

BODAS Inclination Sensor INC

RE 95166/05.09 1/4

Data Sheet

Series 20
Inclination sensor with MEMS technology



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Features

- 2 axes inclination sensor
- High resolution and accuracy
- Current interface
- Type of protection IP67

Ordering code

INC	2	10	CT	/	2	0
01	02	03	04		05	06

Type

01	Inclination sensor	INC
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Number of axes

02	2 axes	2
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Angle range

03	$\pm 10^\circ$, each axis	10
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Output signal

04	Current, 4 to 20 mA each axis	CT
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Series

05		2
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06		0
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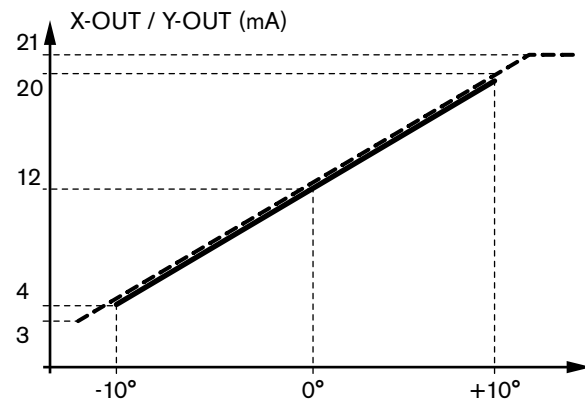
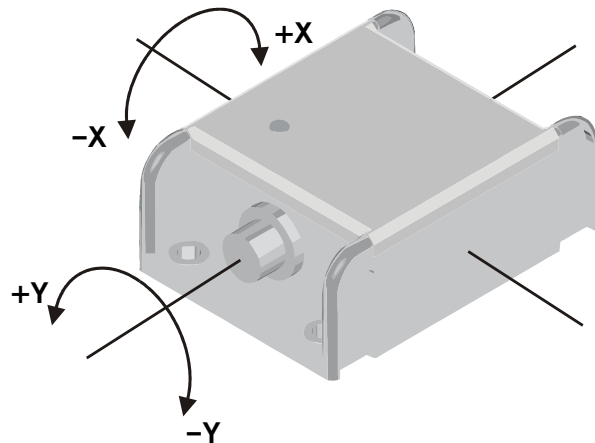
Material number

BODAS INC-2-10CT/20 _____ R913004721

Description

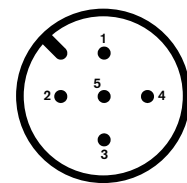
This sensor based upon micro-mechanical MEMS technology is an inclination measuring device for applications in mobile machines. Its function is the monitoring of inclination of 2 axes. The measured range is $\pm 10^\circ$ for each axis.

Axis definition and output signal



Pin assignment

Pin	Function
1	Supply (V+)
2	Sensor output Y (Y-OUT)
3	GND Supply (V-/GND)
4	Sensor output X (X-OUT)
5	GND Sensor outputs



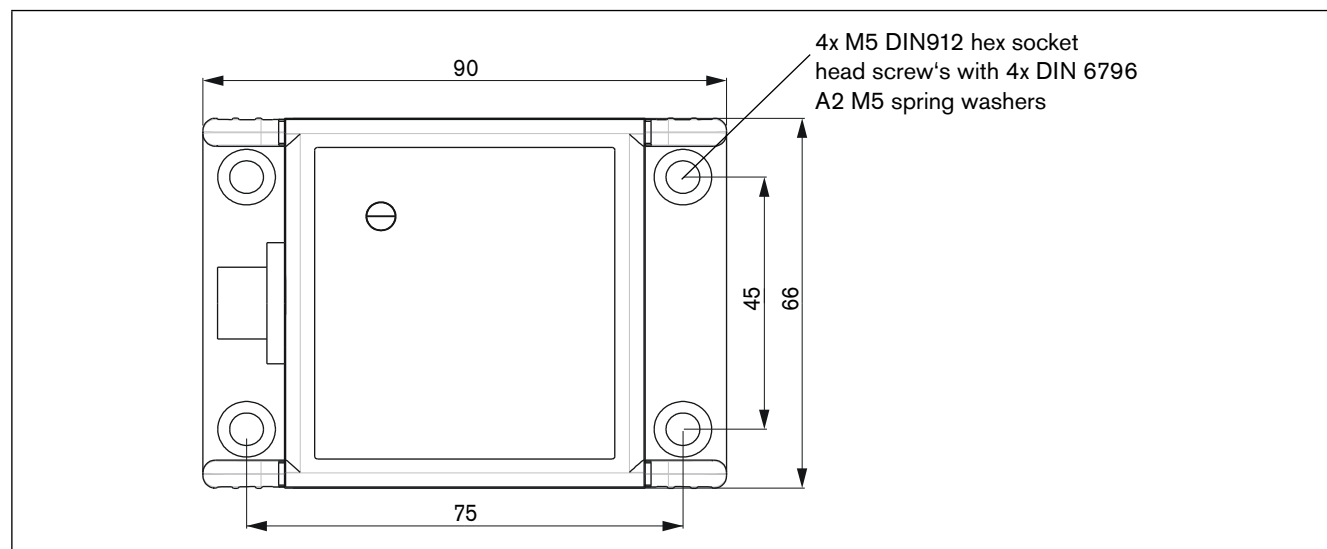
Matching connector:

Phoenix Contact Ref# 1681486 (unshielded) or Ref# 1694318 (shielded). To be ordered directly at the connector manufacturer's.

Technical data

Type	INC2
Number of axes	2
Measuring range per axis	+/- 10°
Resolution at zero point	0.01°
Calibration accuracy at 25 °C	+/- 0.1° in +/-3° window, +/- 0.3° outside
Linearity Sinus	Maximum +/- 0.2°
Temperature Drift at zero point	Maximum +/- 0.01°/K
Cross-Sensitivity	Maximum 1.5 %
Supply	11 VDC to 30 VDC
Current Consumption	Maximum 60 mA
Output signals per axis	Current interface 4..20 mA. Maximum Load at U = 11 V: 250 Ohm at U = 9 V, I _{out} maximum = 18 mA
Storage temperature	-40 °C ... +85 °C
Operating Temperature	-40 °C ... +80 °C
Case	Shock resistant plastic material
Type of protection (DIN 40 050-9)	IP65 + IP67
Dimensions	66 mm x 90 mm x 36 mm
Mass	Ca. 200 g
Assembly	4x M5 DIN912 hex socket head screw's with 4x DIN 6796 A2 M5 spring washers
Connector	Sensor-Actuator 5-pin Connector (M12), IEC 61706-2-101, IEC 60947-2
Electromagnetic compatibility EMC / Environmental Data	
EMC Stripline (ISO 11452-5:2005)	100 V/m, 0.1 MHz .. 1000 MHz
Road Vehicle Electrical Disturbances (ISO 7637-2)	Pulses 1-4: level 3 Pulse 5: level 1 (tested for 24 V power supply system) If higher disturbances are expected from battery supply, supply the sensor through a Rexroth BODAS RC controller output.
Electrostatic discharge ESD (ISO 10605:2001)	8 kV Direct Discharge 15 kV Air Discharge
Shock resistance	IEC 60068-2-27 50 g, 11 ms, 3 per axis , 6 axes IEC 60068-2-29 25 g, 6 ms, 1000 (500 pos., 500 neg.), shocks in 6 directions
Vibration resistance	IEC 60068-2-6 5 to 57 Hz: +/- 1.5 mm p-p and 57..2000Hz: 3g; 1 Oct/min, 2 hours per direction

Dimensions



Safety instructions

• General instructions

- The suggested circuits do not imply any technical liability for the system on the part of Rexroth.
- System developments, installations and commissioning of electronic systems for controlling hydraulic drives must only be carried out by trained and experienced specialists who are sufficiently familiar with the components used and with the complete system.
- No components that are defective or not working properly should be used. If components fail and/or exhibit malfunction, repair must be carried out immediately.
- Before commissioning the system, you must ensure that the vehicle and the hydraulic system are in a safe condition. Make certain that no persons are present in the danger zone of the machine.
- A sufficiently large distance to radio systems must be maintained.
- All connectors must be unplugged from the electronics during electrical welding operations.
- Cables to the electronics must not be routed close to other power-conducting lines in the machine or vehicle.

• Intended use

- The sensor is designed for use in mobile working machines provided no limitations / restrictions are made to certain application areas in this data sheet.
- Operation of the sensor must generally occur within the operating ranges specified and released in this data sheet, particularly with regard to voltage, temperature, vibration, shock and other described environmental influences. Use outside of the specified and released boundary conditions may result in danger to life and/or cause damage to components which could result in consequential damage to the complete system.
- Any use of the sensor other than described in chapter „Intended use“ is considered to be improper.
- Damages which result from improper use and/or from unauthorized, unintended interventions in the device not described in this data sheet render all warranty and liability claims with respect to the manufacturer void.

• Use in safety-related functions

- It is the customer's responsibility to perform a risk analysis of the system and de-terminer the possible safety-related functions. It is the customer's responsibility to take appropriate measures in safety-related applications (sensor redundancy, plausibility check, emergency switch,...).