

Operating Manual

Electronic Pressure Switch DS 230



**READ THOROUGHLY BEFORE USING THE DEVICE
KEEP FOR FUTURE REFERENCE**

ID: BA_DS230_E | Version: 11.2024.0

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1. General and safety-related information on this operating manual

This operating manual enables safe and proper handling of the product, and forms part of the device. It should be kept in close proximity to the place of use, accessible for staff members at any time.

All persons entrusted with the mounting, installation, putting into service, operation, maintenance, removal from service, and disposal of the device must have read and understood the operating manual and in particular the safety-related information.

Complementary to this operating manual the current data sheet has to be adhered to.

Download this by accessing www.bdsensors.de or request it: info@bdsensors.de / phone: +49 (0) 92 35 / 98 11 0

In addition, the applicable accident prevention regulations, safety requirements, and country-specific installation standards as well as the accepted engineering standards must be observed.

1.1 Symbols used

	- Type and source of danger - Measures to avoid the danger
Warning word	
	- Imminent danger! - Non-compliance will result in death or serious injury.
DANGER	
	- Possible danger! - Non-compliance may result in death or serious injury.
WARNING	
	- Hazardous situation! - Non-compliance may result in minor or moderate injury.
CAUTION	

NOTE - draws attention to a possibly hazardous situation that may result in property damage in case of non-compliance.

✓ Precondition of an action

1.2 Staff qualification

Qualified persons are persons that are familiar with the mounting, installation, putting into service, operation, maintenance, removal from service, and disposal of the product and have the appropriate qualification for their activity.

This includes persons that meet at least one of the following three requirements:

- They know the safety concepts of metrology and automation technology and are familiar therewith as project staff.
- They are operating staff of the measuring and automation systems and have been instructed in the handling of the systems. They are familiar with the operation of the devices and technologies described in this documentation.
- They are commissioning specialists or are employed in the service department and have completed training that qualifies them for the repair of the system. In addition, they are authorized to put into operation, to ground, and to mark circuits and devices according to the safety engineering standards.

All work with this product must be carried out by qualified persons!

1.3 Intended use

The device is intended for converting the physical parameter of pressure into an electric signal. The current system pressure is shown in a 4-digit LED-display.

The electronic pressure switch DS 230 has been designed for OEM-customers for the basic equipment of e. g. pneumatics, pumps, and hydraulic systems.

The device has to be used only for this purpose, considering the following information.

Permissible measuring and cleaning media are gases or liquids, which are compatible with the media wetted parts of the device (according to data sheet) and your system. This must be ensured for the application.

The user must check whether the device is suited for the selected use. In case of doubt, please contact our sales department: info@bdsensors.de | phone: +49 (0) 92 35 98 11 0
BD|SENSORS assumes no liability for any wrong selection and the consequences thereof!

The technical data listed in the current data sheet are engaging and must absolutely be complied with. If the data sheet is not available, please order or download it from our homepage: <http://www.bdsensors.de>

1.4 Incorrect use

	Danger through incorrect use - Only use the device in permissible media and in accordance with its intended use. - Do not use the device as a ladder or climbing aid. - The device must not be altered or modified in any way. - BD SENSORS is not liable for damage caused by improper or incorrect use.
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1.5 Limitation of liability and warranty

Failure to observe the instructions or technical regulations, improper use and use not as intended, and alteration of or damage to the device will result in the forfeiture of warranty and liability claims.

1.6 Safe handling

NOTE - Do not use any force when installing the device to prevent damage of the device and the plant!

NOTE - Treat the device with care both in the packed and unpacked condition!

NOTE - Do not throw or drop the device!

NOTE - Excessive dust accumulation and complete coverage with dust must be prevented!

NOTE - The device is state-of-the-art and is operationally reliable. Residual hazards may originate from the device if it is used or operated improperly.

1.7 Scope of delivery

Check that all parts listed in the scope of delivery are included free of damage, and have been delivered according to your purchase order:

- electronic pressure switch
- for mechanical pressure ports DIN 3852: O-Ring (pre-mounted)
- mounting instructions or operating manual

1.8 UL approval (for devices with UL Marking)

The UL approval was effected by applying the US standards, which also conform to the applicable Canadian standards on safety.

Observe the following points so that the device meets the requirements of the UL approval:

- only indoor usage
- maximum operating voltage: according to data sheet
- The device must be operated via a supply with energy limitation (acc. to UL 61010) or an NEC Class 2 energy supply.

2. Product identification

The device can be identified by means of the manufacturing label with ordering code. The most important data can be gathered therefrom. The version of the firmware, (e. g. P01) will appear for about 1 second in the display after starting up the device. Please hold it ready for inquiry calls.

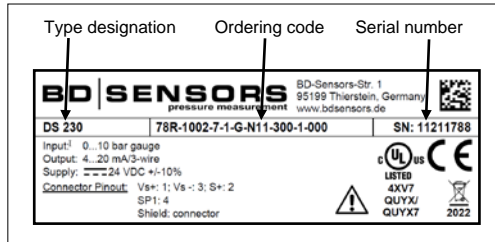


Fig. 1 Example of manufacturing label

NOTE - The manufacturing label must not be removed!

3. Mounting

3.1 Mounting and safety instructions

	Danger of death from airborne parts, leaking fluid, electric shock - Always mount the device in a depressurized and de-energized condition!
	Danger of death from improper installation - Installation must be performed only by appropriately qualified persons who have read and understood the operating manual.

NOTE - Do not remove the packaging or protective caps of the device until shortly before the mounting procedure, in order to exclude any damage to the diaphragm! Protective caps must be kept! Dispose of the packaging properly!

NOTE - If there is increased risk of damage to the device by lightning strike or overvoltage, increased lightning protection must additionally be provided!

NOTE - Treat any unprotected diaphragm with utmost care; this can be damaged very easily.

NOTE - The display module and the plastic housing are equipped with rotation limiters. Please do not attempt to overtighten it by applying increased force.

NOTE - Never use the display as a mounting / dismounting aid, otherwise the device may be irreparably damaged. For mounting or dismounting the device, only use the hexagon on the pressure port.

NOTE - Provide a cooling line when using the device in steam piping and clarify the material compatibility.

NOTE - The measuring point must be designed in such a way that cavitation and pressure surges are avoided.

NOTE - When installing the device, avoid high mechanical stresses on the pressure port! This will result in a shift of the characteristic curve or to damage, in particular in case of very small pressure ranges and devices with a pressure port made of plastic.

NOTE - In hydraulic systems, position the device in such a way that the pressure port points upward (ventilation).

NOTE - The permissible tightening torque depends on the conditions on site (material and geometry of the mounting point). The specified tightening torques for the pressure switch must not be exceeded!

NOTE - If the device is installed with the pressure port pointing upwards, ensure that no liquid drains off on the device. This could result in humidity and dirt blocking the gauge reference in the housing and could lead to malfunctions. Dust and dirt must be removed from the edge of the screwed joint of the electrical connection.

NOTE - Please check the conditions of use and operation of the device at regular intervals. If the properties are changed, initiate appropriate measures.

NOTES - for mounting outdoors / in a humid environment and for cleaning:

- Please note that your application does not show a dew point, which causes condensation and can damage the device. There are specially protected devices for these operating conditions. Please contact us in such case.
- Connect the device electrically straightaway after mounting or prevent moisture penetration, e.g. by a suitable protective cap. (The ingress protection specified in the data sheet applies to the connected device.)
- Select the mounting position such that splashed and condensed water can drain off. Stationary liquid on sealing surfaces must be excluded!
- Mount the device such that it is protected from direct solar radiation. In the most unfavourable case, direct solar radiation leads to the exceeding of the permissible operating temperature, which can then damage the device or affect its ability to function correctly. If the internal pressure in the device rises, this could also cause temporary measurement errors.

3.2 Mounting steps for connections according to DIN 3852

NOTE - Do not use any additional sealing material such as yarn, hemp or Teflon tape!

- ✓ The O-ring is undamaged and seated in the designated groove.
- ✓ The sealing face of the mating component has a flawless surface. (Rz 3.2)

- 1 Screw the device into the corresponding thread by hand.
- 2 Devices equipped with a knurled ring: only tighten by hand
- 3 Devices with a spanner flat must be tightened using a suitable open-end wrench. Permissible tightening torques for pressure switch:



Fig. 2 connection G1/4" according to DIN 3852

3.3 Mounting steps for NPT connections

- ✓ Suitable fluid-compatible sealing material, e.g. PTFE tape, is available.

- 1 Screw the device into the corresponding thread by hand
- 2 Then tighten it using an open-end wrench. Permissible tightening torques for pressure switch:



Fig. 3 connection 1/4" NPT

3.4 Positioning of the display module

In order to ensure easy readability even when the device is installed in an awkward location, the display can be rotated into the desired position. Its rotational capability is illustrated below. Note rotation limits.

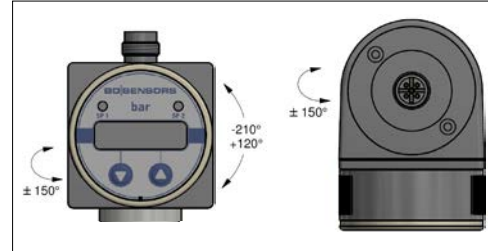


Fig. 4 Display module (example with M12x1)

4. Electrical connection

4.1 Connection and safety instructions

	Danger of death from electric shock - Always mount the device in a depressurized and de-energized condition!
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- ✓ The supply corresponds to protection class III (protective insulation).

NOTE - For the electrical connection a shielded and twisted multicore cable is recommended.

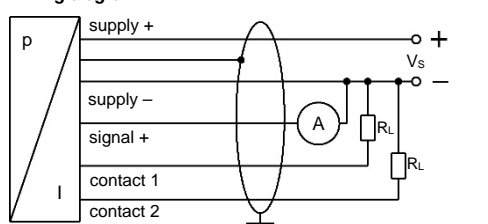
4.2 Electrical installation

Establish the electrical connection of the device according to the technical data shown on the manufacturing label, the following table and the wiring diagram.

Pin configuration:

Electrical connections	M12x1 (5-pin) plastic	M12x1 (5-pin) metal
Supply +	1	1
Supply -	3	3
Signal +	2	2
Contact 1	4	4
Contact 2	5	5
Shield	via pressure port	plug-housing / pressure port

Wiring diagram:



5. Commissioning

	Danger of death from airborne parts, leaking fluid, electric shock - Operate the device only within the specification! (according to data sheet)
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- ✓ The device has been installed properly.
- ✓ The device does not have any visible defect.

6. Operation

6.1 Control and display elements

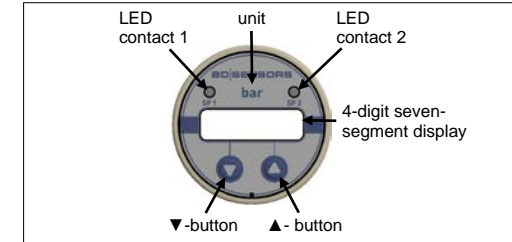


Fig. 5 Touch pad (example with two contacts)

The device has, according to the order max. two LEDs which are allocated to the resp. contacts. The LEDs will light up when the respective set point has been reached and the contact is active. The display of the measured value as well as the configuration of the individual parameters occurs menu-driven via the seven-segment display.

Button functions	
	<ul style="list-style-type: none"> • move forward in the menu system (beginning with menu 1) • increase the displayed value note: increase the counting speed by keeping the button pushed for more than 5 second
	<ul style="list-style-type: none"> • move backwards in the menu system (beginning with the last menu) • decrease the displayed value note: increase the counting speed: keep the button pushed for more than 5 second
	confirm the menu items and set values by pushing both buttons simultaneously

6.2 Configuration

The menu system is a closed system allowing you to scroll both forward and backward through the individual set-up menus to navigate to the desired setting item. All settings are permanently stored in an EEPROM and therefore available again even after disconnecting from the supply voltage. The structure of the menu system is the same for all types of devices, regardless of the number of contacts. However, they only differ by the number of menus. Following figure and the menu list shows all possible menus.

Please follow the manual meticulously and remember that changes of the adjustable parameters (switch-on point, switch-off point, etc.) become only effective after pushing both buttons simultaneously and leaving the menu item.

6.3 Password system

To avoid a configuration by unauthorized persons, the possibility is given to lock the device by an access protection. More information is given in menu 1 of the menu list.

6.4 Description of hysteresis and compare mode

To invert the respective modes, you have to exchange the values for the switch-on and switch-off points.

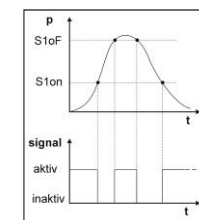


Fig. 6 Compare mode

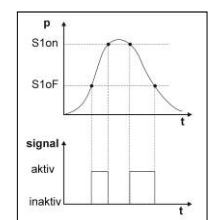


Fig. 7 Compare mode inverted

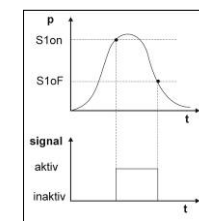


Fig. 8 Hysteresis mode

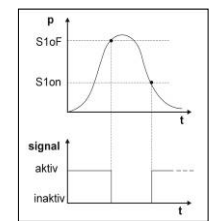


Fig. 9 Hysteresis mode inverted

