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BD|SENSORS
pressure measurement

Operating Manual

optionally:

x|act i

74-

Precision Pressure Transmitter x|act ci and x|act i

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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 and national installation standards 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 precision pressure transmitters have been especially developed for food industry, pharmacy and biotechnology. The pressure transmitters are configurable via integrated display and operating module as standard. Optionally the device offers HART®-communication.
- It is the operator's responsibility to check and verify the suitability of the device for the intended application. In addition, it has to be ensured, that the medium is compatible with the media wetted parts. 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!
- 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)

⚠ WARNING! Danger through improper usage!

1.6 Package contents

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

- precision pressure transmitter
- for mechanical pressure ports DIN 3852: o-ring (premounted)
- mounting instructions

1.7 UL – Approval

The UL – Approval was done with respect to U.S. standards norms which also correspond with the applicable Canadian standards norms for safety.

Note the following points, so that devices fulfils the demands of UL approval:

- The transmitter shall be supplied by Limited Energy Source (per UL 61010) or NEC Class 2 Power Source.
- maximum operating voltage: see technical data

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.

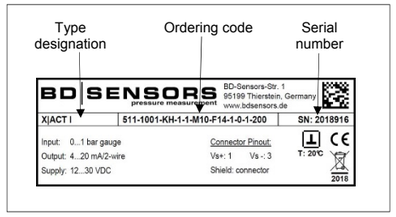


Fig. 1 manufacturing label

! 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!

! 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 directly before starting assembly. The delivered protective cap has to 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.

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

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

- Please note that your application does not show a dew point, which causes condensation and can damage the pressure transmitter. There are specially protected pressure transmitters for these operating conditions. Please contact us in such case.
- 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 the way, so it is protected from sunrays. Direct sunrays can in the worst case, lead to overheating which affects or damages the functionality of the device. Furthermore an internal increase of pressure, can lead to temporary measurement errors.

☞ When installing the device to the pressurized system, the operator has to ensure the correct sealing.

☞ Check the intended resp. delivered seal for compatibility with the medium. If there is no compatibility, take a suitable seal.

☞ 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 there is any danger of damage by lightning or overpressure when the device is installed outdoor, we suggest putting a sufficiently dimensioned overpressure protection between the supply or switch cabinet and the device.

3.2 Conditions for Devices with 3-A symbol

! The device or its connecting piece must be installed in such a way that the surfaces are self-draining.

! 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 standard
- defining adequate service intervals

3.3 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.

3.4 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.
- Devices with a spanner flat have to be tightened with an open-end wrench (wrench size of steel: G1/2": approx. 10 Nm; G1": approx. 20 Nm; G1 1/2": approx. 25 Nm; wrench size of plastic: max. 3 Nm).
- **The indicated tightening torques must not be exceeded!**

3.5 Installation steps for G1" cone

- Screw the device into the corresponding thread by hand. (metallic sealing)
- Tighten the devices with an open-end wrench (P_N < 10 bar: 30 Nm; $P_N \geq$ 10 bar: 60 Nm).

3.6 Installation steps for dairy pipe connections

- 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 nut onto the mounting part.
- Then tighten it with a hook wrench.

3.7 Installation steps for Clamp and Varivent® connections

☞ Note the chapter "3.2 Conditions for devices with 3-A symbol"

- 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 Installation steps for DRD and connecting flanges

- Use a suitable seal corresponding to the medium and pressure input. (e.g. a fiber gasket).
- Put the seal between connecting flange and counter flange.
- Install the device with 4 resp. 8 screws (depending on flange version) on the counter flange.

3.9 Positioning of the display and operating module

The display and operating module is continuously rotatable so that clear readability is guaranteed even in unusual installation positions. To change the position, go ahead as follows:

- Unscrew the metal cap by hand.
- Rotate the display and operating module carefully by hand into the desired position. The module is equipped with a turning limiter.
- Before screwing on the cap again, the o-ring and sealing surfaces of the housing have to be checked for damage and if necessary have to be changed!
- Afterwards screw the metal cap on by hand and make sure that the housing is firmly locked again.

! Pay attention that no moisture can enter the device. Moreover, the seals and the sealing surfaces should not get dirty, as this may cause a reduction of the degree of protection depending on the case of application or place of installation. This can lead to a breakdown of the devices or to irreparable damages on the device!

4. Electrical Installation

⚠ WARNING! Install the device in currentless environments only!

⚠ The supply must correspond to the safety class II (protective insulation)!

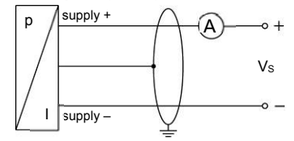
Establish the electrical connection of the device according to the technical data shown on the manufacturing label, the following table and the wiring diagram.

Pin configuration:

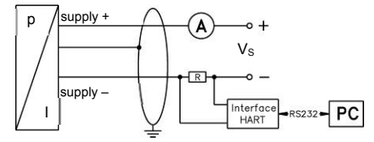
Electrical connections	M12x1 (4-pin)	cable colours (DIN 47100)
Supply +	1	wh (white)
Supply –	3	bn (brown)
Shield	plug housing	gn/ye (green / yellow)

Wiring diagrams:

2-wire-system (current)



2-wire-system (current) HART®



! Make sure that the supply corresponds to protection class III (protective insulation).

! 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

! 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. Route the end of the cable into an area or suitable connection box which is as dry as possible and free from aggressive gases, in order to prevent any damage.

☞ For the electrical connection a shielded and twisted multicore cable has to be used.

☞ 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. HART®-communication (optionally)

The analogue output signal is overridden by an additional signal according to the HART®-specification. The device can be configured via a HART®-communication device. Therefore, we suggest our programming kit CIS 150 (available as accessory). It consists of HART®-modem, connecting cables as well as configuration software and allows a simple and time-saving configuration of all parameters. (The software is compatible with all Windows®-systems from Windows 98 and higher.)

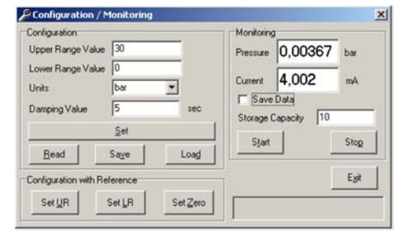


Fig. 2 configurationsoftware

To ensure a trouble-free operation the following requirements should be fulfilled:

maximal cable length between device and power supply:

$$L_{max} = \frac{65 \cdot 10^6}{R_V \cdot C_V} - \frac{40 \cdot 10^3}{C_V}$$

whereas L_{max}: maximum length of cable in [m]
R_V: resistance of the cable together with the load resistance in [Ω]
C_V: capacity of the cable in [pF/m]

resistance R:

$$R = \frac{U - 12}{0.024}\ \Omega$$

whereas U: power supply in [V_{DC}]

The resistance must be at least 240 Ω.

6. 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 (compare the data in the data sheet)!

7. Operation

7.1 Display and operating module

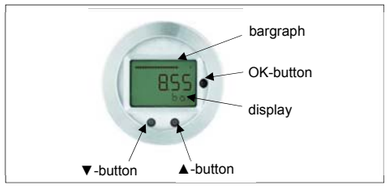


Fig. 3 touch pad

A bar graph is shown in the display, which indicates the applied pressure as a percentage of the measuring range. The display of the measured value and the configuration of the individual parameters is performed through the menu, via the display. The individual functions can be set by means of three buttons arranged under the cap. The three buttons are assigned from the left: ▼, OK, ▲.

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 a Flash EPROM and therefore available again even after disconnecting from the supply voltage.

! Pay attention that no moisture can enter the device during configuration. Moreover, the seals and the sealing surfaces should not get dirty, as this may cause a reduction of the degree of protection depending on the case of application or place of installation. This can lead to a breakdown of the device or to irreparable damages on the device. Right after configuration, the metal cap has to be screwed on again, by hand.

7.2 Structure of the menu system

Please note additionally the "Supplementary sheet to operating manual for x|act ci, xlact i, XMP ci, XMP i, XMD".

- **▲-button:** with this button you move forward in the menu system or increase the displayed value; it will also lead you to the operating mode (beginning with menu item "1 DISPLAY")
- **▼-button:** with this button you move back in the menu system or decrease the displayed value; it will also lead you to the operating mode (beginning with menu item "5 SERVICE")
- **OK-button:** with this button menu items and set values have to be confirmed

execution of configuration:

- set the desired menu item by pushing the ▲- or ▼-button
- activate the set menu item by pushing the OK-button
- 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 the OK-button.

☞ If a parameter is configurable by a value, each digit may be configured separately. That means after activating such a menu item (e. g. "2.3.1 OFFSET") by pushing the OK-button, the first digit of the currently set value will start to blink. Now scroll up or down to the desired digit via the ▼- or ▲-button and confirm it with the OK-button. After that, the next digit will start to blink. Configure it in the same way. In the menu items "2.3.1 OFFSET" and "2.3.2 FINALVAL", the decimal point will then start to blink, and it is also possible to change its position by using the ▼- or ▲-button. By confirming the position with the OK-button, the total value will be stored if permissible. If the value is out of range, an error message (e. g. Error 03) will appear in the display and the set value will **not** be stored.

If you intend to set a negative value, the first digit has to be configured with the ▼-button.

7.3 Menu list

1 DIPLAY	Display parameter
1.1 P_{max}	**Maximum pressure display (high pressure)** The maximum pressure that occurred during the measurement is shown on the display.
1.2 P_{min}	**Minimum pressure display (low pressure)** The minimum pressure that occurred during the measurement is shown on the display.
1.3 T_{max}	**Maximum temperature display (high temperature)** The maximum temperature that occurred during the measurement is shown on the display.
1.4 T_{min}	**Minimum temperature display (low temperature)** The minimum temperature that occurred during the measurement is shown on the display.
1.5 CLEAR	Delete the values 1.1-1.4 (P_{max}, P_{min}, T_{max}, T_{min})
1.6 INFO	**Configuration of the display** Assignment of the settable digits "1": 1st line: measured pressure — 2nd set pressure unit "2": 1st line: Output signal — 2nd line: mA "3": 1st line: measured temperature — 2nd line: °C "4": 1st line: measured pressure — 2nd line: Change between pressure unit / output signal in mA "5": 1st line: measured pressure — 2nd line: Change between pressure unit / temperature in °C" "6": 1st line: measured pressure — 2nd line: Change between pressure unit / output signal in mA / temperature in °C
1.7 RETURN	**Return to menu 1 DISPLAY**
2 CALIB	**Configuration of measuring range, display and output signal**
2.1 ZERO	**Zeroing the display** The message “CONFIRM” appears on the display when selecting the subsidiary menu item with the OK button. By holding the OK button pressed for at least 2 seconds the zeroing is performed, and the message “CONFIRM” disappears from the display.
2.2 CAL REF	**Adjusts the analogue output with pressure reference**
2.2.1 OFFSET	**Adjusts the starting value for the output signal** After the reference pressure has been applied and accepted, selecting the subsidiary menu item with the OK button causes the message "CONFIRM" to appear on the display. By holding the OK button pressed for at least 2 seconds the applied pressure is specified as the starting value for the output signal (4 mA), and the message "CONFIRM" disappears from the display. The displayed value remains unchanged.
2.2.2 FINALVAL	**Adjusts the end value for the output signal** After the reference pressure has been applied and accepted, selecting the subsidiary menu item with the OK button causes the message "CONFIRM" to appear on the display. By holding the OK button pressed for at least 2 seconds the applied pressure is specified as the end value for the output signal (20 mA), and the message "CONFIRM" disappears from the display. The displayed value remains unchanged.
2.2.3 RETURN	**Return to menu 2.2 CAL REF**
2.3 ADJUST	**Sets the measuring range and the zero point**
2.3.1 OFFSET	**Sets the starting value of the measuring range** The ▲ and ▼ buttons allow you to define a starting value for the measuring range. The permitted input range is between 0 … 90% of the original measuring range (turn down max. 1:10). 4 mA is output when the value that has been entered is reached.
2.3.2 FINALVAL	**Sets the end value of the measuring range** The ▲ and ▼ buttons allow you to define an end value for the measuring range. The permitted input range is between 10 … 100% of the original measuring range (turn down max. 1:10). 20 mA is output when the value that has been entered is reached.
2.3.3 Z-CORR	**Zero-point correction of the display and output signal** The message "CONFIRM" appears on the display when selecting the subsidiary menu item with the OK button. By holding the OK button pressed for at least 2 seconds the applied pressure is specified as the starting value for the output signal (4 mA), and the display is zeroed. The message "CONFIRM" disappears from the display.
2.3.4 RETURN	**Return to menu 2.2 CAL REF**
2.4 RETURN	**Return to menu 2 CALIB**
3 SIGNAL	**Signal parameters**
3.1 FUNKTION	**Function selection** "LINEAR" (linear function) “2SQR” $y = \sqrt{x}$ “2SQR3POW” $y = \sqrt{x^3}$ “2SQR5POW” $y = \sqrt{x^5}$ } cut off 2 %
3.2 DENSITY	**Input of the density** settable range: 100 … 9999 kg/m³ Conversion is only applicable to the units [mFH], [cmFH] and [mmFH].
3.3 DAMP	**Configuration of the damping** settable range: 0 … 100 s
3.4 SIMULAT	**Simulation of the output signal** settable range: any, for example: 3.7 ... 22 mA
3.5 RETURN	**Return to menu 3 SIGNAL**
4 SETTINGS	**Basic settings**
4.1 DISPLAY	**Configuration of the display unit**
4.1.1 UNIT P	**Configuration of the unit for pressure** Units: bar, mbar, g/cm², kg/cm², Pa, kPa, Torr, atm, mmWS (mm H20), mmHg, PSI, mFH*, cmFH*, mmFH* The conversion of all pressure-related parameters is performed automatically. *Input of the density is required. (see 3.2)
4.1.2 UNIT T	**Configuration of the unit for temperature** Units: °C and °F
4.1.3 RETURN	**Return to menu 4.1 DISPLAY**
4.2 HART-ID	**HART-ID (only to be set with HART® devices in multi-drop mode)** Set the desired ID no. (between "0" and "15") and confirm this with the OK button. It is only necessary to configure this number if you want to operate the device in multi-drop mode (connection of a number of HART® devices). If the ID no. is set to "0", the multi-drop mode is deactivated, and the measurement transducer operates in analogue mode.
4.3 USER-L	**Configuration of the user's security level** For security reasons it is necessary to enter the password before configuring the security level. Confirm this with the OK button. The password is factory-set to "0000". Security levels: "0": the whole menu system is enabled "1": the following menu items are enabled: 1 Display, 3 Signal, 4.3 USER-L "2": the following menu items are enabled: 1 Display, 4.3 USER-L
4.4 PASSWORD	**Configuration of the password** For security reasons it is necessary to enter the previous password before configuration. Confirm this with the OK button. The password is factory-set to "0000". Then set the new password and confirm this with the OK button. If you have forgotten your password, you can request the master password, which is fixed at manufacture, from BD SENSORS.
4.5 LANGUAGE	**Selection of DE or EN as the user language**
4.6 WPROTECT	**Write protection (HART®-configuration)** Setting YES: write protection is activated, transmission of the HART® commands to the storage location is not possible. Setting NO: write protection is deactivated.
4.7 RETURN	**Return to menu 4 SETTINGS**
5 SERVICE	**Service**
5.1 FACTORY	**Reset to factory settings**
5.2 ERR CURR	**Definition of the current** settable values: 21.6 mA or 3.8 mA; the selected error current is output in response to a malfunction in the electronics
5.3 TYPE	**Display of the device type**
5.4 SER-NO	**Display of the set serial number**
5.5 VERS	**Display of the program version**
5.6 RETURN	**Return to menu 5 SERVICE**
6 RETURN	**Return to display mode**

8. Error handling

8.1 Error messages

PASSED PARAMETER TOO SMALL	entered parameter value is too small
PASSED PARAMETER TOO LARGE	entered parameter value is too large
LOOP CURRENT NOT ACTIVE	loop current is not active (HART ID > 0, device works in Multidrop mode)
APPLIED PROCESS TOO LOW	applied process is too low
APPLIED PROCESS TOO HIGH	applied process is too high
LOWER RANGE VALUE TOO HIGH	lower range value (OFFSET) is too high
LOWER RANGE VALUE TOO LOW	lower range value (OFFSET) is too low
UPPER RANGE VALUE TOO HIGH	upper range value (FINALVAL) is too high
UPPER RANGE VALUE TOO LOW	upper range value (FINALVAL) is too low
SPAN TOO SMALL	span too small
DEVICE MALFUNCT	internal failure → please send the device to BD SENSORS for repair

8.2 More errors and possible corrections

Malfunction	Possible cause	Error detection / corrective
display does not work	falsely connected	inspect the connections
	line break	inspect all connecting lines of the device (including the connector plugs)
	defective energy supply	inspect the power supply and the applied supply voltage at the transmitter
no output signal	wrong connected	inspect the connection
	line break	inspect all line connections necessary to supply the device (including the connector plugs)
	defective amperemeter (signal input)	inspect the amperemeter (fine-wire fuse) or the analogue input of the PLC
analogue output signal too low	load resistance too high	verify the value of the load resistance
	supply voltage too low	verify the output voltage of the power supply
	defective energy supply	inspect the power supply and the applied supply voltage at the device
small shift of output signal	diaphragm is highly contaminated	careful cleaning with non-aggressive cleaning solution and a soft brush or sponge; incorrect cleaning can cause irreparable damages on diaphragm or seals
	diaphragm is calcified or coated with deposit	if possible, it is recommended to send the device to BD SENSORS for decalcification or cleaning
large shift of output signal	diaphragm is damaged (caused by overpressure or manually)	check the diaphragm; if it is damaged, please send the device to BD SENSORS for repair
measured value (display and analogue output) deviates from the nominal value	high pressure / pressure peaks	a recalibrated or replaced of the pressure port by BD SENSORS is necessary
	mechanical damage to diaphragm	
constant output signal at 4 mA	wrong ID-number	ensure in the menu item "ID" that the set value for the ID-number is "0000"

If you detect an error, please try to eliminate it by using this table or send the device to our service address for repair.

! Improper action and opening can damage the device. Therefore, repairs on the device may only be executed by the manufacturer!

9. Placing out of service

⚠ WARNING! Disassemble the device only in current and pressure less condition! Check before disassembly, if it is necessary to drained off the media before dismantling!

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

10. Maintenance

If necessary, clean the housing of the device using a moist cloth and a non-aggressive cleaning solution.

The cleaning medium for the media wetted parts (pressure port/ diaphragm/seal) may be gases or liquids which are compatible with the selected materials.

Permitted cleaning temperature for flush mounted 3A / EHEDG certified pressure ports:

acids / bases: max. 70 ° C
steam: max. 150 ° C / 60 min

Deposits or contamination may occur on the diaphragm/ pressure port in case of certain media. Depending on the quality of the process, suitable maintenance intervals must be specified by the operator. As part of this, regular checks must be carried out regarding corrosion, damage to the diaphragm and signal shift.

If the diaphragm is calcified, it is recommended to send the device to BD SENSORS for decalcification. Please note the chapter “Service/Repair” below.

! Wrong cleaning or improper touch may cause an irreparable damage on the diaphragm. Therefore, never use pointed objects or pressured air for cleaning the diaphragm.

11. Service / Repair

11.1 Recalibration

During the life-time of a transmitter, 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.

11.2 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!

12. Disposal

The device must be disposed of according to the European Directive 2012/19/EU (waste electrical and electronic equipment). It is prohibited to place electrical and electronic equipment in 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.

13. 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.

14. 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.
Additionally, the operational safety is confirmed by the CE sign on the manufacturing label.

Notes: