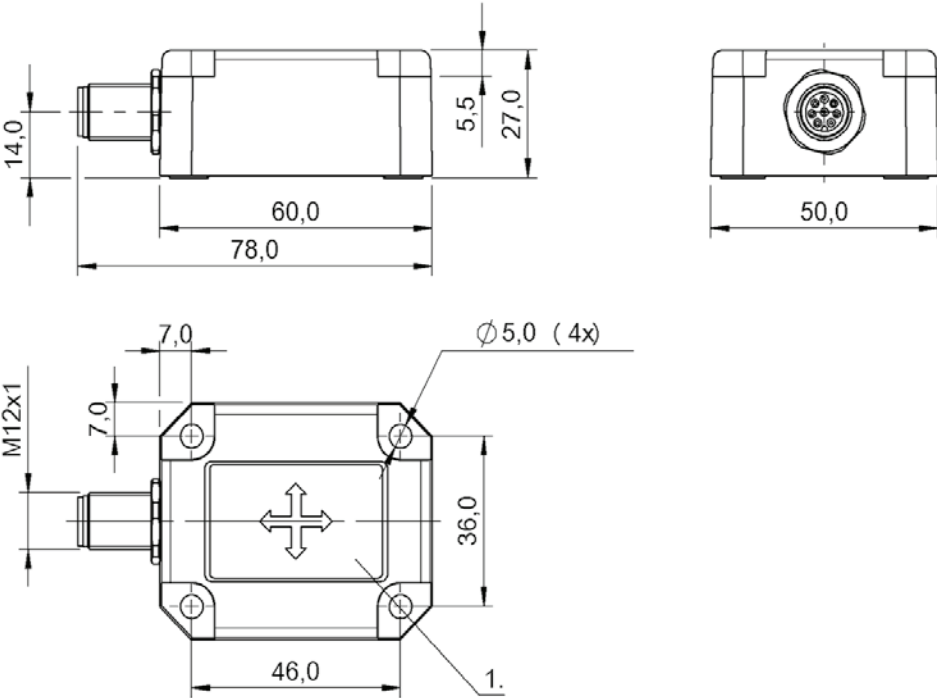
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	MEMS	MEMS	MEMS	MEMS	
	1	1	1	1	
	-30...30°	-45...45°	-90...90°	0...360°	
	10...30 VDC	10...30 VDC	10...30 VDC	10...30 VDC	
	Analog, current 4...20 mA	Analog, current 4...20 mA	Analog, current 4...20 mA	Analog, current 4...20 mA	
	≤ 0.01 °	≤ 0.01 °	≤ 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...80 °C	-40...80 °C	-40...80 °C	-40...80 °C	
	IP67	IP67	IP67	IP67	
	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	
	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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BSI000M, BSI000N, BSI000T, BSI000U, BSI000L, BSI000J, BSI000K, BSI000P, BSI000R, BSI000H



BSI0002, BSI0004, BSI0003



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	0.1°	0.1°	0.1°	
Accuracy	1.0°	1.0°	1.0°	
Connection	Connector, M12x1	Connector, M12x1	Connector, M12x1	
Housing material	Plastic	Plastic	Plastic	
Ambient temperature	-40...80 °C	-40...80 °C	-40...80 °C	
Protection degree	IP67, IP69	IP67, IP69	IP67, IP69	
Approval/Conformity	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	
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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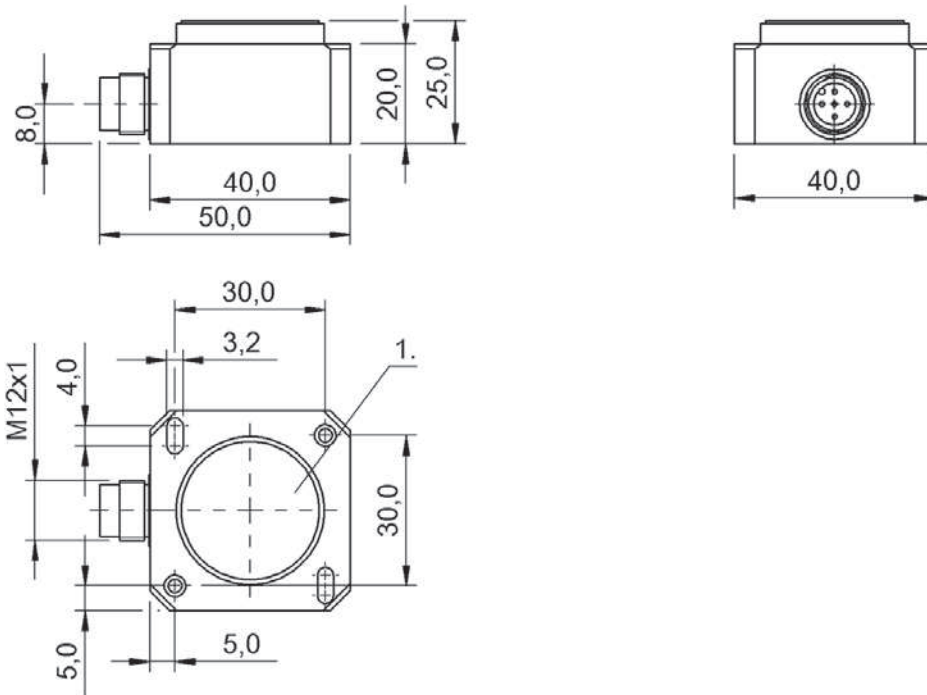
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	MEMS	MEMS	MEMS	MEMS	MEMS
	2	2	2	2	2
	-90...90°	-15...15°	-30...30°	-45...45°	-90...90°
	12...30 VDC	10...30 VDC	10...30 VDC	10...30 VDC	10...30 VDC
	2x Analog, voltage 0...10 V	2x Analog, current 4...20 mA	2x Analog, current 4...20 mA	2x Analog, current 4...20 mA	2x Analog, current 4...20 mA
	0.1°	0.1°	0.1°	0.1°	0.1°
	1.0°	1.0°	1.0°	1.0°	1.0°
	Connector, M12x1	Connector, M12x1	Connector, M12x1	Connector, M12x1	Connector, M12x1
	Plastic	Plastic	Plastic	Plastic	Plastic
	-40...80 °C	-40...80 °C	-40...80 °C	-40...80 °C	-40...80 °C
	IP67, IP69	IP67, IP69	IP67, IP69	IP67, IP69	IP67, IP69
	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE
	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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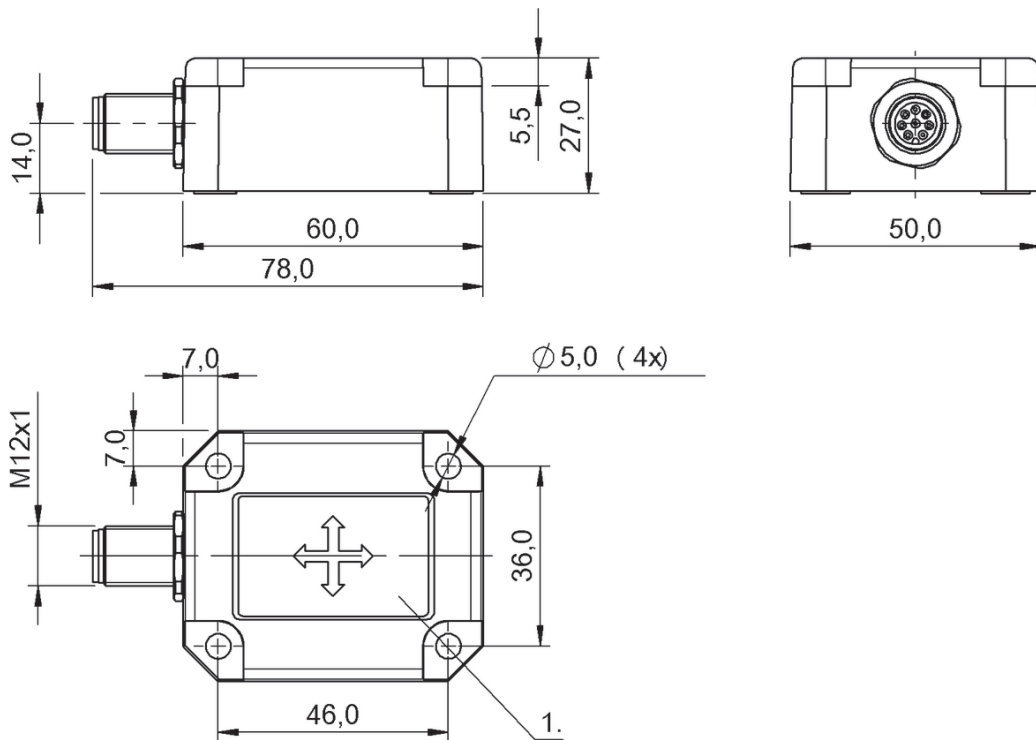
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Measuring principle	MEMS	MEMS	MEMS	
Measuring axes	2	2	2	
Measuring range	-15...15°	-30...30°	-45...45°	
Operating voltage U_b	12...30 VDC	12...30 VDC	12...30 VDC	
Interface	2x Analog, voltage 0...10 V	2x Analog, voltage 0...10 V	2x Analog, voltage 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...80 °C	-40...80 °C	-40...80 °C	
Protection degree	IP67	IP67	IP67	
Approval/Conformity	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	
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...80 °C	-40...80 °C	-40...80 °C	-40...80 °C	-40...80 °C
	IP67	IP67	IP67	IP67	IP67
	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE	CE, cULus, EAC, WEEE
	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