1. General and Safety-Related Information on this Operating Manual

This operating manual contains safety and health instructions on the product and the user. It shall be read carefully by the use of the product. It shall be read by all participants, including maintenance staff.

1.1 Symbols Used

- **WARNING** - Must be considered in connection with this operating manual.
- **DANGER** - Must be considered in connection with this operating manual.
- **NOTE** - Must be considered in connection with this operating manual.
- **CAUTION** - Must be considered in connection with this operating manual.
- **NOTICE** - Must be considered in connection with this operating manual.

**Type and source of danger**

**Measures to avoid the danger**

**WARNING**

- Immediate danger - Non-compliance will result in death or serious injury.
- Possible danger - Non-compliance may result in death or serious injury.
- Cautionary situation - Non-compliance may result in minor or moderate injury.

**NOTE** - Drawing attention to a possible hazardous situation that may result in property damage in case of non-compliance.

1.2 Staff Qualification

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

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

- They know the safety concept of the metering and automation technology and are familiar therewith as project staff.
- They are operating staff of the metering and automation technology and have been instructed in the handling of the systems. They are familiar with the operation of the device and the instructions described in this documentation.
- They are maintenance specialists or are employed in the service department and have completed training that qualifies them for the repair of the system. In addition, they are authorized to perform operations on the equipment, and to mark circuits and devices according to the safety engineering standards.

All work with the product must be carried out by qualified persons.

1.3 Intended Use

The device is used to convert the physical parameter of pressure into an electric signal.

The device is not intended for use in the pressure range beyond the limit of the equipment.

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1.4 Limitation of Liability and Warranty

Failure to observe the instructions of the technical regulations and use not intended is not covered by the warranty or liability claims.

1.5 Safe Handling

**NOTE** - Do not use any force when installing the device to prevent damaging the device and the joint.

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

**NOTE** - The device must not be altered or modified in any way.

**NOTE** - Do not throw or drop the device!

**NOTE** - The device must be protected against dust and moisture.

**WARNING** - Extreme care must be taken when handling the device. Residual hazards may originate from the device if it is damaged.

1.6 Scope of Delivery

Check all parts listed in the scope of delivery are included in the order and have been delivered according to your purchase order.

- Pressure transmitter
- Mounting instructions

2. Product Identification

The device can be identified by its manufacturing label. It provides the most important data. By the reading code the product can be clearly identified.

<table>
<thead>
<tr>
<th>Type designation</th>
<th>Ordering code</th>
<th>Serial number</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP 1/- 1/0 1.454</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Mounting

3.1 Mounting and Safety Instructions

**WARNING**

- Precaution of an action

**DANGER**

- Immediate danger - Non-compliance will result in death or serious injury.
- Possible danger - Non-compliance may result in death or serious injury.
- Cautionary situation - Non-compliance may result in minor or moderate injury.

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

- Precaution of an action

1.6 Safety instructions

- Immediate danger - Non-compliance will result in death or serious injury.
- Possible danger - Non-compliance may result in death or serious injury.
- Cautionary situation - Non-compliance may result in minor or moderate injury.

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

1.6.1 Mounting

This means that the device is mounted in a de-energized condition.

**DANGER**

- Mounting instructions must be performed by appropriately-qualified persons who have read and understood the user manual.

**NOTE** - If there is increased risk of damage to the device by handling, debris or overvoltage, increased lightning protection must additionally be provided.

**NOTE** - Do not remove the packaging or protective caps of the device until before the mounting procedure, in order to exclude any damage to the diaphragm and the threads! Protective caps must be kept! Dispose of the packaging according to the applicable waste disposal instructions.

**NOTE** - Fasten any unprotected diaphragm with utmost care; the housing can be damaged very easily.

**NOTE** - Provide a cooling time when using the device in steam lines.

**NOTE** - When installing the device, avoid high mechanical/thermal loads in the port! The device is not a part of the mechanical/thermal connection curve or to position.

**NOTE** - Ensure that the device is in a position such that the pressure point port up (ventilation).

**NOTE** - The specified tightening torques must not be exceeded!

**NOTE** - If the device is mounted with the pressure port upward, ensure that the leakage test does not drain off the device. This could result in humidity and dirt blocking the gauge reference in the housing and could lead to malfunctions. It is useful, dust and dirt must be removed from the edge of the screwed joint of the device, thereby ensuring a hermetic seal.

**NOTE** - When using cable terminations, use the appropriate hosing or clamping parts. Note: The hosing must fit the diameter of the cable! Maximum clamping diameters are listed in the data sheet.

**NOTE** - For mounting systems or in a melt.

- Please note that your application does not show a dew point, which causes condensation and can damage the pressure transmitter. There are especially protected pressure transmitters for these operating conditions. Please contact us in such cases.

- Correct any electrical withstand strength when mounting or prevent moisture penetration, e.g. by a suitable protective cap.

- The protection classification specified on the device must be matched to the connected device.

- Select a suitable coupling nut and tighten it with clamping torque. Stationary liquid on shielding surfaces must be excluded!

- If the device has a cable outlet, the outgoing cable must be mated due to the threaded nut. The cable outlet must be properly secured. Condensed water can drain off. Stationary liquid on shielding surfaces must be excluded!

- When the cable outlet is used, ensure that the pressure transmitter.

3.2 Mounting Steps for Internal Threads M20x1.5 and 9/16 UNF

1. Remove the plug (socket), which supplies the device.

2. Then tighten it using an open-end wrench. The required tightening torque depends on the manufacturer!

3. Mounting

3.3 Mounting Steps for Internal Threads M20x1.5 and 9/16 UNF

1. Pull the plug assembly out of the housing carefully and hold it non-tensioned.

2. When removing the plug assembly ensure that the device is disassembled and the connected device is cleaned otherwise.

3. Electrical Connection

4.1 Connection and Safety Instructions

**DANGER**

- The supply corresponds to the protection class I (insulating protective equipment).

**NOTE** - For the electrical connection a shielded twisted pair of cables is recommended.

**NOTE** - If the device is equipped with plug IP 40 or IP 65 in a field housing, it must be ensured that the external diameter of the used cable is within the permissible clamping range:

- Cable socket ISO 4405: ø ≤ 6 mm
- Cable socket ISO 4405: ø ≤ 8 mm
- Cable socket ISO 4405: ø ≤ 10 mm
- Cable socket ISO 4405: ø ≤ 12 mm
- Cable socket ISO 4405: ø ≤ 16 mm

**NOTE** - For the magnetic field housing, the terminal clamps are situated under the metal cap. To install the device, the cable must be capped beforehand. Before the cap is inserted, ensure that the cable outlet is aligned with the terminal clamps and that the cable is firmly secured. Make sure that the field housing is firmly locked again.

**NOTE** - For devices with cable outlet

- When using cable terminations, use the appropriate hosing or clamping parts. Note: The hosing must fit the diameter of the cable!

**NOTE** - The device is operated within the specification.

4.2 Electrical Installation

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

**NOTE** - After the installation it is recommended to adjust the offset of the pressure transmitter (see chapter 5.2 offset and span adjustment).

Pin configuration:

- Supply + (80+) calibration + (80+) calibration \(- (80-)\)
- Communication 4-pin calibration + (80+) calibration + (80+)
- Communication 5-pin calibration + (80+)
- Power supply 3-wire-system (voltage)
- Power supply 3-wire-system (current)

Wiring diagram:

- 3-wire-system (current)
- 3-wire-system (voltage)

5. Commissioning

**DANGER**

- The device has been installed properly.
- The device has not been placed in operation.

**NOTE** - By the adjustment of offset and / or span the device has to be opened. Therefore, this only may be done by persons who have appropriate knowledge and experience in this sector and who are familiar with the danger of this.

Preparation for 4-20 mA, 2-wire:

1. Remove the plug (socket), which supplies the device.

2. Loosen the pinch grip by turning it carefully clockwise, by hand.

3. Pull the plug assembly out of the housing carefully and test it for non-function.

**NOTE** - Take note, when pulling down the plug assembly no short circuit can arise.

**NOTE** - When removing the plug assembly ensure that the device is in a de-energized condition. The magnetic field housing is not accessible to the electronics in the device, via contacts. Do not pull on the contacts or limit them but do not damage any electronic components.

In the device the circuit board is placed. The connectors are marked with "2" (offset) and "3" (span) on the copper sheet.

**DANGER**

- Do not test the device with the field housing open.

**NOTE** - You are responsible for the precision of the adjustment.

**WARNING**

- In order to avoid accidents, the device must be operated in accordance with its intended use.

**DANGER**

- Do not use the device for any other purpose than the intended use.

**WARNING**

- In order to avoid accidents, use the device only in accordance with its intended use.
Configuration of offset and / or span:

You have the possibility to change the output signal within the following limits.

<table>
<thead>
<tr>
<th>configuration (offset / range)</th>
<th>input signal</th>
<th>output signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>± 20 mA / 0 ... 10 V</td>
<td>± 0.8 mA</td>
<td>± 0.5 V</td>
</tr>
<tr>
<td>± 10 mA / 0 ... 5 V</td>
<td>± 0.8 mA</td>
<td>± 0.5 V</td>
</tr>
</tbody>
</table>

No negative voltage possible

With the potentiometers offset and / or span of the transmitter can be adjusted. Please take the position of the resp. potentiometer from figures 2 and 3.

Go ahead as follows:

1. Connect a multimeter to the device to control the electrical output signal during configuration.
2. Then the transmitter has to be supplied again.
3. Turn the screw of the respective potentiometer carefully by a screw driver until the desired value is given off by the multimeter.

**NOTE:** Use for the configuration a dressmaker screwdriver 0.5 mm.

**DANGER:** For the configuration of span and for an offset with a value differing from 0 it is necessary to press the device by using a pressure reference. This pressure must correspond to the offset signal for the offset configuration or to the span signal for the span configuration. The reference pressure for the span signal must correspond to the indicated nominal pressure of the transmitter. Note that for adjustment in vacuum the corresponding pressure must be on the device.

4. The plug which supplies the device during the configuration must be disconnected.
5. After that the device has to be fitted again according to the following description and installed electrically.

**Final step for 0 ... 10 V / 3-wire:**
Close the lock screw(s) and tighten it properly.

**Final step for 4 ... 20 mA / 2-wire:**
1. Replace the plug assembly.

**NOTE:** By replacing the plug assembly take care that it is not damaged and becomes skewed or damaged.
2. Ensure the right position of the seal and tighten the grip on the device again clockwise by hand.

6. Maintenance

**DANGER**

- Always switch off the transmitter in case of maintenance, e.g. cleaning, maintenance or repair.

**WARNING**

- Check for loose connectors and terminals.

**DANGER of injury from abrasive parts, baking fluids, electric shock:**
- Always switch off the transmitter in case of maintenance, e.g. cleaning, maintenance or repair.

**WARNING of injury from aggressive fluids or pollutants:**
- Always switch off the transmitter in case of maintenance, e.g. cleaning, maintenance or repair.

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

The cleaning medium for the stainless steel parts (pressure port / diaphragm / filter) may be gases or liquids which are compatible with the relevant components and also cleaning the permissible temperature range according to the data sheet.

In case of malfunction, it must be checked whether the device has been correctly installed mechanically and electrically. Use the following table to analyze the cause and resolve the malfunction, if possible.

**Fault - no output signal**

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Fault detection / remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fault in electronics</td>
<td>Checking of contacts of the power supply</td>
</tr>
<tr>
<td>Conductor / wire breakage</td>
<td>Checking of all connections</td>
</tr>
<tr>
<td>Defective measuring device (signal input)</td>
<td>Checking of the power supply and the power supply being applied to the device</td>
</tr>
</tbody>
</table>

**Fault - output signal too low**

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Fault detection / remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage too low</td>
<td>Checking of power supply</td>
</tr>
<tr>
<td>Defective energy supply</td>
<td>Checking of power supply</td>
</tr>
</tbody>
</table>

**Fault - output signal too high**

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Fault detection / remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load resistance too high</td>
<td>Checking of load resistance of the transmitter</td>
</tr>
</tbody>
</table>

**Fault - static signal**

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Fault detection / remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defective measuring device (signal input)</td>
<td>Checking of the power supply and the power supply being applied to the device</td>
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</table>

**Fault - output signal ranges**

<table>
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<td>Checking of the power supply and the power supply being applied to the device</td>
</tr>
</tbody>
</table>

8. Removal from Service

**DANGER of death from airborne parts, baking fluids, electric shock:**
- Disconnect the device in a de-energized and de-energized condition.

**WARNING of injury from aggressive fluids or pollutants:**
- Depending on the measured medium, this may constitute a danger to the operator.
- Wear suitable protective clothing e.g. gloves, goggles.

**NOTICE:** After dismantling, mechanical connections must be filled with protective caps.

9. Service/Repair

**Information on service / repair:**
- www.bd-sensors.com
- info@bd-sensors.de
- service-phone: +49 (0) 92 35 / 98 11 0

**9.1 Recallation**

During the file-time of a transmitter, the value of offset and span may shift. As a consequence, a deviating signal value in relevance 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 further high accuracy.

**9.2 Return**

**WARNING of injury from aggressive fluids or pollutants:**
- Depending on the measured medium, this may constitute a danger to the operator.
- Wear suitable protective clothing e.g. gloves, goggles.

Before every return of your device, whether for recalibration, decontamination, modifications or repair, it has to be cleaned carefully and packed shock-proof. You have to enclose a notice of return with detailed defect description when sending the device. In case of decontamination substances, a declaration of decontamination is additionally required.

Appropriate forms can be downloaded from our homepage. Download these by accessing www.bd-sensors.com or request them.

info@bd-sensors.de | phone: +49 (0) 92 35 / 98 11 0

10. Disposal

**WARNING of injury from aggressive fluids or pollutants:**
- Depending on the measured medium, this may constitute a danger to the operator.
- Wear suitable protective clothing e.g. gloves, goggles.

The device must be disposed of according to the European Directive 2012/19/EU (waste electrical and electronic equipment). Waste equipment must not be disposed of in household waste!

11. Warranty Terms

The warranty terms are subject to the legal warranty period of 24 months, valid from the date of delivery. If the device is used improperly, modified or damaged, we will rule out any warranty claim. A damaged diaphragm will not be accepted as a warranty claim. Likewise, should there be no entitlement to service or partschanger “Service-Repair” below. In case of doubt regarding the fluid used, devices without a declaration of decontamination will only be examined after receipt of an appropriate declaration!

**“Service-Repair”**

*BD|SENSORS for repair*

BD|SENSORS for repair

info@bd-sensors.de | phone: +49 (0) 92 35 / 98 11 0

In case of doubt regarding the fluid used, devices without a declaration of decontamination will only be examined after receipt of an appropriate declaration!

12. EU Declaration of Conformity / CE

The delivered device fulfils all legal requirements. The applied directives, harmonized standards and documents are listed in the certificate of conformity, which is available online at: http://www.bd-sensors.com.

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