1. General information

1.1 Information on the operating manual

This operating manual contains important information on proper usage of the device. Read the 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.

1.2 Symbols used

DANGER! – dangerous situation, which may result in death or serious injuries

WARNING! – 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 pressure transmitter DMP/DMP and OEM-pressure transmitter have, according to the type, been developed for applications in overpressure and vacuum as well as for absolute pressure measurement. The screw-in transmitters LMK/LMP have been particularly developed for level and process measurement. 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.

1.6 Package contents

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

- pressure transmitter or screw-in transmitter
- for mechanical pressure ports DIN 3852: o-ring
( pre-assembled)
- mounting instructions

1.7 UL – Approval (for devices with UL-identification)

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

Note the following points, so that devices fulfills 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.

Nominal Type Ordering code Serial pressure designation number range

<table>
<thead>
<tr>
<th>Signal Supply</th>
<th>Connector pinout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fig. 1 manufacturing label-example</td>
<td></td>
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</table>

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! When used improperly, special versions of devices suitable for oxygen applications may explode! To avoid damaging the diaphragm, remove packaging and protective cap directly before starting assembly. The delivered protective cap has to be stored!

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

If 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, a high vital medium residue remains 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:

- 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 for outlet 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, a high vital medium residue remains 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 damage. 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 upwards (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 installing a properly dimensioned overpressure protection between the supply or switch cabinet and the device.

- 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 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, TIRE, YARN, HEMP OR TEPFON 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 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; G1 1/2": approx. 25 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 PTFE-strip).
- Ensure that the sealing surface of the taking part is perfectly smooth and clean (Ra 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!

3.9 Installation steps for Clamp and Varivent
- Use a suitable seal corresponding to the medium and the signal. Note the tightening torques.
- Then tighten it with a hook wrench.
- Screw the cup nut onto the mounting part.
- Put the seal between connecting flange and counterpart with seal.
- Screw the device into the corresponding thread by hand.
- Use a suitable seal (e.g. a PTFE-strip).
- Tighten it with a wrench (for 1/4" NPT: approx. 30 Nm; for 3-wire-system: max. 10 Nm).
- Screw the device into the corresponding thread by hand and make sure that the field housing is firmly locked again.
- Prevent the damage or removal of the PTFE filter which is fixed over the end of the air tube on devices with cable outlet following the technical data shown on the manufacturing label, the technical data shown on the manufacturing label, and in the data sheet.
- Please check if the delivered seal is placed between plug and cable socket. After connecting the cable to the device, the PTFE filter is screwed on again, the O-ring and the sealing surface of the O-ring and the seal on the housing have to be checked for damages and then tightened with a max. 10 Nm.
- On devices with field housings, the terminal clamps are situated under the metal cap. To install the device electrically, the cap must be screwed off. Before the cover is screwed on again, the O-ring and the sealing surface on the housing have to be checked for damages and if necessary to be changed! Afterwards screw the metal cap on by hand and make sure the field housing is firmly locked again.

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

Electrical Wiring
- 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 completely.

3.6 Installation steps for flare
- Cut the end at right angle to the piping and remove all internal and external burrs.
- Make the flare; depending on the usage, the device has to be tightened with max. 10 Nm.
- The indicated tightening torques must not be exceeded!

3.7 Installation steps for internal threads M20x1.5 and M12x1 / 4
- Screw the device into the corresponding thread by hand.
- Use a suitable seal (e.g. a PTFE-strip).
- Tighten it with a wrench (for 1/4" NPT: approx. 30 Nm; for 3-wire-system: approx. 70 Nm).
- The indicated tightening torques must not be exceeded!

3.8 Installation steps for cable outlet
- Check to ensure that the O-ring fits properly into the intended groove in the mounting part.
- Center the cable outlet connection in the counterpart.
- Screw the cup nut onto the mounting part.
- Then tighten it with a hook wrench.

3.10 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.
- Center the Clamp or Varivent connection on the flaring counterpart with seal.
- Then fit the device with a suitable fastening element (e.g. semi-ring or retractable ring clip) according to the supplier’s instructions.

5. Initial start-up
4. Wiring Diagram
- 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.

4. Electrical Installation
- The device has to be used within the technical data shown on the manufacturing label, the technical data shown on the manufacturing label, and in the data sheet.
- The transmitter shall be supplied by Limited Energy Source (per UL 61010) or NEC Class 2 Power Source.

Devices with an accuracy of 0.1 % FSO have micro- controlled electronics for processing and improving the signal. Principally, the processing takes more time as for analogue transmitters, which have only one amplifier. To this longer response time, the output signal follows the measured value discontinuously. For nearly stable measured values, this characteristic is secondary. Please compare the specification of the response time in the data sheet.

Intelligent devices with optional communication interfaces can also be configured by these electronics. Offset, span and damping are programmable within the limits given in the data sheet. For configuring the device, the programming kit CLIN 510 consisting of Adapter 1, Windows® compatible programming software P-Scale 510, power supply and connecting cable is necessary. This can be ordered additionally from BD SENSORS.

6. Placing out of service
- WARNING! Disassemble the device only in current and pressure less condition! Check before disassembly, if it is necessary to drain off the media before dismantling!
- WARNING! Depending on the medium, it may cause danger for the user. Comply therefore with adequate precautions for purification.

7. Maintenance
- In principle, this device is maintenance-free. If desired, the housing of the device can be cleaned using a damp cloth and non-aggressive cleaning solutions, in switched-off state. With certain media, however, the diaphragm may be polluted or coated with deposit. It is recommended to define corresponding cleaning procedures. 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 calibrated, it is recommended to send the device to BD SENSORS for decalification. Please note the chapter “Service/Repair” below.

A false cleaning of the device can cause an irreparable damage on the diaphragm. Therefore never use pressurized objects or pressurised air for cleaning the diaphragm.

8. Service / Repair
- 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 value can be observed and the warning point may be transmitted. If one of these two phenomena occurs after prolonged use, a recalibration is recommended to ensure furthermore high accuracy.

9. Return
- Before every return of your device, whether for recalibration, decalification, modifications or repair, it has to be cleaned carefully and packed shatter-proof. 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. Warranty conditions
- The warranty conditions are subject to the legal warranty period of 12 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.

11. Declaration of conformity / CE
- The delivered device fulfills all legal requirements. The applied directives, harmonised standards and documents are listed in the EC declaration of conformity, which is available online at: www.bdsensors.com.

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