

Operating Instructions

Pressure Transmitter Models PTM..., CTM... and DTM...

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Enclosure: Data Sheet (limit values, techn. data)

1. Important Information in advance

Please read these operating instructions carefully before taking the pressure transmitter into operation.

Please inspect the transport packaging and the delivered goods immediately upon their receipt to determine their integrity and completeness. In case of returns, please use the original packaging. You have purchased an instrument that was manufactured in a high quality standard in our company, which is certified according to DIN ISO 9001. Should a reason for complaint however arise, please return the pressure transmitter with a precise description of faults to our factory.

The pressure transmitter models PTM..., CTM... and DTM are manufactured according to the valid norms. The following operating instruction was composed with due care. It is not possible, however, to take into account all variants and possible cases of application in this operating instruction. If you have any questions regarding a special application, instruments, storage, mounting, operation or difficulties, please contact us as manufacturer or the distributor. With special versions (labelling S on the nameplate) please note the specifications indicated on the delivery note.

Please support us in improving this operating instruction. We will gladly accept your advice.



Applications that are not explicitly listed as according to regulations, are improper to intended purpose!

The companies ARMATURENBAU GmbH and MANOTHERM Beierfeld GmbH do not assume liability for damages that arise from incorrect use of the instrument resp. from disregard of the information contained in these operating instructions.

Do not manipulate the instrument. Otherwise you will lose your warranty.

2. Safety Information



Please regard the valid instructions regarding safety at work and prevention of accidents, as well as the country-specific installation standards during installation, starting up and operation.



Installation, putting into operation and monitoring of the operation may only be executed by qualified personnel, i.e. persons that are acquainted with installation, mounting, putting into operation and operation of the product as well as with the respective country-specific regulations and who possess the corresponding knowledge resp. qualifications.



Disregard of the respective regulations can cause severe bodily injuries and / or damages of equipment.



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In order to ensure measurement accuracy and durability of the instrument and to avoid damages, the indicated limit values in the enclosed data sheet have to be observed.



Before installation and putting into operation, please make sure that you have chosen the right instrument for your application purpose regarding load limits, as well as compatibility of material and medium.



In case of visible damages (e.g. leaking liquids) or malfunctioning, the instrument has to be decommissioned immediately resp. an installation and putting into operation must not take place! Please only use intact, faultless pressure transmitters!



All parts, especially the diaphragm in version FB, have to be protected against incorrect handling during installation of the instrument. Only touch the designated surfaces with the specified tool as described below, in order to avoid damages.

3. Description, Application

Pressure transmitter models PTM..., CTM... and DTM.... are temperature-compensated pressure sensors with integrated measuring amplifiers. They measure the pressure in the connected system and convert the measured pressure into a calibrated output signal that is suitable for transmission and control purposes.

Versions FB with flush welded diaphragms can be used for high-viscosity or crystallised media. Versions with standard connection (pressure connection with orifice) may only be used for media that do not clog the inlet port of the connection.

Models.....Data Sheet(DS)

Piezoresistive sensors

PTM	Standard version	DS 9810
PTMFB	flush welded diaphragm	DS 9810
PTMk	Compact version	DS 9810.1
PTMkFB	Compact version, flush welded diaphragm	DS 9810.1
PTMv	welded	DS 9810.2

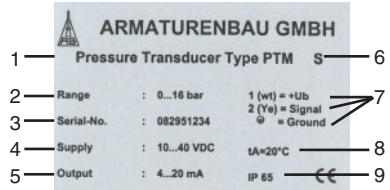
Ceramic sensors

CTMc	Standard version, capacitive	DS 9820
CTMcFG	Field housing, capacitive	DS 9820
CTMd	DMS-stud	DS 9821

Thin-film sensors

DTM	Standard version	DS 9830
DTMk	Compact version	DS 9830.1
DTMFB	Standard version	DS 9830.3

The instrument version is indicated on the nameplate:



- | | |
|-----------------------------------|---|
| 1 Basic model | 7 Pin assignment (power supply, signal, earthing) |
| 2 Pressure range | 8 Reference temperature |
| 3 Serial number | 9 Case protection type |
| 4 Power supply | |
| 5 Output signal | |
| 6 Labelling S for special version | |

4. Technical Data

The relevant technical data can be found in the enclosed data sheet, valid for the instrument type you purchased. Further data sheets are available for download on our website.



It is obligatory to observe the limit values that are indicated in the enclosed data sheet! Exceeding of limit values can cause a breakdown of the instrument and serious bodily injuries and damages of equipment!

5. Installation

Storage and Transport

Pressure transmitters are sensitive sensors and have to be handled with due care.

Please inspect the delivery contents and the condition of the transmitter upon receipt. Ensure in particular that the diaphragm in version FB is intact. Return the instrument immediately, if there are visible damages. Put the transmitter back into the original packaging for further storage. Especially the protection cap must again be attached carefully to the process connection and must not be removed until the installation of the transmitter.

Leave the pressure transmitter in its original packaging until installation and store it protected against damages caused through external influences.

During storage, the temperature indicated in the enclosed data sheet must not fall below or exceed the specified limits.

Mounting

Remove the packaging with due care! Dispose of the packaging according to environmental conditions resp. in accordance with the local waste disposal regulations!



Before installation, putting into operation and operation, ensure that you have the suitable pressure transmitter regarding pressure range, version, case protection type and material (risk of corrosion!) for the specific case of application!

For technical data see enclosed data sheet, as well as further data sheets on our websites, available there for download.



Avoid any kind of contamination and damage at the process connection and especially at the sealing face!



Do not insert any objects into the process connection!



Avoid any contact with the diaphragm, especially with flush welded diaphragms or attached chemical seals!



Connections between chemical seals and pressure transmitters must never be loosened! Possibly existing seals must not be damaged! The sealing screw at the chemical seal must never be loosened.

At process connections with wrench flats only use the matching torque wrench for installation at the measuring point.

The wrench must be applied at the designated wrench flat only.

The right tightening torque depends on material and shape of the used sealing resp. sealing material.

- For pressure connections according to DIN EN 837 use profile sealings / flat sealing rings according to DIN 16258.
- For pressure connections according to DIN 3852 form E use pre-installed elastomer profile packing!
- Tighten conical pressure connections. Use sealing material!
- With chemical seal connections, e.g. diaphragm seal for food industry, use the suitable sealing for this chemical seal
- Ensure that sealing surfaces are clean and intact!
- Do not cant the thread when screwing in.



The matching sealings for each connection must be used under all circumstances.

Depending on the type of application, even the smallest leak can cause unpredictable damages of equipment and bodily injuries!

The installation position is optional, but the instrument must be installed free of vibration and must not be exposed to strong changes in temperature.

Additional measurement errors caused by deviations from the reference temperature of +20 °C have to be observed!

Avoid a direct pressure blast on the sensor diaphragm!

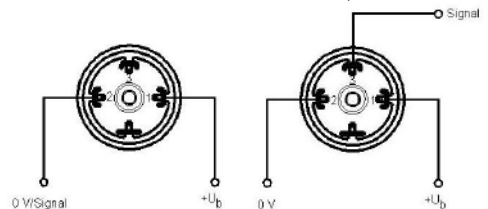
6. Electrical Connection

Electromagnetic compatibility (EMC) can only be ensured by using shielded cables and a properly connected ground connection.

Pin assignment DIN EN plug/ Series G-plug

2-wire
4...20 mA

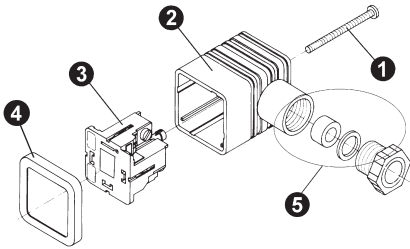
3-wire
0...20 mA, 0...10 V



The indicated protection types can only be obtained with a firmly mounted cable box and a corresponding seal.

Type	Screw fitting	Cable cross-section	Cable-diameter
DIN EN 175308-803-A	PG9	up to 1.5 mm ²	6...8 mm
Series G	PG7	up to 0.5 mm ²	4...7 mm
M 12x1	PG9	up to 0.75 mm ²	4.5...7 mm
Skintop	M16x1.5	—	4.5...10 mm
Skintop	PG7	—	4...7 mm

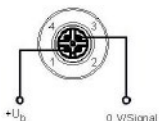
Mounting of the Connection Cable with Universal Plug Connector according to DIN EN 175310-803



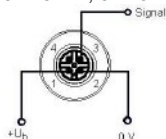
- Unscrew the central screw ① and pull the cable box off the transmitter.
- Remove profile packing ④.
- With a suitable screwdriver lever the inner part ③ out of the case part ②. For this, place the screwdriver in the provided recess at the edge.
- Insert the cable through the cable fitting ⑤ into the case part ②.
- Use the right cable diameter!
- Regard the minimum bending radius of the cable used (manufacturer's information).
- Do not crimp cable!
- Avoid condensation and humidity in the cable!
- At the inner part ③ loosen the screws of the terminals that are to be wired, insert the cable ends and retighten the screws. (Recommendation: use core cable ends with $l = 6 \text{ mm}$.)
- Cable wiring according to connection diagram!
- The inner part ③ can optionally be installed in 90° -steps.
- Insert the inner part ③ so that it engages audibly. If necessary, pull the cable back a bit.
- Tighten screwed cable gland ⑤ until density and strain relief are obtained.
- Press profile packing ④ back on.
- Attach cable box to transmitter, screw central screw ① back in and tighten it hand-tight.

Pin assignment M 12-plug

2-wire
4...20 mA



3-wire
0...20 mA, 0...10 V



7. Maintenance and Repair

Our pressure transmitters are maintenance-free. Should faults occur that cannot be corrected without intervention at the pressure transmitter (cf. section 10.), please return the pressure transmitter to us with a precise description of the faults. Any repairs may only be conducted by the manufacturer.



Never use sharp or hard objects or ultrasonic baths when cleaning the pressure connection, as these destroy the sensor!

To assure accuracy of measurement, we recommend a regular examination of the pressure transmitter. For this the instrument must be separated from the process and has to be compared by using a corresponding test device.

Precision Zero Adjustment

In case of a process-related required zero adjustment

• *for models PTM und CTMc*

the cable box must be detached.

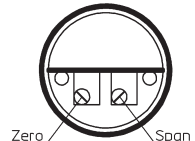
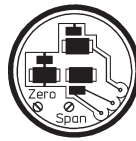
Then loosen the thumb screw, resp. 4 screws. Remove the upper plug section carefully and tilt it to the side. Slip cable box over.

With a screwdriver the potentiometer "Zero" can be adjusted within a range of approximately 5 – 10% by turning to the right (+) or left (-).

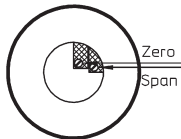
PTM....

2-wire (4...20 mA)

3-wire (0...20 mA, 0...10 V)



CTMc

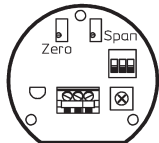


- **for model CTMcFG**

remove screw cap.

Adjust the potentiometer "Zero" with a screwdriver by turning it to the right (+) or left (-).

The potentiometer labelled "Span" next to the zero adjustment (Zero) must not be adjusted in any case!



- **for model CTMd**

Zero point not adjustable

- **for models DTM, DTMk, DTMFB**

Zero point is programmed, therefore only comparable ex works.



Zero adjustment may only be conducted by trained personnel! An incorrectly calibrated measurement range can cause unpredictable damages to equipment or bodily injuries!

8. Accessory

Seals: Item number:

CU-Flat Seal 

G ¼ B(¼" BSP), M12x1.5 100 011 80 01

G ½ B(½" BSP), M20x1.5 100 011 80 02

CU-Profile Seal 

G ¼ B(¼" BSP), M12x1.5 100 011 80 05

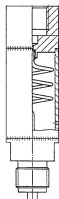
G ½ B(½" BSP), M20x1.5 100 011 80 06

Cooling Elements

Models KEI, KEIv and KEIvR

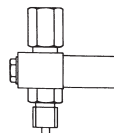
for medium temperatures
up to +150 °C / +250 °C
(+ 302 °F / + 482 °F)

see data sheet 7002



(only for types that are not already delivered with integrated temperature decoupler, typecode TE)

Overpressure Protection-Piston Valve,
stainless steel 1.4571
(316 L),
data sheet 11500



Adjustment Ranges: Item number:

0.4 – 2.5 bar	100 004 30 01
2 – 6 bar	100 004 30 02
5 – 25 bar	100 004 30 03
20 – 60 bar	100 004 30 04
50 – 250 bar	100 004 30 05
240 – 400 bar	100 004 30 06

Snubber

with laterally fixable spindle, 1.4571 (316 L),



G ½ female x G ½ B (½" BSP female x ½" BSP) Item number: 100 003 30 01

9. CE-Marking

CE The CE-Marking on the instruments certifies the conformity with the applicable EU directives for placing products on the market within the European Community. The corresponding Declaration of Conformity is enclosed resp. available upon request.

10. Faults

Description	Possible cause	Corrective action
No output signal	missing operating voltage.....	apply operating voltage
	cable broken.....	check cable and repair
	wiring fault.....	check wiring and correct
	missing input pressure.....	check pressure connection, apply pressure
	incorrect application conditions.....	send in with description of faults and of application conditions
Output signal constant	orifice clogged.....	check measuring point, clean carefully, if necessary send in with description of faults
	pressure transmitter defective.....	send in with description of faults
Output signal too high	incorrect measurement range.....	replace pressure transmitter
	pressure transmitter defective.....	send in with description of faults
Output signal too low	incorrect measurement range.....	replace pressure transmitter
	for current signal: load impedance too high.....	reduce load impedance or boost operating voltage
	for voltage signal: load impedance too low.....	increase load impedance
	operating voltage too low.....	boost operating voltage
	pressure transmitter defective.....	send in with description of faults
Incorrect zero signal	zero point changed due to incorrect operating conditions.....	send in with description of faults
	incorrect operating voltage.....	apply allowed operating voltage
	pressure transmitter defective.....	send in with description of faults
Output signal non-linear	Span changed due to incorrect operating conditions or calibration at "Span" potentiometer.....	send in with description of faults
	pressure transmitter defective.....	send in with description of faults

The latest versions of our data sheets are available as PDF in the download area on our websites

www.armaturenbau.com and www.manotherm.com.

Under heading 9 you can find, among others, the data sheets for pressure transmitters.

The latest issues of our operating instructions can also be found as PDF on our above mentioned websites, under *Downloads – Operating instructions*.

If you have any questions, please do not hesitate do contact our sales departments:

Monday – Thursday from 7:00 a.m. to 4:30 p.m.

Friday from 7:00 a.m. to 3:15 p.m.

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