FISCHER MESS- UND REGELTECHNIK

Instruction Manual

DE61 || 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

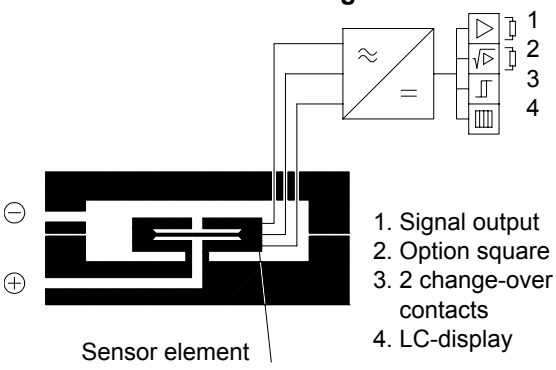
The safety instructions given in this manual, existing national regulations relating to accident prevention, and the internal safety rules and procedures of the user organization regarding safety during installation, operation and servicing must all be followed meticulously.
It is the responsibility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

Measuring transmitter with limit switching functions for acquisition and transmission of lowest pressure and differential pressure. The product must be used only for applications and under conditions specified by the manufacturer. Please confer with Fischer Mess- und Regeltechnik GmbH prior to using this transmitter along with polluted or aggressive media. For use with this media it needs to be adjusted in every part with direct contact to the media.

3. Product Description and Functions

3.1. Block Schematic Diagram



1. Signal output
2. Option square rooted
3. 2 change-over contacts
4. LC-display

3.2. Principles of Operation

The function of this transmitter is based on a capacitive sensor element. Due to modern micromechanical manufacturing process this sensor is highly overpressure safe, shock and vibration resistant and long-time stable.
The differential pressure acts on the sensor element and effects a measuring signal. The electronic amplifier then generates an electrical output signal of 0 / 4-20 mA. This output signal is used for external data processing and is shown on the LC-display e.g. in mbar.
The LC-display can also be used for indication and precise adjustment of the differential pressure dependent switching functions. Both change-over contacts can be adjusted to any value within the measuring range.

4. Installation

4.1. Process connections

- Only qualified technicians authorized for this type of work should undertake installation.
- Only for intended mechanical process connection (for model information see Type Plate of instrument).
- Ensure that process equipment and pressure lines are at atmospheric pressure before making pressure connections.
- 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.

4.2. Electrical Connections

- Only qualified technicians authorized for this type of work should undertake installation.
- Electrical connections must comply with 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 transmitter through a suitable energy-limiting safety device (isolation or zener barrier).

5. Commissioning

- Power supply and signal cabling to the transmitter must be correctly selected to meet operational requirements, and installed in a way that does not cause physical stress to the instrument.
- Carefully check tightness of all pressure connections before start-up.

5.1. Pressure Connections

The instruments pressure ports are marked by + and – symbols. The pressure applications need to be installed according to the label.

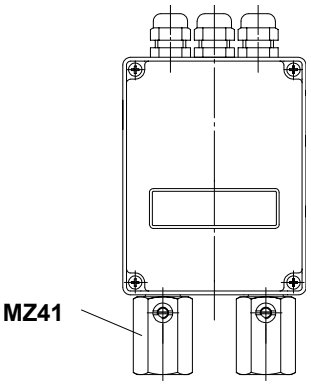
- Differential pressure measurement: + = higher pressure, – = lower pressure.
- Pressure measurement + = pressure port
- Gauge measurement – = negative pressure port

5.2. Shock Pressure Moderation

During pulsating pressure on the plant mechanical wear and disturbances in functional capability may occur. To avoid this we recommend installing absorbers into the pressure lines.

For Gaseous Media

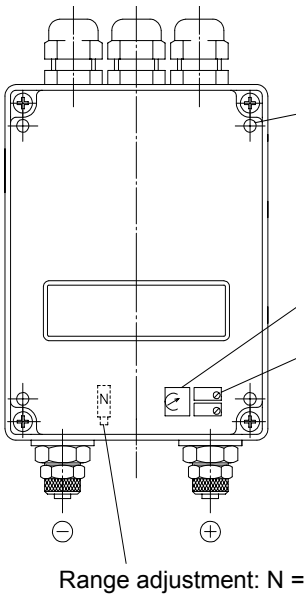
Adjustable attenuator valve **MZ41**
During operating condition adjust needle valve that way, that the indicator follows changements of pressure delayed.



5.3. Zero Point Adjustment

Usually adjustment of the instrument is not necessary for it is factory calibrated. The output signal can be adjusted with inbuilt zero point potentiometer.

Location of zero point potentiometer



Adjustment sequence

- Open housing cover.
- Connect current indicator (0-20 mA) to output signal between terminals 11 and 12.
- Connect and switch on power supply.
- Measuring system depressurized: Output signal = 0 resp. (4) mA. Correct offset using zero point potentiometer N.
- Mount housing cover.

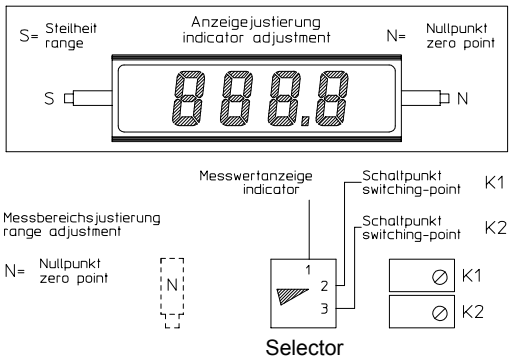
5.4. Switching Point Adjustment

The instrument's main board has two calibration potentiometers and a coding switch to set switching points. After removing housing cover they are freely acessible.

Adjustment sequence

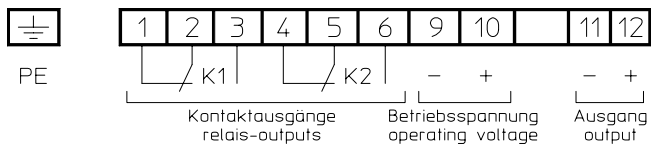
- Switch on supply voltage.
- Open housing cover.
- Selector setting 1: Display indicates actual value.
- Selector setting 2: Display indicates switching point I.
- Selector setting 3: Display indicates switching point II.
- The respective setpoint values for contact 1 and contact 2 can be set in display using potentiometers K1 and K2.
- After adjustment is done turn selector to setting 1: actual value.
- Setpoint values can be displayed any time by turning selector to position 2 or 3.

Selector and Set-up Potentiometer

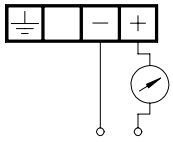


5.5. Electrical Connection

3-wire connection 24 V DC



2-wire connection 24 V DC



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 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 pakked, preferably in the original factory packaging, whenever it is to be transported.

8. Service

Any defective devices or devices with missing parts should be retourned 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

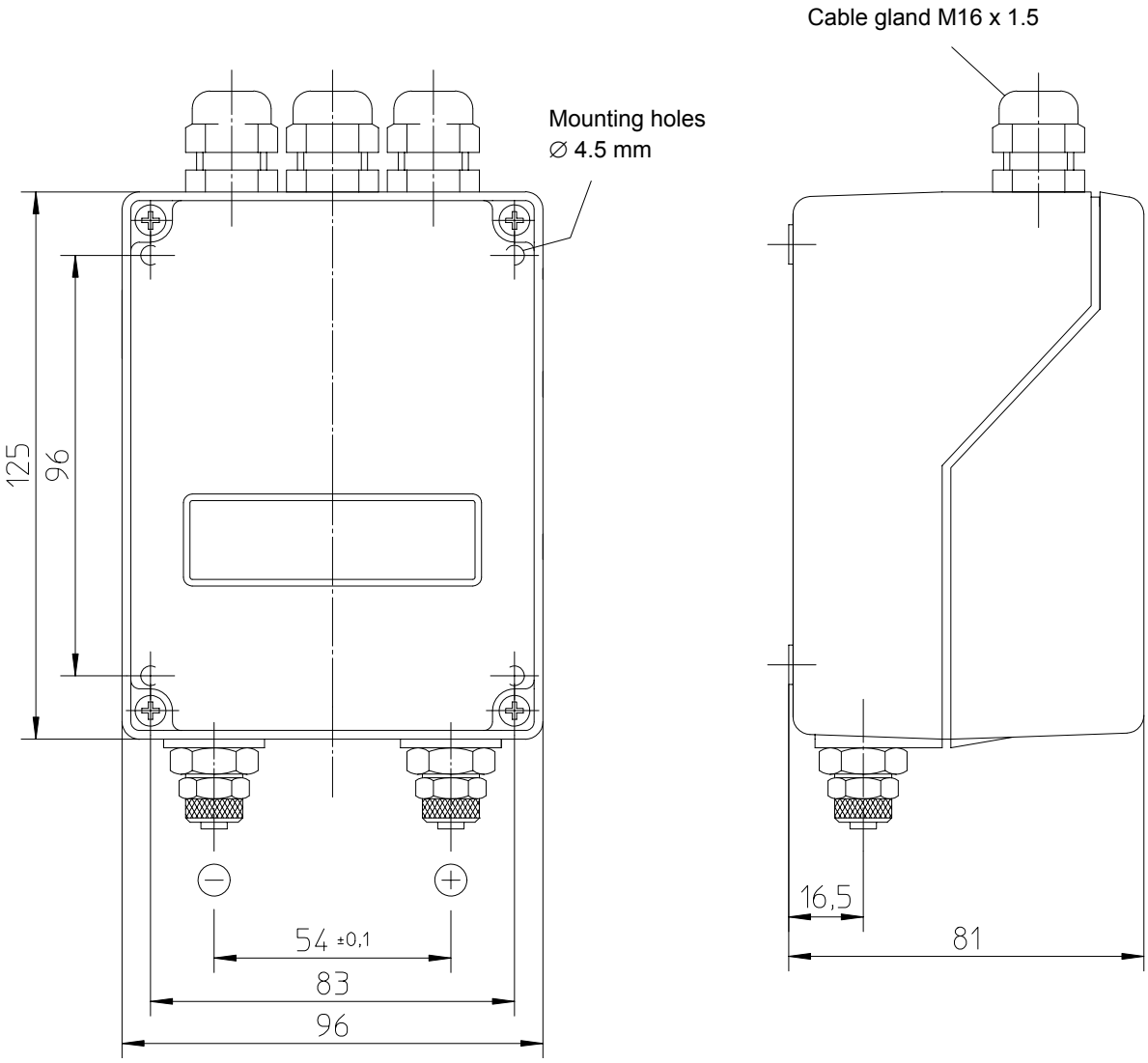
10. Disposal

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			
Measuring ranges	0...0.25 to 0...4.0 mbar (see 13. Ordering Code)		
Nominal pressure	0.6 bar		
Max. static pressure	overpressure safe up to permitted nominal pressure		
Linearity	1% FS		
Hysteresis	0.1% FS		
Temperature drift	0.5% FS / 10K		
Perm. ambient temperature	-10°...60°C		
Perm. medium temperature	-20°...70°C		
Protection class	IP 54 per DIN EN 60529		
Electrical			
Electrical connections	3-wire	3-wire	2-wire
Operating voltages	24 V DC	24 V DC	24 V DC
Power consumption	approx. 3 VA	approx. 3 VA	approx. 3 VA
Output signal	0-20 mA	4-20 mA	4-20 mA
Apparent ohmic resistance	700 Ω	700 Ω	max. 450 Ω
Current limit	approx. 30 mA	approx. 30 mA	approx. 30 mA
Square-rooted output	± 0.5%		
with suppression of leak flow volume	2% set up		
Span adjustment	approx. 10% FS		
Zero point adjustment	approx. 10% FS		
Measuring Indication / Switching Sections			
Measuring indication	3½ digit LC-Display		
Switching point adjustment	The digital display can be switched over between the differential pressure actual value and the switch point adjustments via selector. The display then indicates the related setpoint value. Setpoint values are adjustable within full scale range.		
Switching point hysteresis	approx. 2%		
Contact output	1 or 2 potential-free change-over contacts		
Load data of contacts	$U\sim_{max.}$ = 250 V AC, $I\sim_{max.}$ = 2 A, $P\sim_{max.}$ = 250 VA ohmic resistance $U=_{max.}$ = 30 V, $I=_{max.}$ = 2 A, $P=_{max.}$ = 60 W ohmic resistance		
Connection			
Electrical Connections	internal connector bloc, M16x1.5 connection M12 plug connection		
Pressure Connections	female thread G¼, threaded hose coupling (al) for 6/8 mm flexible tube, cutting ring connection (brass) for 6/8/10 mm tube		
Materials			
Housing	diecasted aluminium, varnished		
Housing cover	ABS, self-extinguishing		
Measuring element	silicium, glass, aluminium		
Installation			
wallmounting	vertical, pressure ports downward		
any other orientation	correction of zero point recommended		

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



13. Ordering Code

Differential Pressure Transmitter **DE61** [ ][ ][ ][ ][ ][9][ ][ ]

Measuring Range

0...0.25 mbar	>	9 4
0...0.4 mbar	>	9 5
0...0.6 mbar	>	9 6
0...1.0 mbar	>	5 1
0...1.6 mbar	>	9 7
0...2.5 mbar	>	9 8
0...4.0 mbar	>	5 2
other measuring ranges (please indicate in plain text)	>	9 9

Pressure Connection

Female thread G ¼	>	0 1
Cutting ring connection brass for 6 mm tube	>	2 8
Cutting ring connection brass for 8 mm tube	>	2 9
Cutting ring connection brass for 10 mm tube	>	3 0
Screw connection Al for 6 mm flexible tube	>	4 0
Screw connection Al for 8 mm flexible tube	>	4 1

Electrical Output Signal

0–20 mA linear, 3-wire	>	A
4–20 mA linear, 2-wire, only 24 V DC, without contacts and square-root extraction	>	B
0–20 mA square-rooted, 3-wire	>	E
4–20 mA square-rooted, 3-wire	>	F
4–20 mA linear, 3-wire	>	P

Supply Voltage

24 V DC	>	9

Indication / Switching Sections

Without indication / without contacts	>	0
3½ digit LC-display / without contacts	>	1
3½ digit LC-display / with 1 potential-free contact	>	2
3½ digit LC-display / with 2 potential-free contacts	>	5

Electrical Connection

Internal connector bloc	>	E
M12 plug connection	>	M

14. CE-Certificate

Declaration of conformity

FISCHER MESS- UND REGELTECHNIK

CE

TÜV CERT DIN EN ISO 9001 Zertifiziert nach DIN EN ISO 9001
Zertifizierungs-Nr.: **08 100 1999**

We declare under our sole responsibility that the following products

Type of instrument: Differential Pressure Transmitter

Type: DE61

meet the requirements of protection according to the EC directive 89/336EWG and its modification 92/31/EWG and 93/68/EWG referring to the electro magnetical ableness and the requirements of protection according to the low voltage directive 73/23/EWG and ist modification 93/68/EWG.

Generic standards

- **Immunity standard:**
  EN 50082-2 2/96 — Electromagnetic compatibility - industrial environment
  with standards:
  EN 50204
  EN 61000-4-2
  EN 61000-4-3
  EN 61000-4-4
  EN 61000-4-6

- **Emission standard:**
  EN 50081-1 3/93 — Electromagnetic compatibility - residential enviroment
  with standards:
  EN 55014
  EN 55022

- **Safety requirements:**
  EN 61010-1 3/94 — Safety requirements for electrical equipment for measurement, control and laboratory use

Bad Salzuflen, 12.06.2001

ppa Günther Hauschild

003/7/503

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