AX12-XMD

AX17-XMD

**Operating Manual** 

BD SENSORS GmbH

1. General information

must be complied with!

AX12:

AX17:

effects

1.2 Symbols used

operation

1.3 Target group

death or serious injuries

result in minor injuries

result in physical damage

result in death or serious injuries

out by qualified technical personnel.

1.1 Information on the operating manual

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Germany

Differential-Pressure Transmitter for IS-areas

www.bdsensors.de

This operating manual contains important information on

proper usage of the device. Read this operating manual care-

fully before installing and starting up the pressure measuring

Adhere to the safety notes and operating instructions which

are given in the operating manual. Additionally, applicable reg-

ulations regarding occupational safety, accident prevention as

well as national installation standards and engineering rules

For the installation, maintenance and cleaning of the device,

stipulations on explosion protection (VDE 0160, VDE 0165 or

EN60079-11:2012, EN60079-26:2015

This operating manual is part of the device, must be kept near-

This operating manual is copyrighted. The contents of this op-

ing. It has been issued to our best knowledge. However, BD

SENSORS is not liable for any incorrect statements and their

- Technical modifications reserved -

▲ DANGER! – dangerous situation, which may result in

MARNING! - potentially dangerous situation, which may

▲ CAUTION! – potentially dangerous situation, which may

! CAUTION! - potentially dangerous situation, which may

INTE - tips and information to ensure a failure free

MARNING! To avoid operator hazards and damages of

the device, the following instructions have to be worked

erating manual reflect the version available at the time of print

EN IEC 60079-0:2018, EN60079-1:2014

EN 60079-14) as well as the occupational safety provisions.

EN60079-0:2012+A11:2013,

est its location, always accessible to all employees.

The device was constructed acc. to standards:

you must absolutely observe the relevant regulations and

# BD SENSORS

# 1.5 Intended use

- The Differential Pressure Transmitter XMD has been especially designed for the process industry and can be used for level measurement of closed, pressurized tanks, pump or filter controlling, etc. The transmitter is as a standard equipped with HART®-communication and the parameterization can be done via PC, HART®-communicator etc
- This operating manual applies to devices with explosion protection approval and is intended for the use in IS-areas. A device has an explosion protection approval if this has been specified in the purchase order and confirmed in our order confirmation. In addition, the manufacturing label contains the @-symbol. - It is the operator's responsibility to check and verify the suitability of the device for the intended application. In ad-
- dition, it has to be ensured, that the medium is compatible with the media wetted parts. If any doubts remain, please contact our sales department in order to ensure proper usage. BD SENSORS is not liable for any incorrect selections and their effects!
- The technical data listed in the current data sheet are engaging and must be complied with. If the data sheet is not available, please order or download it from our homepage. (http://www.bdsensors.de)
- M WARNING! Danger through improper usage!

# 1.6 Safety technical maximum values

# 1.6.1 Intrinsically safe version

AX 12-XMD: IBExU 05 ATEX 1106 X application in zone 1: II 1/2G Ex ia IIB T4 Ga/Gb permissible temperatures for environment: -40 ... 70 °C supply and signal circuit

- $\tilde{U}_i$  = 28  $\breve{V},~I_i$  = 98 mA,  $P_i$  = 680 mW,  $C_i\approx 0$  nF,  $L_i\approx 0~\mu H$ plus cable inductivity 1 µH/m and cable capacity 160 pF/m (for cable by factory)
- The internal capacity of supply connections compared to the housing is max. 33 nF
- NOTE The limit values are valid only for the devices with own-sure circuits!

# 1.6.2 Flameproof enclosure

AX 17-XMD: IBExU 12 ATEX 1045 X zone 1: II 2G Ex db IIC T5 Gb

permissible temperatures: -20 ... 70 °C

#### NOTE - The use of the devices with flameproof enclosure is not allowed in the areas of dust!

### 1.7 Package contents

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

- differential pressure transmitter
- protective cap - this operating manual

# 2. Product identification

The device can be identified by its manufacturing label. It pro-

vides the most important data. By the ordering code the prod-uct can be clearly identified. code of serial ordering code nominal range number



# setting range



Ex-designation and number of EU type safety technical examination certificate maximum values

- Fig. 1 example of manufacturing lables
- I The manufacturing label must not be removed from the device!

#### 1.4 Limitation of liability

By non-observance of the operating manual, inappropriate use, modification or damage, no liability is assumed, and warranty claims will be excluded

# 3 Mechanical installation

and currentless

#### 3.1 Mounting and safety instructions

- MARNING! Install the device only when depressurized
- MARNING! This device may only be installed by qualified technical personnel who has read and understood the operating manual!
- A DANGER! Caused by the explosion hazard following instructions have to be complied with:
  - The technical data listed in the EU type-examination certificate are engaging. If the certificate is not available, please order or download it from our homepages http://www.bdsensors.de
  - Working on supplied (active) parts, except for intrinsically safe circuits, is principally prohibited during an explosion hazard.
  - Make sure that an equipotential bonding is in place for the entire course of the line, both inside and outside the intrinsic area.
  - In case of increased danger of lightning strike or damage by overvoltage, a stronger lightning protection should be planned
  - Observe the limiting values specified in the EU typeexamination certificate. (Capacitance and inductance of the connection cable are not included in the values )
  - Make sure that the entire interconnection of intrinsically safe components remains intrinsically safe. The operator is responsible for the intrinsic safety of the
  - overall system (installation of intrinsic parts). - Do not mount the device in a pneumatic flow rate!
  - Excessive dust deposits (over 5 mm) and a complete dust covering must be avoided
  - When installing the device, at least the ingress protection IP 20 must be realised.
- I Handle this high-sensitive electronic precision measuring device with care, both in packed and unpacked condition!
- I There are no modifications/changes to be made on the device.
- Do not throw the package/device!
- ! To avoid damaging the diaphragm, remove packaging and protective cap directly before starting assembly. The delivered protective cap has to be stored!
- Place the protective cap on the pressure port again immediately after disassembling
- I Handle the unprotected diaphragm very carefully it is very sensitive and may be easily damaged
- Do not use any force when installing the device to prevent damage of the device and the plant!
- . For installations outdoor and in damp areas following these instructions:
  - Please note that your application does not show a dew point, which causes condensation and can damage the pressure transmitter. There are specially protected pressure transmitters for these operating conditions. Please contact us in such case.
  - To prevent moisture admission in the plug the device should be installed electrically after mounting, at once. Otherwise a moisture admission has to be blocked e.g. by using a suitable protection cap. (The ingress protection in the data sheet is valid for the connected device.)
  - Choose an assembly position, which allows the flow-off of splashed water and condensation. Avoid permanent fluid at sealing surfaces!
  - When using a device with cable outlet, turn the outgoing cable downwards. If the cable has to be turned upwards, then point it downward so the moisture can drain.
- Install the device in such a way that it is protected from direct solar irradiation. Direct solar irradiation can lead to the permissible operating temperature being overstepped in the worst case. This is prohibited for applications in IS-areas!
- When installing the device to the pressurized system, the operator has to ensure the correct sealing
- Source the intended resp. delivered seal for compatibility with the medium. If there is no compatibility, take a suitable seal.
- Take note that no inadmissibly high mechanical stresses occur at the pressure port as a result of the installation. since this may cause a shifting of the characteristic curve or to the demage. This is especially important for very small pressure ranges as well as for devices with a
- pressure port made of plastic. In hydraulic systems, position the device in such a way
- that the pressure port points upward (ventilation) IN Provide a cooling line when using the device in steam piping.
- If there is any danger of damage by lightning or overpressure when the device is installed outdoor, we suggest putting a sufficiently dimensioned overpressure protection between the supply or switch cabinet and the device.

#### 3.2 General installation steps

- Carefully remove the pressure measuring device from the package and dispose of the package properly
- Go ahead as detailed in the specific instructions below. Therefore, you will have to observe that:
- the higher pressure must be connected with input "H" - the lower pressure must be connected with input "L"

#### 3.3 Installation steps for NPT connections - Use a suitable seal (e. g. a PTEE-strip)

- Screw the device into the corresponding thread by hand
- Tighten it with a wrench (for 1/2" NPT: approx. 70 Nm).
- The indicated tightening torques must not be

#### exceeded

#### 3.4 Positioning of the display and operating module The display and operating module is continuously rotatable so that clear readability is guaranteed even in unusual installation positions. To change the position, go ahead as follows:

- Screw off the metal cap by hand.
- Turn the display and operating module carefully into the desired position by hand. The module is equipped with a rotational limiter.
- Before screwing on the cap again, the o-ring and sealing surfaces of the housing have to be checked for damage and if necessary have to be changed! Afterwards screw the metal cap on by hand and make
- sure that the housing is firmly locked again.
- MARNING! It is prohibited to open and configure the devices in the presence of explosion hazards. Therefore, it is recommended to position the display and operating module together with the mechanical installation
- Pay attention that no moisture can enter the device. Moreover, the seals and the sealing surfaces should not get dirty, as this may cause a reduction of the degree of protection depending on the case of application or place of installation. This can lead to a breakdown of the devices or to irreparable damages on the device.

#### 4. HART<sup>®</sup> communication

**DANGER!** It is prohibited to interrupt the intrinsically safe circuit in the presence of explosion hazards in order to loop in a HART<sup>®</sup> communication interface (HART<sup>®</sup>-communicator or HART<sup>®</sup>-modem).

The analogue output signal is overridden by an additional signal according to the HART®-specification. The device can be configured via a HART<sup>®</sup>-communication device. Therefore. we suggest our programming kit CIS 150 (available as accessory).

To ensure a trouble-free operation the following requirements should be fulfilled

maximal cable length between device and power supply

$L_{\max} = \frac{65 \cdot r}{R_v}$	$\frac{10^{\circ}}{C_{v}} - \frac{40 \cdot 10}{C_{v}}$	3
whereas	L <sub>max</sub> :	maximum length of cable in [m]
	Rv:	resistance of the cable together with
		the load resistance in Ω]
	Cv.	capacity of the cable in [pF/m]

n [pF/m] capacity of the ca

# resistance R: 11 - 120.024

- whereas U٠ power supply in [V<sub>DC</sub>]
- The resistance must be at least 240  $\Omega$ .

#### 5. Special regulations for IS-areas

5.1 Protection against electrostatic charge hazards Different types of the device partially consist of chargeable plastic components. These are in particular coating of the housing as well as the plastic pressure port (optionally). A potential electrostatic charge presents the danger of spark gen eration and ignition. An electrostatic charge must therefore be absolutely prevented.

- Reference of the second second
- Re Avoid friction on the plastic surfaces!

IST Do not clean the device dry! Use, for example, a damp cloth

The following warning sign is, if applicable, attached to the device. It points once more to the hazard of electrostatic charging.

I The warning sign must not be removed from the device!



Fig. 2 warning sign

If the device is used as electrical equipment of category 1 G, a suitable overvoltage protection device must be connected in series (attend the valid regulations for operating safety as well

5.2 Overvoltage protection

as EN60079-14).

5.3 Schematic circuit

IS-area

K\_

Fig. 3 circuit diagrams

rent will flow

transmitte

cally safe operation.

galvanic power supply

physical input signal (pressure).

ner barrier.

trinsically safe.

put signal / Supply"

The operation of an intrinsically safe transmitter in intrinsic safe areas requires special care when selecting the necessary Zener barrier or transmitter repeater devices to allow the utilization of the device's properties to the full extent.

The following diagram shows a typical arrangement of powe supply, Zener barrier and pressure transmitter



Please pay attention to item (17) of the type examination certificate, which stipulates special conditions for intrinsi-

### 5.4 Exemplary circuit description

The supply voltage of e.g. 24 V<sub>DC</sub> provided by the power supply is led across the Zener barrier. The Zener barrier contains series resistances and Zener diodes as protective components. Subsequently, the operating voltage is applied to the device and, depending on the pressure a particular signal cur-

A DANGER! When installing the intrinsically safe device as a zone-0-equipment, the supplying must be carried out by a power supply which must be galvanically insulated and which is not allowed to be grounded.

#### 5.5 Functional selection criteria for Zener barriers and

The minimum supply voltage V<sub>S min</sub> of the device must not fall short since a correct function of the device can otherwise not be guaranteed. The minimum supply voltage has been defined in the respective product-specific data sheet under "Out-

When using a galvanically insulated amplifier with a linear bonding, please attend that the terminal voltage of the device will decrease like it does with a Zener barrier. Furthermore, it has to be attended that the supply of the device will also decrease with an optionally used signal amplifier.

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

In order not to fall below V<sub>S min</sub>, it is important to verify which minimum supply voltage is available at full level control of the device. Full level control, i. e. a maximum or nominal output signal (20 mA), can be reached by applying the maximum

The technical data of the barrier will usually provide the information needed for the selection of the Zener barrier. However, the value can also be calculated. If a maximum signal current of 0.02 A is assumed, then - according to Ohm's law - a par ticular voltage drop results on the series resistance of the Ze-

This voltage drop is subtracted from the voltage of the powe supply and as a result, the terminal voltage is obtained which is applied on the device at full level control. If this voltage is smaller than the minimum supply voltage, another barrier or a higher supply voltage should be chosen

R Please pay attention when choosing the barrier or the transmitter repeater because some supplied devices / Zener barriers are not suitable for HART<sup>®</sup> communication. Most manufacturers offer a device group especially developed for this application.

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

#### 6 Electrical Installation

- MARNING! Install the device in currentless environments only
- WARNING! Install the connection for devices equipped with terminal clamps so that the separating spaces comply with the standard and the connecting lines cannot be loosened
- MARNING! For devices with flameproof enclosure, a M20x1.5 cable gland HSK-M-Ex-d / Metr. is prescribed: this is already pre-mounted. Technical data: cable diameter Ø10 ... Ø14 mm, width across flats: 24 mm, continuous operating temperature: -60 ... 105 °C, certificate: II 2G 1D Ex d IIC
- $\triangle$  By devices with pressure flameproof enclosure a cable gland M20x1.5 with the name HSK-M-Ex-d is prescribed. This is already premounted.
- A DANGER! Danger of explosion when surpassing the maximum supply of 28 V<sub>DC</sub>!
- NOTE The cap for the connection clamps and display can be opened only if a locking protection, headless screw with inside hexagonal, remove became. The screw is on the right side below the cap. After attach of the cap for display and for the connection clamps, the locking protection must be screwed again purely. Besides, the lubrication of the thread ways is not necessary.
- INTE The cable glnad by devices with flameproof enclosure is suitable only for the firm transfer!

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

Pin configuration:

Electrical connections	Terminal clamps in clamping chamber with cable gland M 20 x 1,5 (for cable Ø 5 up to 14 mm)		
Supply +	+		
Supply –	-		
Test	TEST+		
COM / Test -	COM/TEST-		
COM	COM		
Shield	Ð		

Wiring diagram:

2-wire system (current) HART®



- ! Make sure that the supply corresponds to protection class III (protective insulation
- ! For the installation of a device with cable outlet following bending radiuses have to be complied with: cable without ventilation tube
  - static installation : 8-fold cable diameter dynamic application: 12-fold cable diameter
- cable with ventilation tube:

static installation : 10-fold cable diameter dynamic application: 20-fold cable diameter

- I To install a device with terminal clamps, the cap has to be screwed off. If the device is equipped with a display and operating module, this has to be pulled out carefully. Put it as long as installing the device non-tensioned next to the housing. Next insert it again carefully and ensure that the cords are not turned or squeezed. Before screwing on the cap again, the o-ring and sealing surfaces of the housing have to be checked for damage and if necessary to be changed! Afterwards screw the metal cap on by hand and make sure that the field housing is firmly locked again.
- I For a clear identification, the intrinsically safe cables are marked with light blue shrink tubing (over the cable insu-lation). If the cable has to be modified (e.g. shortened) and the marking at the cable end has been lost in the process, it must be restored (for example, by marking it again with light blue shrink tubing or an appropriate identification label)
- For the electrical connection a shielded and twisted multicore cable has to be used.

### 7. Initial start-up

- MARNING! Before start-up, the user has to check for proper installation and for any visible defects
- ${igt \Delta}$  WARNING! The device can be started and operated by authorized personnel only, who have read and understood the operating manual!
- MARNING! The device has to be used within the technical specifications, only (compare the data in the data sheet and the EU type-examination certificate)!

#### 8 Operation

# 8.1 Display and operating module



### Fig. 4 touch pad

A bargraph is shown in the display, indicating the current pressure input as percentage of the specified pressure range. The indication of the measured value as well as the configuration of the individual parameters occurs through a menu via the display. The individual functions can be set with the help of three miniature push buttons located under the metal cap. For devices of the XMD series with aluminium die cast case, additionally the possibility is given to operate via three push buttons (accessible from above). This is especially an advantage in IS-areas, caused by the fact that the device can be configured in situ without opening the operating and display module Therefore, the metal plate (on the top side of the device), has to be folded backwards after loosening the right screw. The definition of the three buttons is: ▼. OK. ▲ (starting at the left side)

The menu system is a closed system allowing you to scroll both forward and backward through the individual set-up menus to navigate to the desired setting item. All settings are permanently stored in a Flash EPROM and therefore available even after disconnecting from the supply voltage.

- MARNING! It is prohibited to open and configure the devices in the presence of explosion hazards. After configuration it must be ensured that the device is completely closed again outside the explosion hazard area.
- Pay attention that no moisture can enter the device during configuration. Moreover, the seals and the sealing surfaces should not get dirty, as this may cause a reduction of the degree of protection depending on the case of application or place of installation. This can lead to a breakdown of the device or to irreparable damages on the device. Right after configuration, the metal cap has to be screwed on again.

### 8.2 Structure of the menu system

Please note the "Supplementary sheet to operating manual for x|act ci, xlact i, XMP ci, XMP i, XMD"

- **A-button:** with this button you move forward in the menu system or increase the displayed value; it will also lead you to the operating mode (beginning with menu item "1 DISPLAY")
- ▼-button: with this button you move back in the menu system or decrease the displayed value; it will also lead you to the operating mode (beginning with menu item "5 SERVICE")
- OK-button: with this button menu items and set values have to be confirmed

execution of configuration:

- set the desired menu item by pushing the ▲- or ▼-button - activate the set menu item by pushing the OK-button
- set the desired value or select one of the offered settings
- by using the ▲- or ▼-button store/confirm the set value/selected setting and exit the
- menu by pushing the OK-button
- If a parameter is configurable by a value, each digit may be configured separately. That means after activating such a menu item (e. g. "2.3.1 OFFSET") by pushing the OK-button, the first digit of the currently set value will start to blink. Now scroll up or down to the desired digit via the ▼- or ▲-button and confirm it with the OK-button. After that, the next digit will start to blink. Configure it in the same way. In the menu items "2.3.1 OFFSET" and "2.3.2 FINALVAL", the decimal point will then start to blink, and it is also possible to change its position by using the  $\nabla$ - or  $\blacktriangle$ -button. By confirming the position with the OK-button, the total value will be stored if permissi ble. If the value is out of range, an error message (e.g. Error 03) will appear in the display and the set value will not be stored.

If you intend to set a negative value, the first digit has to be configured with the v-button

8.3 Menu list					
1 DIPLAY	Display parameter				
1.1 P <sub>max</sub>	Maximum pressure display (high pressure)				
4.2.0	The maximum pressure that occurred during the measurement is shown on the display.				
1.2 P <sub>min</sub>	Minimum pressure display (low pressure) The minimum pressure that occurred during the measurement is shown on the display				
1.3 T <sub>max</sub>	Maximum temperature display (high temperature)				
	The maximum temperature that occurred during the measurement is shown on the display.				
1.4 T <sub>min</sub>	Minimum temperature display (low temperature)				
1.5 CLEAR	Delete the values 1.1-1.4 (P <sub>max</sub> , P <sub>min</sub> , T <sub>max</sub> , T <sub>min</sub> )				
1.6 INFO	Configuration of the display				
	Assignment of the settable digits				
	"1": 1st line: measured pressure 2nd set pressure unit				
	"3": 1st line: measured temperature 2nd line: °C				
	"4": 1st line: measured pressure 2nd line: Change between pressure unit / output signal in mA				
	"5": 1st line: measured pressure 2nd line: Change between pressure unit / temperature in °C"				
	6. Ist line. measured pressure 2nd line. Change between pressure unit / output signal in mA / temperature in °C				
1.7 RETURN	Return to menu 1 DISPLAY				
2 CALIB	Configuration of measuring range, display and output signal				
2.1 ZERU	Zeroing the display The message "CONFIRM" appears on the display when selecting the subsidiary menu item with the OK button. By				
	holding the OK button pressed for at least 2 seconds the zeroing is performed, and the message "CONFIRM" dis-				
	appears from the display.				
2.2 CAL REF	Adjusts the analogue output with pressure reference				
2.2.1 0FF3E1	Adjusts the starting value for the output signal After the reference pressure has been applied and accepted, selecting the subsidiary menu item with the OK button				
	causes the message "CONFIRM" to appear on the display. By holding the OK button pressed for at least 2 seconds				
	the applied pressure is specified as the starting value for the output signal (4 mA), and the message "CONFIRM"				
2 2 2 ΕΙΝΔΙ VΔΙ	Adjusts the end value for the output signal				
	After the reference pressure has been applied and accepted, selecting the subsidiary menu item with the OK button				
	causes the message "CONFIRM" to appear on the display. By holding the OK button pressed for at least 2 seconds				
	the applied pressure is specified as the end value for the output signal (20 mA), and the message "CONFIRM" dis-				
2.2.3 RETURN	Return to menu 2.2 CAL REF				
2.3 ADJUST	Sets the measuring range and the zero point				
2.3.1 OFFSET	Sets the starting value of the measuring range				
	The $\blacktriangle$ and $\forall$ buttons allow you to define a starting value for the measuring range. The permitted input range is				
	between 0 90% of the original measuring range (turn down max. 1.10). 4 ma is output when the value that has been entered is reached.				
2.3.2 FINALVAL	Sets the end value of the measuring range				
	The ▲ and ▼ buttons allow you to define an end value for the measuring range. The permitted input range is be-				
	tween 10 100% of the original measuring range (turn down max. 1:10). 20 mA is output when the value that has been entered is reached				
2.3.3 Z-CORR	Zero-point correction of the display and output signal				
	The message "CONFIRM" appears on the display when selecting the subsidiary menu item with the OK button. By				
	holding the OK button pressed for at least 2 seconds the applied pressure is specified as the starting value for the				
2.3.4 RETURN	Return to menu 2.2 CAL REF				
2.4 RETURN	Return to menu 2 CALIB				
3 SIGNAL	Signal parameters				
3.1 FUNKTION	Function selection				
	$\frac{1}{2} SOB^{*} \qquad y = \sqrt{\pi}$				
	"2SOB3POW" $y = \sqrt{x^3}$ cut off 2 %				
	"2SOP5POW" $y = \sqrt{x}$				
3.2 DENSITY	Input of the density				
	settable range: 100 9999 kg/m <sup>3</sup> Conversion is only applicable to the units [mFH], [cmFH] and [mmFH].				
3.3 DAMP	Configuration of the damping				
3.4 SIMULAT	Simulation of the output signal				
0.4 OIMOLAT	settable range: any, for example: 3.7 22 mA				
3.5 RETURN	Return to menu 3 SIGNAL				
4 SETTINGS	Basic settings				
4.1 DISPLAY	Configuration of the unit for pressure				
4.1.1 010111	Units: bar, mbar, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Pa, kPa, Torr, atm, mH2O, ftH2O, MPa, mFH*, cmFH*, mmFH*, mmH2O, mmHg,				
	psi				
	I ne conversion of all pressure-related parameters is performed automatically.				
4.1.2 UNIT T	Configuration of the unit for temperature				
	Units: <sup>°</sup> C and <sup>°</sup> F				
4.1.3 RETURN	Return to menu 4.1 DISPLAY				
4.2 HAR I -IÚ	עווטן עס אם אחד (only to be set with HAR I ~ devices in multi-drop mode) Set the desired ID no. (between "0" and "15") and confirm this with the OK button. It is only necessary to configure				
	this number if you want to operate the device in multi-drop mode (connection of a number of HART® devices). If the				
	ID no. is set to "0", the multi-drop mode is deactivated, and the device operates in analogue mode.				
4.3 USER-L	Configuration of the user's security level				
	the OK button. The password is factory-set to "0000".				
	Security levels:				
	"0": the whole menu system is enabled				
	"1": the following menu items are enabled: 1 Display, 3 Signal, 4.3 USER-L				
	une tonowing menu items are enabled: 1 Display, 4.3 USER-L  Configuration of the password				
	For security reasons it is necessary to enter the previous password before configuration. Confirm this with the OK				
	button. The password is factory-set to "0000". Then set the new password and confirm this with the OK button.				
	It you have forgotten your password, you can request the master password, which is fixed at manufacture,				
4.5 LANGUAGE	Selection of DE or EN as the user language				
4.6 WPROTECT	Write protection (HART <sup>®</sup> -configuration)				
	Setting YES: write protection is activated, transmission of the HART® commands to the storage location is not pos-				
	suble. Setting NO: write protection is deactivated.				
4.7 KETUKN	Return to menu 4 SETTINGS				
5.1 FACTORY	Reset to factory settings				
5.2 ERR CURR	Definition of the current				
	settable values: 21.6 mA or 3.8 mA; the selected error current is output in response to a malfunction in the electron-				
5 3 TVPE	ICS Display of the device type				
5.4 SER-NO	Display of the set serial number				
5.5 VERS	Display of the program version (firmware)				
5.6 RETURN	Return to menu 5 SERVICE				
6 RETURN	Return to display mode				

# 9. Error handling

9.1 Error messages	TOO SMALL	cautions for purification
entered parameter value	e is too small	11. Maintenance
PASSED PARAMETER		In principle, this device in
entered parameter value		housing of the device can be
loop current is not active	e (HART ID > 0, device works in	a damp cloth and non-aggre
APPLIED PROCESS T	OO LOW	With certain media, howeve
applied process is too lo	0W	sponding service intervals for
APPLIED PROCESS T applied process is too h	DO HIGH iah	out of service correctly, the
LOWER RANGE VALU	E TOO HIGH	brush or sponge. If the dia
lower range value (OFF	SET) is too high	mended to send the device
lower range value (OFF	SET) is too low	tion. Please read therefore
UPPER RANGE VALUE	E TOO HIGH	A false cleaning of the damage on the diaphr
UPPER RANGE VALUE	E TOO LOW	objects or pressured a
upper range value (FIN/	ALVAL) is too low	12 Comiss / Donain
span too small		12. Service / Repair
DEVICE MALFUNCT		12.1 Recalibration
Internal failure → please for repair	e send the device to BD SENSORS	During the life-time of a tran
2 More errors and nos	sible corrections	in reference to the nominal
Fault: display does not v	vork	end point may be transmitte
Possible cause	Fault detection / remedy	mended to ensure furtherm
Connected incorrectly	inspect the connections	
	inspect an connecting lines	
Defective energy supply	applied supply voltage at the	
	uansmitter	
Fault: no output signal	Fault detection / remody	
Connected incorrectly	inspect the connection	15. Declaration of confo
Line breek	inspect all line connections nec-	The delivered device fulfils
Line break	essary to supply the device (in- cluding the connector plugs)	EU declaration of conformit
Defective amperemeter	inspect the amperemeter (fine-	limed by the CE sign on th
(signal input)	wire fuse) or the analogue input of the PLC	
Eault: analogue output s	ignal too low	
Possible cause	Fault detection / remedy	
Load resistance too high	verify the value of the load re-	
	verify the output voltage of the	
Supply voltage too low	power supply	
Defective energy supply	applied supply voltage at the de-	
3, 11, 11, 11, 11, 11, 11, 11, 11, 11, 1	vice	BD SENSORS GmbH
Fault: small shift of the c	output signal	BD SENSORS GmbH d
Possible cause	Fault detection / remedy	x act ci; x act i; XM
Diaphragm is highly polluted	cleaning using a non-aggressive cleaning solution and brush or	mit den aufgeführten fulfil the below mentione
Dianhragm is coloified or	recommendation: send the	
coated with deposit	device to BD SENSORS for	2014/34/EU (EMC)
		2011/65/EU (RoHS)
Fault: large shift of the o	Eault detection / remody	Eür Garöta mit Ev. Zul
Diaphragm of sensor is	checking of diaphragm; when	For devices with IS appr
damaged (caused by ove	er damaged, send the device to	0014/04/511/4555
pressure or mechanically	יוואלאו וחו פעוספעוםפותפוניין (א	2014/34/EU (ATEX)
Fault: measured value ( ates from the nominal va	(display and analogue output) devi-	
Possible cause	Fault detection / remedy	
High pressure / pressure	recalibration or replacement of	IBExU05ATEX1106
peaks Mechanical damage to d	the pressure port by	IBExU12ATEX1045
aphragm	BD SENSORS is required	Benannte Stelle / Ke
Fault: constant output si	gnal at 4 mA	Notified Body / identified
Possible cause	Fault detection / remedy	IBExU19ATEXQ01
Wrong ID number	under menu item "ID" is "0000"	Benannte Stelle / Ke
If you detect an error, pl this table or send the d	lease try to eliminate it by using evice to our service address for	Notified Body / identifi
repair.	<b>.</b>	In Erfüllung der Druck
DANGER! Working intrinsically safe circ	In conformance to the P	
an explosion hazar	d. Additionally, the operator is obli-	following module has be
gated to observe th and maintenance we fixed to the device	e information concerning operation ork on the warning signs possibly af-	Für Geräte mit max For devices with maxi
Improper action and	opening can damage the device	Thierstein 2020-06-2
Therefore repairs on	the device may <u>only</u> be executed	
by the manufacturer	1	. / )

#### 10. Placing out of service

MARNING! Disassemble the device only in current and pressure less condition! Check before disassembly, if it is necessary to drained off the media before dismantling! A WARNING! Depending on the medium, it may cause danger for the user. Comply therefore with adequate precautions for purification

#### laintenance

inciple, this device is maintenance-free. If desired, the ng of the device can be cleaned when switched of using np cloth and non-aggressive cleaning solutions.

certain media, however, the diaphragm may be polluted pated with deposit. It is recommended to define correding service intervals for control. After placing the device service correctly, the diaphragm can usually be cleaned ally with a non-aggressive cleaning solution and a soft or sponge. If the diaphragm is calcified, it is recomed to send the device to BD SENSORS for decalcifica-Please read therefore the chapter "Repair" below

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

# Service / Repair

g the life-time of a transmitter, the value of offset and may shift. As a consequence, a deviating signal value erence to the nominal pressure range starting point or point may be transmitted. If one of these two phenomoccurs after prolonged use, a recalibration is recomed to ensure furthermore high accuracy.

# eclaration of conformity / CE

d by the CE sign on the manufacturing label.

BDSENSORS GmbH declares on its own responsibility that the product

# x|act ci; x|act i; XMD; XMP ci; XMP i

fulfil the below mentioned requirements and standards

# 2014/34/EU (EMC)

Für Geräte mit Ex-Zulassung: For devices with IS approval

# 2014/34/EU (ATEX)

# IBExU05ATEX1106 X

# IBExU12ATEX1045 X

Benannte Stelle / Kennnummer Notified Body / identification number:

# IBExU19ATEXQ013

Benannte Stelle / Kennnummer Notified Body / identification number

In Erfüllung der Druckgeräterichtlinie 2014/68/EU und als Ergebnis des darin geforderten Konformitätsbewertungsverfahrens wird folgendes Modul gewählt: In conformance to the Pressure Equipment Directive 2014/68/EU and as result of therein demanded conformity assessment procedures the following module has been cho



D. Sanvenero

Leiter Konstruktion/ Mechanical Design Manager

#### 12.2 Return

Before every return of your device, whether for recalibration decalcification, modifications or repair, it has to be cleaned carefully and packed shatter-proofed. You have to enclose a notice of return with detailed defect description when sending the device. If your device came in contact with harmful substances, a declaration of decontamination is additionally required. Appropriate forms can be downloaded from our homepage www.bdsensors.de. Should vou dispatch a device without a declaration of decontamination and if there are any doubts in our service department regarding the used medium, repair will not be started until an acceptable declaration is sent.

#### $\triangle$ If the device came in contact with hazardous substances, certain precautions have to be complied with for purification!

# 13. Disposal

The device must be disposed of according to the European Directive 2012/19/EU (waste electrical and electronic equipment). It is prohibited to place electrical and electronic equipment in domestic refuse!



MARNING! Depending on the measuring medium, deposit on the device may cause danger for the user and the environment. Comply with adequate precautions for purification and dispose of it properly.

#### 14. Warranty conditions

The warranty conditions are subject to the legal warranty period of 24 months from the date of delivery. In case of improper use, modifications of or damages to the device, we do not accept warranty claims. Damaged diaphragms will also not be accepted. Furthermore, defects due to normal wear are not subject to warranty services.

lelivered device fulfils all legal requirements. The applied directives, harmonised standards and documents are listed in the eclaration of conformity, which is available online at: http://www.bdsensors.de. Additionally, the operational safety is con-



# EU-Konformitätserklärung

EC Declaration of Conformity

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

mit den aufgeführten Richtlinien und Normen übereinstimmen.

EN 61326-1:2013

AX12-x|act ci; AX12-x|act i; AX12-XMD; AX12-XMP ci: AX12-XMP i AX17-XMD; AX17-XMP ci; AX17-XMP i EN 60079-0:2012+A11:2013, EN 60079-11:2012, EN 60079-26:2015 EN IEC 60079-0:2018, EN 60079-1:2014

EN ISO/IEC 80079-34:2012

IBExU Institut für Sicherheitstechnik GmbH / 0637

IBExU Institut für Sicherheitstechnik GmbH / 0637

Für Geräte mit maximal zulässigem Überdruck > 200 bar: For devices with maximum permissible overpressure > 200 bar

Bewertungsverfahren Modul A Assessment procedure Module A

Marker Mart

Leiter Elektronikentwicklung/ Electronics Design Manager