

Contact Differential Angle Sensor R 02500



1. Introduction

The sensor is designed to track the differential displacement of two rotors. In this arrangement, the torque shaft moves approximately $\pm 8^\circ$ relative to the steering shaft. Movement of the torque shaft indicates that the driver of the vehicle is experiencing resistive torque when turning the steering wheel. The sensor consists of 2 potentiometric sensors arranged as a complementary pair. The pair of outputs (POSN1 and POSN2) track the movement of the torque shaft relative to the steering shaft - an indication of steering torque. The 2 sensors are packaged in a single housing containing two independent rotors.

2. Technical Data

2.1. General Data

- Total Mechanical travel $- 810^\circ$ to $+ 810^\circ$
- Mechanical travel $- 11.4^\circ$ to $+ 11.4^\circ$
- Electrical travel $- 8^\circ$ to $+ 8^\circ$
- Total resistance 575 Ohms $\pm 25\%$
- Absolute Linearity see Figure 3 and 4
- Hysteresis $\leq 0.5\% V_{cc}$

2.2. Signal

- Analog 10% V_{cc} to 90% V_{cc}
- Redundant/opposite slopes see Figure 1 and 2

2.3. Durability

- Spin cycles $1 \times 10^6 (\pm 360^\circ)$
- Short strokes $50 \times 10^6 (\pm 2^\circ)$
- Noise $\leq 4 \text{ k}\Omega / t \geq 2 \text{ ms}$

2.4. Adjusting a zero position

- mechanical position fixed by laser weld

2.5. Power Supply Voltage

$+ 4.75 \dots 5.25 \text{ Vdc}$

2.6. Power input protection

16 Vdc

2.7. Ambient temperature

$- 40^\circ\text{C}$ to $+ 85^\circ\text{C}$

2.8. Type of protection

- Sensor housing IP 42
- Cable and grommet IP 67

3. Electrical Connection

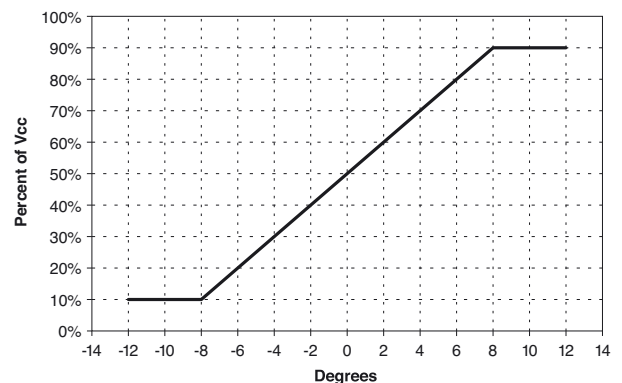
The device can be interfaced to an external circuit via a wiring harness with connector. Description of the signals and colour encoding harness are shown in Table 1.

Table 1 Colour encoding of harness

Signal	Colour
GND	black
Power Supply	red
POSN 1	blue
POSN 2	white

4. Analog Signals

Figure 1 Analog Position Signal POSN 1



Contact Differential Angle Sensor R 02500

Figure 2 Analog Position Signal POSN 2

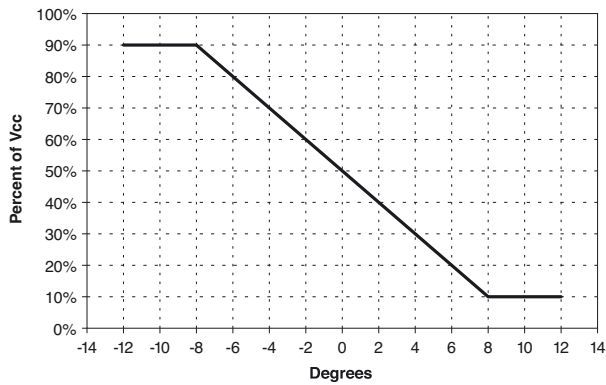


Figure 3 Absolute Linearity POSN 1

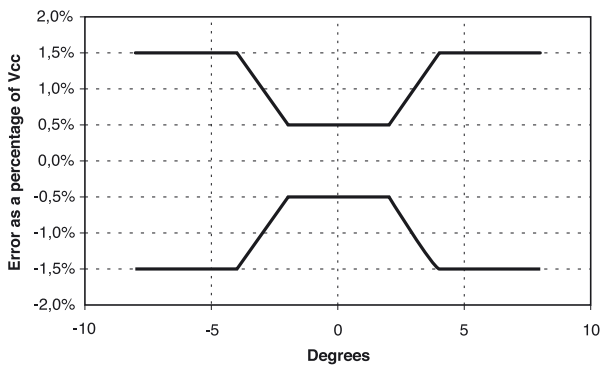
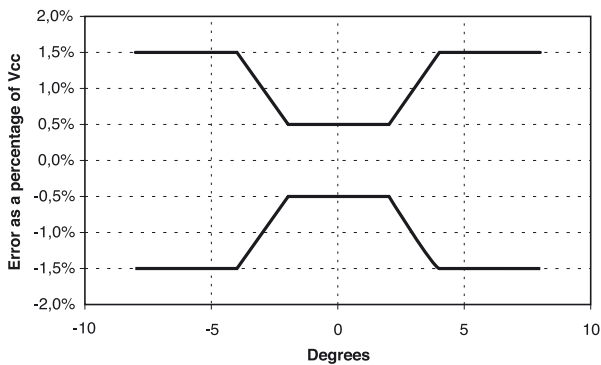


Figure 4 Absolute Linearity POSN 2



Bourns Sensors GmbH
 Robert-Bosch-Str. 14
 D-82054 Sauerlach
 Phone: +49 (0) 8104 646-0
 Fax: +49 (0) 8104 646-803
 http: www.bourns.com
 e-mail: automotive@bourns.com