FISCHER MESS- UND REGELTECHNIK

Operating Instructions

ME12 | Remotely Configurable Digital Pressure Transmitter

Contents

1. Safety instructions

1.1 General

This manual contains detailed information about the product and instructions for its installation, operation and maintenance. Operators and other technical personnel responsible for the equipment must read this thoroughly before attempting to install or operate this equipment. A copy of this manual must always be kept accessible at the place of work for reference by concerned personnel.

Chapter 1 (sections 1.2 through 1.7) contains general as well as specific safety instructions. Chapters 2 through •, covering topics ranging from intended purpose of the equipment to its final disposal, also include important points relating to safety. Overlooking or ignoring any of these safety points can endanger humans and animals, and possibly cause damage to other equipment.

1.2 Personnel qualification

Personnel responsible for installation, operation, maintenance and inspection of this product must have the qualifications, training and experience necessary to carry out such work on this type of equipment.

1.3 Risks of disregarding safety instructions

Disregarding safety instructions, use of this product for purposes for which it is not intended, and/or operation of this product outside the limits specified for any of its technical parameters, can result in harm to persons, the environment, or the plant on which it is installed. Fischer Mess- und Regeltechnik GmbH will not be responsible for consequences in such circumstances.

1.4 Safety instructions for operators

Safety instructions for the proper use of this product must be followed. This information must be available at all times by personnel responsible for installation, operation, maintenance and inspection of this product. Adequate steps must be taken to prevent the occurrence of hazardous conditions that can be caused by electric energy and the convertible energy of the process media. Such conditions can, for example, be the result of improper electrical or process connections. Detailed information is available in relevant published norms (DIN EN, UVW in Germany; and equivalents in other countries), industrial standards such as DVWG, Ex-, GL-, VDE guidelines, as well as regulations of the local authorities (e.g., EVUs in Germany).

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1.5 Modification forbidden

Modification or other technical alteration of the product is not permissible. This also applies to the use of unauthorized spare parts for repair / maintenance of the product. Any modifications to this product, if and as necessary, should be done only by Fischer Mess- und Regeltechnik GmbH.

1.6 Operational restrictions

The operational reliability of the product is guaranteed only when used for intended purposes. The product must be selected and configured for use specifically with defined process media. The limiting values of operating parameters, as given in the product specification sheet, must never be crossed.

1.7 Safety considerations during installation and maintenance

The safety instructions given in this manual, existing national regulations relating to accident prevention, and the internal safety rules and procedures of the user organization regarding safety during installation, operation and servicing must all be followed meticulously.

It is the responsibility of the users to ensure that only suitably qualified and experienced technical personnel are used for installation, operation and servicing of this equipment.

2. Intended applications

Pressure transmitter with a ceramic measuring cell for measuring overload and negative pressures.

- Relative pressure measuring range
  from -1...0 bar to 0...60 bar.
- Absolute pressure measuring range
  from 0...1 bar to 0...16 bar.

The pressure transmitters of this series are suited to a range of measuring applications in the fields of:

- Chemical engineering
  Process technology
  Environmental technology

The instrument is to be used only for the application specified by the manufacturer. If this instrument in to be used in situations in which parts will come into contact with soiled or aggressive in-plant media, please first contact Fischer Mess- und Regeltechnik GmbH as those parts will need to be adapted to suit.

3. Product description and functions

3.1 Design and mode of operation

The pressure sensor works on the thick-film DMS principle. The pressure to be measured acts directly on a ceramic membrane, thus deforming it. This changes the resistance of the DMS Bridge. Electronics integrated into the instrument convert this bridge signal into an electrical output signal.

3.2 Configuration

The specifications given in the order codes are those with which it is programmed on delivery. In addition, the connecting line can be used to configure the pressure transmitter, adjusting it ideally to suit the process conditions. For this you will require the transmitter-PC interface EU13 or EU03, available as an accessory.

4. Installation and setup

The instrument is equipped as standard for connection to the connection shanks of plant-side pipes. It is calibrated in-factory for vertical installation, though it can be installed in any position required.

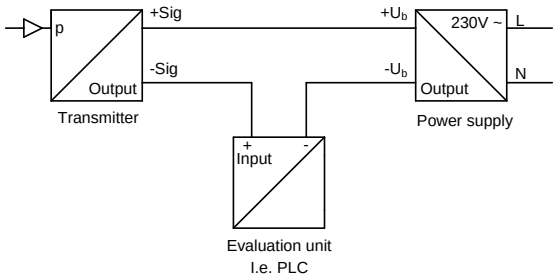
4.1 Process connection

- The process connection may be made by authorized and qualified specialized personnel only.
- Appropriate shutoff valves must be provided to ensure safety during installation, maintenance and inspection.
- The connection may only be made for the intended mechanical process connection. Please refer to the instrument order code on the rating plate or the dimensioned drawing in section 12 to determine your model.
- Isolate the pipes before connecting the instrument.
- Do not install the instrument if there are standing water columns.
- Take appropriate steps to protect the instrument from pressure surges.
- All connecting pipes must be laid in a way that ensures that no mechanical forces act on the instrument.

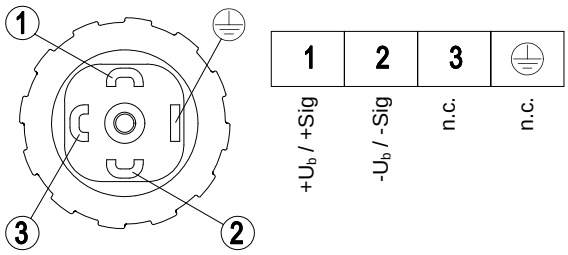
4.2 Electrical connection

- The electrical connection may be made by authorized and qualified specialized personnel only.
- Disconnect the system before attaching the instrument.
- Ground the instrument via the pressure connection.
- Do not remove the connecting plug while energized.
- The protection class given applies only when plugged and if the plug used is suitable (see below).

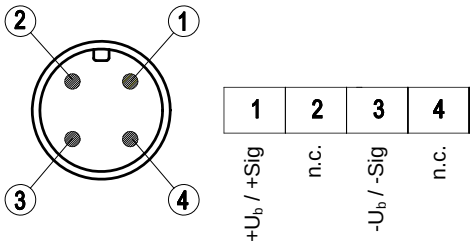
4.2.1 2-Wire circuit



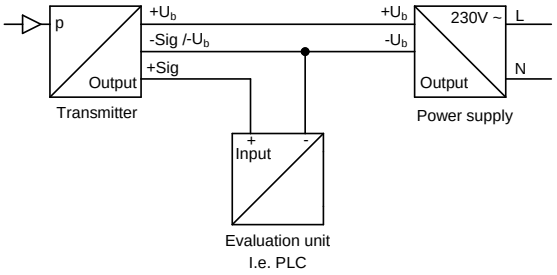
- Line socket DIN EN 175 301-803 A



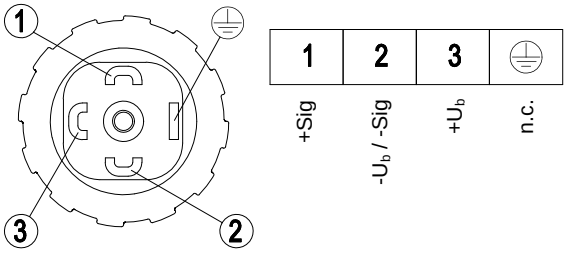
- M12 Circular plug connector
  DIN EN 61076-2-101



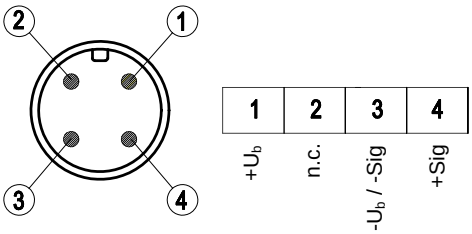
4.2.2 3-Wire circuit



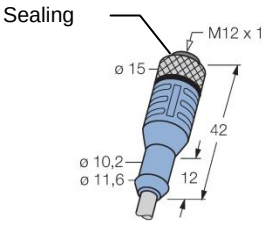
- Line socket DIN EN 175 301-803 A

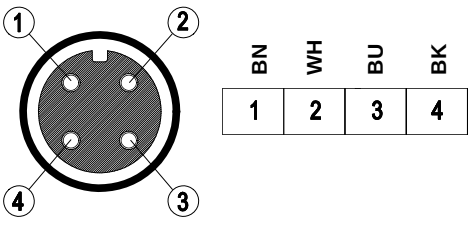


- M12 Circular plug connector
  DIN EN 61076-2-101



4.2.3 Connecting cable with M12 connector





5. Initial operation

- Check that the pressure connection line and all of the electrical supply, operating and measuring lines have been correctly installed.
- Check that the pressure connection lines are leak-tight.
- Observe the maximum pressure given in the technical data (overload-pressure safety).
- Refer to the corresponding technical data sheet for the maximum permissible temperatures of the media and the surroundings.
- The instrument must be protected against frost if water is used as a medium.
- If liquid media are used the pressure connection lines must be deaerated, as liquid columns of different heights in the pipes can cause measuring errors.
- The instrument may be used only with media that are compatible with the materials of which those parts of the instrument with which they come into contact are made.
- Pressure surges and sudden changes in temperature should as far as possible be avoided when performing initial operation.
- Slowly open any upstream shutoff valves.

6. Maintenance

The instrument is inherently maintenance-free.

However, to ensure reliable operation and maximize the operating life of the instrument, it is recommended that the instrument, its external electrical and process connections, and external connected instruments be regularly inspected, e.g.:

- Check the display.
- Check the switching function in connection with secondary components.
- Check all pressure connections for leak-tightness.
- Check the integrity of all electrical connections of the instruments.

Inspection and test schedules depend on operating and site conditions. The operating manuals of other equipment to which the differential pressure transmitter is connected must be read thoroughly to ensure that all of them work correctly when connected together.

7. Transport

The product must be protected against shock and vibration during transport. It must therefore be properly packed, preferably in the original factory packaging, whenever it is to be transported.

8. Service

Any defective instruments or instruments with missing parts should be returned to Fischer Mess- und Regeltechnik GmbH. For quick service contact our service department.

Remaining medium in and on dismantled measuring instruments may cause danger to persons, environment and equipment. Take reasonable precautions! Clean the instrument thoroughly if necessary.

9. Accessories

- EU13 USB transmitter PC interface for 2-wire transmitter.
- EU03 USB transmitter PC interface for 3-wire transmitter.
- 4-pole connecting cable with M12 connector.

10. Disposal

Protect your environment!

Use the product in accordance with relevant regulations. Please be aware of environmental consequences of disposal at the end of the product's life, and take care accordingly.

11. Technical data

Relative pressure measuring range [bar]	-1...0	-1...+0.6	-1...+1.5	-1...+3	-1...+5	-1...+9	-1...+15	-1...+24		0...0.6	0...1	0...1.6	0...2.5	0...4	0...6	0...10	0...16	0...25	0...40	0...60
Overload pressure safety [bar]	4	4	4	10	20	40	40	100		4	4	4	10	12	20	40	40	100	100	200
Absolute pressure measuring range [bar]											0...1	0...1.6	0...2.5	0...4	0...6	0...10	0...16			
Overload pressure safety [bar]											2	2	5	5	10	20	20			

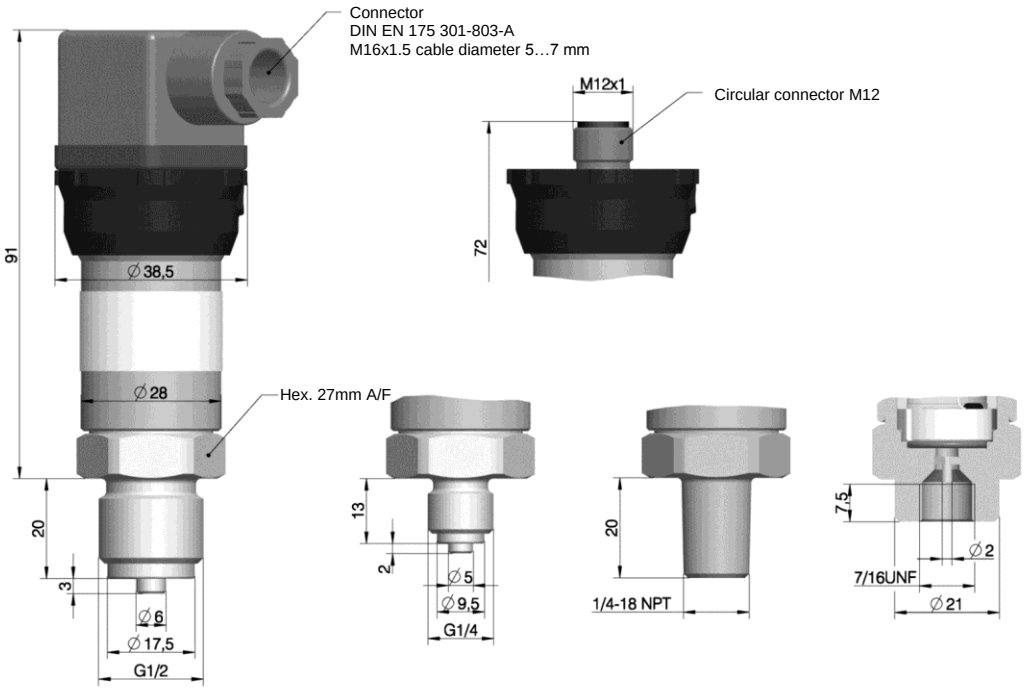
General:	
Linearity	< 1.0 % FS (optionally < 0.5 %FS)
Hysteresis	< 0.5 % FS
Permissible ambient temperature	-10 °C...+70 °C
Permissible continuous media temperature	-10 °C...+85 °C
Pressure connection	See order code
Electrical connection	Line socket DIN EN 175 301-803-A or M12 plug connector DIN EN 61076-2-101
Protection class	IP 65 according to DIN EN 60 529
Materials in contact with media	Chromium nickel steel 1.4404, ceramic Al_2O_3, see order code for seal
Casing materials	Chromium nickel steel 1.4305

Electrical Data:	**2-wire current output**	**3-wire voltage output**	**3-wire current output**
Rated voltage	24 VDC	24 VAC/DC	24 VAC/DC
Permissible supply voltage U_b	6...30 VDC	15...30 VAC/DC	15...30 VAC/DC
Output signal	4...20 mA	0...10 VDC	0...20 mA 4...20 mA
Limit of the output signal	ca. 26 mA	ca. 10.5 VDC	ca. 23 mA
Apparent ohmic resistance	(U_b - 6V) / 0.02A	≥ 5 kΩ ab 15 VDC ≥ 2 kΩ ab 20 VDC	[(U_b - 10V) / 0.02A] + 300 Ω
Zero-point temperature drift	0.07 % FS/K	0.07 % FS/K	0.07 % FS/K
Measuring range temperature drift	0.05 % FS/K	0.05 % FS/K	0.05 % FS/K

Configuration:	
Characteristic curve inversion	Increasing / decreasing
Attenuation	0...200 s
Adjustable signal limits	Uppers current limit 3.5...22.5 mA Lower current limit 3.5...22.5 mA Error signal 3.5...22.5 mA
Offset correction	+/-25 %FS
Span correction	+/-25 %FS

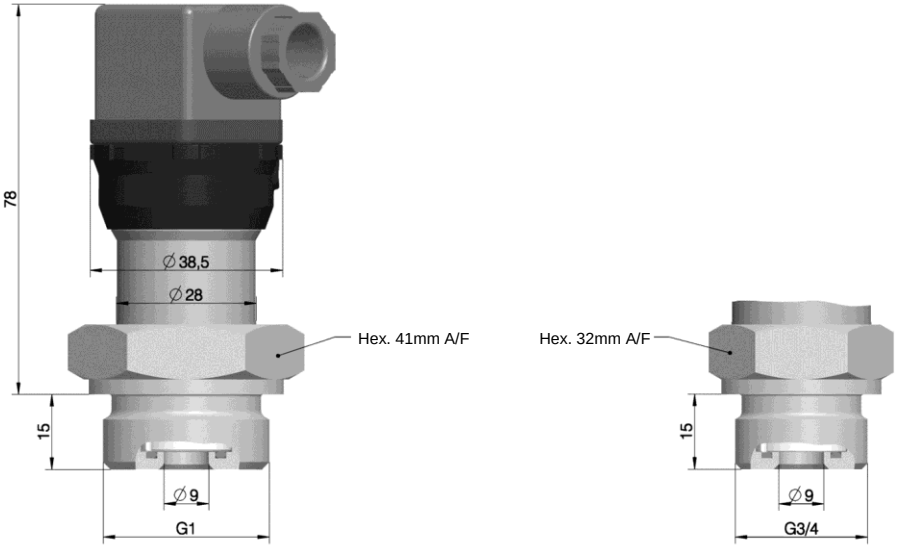
12. Dimensioned drawings

Possible pressure and electrical connections:



Code 87 85 88 S1

Model with near flush-mounted front sensor:



Code A3 A8

13. Order codes

Remotely Configurable Digital Pressure Transmitter

ME12 [| | | | | | | | | | | **0** |]

Measuring Ranges

0	...	0.6	bar	>	**0 1**
0	...	1	bar	>	**0 2**
0	...	1.6	bar	>	**0 3**
0	...	2.5	bar	>	**0 4**
0	...	4	bar	>	**0 5**
0	...	6	bar	>	**0 6**
0	...	10	bar	>	**0 7**
0	...	16	bar	>	**0 8**
0	...	25	bar	>	**0 9**
0	...	40	bar	>	**1 0**
0	...	60	bar	>	**1 1**
-1	...	0	bar	>	**3 1**
-1	...	0.6	bar	>	**3 2**
-1	...	1.5	bar	>	**3 3**
-1	...	3	bar	>	**3 4**
-1	...	5	bar	>	**3 5**
-1	...	9	bar	>	**3 6**
-1	...	15	bar	>	**3 7**
-1	...	24	bar	>	**3 8**
0	...	-1	bar	>	**3 9**

Measuring Accuracy

Characteristic curve deviation relative pressure 1.0%	> **M**
Characteristic curve deviation relative pressure 0.5%	> **O**
Characteristic curve deviation absolute pressure 1.0%	> **S**
Characteristic curve deviation absolute pressure 0.5%	> **T**

For the green measuring range only

Pressure Connection

Connection shanks G¼ B; material 1.4404	>	**8 5**
Connection shanks G½ B; material 1.4404	>	**8 7**
Connection shanks with external thread ¼ -18 NPT EXT, 1.4404	>	**8 8**
Connection for Schrader® fitting, 1.4404	>	**S 1**
G 1 B with near flush-mounted front pressure sensor, 1.4404	>	**A 3**
G ¾ B with near flush-mounted front pressure sensor, 1.4404	>	**A 8**

Electrical Output Signal

0	...	20	mA	Three-wire	>	**A**
4	...	20	mA	Three-wire	>	**P**
0	...	10	V	Three-wire	>	**C**
1	...	5	V	Three-wire	>	**D**
4	...	20	mA	Two-wire	>	**B**

Electrical Connection

4-pole Line socket DIN EN 175 301-803-A	>	**H**
4-pole circular plug connector M12 DIN EN 61076-2-101	>	**M**

Operating Voltage

24 VDC	(with two-wire only)	>	**9**
24 VAC/VDC	(with three-wire only)	>	**L**

Casing

IP65 as per DIN EN 60 529	>	**0**
IP65 as per DIN EN 60 529; encapsulated model	>	**V**

Media-Contact Seal

FKM	(Fluororubber, Viton®)	>	**V**
CR	(Chloroprene rubber, Neoprene®)	>	**C**
EPDM	(Ethylene propylene diene rubber)	>	**E**
H-NBR	(Hydrogenated nitrile rubber),deployable to -25°C	>	**H**
FFPM	(Perfluororubber, Kalrez®)	>	**K**

Measuring System / Type

Standard	>	**0**
Suitable for O_2 measurement (FKM seal only)	>	**3**
Silicone-free model	>	**A**

13.1 Accessories

Order Code	Description	No. of Poles	Application	Length
EU13.F200	USB transmitter PC interface incl. PC software		for 2-wire transmitter	
EU03.F300	USB transmitter PC interface incl. PC software		for 3-wire transmitter	
06401993	Connection cable with M12 connector	4-pole	for supply / signal	2 m
06401994	Connection cable with M12 connector	4-pole	for supply / signal	5 m

14. Declaration of conformity

EG-Konformitätserklärung

Wir erklären in alleiniger Verantwortung, dass nachstehend genannte Produkte

EC Declaration of Conformity

We declare under our sole responsibility that the products mentioned below

Fernparametrierbarer Digitaler Drucktransmitter / Remotely Configurable Digital Pressure Transmitter

ME12 ##########

gemäß gültigem Datenblatt übereinstimmen mit den

as specified by the current data sheet complies with

EMV-Richtlinien

2004/108/EG (EMV)

EMC-directives

2004/108/EC (EMC)

Die Produkte wurden entsprechend der folgenden Normen geprüft (Störfestigkeit für Industriebereich, Störaussendung für Wohnbereich):

DIN EN 61326-1:2006-10
DIN EN 61326-2-3:2007-05
DIN EN 61010-1:2002-08

The products were tested in compliance with the following standard (Interference immunity for industrial environments, interface emission for residential environments)

DIN EN 61326-1:2006-10
DIN EN 61326-2-3:2007-05
DIN EN 61010-1:2002-08

Die Geräte werden gekennzeichnet mit:

The devices bear the following marking:

CE

Bad Salzuflen, 19.08.10
(Ort, Datum / place, date)

(rechtsverb. Unterschrift / legally authorized signature)

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