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## 1. Information on This Operating Instruction

- The manual is aimed at specialists and semi-skilled personnel.
- Please read the instructions carefully before carrying out any operation and keep the specified order.
- Thoroughly read and understand the information in chapter 2 "Safety Instructions".

If you have any problems or questions, please contact your supplier or contact us directly at:



### **ARMANO Messtechnik GmbH**

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# Operating Instructions Pressure Transmitter

## Models PTME<sub>x</sub>, PTME<sub>x</sub>FB, PTME<sub>x</sub>FG, PTME<sub>x</sub>FBFG

### 1.1 Pictographs Used

In this manual, pictographs are used as hazard warnings.

Particular information, instructions and restrictions designed for the prevention of personal or substantial property damage:



**WARNING!** Is used to warn you against an imminent danger that may result in personal injury or death.

**IMPORTANT!** Is used to warn you against a possibly hazardous situation that may result in personal, property or environmental damage.

**CAUTION!** Is used to draw your attention to important recommendations to be observed. Disregarding them may result in property damage.



The following symbol highlights **actions** you have to conduct or **instructions** that have to be strictly observed.

### 1.2 Exclusion of Liability

We accept no liability for any damage or malfunction resulting from incorrect installation, inappropriate use of the device or failure to follow the instructions in this manual.

### 1.3 General Information

Please inspect the transport packaging and the delivered items immediately upon their receipt to determine their integrity and completeness. You have purchased an instrument that was manufactured according to high quality standards in our company, which is certified according to DIN ISO 9001.

## 2. Safety Instructions

Please read this operating instruction thoroughly before installing the device.

Disregarding the containing warnings, especially the safety instructions, may result in danger for people, the environment, and the device and the system it is connected to.

The ARMANO Messtechnik GmbH provides support for the use of its products either personally or via relevant literature. The customer verifies that our product is fit for purpose based on our technical information. The customer performs customer and application specific tests to ensure that the product is suitable for the intended use. With this verification, all hazards and risks are transferred to our customers. Our warranty expires in case of inappropriate use.

#### **Qualified personnel:**

The personnel that is charged for the installation, operation and maintenance of the instrument must hold a relevant qualification. This can be based on training or relevant tuition. The personnel must be aware of this manual and have access to it at all times.

#### **General safety instructions:**

- In all work, the existing national regulations for accident prevention and safety at the workplace must be complied with. Any internal regulations of the operator must also be complied with, even if these are not mentioned in this manual.
- Please regard relevant national and international safety instructions (ATEX 137, ExVo, BetrSichV etc.).
- The limit values, specified in the EU type examination certificate, are to be regarded!
- All works must take place in a de-energised state.
- The instruments are not of the pressure sustaining type with a safety function in the sense of PED 2014/68/EU.
- Please do never manipulate the device! Otherwise, you will lose your warranty!
- Repairs may only be carried out by the manufacturer.
- Use the instrument in its perfect technical condition only. Damaged or defective instruments need to be checked immediately and replaced if necessary.
- Only use appropriate tools for mounting, connecting and dismantling the device.
- Nameplates or other information on the device shall neither be removed nor obliterated, since otherwise any warranty and manufacturer responsibility expires.

# Operating Instructions Pressure Transmitter

## Models PTMEx, PTMExFB, PTMExFG, PTMExFBFG



**IMPORTANT!** Disregarding the respective regulations may result in severe personal injuries and / or property damage.



### Special safety instructions:

Warnings, which are specifically relevant to individual operating procedures or activities, are to be found at the beginning of the relevant sections of this operating instruction.

### 3. Device Description

The pressure transmitters are temperature-compensated and provide a calibrated output signal. The rugged design allows for application in difficult conditions, e.g. in shipping.

The piezoresistive pressure measuring cell, filled with silicone oil, is welded into the pressure connection piece. A thin stainless steel diaphragm separates the elementary sensor from the medium.

#### 3.1 Intended Use

Pressure transmitter models PTMEx are suitable for liquid and gaseous media, which do not corrode stainless steel 316L (1.4404). When connecting to a certified intrinsically safe circuit, the devices have the ignition protection type II 2G Ex ib IIC T6 according to ATEX. Two basic models are available:

Gauge pressure (r)	
Model PTMEx	0 – 1 bar to 0 – 400 bar
Model PTMExFB	0 – 1 bar to 0 – 60 bar

both models are also suitable for vacuum and compound ranges (with ventilation to the atmosphere)

Absolute pressure (a) 0 – 1 bar to 0 – 25 bar  
(reference point zero absolute)

### 4. Technical Data

Overload capability	pressure range dependent, typically at least 2-fold
Output signal	4...20 mA (2-wire)
Supply voltage	6...30 V DC, max. permissible operating voltage 30 V DC
Load impedance	$R_{Bmax} = (U_B - 6 V) / 0.02 A$
Storage temperature	-40 to +90 °C (-40 to +194 °F)
Rated temperature	-25 to +70 °C (-13 to +158 °F)
Accuracy	pressure ranges < 60 bar ±0.2 % FS pressure ranges ≥ 60 bar ±0.3 % FS
Long-term stability	better than ±0.25 % p.a.
Reference temperature	+20 °C (+68 °F)
Process connection	
PTMEx	G ½ B, stainless steel 316L
PTMExFB	pressure connection with flush welded membrane G ½ B according to DIN 3852
Case	stainless steel
Degree of protection	IP65

### 5. Application in Potentially Explosive Areas

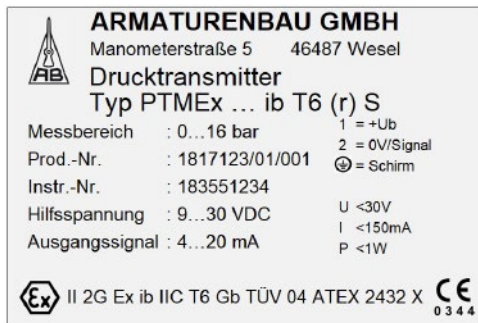
#### 5.1 General Information

CENELEC approval  
ATEX explosion protection, intrinsically safe  
TÜV 04 ATEX 2432 X  
II 2G Ex ib IIC T6  
 $U_{max} < 30 V DC$   
 $I_{max} < 150 mA$   
 $P_{max} < 1 W$   
 $C_i < 49 nF$   
 $L_i < 33 \mu H$

# Operating Instructions Pressure Transmitter

## Models PTMEx, PTMExFB, PTMExFG, PTMExFBFG

### 5.2 Marking for the Potentially Explosive Area



(content obligatory, free layout)

## 6. Mounting and Operation

### 6.1 Mounting

- Prior to mounting, ensure that the device is suitable for the process in terms of pressure range, overpressure resistance, media compatibility, temperature resistance and pressure connection.
- Complete the mounting to the process prior to the electrical installation.
- To avoid contamination or damage, do not remove the protective cap or cover in front of the separating membrane until immediately before mounting.
- Do not touch the flush welded separating membrane. For pressure ranges up to 10 bar/150 psi there is a risk of deformation. This might influence the zero point and measuring characteristics of the devices.
- Seals must be suitable for the process connection and resistant to the medium. For cylindrical threads, sealing is effected by using a flat gasket on the seal face. For conical threads, sealing is effected by screwing the threads; usually, a sealant is applied to the male thread. When mounting, ensure that the set of gaskets is faultless. Unsuitable seals can lead to faults.
- Check the transmitter for pressure tightness during commissioning.
- Do not isolate the temperature decoupler since this would reduce the decoupling effect.

- Connect the electrical connections with the supply voltage switched off.
- For degree of protection IP67 and pressure ranges up to 16 bar / 250 psi, the devices are ventilated via the connection cable. During installation, place a ventilated cable in a ventilated terminal compartment to compensate atmospheric fluctuations.
- Protection against electromagnetic interferences (EMC) is only achieved if the conditions for shielding, earthing, wiring and electrical isolation are fulfilled during installation and mounting.
- When checking the zero point signal, pay attention to the position of installation. For the standard version, the pressure transmitter is factory-set to vertical mounting. Changes to the position of installation lead to zero point offsets (approx. 1...5 mbar) for pressure ranges < 2 bar. These offsets can be corrected by a subsequent adjustment (see in chapter 7 "Zero adjustment").
- After the device has been opened, there is a risk of influencing the signal by touching the electrical connections. This can be avoided by switching off the supply voltage or disconnecting the signal circuit.
- Maintenance of the device is basically not necessary.

### 6.2 Electrical Connection

Angular plug connector according to DIN EN 175301-803, 3-pin + protective contact  
For assuring the electromagnetic compatibility (EMC), please use a shielded cable (e.g. LP/LiMYCY). The shield has to be connected to the case.

# Operating Instructions Pressure Transmitter

## Models PTME<sub>x</sub>, PTME<sub>x</sub>FB, PTME<sub>x</sub>FG, PTME<sub>x</sub>FBFG

### 7. Maintenance / Cleaning, Storage and Transport



#### **CAUTION! Material damage and loss of warranty!**

Any modifications or interventions in the device, made by the customer, might damage important parts or components. Such intervention leads to the loss of any warranty and manufacturer's responsibility!

→ Never modify the device or perform any repairs yourself.

#### **Maintenance:**

The instruments are maintenance-free.

To ensure measurement accuracy, we recommend checking the instruments regularly (once or twice a year). For this, the instrument must be separated from the process and checked by using a pressure test device.

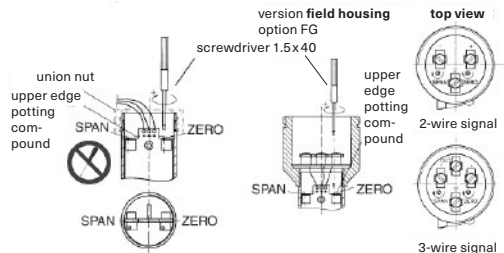
The instrument cannot be repaired by the operator. In case of faults, which cannot be eliminated without interference in the device, please return the instrument to the manufacturer for repair. Any arising repairs may only be executed by the manufacturer.

#### Zero adjustment:

If a subsequent zero adjustment is necessary, the potentiometers, embedded in the potting, can be accessed via the terminal board in the terminal compartment for the version with field housing. For the version with plug or with cable connection, unscrew the union nut and carefully pull out the plug insert from above. The internal potentiometers for zero point (ZERO) and span (SPAN) are accessible from above through the potting and adjustable with a screwdriver (1.5x40). (10 turns are about  $\pm 5\%$  of the measuring range.) To set the span, apply a precise reference pressure.



#### **Do never adjust the upper range value (SPAN)!**



#### **Cleaning:**

- Clean the device with a dry or slightly dampened lint-free cloth.
- Before cleaning the interior of connector or cable box, they must be de-energised.
- Before switching the instrument on again, please make sure that all parts have properly dried.
- Do not use any sharp objects or aggressive agents for cleaning.

#### **Storage and transport:**

- Use the original packaging or comparable packaging for transport.
- Avoid impacts or strong vibrations.
- Protect the device against moisture, dust, direct sunlight and other heat sources.
- Permissible storage temperature:  $-40 / +90\text{ °C}$  ( $-40 / +194\text{ °F}$ ).
- Before use, allow adaptation to the prevailing temperature.

# Operating Instructions Pressure Transmitter

## Models PTMEx, PTMExFB, PTMExFG, PTMExFBFG

### 8. Dismounting and Disposal

#### Before dismounting:

Check before dismounting, whether the system

- is switched off,
- is in a safe and currentless state,
- is unpressurised and cooled down.

#### Dismounting:

→ Pay attention to potentially leaking media. Take appropriate precautions to collect them.

#### Disposal:



#### **NO DOMESTIC WASTE!**

The device comprises various materials. It shall not be disposed of together with domestic waste.

→ Bring the device to your local recycling plant

or

→ send the device back to your supplier or to the ARMANO Messtechnik GmbH.

### 9. CE Conformity

**CE** The CE marking of the instruments certifies the conformity with prevailing EU directives for placing products on the market within the European Union. The following directives apply:

2014/68/EU (PED)  
2014/30/EU (EMC)  
2014/34/EU (ATEX)

## 10. Declaration of Conformity

### EU-Konformitätserklärung

### EU Declaration of Conformity

Für die nachfolgend bezeichneten Erzeugnisse

#### DRUCKMESSUMFORMER

Typen PTMEx, PTMExFB, PTMExFG, PTMExFBFG

wird hiermit bestätigt, dass sie den wesentlichen Schutzanforderungen entsprechen, die in den Richtlinien des Rates zur Angleichung der Rechtsvorschriften der Mitgliedsstaaten festgelegt sind.

Diese Erklärung gilt für alle nach Datenblatt 9812 hergestellten Exemplare.

Zur Beurteilung der Erzeugnisse hinsichtlich der Anforderungen nach den Richtlinien 2014/34/EU (ATEX), 2014/30/EU (EMV) wurden folgende Normen herangezogen:

DIN EN 60079-0:2019-09	2014/34/EU	(ATEX)
DIN EN 60079-11:2012-06		
DIN EN 61326-1:2013-07	2014/30/EU	(EMV) (EMC)

Des Weiteren fallen Geräte dieser Typenreihe mit einem Druckmessbereich >0,5 bar als „druckhaltende Ausrüstungsteile“ unter die

#### Druckgeräterichtlinie (2014/68/EU).

Diese Geräte werden nach geltender guter Ingenieurpraxis ausgelegt und gefertigt.

Mit Messbereichen ab 0 – 200 bar wurden sie folgendem Konformitätsbewertungsverfahren unterzogen:

#### Modul A „Interne Fertigungskontrolle“

Bei diesen Ausführungen erstreckt sich die CE-Kennzeichnung auch auf diese Richtlinie.

Benannte Stelle für EU-Baumusterprüfbescheinigung:  
TÜV NORD CERT GmbH

Kennnummer: 0044

EU-Baumusterprüfbescheinigung:

We hereby declare for the following named goods

#### PRESSURE TRANSMITTERS

Models PTMEx, PTMExFB, PTMExFG, PTMExFBFG

that they meet the essential protective requirements, which have been fixed in the Directive of the European Parliament and the Council on the approximation of the laws of the Member States.

This declaration applies to any specimen manufactured according to data sheet 9812.

The following standards have been used to assess the goods regarding the requirements of the directives 2014/34/EU (ATEX) and 2014/30/EU (EMC):

Moreover, instruments of this series with a pressure range >0.5 bar are, as pressure equipment parts, subject to

#### Pressure Equipment Directive (2014/68/EU).

These instruments are designed and manufactured according to sound engineering practice.

Versions with pressure ranges from 0 – 200 bar are subjected to the following conformity assessment procedure:

#### Module A "Internal Production Control"

Concerning these versions, the CE-marking also applies to this directive.

Notified body for EU-Type Examination:  
TÜV NORD CERT GmbH

Identification Number: 0044

EU-Type Examination Certificate:

TÜV 04 ATEX 2432 X

Diese Erklärung wird verantwortlich für den Hersteller:

This declaration is issued under the sole responsibility of the manufacturer:

**ARMANO Messtechnik GmbH**

abgegeben durch/by

Grünhain-Beierfeld, 2021-04-14

**Bernd Vetter**

Geschäftsführender Gesellschafter / Managing Director

**ARMANO**

**ARMANO Messtechnik GmbH**

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