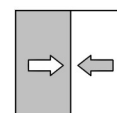




Operating manual

DE40

Differential pressure transmitter



Masthead

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Subject to technical amendments.



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Version history

Rev. ST4-A 11/15	Version 1 (first edition)
	Version 2 (Correction)
Rev. ST4-B 02/16	Version 3 (extended measuring ranges)
Rev. ST4-C 07/17	Version 4 (EAC conformity)
Rev. ST4-D 11/19	Version 5 (Dimension drawing corrected)

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1 Safety guidelines

1.1 General

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



DANGER

Type and source of danger

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

- a) Avoid danger by observing the valid safety regulations.



WARNING

Type and source of danger

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

- a) Avoid danger by observing the valid safety regulations.



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).

- a) Avoid danger by observing the valid safety regulations.



NOTICE

Note / advice

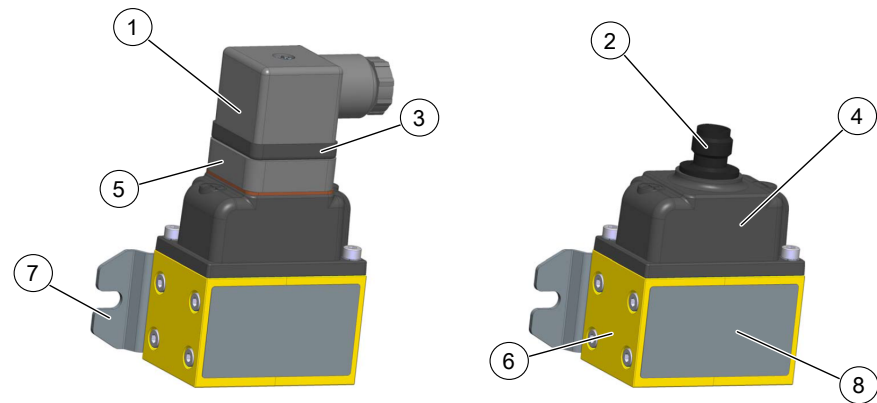
This indicates useful information of advice for efficient and smooth operation.

2 Product and functional description

2.1 Delivery scope

- Differential pressure transmitter DE40
- Operating Instructions

2.2 Product overview



Standard plug DIN EN 175301-803 A

M12 plug DIN EN 61076-2-101

Fig. 1: Overview

1	Line socket (4-pin)	2	M12 flanged connector (5-pin)
3	Profile seal	4	Closing lid
5	Flanged connector (4-pin)	6	Pressure chamber
7	Wall mount	8	Type plate

Design of the measuring system

The pressure chamber of the DE40 can be made of brass or stainless steel. There are also several options for the process connection. Please note that the version with the process connection at the rear cannot be mounted to a wall.

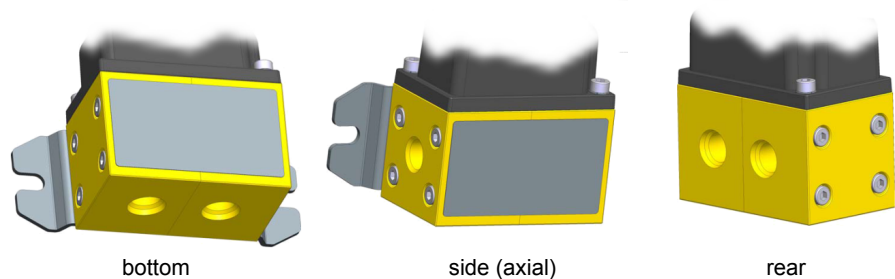


Fig. 2: Process connection

Type plate

The type plate is always attached to the pressure chamber; the selected example on the type plate is a 3-line version (0...10 V) with a line socket acc. to DIN EN 175 301-803-A.

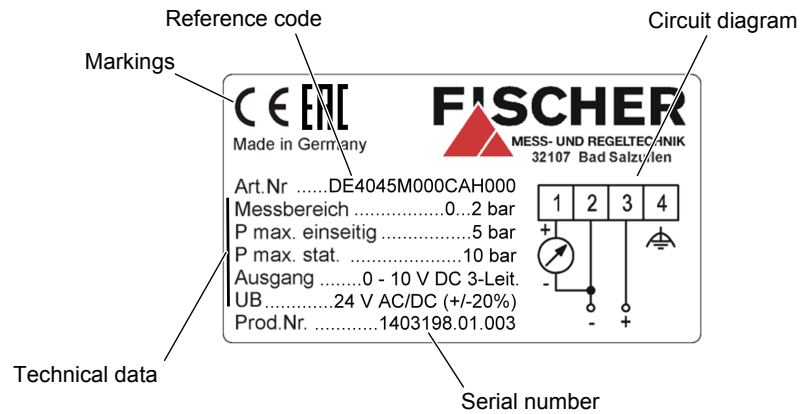


Fig. 3: Type plate

2.3 Use as intended

The differential pressure transmitter DN 40 is suitable for measuring over-pressure, under-pressure and differential pressure in basically neutral fluids and gases. It is suitable for all measuring tasks in industrial or sanitary sectors.

Please check with the manufacturer first before using with aggressive or dirty media. Please note the technical data of the materials used.

2.4 Function diagram

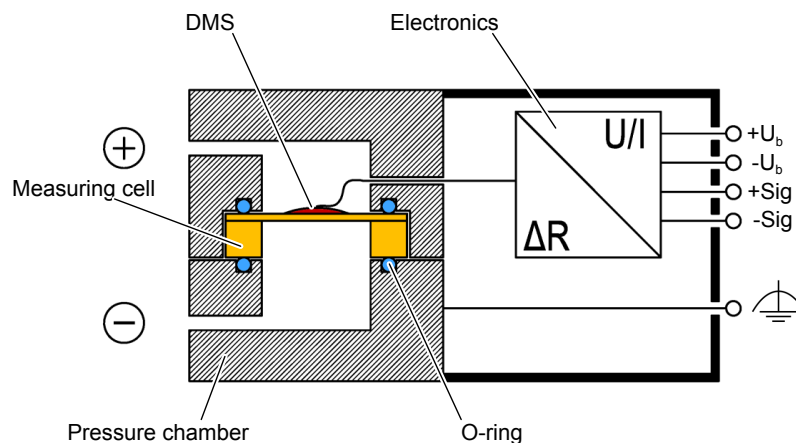


Fig. 4: Function diagram

2.5 Design and mode of operation

The differential pressure transmitters of this type series DN40 are equipped with a non-sensitive ceramic pressure measuring cell. The measuring bridge is pressed directly onto the ceramic membrane by means of a thick layer technology.

The measuring pressure acts on the membrane which in turn deforms. In turn, the bridge resistors change and a voltage signal that is proportional to the measuring pressure is created. The electronics integrated into the transmitter housing convert this signal into a uniform signal 0...10V or 4...20mA.

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.

All supply lines are arranged so that there are no mechanical forces acting on the device. Any installation position is possible.

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)

The pressure lines must be kept as short as possible and installed without any tight bends to avoid delays.

The pressure connections are marked with (+) and (-) symbols on the device. When the differential pressure is measured, the higher pressure is connected to the (+) side and the lower pressure to the (-) side.

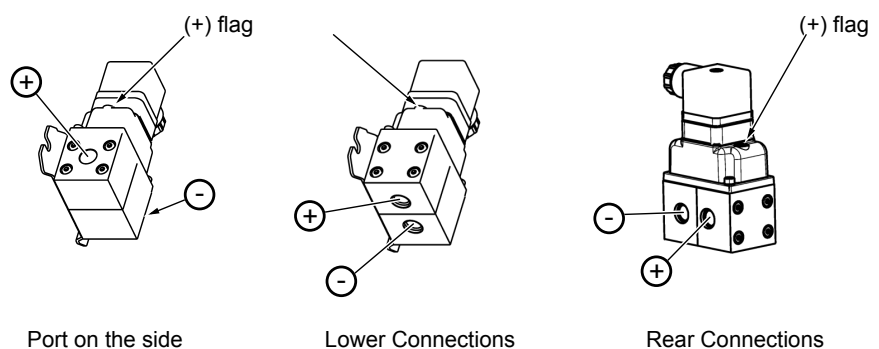


Fig. 5: Process connection

The measuring chamber must be equipped with G $\frac{1}{8}$ inch inner threads for the process connection. However, the device can also be supplied with cutting ring screw connections or pneumatic plug connections. For more information about this, please see the order code [► 17].

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.

3.3.1 3-wire connection

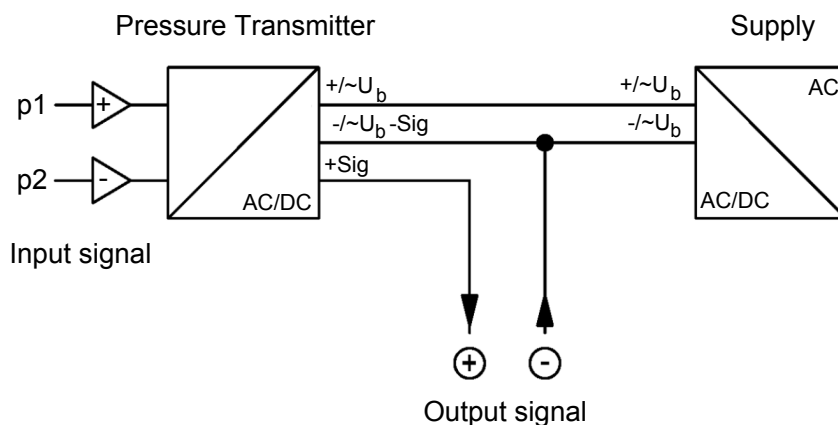


Fig. 6: 3L connection AC/DC

3.3.2 Standardised plug DIN EN 175 301-803-A

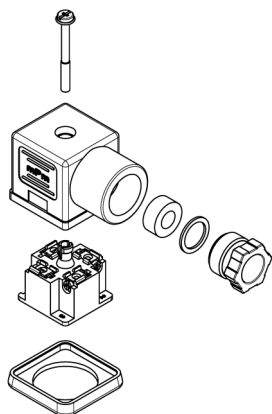
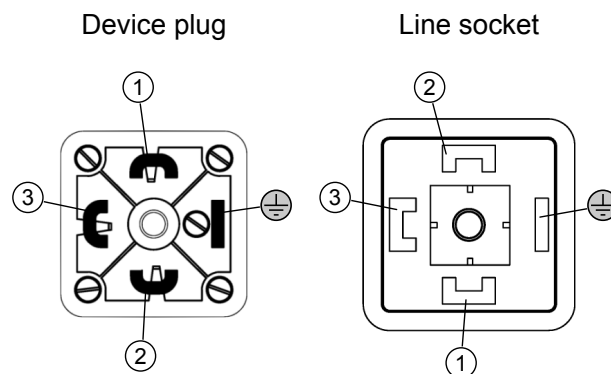
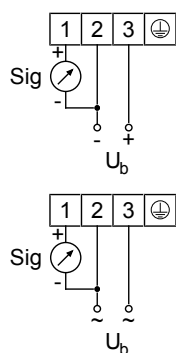


Fig. 7: Line socket DIN EN 175 301-803-A



Ter- minal	Signal name	DC	AC	Cable colour
1	Outlet	+Sig	+Sig	Black
2	Supply	-U _b	~U _b	blue
3	Supply	+U _b	~U _b	brown
⊕	Functional earth	⊕	⊕	Green/yellow

Tab. 1: 3-wire connection norm plug

A silicone and halogen-free control cable 4 x 0.5 mm² to max. 1.5 mm² can be used as a connection cable.

3.3.3 M12 plug DIN EN 61079-2-101

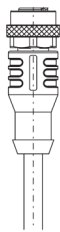
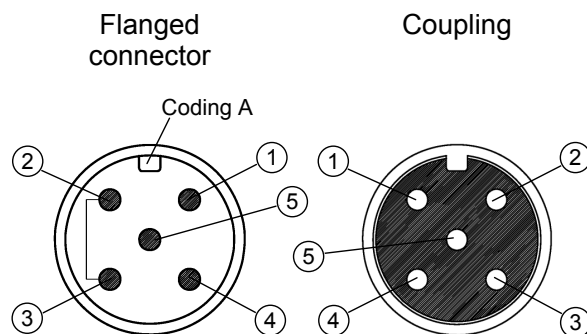
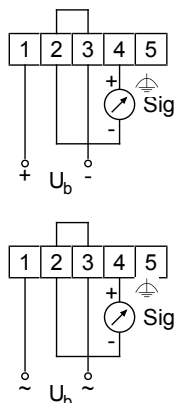


Fig. 8: M12 coupling device DIN EN 61076-2-101



Ter- minal	Signal name	DC	AC	Cable colour
1	Supply	+U _b	~U _b	brown
2	Outlet	-Sig	-Sig	white
3	Supply	-U _b	~U _b	blue
4	Outlet	+Sig	+Sig	Black
5	Functional earth	⏏	⏏	Green/yellow

Tab. 2: 3-wire connection M12 plug

A flexible, silicone and halogen-free control cable (5 x 0.34 mm²) with an axial M12 coupling can be used as a connection cable. Prefabricated lines in different lengths are available as accessories.

3.3.4 Functional earth

To ensure that the unit satisfies the promised EMC properties, the functional earth must be connected to a low-noise earth. If several units are used, the function earth is connected in a star shape.



NOTICE

Functional earth

This kind of earth is **not** a protective earth. It only serves to deflect cable-based noise and has no safety-related function.

3.4 Commissioning

A prerequisite for commissioning is correct installation of all electrical supply lines and the differential pressure lines. All connections are arranged so that there are no mechanical forces acting on the device.



CAUTION

Leak test

The differential pressure lines need to be checked for leaks before commissioning.

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.



WARNING

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 (see order code [► 17]).

- PUR cable with M12 coupling, straight
in the lengths 1m, 2m, 5m, 7m, 10m, 15m

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.

5 Technical data

5.1 Generalities

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

5.2 Input variables

The unit is designed for the pressure level PN16 in all measuring ranges.

Measuring range		Pressure safety		
	<i>SI unit</i>	<i>(+) side</i>	<i>(-) side</i>	<i>Bursting pressure on both sides</i>
0...0.6 bar	0 ... 60 kPa	10 bar	5 bar	64 bar
0...1 bar	0 ... 100 kPa	10 bar	5 bar	64 bar
0...1.6 bar	0 ... 160 kPa	10 bar	5 bar	64 bar
0...2 bar	0 ... 200 kPa	10 bar	5 bar	64 bar
0...2.5 bar	0 ... 250 kPa	10 bar	5 bar	64 bar
0...4 bar	0 ... 400 kPa	21 bar	15 bar	64 bar
0...6 bar	0 ... 600 kPa	21 bar	15 bar	64 bar
0...10 bar	0 ... 1000 kPa	25 bar	25 bar	64 bar

5.3 Output parameters

Output signal		4 ... 20 mA	0 ... 10 V
Limits		Max. 21 mA	Max.. 10.5V
Apparent ohmic resistance	24 V DC	≤ 700 Ω	> 2 kΩ
	24 V AC	≤ 400 Ω	
Connection type		3-Conductor	3-Conductor

5.4 Measurement accuracy

Characteristic curve deviation ^(*)	≤1%
Deviating from this measuring range 0 ... 0.6 bar	≤1.6%

^(*) incl. non-linearity and hysteresis in the entire temperature range 10 ... 70 °C

5.5 Auxiliary energy

Rated Voltage	24 V AC (50...60 Hz) or 24 V DC
Admissible operating voltage	19.2 ... 28.8 V AC/DC (24V AC/DC ±20%)
Power consumption	< 1.5 W (VA)

5.6 Application conditions

Ambient temperature range	-20 ... +80 °C
Storage temperature range	-20 ... +90 °C
Medium temperature range (for non-freezing media)	-20 ... +80 °C
EMV	EN 61326-1:2013 EN 61326-2-3:2013
RoHS	EN 50581:2012
Type of protection	IP65 as per DIN EN 60529

Materials of the parts that come into contact with the surroundings

Closing lid	Zamak3 ZL0400 (GD-ZnAL4)
Pressure chamber	Brass CW614N (formerly 2.0401) or stainless steel 1.4305
Wall mount	Stainless steel 1.4301
Process connection	Nickel-plated brass or stainless steel (1.4571)
Electrical plug	Polyamid

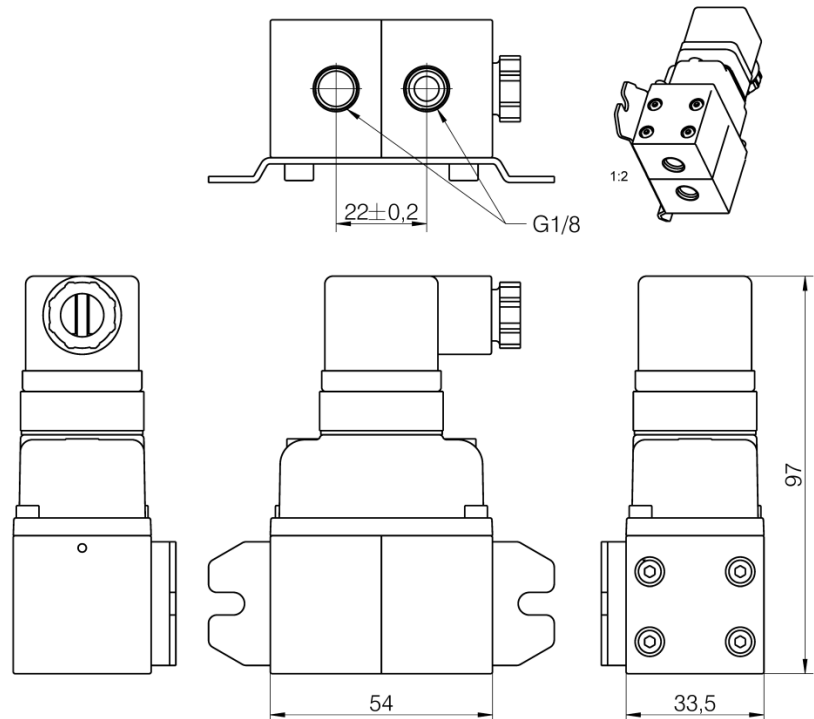
Materials of the parts that come into contact with the measuring medium

Pressure chamber	Brass 2.0401 or stainless steel 1.4305
Sensor membrane	Ceramic (Al ₂ O ₃) with a Parylene coating
- O-ring	EPDM
Process connection	Nickel-plated brass
- Cutting ring screw connection O-ring	EPDM
- Pneumatic plug connector O-ring	NBR

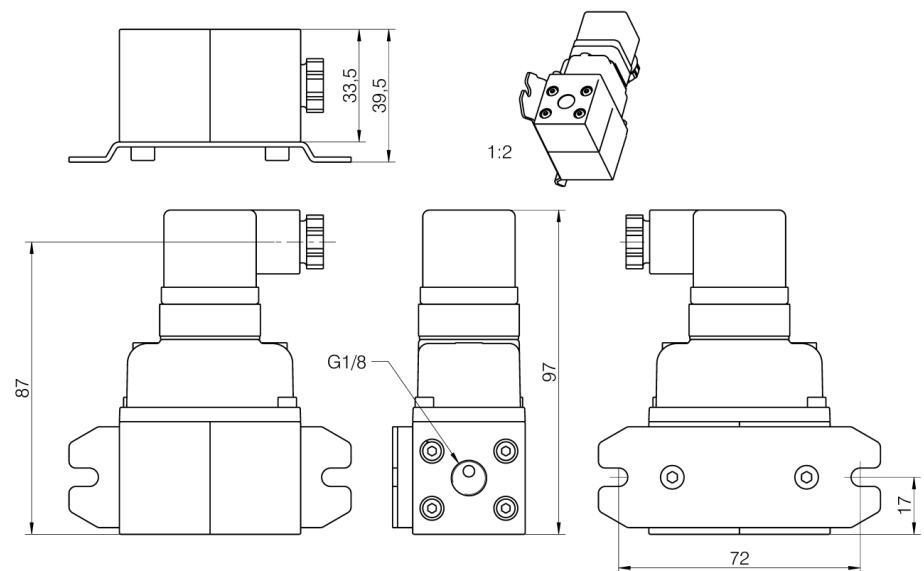
5.7 Construction design

5.7.1 Dimensional picture

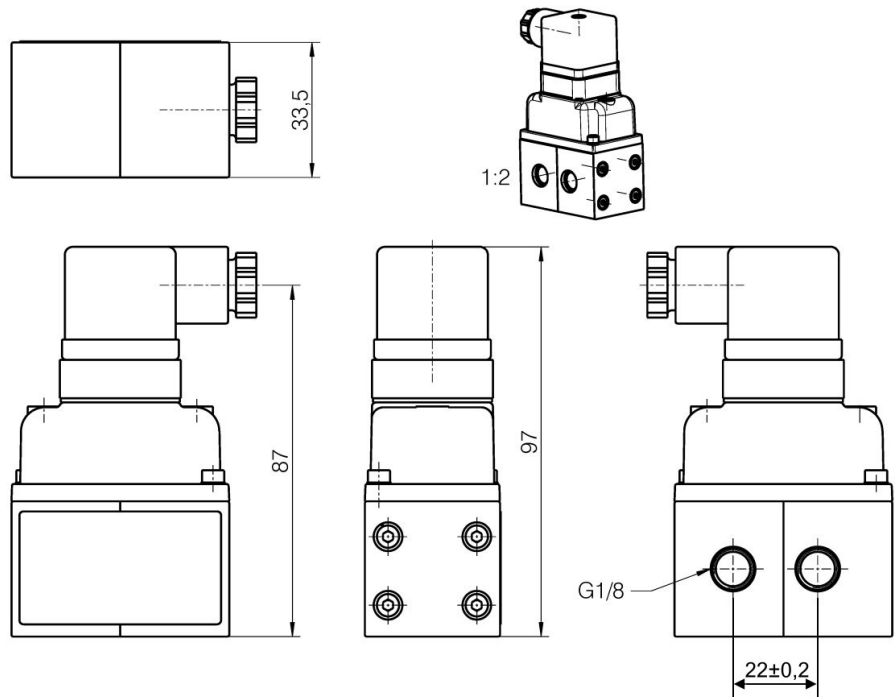
5.7.1.1 Process connection below



5.7.1.2 Process connection side (axial)



5.7.1.3 Process connection rear



5.7.2 Process connection

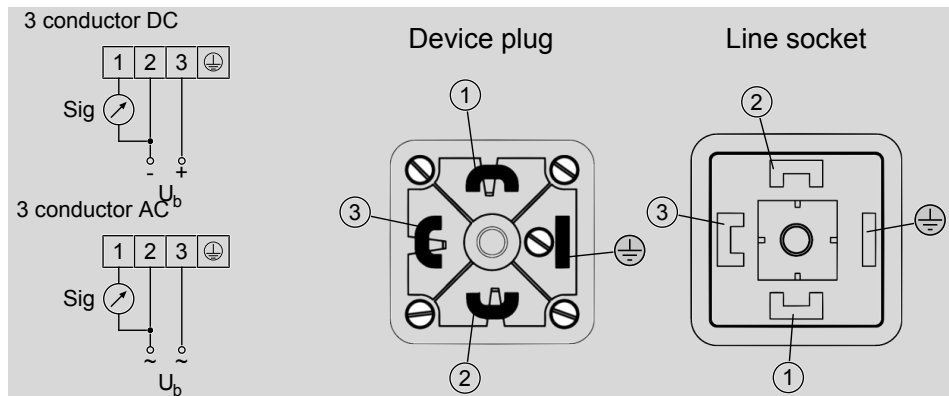
Type	the material.	Seal
Inner thread G1/8	Brass or stainless steel 1.4305 (+)	---
Cutting ring connection for 6 or 8 mm pipe	Brass or stainless steel 1.4771	EPDM silicone-free
Pneumatic plug connector for 6/4 or 8/6 mm hose	Nickel-plated brass stainless steel 1.4401	NBR silicone-free

(+) depends on the design of the pressure chamber

5.7.3 Electrical connections

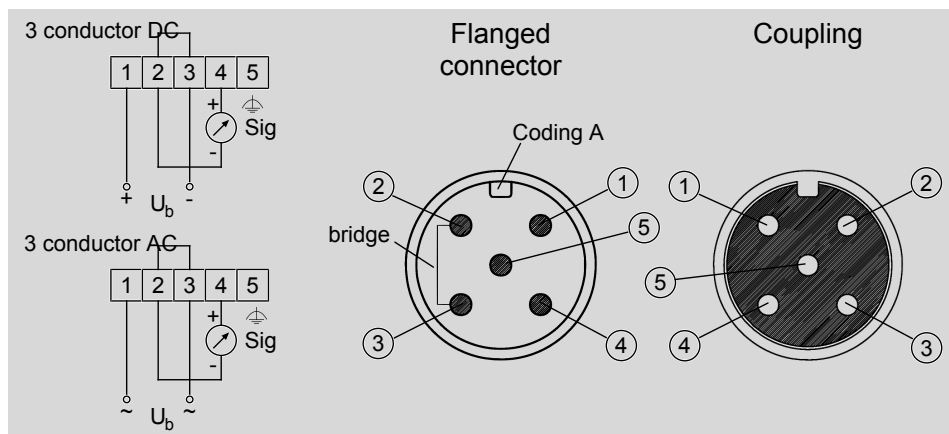
Standardised plug DIN EN 175 301-803-A

A silicone and halogen-free control cable 4 x 0.5 mm² to max. 1.5 mm² can be used as a connection cable.

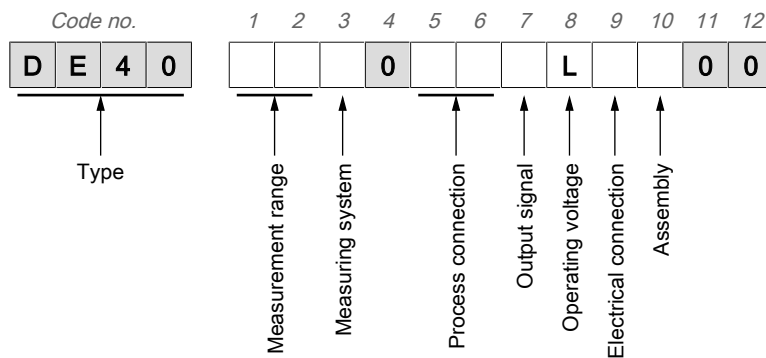


M12 plug DIN EN 61079-2-101

A flexible, silicone and halogen-free control cable (5 x 0.34 mm²) with an axial M12 coupling can be used as a connection cable. Prefabricated lines in different lengths are available as accessories.



6 Order Codes



[1.2] Measuring range

01	0...0.6 bar
02	0...1 bar
03	0...1.6 bar
45	0...2 bar
04	0...2.5 bar
05	0...4 bar
06	0...6 bar
07	0...10 bar

[3] Design of the measuring system (pressure chamber)

M	Pressure chamber brass (CW614N), process connection below
N	Pressure chamber brass (CW614N), process connection side (axial)
H	Pressure chamber brass (CW614N), process connection at the rear
W	Pressure chamber stainless steel (1.4305), process connection below
V	Pressure chamber stainless steel (1.4305), process connection side (axial)
I	Pressure chamber stainless steel (1.4305), process connection at the rear

[5.6] Process connection

00	Inner thread G $\frac{1}{8}$
P6	Pneumatic plug connector for 6/4 mm hose
P8	Pneumatic plug connector for 8/6 mm hose
28	Cutting ring connection in brass for 6 mm pipe
29	Cutting ring connection in brass for 8 mm pipe
24	Cutting ring connection in stainless steel (1.4571) for 6 mm pipe
25	Cutting ring connection in stainless steel (1.4571) for 8 mm pipe

[7] Output signal (3-wire connection)

C	0 ... 10 V DC
P	4 ... 20 mA DC

[8] Operating voltage**L** 24 V AC/DC**[9] Electrical connection****H** Standardised plug (valve plug) DIN EN 175 301-803-A**M** M12 plug DIN EN 61079-2-101**[10] Assembly****O** Standard (attachment boreholes⁽⁺⁾)**W** Wall mounting⁽⁺⁾ not required for process connection at the rear**6.1 Prefabricated connection lines**

Art. No.	Planned measures	Length
06401571	5 x 0.34 mm ² PUR cable with M12 coupling, straight	1 m
06401995	5 x 0.34 mm ² PUR cable with M12 coupling, straight	2 m
06401996	5 x 0.34 mm ² PUR cable with M12 coupling, straight	5 m
06401564	5 x 0.34 mm ² PUR cable with M12 coupling, straight	7 m
06401573	5 x 0.34 mm ² PUR cable with M12 coupling, straight	10 m
06401567	5 x 0.34 mm ² PUR cable with M12 coupling, straight	15 m

7 Attachments



EU Declaration of Conformity

(Translation)

For the product described as follows

Product designation **Differential Pressure Transmitter**

Type designation **DE40**

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

2014/30/EU EMC Directive
2011/65/EU RoHS Directive

The products were tested in compliance with the following standards.

Electromagnetic compatibility (EMC)
EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
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
EN 50581:2012 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Also they were subjected to the conformity assessment procedure „**Internal production control**“.

The object of the declaration described above is in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

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 **FISCHER Mess- und Regeltechnik GmbH**
Bielefelder Str. 37a
32107 Bad Salzufflen, Germany
Tel. +49 5222 974 0

Documentation representative Mr. Stefan Richter
Dipl. Ing.
General Manager R & D

The devices bear the following marking:



**Bad Salzufflen,
2017-07-05**


S. Richter
General Manager R & D



Seite 1 von 1

Fig. 9: CE_DE_DE40



ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ ДЕКЛАРАЦИЯ О СООТВЕТСТВИИ

Заявитель Общество с ограниченной ответственностью «МАТИС-М». Место нахождения: 117261, город Москва, улица Вавилова, дом 70, корпус 3, комната правления, Российская Федерация. Адрес места осуществления деятельности: 109029, город Москва, город, Сибирский проезд, дом 2, корпус 12, Российская Федерация, Основной государственный регистрационный номер: 1037739575125, телефон: +7 495 725-23-09, адрес электронной почты: info@matis-m.ru

в лице Генерального директора Шарова Александра Анатольевича

заявляет, что Датчик/преобразователь перепада давления, тип DE13, DE25, DE27, DE38, DE39, DE40, DE44, DE45, DE46, DE49, DE50

Продукция изготовлена в соответствии с Директивой 2014/30/EU

Изготовитель «FISCHER Mess- und Regeltechnik GmbH»

Место нахождения: Bielefelder StraBe 37a, D-32107 Bad Salzuflen, Германия. Филиал завода-изготовителя: FISCHER Mess- und Regeltechnik GmbH, Место нахождения: Bielefelder StraBe 37a, D-32107 Bad Salzuflen, Германия.


Код ТН ВЭД ЕАЭС 9026 20 200 0, серийный выпуск

Соответствует требованиям Технического регламента Таможенного союза ТР ТС 020/2011 "Электромагнитная совместимость технических средств"

Декларация о соответствии принята на основании протокола № 01331-02/2017-06 от 15.06.2017 года. Испытательной лаборатории (центра) продукции народного потребления "Отдел 101" Общества с ограниченной ответственностью "Межрегиональный центр исследований и испытаний", регистрационный номер аттестата аккредитации № RA.RU.21AO47 Схема декларирования: Зд

Дополнительная информация разделы 5 и 7 ГОСТ 30804.3.2-2013 (IEC 61000-3-2:2009) «Совместимость технических средств электромагнитная. Эмиссия гармонических составляющих тока техническими средствами с потребляемым током не более 16 А (в одной фазе). Нормы и методы испытаний», раздел 5 ГОСТ 30804.3.3-2013 (IEC 61000-3-3:2008) «Совместимость технических средств электромагнитная. Ограничение изменений напряжения, колебаний напряжения и фликера в низковольтных системах электроснабжения общего назначения. Технические средства с потребляемым током не более 16 А (в одной фазе), подключаемые к электрической сети при несоблюдении определенных условий подключения. Нормы и методы испытаний». Условия хранения продукции в соответствии с ГОСТ 15150-69. Срок хранения (службы, годности) указан в прилагаемой к продукции товаросопроводительной и/или эксплуатационной документации.

Декларация о соответствии действительна с даты регистрации по 14.06.2022 включительно

 (подпись) М.П. Шаров Александр Анатольевич (Ф. И. О. заявителя)

Регистрационный номер декларации о соответствии: ЕАЭС N RU Д-ДЕ.АЛ16.В.77757

Дата регистрации декларации о соответствии: 15.06.2017

Fig. 10: ЕАЭС N RU Д-ДЕ.АЛ16.В.77757