

Operating Manual



Pressure transmitters / screw-in probes

AX12-x|act ci, AX12-x|act i, AX12-XMP ci and AX12-XMP i
AX17-XMP ci and AX17-XMP i



READ THOROUGHLY BEFORE USING THE DEVICE
KEEP FOR FUTURE REFERENCE

ID: BA_xact-XMP_EX_E | Version: 06.2018.0

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

This operating manual enables safe and proper handling of the product, and forms part of the device. It should be kept in close proximity to the place of use, accessible for staff members at any time.

All persons entrusted with the mounting, installation, putting into service, operation, maintenance, removal from service, and disposal of the device must have read and understood the operating manual and in particular the safety-related information.

The following documents are an important part of the operating manual:

- Data sheet
- Type-examination certificate
- Supplementary sheet on operation (ZUSATZ_BA_X-GERÄTE)

For specific data on the individual device, please refer to the respective data sheet.

Download these by accessing www.bdsensors.com or request them by e-mail or phone: info@bdsensors.de | phone: +49 (0) 92 35 98 11 0

The explosion-proof versions of our products are variants of the standard products.

Example:

Standard: x|act i → Explosion-proof version: AX12-x|act i

In addition, the applicable accident prevention regulations, safety requirements, and country-specific installation standards as well as the accepted engineering standards must be observed.

For the installation, maintenance and cleaning of the device, the relevant regulations and provisions on explosion protection (VDE0160, VDE 0165 and/or EN 60079-14) as well as the accident prevention regulations must absolutely be observed. The device was designed by applying the following standards:

AX12: EN60079-0:2012+A11:2013,
EN60079-11:2012,
EN60079-26:2015

AX17: EN60079-0:2009,
EN60079-1:2007

1.1 Symbols Used

	- Type and source of danger - Measures to avoid the danger
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Warning word	Meaning
	- Imminent danger! - Non-compliance will result in death or serious injury.

	- Possible danger! - Non-compliance may result in death or serious injury.
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	- Hazardous situation! - Non-compliance may result in minor or moderate injury.
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NOTE – draws attention to a possibly hazardous situation that may result in property damage in case of non-compliance.

- ✓ Precondition of an action

1.2 Staff Qualification

Qualified persons are persons that 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 activity.

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

- They know the safety concepts of metrology and automation technology and are familiar therewith as project staff.
- They are operating staff of the measuring and automation systems and have been instructed in the handling of the systems. They are familiar with the operation of the devices and technologies described in this documentation.
- They are commissioning 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 put into operation, to ground, and to mark circuits and devices according to the safety engineering standards.

All work with this product must be carried out by qualified persons!

1.3 Intended Use

The devices are used to convert the physical parameter of pressure into an electric signal.

The **pressure transmitters** are exclusively suited for measuring positive, negative and absolute pressures.

A device has an explosion-protection approval if this was specified in the purchase order and confirmed in our order acknowledgement. In addition, the type plate includes a sign. The user must check whether the device is suited for the selected use. In case of doubt, please contact our sales department (info@bdsensors.de, phone: +49 (0) 92 35 98 11 0). BDSENSORS assumes no liability for any wrong selection and the consequences thereof!

The fluids that can be measured are gases and liquids that are compatible with the materials in contact with the fluids, described in the data sheet. For application, it must additionally be ensured that the fluid is compatible with the parts in contact with the fluid.

1.4 Limitation of Liability and Warranty

Failure to observe the instructions or technical regulations, improper use and use not as intended, and alteration of or damage to the device will result in the forfeiture of warranty and liability claims.

1.5 Safe Handling

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 – Excessive dust accumulation (over 5 mm) and complete coverage with dust must be prevented!

The device is state-of-the-art and is operationally reliable. Residual hazards may originate from the device if it is used or operated improperly.

1.6 Safety-Related Maximum Values

1.6.1 Intrinsically safe versions

AX 12-XMP ci / AX12-XMP i / AX 12-x|act ci / AX12-x|act i

Range of ambient temperature:
Use in zone 0 (p_{atm} 0.8 bar to 1.1 bar): -20 ... 60 °C

Use in zone 1 and 2: -40 ... 70 °C

Supply and signal circuit:
 $U_i = 28$ V, $I_i = 98$ mA, $P_i = 680$ mW, $C_i \approx 0$ nF, $L_i \approx 0$ μ H plus Line inductance 1 μ H/m and line capacity 160 pF/m (with factory cable)

With respect to the housing, the supply connections have an interior capacity of max. 27 nF

NOTE – The limit values only apply for devices with intrinsically safe circuits

1.6.2 Pressure-resistant casing (only with cast aluminum housing)

AX 17-XMP ci and AX 17-XMP i

Operating temperature range: -20 ... 70 °C

NOTE – The use of devices with pressure-resistant casing is not appropriate in areas of dust!

1.7 Scope of Delivery

Check that all parts listed in the scope of delivery are included free of damage, and have been delivered according to your purchase order:

- Pressure transmitter, protective cap
- for mech. connections to DIN 3852: O-ring (premounted)
- Operating Manual, supplementary sheet / Menu system structure

1.8 UL Approval (for Devices with UL Marking)

The UL approval was effected by applying the US standards, which also conform to the applicable Canadian standards on safety.

Observe the following points so that the device meets the requirements of the UL approval:

- The transducer must be operated via a supply with energy limitation (acc. to UL 61010) or an NEC Class 2 energy supply.
- Maximum operating range: see data sheet

1.9 3A - Approval (for Devices with 3A Marking)

The device must be assembled according to 3-A standard 74-06. The device has to be installed so that drainability and demands are met. The device must be installed with the pressure port down or aside. Make sure that welding sockets are mounted flush inside the tank

The user is responsible for:

- choosing a suitable sealing material
- defining adequate service intervals
- choosing an elastomer sealing material, according to 3-A standard
- the right dimension of the gasket

2. Product Identification

The device can be identified by means of the type plate with order code. The most important data can be gathered therefrom.

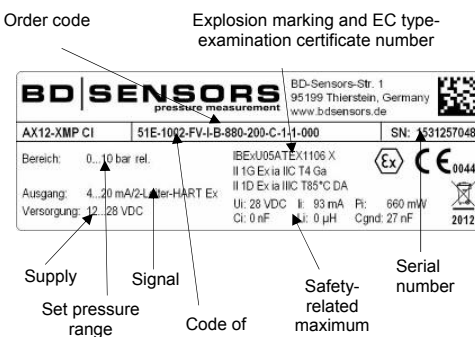


Fig. 1: Type plate

NOTE – The type plate must not be removed!

The marking for devices with explosion-protection approval must include the following information:

AX 12:
EC Type-examination certificate **IBExU05ATEX1106 X**

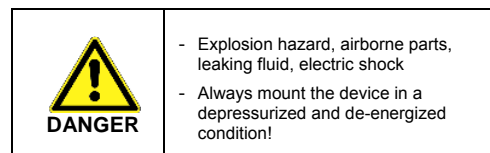
Marking:
II 1G Ex ia IIC T4 Ga or
II 1/2G Ex ia IIC T4 Ga/GB or
II 2G Ex ia IIB T4 Gb,
II 1D Ex ia IIC T85°C DA

AX 17:
EC Type-examination certificate **IBExU12ATEX1045 X**

Marking:
II 2G Ex d IIC T5 Gb

3. Mounting

3.1 Mounting and Safety Instructions



NOTE – The technical data listed in the EC type-examination certificate are binding. Download these by accessing www.bdsensors.com or request them by e-mail or phone: info@bdsensors.de | phone: +49 (0) 92 35 98 11 0

NOTE – Make sure that the entire interconnection of intrinsically safe components remains intrinsically safe. The owner-operator is responsible for the intrinsic safety of the overall system (entire circuitry).

NOTE – If there is increased risk of damage to the device by lightning strike or overvoltage, increased lightning protection must additionally be provided!

NOTE – Treat any unprotected diaphragm with utmost care; this can be damaged very easily.

NOTES – for mounting outdoors or in a moist environment:

- Connect the device electrically straightaway after mounting or prevent moisture penetration, e.g. by a suitable protective cap. (The ingress protection specified in the data sheet applies to the connected device.)
- Select the mounting position such that splashed and condensed water can drain off. Stationary liquid on sealing surfaces must be excluded!
- If the device has a cable outlet, the outgoing cable must be routed downwards. If the cable needs to be routed upwards, this must be done in an initially downward curve.
- Mount the device such that it is protected from direct solar radiation. In the most unfavorable case, direct solar radiation leads to the exceeding of the permissible operating temperature. This must be excluded if the device is used in any explosion-hazardous area!
- A device with gauge reference in the housing (small hole next to the electrical connection) must be mounted such that the gauge reference is protected against dirt and humidity. If the transducer is exposed to liquid admission, the gauge reference will be blocked, and the equalization of air pressure will be prevented. In this condition, a precise measurement is impossible and damage to the transducer may occur.
- Provide for a cooling section if the device is used in a steam line.

NOTE – When installing the device, avoid high mechanical stresses on the pressure port! This will result in a shift of the characteristic curve or to damage, in particular in case of very small pressure ranges and devices with a pressure connection/port made of plastic.

NOTE – In hydraulic systems, arrange the device such that the pressure port points upwards. (venting)

NOTE – If the device is installed with the pressure port pointing upwards, ensure that no liquid drains off on the device. This could result in humidity and dirt blocking the gauge reference in the housing, and could lead to malfunctions. If necessary, dust and dirt must be removed from the edge of the screwed joint of the electrical connection.

NOTE – Do not remove the packaging or protective caps of the device until shortly 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 properly!

NOTE – The specified tightening torques must not be exceeded!

3.2 Mounting Steps for Connections According to DIN 3852

NOTE – Do not use any additional sealing material such as tow, hemp or Teflon tape!

- ✓ The O-ring is undamaged and seated in the designated groove.
- ✓ The sealing face of the mating component has a flawless surface. (R_z 3.2)

- 1 Screw the device into the mating thread by hand.
- 2 Devices equipped with a knurled ring: only tighten by hand
- 3 Devices with a wrench flat must be tightened using a suitable open-end wrench.
 - Wrench flat made of steel: G1/2": approx. 10 Nm; G1": approx. 20 Nm; G1 1/2": approx. 25 Nm;
 - Wrench flat made of plastic: max. 3 Nm)

3.3 Mounting Steps for Connections According to EN 837

- ✓ A suitable seal for the measured fluid and the pressure to be measured is available. (e.g. a copper seal)
- ✓ The sealing face of the mating component has a flawless surface. (R_z 6.3)

- 1 Screw the device into the mating thread by hand.
- 2 Then tighten it using an open-end wrench: Process connection made of steel: G1/2": approx. 50 Nm

3.4 Mounting Steps for NPT Connections

- ✓ Suitable fluid-compatible sealing material, e.g. PTFE tape, is available.

- 1 Screw the device into the mating thread by hand
- 2 Then tighten it using an open-end wrench: 1/2" NPT: approx. 70 Nm

3.5 Mounting Steps for G1" cone connection

- 1 Screw the device into the mating thread by hand (seal produced metalically)
- 2 Then tighten it using an open-end wrench: PN < 10 bar: 30 Nm; PN \geq 10 bar: 60 Nm

3.6 Mounting Steps for Dairy Pipe Connections

- ✓ The O-ring is undamaged and seated in the designated groove.
- 1 Center the dairy pipe connection in the corresponding mating fitting.
 - 2 Screw the sleeve nut onto the mating fitting.
 - 3 Then tighten it using a hook wrench.

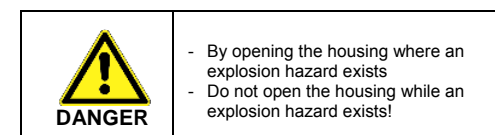
3.7 Mounting Steps for Clamp and Varivent® Connections

- ✓ A suitable seal for the measured fluid and the pressure to be measured is available.
 - ✓ Chapter "1.9 3A-Approval" was noticed.
- 1 Place the seal onto the corresponding mating fitting
 - 2 Center the clamp connection or Varivent® connection above the corresponding mating fitting
 - 3 Then fasten the device using a suitable fastener (e.g. half-ring or retractable ring clamp connection) according to the instructions specified by the manufacturer

3.8 Mounting Steps for DRD and Flange Connections

- ✓ A suitable seal for the measured fluid and the pressure to be measured is available. (e.g. a fiber seal)
- 1 Position the seal between the connecting flange and the mating flange
 - 2 Then attach the device to the mating flange using 4 or 8 bolts/nuts (depending on flange design)

3.9 Orientation of the Display and Operating Module (standard on x|act, optional for XMP)



The display and operating module can be rotated continuously so as to guarantee easy readability even in unusual mounting positions. Proceed as follows to change the position:

- Unscrew the housing cover by hand.
- Rotate the display and operating module carefully by hand into the desired position. The module is equipped with a turning limiter.
- Before the cover is screwed on again, the O-ring and sealing surface on the housing must be checked for damage and, if necessary, replaced!
- Then screw on the cover by hand and make sure that the housing is tightly closed again.

NOTE – Ensure that moisture cannot enter the device! The seals and sealing surfaces must not get dirty, as (depending on application and location) fouling can cause a reduced degree of protection and therefore lead to device failure or irreparable damage to the device.

4. Electrical Connection

4.1 Connection and Safety Instructions

	- Improper installation may result in electric shock - Always mount the device in a depressurized and de-energized condition!
	- Explosion hazard if the operating voltage is too high (max. 28VDC)! - Operate the device only within the specification! (data sheet)
	- by opening the field housing where an explosion hazard exists - Do not open the field housing while an explosion hazard exists!

- ✓ The limit values listed in the EC type-examination certificate are observed. (Capacity and inductance of the connection cable are not included in the values.)

- ✓ The supply corresponds to protection class II. (protective insulation)

- ✓ The transducer is operated via a supply with energy limitation (acc. to UL 61010) or an NEC Class 2 energy supply.

NOTE – For devices with connection terminals, the connection must be made such that the isolation distances according to standard are observed and that loosening of the connecting lines is impossible.

NOTE – Use a shielded and twisted multicore cable for the electrical connection.

NOTE – for devices with cable outlet

- When routing the cable, the following minimum bend radii must be observed:

Cable without air hose:

fixed installation: 5-fold cable diameter
flexible use: 10-fold cable diameter

Cable with air hose:

fixed installation: 10-fold cable diameter
flexible use: 20-fold cable diameter

- In case of devices with **cable outlet** and integrated ventilation hose, the PTFE filter located at the cable end on the relative pressure hose must neither be damaged nor removed!

NOTE – The cover for the connection terminals and display can only be opened if a safety lock, grub screw with hexagon socket, has been removed. The screw is located on the right-hand side below the cover. After affixing the cover for the display and connection terminals, the safety lock must be screwed in again. Greasing of the threads is not necessary for this.

NOTE – In order to electrically connect the device with connection terminals, the cover must be screwed off. If the device has a display and operating module, this should be pulled out carefully. During installation, place it next to the housing such that the wires are not under stress. Afterwards, insert it again carefully and ensure that the connection wires are not twisted or pinched. Before the cover is screwed on again, the O-ring and sealing surface on the housing must be checked for damage and, if necessary, replaced! Then screw on the cover by hand and make sure that the field housing is tightly closed again.

NOTE – The cable entry on devices with pressure-resistant casing is only suitable for permanent installation!

NOTE – For devices with pressure-resistant casing, a compulsory **M20x1.5** cable gland **HSK-M-Ex-d / Metr.** should be used; this is already pre-mounted. Technical data: cable diameter \varnothing 10 ... \varnothing 14 mm, width across flats: 24 mm, continuous operating temperature: -60 ... 105 °C, certificate: II 2G 1D Ex d IIC.

4.2 Conditions for the Explosion-Hazardous Area

Danger generated by electrostatic charging

- Explosion hazard due to spark formation from electrostatic charging of plastic components.
- If devices are equipped with a cable outlet, the connection cable routing must be fixed.
- Do not clean the device and, if applicable, the connection cable, in a dry state! Use a moist cloth, for example.

The following warning sign is affixed on devices with plastic components.



Fig. 2: Warning sign

NOTE – The warning sign must not be removed from the device!

Overvoltage protection

If the pressure transmitter is used as a Category 1 G piece of equipment, a suitable overvoltage protector must be installed upstream (refer to the German Ordinance on Industrial Health [BetrSichV] and EN60079-14).

Schematic circuit design

The operation of an intrinsically safe device in the explosion-hazardous area requires special care when selecting the required Zener barrier or transmitter repeater devices in order to utilize the device properties to the full extent. The following diagram shows a typical arrangement consisting of power pack, Zener barrier and pressure transmitter.

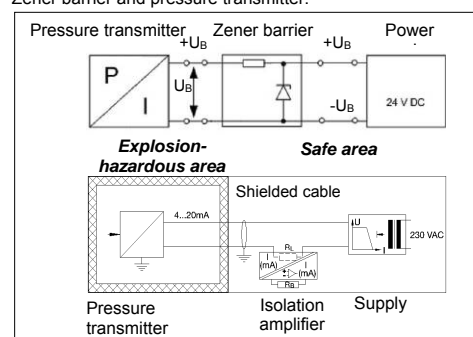


Fig. 3: Wiring diagrams

NOTE – Observe item (17) of the type-examination certificate! (special conditions for intrinsically safe operation)

Exemplary circuit description

The supply voltage of e.g. 24 V_{DC} provided by the power pack is led through the Zener barrier. The Zener barrier contains series resistors and Zener diodes as protective components. The operating voltage is applied to the device by the Zener barrier and, depending on the pressure, a particular signal current will flow.

- Danger to life
- Operation of intrinsically safe devices as zone-0 equipment only with ungrounded and galvanically isolated power supply

Selection criteria for Zener barriers and power supplies

The minimum supply voltage U_{B min} of the device must not be undercut; the minimum supply voltage is defined in the product-specific data sheet under "Output signal / auxiliary energy".

When using a galvanically isolated power supply with linear limitation, it must be taken into account that the terminal voltage of the device will decrease because of the linear limitation, as with a Zener barrier. Furthermore, account must be taken of the fact that a certain voltage drop will also occur on an optionally used signal isolation amplifier, whereby the operating voltage of the pressure transmitter will decrease additionally.

Test criteria for the selection of the Zener barrier

In order not to undercut U_{B min} it is important to check which minimum supply voltage is available at full-level modulation of the device. The full-level modulation, that is, a maximum and nominal output signal (20 mA), is achieved by applying the maximum physical input signal (pressure).

Usually the specifications of the Zener barrier will provide an answer as to the selection of the barrier. However, the value can also be determined by calculation. If a maximum signal current of 0.02 A is assumed, a certain voltage drop on the series resistor of the Zener barrier follows in accordance with Ohm's law. This voltage drop must be subtracted from the voltage of the power pack, in order to reach the terminal voltage applied to the device in the full-level modulation state. If this voltage is less than the minimum supply voltage, either another barrier or a higher supply voltage must be selected.

NOTE – When selecting the barrier or power supply, you must look out for any ballasts which are not suitable for HART® communication. Most manufacturers offer a device group specially developed for this application.

NOTE – When selecting the ballasts, the maximum operating conditions according to the type-examination certificate must be observed. When assessing the ballasts, refer to their current data sheets to ensure that the entire interconnection of intrinsically safe components will remain intrinsically safe.

Calculation example for the selection of the Zener barrier

The nominal voltage of the power pack (supply) upstream of the Zener barrier is 24 V_{DC} ± 5 %.

From this follows:

- maximum supply voltage:
U_{Sup max} = 24 V * 1.05 = 25.2 V
- minimum supply voltage:
U_{Sup min} = 24 V * 0.95 = 22.8 V

The series resistor of the Zener barrier is specified with 295 Ohms. The following values remain to be calculated:

- Voltage drop at the barrier (at full-level modulation):
U_{ab barrier} = 295 Ω * 0.02 A = 5.9 V
- Terminal voltage of the device with Zener barrier:
U_{KI} = U_{Sup min} - U_{ab barrier} = 22.8 V - 5.9 V = 16.9 V
- Minimum supply voltage of the device, e.g. LMK 351 (as per data sheet):
U_{KI min} = 12 V_{DC} (corresponds to U_{B min})

Condition:

$$U_{KI} \geq U_{KI \min}$$

Result:

The terminal voltage of the device with Zener barrier amounts to 16.9 V and is thus higher than the device's minimum supply voltage which is 12 V_{DC}. This means that the Zener barrier was correctly selected with respect to the supply voltage.

NOTE – Please note that no line resistances have been listed in this calculation. These lead additionally to a voltage drop that must be taken into account.

4.3 Electrical Installation

Connect the device electrically according to the information specified on the type plate, the following table, and the connection circuit diagram.

Terminal assignment table:

Electrical connections	M12x1 (4-pin)	Cable colors (IEC 60757)
Supply +	1	wh (white)
Supply -	3	bn (brown)
Shield	Connector housing	grye (green-yellow)

Connection terminals	Die-cast aluminum housing: Cross section 2.5 mm ²	Stainless steel field housing: Cross section 1.5 mm ²
Supply +	IN+	IN+
Supply -	IN-	IN-
Test ¹	Test	-
Shield	-	-

¹ By connecting an ammeter between Supply + and Test, the output signal can be checked without disconnecting the supply voltage.

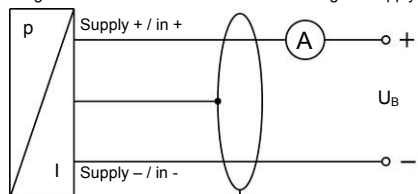


Fig. 4: Connection circuit diagram 2-wire system (power)

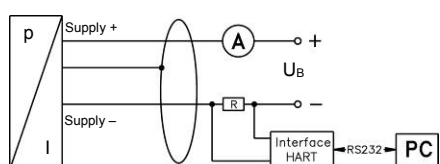


Fig. 5: Connection circuit diagram 2-wire system (power) HART®

NOTE – For unambiguous identification, the intrinsically safe cable is marked with a light blue shrinkable tube (around the cable insulation). If a modification (e.g. a shortening) of the cable is inevitable whereby the marking at the end of the cable is lost, the marking must be restored! (Renewed marking by a light blue shrinkable tube or by an appropriate marking label)

NOTE – In the case of relative pressure gauges, the cable contains a ventilation hose for pressure equalization. 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.

5. HART® communication (standard on XMP, optional for x|act)

- Risk of explosion when interrupting the intrinsically safe circuit where an explosion hazard exists
- Only interrupt the intrinsically safe circuit for looping-in a HART® communication interface (HART® Communicator or HART® Modem) when no explosion hazard is present.

An additional signal as per HART® specification is superimposed on the analog output signal. The device may be configured by means of a HART® communication device. In this regard, we recommend the CIS 150 programming kit (available as accessory).

In order to ensure trouble-free operation, the following requirements must be taken into account:

Maximum cable length between measuring device and supply:

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

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

Resistance R:

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

wherein U: supply in [V_{DC}]

The resistance must be at least 240 Ω.

6. Commissioning

- ✓ The device has been installed properly
- ✓ The device does not have any visible defect
- ✓ The device is operated within the specification. (see data sheet and EC type-examination certificate)

7. Operation (standard on x|act, optional for XMP)

Supplementary sheet on operation (ZUSATZ_BA_X-GERÄTE)

8. Maintenance

- Airborne parts, leaking fluids, electric shock
- Always service the device in a depressurized and de-energized condition!

- due to aggressive fluids
- Wear suitable protective clothing, e.g. gloves, safety goggles.

In principle, the device requires no maintenance.

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

Cleaning of the diaphragm:

Deposits or contamination may occur on the diaphragm in case of certain fluids. It is recommended to establish appropriate maintenance intervals for checking purposes.

Clean the diaphragm cautiously using a non-aggressive cleaning solution and a soft paintbrush or sponge.

If the diaphragm is calcified, it is recommended to have the decalcification performed by BD|SENSORS. Please note the chapter "Service/Repair" with regard to this.

NOTE – Wrong cleaning may damage the measuring cell beyond repair. Do not use any sharp or pointed item, or compressed air to clean the diaphragm.

9. Troubleshooting

- Airborne parts, leaking fluids, electric shock
- If malfunctions cannot be resolved, put the device out of service and proceed according to sections 8 and 10!

- Explosion hazard
- As a matter of principle, work on energized parts, except for intrinsically safe circuits, is prohibited while there is an explosion hazard.

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: Display does not work	
Possible cause	Fault detection / remedy
connected incorrectly	Checking of connections
Conductor/wire breakage	Checking of all line connections.
Defective energy supply	check the power pack and the supply voltage present at the transducer

Fault: no output signal	
Possible cause	Fault detection / remedy
connected incorrectly	Checking of connections
Conductor/wire breakage	Checking of all line connections.
Defective measuring device (signal input)	Checking of ammeter (miniature fuse) or of analog input of your signal processing unit

Fault: analog output signal too low/small	
Possible cause	Fault detection / remedy
Load resistance too high	Checking of load resistance (value)
Supply voltage too low	Checking of power pack output voltage
Defective energy supply	Checking of the power pack and the supply voltage being applied to the device

Fault: slight shift of the output signal	
Possible cause	Fault detection / remedy
Diaphragm of measuring cell is severely contaminated	Cleaning using a non-aggressive cleaning solution and soft paintbrush or sponge
Diaphragm of measuring cell is calcified or crusted	Recommendation: Have the decalcification or cleaning performed by BD SENSORS

Fault: large shift of the output signal	
Possible cause	Fault detection / remedy
Diaphragm of measuring cell is damaged (caused by overpressure or mechanically)	Checking of diaphragm; when damaged, send the device to BD SENSORS for repair

Fault: Measured value (display and analog output) deviates from the target value	
Possible cause	Fault detection / remedy
Over-pressure / pressure surges	recalibration or replacement of the pressure connection by BD SENSORS is required
mech. damage to the diaphragm	

Fault: constant output signal at 4 mA	
Possible cause	Fault detection / remedy
wrong ID number	make sure that the set value under menu item "ID" is "0000"

10. Removal from Service

- Airborne parts, leaking fluids, electric shock
- Always dismount the device in a depressurized and de-energized condition!

- due to aggressive fluids.
- Wear suitable protective clothing, e.g. gloves, safety goggles.

NOTE – After dismounting, mechanical connections must be fitted with protective caps.

11. Service/Repair

Information on service / repair:

- www.bdsensors.com
- info@bdsensors.de
- Service phone: +49 (0) 92 35 98 11 0

11.1 Recalibration

The offset value or range value may shift during the life of the device. In this case, a deviating signal value in relation to the set lower or upper measuring range value is output. If one of these two phenomena occurs after extended use, a recalibration in the factory is recommended. Please note the chapter "Service/Repair" with regard to this.

11.2 Return

- due to pollutants
- Wear suitable protective clothing, e.g. gloves, safety goggles

For every return shipment, whether for recalibration, decalcification, alteration or repair, the device must be cleaned thoroughly and packed in a break-proof manner. A return declaration with a detailed fault description must be added to the defective device. If your device has come into contact with pollutants, a declaration of decontamination is additionally required. . Appropriate templates can be found on our homepage. Download these by accessing www.bdsensors.com or request them by e-mail or phone: info@bdsensors.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. Disposal

- due to pollutants
- Wear suitable protective clothing, e.g. gloves, safety 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!

NOTE – Dispose of the device properly!

13. 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 case. Likewise, there shall be no entitlement to services or parts provided under warranty if the defects have arisen due to normal wear and tear.

14. EU Declaration of Conformity / CE



EU-Konformitätserklärung
EC Declaration of Conformity

BD|SENSORS GmbH erklärt hiermit in alleiniger Verantwortung, dass die Produkte

BD|SENSORS GmbH declares on its own responsibility that the products

HMP 331

x|act cl.; x|act i; XMD; XMP cl.; XMP i

mit den aufgeführten Richtlinien und Normen Übereinstimmen.

They fulfil the below mentioned requirements and standards.

2014/34/EU (EMC) EN 61326-1:2013

2011/65/EU (RoHS) EN 61326-1:2013

2014/34/EU (ATEX) AX12+HMP 331; AX12+ | act cl; AX12+ | act i; AX12+XMD; AX12+XMP cl; AX12+XMP i

IBEX05ATEX1106 X EN 60079-0:2012+A11:2013, EN 60079-11:2012, EN 60079-26:2015

IBEX05ATEX1045 X EN 60079-0:2012+A11:2013, EN 60079-1:2014

Benannte Stelle / Kennnummer

Notified Body / identification number: IBEX Institut für Sicherheit GmbH / 0637

TÜV 10 ATEX 302477 Q EN ISO IEC 60079-34:2011

Benannte Stelle / Kennnummer

Notified Body / identification number: TÜV NORD CERT GmbH / 0044

In Erfüllung der Druckgeräterichtlinie 2014/68/EU und als Ergebnis des darin getätigten Konformitätsbewertungsverfahrens wird folgendes Modul gewählt:

In conformity to the Pressure Equipment Directive 2014/68/EU and as result of therein demanded conformity assessment procedure the following module has been chosen:

Für Geräte mit maximal zulässigem Überdruck > 200 bar: Bewertungsverfahren Modul A

For devices with maximum permissible overpressure > 200 bar: assessment procedure Module A

Thüringen, 2017-12-30

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