

Angle Sensor HAT 1000 Singleturn Absolute Value

Functional Safety
PL d
SIL 2

Description:


HAT 1000 is an absolute measuring singleturn angle sensor. Thanks to its contactless magnetic measuring method and its robust design, HAT 1000 is ideally suited for rotational angle measurement in mobile machines.

Due to its two-chamber design, the electronic unit is completely encapsulated which means it meets IP 6K9K if the electrical connection is carried out accordingly.

The sensors meet the safety requirements according to SIL2 (IEC 61508) or PL d (ISO 13849).

The sensor is therefore suitable for a large variety of applications, i.e. in automobile industry and in mobile work machines, especially for applications with increased safety requirements.

Special features:

- Measuring range from 0° to 360°, continuous rotation
- Robust stainless steel housing
- Fully encapsulated electronics unit, IP 6K9K
- Option: External magnetic actuator
- ECE type approval  (approved for road vehicles) ³⁾
- SIL2, PLd, Kat 2 Certification ³⁾

Technical Data:

Input data		
Type ¹⁾	Solid shaft	
Type	Absolute singleturn	
Mechanical adjusting angle	360° continuous rotation	
Measuring range ²⁾	0 .. 360°	
Direction of rotation	No orientation restrictions	
Max. speed	17.000 1/min	
Starting torque	< 1 Ncm	
Max. axial load	60 N	
Max. radial load	100 N	
Shaft material	Stainless steel	
Housing material	Stainless steel	
Output data		
Output signal ¹⁾	Analog: 4 .. 20 mA load ≤ 500 Ω	Digital: CANopen-Safety
Resolution	12 Bit	14 Bit
Accuracy	≤ ± 0.5° span over the entire measuring and temperature range	
Repeatability	≤ ± 0.2°	
Characteristic curve	linear, direction available factory-set (cw / ccw)	
Ambient conditions		
Operating temperature range	-40 .. +185°F	
Storage temperature range	-40 .. +185°F	
Protection class to IEC 60529	IP 67, IP 6K9K (electronics)	
CE mark	EN 61000-6-1 / 2 / 3 / 4	
Vibration resistance to DIN EN 60068-2-6: 2010	7.5 mm (5 Hz ≤ f < 8.2 Hz) 2 g (8.2 Hz ≤ f < 2000 Hz)	
Shock resistance to DIN EN 60068-2-27: 2011	20 g (11ms in 3 axes)	
Other data		
Supply voltage	9 .. 36 VDC	
Residual ripple of supply voltage	≤ 5%	
Power consumption	< 1.4 W	
Electrical connection ¹⁾	Male M12x1, 5 pole	
Life time	1.5 * 10 ⁹ rotations at 3000 min ⁻¹	
Weight	approx. 120 g	
Safety-related data		
Performance Level ³⁾		
Based on	DIN EN ISO 13849-1:2008	
PL	d	
Architecture	Category 2	
Safety Integrity Level ³⁾		
Based on	DIN EN 61508:2010	
SIL	2	

Note: Reverse polarity protection of the supply voltage, excess voltage and short circuit protection are provided.

¹⁾ Other models on request

²⁾ Further measuring ranges in intervals of 15°C within a range of 0..360° on request

³⁾ The ECE approval as well as the SIL2, PLd approval are pending

Model Code:

HAT 1X 36 - XXX - XXXX - P01 - XXXX - XXX - S2PD- 000

Resolution¹⁾

2 = 12 Bit
4 = 14 Bit

Flange diameter

36 = 36 mm

Signal output

C01 = Analog 4 .. 20 mA, 3 conductor
F13 = CANopen Safety

Measuring range in ° and rotational direction

360R = 360°, clockwise rotation
360L = 360°, anti-clockwise

Electrical connection²⁾

P01 = Installation plug M12x1; 5 pole, axial

Mechanical connection³⁾

V106 = Solid shaft, length 10 mm, diameter 6 mm

Fixing type

M21 = Clamping flange with 4 threaded bores

Functional safety

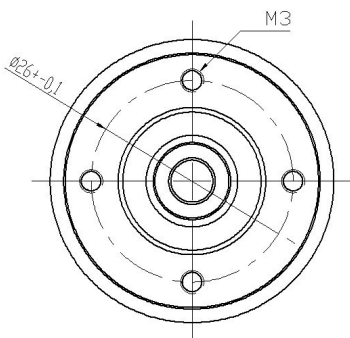
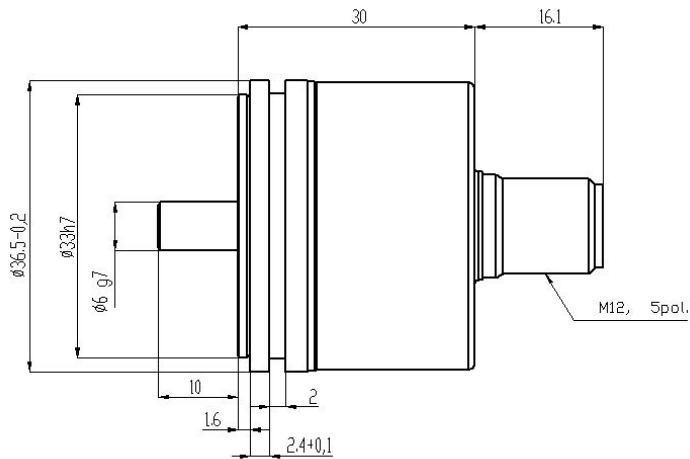
S2PD = SIL 2 acc. to IEC 61508 and PLd – Cat 2 acc. to DIN EN 13849-1

Modification

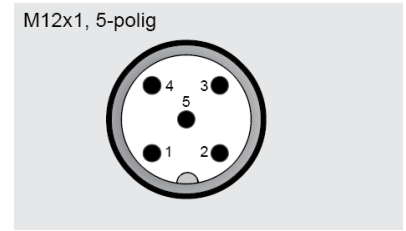
000 = Standard

- Note:
- ¹⁾ Resolution 2 (12Bit) only in conjunction with signal output C01
Resolution 4 (14Bit) only in conjunction with signal output F13
 - ²⁾ Other models on request
 - ³⁾ Other models, i.e. with external magnet, on request

Dimensions:



Pin Connections:



Analogue

PIN	Assignment
1	+U _b
2	n.c.
3	0 V
4	Signal
5	n.c.

CANopen Safety

PIN	Assignment	Description
1	n.c.	
2	+U _b	Supply+
3	-U _b	Supply-
4	CAN_H	Bus line dominant high
5	CAN_L	Bus line dominant low

Note:

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described please contact the relevant technical department. Subject to technical modifications.

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