

Angle Sensor WS1

RE 95140/07.07 1/4
Replaces: 05.03

Technical data sheet

Series 10



Features

The angle sensor is used for measuring rotary movements of an adjusting shaft or the angle positions of levers, e.g. to determine the setting of the injection pump lever of a diesel engine.

The sensor has a robust, sealed housing and an integrated electronic system specially developed for automotive applications.

The voltage supply for the WS1 angle sensor can be delivered directly by the control units (MC or RC).

As output variable, the WS1 angle sensor delivers a voltage proportional to the angle of rotation.

The sensor contains two internal contact-free measuring systems with a common power supply.

For safety-related system solutions, the output signals are partially redundant.

Main components

- Hall-effect semiconductor elements and integrated amplifiers
- Robust plastic housing with moulded plug
- Metal inner housing and line filter for high electromagnetic compatibility (EMC)
- Guide lever with fixing hole

Special features

- Life span designed for more than 30 million cycles
- Resistant to shock and vibration
- Molded-in metal bushing for low-wear on lever arm

Type Code

WS1	T	90	/	1	0
01	02	03		04	05

Type

01	Angle sensor	WS1
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Safety

02	Partially redundant (2 output signals)	T
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Version/ Measuring range

03	90° angle of rotation	90
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Series

04		1
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Index

05		0
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Technical Data

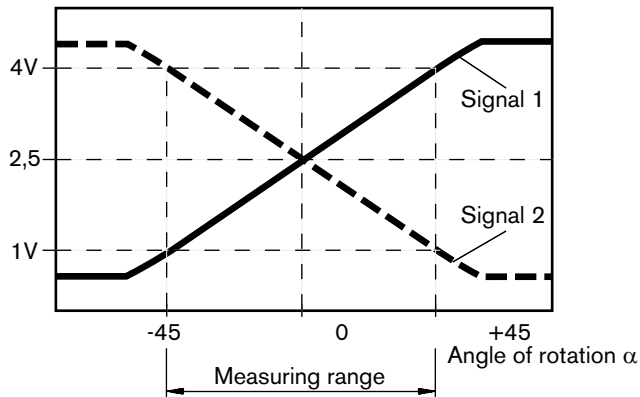
Table of values

Type	WS1T90/10
Supply voltage U_b	5V DC \pm 0,25 V
Input current	max. 11 mA
Output voltage U_a	0,5 ... 4,5 V (bei 5 V power supply)
Linearity of the output voltage U_a	\pm 0,5 % bei $-45^\circ \leq \alpha \leq -15^\circ$ \pm 0,25 % bei $-15^\circ \leq \alpha \leq +15^\circ$ \pm 0,5 % bei $+15^\circ \leq \alpha \leq +45^\circ$
Accuracy of output voltage U_a at 20°C	\pm 2 %
Load impedance to earth	min. 10 k Ω max. 22 nF
Short-circuit resistance of the signal outputs to	Supply voltage and earth
Polarity mismatch protection	Supply voltage to earth
Electromagnetic compatibility	
Broadcast noise (ISO 11452)	200 V _{eff} /m
Line-borne interference (ISO 7637-1)	Values on request
Operating temperature, housing	-40°C ... +100°C, max. +120°C for 1h
Storage temperature, housing	-40°C ... +100°C, max. +130°C for 16h
Vibration resistance (IEC 60086-2):	
Oscillation, sinusoidal	10 g / 50...500 Hz
Oscillation, noise	4,5 g rms/ 5...500 Hz
Protection class (DIN/EN 60529)	IP 6k6
with connected mating plug	IP 6k9k
Housing material	Plastic
Mass	approx. 95 g
Angle of rotation, mechanical	360° (spinnable)
Angle of rotation, measuring range	a = \pm 45°
Actuating torque at lever arm	\leq 0,1 Nm
Installation position	any

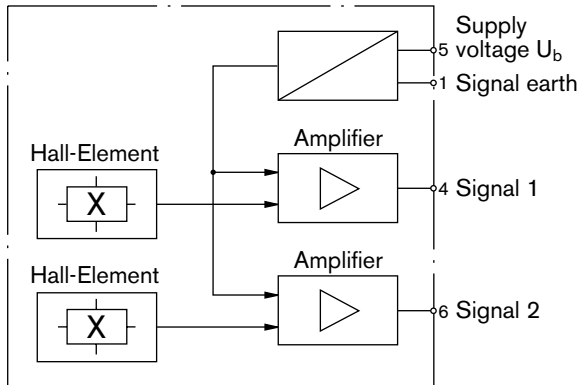
Technical Data

Characteristic

Output voltage U_a at supply voltage U_b 5V. (The output voltage is proportional to the supply voltage)

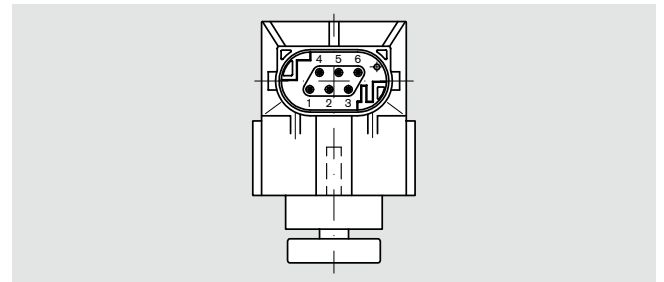


Block Circuit Diagram



Pin Assignment

Pin. Nr.	Connection
1	Ground
2	-
3	-
4	Signal 1
5	Supply voltage U_b
6	Signal 2



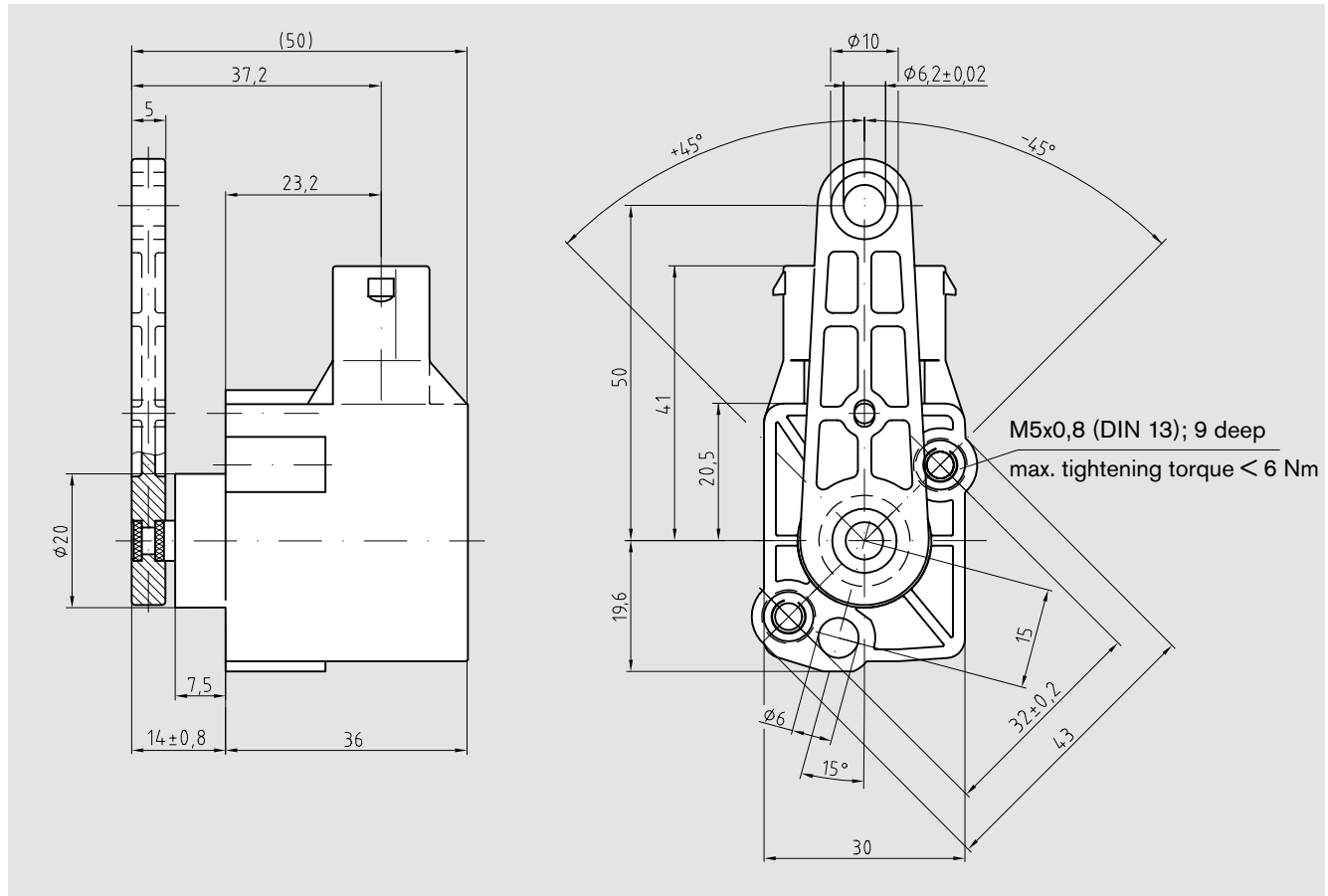
Mating Connector

AMP MQS female connector 6-pin, comprising:

- 1 MQS female connector 6-pin, code A _____ 1-967616-1
- 7 sleeve contacts _____ 0-0963727-1
- 3 blanking plugs _____ 0-0967056-1
- 6 single lead seals _____ 0-0967067-1

The connector is not included as standard. Female connector AMP MQS 6-pin can be ordered from Rexroth under the Mat. No. R902601914.

Dimensions



Safety Notes

- The suggested circuits do not imply any technical liability for the system on the part of Rexroth.
- System developments and commissioning of electronic systems for controlling hydraulic drives must only be performed by trained and experienced specialists who are suitably familiarized with working with the used components as well as the entire system.
- No defective or incorrectly functioning components may be used. If the components should fail or demonstrate faulty operation, repairs must be performed immediately.
- During commissioning, make certain that no one is present in the immediate working or movement range of the machine or can be placed at risk by the machine.
- All connectors must be unplugged from the electronics during electrical welding and paint operations.
- Cables to the electronics must not be routed close to other power-conducting cables in the machine or vehicle.
- A sufficiently large distance to radio systems must be maintained.
- Cables/wires must be sealed individually to prevent water from entering the device.

Bosch Rexroth AG
 Hydraulics
 Product Segment Mobile Electronics
 Elchingen Plant
 Glockeraustrasse 4
 89275 Elchingen, Germany
 Phone +49 (0) 73 08 82-0
 Fax +49 (0) 73 08 72-74
 info.brm-me@boschrexroth.de
 www.boschrexroth.com/mobile-electronics

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Subject to change.