BOURNS®
Automotive Division

Non-contact multiturn angle sensor P 8539

1. Introduction

The device is based on three magnetoresistive (AMR) sensor chips elements; each of them converts an angle position of a permanent magnet into two analog sinusoidal signals. An efficient software algorithm is used to calculate the absolute angle position of a drive shaft with high accuracy and resolution.

2. Specifications

2.1. Angular position

- Range – 720 ° to 720 °
- Resolution 0.05 °
- Absolute Linearity ± 0.5 °

2.2. Angular speed

- Range – 2000 to 2000 °/s
- Resolution 0.1 °/s

2.3. Data and control interface

- CAN 2.0B (see CAN protocol)
- Baud rate 500 kbit/s
- Data rate 1.0 ms

2.4. Adjusting a zero position **via CAN bus**

2.5. Calibration control **via CAN bus**

2.6. „On board" software update **via CAN bus**

2.7. Automatic self-test **(see CAN protocol)**

2.8. Power Supply Voltage **+ 5V ± 0,3 V**

2.9. Supply current **50 mA**

2.10. Ambient temperature **– 40°C to +125 °C**

3. Electrical Interface

Table 1 Supply and data link

Signal	Colour
+ 5 VDC	brown
GND	green
CAN high	white
CAN low	yellow
shield	

4. CAN protocol

4.1. CAN protocol

Table 2 CAN protocol

CAN-ID Kind of message	Byte	Bits	Signal destination	Unit	Measure range	Measure range (digit)	Offset	Resolution (unit/digit)	Comments
0 x 30 transmit	0 – 1 (0 – LB 1 – HB)	00 – 15	Absolute angle position	Degree	– 720 ... + 720	18368 ... 47168	32768	0,05	Fault/not trimmed/ default: 0 x FFFF
	2 – 3 (2 – LB 3 – HB)	16 – 31	Angle speed	Degree/s	– 2000 ... + 2000	12768 ... 52768	32768	0,1	Fault/not trimmed/ default: 0 x FFFF
	4	32 – 33	International status: 00 = Trimmed and OK 01 = Not trimmed 10 = Fault 11 = Fault und not trimmed		0 ... 3	0 ... 3	0	1	
	4	34 – 35	Free		0	0			Default: 00
	4	36 – 39	Message counter		0 ... 15	0 ... 15		1	Should be incremented by each message
	5	40 – 47	Check sum		0 ... 256	0 ... 256		1	Check sum: Byte0 XOR Byte1 XOR Byte4
0 x F2 receive	0	0 – 7	Sensor control: M = set up a zero position						Zero position code: 0 x 8000

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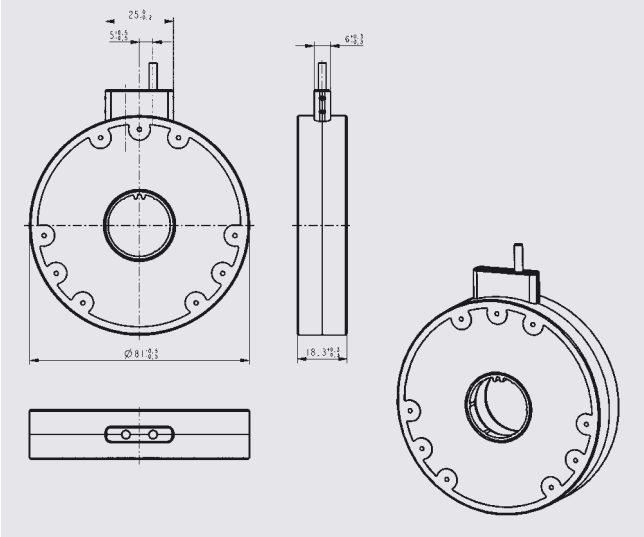
4.2. Fail-silent function

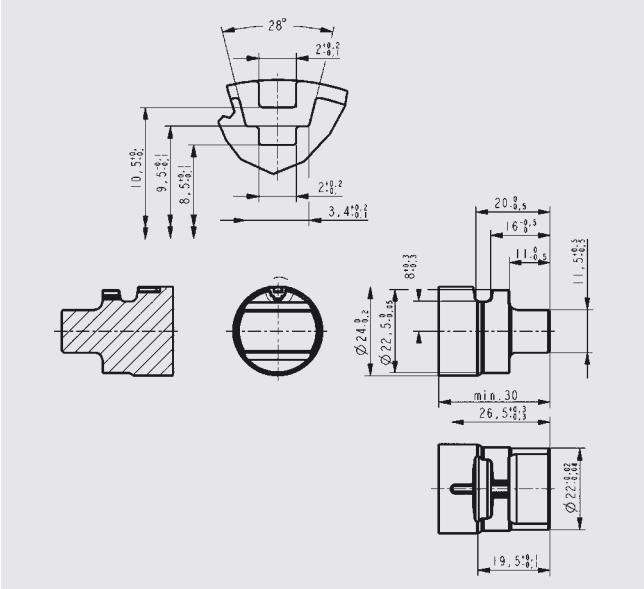
The self-test of the multiturn angle sensor covers two functions, i.e. a basic sensor element signal monitoring and a redundancy concept. The device checks the output signals of the AMR elements and calculates the absolute position output by means of two different, independent angle sensor modules. In case of a significant discrepancy, the sensor output is set to a failure status (error flag).

5. Design and mechanical interface

5.1. Outline Dimensions



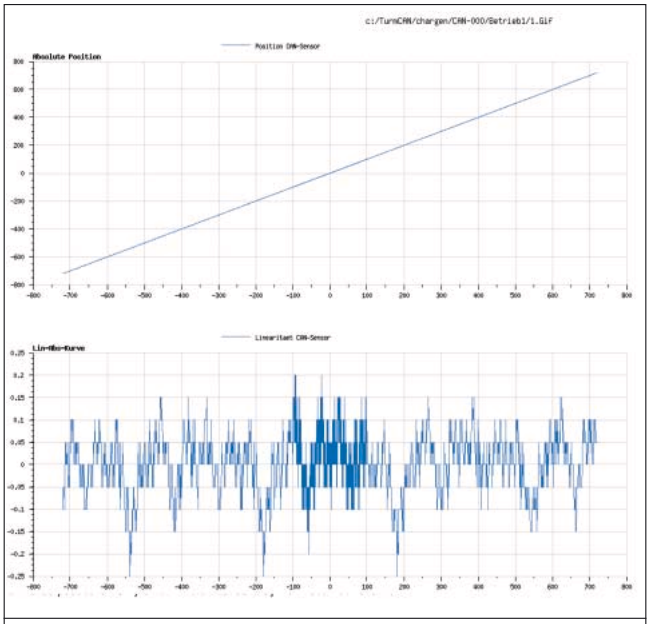
5.2. Drive shaft interface



5.3. Marking

Customer specific labeling can be defined.

6. Typical test results @ R. T.



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