Neutral position switch
NLS series 10

RE 95152
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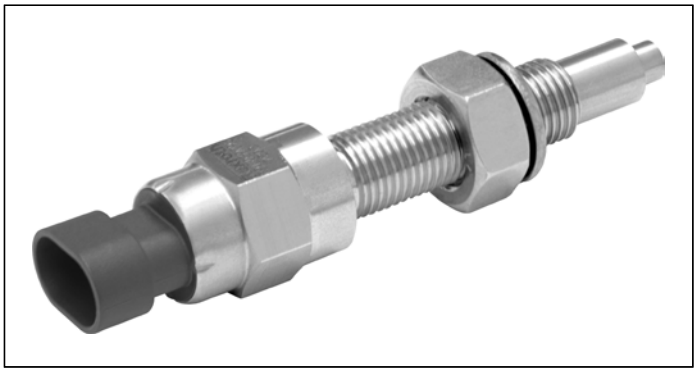


- For installation in Rexroth axial piston motors A6VM series 65 and 71
- Switch for detecting the neutral position of the axial piston motor A6VM

Features

- High type of protection IP67/IP69K
- Robust design due to full metal housing
- Evaluation with BODAS controllers possible
- Detection of cable break and short circuits during analog evaluation

Contents

Type code

01	02	03	04		05
NLS	**M**	**S**	**V**	**/**	**10**

Type

01	Neutral position switch	**NLS**

Mechanical connection

02	M14 × 1.5 according to DIN 3852	**M**

Electrical connection

03	AMP Superseal1.5, 2-pin	**S**

Seal

04	FKM	**V**

Series

05	Series 1	**10**

Description

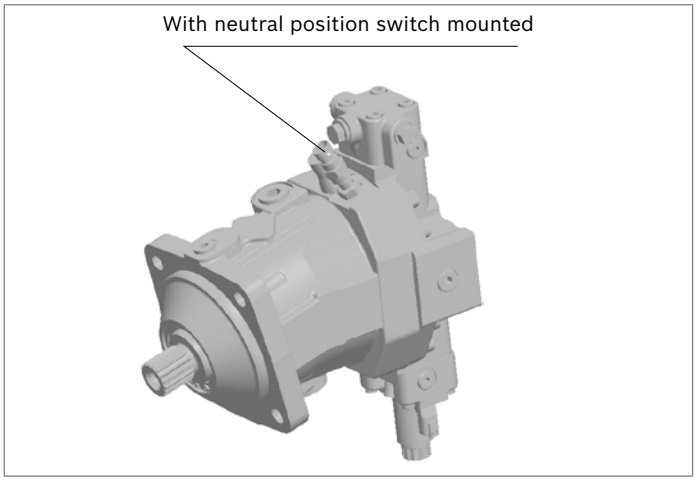
The neutral position switch NLS detects the neutral position of A6VM axial piston motors of series 65 and 71.

Application example

The neutral position switch NLS electronically detects the neutral position of the A6VM, thereby ensuring the torque freedom of the motor. The use of the NLS in a transmission control provides a faster switching cycle in the drive. In addition, the switch reliability is improved and thereby the service life of the drive increased.

The neutral position switch NLS is delivered in adjusted condition, installed in the axial piston motor A6VM.

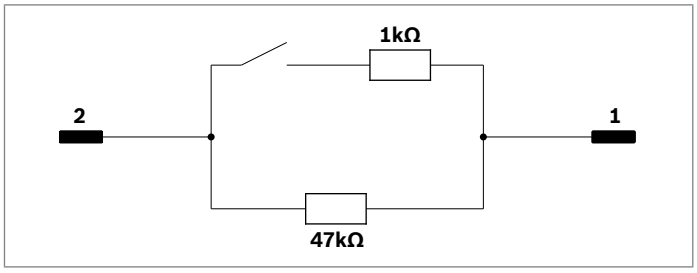
▼ **Example, axial piston variable motor A6VM**



Technical data

Type		NLS
Recommended operating voltage		5 V
Maximum voltage	not actuated	32 V
	actuated	11.5 V
Minimum permissible current		0 mA
Maximum permissible current		10 mA
Maximum switching cycle number		1 million
Contact type		normally open contact (open in unactuated state)
Type of protection (with mating connector plugged)		IP67/IP69K
Temperature range sensor (medium and ambient temperature)[1)]		–40 °C ... 125 °C
Temperature range thread seal ring FKM[1)]		-15 °C ... 125 °C
Burst strength	nominal	3 bar
	maximum (short-term peaks)	10 bar[2)]

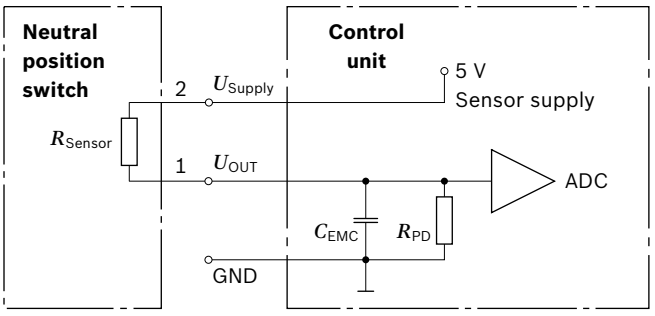
▼ **Schematic**



1) Observe the permissible temperature range of the axial piston motor.
2) Observe the permissible viscosity range of the axial piston motor. At oil viscosities > 1800 mm²/s, the switch may be unintentionally actuated by case pressure peaks of > 10 bar.

Connection to the control unit

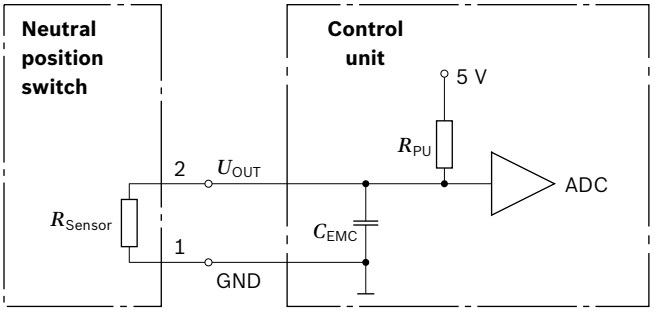
Analog input with pull-down



$$U_{OUT} = \frac{U_{Supply} \times R_{PD}}{R_{PD} + R_{Sensor}}$$

- Neutral with R_{Sensor} = 47 kΩ ± 20%
- Active with R_{Sensor} = 980 kΩ ± 20%
- Recommended pull-down resistor R_{PD}:
- 5 kΩ to 30 kΩ (for optimal diagnosis)

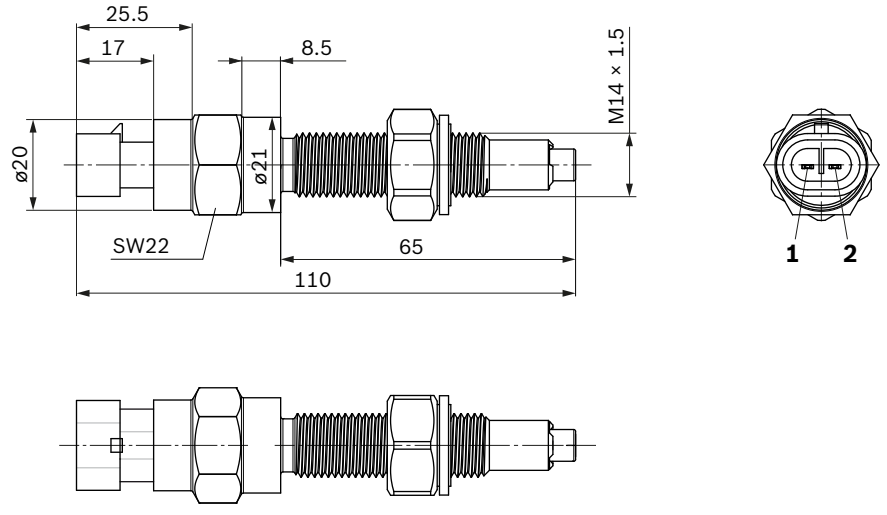
Analog input with pull-up



$$U_{OUT} = \frac{U_{Supply} \times R_{Sensor}}{R_{PU} + R_{Sensor}}$$

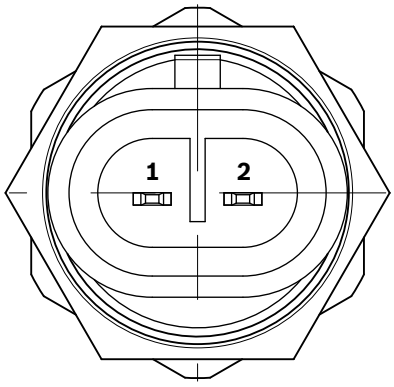
- Neutral with R_{Sensor} = 47 kΩ ± 20%
- Active with R_{Sensor} = 980 kΩ ± 20%
- Recommended pull-up resistor R_{PU}:
- 5 kΩ to 30 kΩ (for optimal diagnosis)

Dimensions



Connector AMP Superseal 1.5

Pin assignment



1, 2 Pin assignment freely selectable without functional impairment

Mating connector

Designation	Number	Material number
Housing	1	282080
Socket contact	1	282403-1

- The mating connector is not included in the scope of delivery.
- This mating connector can be ordered from AMP.

Safety instructions

General instructions

- Before finalizing your design, request a binding installation drawing.
- 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 sensor or to modify or repair the sensor. Modifications or repairs to the wiring could lead to dangerous malfunctions.
- Connections in the hydraulic system may only be opened in depressurized state.
- The sensor may only be assembled/disassembled in depressurized and deenergized state.
- 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 both the components used and the complete system.
- When commissioning the sensor, the machine may pose unforeseen hazards. 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 sensor should fail or demonstrate faulty operation, it must be replaced and adjusted.
- Despite every care being taken when compiling this document, it is not possible to take into account all feasible applications. If instructions for your specific application are missing, you can contact Bosch Rexroth.
- Sensors do not fall under the scope of EMC-RL 2004/108/EC or 2014/30/EU. A declaration of conformity and the CE marking for individually sold sensors is not required, since the sensors are only sold to machine manufacturers (OEM) or to companies with the necessary expertise (i.e. certified Bosch Rexroth partners or companies with trained and qualified service personnel). Furthermore, the responsibility of the above mentioned companies for machine EMC testing remains unaffected in principle.
- The use of sensors by private users is not permissible, since these users do not typically have the required level of expertise.

Notes on the installation location and position

- Do not install the sensor close to parts that generate considerable heat (e.g., exhaust).
- Lines are to be routed with sufficient distance from hot or moving vehicle parts.
- A sufficiently large distance to radio systems must be maintained.
- The connector of the sensor is to be unplugged during electrical welding and painting operations.
- Cables/wires must be sealed individually to prevent water from entering the sensor.

Notes on transport and storage

- Please examine the sensor for any damages which may have occurred during transport. If there are obvious signs of damage, please immediately inform the transport company and Bosch Rexroth.
- If it is dropped, the 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 sensors must be designed as 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 sensor mating connector must only be plugged and unplugged when it is in a deenergized state.
- 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.
- Lines from the sensor to the electronics must not be routed close to other power-conducting lines in the machine or vehicle.
- 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.

Intended use

- The sensor is designed for use in mobile and stationary 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 temperature 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 machine.

Improper use

- Any use of the 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, interference in the component 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 on the 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 upon request or are listed in this data sheet.

More detailed information

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

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