EN

BD SENSORS® pressure measurement

Operating Manual CE

Electronic Pressure Switch DS 2XX

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

DS 200

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Table of contents

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. 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.
- 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 device has to be used only for this purpose, considering the following information.
- Devices with 3-A and / or EHEDG certified process connection have been developed especially for applications in food and pharmaceutical industry. The process connection is hygienic and can be sterilized.

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.

- 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, which are compatible with the media wetted parts described 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. If the data sheet is not available, please order or download it from our homepage. (http://www.bdsensors.com)

⚠ WARNING! – Danger through improper usage!

⚠ - 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.

⚠ - electronic pressure switch

⚠ - for mechanical pressure ports DIN 3852: O-Ring (premounted)

⚠ - mounting instructions or operating manual

1.6 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.

1.7 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 - 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 - 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.

1.8 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:

1.9 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.

1.10 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
- for mechanical pressure ports DIN 3852: o-ring (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.

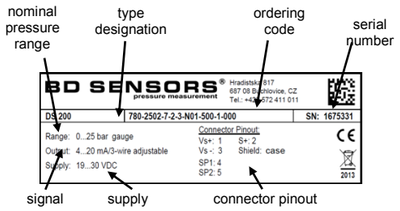


Fig. 1 manufacturing label

! 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!

⚠ WARNING! This device may only be installed by qualified technical personnel who has read and understood the operating manual!

Oxygen

⚠ DANGER! Explosion hazard, with devices for oxygen applications, when used improperly. To ensure a usage without danger, the following points must be adhered to:

- Make sure, your device has been ordered and delivered as a special version for oxygen applications. You can check the manufacturing label (see figure 1). If the ordering code ends with "007", then the device is suitable for oxygen applications.
- At time of delivery the device is packed into a plastic bag in order to prevent it from impurity. Please observe the indication label "Device for oxygen, unpack only directly before assembling". Also, avoid any skin contacts during unpacking and assembly, in order to prevent greasy residues on the device.
- During installation, the respective explosion protection regulations have to be met. Check, if ATEX-approval is necessary for this type (oxygen) device. (the delivered device has no ATEX-approval)
- Note the entire design requirements meet the standard demand of BAM (DIN 19247).
- For oxygen applications over 25 bar are recommended pressure transmitter without seals.
- Transmitters with o-rings of 70 EPDM 281: permissible maximum values: 15 bar/ 60° C and 10 bar/ 60 up to 90°C.
- Transmitters with o-rings of FKM Vi 567: permissible maximum values: 15 bar/ 60° C.

! Handle this high-sensitive electronic precision measuring device with care, both in packed and unpacked condition!

! There are no modifications/changes to be made on the device.

! Do not throw the package/device!

! To avoid damaging the diaphragm, remove packaging and protective cap only directly before starting up the device. A delivered protective cap must be stored!

! Place the protective cap on the pressure port again immediately after disassembling.

! Handle the unprotected diaphragm very carefully - it is very sensitive and may be easily damaged.

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

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

! The display and the plastic housing are equipped with rotational limiters. Please do only rotate the display or the housing within the limit.

! For installations outdoor and in damp areas following these instructions:

- To prevent moisture admission in the plug the device should be installed electrically after mounting, at once. Otherwise a moisture admission has to be blocked e.g. by using a suitable protection cap. (The ingress protection in the data sheet is valid for the connected device.)
- Choose an assembly position, which allows the flow-off of splashed water and condensation. Avoid permanent fluid at sealing surfaces!
- When using a cable gland device, turn the outgoing cable downwards. If the cable has to be turned upwards, then point it downward so the moisture can drain.
- Install the device in such a way that it is protected from direct solar irradiation. Direct solar irradiation can lead to the permissible operating temperature being overstepped in the worst case. By this the operability of the device can be affected or damaged. If the internal pressure increases due to solar irradiation, measurement errors may be caused.

! For devices with gauge reference in the housing (small hole next to the electrical connection), install the device in such a way, that the gauge reference is protected from dirt and moisture. Should the device be exposed to fluid admission, the functionality will be blocked by the gauge reference. An exact measurement in this condition is not possible. Furthermore this can lead to damages on the device.

☞ Take note that no inadmissibly high mechanical stresses occur at the pressure port as a result of the installation, since this may cause a shifting of the characteristic curve or to the demage. This is especially important for very small pressure ranges as well as for devices with a pressure port made of plastic.

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

☞ Provide a cooling line when using the device in steam piping.

☞ If installing the device outdoor and there is any danger of lightning or overpressure we suggest putting a overpressure protection unit between the supply/switch cabinet and the device to prevent damage.

☞ If the device is installed with the pressure connection up, it has to be made sure that no liquid drain off at the case. Humidity and dirt can block the relative cover in the case and it could lead to malfunctions through this. Dust and dirt must be removed from the edge of the thread connection of the electrical connection if required.

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

⚠ **DO NOT USE ANY ADDITIONAL SEALING MATERIALS, LIKE YARN, HEMP OR TEFLON TAPE!**

- 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. (R_Z 3.2)
- 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).
- **The indicated tightening torques must not be exceeded!**

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. (R_Z 6.3)
- 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).
- **The indicated tightening torques must not be exceeded!**

G1/4" EN 837	p ≤ 600 bar	Counterpart has to be of steel according to DIN 17440 with strength $R_{p0.2} \geq 190$ N/mm²
G1/2" EN 837	p ≤ 1000 bar	
G1/4" EN 837	p > 600 bar, p ≤ 1000 bar	Counterpart has to be of steel according to DIN 17440 with strength $R_{p0.2} \geq 260$ N/mm²
G1/2" EN 837	p > 1000 bar, p ≤ 1600 bar	

NOTE - Please refer to data sheet or contact sales department at BD SENSORS regarding max. permitted pressure of device.

3.5 Installation steps for NPT

- Use a suitable seal (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).
- **The indicated tightening torques must not be exceeded!**

3.6 Installation steps for dairy pipe

- Check to ensure that the O-ring fits properly into the intended groove in the mounting part.
- EHEDG conformity is only ensured in combination with an approved seal. This is e.g.:
- ASEPTO-STAR k-flex upgrade seal by Kieselmann GmbH
- Centre the dairy pipe connection in the counterpart.
- Screw the cup nut 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.
  EHEDG conformity is only ensured in combination with an approved seal. This is e.g.:
  for Clamp connections: T-ring seal from Combifit International B.V.
- for Varivent connections: EPDM-O-ring which is FDA-listed
- Note, that P40 can only be used for tank flanges.
- 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 Conditions for devices with 3-A symbol and / or EHEDG certificate

- The device or its connecting piece must be installed in such a way that the surfaces are self-draining (permissible installation position 273° … 87°).
- Make sure that the welding socket is mounted flush inside the tank.
- The user is responsible for:
- the correct size of the seal and the choice of an elastomeric sealing material that complies with the 3-A and / or EHEDG standard(s)
- an easy to clean installation position of the pressure switch with little dead space, as well as definition / verification / validation of a suitable cleaning process
- defining adequate service intervals

3.9 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.

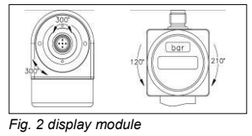


Fig. 2 display module

3.10 Conditions for devices, with EHEDG certificate

Install the device according to the requirements given in EHEDG Guidelines 8, 10 and 37. That is to mount the device in a self-draining orientation. The device should be installed flush to the process area. If mounting in a T-piece, the ratio between the depth of the upstand (L) and the diameter (D) of the upstand shall be L/D<1. If welded adapters are used, the food contact surface must be smooth, and the welding has to be done according to EHEDG Guideline 9 and 35. Suitable pipe couplings and process connections must be applied according to the EHEDG Position Paper. (List the available ones.)

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.

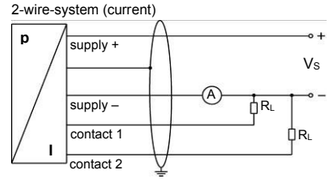
Pin configuration:

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	bn (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 [1]	-	-	-
Contact 4	7 [1]	-	-	-
Shield	via pressure port	plug-housing/ pressure port	ground contact	gn/ye (green/ yellow)

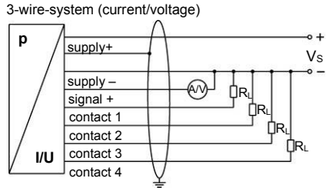
[1] for 8-pin plug

Wiring diagrams:

2-wire-system (current)



3-wire-system (current/voltage)



! 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

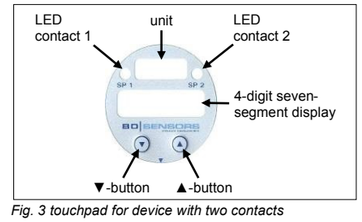


Fig. 3 touchpad for device with two contacts

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.

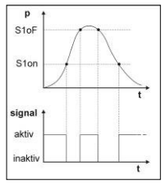


Fig. 4 compare mode inverted

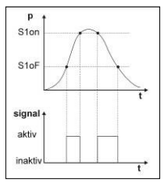


Fig. 5 compare mode

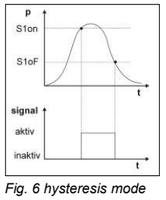


Fig. 6 hysteresis mode

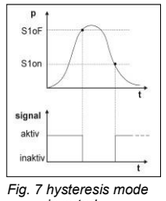


Fig. 7 hysteresis mode inverted

6.6. Structure of the menu system

standard 2-/3-wire-system (version P07)

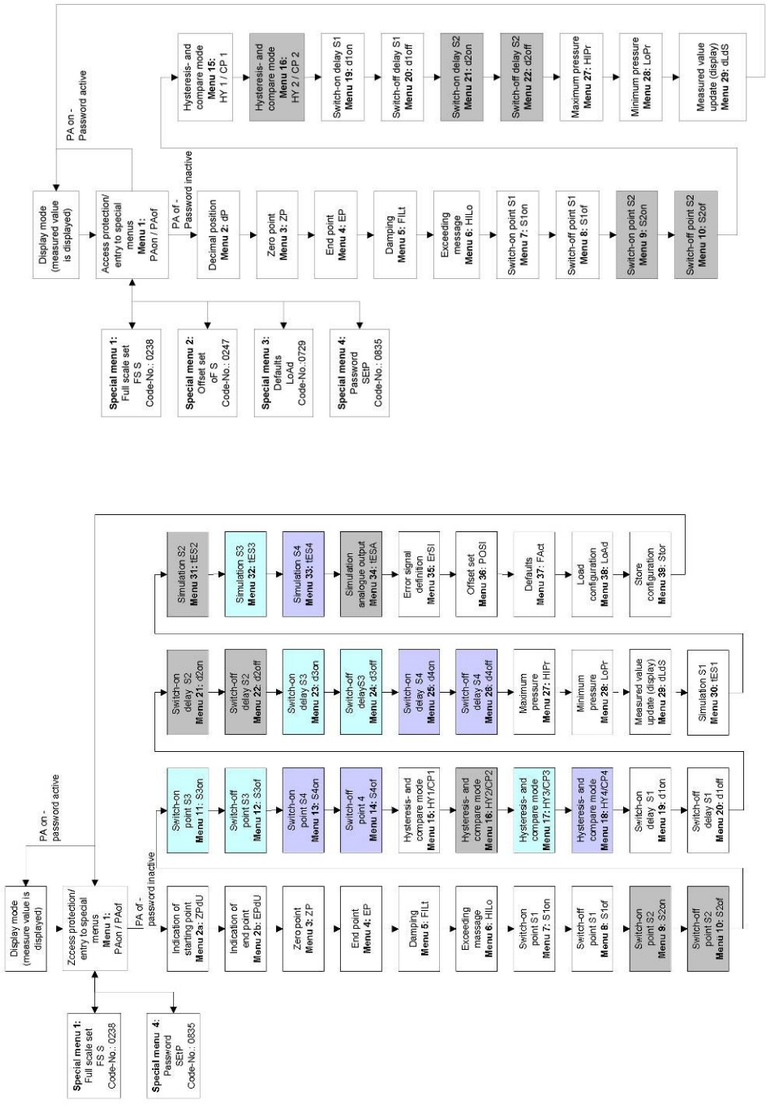
*4 … 20 mA / 3-wire adjustable (version P07)***6.7 Menu list**

- ▲-button: move in the menu system (forward) or increase the displayed value; it will also lead you to the operating mode (beginning with menu 1)
- ▼-button: move in the menu system (backward) or decrease the displayed value; it will also lead you to the operating mode (beginning with the last menu)
- both buttons simultaneously: confirm the menu items and set values

☞ to increase the counting speed, when setting the values: keeping the respective button pushed for more than 5 seconds

execution of configuration:

- set the desired menu item by pushing the ▲- or ▼-button
- activate the set menu item by pushing both buttons simultaneously
- set the desired value or select one of the offered settings by using the ▲- or ▼-button
- store/confirm the set value/selected setting and exit the menu by pushing both buttons simultaneously



PAon PAoF	**menu 1 – access protection** PAon ➔ password **active** ➔ to deactivate: set password PAof ➔ password **inactive** ➔ to activate: set password ☞default setting for the password is "0005"; modification of the password is described in special menu 4
dP	**menu 2 – set decimal point position** ☞for devices with 3-wire output 4 ... 20 mA and 0 ... 20 mA the decimal point was already set during production
zP EP	**menus 3 and 4 – set zero point / end point** the device has been configured correctly before delivery, so a later setting of a 2-wire device is only necessary, if a differing displayed value is desired (e. g. 0 ... 100 %) ☞For devices with 3-wire output 4 ... 20 mA and 0 ... 20 mA this menu has a different meaning: The configuration of the zero point causes a changing of the analogue output, whereas the display value remains unchanged. (zero and end point can be configured within the limits of the nominal pressure range, according to the manufacturing label); for more information see "5.4 Configuration example of the analogue output for 3-wire-devices"
FiLt	**menu 5 – set damping** this function allows getting a constant display value although the measuring values may vary considerably; the time constant for a simulated low-pass filter can be set (0.3 up to 30 sec permissible)
HiLo	**menu 6 – exceeding message** set "on" or "off"
S1on	**menus 7, 9, 11 and 13 – set switch-on points** set the particular values, for the activation of contact 1 (S1on) up to 4 (S4on)
S1oF	**menus 8, 10, 12 and 14 – set switch-off points** set the particular values, for the deactivation of contact 1 (S1oF) up to 4 (S4oF)
HY 1 CP 1	**menus 15 up to 18 – select hysteresis or compare mode** select the hysteresis mode (HY 1 up to HY 4) or compare mode (CP 1 up to CP 4) for the contacts 1 up to 4 (no. corresponds to the contact) ☞compare "6.5. Description of hysteresis and compare mode"
d1on	**menus 19, 21, 23 and 25 – set switch-on delay** set the particular value of the switch-on delay after reaching contact 1 (d1on) up to 4 (d4on) (0 up to 100 sec permissible)
d1oF	**menus 20, 22, 24 and 26 – set switch-off delay** set the particular value of the delay after reaching the switch-of point 1 (d1oF) up to 4 (d4oF) (0 up to 100 sec permissible)
HIPr LoPr	**menus 27 and 28 – maximum / minimum pressure display** view high pressure (HIPr) or low pressure (LoPr) during the measurement process (the value will not remain stored if the power supply is interrupted) ☞to erase: push both buttons again within one second
dUdS	**menu 29– measured value update (display)** set the length of the update cycles for the display (0.0 up to 10 sec permissible)
tES1	**menus 30 up to 33 – simulate contacts (only 4 … 20 mA / 3-wire adjustable)** with the ▲- or ▼-button the contacts 1 (tES1) up to 4 (tES4) can be activated or deactivated
tESA	**menu 34 – simulate analogue output (only 4 … 20 mA / 3-wire adjustable)** select one of the following settings: "oi 4" (4 mA or 2 V), "oi12" (12 mA or 6 V) and "oi20" (20 mA or 10 V)
Er5	**menu 35 – error signal definition (only 4 … 20 mA / 3-wire adjustable)** set the desired error signal (this is given out in case of a defect); permissible settings are "OFF" (no error signal output), "C 0" (0 mA or 0 V), "C L0" (3.5 mA or 1.75 V) and "C HI" (23 mA or 11.5 V) ☞an output of the error signal is only given when menu 6 is set on "on"
POSI	**menu 36 –offset compensation / position correction (only 4 … 20 mA / 3-wire adjustable)** confirm menu item "POSI"; if offset ≠ ambient pressure it is necessary to place the device under pressure pended on mounting position (pressure reference has to corresponding to the zero point of the pressure measuring range); push both buttons; "oF I" will be appeared in the display; push both buttons; in the display "Pro2" will be appeared; push both buttons; in the display "o" will be appeared; now the reference value can be inputted by using both buttons; the reference value is for instance 5% (-0.2bar) of metering range: -1 … 15 bar; insert 5 (5%) by using both buttons; then push both buttons; in the display "oF5" will be appeared; accordingly the right and stable pressure (see instance -0.2bar) must be fed. If the measured value shown in the display is a wrong value, the operating sequence must be retreated. ☞a position correction is necessary, if the installation position differs from the calibration position (otherwise this can cause a little deviation of the signal, which gives a wrong value indication) ☞the analogue output signal (for devices with analogue output) is not affected by this change; when displacing the offset, the full scale will also be displaced
FAct	**menu 37 – load defaults (only 4 … 20 mA / 3-wire adjustable)** to load the defaults, push both buttons simultaneously, after confirming the menu item ☞any changes carried out will be reset (password will be set on "0005")
LoAd	**menu 38 – load configuration (only 4 … 20 mA / 3-wire adjustable)** to load a stored configuration (via menu 39), set the desired number 1 up to 5
Stor	**menu 39 – store configuration (only 4 … 20 mA / 3-wire adjustable)** to store a configuration, set the desired number 1 up to 5
special menus	(to access a special menu, select the menu item "PAof" with the ▲- or ▼-button and confirm it; "1" appears in the display)
FS S	**special menu 1 – full scale compensation** for full scale compensation, which is necessary if the indicated value for full scale differs from the real full scale value in the application; a compensation is only possible with a respective reference source, if the deviation of the measured value is within defined limits; set "0238"; confirm with both buttons; "FS S" will appear in the display; now it is necessary to place the device under pressure (the pressure must correspond to the end point of the pressure measuring range); push both buttons, to store the signal being emitted from the pressure switch as full scale; in the display the set end point will appear although the full scale sensor signal is displaced. ☞the analogue output signal (for devices with analogue output) is not affected by this change
oF S	**special menu 2 – offset compensation / position correction (not with 4 … 20 mA / 3-wire adjustable)** set "0247"; the menu description is identical with menu "POSI" (menu 36) for 3-wire-devices
LoAd	**special menu 3 – load defaults (not with 4 … 20 mA / 3-wire adjustable)** set "0729"; the menu description is identical with menu "FAct" (menu 37) for 3-wire-devices
SEtP	**special menu 4 – set password** set "0835"; confirm with both buttons; "SEtP" appears in the display; set the password using the ▲- or ▼-button (0 ... 9999 are permissible, the code numbers 0238, 0247, 0729, 0835 are exempt); confirm the password by pushing both buttons simultaneously

7. Placing out of service

⚠ WARNING! When dismantling the device, it must always be done in the depressurized and currentless condition! Check also if the medium has to be drained off before dismantling!

⚠ WARNING! Depending on the medium, it may cause danger for the user. Comply therefore with adequate precautions for purification.

During the cleaning processes, note the compatibility of

8. Maintenance

In principle, this device is maintenance-free. If desired, the housing of the device can be cleaned when switched of using a damp cloth and non-aggressive cleaning solutions.

With certain media, however, the diaphragm may be polluted or coated with deposit. It is recommended to define corresponding service intervals for control. After placing the device out of service correctly, the diaphragm can usually be cleaned carefully with a non-aggressive cleaning solution and a soft brush or sponge. If the diaphragm is calcified, it is recommended to send the device to BD SENSORS for decalcification. Please read therefore the chapter "Service/Repair" below.

the cleaning media used in combination with the media-wetted materials of the pressure measuring devices. Permissible concentrations and temperatures must be observed. Verification/ validation by the user is essential.

⚠ Deposits or contamination may occur on the diaphragm/ pressure port in case of certain media. Depending on kind and quality of the process, suitable cyclical maintenance intervals must be specified by the operator. As part of this, regular checks must be carried out regarding corrosion, damage of diaphragm/seal(s) and signal shift. A periodical replacement of the seal(s) may be necessary.

! An incorrect cleaning can cause irreparable damages on diaphragm. Never use spiky objects or pressured air for cleaning the diaphragm.

For EHEDG certified devices in tanks, the cleaning device must be positioned in such a way that the sensor is directly assessed and wetted for cleaning. The device has been developed for Cleaning in Place (CIP) applications and must not be dismantled for cleaning.

9. Service / Repair

9.1 Recalibration

During the life-time of the device, the value of offset and span may shift. As a consequence, a deviating signal value in reference to the nominal pressure range starting point or end point may be transmitted. If one of these two phenomena occurs after prolonged use, a recalibration is recommended to ensure furthermore high accuracy.

9.2 Return

Before every return of your device, whether for recalibration, decalcification, modifications or repair, it has to be cleaned carefully and packed shatter-proofed. You have to enclose a notice of return with detailed defect description when sending the device. If your device came in contact with harmful substances, a declaration of decontamination is additionally required. Appropriate forms can be downloaded from our homepage **www.bdsensors.com**. Should you dispatch a device without a declaration of decontamination and if there are any doubts in our service department regarding the used medium, repair will not be started until an acceptable declaration is sent.

⚠ **If the device came in contact with hazardous substances, certain precautions have to be complied with for purification!**

10. Disposal

The device must be disposed according to the European Directives 2002/96/EC and 2003/108/EC (on waste electrical and electronic equipment). Waste of electrical and electronic equipment may not be disposed by domestic refuse!

⚠ WARNING! Depending on the measuring medium, deposit on the device may cause danger for the user and the environment. Comply with adequate precautions for purification and dispose of it properly.

11. Warranty conditions

The warranty conditions are subject to the legal warranty period of 24 months from the date of delivery. In case of improper use, modifications of or damages to the device, we do not accept warranty claims. Damaged diaphragms will also not be accepted. Furthermore, defects due to normal wear are not subject to warranty services.

12. Declaration of conformity / CE

The delivered device fulfils all legal requirements. The applied directives, harmonised standards and documents are listed in the EC declaration of conformity, which is available online at: http://www.bdsensors.com/download/certificates. Additionally, the operational safety is confirmed by the CE sign on the manufacturing label.