



Operating Instructions for Manometer

Model: MAN



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2. Note

2.1. General

Before unpacking and commissioning the device, the operating instructions and the “General Safety Instructions” document must be read and followed carefully. The general safety instructions, the operating instructions, the data sheet as well as approvals and further information can be downloaded via the QR code on the device or under the respective product on www.kobold.com.

Due to technical changes, the device documentation 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.



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.

When used in machines, the device should be used only when the entire machine fulfils the EU machinery directive.

2.2. Hazard warnings

The following instructions are intended to ensure your personal safety and to prevent damage to the product described or connected devices. Safety instructions and warnings to prevent danger to the life and health of users or maintenance personnel, or to prevent damage to property, are highlighted in this documentation using the symbols defined here. *The symbols and terms used have the following meaning in the documentation itself:*

| Symbol | Explanation | Symbol | Explanation |
|---|--|--|--|
|  Note | Is important information about the product, the handling of the product or the respective part of the documentation to which particular attention should be drawn. |  Caution | Means that minor personal injury or minor property damage may occur if proper precautions are not taken. |

| Symbol | Explanation | Symbol | Explanation |
|--|--|--|---|
|  Warning | Indicates that serious personal injury or substantial property damage may occur if proper precautions are not taken. |  Danger | Means that death can occur if proper precautions are not taken. |
|  Warning | Attention: Hot surface! |  Warning | Warning: Dangerous electrical voltage |

2.3. As per PED 2014/68/EU

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

| | | Pipe | |
|-------|-----------|---|--|
| Model | P max/bar | Diagram 7 Group 2 no dangerous fluids | Diagram 6 Group 1 dangerous fluids |
| MAN | < 200 | Art. 4, § 3 | Art. 4, § 3 |
| MAN | < 500 | Art. 4, § 3 | Cat. I |
| MAN | < 1000 | Art. 4, § 3 | Cat. I |
| MAN | > 1000 | Cat. I | Cat. I |

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.

The packing material must be thoroughly searched, so that no accompanying accessories are thrown away.

4. Regulation Use

The units of the model MAN serve to measure and monitor pressure-dependent processes in machines systems.

If applicable, the existing cap-holder on the connection body should only be removed immediately before connecting measurement conductors, so that no foreign particles may enter the pressure chamber. The storage of any measurement unit should be in a dry and dust-free area.


5. Operating Principle

Depending on the measuring range as well as the method of measurement (capsule, diaphragm, bourdon), the pressure to be measured is displayed via a mechanical pointer apparatus. The measuring element deforms in flexible range.

6. Mounting

6.1. General

The assembly has to be carried out following the corresponding general technical regulations for pressure measuring devices (e.g. DIN 16255 or EN 837-2).

| | |
|---|---|
|  | <p>While screwing in at the connection point, the required force must not be applied using the housing, instead only use the key areas designated for this purpose.</p> |
| <p>Note</p> | |

The installation location of the pressure-gauges should be easily accessible and close to the gas pressure measurements; if possible, above the measuring point. To avoid display deceleration time the distance between pressure withdrawal and pressure connection should be kept small.

Between the pressure withdrawal point and the measuring unit, a shut-off device should be introduced which allows a renewal and null-point check of the running system. Up to the final commissioning, the shut-off equipment should remain closed in the measurement piping. If pressure peaks are expected, suitable protective equipment may be considered, such as a pressure peak suppressor or a similar device. Alternatively, pressure measuring units with damping-liquid filling such as a glycerine manometer may be provided.

The piping up to the measuring unit should provide a vibration-free, stable attachment; otherwise, a wall bracket or some additional fortification via an attachment rim on the housing should be provided. Alternatively, mounting in an instrument panel may be considered.

The attachment of the manometer is to be executed in such a way that the admissible operating temperature does not violate min. and max. limits. In addition, measurement and stop valve should be protected through sufficiently long dimensional piping or water-bag pipes. The temperature conditions can influence the display accuracy.

With gauges for gas measurements, accumulation of condensation is to be avoided by a suitable piping design. If the device for operational reasons cannot be attached above the measuring point, a drainage possibility is to be provided. An additional liquid column may affect the gauge only if this pressure is noted on the scale. In the unfavourable case, the result of measurement is falsified.

For sealing of measuring unit's connections, sealing disks or sealing-edge-rings are utilised. The connection is recommended with stress-sockets or union-nuts; with that the manometer can be placed in the best reading position. During screw-in or screw-out, the force must not be exerted on the manometer housing, rather applied only over the four hexagonal connection-clips.

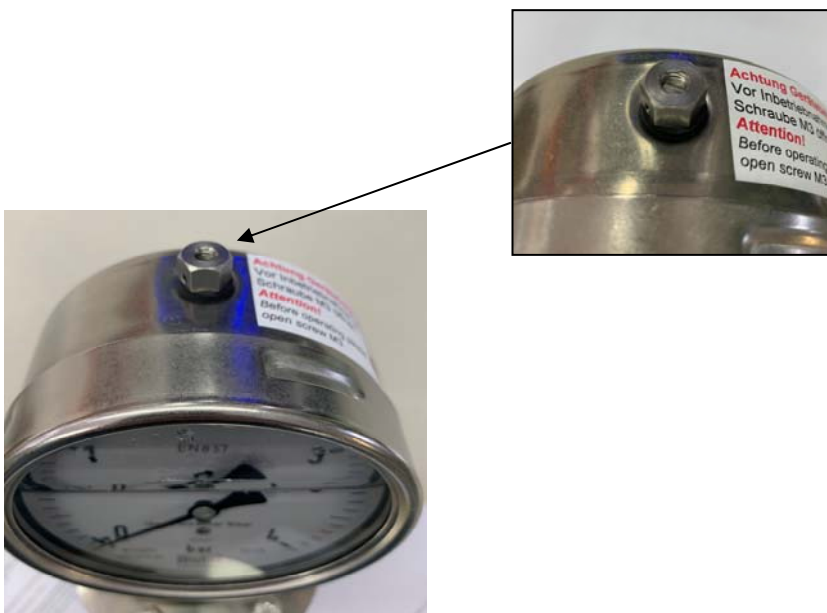
Before attaching the gauges, the measuring piping should be cleaned with the Medium to be measured or with clean compressed air. While squeezing off or blowing through the piping or containers, the gauge may not be over-pressed. If the expected pressure is higher, the manometer must be removed or locked off.

6.2. Commissioning of pressure compensating valve

Instruments which are fitted with a pressure compensating valve must, following installation, be vented for internal pressure compensation.

Tool: Open-ended spanner SW 10 + Screwdriver (slot 4 mm)

- Hold the valve body tight with open-end spanner SW 10 and loosen the screw M3 in valve body by 1½ rotations using the screw driver



6.3. Assembly for Differential Pressure Manometer

Pressure-difference manometers have two pressure connections.

On + marked pressure connection, connect high pressure side, on - marked pressure connection, connect low pressure side. In order to protect the unit, a pressure equalization valve manifold **MUST** be used. Equalization valve manifolds are available from Kobold Instruments.

6.4. Assembly for Contact Manometer

In order to avoid bouncing of closed switch and thus resulting increase in wear, care should be taken during installation such that the units remain vibration-free. If excessive vibration exists, the manometer should be isolated from the vibration via a tubing line of flexible capillary. The units should be protected against coarse contamination strong variations of ambient temperature.


6.5. Disassembly

Before disassembling the gauge unit, ensure the machine/equipment is depressurized or that the gauge is thoroughly isolated from the system. If possible, the measuring pipe should be emptied. In case of diaphragm type manometers, upper and lower flanges should not be loosened. Hydraulic liquid inside disassembled measuring unit can be dangerous for the environment, in which case corresponding safety precautions should be used. Pressure-measuring units, whose measuring elements are filled with water or water-based chemicals, must be protected from freezing.


7. Sliding or Magnet-Spring Contacts

7.1. General

The built-in limit switches (Sliding or magnet-spring contacts) are field adjustable via a rotator on the gauge face. The contacts are actuated by the pointer indicator as it moves up and down scale.

| | |
|---|---|
|  | <p>Pay attention during assembly, commissioning and operation of these units that the applicable national safety regulations (such as VDE 0100) are complied with. All work must be carried out while the system is disconnected from the power supply.</p> |
| Note | |

- The electrical connections may only be completed by qualified personnel.
- Make sure that the electrical supply lines are de-energized.
- The connection assignments and the switching functions are given on the type-label of the unit and the connection terminals (1...6) as well as the ground terminals are tagged accordingly. The power supply leads must be sized to accommodate the maximum current carrying rating of the switch and should follow IEC 227 or IEC 245.

| | |
|---|--|
|  | <p>Not observing the relevant regulations can result in serious life and/or material damage.</p> |
| Warning | |

7.2. Contact Ratings

Table 1: Sliding or magnetic spring contact ratings

| Limit-value for contact loading with resistive load | Sliding Contact | Magnet-spring contact | |
|---|-----------------|-----------------------|--------------|
| | unfilled units | Unfilled units | Filled units |
| Max. op. Voltage U_{eff} | 250 V | 250 V | 250 V |
| Max. op. Current | | | |
| Connecting current | 0.7 A | 1.0 A | 1.0 A |
| Interrupting current | 0.7 A | 1.0 A | 1.0 A |
| Continuous current | 0.6 A | 0.6 A | 0.6 A |
| Power dissipation | 10 W / 18 VA | 30 W / 50 VA | 20 W/20 VA |

Note: Under no circumstances, the limiting values of voltage, current or power may be exceeded!

Table 2: Recommended contact rating with different supply voltages and device versions

| Voltage AC / DC V | Sliding contact | | | Magnet-spring contact | | | | | |
|-----------------------------|------------------|-----|--|-----------------------|-----|--|----------------|-----|--|
| | Unfilled housing | | | Unfilled housing | | | Filled housing | | |
| | Resistive Load | | Inductive load $\cos \varphi > 0.7$ | Resistive load | | Inductive load $\cos \varphi > 0.7$ | Resistive load | | Inductive load $\cos \varphi > 0.7$ |
| | AC | DC | | AC | DC | | AC | DC | |
| | mA | mA | mA | mA | mA | mA | mA | mA | |
| 230 | 40 | 45 | 25 | 100 | 120 | 65 | 65 | 90 | 40 |
| 110 | 80 | 90 | 45 | 200 | 240 | 130 | 130 | 180 | 85 |
| 48 | 120 | 170 | 70 | 300 | 450 | 200 | 190 | 330 | 130 |
| 24 | 200 | 350 | 100 | 400 | 600 | 250 | 250 | 450 | 150 |

At low voltages, on grounds of switching safety, the switching current may not be less than 20 mA.

For higher loads and, as well as for the units with liquid -filled housings, in order to protect against oil turbidity, we recommend the use of an additional protective contact relay.

7.3. Over-Current Protection Equipment

These devices do not contain built-in over-current protection. In case, over-current protection is required, we suggest the following values to be considered in accordance with EN 60 947-5-1.

Table 3: Over-current protection device

| Voltage | Sliding contact | Magnet spring contact |
|---------|-----------------|-----------------------|
| 24 V | 1 A | 2 A |
| 250 V | 0.315 A | 1 A |


8. Inductive and Electronic Contacts

8.1. General


Inductive contacts (Electronic limit-signal generators, DIN 19234 or NAMUR) are simply DC voltage switches in two-wire form that only contain transistor oscillators.

For the operation of inductive contacts, the use of switching amplifier, such as REL-6000 is recommended.

Electronic contact (electronic limit-signal generator in three-wire form) are simple inductive DC voltage switches for switching of DC loads up to 100 mA.

| | |
|---|--|
|  | <p>Pay special attention during assembly, commissioning and operation of these units such that applicable national safety regulations are followed, for example, VDE 0100 etc. All work must be performed while the power is disconnected from the system.</p> |
| <p>Note</p> | |

- The electrical connections may only be conducted by qualified personnel.
- Make sure, that the electrical connection wires are de-energized.
- The connection terminals and switching functions are given on the type-label and the connection terminals (1...6) as well as the grounding terminals are accordingly marked. The wires provided for supply connection must be appropriate for the largest current handling capability by the switch and should follow IEC 227 or IEC 245.

| | |
|---|--|
|  | <p>Not complying with the applicable regulations, serious damage to life and materials may result.</p> |
| <p>Warning</p> | |

8.2. Mode of Operation

The proximity switches, due to their slit-groove construction are also known as slit-initiators. The electromagnetic field is concentrated between two coils, which face each other axially. The switch responds if the measuring pointer moves an aluminium target into the air-gap between both the coils (slit). This results in switch activation.

With inductive contacts, if there is no damping material present within the slit-range, oscillator swings. In this state, system has a very low resistance (approx. 1k Ω).

When the target enters the air-gap, the coil system is damped, the oscillations in the oscillator are set up and the system becomes more resistive (approx. 7k Ω).

8.3. Electrical Data – Inductive (NAMUR) Contact

| | |
|--|---|
| Nominal voltage | 8 V _{DC} (R _i approx. 1 kΩ) |
| Self-inductivity | 29 μH |
| Self-capacitance | 20 nF |
| Current-intake (active surfaces free) | ≥ 3 mA |
| Current-intake (active surfaces covered) | ≤ 1 mA |

8.4. Electrical Data - Electronic Contact

| | |
|--------------------------------------|------------------------------|
| Operational voltage | 10...30 V _{DC} |
| Residual ripple | 10 % |
| No load current | ≤ 10 mA |
| Polarity protection | Restricted (U _b) |
| Inductive protection | 1 kV; 0.1 ms ; 1k |
| Oscillator frequency | 1000 kHz |
| EMV DIN 60947-5-2 supplement ZA | Yes |
| Switching frequency | 1000 Hz |
| Output | PNP |
| Switching element function | N.O. |
| Switching current | ≤ 100 mA |
| Residual current | ≤ 100 μA |
| Voltage drop (at I _{max} .) | ≤ 0.7 V |

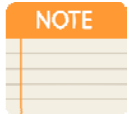
9. Commissioning

9.1. General

Pressure should be applied to the gauge slowly, in order to avoid damage to the measuring unit. Thereby the unit must be monitored continuously. The maximum permitted pressure must not be exceeded.

After commissioning of the unit, all piping connected to the measurement unit must be checked for proper sealing. Moreover, if present, the shut-off valve for the system pressure at the pressure-intake point must be closed.

The pointer moves in the null-point direction (possible temperature changes, condensation, to be considered), check also if the leakage exists.

| | |
|---|--|
|  | <p>Attention! With dangerous materials, such as Oxygen, Acetylene, flammable or poisonous materials, as well as chillers, compressors etc. all the general regulations, along with the existing relevant regulatory directions must be observed.</p> |
| <p>Note</p> | |

9.2. Adjustment of Set-Point Value with Contact Manometers

The adjustment of desired value (set-point value) is carried out via the supplied adjustment key which is inserted into the back of the contact electrical plug. The adjustment is made by inserting into the centre of the gauge face and rotating the contact pointer to the setpoint value. The switching point should be tested at operating pressure due to different hysteresis behaviours, particularly with magnet spring contact.

For reasons of hysteresis, switching accuracy, switching safety and the working-life of mechanical measuring systems, the switching points however should not be set in the range 0 to 10% and 90 to 100% of respective measurement span.

10. Maintenance

If the medium to be measured is not contaminated, the unit is maintenance-free. An examination of the display and the switching function should take place about 1 to 2 times per year. In order to check the display and switching function, the device is to be separated from the process and be subjected with a test pressure with appropriate inspection temperature.

10.1. Cleaning

Clean the devices with a dry or soap-water solution dampened cloth. If the electrical connections require cleaning make sure the power is disconnected first. Before restarting, it must be guaranteed that all parts are dried.

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

See “General Safety Instructions” - via the QR code on the device or via www.kobold.com

15. EU Declaration of Conformance

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

Manometer with Inductive and Electronic Contacts Model: MAN

to which this declaration relates is in conformity with the following EU directives stated below:

| | |
|--------------------|--------------------------------|
| 2011/65/EU | RoHS II (category 9) |
| 2015/863/EU | Delegated Directive (RoHS III) |

Additional for **MAN** **p_{max} > 200 bar**

| | |
|-------------------|--|
| 2014/68/EU | PED |
| | <ul style="list-style-type: none"> • Category I, Table 6, pipe, gases, Group 1 dangerous fluids • Module A |

Additional for **MAN** **p_{max} > 1000 bar**

| | |
|-------------------|---|
| 2014/68/EU | PED |
| | <ul style="list-style-type: none"> • Category I, Table 7, pipe, Group 2 non dangerous fluids • Module A |

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

| | |
|-------------------|------------------------------|
| 2014/35/EU | Low Voltage Directive |
| 2014/30/EU | EMC Directive |

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

Also, the following standards are fulfilled:

EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Additional for **MAN** **p_{max} > 200 bar**

AD 2000 Pamphlets

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

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

Hofheim, 15 Jan. 2026



H. Volz
General Manager

J. Burke
Compliance Manager

16. UK Declaration of Conformity

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

Manometer with Inductive and Electronic Contacts Model: MAN

to which this declaration relates is in conformity with the following UK directives stated below:

S.I. 2012/3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Additional for **MAN** **pmax > 200 bar**

S.I. 2016/1105 **The Pressure Equipment (Safety) Regulations 2016**

Additional for **MAN** **pmax > 1000 bar**

S.I. 2016/1105 **The Pressure Equipment (Safety) Regulations 2016**

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

S. I. 2016/1101 **Electrical Equipment (Safety) Regulations 2016**
S.I. 2016/1091 **Electromagnetic Compatibility Regulations 2016**

Also, the following standards are fulfilled:

BS EN IEC 63000:2018

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Additional for **MAN** **pmax > 200 bar**



AD 2000 Pamphlets

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

BS EN 60947-1:2007+A2:2014
General rules

Low-voltage switchgear and controlgear.

Hofheim, 15 Jan. 2026



H. Volz
General Manager

J. Burke
Compliance Manager