Rexroth
Bosch Group

Hall-effect Angle Sensor AN2

RE 95143/12.08 1/8
Replaces: 07.08

Data Sheet

Series 3
Hall-effect Sensor for Angular Measurement
(electronic-hydraulic hitch control EHR)

Contents

Features

- Angle sensor element based on the Hall-effect principle
- Shaft can be turned through mechanically
- Integrated electronics with temperature compensation
- Output signal ratiometrically proportional to angle
- Precise balance adjustment for zero point and sensitivity

Installation instructions

- As far as possible, the angle sensor shaft should be coupled to the object to be measured in such a way that it is free of play and tensile force.

Ordering Code

AN2				10	/	3	0
01	02	03	04	05		06	07

Typ

01	Hall-effect Angle Sensor	**AN2**

Version

02	without pin	**V1**
	with pin to the bottom	**V2**
	with pin to the top	**V3**

Characteristics

03	positive course	**A**
	negative course	**B**

Angles

04	± 17°	**17**
	± 28°	**28**
	± 35°	**35**
	± 36°	**36**
	± 41°	**41**
	± 44°	**44**

Supply / Signal

05	U_{sup}: 8..10,4 V / Signal: 0.25 to 0.75 *U_{sup}	**10**

Series

06		**3**

Index

07		**0**

Description

The angle sensor AN2 is used for the angular measurement up from ± 17° till ± 44°.

The sensor is supplying a ratiometric voltage, available with increasing curve (positive course) or inverted curve (negative course).
This sensor is a typical part of an electronic-hydraulic hitch control (EHR) and is supplied directly by a Rexroth EHR controller or by a Rexroth SRC.

Material Number

Sensors								Material number
AN2	V1	B	35	10	/	3	0	R917005 164
AN2	V1	A	41	10	/	3	0	R917005 165
AN2	V2	A	36	10	/	3	0	R917005 166
AN2	V1	A	44	10	/	3	0	R917004 856
AN2	V3	A	28	10	/	3	0	R917005 167
AN2	V1	A	17	10	/	3	0	R917005 168
AN2	V2	A	41	10	/	3	0	R917005 169
AN2	V3	A	41	10	/	3	0	R917005 170

Technical Data

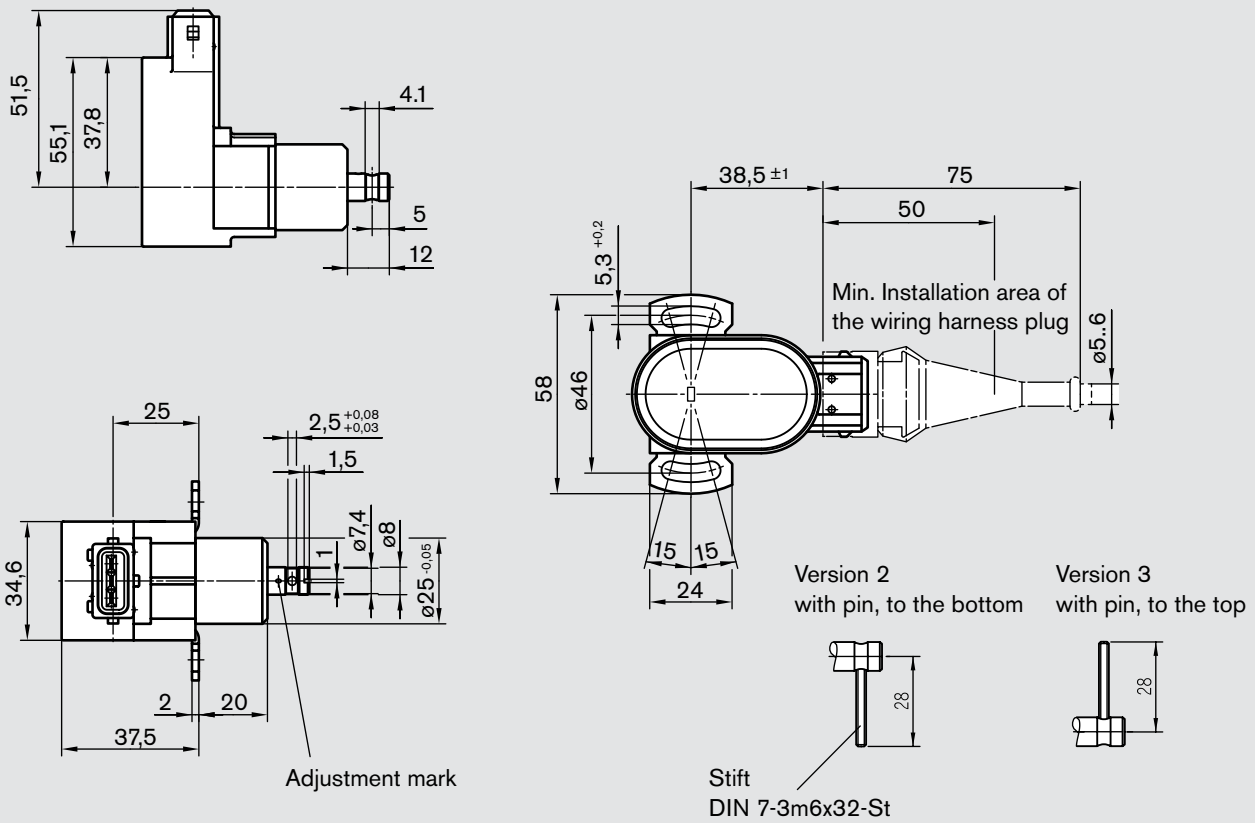
Size		
Mechanical angle		can be turned through 360°
Starting torque		≤ 5 Ncm
Shaft load	radial	≤ 10 N
	axial	≤ 20 N
Linearity		< ± 1%
Zero position		Marking on shaft (see drawing)
Sensitivity of the end points		< ± 1% of supply voltage
Hysteresis		not measurable
Resolution		0,025% U_{supply}
Temp. coefficient of zero point		≤ ± 0,15% / 10°C
Temp. coefficient of sensitivity		≤ ± 0,2% / 10°C
Operating temperature range		–30°C .. + 80°C
Storage temperature range		–35°C .. + 100°C
Case material		PBT GF 30
Shaft material		X 5 CrNi 18
Type of protection with fitted mating connector (IEC 60529)		IP67 und IP69k
Plug-in connection		3-pin plug with sleeve and single sealed
Supply voltage U_{sup}		8 ..10,4 V
Supply current		≤ 15 mA
Signal voltage U_{sig} (ratiometric)		0,25 .. 0,75 x U_{sup}
Residual ripple		< 10 mVss
Load resistance		> 3 kΩ
Insulation to case		> 100 MΩ
Dielectric strength to case		< 200 V
EMC[1]) (ISO 11452-2)		
1MHz...1GHz		200 V/m, authorized deviation 1% U_{sup}
1GHz...4GHz		100 V/m, authorized deviation 1% U_{sup}
ESD[2]) (ISO TR 10605, intensity IV)		
Contact discharge		± 8 kV
Air discharge		± 15 kV
Overvoltage / reverse polarity / short-circuit resistance		Resistance against reverse polarity and short circuits Overvoltage protection up to 18 V
Dynamic tests		
Broadband noise test (IEC 68-2-64)		a_{eff} = 0.05 *g* 2/Hz, 10 - 2000 Hz
Transport shock (IEC 60068-2-27)		15 *g*, 11 ms, 3x each direction (pos/reg)
Continuous shock (IEC 60068-2-29)		25 *g*, 6 ms, 1000x each direction (pos/reg)

[1]) EMC = Electromagnetic compatibility

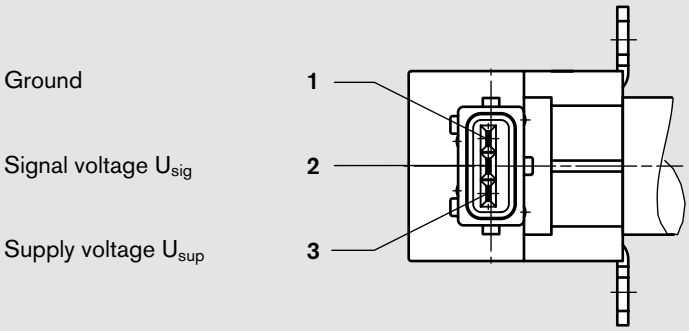
[2]) ESD = Electrostatic discharge

Dimensions

Version 1, without pin

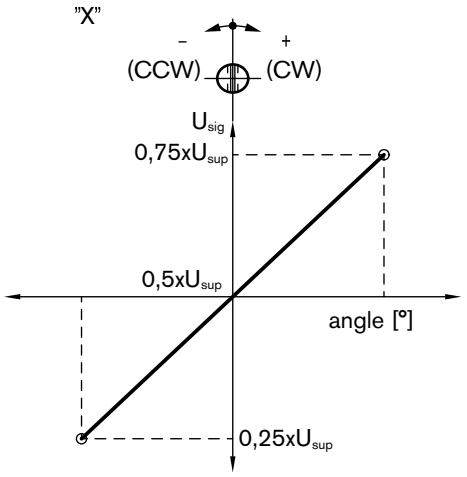


Pin Assignment

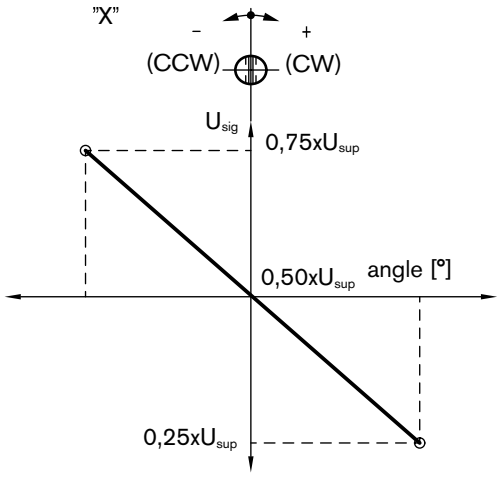


Characteristics

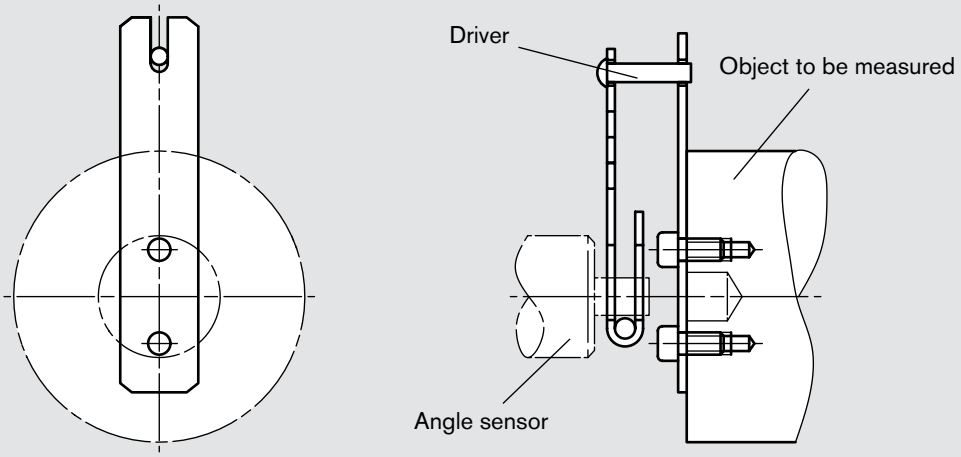
positive course



negative course

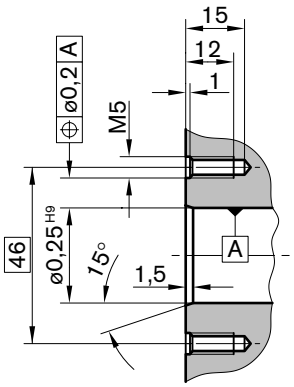


Coupling Examples



The angular sensor shaft is to be coupled to the measurement object as free of force and play as possible.

Mounting Dimensions



- Mounting screws DIN 912-M5x20-8.8
- Disk DIN 125-A 5.3 – St
- Shaft load: axial 20 N; radial 10 N
- Starting torque <5Ncm

Mating Connector

Order designations for mating connector, comprising:

Description	Quantity	Material Number
Plug housing	1x	1 928 402 579*
Protective cap	1x	1 280 703 022*
Contacts	3x	929 939**
Single wire sealing (wire size: 0,5 – 1,0 mm^2)	3x	828 905-1** at FLK cable type
		828 904-1** at FLKr, FLX cable

*: can be purchased at Bosch

**: can be purchased at AMP

The mating connector is not included in supply.

Safety Notes

• General instructions:

- The suggested circuits do not imply any technical liability for the system on the part of Rexroth.
- System developments, installations and commissioning of electronic systems for controlling hydraulic drives must only be carried out by trained and experienced specialists who are sufficiently familiar with the components used and with the complete system.
- No components that are defective or not working properly should be used. If components fail and/or exhibit malfunction, repair must be carried out immediately.
- Before setting the system into operation, you must ensure that the vehicle and the hydraulic system are in a safe condition. Make certain that no persons are present in the danger zone of the machine.
- A sufficiently large distance to radio systems must be maintained.
- All connectors must be unplugged from the electronics during electrical welding operations.
- Cables to the electronics must not be routed close to other power-conducting lines in the machine or vehicle.

• Conventional use:

- The sensor is designed for use in mobile working machines provided no limitations / restrictions are made to certain application areas in this data sheet.
- Operation of the sensor must generally occur within the operating ranges specified and released in this data sheet, particularly with regard to voltage, temperature, vibration, shock and other described environmental influences. Use outside of the specified and released boundary conditions may result in danger to life and/or cause damage to components which could result in consequential damage to the complete system.
- Damages which result from improper use and/or from unauthorized, unintended interventions in the device not described in this data sheet render all warranty and liability claims with respect to the manufacturer void.

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