



Operating Instructions for Diaphragm Differential Pressure Gauges

Model: MAN-D...



We don't accept warranty and liability claims neither upon this publication nor in case of improper treatment of the described products.

The document may contain technical inaccuracies and typographical errors. The content will be revised on a regular basis. These changes will be implemented in later versions. The described products can be improved and changed at any time without prior notice.

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2. Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.

The instruction manuals on our website www.kobold.com are always for currently manufactured version of our products. Due to technical changes, the instruction manuals available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email (info.de@kobold.com) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form against an applicable postage fee.

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

2.1 Notes on the machine and pressure equipment directive

When used in machines, the MAN-D should be used only when the machines fulfil the EC-machine guidelines.

as per PED 2014/68/EU

"Pressure gauges with a volume ≤ 0.1 L"

In acc. with Article 4 Paragraph (3), "Sound Engineering Practice", of the PED 2014/68/EU no CE mark.

Diagram 2

Vessels referred to in Article 4(1)(a)(i), second indent

3. Instrument Inspection

Instruments are inspected before shipping and sent out in perfect condition. Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:

The standard delivery includes:

- Diaphragm Differential Pressure Gauges model: MAN-D...

4. Regulation Use

Any use of the Diaphragm Differential Pressure Gauges, model: MAN-D..., which exceeds the manufacturer's specification, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

5. Operating Principle

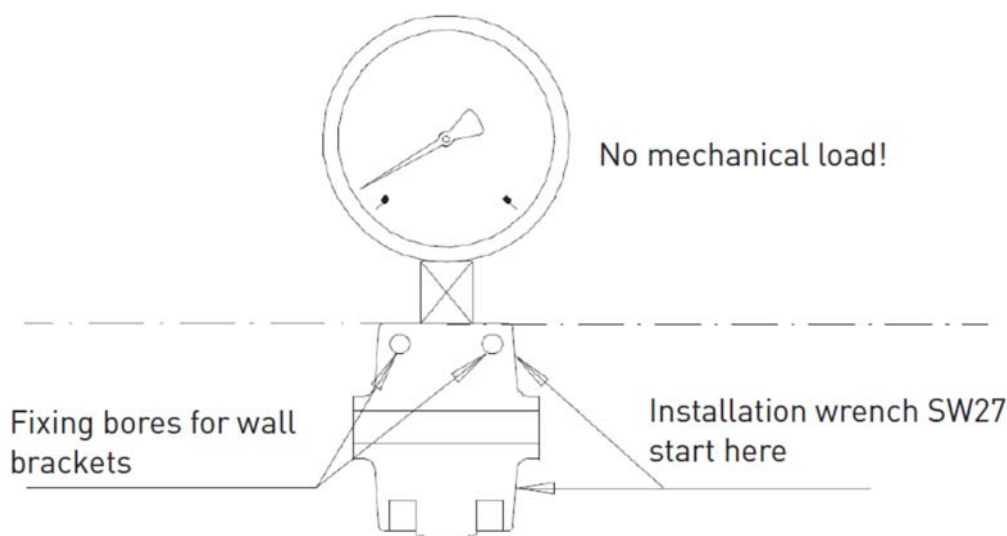
Differential pressure gauges with diaphragms are suitable for liquid or gaseous media, that are neither crystallise nor highly viscous. Due to the materials available these pressure gauges can also be used for chemically aggressive media. Fully stainless steel pressure gauges are ideally suited for use with chemically aggressive ambient conditions. These are used wherever the differential pressure resulting between intake and delivery pressures are to be displayed.

6. Mechanical Connection

- In accordance with the general technical regulations for pressure gauges (i.e. EN 837-2 „Selection and installation recommendations for pressure gauges“).
- When screwing gauges in, the force required for this must not be applied through the case, but rather through the spanner flats (using a suitable tool) provided for this purpose on the square shaft of standard connections.
- When sealing pressure connections must only be hold at the measuring system flange (not on display housing or rectangular pole)

6.1 Installation

- Nominal position per EN 837-3 / 9.6.6 Figure 7: 90° (⊥)
- Process connection: lower mount (LM)
- Connection: according to the specified symbols + and –
+ = higher working pressure (static pressure)
- = lower working pressure (static pressure)
- In order to ensure that, by the Model with safety features, pressure can be safely and reliably vented through the case back, a distance of at least 15 mm must be left free behind the case!
- Before mounting gauges, the measuring lines must be efficient cleaned by tapping, blowing or rinsing. Measuring gauges must be vibration-free mounted and operated. Also measuring gauges must be protected from pollution and high temperature variation. Maximum permissible medium- / ambient temperature must be not exceeded.
- In order to avoid any additional heating, the instruments must not be exposed to direct solar irradiation while in operation!
- With filled versions the ventilating valve at the top of the case must be opened prior to commissioning!



6.2 Bracket

- via rigid pressure connection tailpipes or
- via fixing bores for wall mounting or
- via surface mounting flange, back for panel mounting or
- via surface mounting flange, front for panel mounting or
- via surface mounting brackets for wall- and pipe mounting

7. Electrical Connection

(for gauges with electrical additional facilities)

Works with screw terminals in the cable junction box according to wiring diagram inscription at the housing.

8. Operation / Configuration / Adjustments

8.1 Leak testing

Before starting up, all pressure lines, fittings and other components of the pressurized system circuit must be tested for leaks.

Test methods:

- pressure drop method
- shut off the line circuit, pressure drop observed on time and / or
- method of blowing
- spraying relevant surfaces by means soap bubbles medium - a possible blowing magnification is observed

8.2 Permissible vibration load at the mounting point

- The instruments should always be installed in locations free from vibration.
- If necessary, it is possible to isolate the instrument from the mounting point by installing a flexible connection line between the measuring point and the pressure gauge and mounting the instrument on a suitable bracket.
- If this is not possible, the following limit values must not be exceeded:

Dry gauges: Frequency range < 150 Hz Acceleration < 0.7 g (7 m/s²)

Liquid-filled gauges: Frequency range < 150 Hz
Acceleration < 4 g (40 m/s²)

The liquid filling must be checked on a regular basis.

The liquid level must not drop below 75 % of the gauge diameter.

9. Commissioning

Differential pressure gauge is ready for use, if:

- pressure connections are manufactured and
- the electrical connection (for gauges with electrical additional facilities) is connected as specified.

Zero point must be checked after mounting and adjusted if necessary.

For inspection, the connection cables must be depressurized.

With deviation from the zero error tolerance, the zero point can be adjusted via screw driver at the adjustable pointer at standard pressure gauges.

Pressure loads, maximum working pressure (static pressure) and overload-limits must be complied with range of application.

Pressure surges (rapid pressure changes) must be avoided. By using valves by carefully or slowly valve actuation.

Over pressure overloads (more than the specified overload limits) lead to equipment failure if device-related no safety measures are taken.

9.1 Application information

For dangerous materials, such as for example oxygen, acetylene, flammable and toxic substances, as well as sewage treatment plants, pressure tanks etc., the existing rules beyond the general rules must be followed.

10. Maintenance

The differential pressure gauges require no maintenance or servicing and by correct handling / operating they are characterized for a long economic life-time.

When the zero-point during long-time service, particularly during frequent load changes, changed itself more than $\pm 20\%$ of full scale value, we recommend for safety reasons a checking in our company.

The indicator should be checked once or twice every 12 months.

The instrument must be disconnected from the process to check with a pressure testing device.

The instruments should be cleaned with a damp cloth moistened (with soap solution).

Any residual pressure medium contained in the pressure element may be hazardous or toxic. This should be taken into account when handling and storing pressure gauges which have been removed.

11. Technical Information

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

12. Order Codes

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

13. Dimensions

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

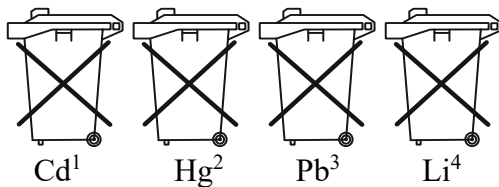
14. Disposal

Note!

- Avoid environmental damage caused by media-contaminated parts
- Dispose of the device and packaging in an environmentally friendly manner
- Comply with applicable national and international disposal regulations and environmental regulations.

Batteries

Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

Electrical and electronic equipment



15. EU Declaration of Conformance

We, KOBOLD Messring GmbH, Hofheim-Ts, Germany, declare under our sole responsibility that the product:

Diaphragm Differential Pressure Gauges

Model: MAN-D...

to which this declaration relates is in conformity with the following EC guidelines:

2011/65/EU **RoHS** (category 9)

Additional for **MAN-...S/M/I/P**:

is in conformity with the standards noted below:

EN 60947-1:2015 Low-voltage switchgear and controlgear - Part 1: General rules

Also the following EC guidelines are fulfilled:

2014/35/EU **Low Voltage Directive**
2014/30/EU **EMC Directive**



H. Peters
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Hofheim, 28 Jan. 2019