Gear Tooth Speed Sensor

Sensors

Two-channel gear tooth speed sensor with mounting flange

Description

The gear tooth speed sensors of the SD74-3501, SD74-3502 and SD74-4501 series are Hall Effect products which have been created for sensing ferromagnetic structures and measuring very slow movements. They operate with an open drain output.

Features

- Sensing capability from almost zero up to 20 kHz.
- Plastic flange-mount housing
- Compatible with unregulated power supply
- RoHS compliant
- IP67
- Typical air gap of 0.3 – 2.2 mm depending on the sensing wheel

Typical applications

- Electric drives (stationary and mobile)
- Automation systems
- Conveyors
- Wind turbines

Environmental Specifications

Vibration	Broadband noise 10 Hz 10m²/s³, 50 Hz 10m²/s³, 1000 Hz 0.1m²/s³, 8h per axis, three axes
Mechanical Shock Resistance	40 g
Maximum Speed Detection	+/- 20 kHz
Operating Temperature	-40°C to +140°C
Storage Temperature	-20°C to +50°C
Ingress protection	IP67

Electrical Specifications

Operating Supply Voltage	4.5 V – 24 V
Maximum Input Voltage	max. 28 V
Maximum Reverse Voltage	-18 V (supply line); -0.5 V (output signals)
Supply Current	max. 13 mA
Sink Current	max. 25mA
Recommended Pull-up Resistor	See Table
Phase Shift, see graphic Channel B before channel A	90° +/- 45° clockwise 270° +/- 45° anticlockwise
Pulse Duty Factor	50% +/-10%

Mechanical Specifications

Housing Material	Glass-fibre reinforced thermoplastic
Maximum Installation Torque	10 Nm (bolt ISO 4762-M6-8.8, washer ISO 7092-6-200HV)
Operating Air Gap / Sensing Distance* * With recommended target type, see graphic	2.2 mm
Sensor Orientation Angle (see graphic)	33° (SD74-3501, SD74-3502), 21° (SD74-4501)
O-ring	11.8x1.8 FKM -80

Products

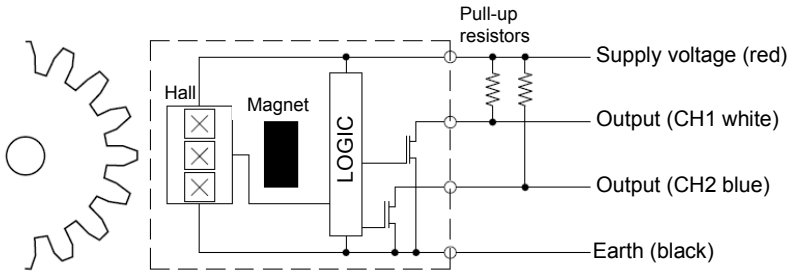
Article number	Wire
SD74-3501	Light plastic-sheathed wire, 4-conductors, 0.34 mm²
SD74-3502	Light plastic-sheathed wire, 4- conductors , 0.34 mm²
SD74-4501	Light plastic-sheathed wire, 4- conductors , 0.34 mm²

Please note: An external pull-up resistor whose value depends on the supply voltage is required. The resistor should be connected between the output and Vcc. Refer to the circuit diagram for the color coding of the cables and the pin numbering.

Recommended External Pull-up Resistor

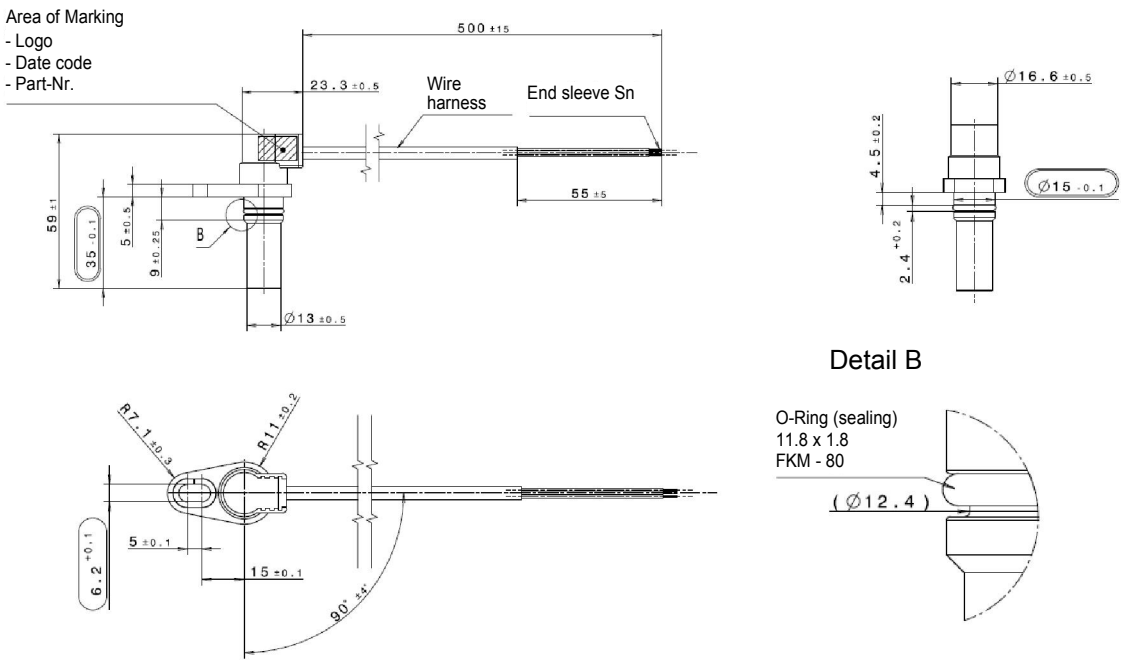
Volt DC	5	9	12	15	24
Ohms	470	820	1 k	1.2 k	2.2 k

Open Collector Sinking Block Diagram



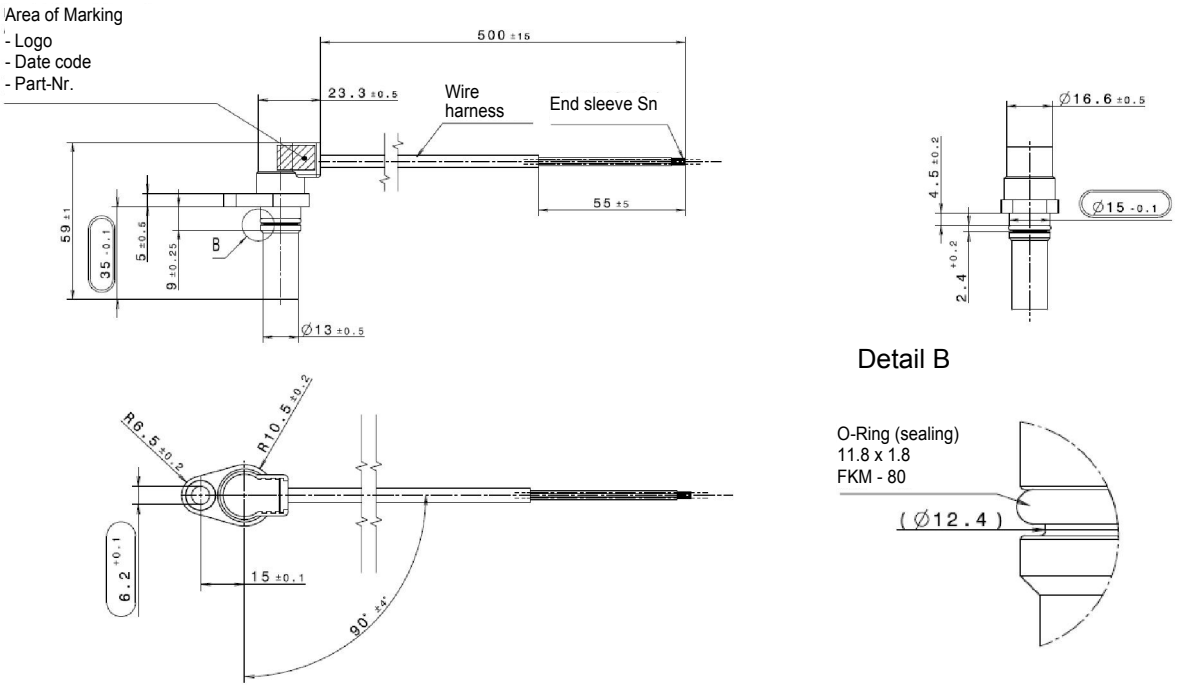
Dimensions in mm

SD74-3501



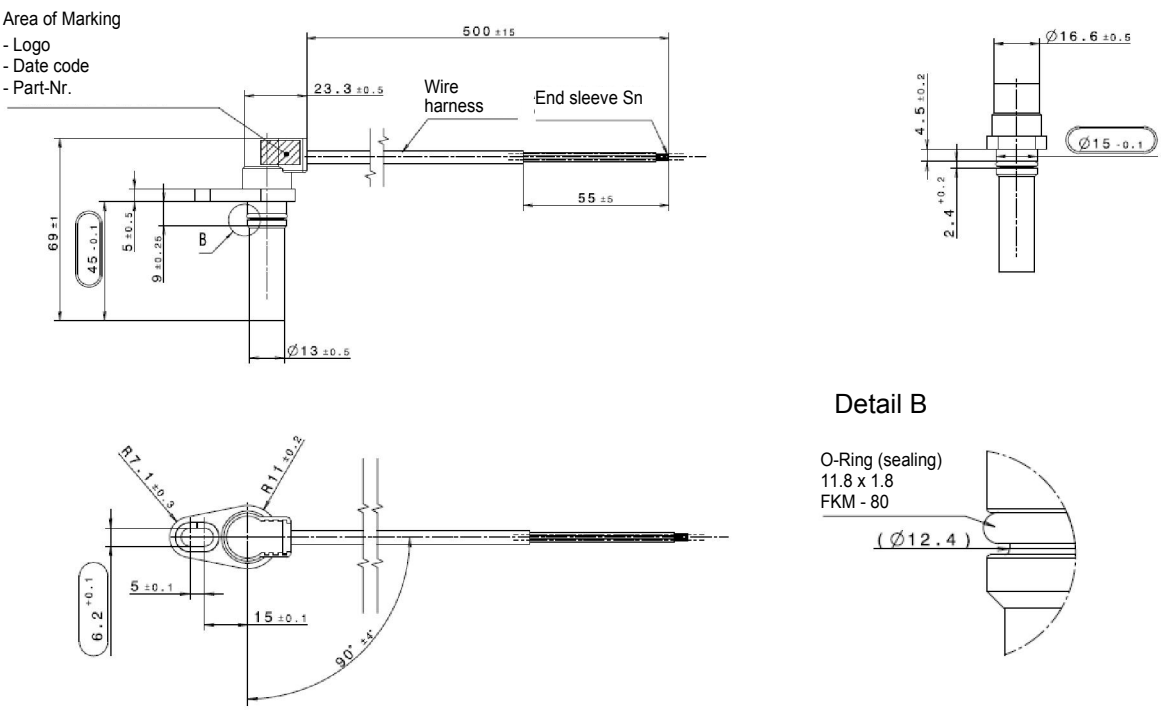
Dimensions in mm

SD74-3502

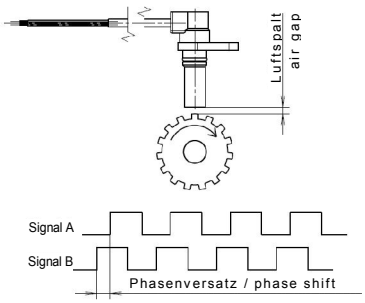


Dimensions in mm

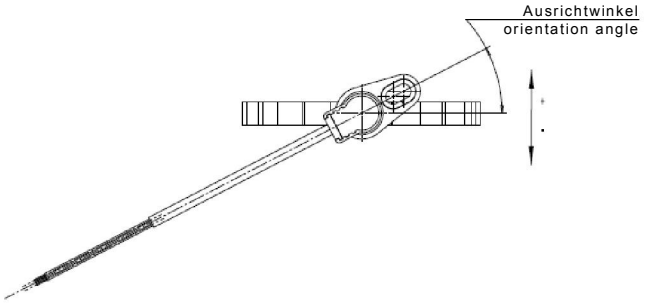
SD74-4501



Operating air gap/phase shift

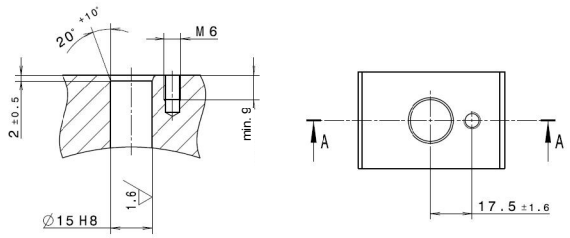


Sensor orientation

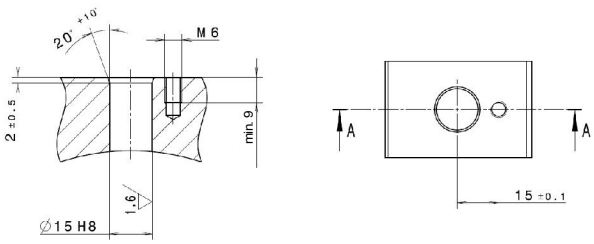


Mounting interface

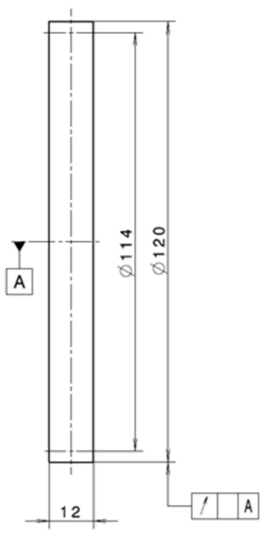
SD74-3501/SD74-4501

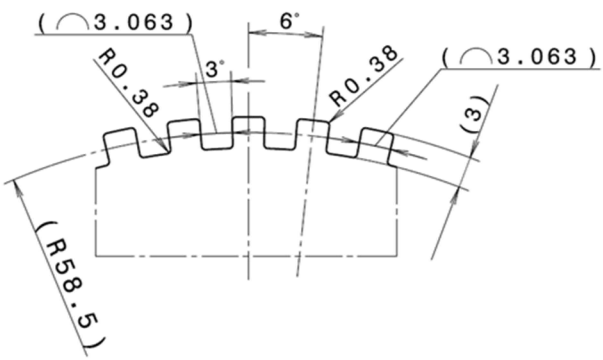


SD74-3502



Sensing wheel





The material of the sensing wheels must be soft magnetic and therefore magnetically conductive. St37 has been tested so far. Different materials and geometries must be checked before use.