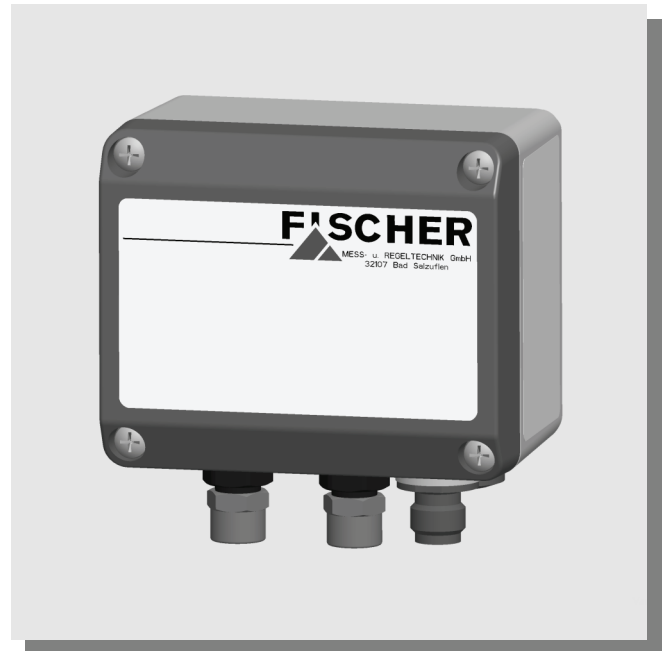


Instruction Manual

DE23 || Differential Pressure Transmitter

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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.

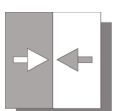
Chapter 1 (sections 1.2 through 1.7) contains general as well as specific safety instructions. Chapters 2 through 10, covering topics ranging from intended purpose of the equipment to its final disposal, also include important points relating to safety. Overlooking or ignoring any of these safety points 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 to 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).

1.5. Modifications 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.

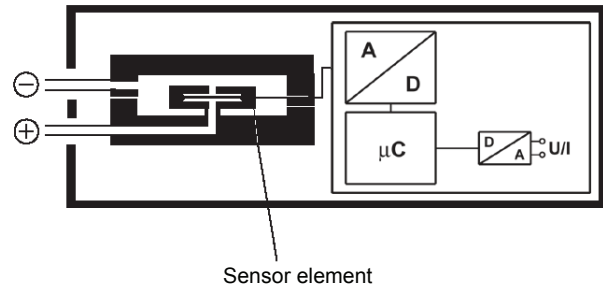
It is the responsibility of the users to ensure that only suitably qualified and experienced technical personnel are used for installation, operation and servicing of this equipment.

2. Intended Applications

The DE23 is a 2-wire transmitter. It is suitable for accurate measurement of low positive / negative gauge pressure or differential pressure of air and gases.

3. Product Descriptions and Functions

3.1. Functional Scheme



3.2. Principles of Operation

The instrument is based on a capacitance sensor element and can measure positive gauge, negative gauge or differential pressure.

The pressure is measured directly by a micromachined silicon-on-glass differential capacitance sensor element.

Pressure changes cause capacitance changes interpreted by the integrated electronics.

4. Installation

The electronic module is mounted on a flat plate or panel, for which it has 4 holes at the rear for self-tapping screws $\varnothing 3.5$ mm. A wall-mounting plate is available as an option (s. 13. Ordering Code).

The pressure transmitters are calibrated at the factory while mounted vertically, pressure ports downward. However, they can be mounted in any orientation.

IP65 protection for the housing is guaranteed only if suitable connecting cable is used.

If the instrument is intended for outdoor application, we highly recommend using an adequate protective housing (or at least a big enough shelter) as protection against UV-radiation on the membrane keyboard and against exposure of the instrument to rain or snow.

4.1. Process Connections

- Only technicians who are qualified and authorized for this type of work should undertake installation.
- Ensure that the process equipment and pressure lines are at atmospheric pressure before making pressure connections to the instrument.
- The instrument should be provided with suitable protection against pressure surges (e.g., snubber or pulsation damper).
- Ensure that the mechanical configuration and materials of construction of the instrument are compatible with the process media.

- Ensure that process pressure is always less than the specified safe pressure rating.
- Carefully check the pressure-tightness of all pressure connections before start-up.

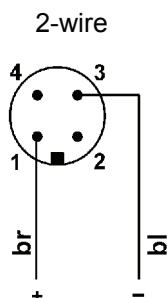


Do not blow into the pressure connections!

4.2. Electrical Connection

- Only technicians who are qualified and authorized for this type of work should undertake installation.
- Electrical connections must conform to relevant international, national and local regulations and norms relating to electrical and instrumentation installations.
- Switch off electrical power to the plant before attempting electrical installation work of any kind.
- Make electrical connections to the instrument through a suitable fuse.

4.3. Connection Scheme



Nominal supply voltage and the operating supply voltage range are indicated under 11. Specifications. The maximum output signal loads are indicated under 11. Specifications.

5. Commissioning

- Power supply and pressure lines to the instrument must be correctly selected to meet operational requirements, and installed in way that does not cause physical stress to the instrument.
- If pressure lines are used to connect the pressure instrument and the process vessel / pipe, the pressure lines must have a downward gradient throughout, from the pressure instrument to the process vessel / pipe. This is to prevent formation of liquid plugs (for air / gas applications). If this continuous downward gradient cannot be provided for any reason, then suitable water separation devices must be inserted in the pressure lines.

- Pressure lines must be kept as short as possible and must not have short bends to avoid measurement errors induced by pressure line delays.

5.1. Pressure Connections

The instrument's pressure ports are marked by "+" and "-" symbols. For differential pressure applications the "+" port must be connected to the higher pressure and the "-" port should be connected to the lower pressure.

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 devices be regularly inspected, e.g.:

- 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 level 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 devices or devices 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

- Wall mounting set (s. 13. Ordering Code)
- M12 connector plug with cable (s. 13. Ordering Code)

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. Specifications

General

| Base measuring range | Pa | 0-25 | 0-50 | 0-100 | 0-250 | 0-500 | 0-1000 | - 25...+ 25 | - 50...+ 50 | - 100...+ 100 |
|--------------------------------|------------|------|------|-------|-------|-------|--------|-------------|-------------|---------------|
| Max. static operating pressure | bar | 0.7 | | | | | | | | |
| Max. safe pressure | bar | 1.7 | | | | | | | | |
| Straight line error (max.)° | %FS | 1.0 | | | | | | | | |
| Repeatability° | %FS | 0.1 | | | | | | | | |
| TC span and offset max.°° | %FS 10K | 0.6 | | | | | | | | |

° Straight-line error = nonlinearity + hysteresis; at 25 °C

°° Compensated temperature range 4 to 50 °C.

| | |
|---------------------------|----------------------------|
| Operating temp. (ambient) | -10 ... 70°C |
| Operating temp. (media) | -10 ... 70°C |
| Storage temperature | -20 ... 70°C |
| Protection class housing | IP 65 acc. to DIN EN 60529 |

Electrical

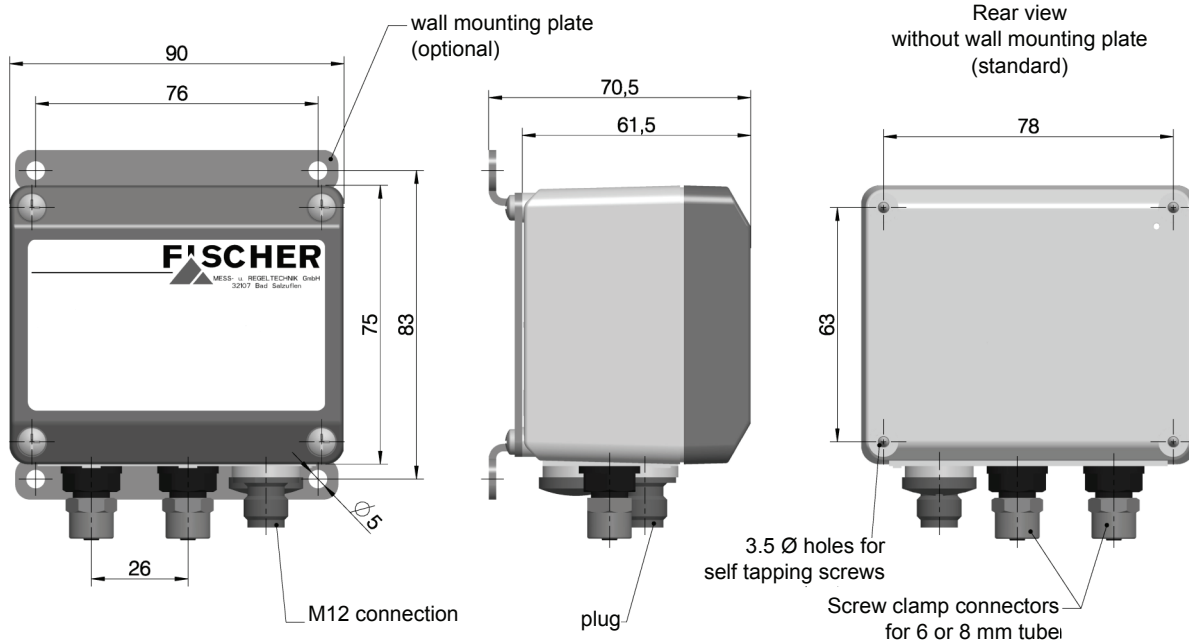
| | |
|------------------------------|--|
| Nominal supply voltage | 24 V DC |
| Operating supply voltage | 12 ... 36 V DC |
| Output signal | 4 ... 20 mA 2-wire |
| Output signal load impedance | $R_L \leq (U_B - 12 \text{ V}) / 0.02 \text{ A}$ |

Connections, Materials, Mounting

| | |
|--------------------------|---|
| Electrical connection | 1 round-shell connector M12 (5 pin, male) |
| Pressure connections | Screw clamp connectors (aluminum) for 6/4 mm or 8/6 mm tube |
| Materials, housing | Polyamide PA 6,6 |
| Materials, media contact | Silicon, PVC, aluminium, brass |
| Mounting | Rear mounting holes for back-panel mounting Wall mounted with mounting plate |

If the instrument is intended for outdoor application, we highly recommend using an adequate protective housing (or at least a big enough shelter) as protection against UV-radiation on the membrane keyboard and against exposure of the instrument to rain or snow.

12. Dimensions (all units in mm unless otherwise stated)



13. Ordering Code

| | | | | | | | | | | | | | |
|--|-------------|--|--|---|---|--|--|----------|----------|---|---|----------|--|
| Differential Pressure Transmitter | DE23 | | | # | # | | | B | 9 | # | # | M | |
|--|-------------|--|--|---|---|--|--|----------|----------|---|---|----------|--|

| | | | | | | | | | | | | | |
|---|---|---|--|--|--|--|--|--|--|--|--|---|---|
| Range | | | | | | | | | | | | | |
| 0 ... 25 Pa.....> | D | 1 | | | | | | | | | | | |
| 0 ... 50 Pa.....> | J | 6 | | | | | | | | | | | |
| 0 ... 100 Pa.....> | D | 4 | | | | | | | | | | | |
| 0 ... 250 Pa.....> | D | 6 | | | | | | | | | | | |
| 0 ... 500 Pa.....> | J | 7 | | | | | | | | | | | |
| 0 ... 1000 Pa.....> | D | 9 | | | | | | | | | | | |
| - 25.0 ... + 25.0 Pa.....> | L | 5 | | | | | | | | | | | |
| - 50.0 ... + 50.0 Pa.....> | L | 2 | | | | | | | | | | | |
| - 100.0 ... + 100.0 Pa.....> | L | 7 | | | | | | | | | | | |
| Pressure Connection | | | | | | | | | | | | | |
| Screw clamp connectors (aluminum) for 6/4 mm tube.....> | 4 | 0 | | | | | | | | | | | |
| Screw clamp connectors (aluminum) for 8/6 mm tube.....> | 4 | 1 | | | | | | | | | | | |
| Electrical Output Signal | | | | | | | | | | | | | |
| 4 - 20 mA linear, 2-wire.....> | B | | | | | | | | | | | | |
| Power Supply | | | | | | | | | | | | | |
| 24 V DC.....> | | 9 | | | | | | | | | | | |
| Electrical Connection | | | | | | | | | | | | | |
| M12 connection.....> | | | | | | | | | | | | M | |
| Mounting | | | | | | | | | | | | | |
| Standard (rear mounting holes).....> | | | | | | | | | | | | | 0 |
| Mounting rail.....> | | | | | | | | | | | | | S |
| Wall mounting plate.....> | | | | | | | | | | | | | W |

Accessories

| Ordering Code | Description | Pin | Length |
|---------------|-------------------------------|-------|--------|
| 06401995 | M12 connector plug with cable | 5 pin | 2 m |
| 06401996 | M12 connector plug with cable | 5 pin | 5 m |
| 04005144 | Wall mounting set | | |

14. Declaration of Conformity



EG-Konformitätserklärung

EC Declaration of Conformity

Wir erklären in alleiniger Verantwortung, dass nachstehend genannte Produkte

We declare under our sole responsibility that the products mentioned below

Differenzdrucktransmitter / Differential Pressure Transmitter

DE23 #####

gemäß gültigem Datenblatt übereinstimmen mit der

specified by the actual data sheet complies with the

EG-Richtlinie

EC Directive

2004/108/EG (EMV)

2004/108/EC (EMC)

Die Produkte wurden entsprechend der folgenden Normen geprüft:

The instruments have been tested in compliance with the norms:

DIN EN 61326-1:2004-05
DIN EN 61326-2-3
DIN EN 61010-1:2002-08

DIN EN 61326-1:2004-05
DIN EN 61326-2-3
DIN EN 61010-1:2002-08

Die Geräte werden gekennzeichnet mit:

The gauges are marked with:



Bad Salzufen, 14.01.08
(Ort, Datum / place, date)

(rechtsverb. Unterschrift / authorized signature)

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