

Gear Tooth Speed and Direction Sensor



Sensors

Two-channel hall effect sensor with mounting flange

Description

The SD74, SD84 and SDB4 sensor series are Hall Effect products for measuring very slow movements of ferromagnetic targets. They work with an Open Collector output. Immersion depths from 20 mm to 60 mm available.

Features

- From near zero speed up to 20 kHz sensing capability
- Can be used with unregulated power supply
- RoHS compliant
- IP67 & IP69 (excluding wire/connector)
- Typical air gap range of 0.3 – 2.2 mm (0.01" to 0.09")*

Typical applications

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

Environmental Specifications

Vibration	Broadband noise 10 Hz 10m ² /s ³ , 50 Hz 10m ² /s ³ , 1000 Hz 0.1m ² /s ³ , 8h per axis, three axes
Shock	40 g
Maximum Speed Detection	+/- 20 kHz
Operating Temperature	-40°C to +140°C
Storage Temperature	-20°C to +50°C
Ingress protection	IP67 & IP69 (excluding wire/connector)

Electrical Specifications

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
Output 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*	0.3 mm - 2.2 mm
* With recommended sensing wheel, see graphic	
O-ring	11.8x1.8 FKM -80

Products

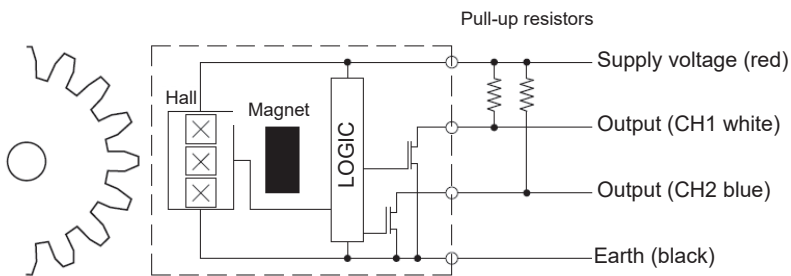
Part number	Cable	Connector	Special features
SD74-3501	Light plastic-sheath, 4-core, 0.34 mm ²		
SD74-3502	Light plastic-sheath, 4-core, 0.34 mm ²		
SD74-4502	Light plastic-sheath, 4-core, 0.34 mm ²		
SD74-2001	Light plastic-sheath, 4-core, 0.34 mm ²		
SD74-6001	Light plastic-sheath, 4-core, 0.34 mm ²		
SD84-3505	Light plastic-sheath, 4-core, 0.34 mm ²	AMP Superseal	
SD84-4501	Light plastic-sheath, 4-core, 0.34 mm ²	AMP Superseal	Rubber boot
SDB4-4501	Light plastic-sheath, 4-core, 0.34 mm ²	AMP Superseal	Straight cable outlet

Note: An external pull-up resistor is required, the value of which is dependent on the supply voltage. The resistor should be connected between the output and Vcc. Refer to the circuit diagram for lead colors or pin numbering as applicable.

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

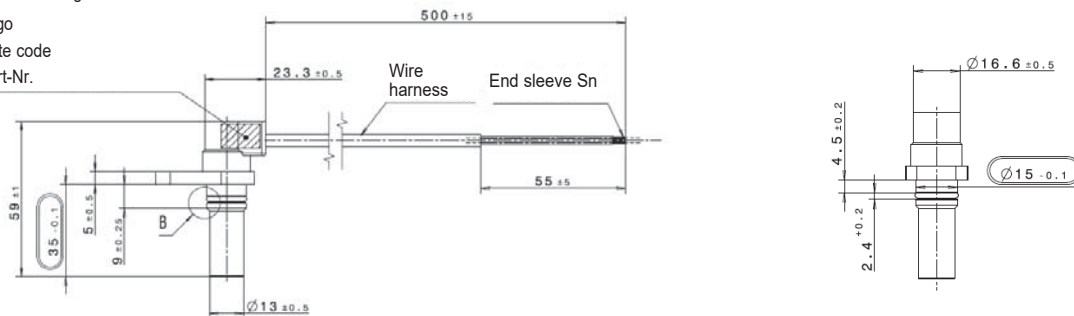


Dimensions in mm

SD74-3501

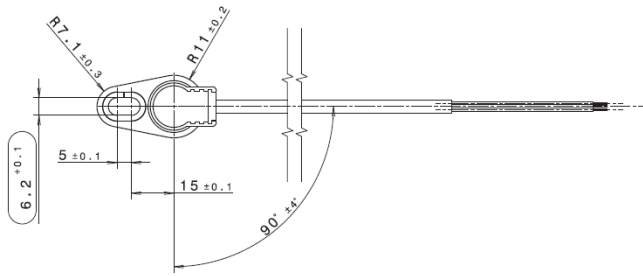
Area of Marking

- Logo
- Date code
- Part-Nr.

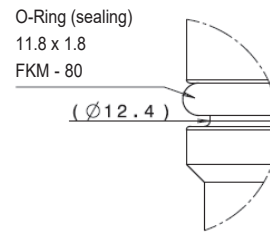


switches-sensors.zf.com





Detail B

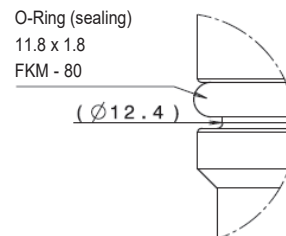
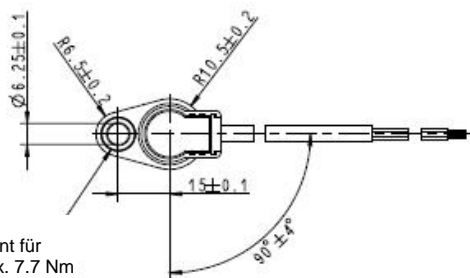
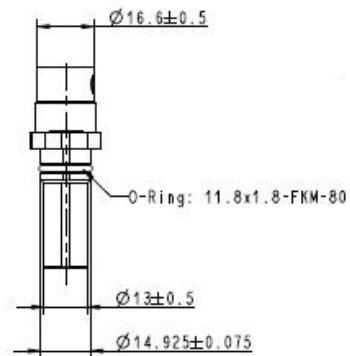
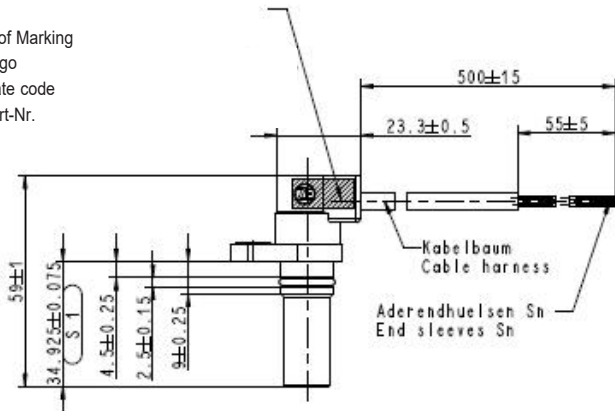


Dimensions in mm

SD74-3502

Area of Marking

- Logo
- Date code
- Part-Nr.



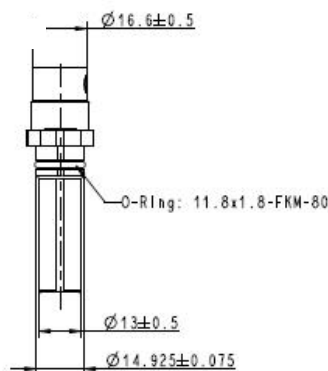
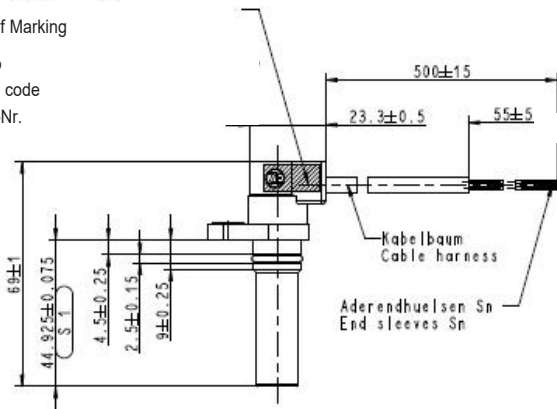
CuZn-Buchse:
Anzugsdrehmoment für
Schraube M6: max. 7.7 Nm
Brass bush:
Bushing M6: max. 7.7Nm

Dimensions in mm

SD74-4502

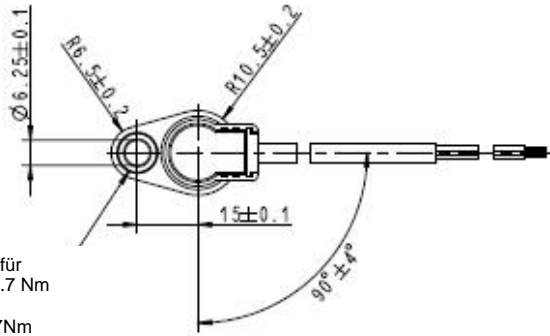
Area of Marking

- Logo
- Date code
- Part-Nr.



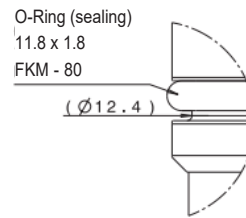
switches-sensors.zf.cpm





CuZn-Buchse:
Anzugsdrehmoment für
Schraube M6: max 7.7 Nm
Brass bush:
Bushing M6: max. 7.7Nm

Detail B

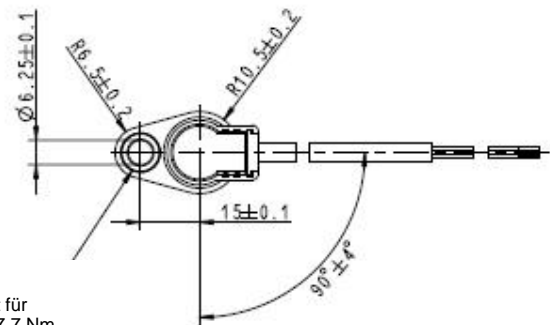
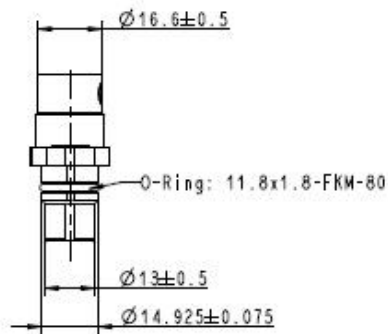
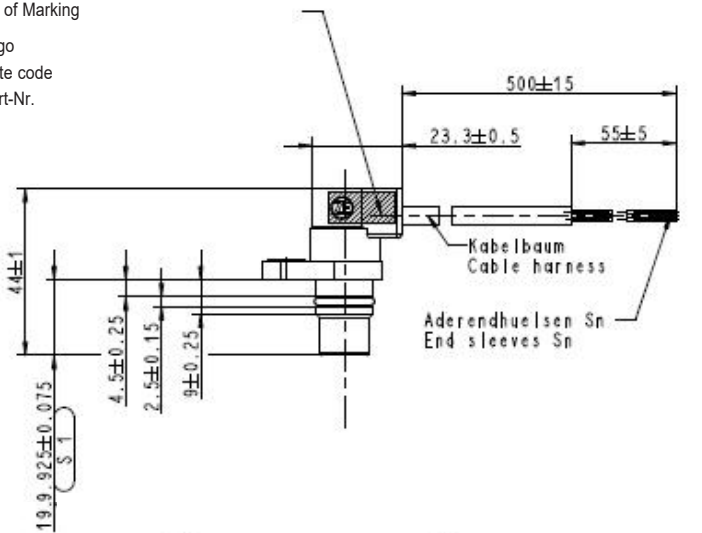


Dimensions in mm

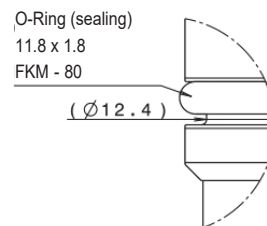
SD74-2001

Area of Marking

- Logo
- Date code
- Part-Nr.



CuZn-Buchse:
Anzugsdrehmoment für
Schraube M6: max 7.7 Nm
Brass bush:
Bushing M6: max. 7.7Nm

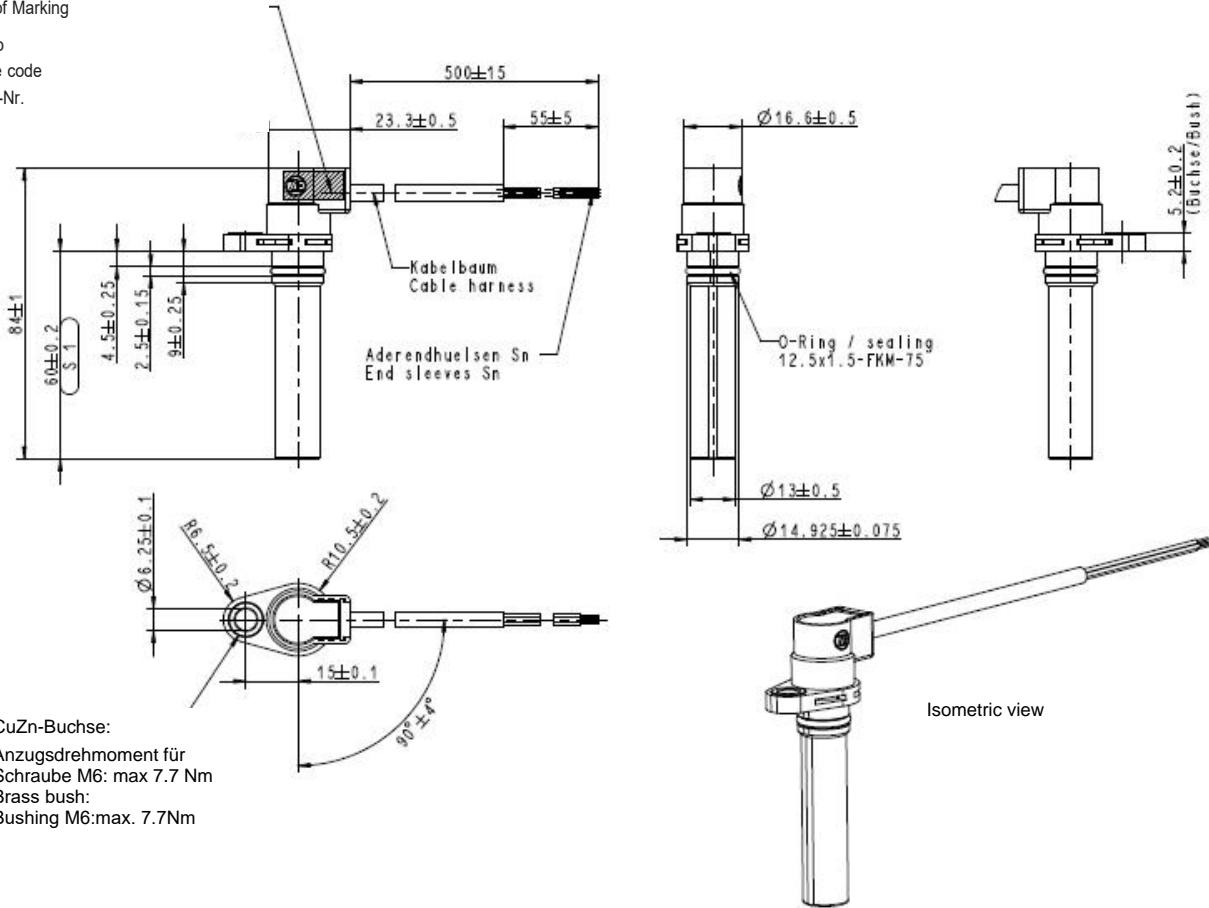


Dimensions mm

SD74-6001

Area of Marking

- Logo
- Date code
- Part-Nr.



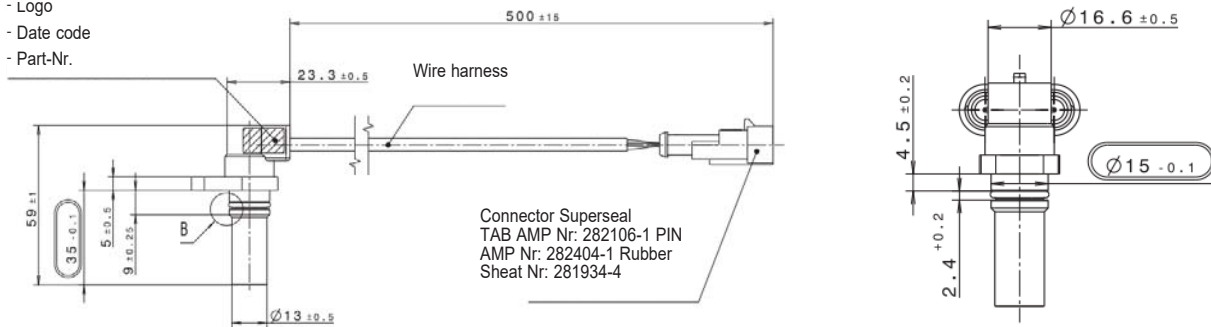
CuZn-Buchse:
Anzugsdrehmoment für
Schraube M6: max 7.7 Nm
Brass bush:
Bushing M6: max. 7.7Nm

Dimensions in mm

SD84-3505

Area of Marking

- Logo
- Date code
- Part-Nr.

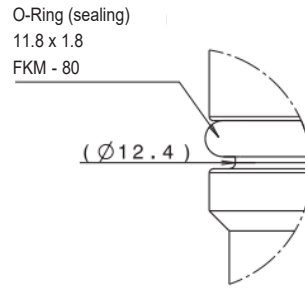
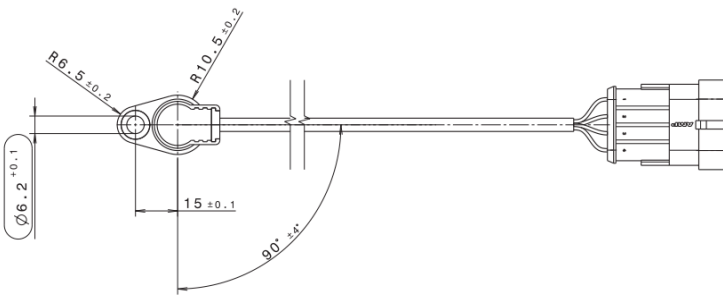


switches-sensors.zf.com

Page 5 of 8, last saved on 2021-05-11,
Specifications can change without notice.



Detail B

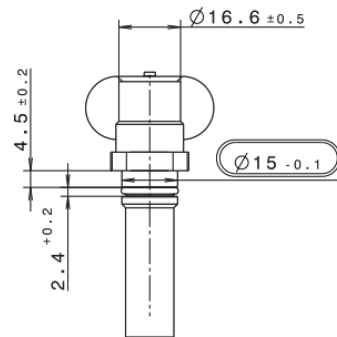
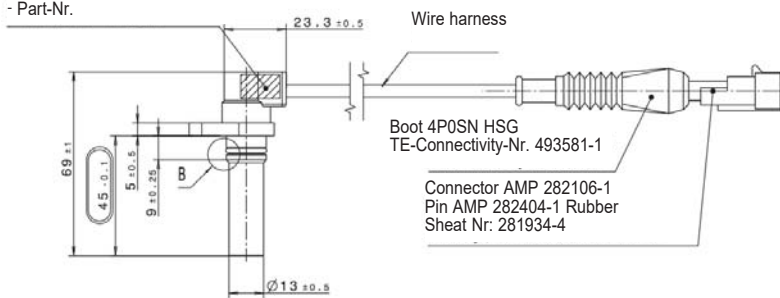


Dimensions in mm

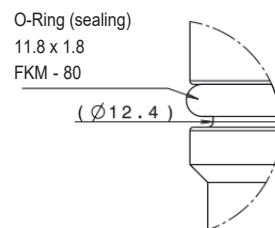
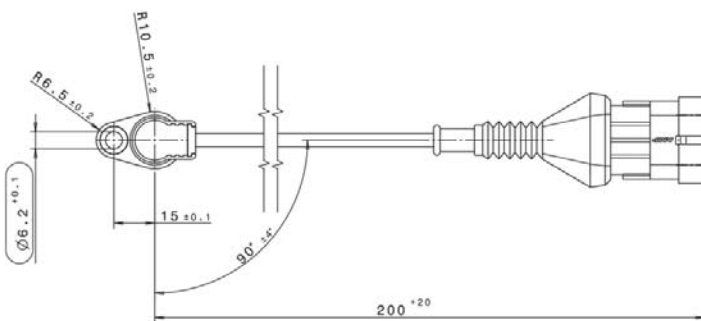
SD84-4501

Area of Marking

- Logo
- Date code
- Part-Nr.



Detail B



CuZn-Buchse:

- Anzugsdrehmoment für Schraube M6: max 7.7 Nm
- Brass bush: Bushing M6: max. 7.7Nm

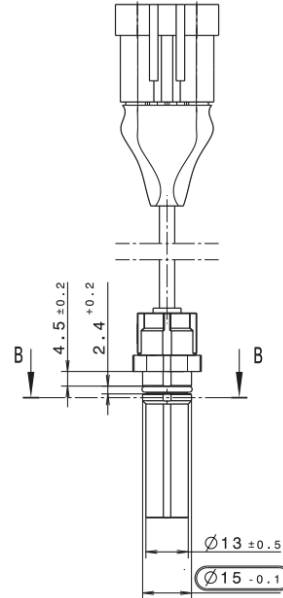
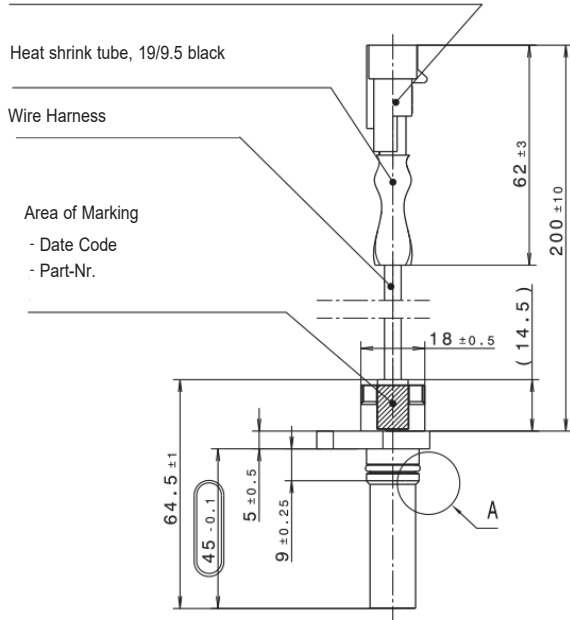
Dimensions in mm

SDB4-4501

Connector superseal AMP Nr. 282106-1

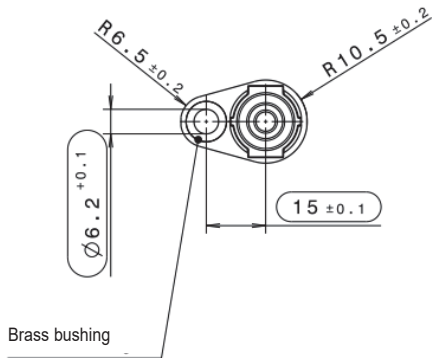
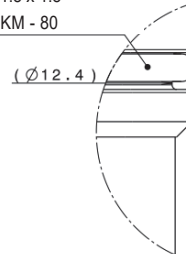
Pin AMP Nr. 282404-1

Rubber Sheat No: 281934-4

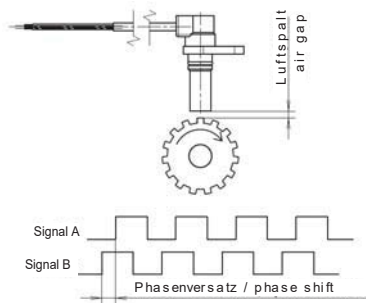


Detail B

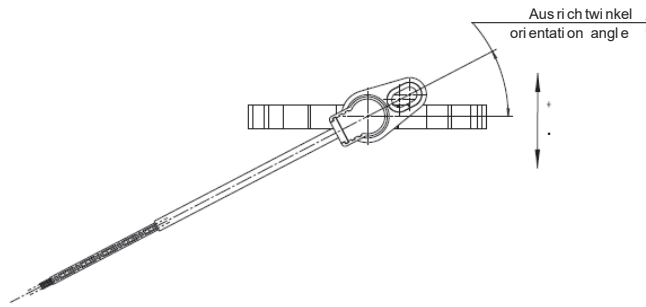
O-Ring (sealing)
 11.8 x 1.8
 FKM - 80



Operating air gap/phase shift

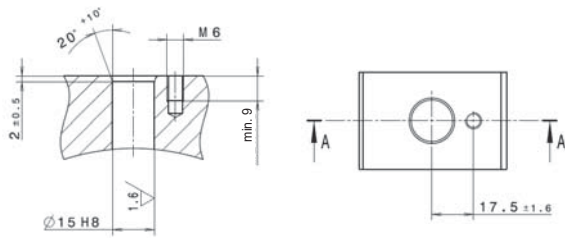


Sensor orientation

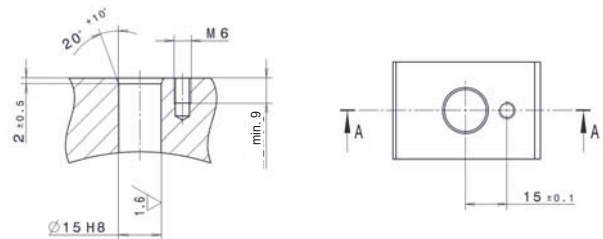


Mounting interface

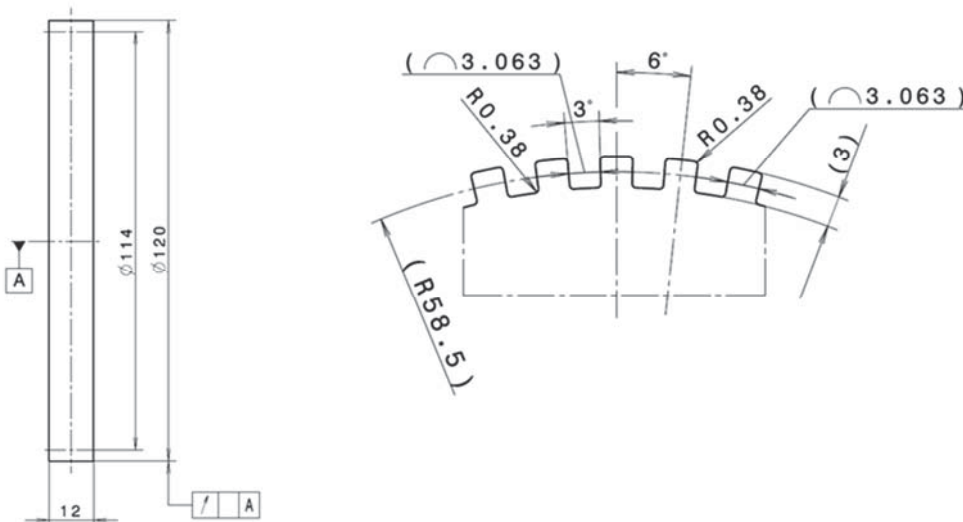
SD74-3501



SD74-3502/SD74-4502



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.