

**Operating Manual**



Electronic Pressure Switch DS 2XX

DS 200, DS 200 P, DS 201, DS 201 P, DS 202, DS 210, DS 217



DS 200

www.bdsensors.com

**Headquarter Western Europe / International**

BD SENSORS GmbH  
BD-Sensors-Str. 1  
D - 95199 Thiersheim  
Germany  
Tel: +49 (0) 92 35 / 98 11-0  
Fax: +49 (0) 92 35 / 98 11-11

**Headquarter Eastern Europe**

**Russia**  
BD SENSORS RUS  
Hraditskaja 817  
39a, Varshavskoe shosse  
CZ - 687 08 Buchlovce  
Czech Republic  
Tel: +42 (0) 572 / 4 11-0 11  
Tel: +7 (0) 9 59 81 / 09 63  
Fax: +42 (0) 572 / 4 11-4 97  
Fax: +7 (0) 9 57 95 / 07 21

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**1. General information**

**1.1 Information on the operating manual**  
This operating manual contains important information on proper usage of the device. Read this operating manual carefully before installing and starting up the pressure measuring device.

Adhere to the safety notes and operating instructions which are given in the operating manual. Additionally applicable regulations regarding occupational safety, accident prevention as well as national installation standards and engineering rules must be complied with!

This operating manual is part of the device, must be kept nearest its location, always accessible to all employees.

This operating manual is copyrighted. The contents of this operating manual reflect the version available at the time of printing. It has been issued to our best knowledge. However, errors may have occurred. BD SENSORS is not liable for any incorrect statements and their effects.

– Technical modifications reserved –

**1.2 Symbols used**

- ⚠ DANGER! – dangerous situation, which may result in death or serious injuries
- ⚠ WARNING! – potentially dangerous situation, which may result in death or serious injuries
- ⚠ CAUTION! – potentially dangerous situation, which may result in minor injuries
- ! CAUTION! – potentially dangerous situation, which may result in physical damage
- NOTE – tips and information to ensure a failure-free operation

**1.3 Target group**

⚠ WARNING! To avoid operator hazards and damages of the device, the following instructions have to be worked out by qualified technical personnel.

**1.4 Limitation of liability**

By non-observance of the operating manual, inappropriate use, modification or damage, no liability is assumed and warranty claims will be excluded.

**1.5 Intended use**

The electronic pressure switch DS 2XX has been developed, according to the type for applications, for absolute, vacuum and overpressure measurement. It is equipped with a 4-digit LED-display to show the current system pressure. Depending on the device and the mechanical connection it is suitable for various areas of use. It is the operator's responsibility to check and verify the suitability of the device for the intended application. If any doubts remain, please contact our sales department in order to ensure proper usage. BD SENSORS is not liable for any incorrect selections and their effects!

- Permissible media are gases or liquids, specified in the data sheet. In addition it has to be ensured, that this medium is compatible with the media wetted parts.
- The technical data listed in the current data sheet are engaging and must be complied with, if the data sheet is not available, please order or download it from our homepage. (<http://www.bdsensors.com/products/download/datasheets>)

⚠ WARNING! – Danger through improper usage!

**1.6 Package contents**

Please verify that all listed parts are undamaged included in the delivery and check for consistency specified in your order:

- electronic pressure switch, series DS 2XX (pre-assembled)
- mounting instructions

**2. Product identification**

The device can be identified by its manufacturing label. It provides the most important data. By the ordering code the product can be clearly identified. The programme version of the firmware, (e. g. P07) will appear for about 1 second in the display after starting up the device. Please hold it ready for inquiry calls.

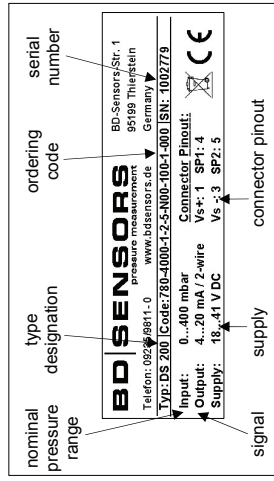


Fig. 1 manufacturing label

! The manufacturing label must not be removed from the device!

**3. Mechanical installation**

**3.1 Mounting and safety instructions**

⚠ WARNING! Install the device only when depressurized and currentless!

**3.2 General installation steps**

- Carefully remove the pressure measuring device from the package and dispose of the package properly.
- Go ahead as detailed in the specific instructions below.

**3.3 Installation steps for DIN 3852**

- Check to ensure the proper groove fitting of the o-ring and additionally to ensure no damage to the o-ring.
- Ensure that the sealing surface of the taking part is perfectly smooth and clean.
- Screw the device into the corresponding thread by hand.

- If you have a device with a knurled ring, the transmitter has to be screwed in by hand only.

- Devices with a spanner flat have to be tightened with an open-end wrench (wrench size of steel: G1/4", approx. 5 Nm; G1/2": approx. 10 Nm; G3/4": approx. 15 Nm; G1": approx. 20 Nm; wrench size of plastic: max. 3 Nm).

**3.4 Installation steps for EN 837**

- Use a suitable seal, corresponding to the medium and the pressure input (e. g. a cooper gasket).

- Ensure that the sealing surface of the taking part is perfectly smooth and clean.

- Screw the device into the corresponding thread by hand.

- Tighten it with a wrench (for G1/4": approx. 20 Nm; for G1/2": approx. 50 Nm).

**3.5 Installation steps for NPT**

- Use a suitable seal, corresponding to the medium and the pressure input (e. g. a PTFE-strip).

- Screw the device into the corresponding thread by hand.

- Tighten it with a wrench (for 1/4" NPT: approx. 30 Nm; for 1/2" NPT: approx. 70 Nm).

**3.6 Installation steps for dairy pipe**

- Check to ensure that the O-ring fits properly into the intended groove in the mounting part.

- Centre the dairy pipe connection in the counterpart.

- Screw the cup onto the mounting part.

- Then tighten it with a hook wrench.

**3.7 Installation steps for Clamp and Varivent®**

- Use a suitable seal corresponding to the medium and the pressure input.

- Put the seal onto the corresponding mounting part.

- Centre the Clamp or Varivent® connection on the fitting counterpart with seal.

- Then fit the device with a suitable fastening element (e. g. semi-ring or retractable ring clamp) according to the supplier's instructions.

**3.8 Positioning of the display module**

The display module is rotatable so that clear readability is guaranteed even on unusual installation positions. The display module can be turned as shown below.

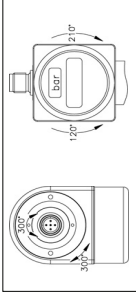


Fig. 2 display module

**4. Electrical installation**

⚠ WARNING! Install the device only when depressurized and currentless!

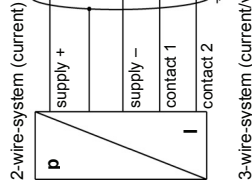
Establish the electrical connection of the device according to the technical data shown on the manufacturing label, the pin configuration and the wiring diagram.

**Pin configuration:**

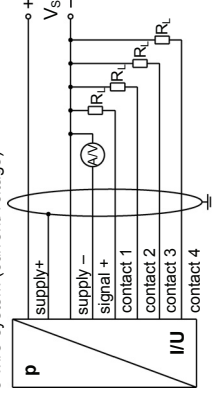
Electrical connections	M12x1 plastic (5-/8-pin)	M12x1 metal (5-pin)	ISO 4400	cable colours (DIN 47100)
Supply +	1	1	1	wh (white)
Supply -	3	3	2	br (brown)
3-wire: Signal +	2	2	3	gn (green)
Contact 1	4	4	3	gr (grey)
Contact 2	5	5	-	pn (pink)
Contact 3	6	-	-	-
Contact 4	7	-	-	-
Shield	via pressure port	plug-housing/pressure port	ground contact	gr/y (green/yellow)

\* for 8-pin plug

**Wiring diagrams:**



2-wire-system (current)



3-wire-system (current/voltage)

**I** For devices with cable gland as well as cable socket, you have to make sure that the external diameter of the used cable is within the allowed clamping range. Moreover you have to ensure that it lies in the cable gland firmly and cleftlessly!

! For the installation of a device with cable outlet following bending radiuses have to be complied with:

- cable without ventilation tube:  
static installation: 5-fold cable diameter  
dynamic application: 10-fold cable diameter

- cable with ventilation tube:  
static installation: 10-fold cable diameter  
dynamic application: 20-fold cable diameter

! Please note for devices with ISO 4400 plug and cable socket, that the socket has to be mounted properly to ensure the ingress protection mentioned in the data sheet. Please check if the delivered seal is placed between plug and cable socket. After connecting the cable fasten the cable socket on the device by using the screw.

! Prevent the damage or removal of the PTFE filter which is fixed over the end of the air tube on devices with cable outlet and integrated air tube.

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

! If a transition is desired from a transmitter cable with gauge tube to a cable without gauge tube, we recommend our terminal box KL 1 or KL 2.

**5. Initial start-up**

⚠ WARNING! Before start-up, the user has to check for proper installation and for any visible defects.

⚠ WARNING! The device can be started and operated by authorized personnel only, who have read and understood the operating manual!

⚠ WARNING! The device has to be used within the technical specifications, only! (check the technical data in the data sheet!)

**6. Operation**

**6.1 Operating and display elements**

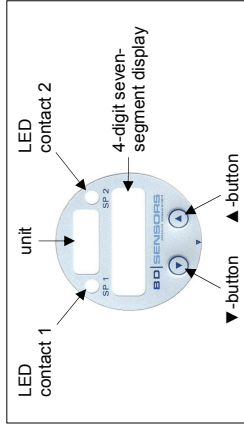


Fig. 3 touchpad for device with two contacts

The device has, according to the order max. four 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.

**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. On devices with 3-wire output 4 ... 20 mA and 0 ... 20 mA, the menus ZP and EP have special functions. The menu DP is not applied, as the decimal point is already factory set during production.

! 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 Configuration example of the analogue output for 4 ... 20 mA / 3-wire adjustable**

By the menus ZP and EP, the analogue output can be configured. In the following, the function of these menus shall be made clear by an example. Assuming you have a device with a nominal pressure range 0 ... 400 bar by factory the following performance is set:

0 bar = 4.00 mA    200 bar = 12.00 mA    400 bar = 20 mA

If you change the value in the menu ZP from 0 to 20 and the value in the menu EP from 400 to 300, the following performance will appear:

20 bar = 4.00 mA    160 bar = 12.00 mA    300 bar = 20 mA

! The values of ZP and EP are adjustable up to 1:5 of the nominal pressure range.

**6.5. 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.

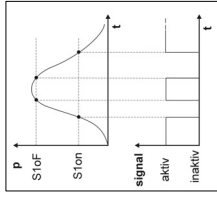


Fig. 4 compare mode inverted

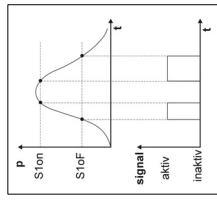


Fig. 5 compare mode

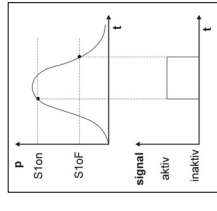


Fig. 6 hysteresis mode

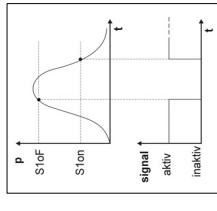


Fig. 7 hysteresis mode inverted

