

OPERATING INSTRUCTIONS SERIES 050 B





Notes / comments

Device type _____

Serial number: _____

TAG number: _____

Measuring range: _____

Operating location: _____

Device delivered on: ____/____/____

Next calibration on: ____/____/____

Date: ____/____/____ Signature: _____

	<p>Please use this space for your own notes or comments. For example, you can enter the TAG numbers of the device, to which these operating instructions belong. Furthermore, you can specify details such as device settings or reminders of service intervals.</p>
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1 Explanation of the notes and warnings

	Information	<i>Information</i> can be used to facilitate or explain operation.
	Warning	<i>Warnings</i> point to important criteria required for smooth and safe operation.
	Attention	Notes marked with <i>Attention</i> require absolute compliance. Failure to do so could result in damage to the device.
	Do not touch	The injunction <i>Do not touch</i> , requires absolute compliance. Failure to do so could result in irreparable damage to the device.
	Protect against moisture	<i>Protect against moisture</i> indicates that contact with moisture could result in damage to the device or its components, thus exercising a negative influence on the operation.
	Electrostatic danger	<i>Electrostatic danger</i> points to the fact that the device or its components could suffer irreparable damage from electrostatic discharge.
	Magnetically sensitive	<i>Magnetically sensitive</i> points to the fact that placement of the device in electromagnetic fields can subject its operation to a negative influence.
	Caution heat	<i>Caution heat</i> is a warning of personal injury from burns or scalds
	Caution cold	<i>Caution cold</i> is a warning of personal injury from cold burns or freezing
	Explosive atmosphere	<i>Explosive atmosphere</i> refers to the operation of the device in areas with an increased danger of explosion.
	Caution overpressure	<i>Caution overpressure</i> gives warning of situations presenting an increased danger of injury from pressurised components.
	Caution corrosive	<i>Caution corrosive</i> points to the danger of injury from aggressive media.
	Caution electricity	<i>Caution electricity</i> points to the danger of an electric shock from live components.
	Open cautiously	<i>Open cautiously</i> warns against unintended damage of interior parts from sharp objects.



2 Symbols used in this manual

	Status LED off	The status LED in the device interior is off. It displays neither green nor red
	Status LED illuminates green	The status LED in the device head interior illuminates green. The duration of illumination is constant and uninterrupted.
	Status LED flashes green	The status LED in the device head interior flashes green. The frequency of flashing is c. 2Hz
	Status LED illuminates red	The status LED in the device head interior illuminates red. The duration of illumination is constant and uninterrupted.
	Status LED flashes red	The status LED in the device head interior flashes red. The frequency of flashing is c. 2Hz
	The status LED flashes red/green alternately	The status LED in the device head flashes red/green alternately. The frequency of flashing of every colour is c. 6Hz
	⊖ key	This symbol represents the key in the device head with the following designation: ⊖.
	⊕ key	This symbol represents the key in the device head with the following designation: ⊕.
	⊕ and ⊖ keys	This symbol represents the combination of the keys in the device head ⊕ and ⊖.
	Press the ⊖ key	The ⊖ key in the device head is depressed.
	Press the ⊕ key	The ⊕ key in the device head is depressed.
	Press the ⊕ and ⊖ keys	The ⊕ and ⊖ keys in the interior of the device head are pressed simultaneously.
	Release the ⊖ key	The ⊖ key in the interior of the device head is released after single depression.
	Release the ⊕ key	The ⊕ key in the interior of the device head is released after single depression.
	Release the ⊕ and ⊖ keys	The ⊕ and ⊖ keys in the interior of the device head are released after simultaneous depression.
	Waiting time	The clock indicates that the device is working internally, necessitating a waiting time.



3 Important notes

3.1 Intended use

The pressure transmitters of the 050D series are designed for measuring the process pressure of aggressive and non-aggressive gases, vapours and fluids. Depending on the construction of the device, the transmitter can be used for measuring both absolute and relative pressures.

	The manufacturer cannot assume any liability for damage due to any other kind of use or the incorrect use of the devices. If in doubt, please contact the manufacturer with regard to the suitability of the device for your specific application before its installation.
	The device is <u>not</u> intended for operation in an explosive atmosphere.

Please read these operating instructions carefully before commissioning the devices. If you have questions, please contact the manufacturer's technical department.

The manufacturer can be contacted under the following address:

<p style="text-align: center;">Hengesbach Prozessmesstechnik GmbH & Co. KG Schimmelbuschstr. 17 40699 Erkrath</p> <p style="text-align: center;">GERMANY</p> <p style="text-align: center;">Tel.: +49 (0) 2104 3032 – 0 Fax: +49 (0) 2104 3032 – 22</p> <p style="text-align: center;">www.hengesbach.com</p> <p style="text-align: center;">info@hengesbach.com service@hengesbach.com</p>

3.2 Assembly, commissioning and operation of the device

The transmitter has been manufactured according to state-of-the-art technical knowledge and complies with all relevant guidelines for it to be safely operated.

The assembly, connection, commissioning, operation and service of the device should always be carried out by qualified personnel. Personnel who are carrying out the above tasks must have been authorised by the plant operator.

This document is to be kept in a location accessible to all the persons who need it. A further copy is available from the manufacturer or can be downloaded from their homepage.



4 Commissioning

The commissioning process enables you to parametrise the transmitter with only a few actions. The empty and full adjustment enable setting the thresholds of 4 und 20mA . The wavelet set lies between these two thresholds. This is represented by the transmitter by a 16mA loop current linear to the process.



When making the adjustment, ensure that the (under) pressure lies within the max. permissible threshold for the transmitter.

4.1 Setting the measuring range begin (empty adjustment)

Use the empty adjustment to set the start of the transmitter measuring range. To this end, apply the desired (under) pressure to the transmitter / filling level and hold the \ominus key depressed. Whilst continuing to hold the key depressed, the status LED will extinguish and then after c. 5 s will illuminate green permanently. You can release the key - the transmitter has saved the pressure value as the new measuring range begin and issues a 4mA signal.



Hold the \ominus key depressed



Status LED extinguishes



Initialisation phase (5s)



Status LED illuminates green



Release the \ominus key

4.2 Setting the end of the measuring range (full adjustment)

Use the full adjustment to set the transmitter measuring range end. To this end, apply the desired (under) pressure to the transmitter / filling level and hold the \oplus key depressed. Whilst continuing to hold the key depressed, the status LED will illuminate and then after c. 5 s will continue to illuminate green. You can release the key - the transmitter has saved the pressure value as the new measuring range end and issues a 20mA signal.



Hold the \oplus key depressed



Status LED extinguishes



Initialisation phase (5s)



Status LED illuminates green



Release the \oplus key

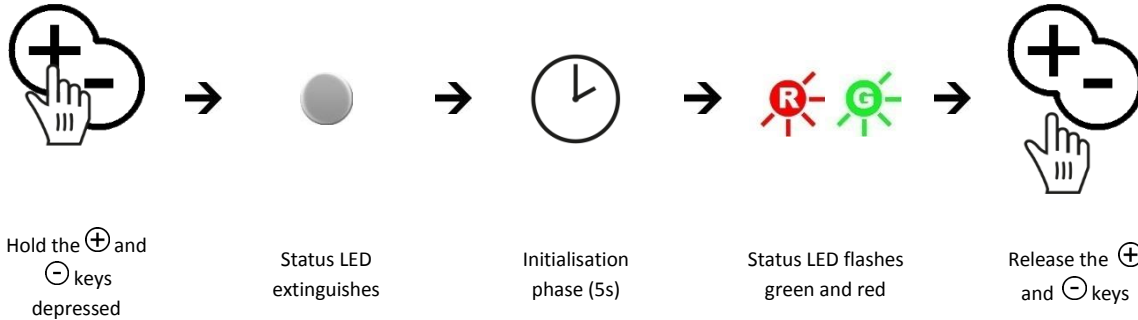


If the status LED illuminates **red** after extinguishing, the transmitter is not able to process the current (under) pressure for the empty or full adjustment. In this case, check whether the measuring range is smaller than 25% of the nominal measuring range. Before adjusting, it may be necessary to restore the factory settings, so that threshold values already set can be reset to their origin.



4.3 Restoring factory settings

Resetting the factory settings returns the device to its delivery state. Hold the \oplus and \ominus key depressed simultaneously. Whilst continuing to hold the keys depressed, the status LED extinguishes and then after c. 5 s will alternate between green and red. This signals that the reset of the factory settings has been successful. You can release the keys - the transmitter will continue with the factory settings.



4.4 Reading the status LED in measuring mode

The status LED in the device head interior provides information as to which operating area the process (and thus the device) currently finds itself. In addition to the analogue output current, it issues optical feedback regarding current operation. The following flash patterns and their significance are explained here:

	Status LED illuminates green	The current process pressure is located within the operating thresholds set for the transmitter. The output current is proportional to the measuring value. The transmitter is in its optimum transducer mode.
	Status LED flashes green	The current process pressure is located outside the operating thresholds set for the transmitter. The transmitter has left its optimum working area. The output current still follows the measurement signal in a linear fashion.
	Status LED flashes red	The process pressure has exceeded or is below the set measuring threshold so that the output current is already restricted. The current is either 3.8mA or 21mA, depending on whether the pressure has been exceeded or undercut.
	Status LED illuminates red	Device malfunction or damage. The process pressure can no longer be measured or could be faulty. The output current is held at 22mA in order to signal the transmitter outage.

	The transmitter allows a shortfall of -1.25% (3.8mA) of the measuring range set and excess of +6.25% (21mA). The output signal is linear to the process pressure within these thresholds. Outside these thresholds, the transmitter begins current limitation.
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5 Opening the outer packaging

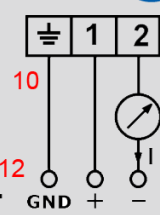
To avoid damaging the parcel, please read the following information before opening the outside packaging.

	Exercise care when using sharp objects to cut open the packaging - you could destroy the components inside.
	Avoid all contact with the sensor membrane. Depending on the design of the device, it is protected with a protective cover. This is only to be removed immediately before fitting the transmitter. Contact with the membrane can result in irreparable damage to the device.
	Please protect the contents of the shipment until its commissioning and the check of the moisture-proof status of the screw connections.

Check that the goods are correct, undamaged and complete. Compare the details on the delivery note with the contents of the shipment received. Please notify the manufacturer of any discrepancies.

6 Identifying the device

The following figures show a transmitter type plate (example) and the meaning of the information on the type plates. Compare the information on the transmitter type plate with the specifications from the delivery note and the order data. In the case of discrepancies, the data on the type plate is binding. In such a case, contact the manufacturer.

<p>1 PZM050D_1bar_KT1</p> <p>range: 2 0...1bar, P_{max}: 3 3bar</p> <p>adj. range: 4 0...800mbar, TD 4:1 5</p> <p>output: 6 4...20mA, 2-wire 7</p> <p>supply: 8 12...30V DC</p> <p>serial-no.: 12345.1.12345678.0114 13</p> <p>Made in Germany 11</p> <p>Hengesbach GmbH & Co. KG • 40699 Erkrath • Tel. +49 (0) 2104 / 30 32-0</p> <p>9 T_{amb}: -40...+85°C</p>  <p>10 GND 1 + 2 -</p> <p>www.hengesbach.com</p>	<p>1: Device designation</p> <p>2: Maximum measuring range</p> <p>3: Overload protection</p> <p>4: Set measuring range</p> <p>5: Turn down ratio</p> <p>6: Output signal</p> <p>7: Connection type</p> <p>8: Supply voltage</p> <p>9: Ambient temperature</p> <p>10: Electrical connection</p> <p>11: Manufacturing location</p> <p>12: Serial number</p> <p>13: Serial number as bar code</p>
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7 Assembly information

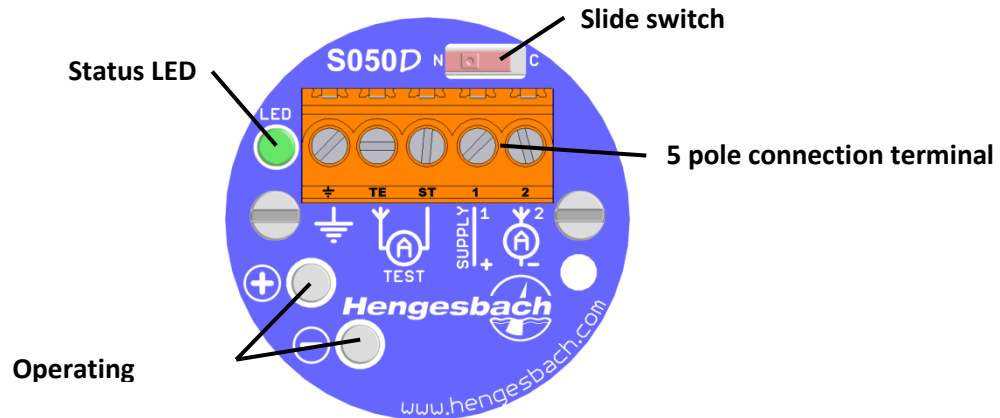
Please observe the following device assembly notes. This information serves your own safety and guarantees smooth installation and low-maintenance and reliable operation of your transmitter.

	The plant must be returned to the ambient pressure before assembly. Failure to do so brings the danger of flying parts or the sudden release of gases or other media.
	Before assembly, ensure that the locations affected does not become too hot for working without danger. Allow the surfaces and attachments to cool before assembly.
	Continue to be aware of the danger of cold burns on strongly-cooled system components. Ensure that you can work without danger.
	Ensure that you do not come into contact with aggressive residual media remaining in the plant during assembly.
	Make sure that the potential equalisation between the transmitter and plant is facilitated. In this respect, please also read the section regarding the electrical connections of the device.
	Do not remove the protective cover from the measuring cell during the assembly preparations. Only remove the cover shortly before installing the transmitter. Make sure that you don't touch the membrane during the installation.
	The device manufacturer recommends that device openings such as ventilation openings should point downwards during the installation if possible. This way, in the event that process media make the device wet, its blockage by highly viscose or drying substances is avoided.
	The device should be installed in a low-vibration location and with some distance to larger plants and strong electrical fields if possible.
	Make sure that the process connection with the plant has a tight fit and no medium leaks from the connection point. For this purpose, use a seal which is suited for your specific process, and pay special attention to its suitability for the process temperature and compatibility with the medium.
	Tighten the transmitter with the torque that is suitable for your process connection. If in doubt, please contact the manufacturer. Under certain circumstances, metal screw connections damaged by improper installation may not be able to be loosened without causing problems.
	If the provided reference cable is used, please observe a minimum bending radius of the cable of 120 mm. Protect the cable against the ingress of moisture by making sure that it ends inside a dry room.



8 The connection and operating elements in the device head

The electrical connection, the operation elements for parametrising, a status LED and a converter for selecting normal measuring operation and the integrated calibration function are all located in the housing head. The following elements are marked:



5 pole connection terminal

The 5-pole connection terminal is used to establish the electrical connection. At the same time, it serves the continuous tapping of the loop current. A mobile process calibrator can be connected to the connection terminal without needing to disconnect the power supply to control. Additionally, potential equalisation to the control unit can be made via the terminal.

Slide switch

The slide switch can be used to switch the transmitter from normal measuring operation and the calibration function. It enables power supply of the device from a further source.

Status LED

The status LED provides information about the current measuring operation and e.g. signals whether the process pressure is located within the foreseen thresholds. It gives optical feedback in the parametrisation of the device.

Operating elements for parametrisation:



The device is parametrised to the desired settings via the \oplus and \ominus keys. This is performed via the empty and full adjustment. They can also be used to restore the factory settings.



9 Electrical connection

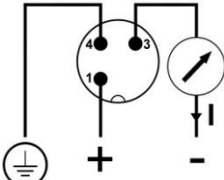
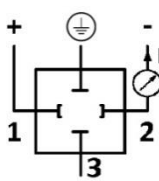
9.1 Operating voltage range

This transmitter is a loop-fed, 2-wire, low-voltage DC device. Like all devices with a 2-wire design, the transmitter is supplied directly from the current loop and enters a current proportional to the measuring size from 4...20mA .

	<p>The operating voltage of the device is 12...30 VDC. The transmitter must under NO circumstances be operated with ANY other supply voltage. Too low a voltage can result in malfunctions; too great a voltage can cause irreparable damage to the device.</p>
	<p>Ensure the correct polarity when making the electrical connection. Inverted polarity means that the device does not work. The transmitter will not be damaged, as its connection terminals are secured against voltage reversal.</p>

9.2 Types of electrical connection

Depending on the connection variant, which you have ordered, the transmitter can come in one of four possible configurations. The electrical connection of the device is contained in the device designation. The four possible variants are listed in the following:

<p><u>Cable screw connection</u></p> <p>PZM050D_1bar_KT1</p> <p>(example for the designation of a device with a cable screw connection)</p> <p><i>Cable connection acc. to connection terminal designation</i></p>	<p><u>M12 device plug</u></p> <p>PZM050D_1bar_MT1</p> <p>(example for the designation of a device with an M12 device plug)</p>  <p>Assignment of the M12 plug (as viewed from the plug side of the housing)</p>								
<p><u>Angle plug</u></p> <p>PZM050D_1bar_WT1</p> <p>(example for the designation of a device with an angle plug)</p>  <p>Assignment of the angle plug (as viewed from the plug side of the housing)</p>	<p><u>Reference cable is connected</u></p> <p>PZM050D_1bar_R10T1</p> <p>(example for the designation of a device with a connected 10 metre reference cable)</p> <table border="1" data-bbox="925 1758 1268 1904"> <tr> <td>Brown</td> <td>Supply+</td> </tr> <tr> <td>Black</td> <td>Supply -</td> </tr> <tr> <td>White</td> <td>EARTH</td> </tr> <tr> <td>Shield</td> <td>EARTH</td> </tr> </table>	Brown	Supply+	Black	Supply -	White	EARTH	Shield	EARTH
Brown	Supply+								
Black	Supply -								
White	EARTH								
Shield	EARTH								

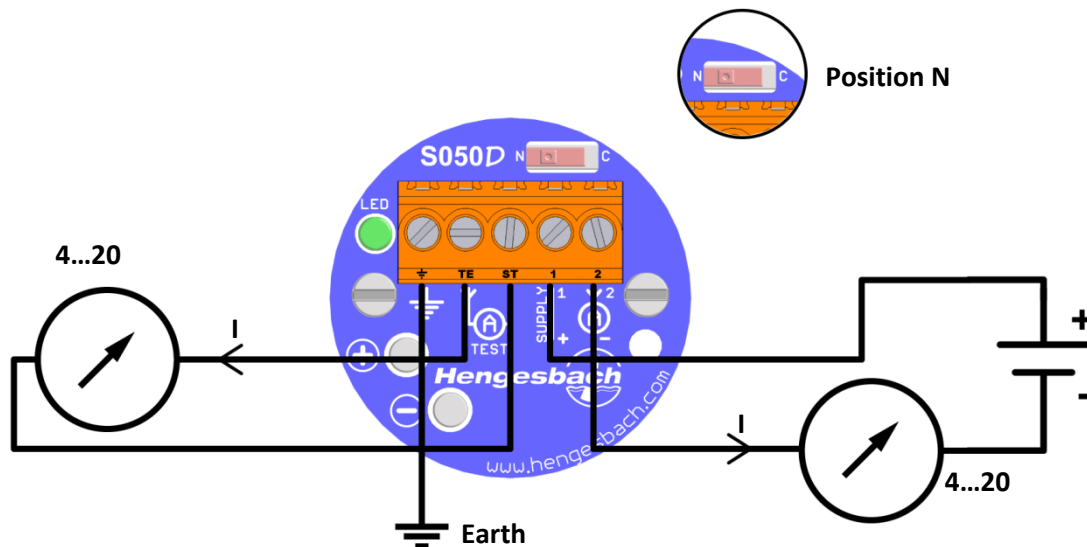


9.3 Connection diagram for normal measuring mode

The electrical connection of the device is made via the connection terminals in the housing head. A device with an integrated M12 device connector or a permanently connected reference cable does not require any alterations - the connections of connection terminals with the pin allocation specified on the type plate has been made in the factory. The reference cable wires are coloured according to their function and are already wired in accordance with the type plate upon delivery.

If your device is equipped with a cable screw connection, you will need to connect the device yourself. To do so, unscrew the device lid in an anti-clockwise direction - this could require a little strength as the seal is guaranteed only by a secure lid.

After removing the device lid, you have access to the connection terminals. The electrical connection for normal measuring operation is performed according to the following schematic:



Connect the power supply with the transmitter via the terminals **1 (+)** and **2 (-)**. Observe and comply with the permissible voltage range of 12...30V DC. Ensure maintenance of the correct polarity - the voltage reversal does not cause any damage, but it will not commence measurement operation. The pressure value determined by the transmitter is depicted in the supply loop with a current proportional to the process pressure from 4...20mA. This value can be determined by a looped-in current measuring device.

The loop current can be checked on the device via the **TE** and **ST** terminals without needing to separate the supply loop. To this end, connect a hand-held multimeter or similar current measuring device to the terminals. TE represents the positive and ST the negative connections.

A potential equalisation can be established with the connected control via the connection marked with an earthing symbol. If the transmitter housing does not have a connection with sufficient conductance, we recommend using this connection.

Use shielded wires for the electrical connection and ensure that the shield is connected to the housing conductively. This can either be performed via the cable screw connection or a suitable M12 device connector.

The slide switch must be in the N position (delivery state) for normal measuring mode.



9.4 Calibration function with external process calibrator

In order to be able to use the calibrator function with a mobile process calibrator, use a small screwdriver or similar instrument to bring the slide switch in position C. The electrical connection of the process calibrator is performed via the terminals TE and ST. TE represents the positive (+), ST the negative (-) poles of the supply.



Ensure that the instrument used to calibrate the power supply has its own power supply located within the specified thresholds between 12...30V DC. It must be able to provide a minimum current of 22mA.

In this configuration, the transmitter is supplied by a mobile instrument and depicts its measured value through a proportional current in the calibrator loop. The supply via the terminals 1 and 2 is not in operation - it need not be disconnected.

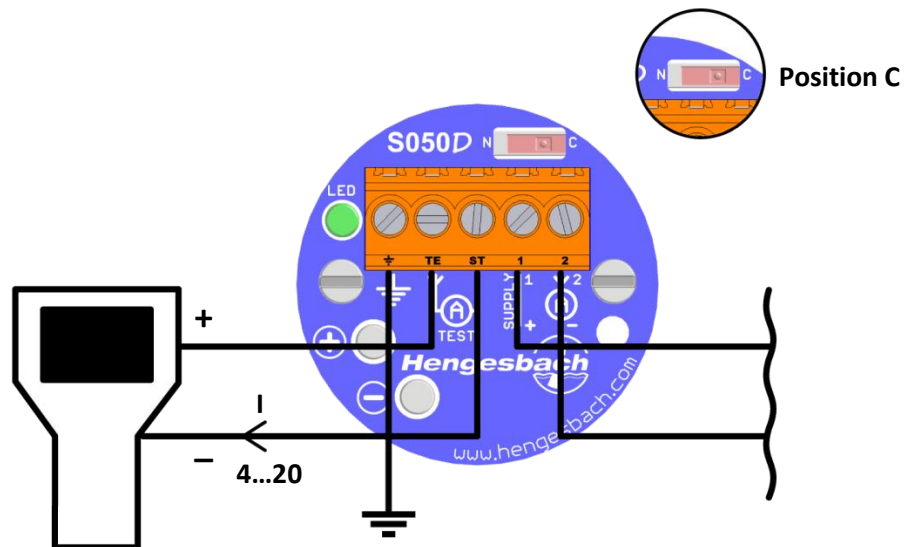


The slide switch does not establish a galvanic isolation between the two circuits. The calibration function is designed for the use of mobile process calibrators alone. Given other applications, ensure a galvanic isolation of the supply.



Whilst the slide switch is in position C, a signal is not issued via the normal power supply on terminals 1 and 2. Ensure that this does not lead to any malfunctions in the control.

The following figure shows the electrical connection of a mobile process calibrator:



Ensure that the slide switch is returned to the N position after successful calibration otherwise the device will not issue an output signal.



10 Servicing and cleaning

The transmitter does not contain any parts that can be serviced by the user. Should the device not perform as expected, first read the troubleshooting and rectification section in chapter 14. Should anything remain unclear, contact the manufacturer in order to determine the next step.



Any changes that are made to the inside of the device will automatically result in the loss of warranty. Furthermore, the manufacturer reserves the right to reject any repair request for devices, which have been opened by the customer. This does not apply to the opening of the device lid for the purpose of wiring or parametrisation.

You should only check the electrical connections, seals and pressure compensation openings (only for relative pressure devices) as part of your regular service activities.

Make sure that the connection wires are tightly secured in the screw terminals and the cable screw connections are tightly connected to the connection wire (if applicable). For devices with an M12 plug, the screw connection must be checked for a tight fit. Also check the tight fit of the lid in order to ensure the best possible sealing.

The ventilation opening must be free from highly viscose media or other adhesive media. A blocked ventilation opening prevents the pressure compensation of relative pressure devices and will result in the distortion of the measuring value. If the reference cable is used, the ventilation tube must also be free from foreign objects.

The transmitters are fully encapsulated and therefore have no dead spaces. However, especially during the cleaning process, major heating-up with subsequent cooling-down processes can result in a vacuum inside the device. This effect will be reduced to a minimum due to the small dead space volume. However, the transmitter head should be visually inspected at regular intervals in order to make sure that no foreign media have ingressed. Such foreign media can result in the build-up of conductive deposits (salts, etc.), which cause leakage currents, which will distort the measuring result.

You should also check the seals, both in the lid and at the process connection, for corrosion.



Observe the maximum permitted temperatures when cleaning. Sustained overtemperature can destroy both the electronics and attachments at the housing.



The membrane of the measuring cell may not be directly radiated by localised pressure sources, such as high-pressure cleaning equipment. This may result in the destruction of the membrane. Continue to avoid any other form of mechanical contact with the sensor membrane.

11 Storage and operating conditions

The device is intended for operation / storage in a temperature range of -40°C to +85°C. These specifications do not apply to the medium temperature - depending on the process connection used, this can deviate from the maximum permissible operation thresholds. Read the corresponding entries on the transmitter data sheet (see section 15: Technical Data).



Operation or storage outside the permissible temperature range can result in malfunction and irreversible damage to the device. Observe the permissible thresholds for the medium temperature



12 Repair, return and guarantee

12.1 Repair

If the transmitter shows any sign of malfunction, please always contact the manufacturer first. The manufacturer will help you over the telephone with all further actions that are necessary and may be able to suggest a solution for the problem. Often, the devices are merely incorrectly set and seem to be malfunctioning because of such incorrect settings.

However, if a device has a definite fault, please return it to the manufacturer. The transmitter does not contain any parts, which can be repaired by the user. The manufacturer's QA department will ensure that your device is repaired as quickly as possible or, if the device is still under warranty, will provide you with a free replacement device.



Please do not attempt to repair the transmitter on your own accord. You may lose your warranty entitlement and possibly make the fault worse.

12.2 Return

If you return a device to us, please observe the following notes:

- Secure the measuring cell against all forms of contact
- Pack the device in transport-proof outer packaging
- Pack the electronic components in ESD-compliant outer packaging
- Include a precise description of the transmitter fault with the returned device
- Tell us what you would like us to do with the returned item if applicable
- Use the *product accompaniment form* included in the scope of delivery when returning the device

The manufacturer's returns address is:

Hengesbach Prozessmesstechnik GmbH & Co. KG
Schimmelbuschstr. 17
40699 Erkrath
GERMANY

service@hengeschbach.com / info@hengeschbach.com
www.hengesbach.com
Tel.: +49 (0) 2104 3032-0
Fax.: +49 (0) 2104 3032-22

12.3 Guarantee

The manufacturer warrants all manufactured products for a period of 1 year from delivery. Devices, which develop a fault or fail entirely during this period, will be repaired or replaced by the manufacturer. Please contact the manufacturer before you make your complaint in order to discuss further actions, as this will ensure the quick and smooth processing of your request.



Faults, which are due to incorrect handling, incorrect installation or other improper handling of the product, will not be regarded as warranty cases. In such instances, the manufacturer will prepare a report for each individual case.

Please also observe the return notes in the event of warranty processing. The manufacturer may not be able to tell who should be responsible for a device, which has become damaged during its return transport to the manufacturer because it was incorrectly packed. Therefore, in the worst case scenario, you may have to bear the damage yourself. For this reason we ask you to always make sure that you choose a safe means of transport packaging and pay special attention to the membrane of the measuring cell, as this is the one item, which gets damaged most often.



13 Disposal

A certain packaging effort is required to protect the device against damage during transport. Please recycle the packaging materials correctly or reuse them for packing other items.

The devices consist of a number of different materials, all of which need to be specifically disposed of. Therefore, please dispose of the devices via a suitable recycling specialist or return them to the manufacturer for the purpose of disposal.



The device is not subject to the WEEE directive 2002/96/EC and its associated laws and regulations. Therefore, obsolete devices are not designed for disposal in communal recycling centres.

14 Error diagnosis and remedy

If the device does not perform as expected, please check the following points before contacting the manufacturer.

Fault	Possible causes	Check / correction
The device does not start or no current is flowing in the loop/the status LED remains out	The voltage of the power supply is reversed or incorrectly connected.	Make sure that the power supply is connected correctly.
	The power supply is not switched on.	Use a voltmeter to check whether voltage is applied to the transmitter.
	The supply line has a broken cable.	
	The slide switch is in position C	Return the slide switch to position N
The current value is outside the range of 4...20 mA.	The transmitter has been applied with a pressure, which is outside the set measuring range.	Return the transmitter to its set measuring range.
	The transmitter membrane was damaged	Repair of the membrane is not possible - contact the manufacturer
The current value is constant at 22mA	The device is over-modulated	Return the transmitter to its set measuring range.
	Device fault	Perform a device reset by setting the factory settings. If the problem persists, contact the manufacturer



15 Technical data

Device type / measuring principle	PZM050D / TPF050D / PZT050D: piezoresistive							
Input								
Measuring ranges	PZM050D / TPF050D / PZT050D							
Standard nominal measuring range [bar]	relative	OP	absolute	OP	relative	OP	absolute	OP
OP = overload protection [bar]	0 to 0.35	1			-1/0 to 10	30	0 to 10	30
	0 to 1	3	0 to 1	3	-1/0 to 30	90	0 to 30	90
Special measuring ranges are available on request. All measurement cells are vacuum safe	-1/0 to 2.5	8	0 to 2.5	8	-1/0 to 100	250	0 to 100	250
	-1/0 to 5	15	0 to 5	15				
Setting the measuring ranges	via the 2 keys within the transmitter							
Setting ranges	Measuring range begin zero: 0.....75% of the sensor's nominal measuring span TD=4 Measuring span span: 25...100% of the sensor's nominal measuring span							
Burst pressure DIN16086	>= 4-fold nominal measuring range							
Output								
Output signal	2-wire: 4 to 20mA with a test circuit connection in the device							
Fault signal	22mA							
Current limitation	3.8mA and 21mA							
Measuring accuracy								
Reference conditions	acc. to DIN IEC 770							
Linearity, hysteresis and repeatability acc. to the limit point method DIN IEC 770	≤ ± 0.2% of the sensor nominal measuring range							
Activation time	< 2 s (The device will carry out a self-test.)							
Setting time	< 1s							
Long-time drift	≤ 0.2% of the span per year							
Thermal hysteresis	≤ ± 0.2% of the sensor nominal measuring range / 10K (-20...+80°C) from 4bar ≤ 0.3% of the sensor's nominal measuring range / 10K (-20 to +80°C) up to 0.6 bar							
Conditions of use								
Installation position / calibration position	Any position / standing vertically							
Medium temperature	T1: -40 °C to +125 °C (140 °C for max. an hour) T2: -40...+200°C (high-temperature version)							
Ambient storage temperature	-40...+85°C (below -20 °C danger of cable breakage)							
Protection class acc. to EN60529	IP 67 and IP 69K							
Electromagnetic compatibility	acc.to EN 61326-1							



Construction	
Electrical connection	<ul style="list-style-type: none">- Standard: M16x1.5 cable screw connection, nickel-plated brass (stainless steel available on request)- Optional: M12x1 round plug-in connector, nickel-plated brass (stainless steel available on request)- Optional: angle plug acc. to EN 175301-803- Optional: reference cable
Process connection	<ul style="list-style-type: none">- Membrane, flush-welded on the front, CrNiSt, other materials available on request- EHEDG type EL-ASEPTIC CLASS I, certified connection system PZM / with press screw M38x1.5 and elastomer sealing- Process seal EPM (FDA) (temperature range: -20...+150°C)- Process seal FPM (FDA) (temperature range: -40...+200°C)
Materials	<ul style="list-style-type: none">- Field housing / lid: CrNiSt 1.4301 (304)- Housing seal: FPM (Viton[®])- Pressure compensation element: polyamide- Process connection / connection adapter: CrNiSt 1.4404 (304)- Process membrane: CrNiSt 1.4435/1.4404 (316L)- Reference cable, 5-wire with reference tube: PUR (recommended: 80 m maximum)
Filling fluid	silicon oil (FDA)
Display and operation	
Display	multiple-colour status LED
Operation	2-key concept
Auxiliary energy resources	
Power supply / burden	12...30V DC, max. burden: (V _{supply} - 12V) / 22mA

16 Dimensional drawings and ordering information

Dimensional drawings and ordering information are provided on the data sheet.