





Operating manual

ME11

Pressure Transmitter





Masthead

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Subject to technical amendments.



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Version history

Rev. ST4-A 09/15	Version 1 (first edition)
Rev. ST4-B 04/22	Version 2 (UKCA Declaration of Conformity)

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1 Safety guidelines

1.1 General

This operating manual contains basic instructions for the installation, operation and maintenance of the device that must be followed without fail. It must be read by the installer, the operator and the responsible specialist personnel before installing and commissioning the device.

This operating manual is an integral part of the product and therefore needs to be kept close to the instrument in a place that is accessible at all times to the responsible personnel.

The following sections, in particular instructions about the assembly, commissioning and maintenance, contain important information, non-observance of which could pose a threat to humans, animals, the environment and property.

The instrument described in these operating instructions is designed and manufactured in line with the state of the art and good engineering practice.

1.2 Personnel Qualification

The instrument may only be installed and commissioned by specialized personnel familiar with the installation, commissioning and operation of this product.

Specialized personnel are persons who can assess the work they have been assigned and recognize potential dangers by virtue of their specialized training, their skills and experience and their knowledge of the pertinent standards.

1.3 Risks due to Non-Observance of Safety Instructions

Non-observance of these safety instructions, the intended use of the device or the limit values given in the technical specifications can be hazardous or cause harm to persons, the environment or the plant itself.

The supplier of the equipment will not be liable for damage claims if this should happen.

1.4 Safety Instructions for the Operating Company and the Operator

The safety instructions governing correct operation of the instrument must be observed. The operating company must make them available to the installation, maintenance, inspection and operating personnel.

Dangers arising from electrical components, energy discharged by the medium, escaping medium and incorrect installation of the device must be eliminated. See the information in the applicable national and international regulations.

Please observe the information about certification and approvals in the Technical Data section.

1.5 Unauthorised Modification

Modifications of or other technical alterations to the instrument by the customer are not permitted. This also applies to replacement parts. Only the manufacturer is authorised to make any modifications or changes.

1.6 Inadmissible Modes of Operation

The operational safety of this instrument can only be guaranteed if it is used as intended. The instrument model must be suitable for the medium used in the system. The limit values given in the technical data may not be exceeded.

The manufacturer is not liable for damage resulting from improper or incorrect use.

1.7 Safe working practices for maintenance and installation work

The safety instructions given in this operating manual, any nationally applicable regulations on accident prevention and any of the operating company's internal work, operating and safety guidelines must be observed.

The operating company is responsible for ensuring that all required maintenance, inspection and installation work is carried out by qualified specialized personnel.

1.8 Pictogram explanation



A DANGER

Type and source of danger

This indicates a **direct** dangerous situation that could lead to death or **serious injury** (highest danger level).

1. Avoid danger by observing the valid safety regulations.



MARNING

Type and source of danger

This indicates a **potentially** dangerous situation that could lead to death or **serious injury** (medium danger level).

1. Avoid danger by observing the valid safety regulations.



A CAUTION

Type and source of danger

This indicates a **potentially** dangerous situation that could lead to slight or serious injury, damage or **environmental pollution** (low danger level).

1. Avoid danger by observing the valid safety regulations.



NOTICE

Note / advice

This indicates useful information of advice for efficient and smooth operation.

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2 Product and functional description

2.1 Intended use

The ME11 is a pressure transmitter with a ceramic measuring cell that is suitable for measuring over-pressure and under-pressure in non-aggressive liquid and gaseous media.



NOTICE

Soiled or aggressive media

Please contact the manufacturer before using this unit with dirty or aggressive media because the unit needs to be adapted for the specific customer in terms of the parts that come into contact with the media.

The device may only be used for the purpose stipulated by the manufacturer.

2.2 Product summary

The following provide an overview of the possible connectors and process connections. The code stated corresponds to the respective code in the order code.

Electrical plug

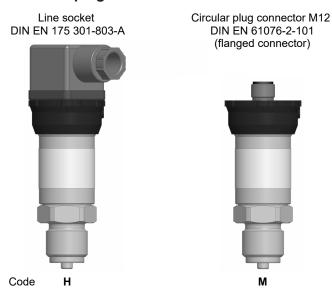


Fig. 1: Electrical plug

Process connections

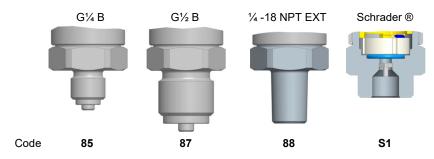


Fig. 2: Process connections

Nameplate

This type plate serves as an example of the information that is stated. The data shown is purely fictive, but does correspond to the actual conditions. For more information, please see the order code at the end of these instructions.

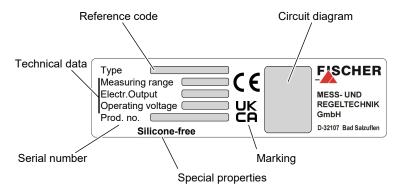


Fig. 3: Nameplate

2.3 Function diagram

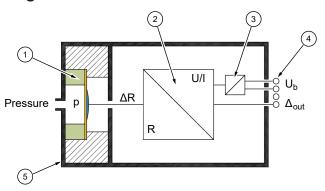


Fig. 4: Function diagram

1	Ceramic sensor	2	electronics
3	Auxiliary energy	4	Electrical connection
5	Process connection		

2.4 Design and mode of operation

The measuring pressure acts on a ceramic membrane that deforms when under pressure. There is a DMS bridge attached to the ceramic membrane. When the ceramic deforms, the output signal of the DMS bridge changes. The electronics integrated into the device convert the bridge signals into electrical unit signals 4...20 mA or 0...10 V DC um.

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3 Installation and assembly

3.1 Generalities

The instrument may only be installed and commissioned by specialized personnel familiar with the installation, commissioning and operation of this product.

Specialized personnel are persons who can assess the work they have been assigned and recognize potential dangers by virtue of their specialized training, their skills and experience and their knowledge of the pertinent standards.



⚠ WARNING

Mounting pressure transmitters

During assembly, observe the respective national and international guidelines and safety regulations.

Only mount the unit to systems that are depressurized. Only ever operate the unit within the permitted measuring range or below the maximum overload.

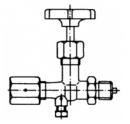


Fig. 5: Shutoff valve.

The device is set ex-works for vertical installation, however any installation position is possible.

To guarantee safe working conditions during installation and maintenance, suitable stop valves must be fitted in the system (see accessories). By means of the manometer shutoff, the unit

- · Can be depressurized or taken out of operation.
- Be disconnected from the power supply within the applicable system for repairs or inspections.

3.2 Process connection

- · By authorized and qualified specialized personnel only.
- The pipes need to be depressurized when the instrument is being connected.
- Appropriate steps must be taken to protect the device from pressure surges.
- Check that the device is suitable for the medium being measured.
- · Maximum pressures must be observed (cf. Tech. data)



MARNING

Earth connection via the system earth

During assembly, ensure that the earth connection between the unit and the system earth is ensured. The connection to the system earth is realised via the process connection. Therefore, never use an insulated Teflon tape or similar. Design the process connection acc. to EN 837 and use a suitable flat seal.

3.2.1 Measuring lines that need to be connected

The following points need to be observed when connecting the pressure line:

- To ensure there is no influence on the measured values, severe bends and coils in the wire should be avoided.
- To prevent deposits, there should be a continuous incline or drop of at least 8%.
- · When measuring steam pressure, a water bag-forming loop must be provided due to the temperature (see accessories).

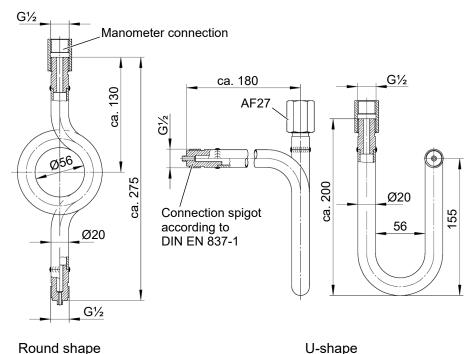


Fig. 6: Siphon MZ1###

U-shape

- The transmitter must be positioned below the measuring point for liquid measurements. Vent the pressure line before commissioning.
- The transmitter must be positioned above the measuring point for gas measurements.

3.2.2 Pressure surge absorption

Pulsating pressure on the system side can lead to functional problems. We recommend installing a damping element in the pressure connection lines as a protective measure.

a) Capillary throttle

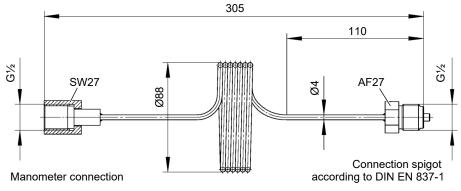


Fig. 7: Capillary throttle MZ400#

b) Settable damping reactor

In operating mode, the damping throttle must be set so that the output signal follows the pressure changes with a delay.

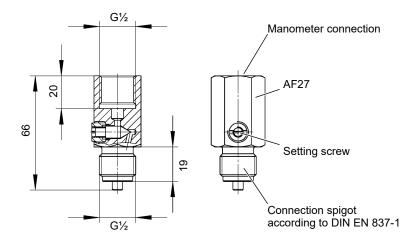


Fig. 8: Damping reactor MZ410#

3.3 Electrical connections

- · By authorized and qualified specialized personnel only.
- When connecting the unit, the national and international electro-technical regulations must be observed.
- Disconnect the system from the mains, before electrically connecting the device.
- · Install the consumer-adapted fuses.
- · Do not connect the connector if strained.

a) 2-wire connection

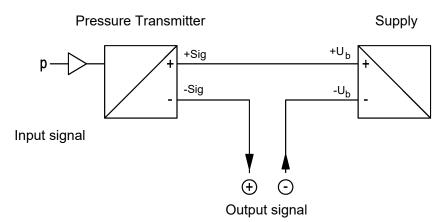


Fig. 9: 2L Circuitry

b) Three-wire connection

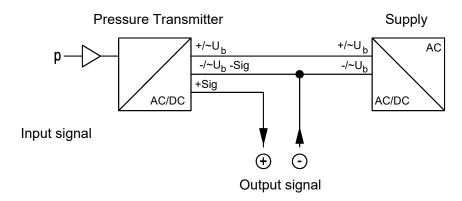


Fig. 10: 3L circuitry AC/DC

3.3.1 Standardised plug DIN EN 175 301-803-A

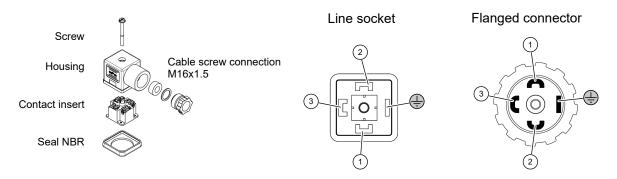


Fig. 11: Line socket DIN EN 175 301-803-A

Ter- minal	Signal name	DC		Cable colour
1	Supply /Output	+U _b	+Sig	red
2	Supply /Output	-U _b	-Sig	blue
3	n.c.			
	n.c.			

Table 1: 2-wire connection 4 ... 20 mA

Ter- minal	Signal name	AC	DC		Cable colour
1	Output			+Sig	Black
2	Supply /Output	~U _b	-U _b	-Sig	blue
3	Supply	~U _b	+U _b		red
	n.c.				

Table 2: 3-wire connection 0 ... 10V

The earth connection in the standardized plug is not connected.

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3.3.2 M12 flanged connector DIN EN 61076-2-101

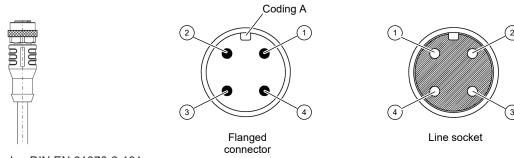


Fig. 12: M12 plug DIN EN 61076-2-101

Pin	Signal name	DC		Cable colour
1	Supply /Output	+U _b	+Sig	brown
2	n.c.			
3	Supply /Output	-U _b	-Sig	blue
4	n.c.			

Table 3: 2-wire connection 4 ... 20 mA

Pin	Signal name	AC	DC		Cable colour
1	Supply	~U _b	$+U_b$		brown
2	n.c.				
3	Supply /Output	~U _b	-U _b	-Sig	blue
4	Output			+Sig	Black

Table 4: 3-wire connection 0 ... 10V

3.4 Commissioning

All electrical supply, operating and measuring lines and the pressure connections must have been correctly installed before commissioning. All supply lines are arranged so that there are no mechanical forces acting on the device.

- If liquid measuring media are used the pressure connection lines must be vented, as liquid columns of different heights in the pipes can cause measuring errors. The instrument must be protected against frost, if water is used as a measuring medium.
- Appropriate shutoff valves must be provided to ensure safety during installation, maintenance and inspection

4 Servicing

4.1 Maintenance

The instrument is maintenance-free. We recommend the following regular inspection to guarantee reliable operation and a long service life:

- · Check the function in combination with downstream components.
- · Check the leak-tightness of the pressure connection lines.
- · Check the electrical connections.

The exact test cycles need to be adapted to the operating and environmental conditions. In combination with other devices, the operating instructions for the other devices also need to be observed.

4.2 Transport

The measuring device must be protected against impacts. It should be transported in the original packaging or a suitable transport container.

4.3 Service

All defective or faulty devices should be sent directly to our repair department. Please coordinate all shipments with our sales department.



MARNING

Process media residues

Process media residues in and on dismantled devices can be a hazard to people, animals and the environment. Take adequate preventive measures. If required, the devices must be cleaned thoroughly.

Return the device in the original packaging or a suitable transport container.

4.4 accessories

- Prefabricated M12 connection lines (pageOrder Codes [▶ 18])
- · Siphons MZ1###
- · Capillary throttle coil MZ400#
- · Settable damping reactor MZ410#
- Manometer shutoff valves MZ5###, MZ6###

Please see here the data sheet MZ measuring devices accessories. Here you will find more detailed information about the technical data and the order codes of the accessory parts MZ.

4.5 Disposal

Please help to protect the environment by always disposing of the work pieces and packaging materials in compliance with the valid national waste and recycling guidelines or reuse them.

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5 Technical Data

5.1 General information

Reference conditions (acc. to IEC 61298-1)					
Temperature	+15 +25 °C				
Relative humidity	45 75 %				
Air pressure	86 106 kPa	860 1060 mbar			
Installation position	User-defined				

5.2 Input variables

Positive measuring ranges

Measuring range		Pressure sa	ıfety
	SI unit	Overpres- sure	Bursting- pressure
0 + 0.6 bar	0 60 kPa	4 bar	7 bar
0 +1 bar	0 100 kPa	4 bar	7 bar
0 +1.6 bar	0 160 kPa	4 bar	7 bar
0 +2.5 bar	0 250 kPa	10 bar	15 bar
0 +4 bar	0 400 kPa	10 bar	15 bar
0 +6 bar	0 600 kPa	20 bar	35 bar
0 +10 bar	0 1000 kPa	20 bar	35 bar
0 +16 bar	0 1600 kPa	40 bar	70 bar
0 +25 bar	0 2500 kPa	100 bar	150 bar
0 +40 bar	0 4000 kPa	100 bar	150 bar
0 +60 bar	0 6000 kPa	200 bar	250 bar

Vacuum and ± measuring ranges

Measuring range		Pressure sa	afety
	SI unit	Overpres- sure	Bursting- pressure
-1 0 bar	-100 0 kPa	4 bar	7 bar
-1 +0.6 bar	-100 60 kPa	4 bar	7 bar
-1 +1.5 bar	-100 150 kPa	4 bar	7 bar
-1 +3 bar	-100 300 kPa	10 bar	15 bar
-1 +5 bar	-100 500 kPa	20 bar	35 bar
-1 +9 bar	-100 900 kPa	40 bar	70 bar
-1 +15 bar	-100 1500 kPa	40 bar	70 bar
-1 +24 bar	-100 2400 kPa	100 bar	150 bar

Special measuring ranges

Measuring range		Pressure sa	afety
	SI unit	Overpres- sure	Bursting- pressure
0 30 PSI	0 206.8 kPa	10 bar	15 bar
0 60 PSI	0 413.7 kPa	10 bar	15 bar
0 100 PSI	0 689.4 kPa	20 bar	35 bar
0 160 PSI	0 1103.2 kPa	40 bar	70 bar
0 250 PSI	0 1723.6 kPa	40 bar	70 bar
0 500 PSI	0 3447.3 kPa	100 bar	150 bar
-30 inHg vac+ 15 psi		4 bar	7 bar
-30 inHg vac+ 100 psi		20 bar	35 bar

5.3 Output parameters

	2-Conductor	3-Conductor
Output signal	4 20 mA DC	0 10 V DC
Limits	Max. 21 mA	Max. 10.5 V
Apparent ohmic resistance	(U _b -6V)/0.02A	$U_b \ge 15V \ge 5k\Omega$
		$U_b \ge 20V \ge 2k\Omega$

5.4 Measurement accuracy

Non-linearity		< 1.0 % FS
Hysteresis		< 0.5 % FS
Characteristic curve deviation *)		1.0 %
Temperature drift Zero point		0.07 % FS/K
	Measuring range	0.05 % FS/K

^{*)} incl. non-linearity and hysteresis

5.5 Auxiliary energy

	2-Conductor	3-Conductor
Rated Voltage	24v DC	24 V AC/DC
Admissible operating voltage	6 30 V DC	19.228.8 V AC/DC
Power input	0.7 W	0.5 W (VA)

5.6 Operating conditions

Ambient temperature range	0 °C +60 °C
Storage temperature range	-20 °C +85°C
Medium temperature range	0 °C +85 °C
EMC	EN 61326-1:2013 EN 61326-2-3:2013
RoHS	EN 50581:2012
Type of protection:	IP 65 acc. to EN 60529

Materials of the parts that come into contact with the surroundings			
Casing	CrNi Steel 1.4305		
Device plug screw lid	Polypropylene, black		
Device plug	Polyamide, brass, zinc		
Cable socket	Polyamide, polycarbonate, brass, zinc		

Materials of the part	s that con	ne into contact with the measuring medium		
Process connection	CrNi Stee	CrNi Steel 1.4404		
Sensor membrane	Ceramic	Ceramic Al ₂ O ₃		
Seal 1)	FKM Fluorinated rubber, Viton®			
	CR Chloroprene rubber, Neoprene®			
EPDM Ethylene propylene diene rubber				
	H-NBR	Hydrogenated acrylonitrile butadiene rubber (for hot water applications)		

¹⁾ see order code

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5.7 Construction design

5.7.1 Standard casing dimensional drawing

All dimensions in mm unless otherwise stated

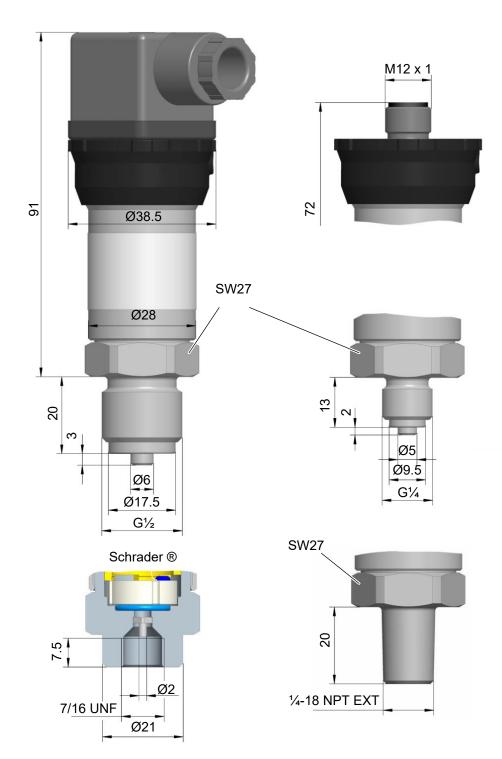


Fig. 13: Standard casing dimensional drawing

5.7.2 Process connection

1/4-18 NPT EXT	Connection shanks with external thread
Schrader [©]	Connection for Schrader screw connection
G¾ B	Connection shanks with external thread
G1/4 B	Connection shanks with external thread

5.7.3 Electrical connections

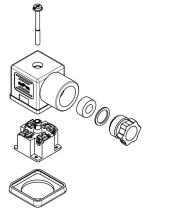
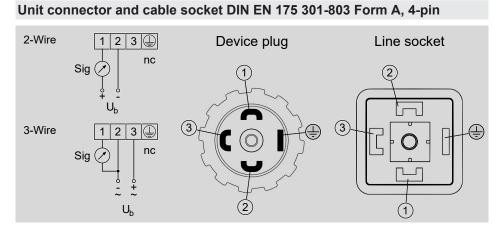


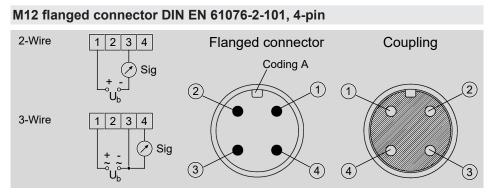
Fig. 14: Line socket DIN EN 175 301-803-A



The earth connection is not connected.

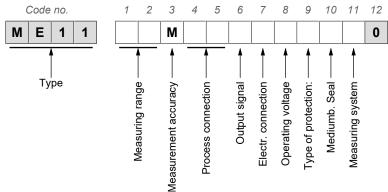


Fig. 15: M12 coupling device DIN EN 61076-2-101



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6 Order Codes



	Σ
[1.2]	Measuring range
01	0 0,6bar
02	0 1bar
03	01.6 bar
04	02.5 bar
05	0 4bar
06	0 6bar
07	0 10bar
08	0 16bar
09	0 25bar
10	0 40bar
11	0 60bar
31	-1 0 bar
32	-10.6 bar
33	-11.5 bar
34	-13 bar
35	-15 bar
36	-19 bar
37	-115 bar
38	-124 bar
	12 1 501
F1	0 60 kPa
F2	0 100 kPa
F3	0 160 kPa
F4	0 250 kPa
F5	0 400 kPa
F6	0 600 kPa
F7	0 1000 kPa
F8	0 1600 kPa
G1	0 2500 kPa
G2	0 4000 kPa
G3	0 6000 kPa

H5	0 30 PSI
110	0 30 1 61
Н6	0 60 PSI
H7	0 100 PSI
Н9	0 160 PSI
Q1	0 250 PSI
P9	0 500 PSI
S2	-30 inHg vac +15 psi
S2	-30 inHg vac +100 psi

[3] Measurement accuracy

M Characteristic curve deviation 1.0%

[4.5] Process connection 85 Connection shanks with external thread G¼ B 87 Connection shanks with external thread G½ B 88 Connecting port with outer thread ¼-NPT EXT S1 Connection for Schrader ® screw connection

[6]	Output signal	Connection type	Condition (Operating voltage)
В	4 20 mA DC	2-Wire	24V DC
С	0 10 V DC	3-Conductor	24 V AC/DC

[7]	Electrical connection
Н	4-pin standard plug DIN EN 175 301-803-A
M	4-pin M12 plug connection DIN EN 61076-2-101

[8]	Operating voltage	
9	24 V DC	2 wire output signal
Α	24 V DC	3 wire output signal
L	24 V AC/DC	3 wire output signal

[9]	Casing
0	IP65
R	IP65 (cast version)

[10]	Media-C	ontact Seal	Application
R	FKM	Fluorocarbon rubber	For O ₂ measure- ment mandatory
С	CR	Chloroprene Rubber	
Е	EPDM	Ethylene propylene diene rubber	
Н	H-NBR	Hydrogenated acrylonitrile butadiene rubber	Hot-water

[11]	Measuring system	Condition
0	Default	
3	Suitable for O ₂ measurements;	O-ring FKM (BAM tested) *)
Α	Silicon-free version	

^{*)} BAM:= Bundesanstalt für Materialforschung und -prüfung

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6.1 Prefabricated connection lines

Order no.	Designation	No. of Poles	length
06401993	PUR cable with M12-coupling	4-pin	2m
06401994	PUR cable with M12-coupling	4-pin	5m
06401563	PUR cable with M12-coupling	4-pin	7m
06401572	PUR cable with M12-coupling	4-pin	10m

7 Attachments



(Translation) **CE**

EU Declaration of Conformity

For the product described as follows

Product designation

Pressure transmitter

Type designation

ME11

it is hereby declared that it corresponds with the basic requirements specified in the following designated directives:

2014/30/EU

FMC Directive

2011/65/EU

RoHS Directive

(EU) 2015/863

Delegated Directive amending Annex II to Directive 2011/65/EU

The products were tested in compliance with the following standards.

Electromagnetic compatibility (EMC)

DIN EN 61326-1:2013-07

Electrical equipment for measurement, control and laboratory use - EMC requirements - Part

EN 61326-1:2013

1: General requirements

DIN EN 61326-2-3:2013-07 EN 61326-2-3:2013

Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning

RoHS Directive (RoHS3)

DIN EN IEC 63000:2019-05 EN IEC 63000:2018

Technical documentation for the assessment of electrical and electronic products with re-

spect to the restriction of hazardous substances

Also they were subjected to the conformity assessment procedure "Internal production control".

Sole responsibility for the issue of this declaration of conformity in relation to fulfilment of the fundamental requirements and the production of the technical documents is with the manufacturer.

Manufacturer

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Bielefelder Str. 37a

32107 Bad Salzuflen, Germany

Tel. +49 (0)5222 974 0

Documentation representative

Torsten Malischewski

General Manager R&D

The devices bear the following marking:

Bad Salzuflen

29 March 2022

CE

G. Gödde

Managing director

09010117 • CE_EN_ME11 • Rev. ST4-C • 04/22

1/1

Fig. 16: CE_EN_ME11





UKCA Declaration of Conformity

For the product described as follows

is hereby declared to comply with the essential requirements, specified in the following UK regulations:

Product designation

Pressure transmitter

Type designation

ME11

Statutory regulation No.

Description

2016 No. 1091

The Electromagnetic Compatibility Regulations 2016

2021 No. 422

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic

Equipment (Amendment) Regulations 2021

2022 No. 1647

The Hazardous Substances and Packaging (Legislative Functions and Amendment) (EU

Exit) Regulations 2020

The products have been tested according to the following standards.

Electromagnetic compatibility (EMC):

BS EN 61326-1:2013-02-28

Electrical equipment for measurement, control and laboratory use. EMC requirements. Gen-

eral requirements

BS EN 61326-2-3:2013-02-28

Electrical equipment for measurement, control and laboratory use. EMC requirements. Particular requirements. Test configuration, operational conditions and performance criteria for

transducers with integrated or remote signal conditioning.

Restriction of Hazardous Substances (RoHS):

BS EN IEC 63000:2018-12-10

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

The sole responsibility for drawing up this declaration of conformity in relation to the fulfilment of the essential requirements and the preparation of the technical documentation lies with the manufacturer.

Manufacturer

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Die Geräte werden gekennzeichnet mit:

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Bad Salzuflen 29 March 2022 G. Gödde

Managing director

Notes

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