



## Operating Manual

Pressure transmitters / screw-in probes

DX14-DMK 351, DX14-DMK 351 P, DX14-LMK 351  
DX19-DMK 331, DX19-DMK 331 P, DX19-DMP 311,  
DX19-DMP 321, DX19-DMP 331, DX19-DMP 331 i,  
DX19-DMP 331 P, DX19-DMP 331 Pi, DX19-DMP 335,  
DX-19 DMP 333 i, DX19-DMP 334, DX-19-DMP 335,  
DX19-DMP 339, DX19-DMP 343, DX19-LMK 331,  
DX19-LMP 331, DX19-LMP 331i, DX19-17.600G,  
DX19-17.605G, DX19-26.600G



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**READ THOROUGHLY BEFORE USING THE DEVICE**  
**KEEP FOR FUTURE REFERENCE**

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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

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

Download these by accessing [www.bdsensors.de](http://www.bdsensors.de) or request them by e-mail or phone: [info@bdsensors.de](mailto:info@bdsensors.de) | Tel.: +49 (0) 9235 9811 0

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

**Example:**

Standard: DMK 351 → Explosion-proof version: DX14-DMK 351

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:

DX14: EN60079-0:2012+A11:2013  
EN60079-11:2012  
EN60079-26:2007

DX19: EN60079-0:2012+A11:2013/ IEC 60079-0 Ed.6,  
EN60079-11:2012/ IEC 60079-11 Ed. 6  
EN60079-26:2007 / IEC 60079-26 Ed. 3

### 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 <b>will result in</b> death or serious injury.
	- Possible danger! - Non-compliance <b>may result in</b> death or serious injury.
	- Hazardous situation! - Non-compliance <b>may result in</b> minor or moderate injury.

**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 transducers** are exclusively suited for measuring positive, negative and absolute pressures.

The **screw-in probes** are exclusively suited to filling-level and process measuring technology.

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](mailto:info@bdsensors.de) | Phone: +49 (0) 9235 9811 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

DX14-...:

$U_i = 28 \text{ V}$ ;  $I_i = 93 \text{ mA}$ ;  $P_i = 660 \text{ mW}$ ;  $C_i = 27 \text{ nF}$ ;  $L_i = 5 \text{ }\mu\text{H}$ ;  
 $C_{\text{opt}} = 27 \text{ nF}$  plus line inductances of  $1 \text{ }\mu\text{H/m}$  and line capacities of  $100 \text{ pF/m}$  (with factory-supplied cable)

Range of ambient temperature

Use in zone 0 ( $p_{\text{atm}}$  0.8 bar to 1.1 bar): -20 ... 60 °C

Use in zone 1: -25 ... 70 °C;

for T6: -25 ... 60 °C

DX19-...:

$U_i = 28 \text{ V}$ ;  $I_i = 93 \text{ mA}$ ;  $P_i = 660 \text{ mW}$ ;  $C_i = 0 \text{ nF}$ ;  
 $L_i = 0 \text{ }\mu\text{H}$ ; with respect to the housing, the supply connections have an interior capacity of max.  $27 \text{ nF}$  plus line inductances of  $1 \text{ }\mu\text{H/m}$  and line capacities of  $160 \text{ pF/m}$  (with factory-supplied cable)

Range of ambient temperature: -20 ... 70 °C

for type DX19-...: -20 ... 65 °C

Use in zone 0 ( $p_{\text{atm}}$  0.8 bar to 1.1 bar): -20 ... 60 °C

### 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 transducer or screw-in probe
- for mech. connections to DIN 3852: O-ring (premounted)
- this operating manual
- in case of SIL2 design option: functional safety manual, safety data sheet

### 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

### 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.

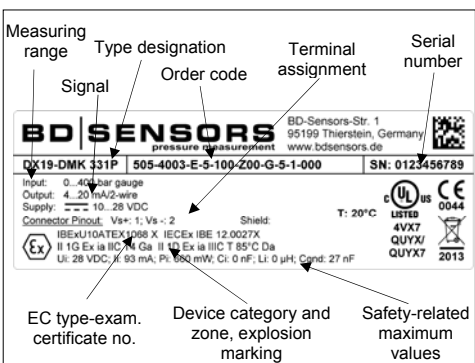


Fig. 1: manufacturing label

**NOTE** – The type plate must not be removed!

### 3. Mounting

#### 3.1 Mounting and Safety Instructions

	- Explosion hazard, airborne parts, leaking fluid, electric shock - Always mount the device in a depressurized and de-energized condition!
	- Explosion hazard due to high-charging processes in connection with free-hanging submersible transmitters with cable FEP - Fixed installation of the FEP cable!

**NOTE** – The technical data listed in the EC type-examination certificate are binding. Download these by accessing [www.bdsensors.de](http://www.bdsensors.de) or request them by e-mail or phone: [info@bdsensors.de](mailto:info@bdsensors.de) | Tel.: +49 (0) 9235 9811 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 protection rating specified on 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 Conditions for Oxygen Applications

Make sure that your device was ordered for oxygen applications and delivered accordingly. (see type plate – order code ends with the numbers "007")

Unpack the device directly prior to the installation.

Skin contact during unpacking and installation must be avoided to prevent fatty residues remaining on the device. Wear safety gloves!

The entire system must meet the requirements of the German Federal Agency for Material Testing [BAM] (DIN19247)!

For oxygen applications > 25 bar, transducer types without seals are recommended.

Transmitters with o-rings of FKM VI 567: permissible maximum values: 25 bar / 150° C (BAM approval)

### 3.3 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. (Rz: 6.3)
- 1 Screw the device into the mating thread by hand.
  - 2 Devices with a wrench flat must be tightened using a suitable open-end wrench.  
Wrench flat made of steel:  
G1/4": approx. 5 Nm; G1/2": approx. 10 Nm;  
G3/4": approx. 15 Nm; G1": approx. 20 Nm  
Wrench flat made of plastic:  
max. 3 Nm)
  - 3 Devices equipped with a knurled ring: only tighten by hand

### 3.4 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. (Rz 6.3)

- 1 Screw the device into the mating thread by hand.
- 2 Then tighten it using an open-end wrench: G1/4": approx. 20 Nm; G1/2": approx. 50 Nm

### 3.5 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: 1/4" NPT: approx. 30 Nm; 1/2" NPT: approx. 70 Nm

### 3.6 Mounting Steps for Female Threads M20x1.5 and 9/16" UNF (for Extreme-Pressure Devices)

	- Due to wrong installation - Do not use any seal!
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**NOTE** – The high-pressure tube will seal metallically in the chamfer on the pressure port. (sealing cone 60°)

- 1 Screw the high-pressure fitting into the female thread on the pressure transducer.
- 2 Then tighten it using an open-end wrench: approx. 120 Nm.

### 3.7 Mounting Steps for Milk Pipe Connections

- ✓ The O-ring is undamaged and seated in the designated groove.

- 1 Center the milk pipe connection in the corresponding mating fitting.
- 2 Screw the sleeve nut onto the mating fitting.
- 3 Then tighten it using a hook wrench.

### 3.8 Mounting Steps for Clamp and Varivent® Connections

- ✓ A suitable seal for the measured fluid and the pressure to be measured is available.

- 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

### 3.9 Mounting Steps for 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)

## 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** – If the device is equipped with a **cable gland** or **cable box**, it must be ensured that the outer diameter of the line used is within the permissible clamping range. (cable gland M12x1,5 cable Ø 3 – 6.5 mm, cable box ISO 4400 cable Ø 4.5 – 10 mm). Additionally it must be ensured that this is seated firmly and gaplessly in the cable gland!

**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** – When devices with **ISO 4400** or **Buccaneer connector** are used, the cable box must be properly mounted so that the protection rating specified on the data sheet is ensured! Ensure that the seal supplied is installed between the connector and the cable box. After connecting the cable, attach the cable box to the device by means of the screw.

**NOTE** – On a device equipped with **field housing**, the connection terminals are located underneath the housing cover. The cover must be screwed off in order to connect the device electrically. 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.

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

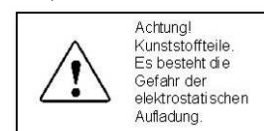


Fig. 2: Warning sign

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

#### Particularity for TRIM TRIO® connector (code 5T2)

In case of devices with TRIM TRIO® connector by SOURIAU, the use in explosion-hazardous areas is restricted. This design type can be identified by the code "5T2" in the "Electrical Connection" segment of the order code. The identification on the type plate of the device as well as the order documents provide information on the approved areas of application.

#### Overvoltage protection

If the pressure transducer 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 so that the device properties can be utilized to the full extent. The following diagram shows a typical arrangement consisting of power pack, Zener barrier and screw-in probe or transducer.

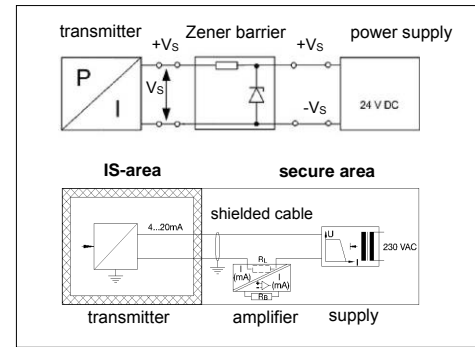


Fig. 3 circuit diagrams

**NOTE** – Observe item (17) of the type-examination certificate which specifies special conditions for intrinsically safe operation.

### Exemplary circuit description

The supply voltage of e.g. 24 V<sub>DC</sub> 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<sub>B,min</sub> 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 transducer will decrease additionally.

### Test criteria for the selection of the Zener barrier

In order not to undercut U<sub>B,min</sub> 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 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<sub>DC</sub> ± 5%.  
From this follows:

- maximum supply voltage:  
 $V_{Sup,max} = 24 V \cdot 1.05 = 25.2 V$

- minimum supply voltage:  
 $V_{Sup,min} = 24 V \cdot 0.95 = 22.8 V$

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):

$$V_{ab,barrier} = 295 \Omega \cdot 0.02 A = 5.9 V$$

- Terminal voltage of the device with Zener barrier:

$$V_{KI} = V_{Sup,min} - V_{ab,barrier} = 22.8 V - 5.9 V = 16.9 V$$

- Minimum supply voltage of the device,

e.g. LMK 351 (as per data sheet):  
 $V_{KI,min} = 12 V_{DC}$  (corresponds to V<sub>S,min</sub>)

#### Condition:

$$V_{KI} \geq V_{KI,min}$$

#### 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<sub>DC</sub>. 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.

### Pin configuration:

Electrical connections	ISO 4400	Binder 723 (5-pin)	M12x1 (4-pin)
Supply +	1	3	1
Supply -	2	4	2
Shield	ground contact	5	4

Electrical connections	Buccaneer (4-pin)	TRIM TRIO® (4-pin)
Supply +	1	1
Supply -	2	2
Shield	4	4

Electrical connections	Bayonet MIL-C-26482 (10-6)
Supply +	A
Supply -	B
Shield	pressure port

Electrical connections	Field housing	Cable colors (IEC 60757)
Supply +	IN +	wh (white)
Supply -	IN -	bn (brown)
Shield	⏏	gnye (green-yellow)

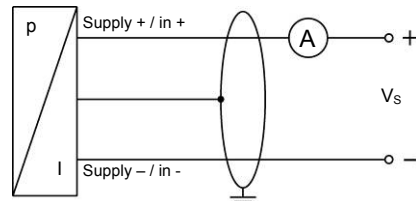


Fig. 4: Wiring diagram

**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. 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)

**In case of highly precise devices** with an accuracy of 0.1 % FSO, a microcontroller-controlled electronic system is used for signal processing. This electronic system is used for signal improvement. Due to the principle, the processing of measured values requires a longer time than with purely analog sensors, which only comprise amplification circuitry. Due to the longer processing time, the output signal follows the measured value not continuously but in jumps. In case of relatively stable and slowly changing measured values, this property plays a minor role. Compare this with the information on the adjusting time in the data sheet.

**In the case of i-devices** with communications interface, the offset, range, and damping can be adjusted within the limits specified in the data sheet, due to the electronic system. The CIS 510 programming kit is required for the configuration. The kit consists of: Adapt 1, Windows-compatible P-Scale 510 programming software, power pack and connection cable. This can be ordered from BD|SENSORS as an accessory.

## 6. 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.

## 7. 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: 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	<b>Recommendation:</b> 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: wrong or no output signal	
Possible cause	Fault detection / remedy
Cable damaged mechanically, thermally or chemically	Checking of cable; pitting corrosion on the stainless-steel housing as a result of damage on cable; when damaged, send the device to BD SENSORS for repair

## 8. 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.

## 9. Service/Repair

Information on service / repair:

- www.bdsensors.de
- info@bdsensors.de
- Service phone: +49 (0) 9235 9811 0

### 9.1 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.

### 9.2 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.de or request them by e-mail or phone: info@bdsensors.de | Tel.: +49 (0) 9235 9811 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.

## 10. 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!

## 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 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.

## 12. EU Declaration of Conformity / CE

BD Sensors GmbH hereby declares its sole responsibility that the products mentioned above comply with the Directives and standards listed.

2014/30/EU (EMC) EN 61326-1:2013

### 2014/34/EU (ATEX)

DX14: **IBExU05ATEX1070 X**  
EN60079-0:2012+A11:2013, EN60079-11:2012; EN 60079-26:2015

DX19: **IBExU10ATEX1068 X**  
EN 60079-0:2012+A11:2013, EN 60079-11:2012, EN 60079-26:2015

Notified body / ID number: **IBExU Institut für Sicherheit GmbH / 0637**

**TÜV 10 ATEX 382477 Q EN ISO/IEC 9001:2015**

Notified body / ID number: **TÜV NORD CERT GmbH / 0044**

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

For devices with permissible max. positive pressure > 200 bar: **Module A** evaluation method

Thierstein, 01.08.2016

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Mechanical Design Manager

W. Leupold  
Leiter Elektronikentwicklung/  
Electronics Design Manager