



Angle Sensor

HAT 3800

CANopen Safety

Enhanced functional safety

Magnetic

Absolute

Singleturn, 18 bit



Functional Safety
PL d
SIL 2

Features

- High-resolution data recording
- Contactless magnetic measurement method
- Robust design
- Functional safety acc. to EN 61508 SIL 2
ISO 13849 PL d

Description

HAT 3800 is a high-resolution absolute measuring Singleturn angle sensor.

The sensors meet the safety requirements according to SIL 2 (EN 61508) and PL d (ISO 13849).

The measured value is digitized and made available to the CAN field bus system via the CANopen protocol. The instrument parameters can be viewed and configured by the user via the CANopen object directory using standard CAN software.

Application fields

Thanks to its non-contact magnetic measuring method and its robust design, HAT 3800 is ideally suited for rotational angle measurement in mobile machines as well as in stationary applications.

The sensor is therefore ideally suited for mobile machines and industrial applications, especially in applications with increased safety requirements and wherever high-resolution measured value recording is required.

Especially for the use in public traffic vehicles, HAT 3800 is approved for road vehicles according ECE type approval via the E13 approval.

Technical Data

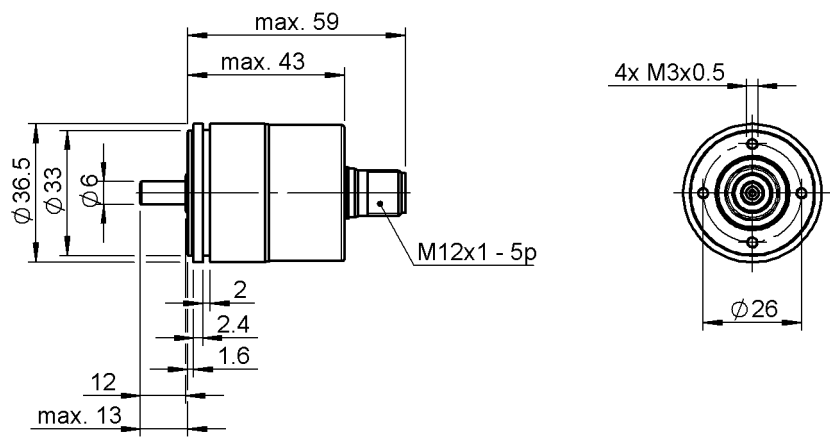
Input data		
Measurement range		0 .. 360 °
Direction of rotation		No orientation restrictions
Max. axial load		60 N
Max. radial load		100 N
Material, housing		Stainless steel
Material, shaft		Stainless steel
Output data		
Output signal		CANopen Safety
Resolution		18 bit
Accuracy (at room temperature)		± 0.1° typ. ± 0.2° max.
Accuracy (over the temperature range)		± 0.05 ° / 10 K typ. ± 0.1° / 10 K max.
Repeatability		≤ ± 0.05 °
Angle increase		cw / ccw (factory-set)
Environmental conditions		
Operating temperature range		-40 .. +85 °C
Storage temperature range		-40 .. +85 °C
CE mark		EN 61000-6-1 / -2 / -3 / -4
E ¹³ mark		E13*10R00*10R05*14137*00
Vibration resistance acc. to DIN EN 60068-2-6: 2008		7.5 mm (5 Hz ≤ f < 8.2 Hz) 2 g (8.2 Hz ≤ f < 2000 Hz)
Shock resistance acc. to DIN EN 60068-2-27: 2010		20 g (11 ms in 3 axes)
Protection type to DIN EN 60529 ¹⁾		IP 67
Protocol data for CANopen Safety		
Communication profile		CiA DS 301 V4.2.0 / DS 304 V1.0.1
NMT-Services		CiA DSP 302 V4.1
Layer setting services and protocol		CiA DSP 305 V2.2
Encoder Device Profile		CiA DS 406 V3.2
Baud rates		10 kbit/s to 1 Mbit/s according to DS305 V2.2
Transmission services		
- SRDO / PDO		Measured value as 32 bit
- Transfer		synchronous, asynchronous, cyclical
Node ID/ Baud rate		Adjustable via LSS
Safety-related data		
Performance Level	Based on PL	DIN EN ISO 13849-1:2008
	PL	d
	Architecture	Category 2
Safety Integrity Level	Based on SIL	DIN EN 61508:2010
	SIL	2
	Architecture	1oo1 / 1oo2
Other data		
Supply voltage		9 .. 36 V DC
Residual ripple of supply voltage		≤ 5 %
Power consumption		< 1.4 W
Weight		~ 180 g

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

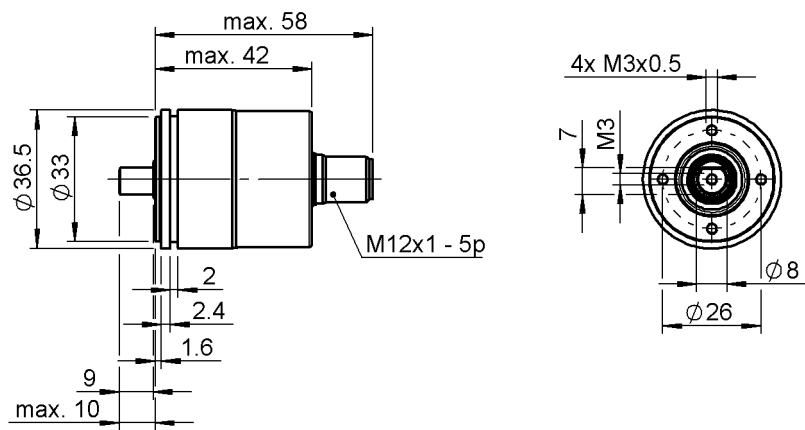
¹⁾ With mating connector of corresponding protection type fitted

Dimensions

Mechanical connection: solid shaft



Mechanical connection: D-shape:



Pin connections

M12x1, 5 pole	Pin	Output signal: F1X	
		Signal	Description
	1	CAN_SHLD	Shield/housing
	2	CAN_V+	External supply +
	3	CAN_GND	Ground / 0 V / V -
	4	CAN_H	Bus line dominant high
	5	CAN_L	Bus line dominant low

Model code

HAT 3 8 36 - F13 - XXXX - P01 - XXXX - M01 - S2PD - 000

Resolution

8 = 18 Bit

Housing diameter

36 = 36 mm

Output signal

F13 = CANopen Safety

Measuring range in ° and rotational direction ¹⁾

360R = 360°, clockwise rotation

360L = 360°, anti-clockwise

Electrical connection

P01 = Installation plug M12x1; 5 pole, axial

Mechanical connection

V126 = Solid shaft, length 12 mm, diameter 6 mm

D098 = D-shape, length 9 mm, diameter 8 mm

Fixing type

M01 = Synchro flange with 4 threaded bores

Functional Safety

S2PD = SIL2 to IEC 61508 and PLd to DIN EN 13849-1

Modification number

000 = Standard

Accessories:

Appropriate accessories, such as mating connectors, can be found in the Accessories brochure.

Note:

Special models on request

¹⁾ Viewed from the side of the shaft

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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