

Standard Versions



Versions with Integrated Limit Switch



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Scope:

Certain parts of this instruction exclusively refer to versions with integrated limit switch only. Please check your actual instrument version to ascertain that the statements marked with * are relevant for your pressure gauge.



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1. General

The User Instructions contain basic as well as absolutely essential instructions on mounting, operating, and maintaining the differential pressure gauge model DiPsPH. The mechanic/electrician, the operator and also other relevant qualified personnel must read these instructions without fail prior to assembling the device and putting it into operation. These operation instructions have to be available at the installation site at all times.

2. Safety Notices



The following sections regarding general safety instructions as well as the then following instructions from application to waste disposal contain safety notices which, if not complied with, can result in danger to humans and animals, property and objects.

2.1 Personnel qualification

Personnel appointed for installing, operating, servicing and inspecting these pressure gauges have to be adequately qualified and to be familiar with the applicable guidelines for occupational safety and accident prevention. They have to be well trained to ensure adequate ability upon completing the requested demands of installing, operating, servicing and inspecting.

2.2 Dangers upon disregarding the safety instructions

Disregarding these safety instructions, the intended application purpose, or the limiting values pointed out in the technical data (nameplate, data sheets 5401, 5495) can result in personal injury, property damages and environmental pollution or can even endanger the entire plant itself.

The ARMATURENBAU GmbH and MANOTHERM Beierfeld GmbH cannot be held responsible for any claims for damages in such a case.

2.3 Safety instructions for operators/service personnel

The operator has to ensure to provide these instructions accessible to the respective personnel for installing, operating, servicing and inspecting purposes. Danger by electrical energy as well as released energy of the pressure medium and danger caused by improper connection of the device must be excluded. Details referring to this subject are available in the relevant regulations, such as:

DIN (German Institute for Standardization), EN (European Standard), as well as trade specific national applications (for example DVGW), EX (Hazardous Area), GL-German Lloyd et cetera, the VDE rules (Association of German Electricians), and also the rules of the local EVU (Electricity Companies).

2.4 Inadmissible conversion

Design modifications or other technical alterations of the device by the customer are **not** admissible. This also counts for the assembly of spare parts. Any necessary modification/alterations must be executed by the manufacturer only.

2.5 Inadmissible operating methods

Secure operating of the device is only guaranteed for the intended application purpose (see below). Other operating methods are inadmissible.

The version of the device has to match the medium used at the plant. Applications for pressure measurement at media that might corrode the wetted parts are inadmissible and can result in damages to objects and even persons.

To fall below or to exceed the limiting values stated in the technical data sheets 5401 and 5495 is inadmissible and could result in damages to objects and even persons.

An inadmissible method of operation leads to the expiration of any warranty.

2.6 Security conscious working whilst servicing and installing

The safety instructions pointed out in these User Instructions as well as existing national regulations referring to accident preventions, and internal job regulations, plant and security regulations imposed by the operator have to be taken into account. The operator has to ensure that all stipulated service, inspection and installation work is executed by qualified, skilled personnel.

3. Application

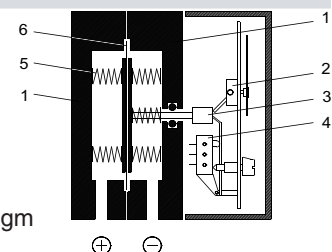
Differential pressure gauges model DiPsPH with or without integrated limit switch are suitable for measuring pressure, vacuum and differential pressure in the field of industrial measuring techniques. Typical applications are the measurement of the differential pressure between forward- and return flow in heating systems and monitoring of filters, blowers and compressors.

The pressure chamber and the measuring diaphragm are available in different materials to meet the various requirements of different applications, compare data sheet 5401.

4. Function

4.1 Function diagram

1. Pressure chamber
2. Movement
3. Tappet
4. Limit switch – initiating element*
5. Measuring springs
6. Measuring diaphragm



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4.2 Construction and function

A rugged and uncomplicated diaphragm measuring system serves as measuring element.

In a state of equilibrium, the forces of the springs on both sides of the diaphragm are balanced. The pressure or differential pressure to be measured creates an unbalanced force at the diaphragm. This force moves the diaphragm against the force of the springs until a new equilibrium is reached.

In the case of overpressure, the diaphragm rests on metal supporting plates.

A centre-mounted tapped transfers the motion of the diaphragm to the movement and, if the gauge is provided with limit switches*, to the initiating elements of the limit switches.

5. Installation/ Mounting

If any further accessories are used in combination with the here described pressure gauge versions, the relevant working instructions of these accessories have to be observed, too.

The standard model DiPsPH is fitted for wall mounting and supplied with G ¼" (¼" BSP) female process connections.

Optionally available are G ¼ B male process connections complying with EN 837, and cutting ring fittings. The three mounting plates cast to the case allow a direct mounting of the pressure gauge to plain walls. At our factory the pressure gauge has been adjusted for vertical installation. Nevertheless it is allowed to vary the fitting position. If the gauge is not vertically mounted, the zero point can be adjusted by the means of an integrated adjustment screw (compare 5.2).

To ensure proper and safety operation during the installation and maintenance, appropriate shut-off fittings have to be installed at the plant. By using recommended accessories (compare section 9. and data sheet 5401) the instrument can be

- ▶ depressurized or taken out of operation;
- ▶ cut off from the relevant pipe net for repair or maintenance purposes;
- ▶ checked and controlled directly on the spot.
- ▶ Please observe the notices on the instrument.

5.1 Process connection

- ▶ The connection to the process may be carried out by authorized and qualified skilled personnel only.
- ▶ The instrument may be mounted to the suitable counterparts of the provided type of mechanical process connections only (see nameplate)!

- ▶ The pipes have to be depressurized before mounting the pressure gauge!
- ▶ Precautions (dependent on the process conditions) have to be taken to ensure that no pressure thrusts might damage the pressure gauge.
- ▶ The pressure pipes have to be mounted -matching to the chosen process connection type- in such a manner that no mechanical forces can effect the mounted pressure gauge.
- ▶ The pressure gauge DiPsPH may be applied only for pressure media that do not corrode the wetted parts (compare data sheet 5401)!
- ▶ Be aware of the maximum pressure limit for the DiPsPH! It may not be exceeded!
- ▶ For fluid measuring media the pressure pipes have to be deaerated.
The pressure gauge has to be protected against frost when water is the pressure medium.
- ▶ To ensure proper and safety operation during the installation and maintenance, appropriate shut-off fittings have to be installed.
- ▶ Before starting operation, the tightness of the pressure pipe has to be tested and ensured.

5.2 Electrical connection*

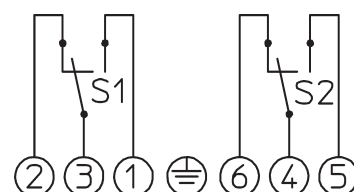
- ▶ The electrical connection may be carried out by authorized and qualified skilled personnel only.



The electrical connection of the device must be carried out according to the relevant regulations of the Association of German Electricians (VDE) as well as the rules of the local electrical company (EVU).

- ▶ Prior to the electrical connection the system has to be taken off the electrical net.
- ▶ Safety fuse devices, suitable for the current consumption, have to be connected in series.

Connection diagram*



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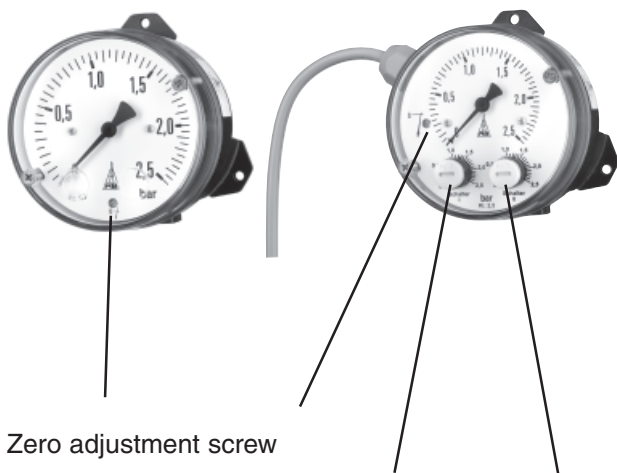
6. Operation

- ▶ The operation may be started only on the condition that all electrical lines, switching lines, measuring lines and pressure connection pipes are properly installed.

6.1 Zero adjustment

- ▶ Depressurize the pressure chambers (by the means of shut-off devices).
- ▶ Dismount the covering cap.
- ▶ Adjust the indication pointer to the zero mark by carefully turning the adjustment screw with a suitable screw driver.
- ▶ Mount the covering cap back to the case.

Without limit switch: With limit switch:



Zero adjustment screw

Adjustment of switching points*

6.2 Switching point adjustment*

- ▶ Unscrew the sealing plugs from the covering cap.
- ▶ Use a suitable screw driver to set the desired switching points according to the markings on the standard switching value scales.
Switching point setting accuracy: $\pm 5\%$.
For higher accuracy in setting the switching points the adjustment has to be carried out at the manufacturer's factory; it can be achieved also by using adequate tools such as test gauges, ohmmeter et cetera.
- ▶ After adjusting the switching points, the sealing plugs have to be screwed back into place.

7. Maintenance

The device is maintenance-free.

To ensure a reliable operation and a long life of the instrument we recommend regular inspections, especially:

- ▶ Checking of the display
- ▶ Checking tightness of the pressure connection pipes
- ▶ Checking the switching function combined with checking the sequence components*
- ▶ Checking the electrical connections (binder of the wires)*

The inspection rates should adapt to the mode of operation and the ambient conditions.

8. Storage and Transport

- ▶ Storage temperature limits: $-30...+70\text{ }^{\circ}\text{C}$
- ▶ Differential pressure gauges DiPsPH have to be protected against concussions, impacts and other mechanical damages during storage and transport. They have to be kept in the original packaging until actually used.
- ▶ The packaging can be provided for waste-paper recycling.
- ▶ The instrument has to be sufficiently protected for any further transport!

9. Service

Defective instruments and instruments with any production defaults have to be returned directly to our repair department.

To ensure the best possible service for you, we recommend a prior coordination with our sales department about claims and repairs of the instrument.

10. Accessories

- Front flange kit **Er** for panel mounting, mounting ring $\varnothing 132\text{ mm}$ alloy steel black or stainl. steel,
- Control and shut-off valves made of stainless steel 316 Ti, 3-fold (type no. 15) or 4-fold (type no. 16, not applicable for wall mounted pressure gauge versions)

11. Entsorgung



Please help us to protect the environment and dispose of the applied materials according to the applicable regulations or provide them for recycling.

Technical changes are reserved



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