

Position sensor

PO1 series 20

RE 95160

Edition: 09.2013

Replaces: 03.2012



- ▶ Inductive sensor for position measurement

Features

- ▶ Axially moving button with spring preload
- ▶ Inductive element according to the differential throttle measuring principle
- ▶ Integrated electronics with temperature compensation
- ▶ Ratiometric output signal proportional to position
- ▶ Zero point and sensitivity are calibrated.
- ▶ Housing with external thread M24 x 1.5 for mounting and adjustment

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Ordering code

01	02	03	04	05
PO1			/	20

Type

01	Position sensor, mobile	PO1
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Version

02	Without bellows	1
	With bellows	2

Characteristic

03	Standard	S
	Inverted	V

Supply voltage

04	5 ±0.5 V	05
	8 to 12 V	10

Series

05		20
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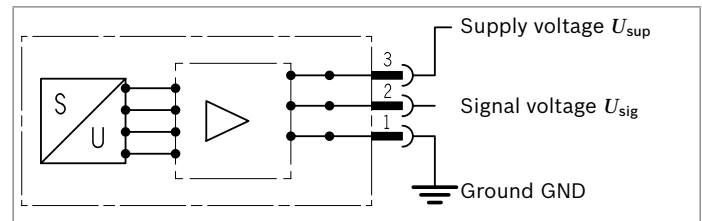
Description

The PO1 position sensor is intended for position measurement up to 10 mm. By mounting an eccentric on a rotation axis, the sensor can also be used for position control of an angle (see page 6).

The sensor returns a ratiometric voltage with increasing characteristic (U_{sig} increases when pressed in) or inverted characteristic (U_{sig} decreases when pressed in). For protection, it can also be supplied with bellows.

This sensor is a typical part of an electro-hydraulic hitch control (EHC) and is supplied directly from a Rexroth EHR control unit or an SRC controller.

▼ Block circuit diagram



Available variants

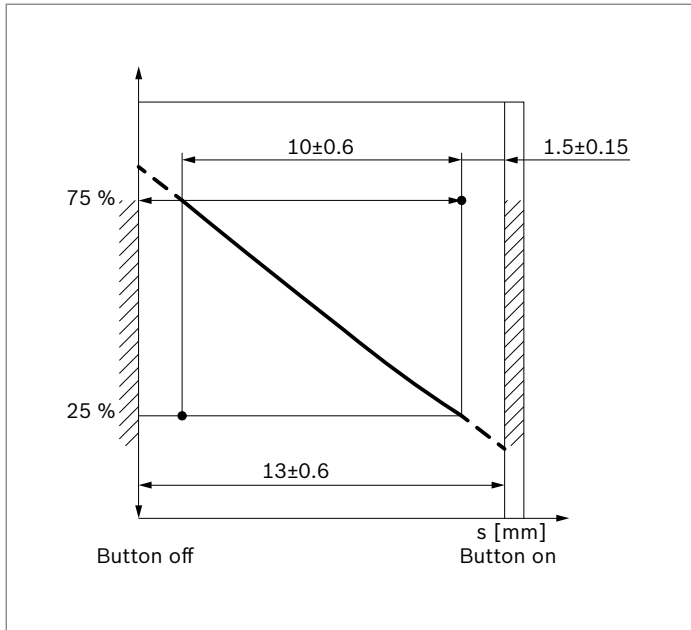
Type	Material number				
PO1 2 S 10 / 20	R917001941				
PO1 1 S 10 / 20	R917001942				
PO1 2 V 10 / 20	R917001943				
PO1 1 V 10 / 20	R917001944				
PO1 2 S 05 / 20	R917008163 ($U_{sig} = 15\% \text{ to } 85\% U_{sup}$)				
PO1 1 S 05 / 20	R917005712				
PO1 2 V 05 / 20	R917008164				
PO1 1 V 05 / 20	R917008165				
PO1 2 S 05 / 20	R917002927 ($U_{sig} = 25\% \text{ to } 75\% U_{sup}$)				

Technical data

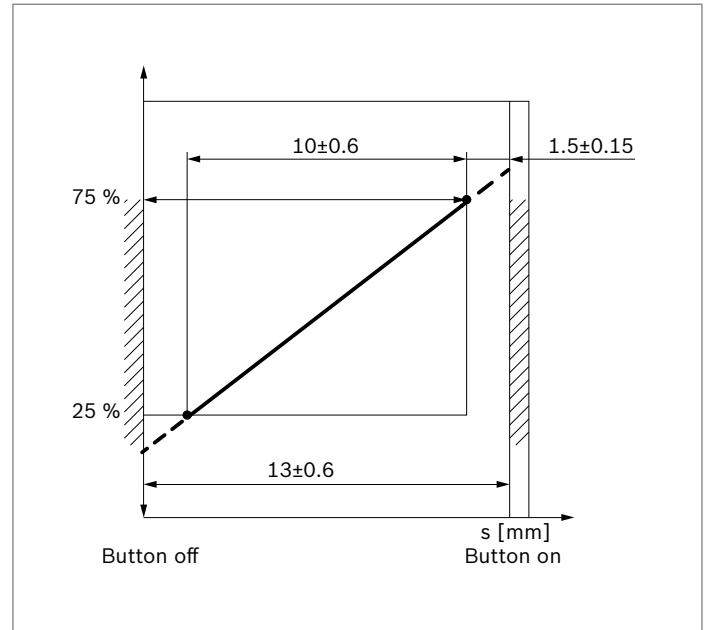
Type	PO1	
Nominal stroke	10 mm	
Mechanical stroke	13 mm	
Actuation force	≤ 16N	
Supply voltage U_{sup}	Standard 8 to 12 V	5 ±0.5 V
Supply current I_{sup}	≤ 30 mA	≤ 20 mA
Signal voltage U_{sig}	25% to 75% U_{sup}	15% to 85% U_{sup} 25% to 75% U_{sup} (R917002927)
Residual ripple	< 20 mVss	< 20 mVss
Load resistance	> 7 kΩ	≥ 10 kΩ
Linearity	≤ ±2 % (end point setting)	
Variation (upper end point)	≤ ±1 %	
Sensitivity variation	≤ ±2.5%	
Hysteresis	Immeasurable	
Resolution	Infinite	
Temperature coefficient of the end point	≤ ±0.15% / 10 °C	
Temperature coefficient of the sensitivity	≤ ±0.15% / 10 °C	
Operating temperature range	-30 °C to +85 °C	
Storage temperature range	-35 °C to 100 °C	
Housing material	GD-Al Si 12 (Cu)	
Type of protection	Coil and electronics: IP69K Connector with installed mating connector: IP69K	
Mating connector	3-pin connector with dust boot	
Insulation resistance to housing	> 100 MΩ	
Dielectric strength of insulation to housing	< 200 V	
Electromagnetic compatibility EMC (ISO 11452-5) 1 MHz to 1 GHz	100 V/m ≤ ±1% U_{sup}	

Characteristics

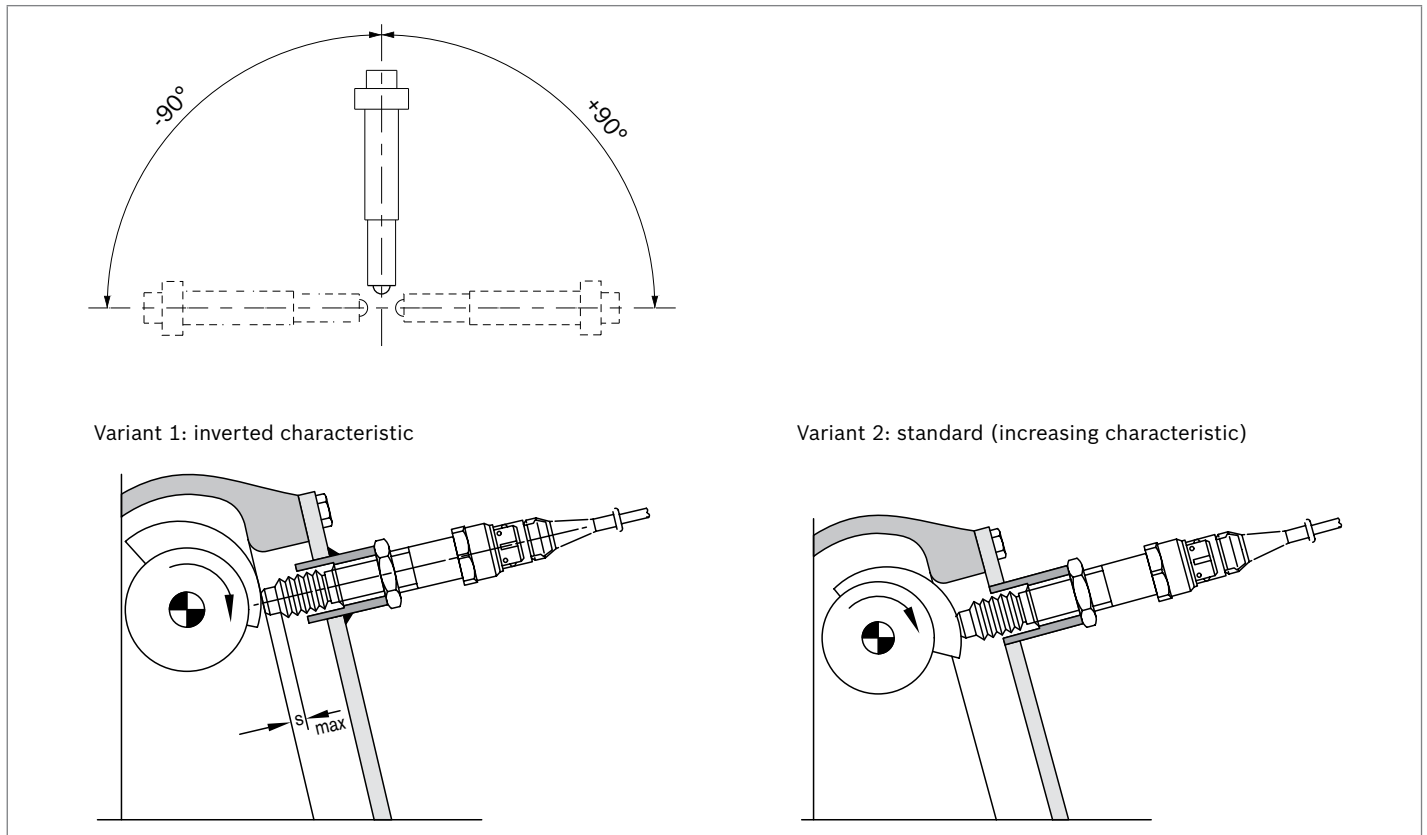
▼ Inverted



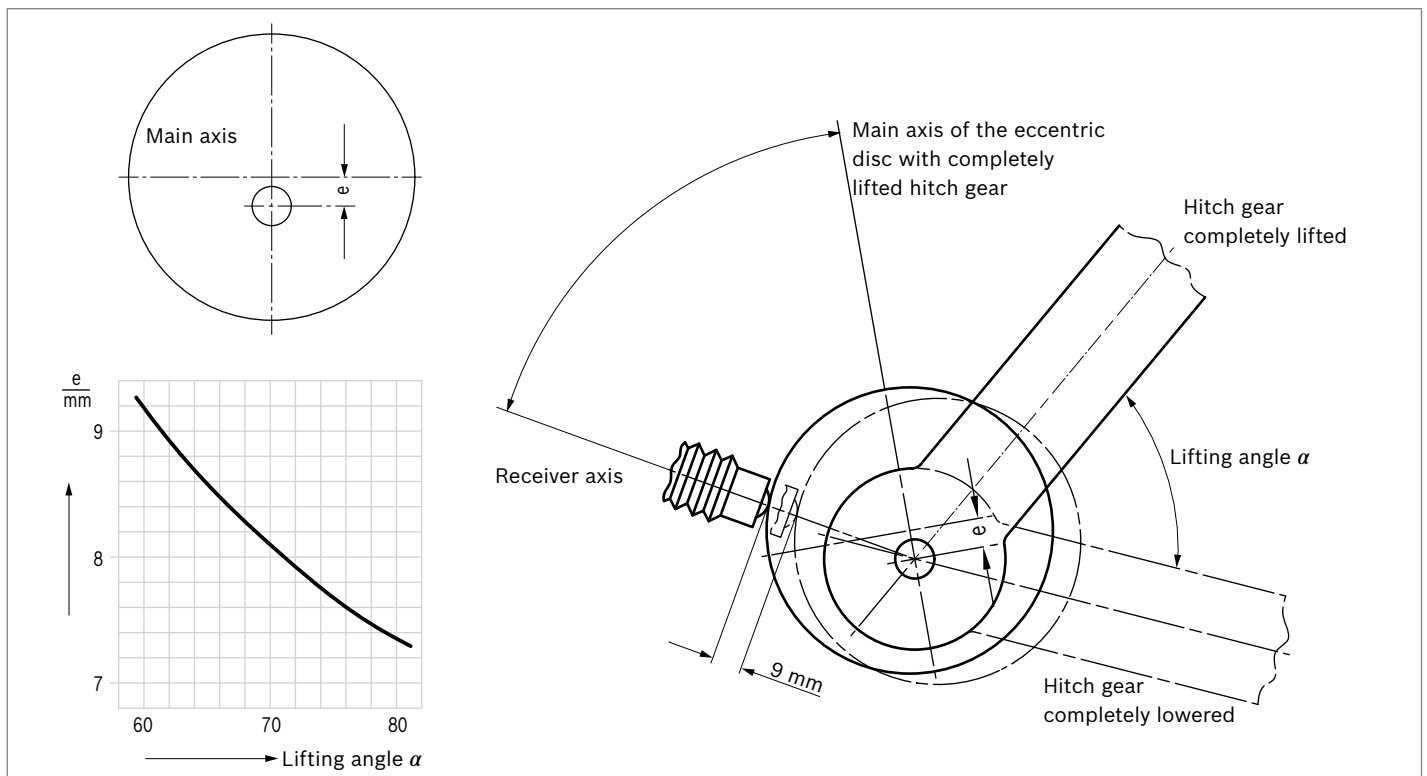
▼ Standard (increasing)



Installation position



Dimensions: Eccentric for position control



Safety instructions

General instructions

- ▶ The proposed circuits do not imply any technical liability for the system on the part of Bosch Rexroth.
- ▶ It is not permissible to open the PO1 position sensor or to modify or repair the PO1 position sensor. Modifications or repairs to the wiring could result in dangerous malfunctions.
- ▶ System developments, installation and commissioning of electronic systems for controlling hydraulic drives must only be carried out by trained and experienced specialists who are sufficiently familiar with both the components used and with the complete system.
- ▶ While commissioning the PO1 position sensor, the machine may pose unforeseen dangers. Before commissioning the system, you must therefore ensure that the vehicle and the hydraulic system are in a safe condition.
- ▶ Make sure that nobody is in the machine's danger zone.
- ▶ No defective or incorrectly functioning components may be used. If the PO1 position sensor should fail or demonstrate faulty operation, it must be replaced.

Notes on the installation point and position

- ▶ Do not install the PO1 position sensor close to parts that generate considerable heat (e.g. exhaust).
- ▶ A sufficiently large distance to radio systems must be maintained.
- ▶ The connector of the PO1 position sensor is to be unplugged during electrical welding and painting operations.
- ▶ Cables/wires must be sealed individually to prevent water from entering the device.

Notes on transport and storage

- ▶ If it is dropped, the PO1 position sensor must not be used any longer as invisible damage could have a negative impact on reliability.

Notes on wiring and circuitry

- ▶ Lines to the position sensors are so short as possible and be shielded. The shielding must be connected to the electronics on one side or to the machine or vehicle ground via a low-resistance connection.
- ▶ The product should only be plugged and unplugged when it is in a de-energized state.
- ▶ Lines from the PO1 position sensor to the electronics must not be routed close to other power-conducting lines in the machine or vehicle.
- ▶ The PO1 position sensor and the connection line should be supported mechanically near the installation location.
- ▶ If possible, lines should be routed in the vehicle interior. If the lines are routed outside the vehicle, make sure that they are securely fixed.
- ▶ Lines must not be kinked or twisted, must not rub against edges and must not be routed through sharp-edged ducts without protection.
- ▶ Lines are to be routed with sufficient distance from hot or moving vehicle parts.
- ▶ The sensor lines are sensitive to radiation interference. For this reason, the following measures should be taken when operating the sensor:
 - Sensor lines should be attached as far away as possible from large electric machines.
 - If the signal requirements are satisfied, it is possible to extend the sensor cable.

Intended use

- ▶ The PO1 position 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 PO1 position 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 mobile working machine.

Improper use

- ▶ Any use of the PO1 position sensor other than that described in chapter "Intended use" is considered to be improper.
- ▶ Use in explosive areas is not permissible.
- ▶ 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.

Use in safety-related functions

- ▶ The customer is responsible for performing a risk analysis of the mobile working machine and determining the possible safety-related functions.
- ▶ In safety-related applications, the customer is responsible for taking suitable measures for ensuring safety (sensor redundancy, plausibility check, emergency switch, etc.).
- ▶ Product data that is necessary to assess the safety of the machine can be provided on request or are listed in this data sheet.

Further information

- ▶ Further information about the PO1 position sensor can be found at www.boschrexroth.com/mobile-electronics.
- ▶ The PO1 position sensor must be disposed according with the national regulations of your country.

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