

Instruction Manual

DA12 || Differential Pressure Gauge

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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.

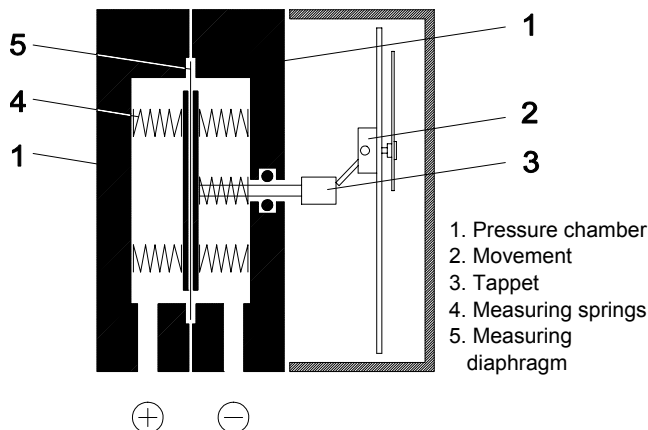
2. Intended Applications

This differential pressure measuring instrument is intended as an indicator for differential pressure measurement. The product must be used only for applications and under conditions specified by the manufacturer.

Please confer with Fischer Mess- und Regeltechnik prior to using this transmitter along with polluted or aggressive media. For use with this media it needs to be adapted in every part with direct contact to the media.

3. Product Description and Functions

3.1. Block Schematic Diagram



3.2. Principles of Operation

This differential pressure instrument is based on a rugged and uncomplicated diaphragm movement, suitable for overpressure-, partial vacuum- and differential pressure measurements. Operating principle of system is identical for all applications of this type.

In a state of balance, forces of springs on both sides of diaphragm are balanced. Pressure or differential pressure to be measured creates an unbalanced force of springs for measuring range until a new balance is reached.

When subjected to excessive pressure, diaphragm rests on metal supporting plates.

A centre-mounted tappet transfers motion of the diaphragm system to indicator movement.

4. Installation

The instrument is intended for wallmounting by default. It can be mounted immediately by 3 fastening elements casted on housing. Optional panel mounting with panel mounting device DZ11 (see 9.). The instrument is factory calibrated while mounted upright, pressure ports downward. No other mounting orientation is allowed.

To ensure safety during installation and maintenance integrate adequate shut-off valves. By recommended accessories (see. 9.) like three- and four-spindle shut-off and equalizing valves DZ13/14 the instrument can be

- depressurized or shut down,
- cut off a plant to enable controlling or repairing,
- operational checked on site.

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.

5. Commissioning

- Pressure connections to the instrument must be correctly selected to meet operational requirements, and installed in a way that does not cause physical stress to the instrument.
- When used with liquid media the pressure lines must be vented, for different heights in head of liquid in lines cause measuring errors. The instrument and lines must be protected against frost when used with water.
- During differential pressure measuring static operating pressure causes offset of zero point which is in dimension of accuracy rating at max operating pressure. This offset can be corrected by adjustment of zero point (see 5.3).
- To ensure safety during installation and maintenance provide adequate shut-off valves.
- Carefully check the pressure-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

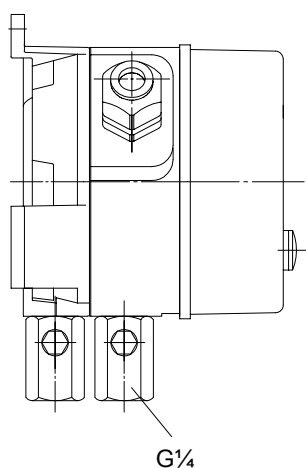
Negative pressure measurement: – negative pressure port

5.2. Shock Pressure Moderation

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

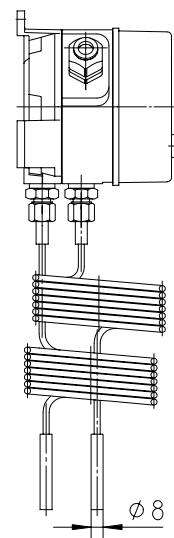
For Liquid Media

Adjustable attenuator valve MZ40
During operating condition adjust needle valve that way, that the indicator follows changes of pressure delayed.



For Gaseous Media

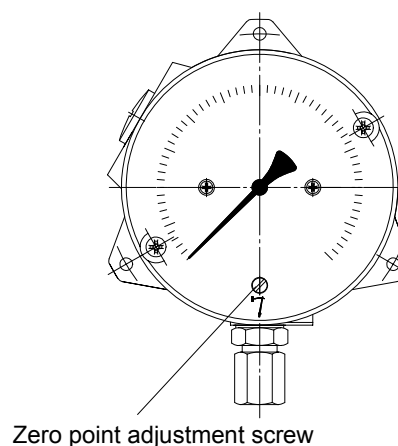
Capillary Reactive Coil MZ401



5.3. Adjustment of Zero Point

- Charge max. static pressure to pressure chambers.
- Open housing cover.
- Set measurement indicator by zero point adjustment screw to zero point of scale.
- Mount housing cover.

Location of Zero Point Adjustment Screw



6. Maintenance

The instrument is inherently maintenance-free. However, to ensure reliable operation and maximize the operating life of 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 all pressure connections for leak-tightness.

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 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

9.1. DZ11

Panel mounting kit \varnothing 132 mm consisting of front ring, spacer and fastening screws.

9.2. DZ13/14

Three- and four-spindle shut-off and equalizing valves DZ13/14 are especially suited for mounting differential pressure instruments.

For example they are used for:

- Depressurizing or shutting down of plant.
- Cutting differential pressure instruments off a plant to enable controlling or repairing.
- Shut-off valves may be used for operational checks on site.

DZ14 - additional to DZ13 - is provided with a venting valve to ventilate the connected pipe system. Nominal pressure of these shut-off and equalizing valves is PN40. Case is available in aluminium, brass or stainless steel 1.4301. Several process connections acc. to 13. Ordering Code are available.

10. Disposal



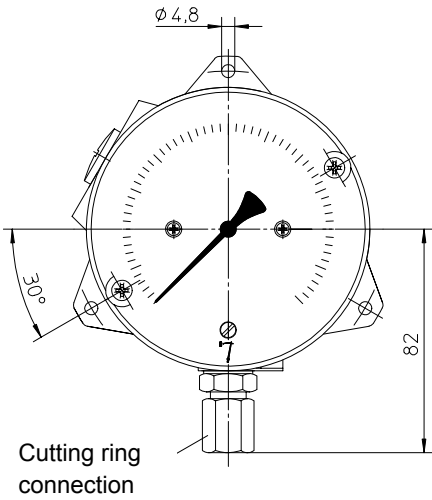
Protect your environment!

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.

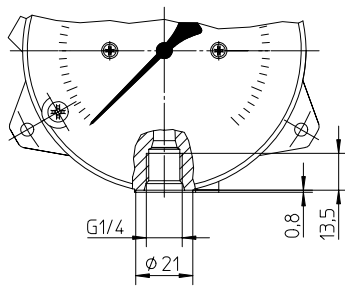
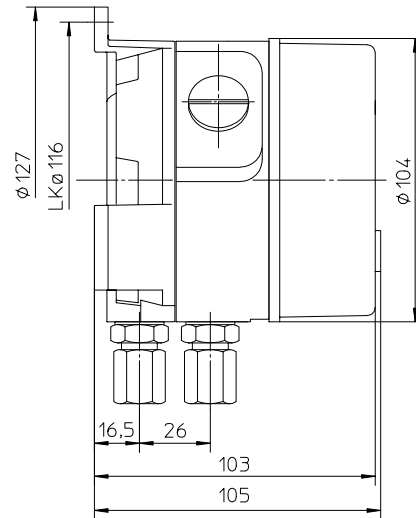
11. Specifications

General	
Measuring ranges	0...400 mbar to 0..25 bar (acc. to 13. Ordering Code)
Nominal pressure	25 bar
Max. static operating pressure	acc. to measuring range
Max. pressure load	one-sided overpressure protected up to nominal pressure on (+)- and (-)-side of diaphragm, partial vacuum protected
Perm. ambient temperature	-10...+70°C (max. 55°C in case of SEV-approval)
Perm. medium temperature	70°C
Protection class	IP54 acc. to DIN EN 60529
Linearity	± 2.5 % FS
Zero point adjustment	located in the dial
Pressure connection	female thread G $\frac{1}{4}$, cutting ring connection for 6 / 8 / 10 mm tube of brass / zinc steel / chrome-nickel-steel male connection shank G $\frac{1}{4}$ B DIN EN 837
Measuring system	
Range ≤ 10 bar	diaphragm measuring system, diaphragms of reinforced elastomere
Range ≥ 16 bar	diaphragm measuring system, diaphragm of DURATHERM [®]
Materials	
Pressure chamber	aluminium Gk Al Si 10 Mg, varnished black aluminium Gk Al Si 10 Mg surface protected with HART-COAT [®] chrome-nickel-steel 1.4305
Measuring diaphragm	diaphragm measuring system and gaskets of NBR or Viton [®] , diaphragm of DURATHERM [®] Ni Cr Co-alloy
Materials, media	stainless steel 1.4310, 1.4305
Materials, housing	macrolon
Weight	pressure chamber Al = 1.2 kg, pressure chamber 1.4305 = 3.5 kg
Mounting	
Pipe mounting	pressure connections ≅ "+", "-" symbols <ul style="list-style-type: none"> • by screwed in cutting ring or clamping ring connection • by screwed in connection shank acc. to DIN EN 837 for nipple fitting acc. to DIN 16284
Wall mounting	3 fastening elements
Panel mounting	with front ring, Ø 132 mm (see 9.1 DZ11)

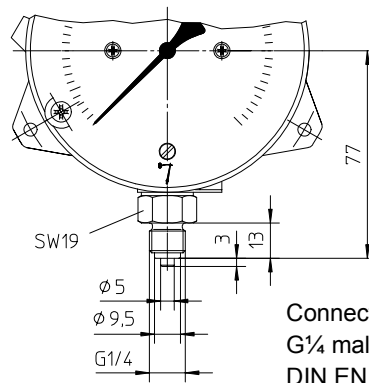
12. Dimensions (all units in mm unless otherwise stated)



**DA12 Wall mounting
(Standard version)**

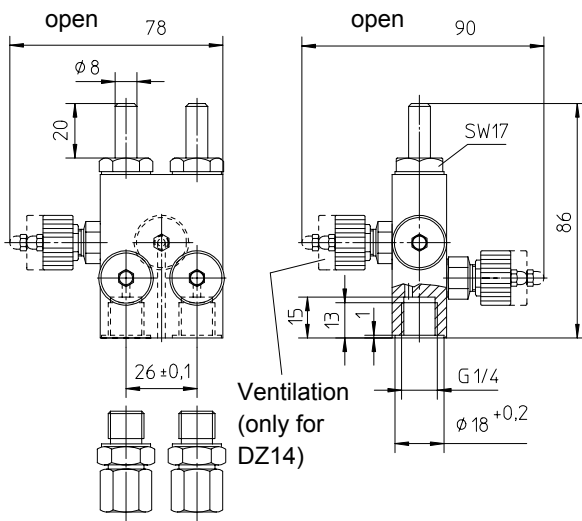


Connection G $\frac{1}{4}$ female



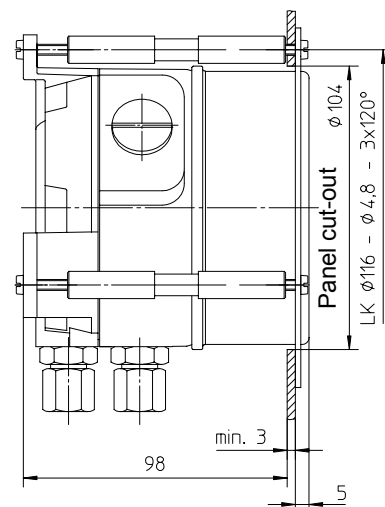
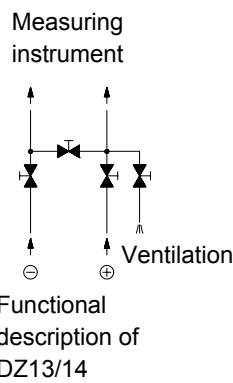
Connection shank
G $\frac{1}{4}$ male acc. to
DIN EN 837

Variants of process connection



Cutting ring connection

DZ13/14 Four-spindle shut-off and equalizing valve



DZ11 Panel mounting

13. Ordering Code

Differential Pressure Gauge **DA12**

						0	0
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Measuring Range	max. stat. operating pressure	↑	↑	↑	↑
0 ... 400 mbar	6 bar.....	> 8	3		
0 ... 0.6 bar	10 bar.....	> 0	1		
0 ... 1 bar	16 bar.....	> 0	2		
0 ... 1.6 bar	25 bar.....	> 0	3		
0 ... 2.5 bar	25 bar.....	> 0	4		
0 ... 4 bar	25 bar.....	> 0	5		
0 ... 6 bar	25 bar.....	> 0	6		
0 ... 10 bar	25 bar.....	> 0	7		
0 ... 16 bar	25 bar.....	> 0	8		
0 ... 25 bar	25 bar.....	> 0	9		
-0.6 ... 0 bar	10 bar.....	> 3	0		
-1 ... 0 bar	16 bar.....	> 3	1		
-1 ... 0.6 bar	25 bar.....	> 3	2		
-1 ... 1.5 bar	25 bar.....	> 3	3		
-1 ... 3 bar	25 bar.....	> 3	4		
-1 ... 5 bar	25 bar.....	> 3	5		
Measuring Diaphragm / Gaskets					
NBR	NBR	>	N		
Viton®	Viton®	>	V		
DURATHERM®	NBR (Range 0-25 bar).....	>	D		
DURATHERM®	Viton® (Range 0-25 bar).....	>	E		
Pressure Chamber					
Aluminium		>	A		
Aluminium HART-COAT®		>	D		
Chrome-nickel-steel 1.4305.....		>	W		
Pressure Connections					
Female thread G1/4.....		>	0	1	
Connection shank G1/4 B male of brass		>	0	6	
Connection shank G1/4 B male of stainless steel 1.4305		>	1	1	
Cutting ring connection for 6 mm tube of steel		>	2	0	
Cutting ring connection for 8 mm tube of steel		>	2	1	
Cutting ring connection for 10 mm tube of steel		>	2	2	
Cutting ring connection for 6 mm tube of stainless steel 1.4571		>	2	4	
Cutting ring connection for 8 mm tube of stainless steel 1.4571		>	2	5	
Cutting ring connection for 10 mm tube of stainless steel 1.4571		>	2	6	
Cutting ring connection for 6 mm tube of brass		>	2	8	
Cutting ring connection for 8 mm tube of brass		>	2	9	
Cutting ring connection for 10 mm tube of brass		>	3	0	

14. Supplier Declaration



Zertifiziert nach DIN EN ISO 9001:2000
Zertifizierungs-Nr.: 08 100 1999

Supplier Declaration

acc. to EC-Machine guidelines 98/37/EC, Appendix II B

We declare herewith, that the delivered components

Designation: Differential Pressure Gauge

Art.-no.: Line DA12 ...

are determined for installation in a machine, and the putting into service of which is prohibited until it has been confirmed, that the machine in which these components will be installed, corresponds to the regulations of the EC guideline 98/37/EC.

Applicated harmonized standards
especially: -----

Applicated harmonized standards and technical specifications
especially: DIN EN 837 (analogously application)

Bad Salzufen, 07.08.06


(authorized signature)

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Sitz: Bad Salzufen
Amtsgericht Lemgo HRB 226
Geschäftsführer:
Günter B. Gödde