



Operating Manual

Industrial pressure transmitter DMK / DMP, screw-in transmitter LMK / LMP and OEM pressure transmitter

DMK 331, DMK 331 P, DMK 351, DMK 351 P, DMP 331, DMP 331i, DMP 331 P, DMP 333, DMP 333i, DMP 334, DMP 343, LMK 331, LMK 351, LMP 331, LMP 331i, 17.6XX, 17.6XX G, 18.6XX, 18.6XX G, 26.6XX, 26.6XX G, 30.6XX, 30.6XX G

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It is possible to download from www.druck-temperatur.de data sheets, operating manuals, ordering codes and certificates, as well.

1. General information

1.1 Information on the operating manual

This operating manual contains important information on proper usage of the device. Read this operating manual carefully before installing and starting up the pressure measuring device.

Adhere to the safety notes and operating instructions which are given in the operating manual. Additionally applicable regulations regarding occupational safety, accident prevention as well as national installation standards and engineering rules must be complied with!

This operating manual is part of the device, must be kept nearest its location, always accessible to all employees.

This operating manual is copyrighted. The contents of this operating manual reflect the version available at the time of printing. It has been issued to our best knowledge. However, errors may have occurred. LEITENBERGER is not liable for any incorrect statements and their effects.

– Technical modifications reserved –

1.2 Symbols used

STOP DANGER! – dangerous situation, which may result in death or serious injuries

STOP WARNING! – potentially dangerous situation, which may result in death or serious injuries

STOP CAUTION! – potentially dangerous situation, which may result in minor injuries

! CAUTION! – potentially dangerous situation, which may result in physical damage

NOTE – tips and information to ensure a failure-free operation

1.3 Target group

STOP WARNING! To avoid operator hazards and damages of the device, the following instructions have to be worked out by qualified technical personnel.

1.4 Limitation of liability

By non-observance of the operating manual, inappropriate use, modification or damage, no liability is assumed and warranty claims will be excluded.

1.5 Intended use

- The **pressure transmitter DMK/DMP** and **OEM-pressure transmitter** have, according to the type, been developed for applications in overpressure and vacuum as well as for absolute pressure measurement. The **screw-in transmitters LMK/LMP** have been particularly developed for level and process measurement. It is the operator's responsibility to check and verify the suitability of the device for the intended application. If any doubts remain, please contact our sales department in order to ensure proper usage. LEITENBERGER is not liable for any incorrect selections and their effects!
- Permissible media are gases or liquids, specified in the data sheet. In addition it has to be ensured, that this medium is compatible with the media wetted parts.
- The technical data listed in the current data sheet are engaging and must be complied with. If the data sheet is not available, please order or download it from our homepage. (<http://www.druck-temperatur.de>)

STOP WARNING! Danger through improper usage!

1.6 Package contents

Please verify that all listed parts are undamaged included in the delivery and check for consistency specified in your order:

- pressure transmitter or screw-in transmitter
- for mechanical pressure ports DIN 3852: o-ring (pre-assembled)
- mounting instructions
- with option SIL2 version:
Functional Safety Manual, Functional Safety Data Sheet, SIL Declaration of Conformity!

2. Product identification

The device can be identified by its manufacturing label. It provides the most important data. By the ordering code the product can be clearly identified.

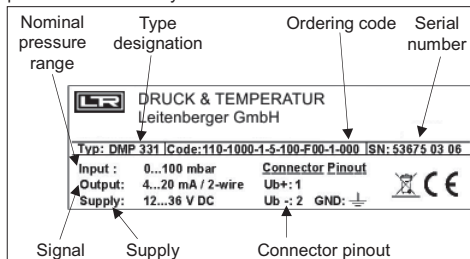


Fig. 1 manufacturing label

! The manufacturing label must not be removed from the device!

3. Mechanical installation

3.1 Mounting and safety instructions

STOP WARNING! Install the device only when depressurized and currentless!

STOP WARNING! This device may only be installed by qualified technical personnel who has read and understood the operating manual!

STOP DANGER! When used improperly, special versions of devices suitable for oxygen applications may explode! To ensure a usage without danger, the following points must be adhered to:

- Make sure that your device has been ordered as a special version for oxygen applications and that it has been delivered conformably. You can check this easily by reading the manufacturing label (see figure 1). If your ordering code ends with the numbers "007", your device is suitable for the oxygen application.
- When being dispatched the device is packed into a plastic bag to keep it from impurity. The indication label with the text "Device for oxygen, unpack only directly before assembling" has to be observed! Furthermore any skin contact must be avoided during unpacking and installing the device, so that no fatty residue remains on the device!

- For installing the respective regulations for explosion protection have to be fulfilled. Please check if an ATEX-approval is necessary for the application in addition to the acceptability for oxygen. (the delivered device has no ATEX-approval)
- Consider that the entire construction must correspond to the standards of BAM (DIN 19247).
- For transmitters with oxygen acceptability up to 50 bar, O-rings of V747-75 with BAM-approval are used. The upper limiting values allowed are 40 bar/130°C and 50 bar/100°C.
- For transmitters with oxygen acceptability over 50 bar, O-rings of FKM 90 are used which were tested for acceptability up to 95°C and 215 bar in the scientific coal research institute in Ostrava – CZ.

! Handle this high-sensitive electronic precision measuring device with care, both in packed and unpacked condition!

! There are no modifications/changes to be made on the device.

! Do not throw the package/device!

! To avoid damaging the diaphragm, remove packaging and protective cap directly before starting assembly. The delivered protective cap has to be stored!

! Place the protective cap on the pressure port again immediately after disassembling.

! Handle the unprotected diaphragm very carefully - it is very sensitive and may be easily damaged.

! Do not use any force when installing the device to prevent damage of the device and the plant!

! For installations outdoor and in damp areas following these instructions:

- To prevent moisture admission in the plug the device should be installed electrically after mounting, at once. Otherwise a moisture admission has to be blocked e.g. by using a suitable protection cap. (The ingress protection in the data sheet is valid for the connected device.)
- Choose an assembly position, which allows the flow-off of splashed water and condensation. Avoid permanent fluid at sealing surfaces!
- When using a cable gland or outlet device, turn the outgoing cable downwards. If the cable has to be turned upwards, then point it downward so the moisture can drain.
- Install the device in such a way that it is protected from direct solar irradiation. Direct solar irradiation can lead to the permissible operating temperature being overstepped in the worst case. By this the operability of the device can be affected or damaged. If the internal pressure increases due to solar irradiation, measurement errors may be caused.

! For devices with gauge reference in the housing (small hole next to the electrical connection), install the device in such a way, that the gauge reference is protected from dirt and moisture. Should the device be exposed to fluid admission, the functionality will be blocked by the gauge reference. An exact measurement in this condition is not possible. Furthermore this can lead to damages on the device.

NOTE Take note that no assembly stress occurs at the pressure port, since this may cause a shifting of the characteristic curve. This is especially important for very small pressure ranges as well as for devices with a pressure port made of plastic.

NOTE In hydraulic systems, position the device in such a way that the pressure port points upward (ventilation).

NOTE Provide a cooling line when using the device in steam piping.

NOTE If there is any danger of damage by lightning or overpressure when the device is installed outdoor, we suggest putting a sufficiently dimensioned overpressure protection between the supply or switch cabinet and the device.

3.2 General installation steps

- Carefully remove the pressure measuring device from the package and dispose of the package properly.
- Go ahead as detailed in the specific instructions below.

3.3 Installation steps for DIN 3852

- Check to ensure the proper groove fitting of the g-rin and additionally to ensure no damage to the o-ring.
- Ensure that the sealing surface of the taking part is perfectly smooth and clean.
- Screw the device into the corresponding thread by hand.
- If you have a device with a knurled ring, the transmitter has to be screwed in by hand only.
- Devices with a spanner flat have to be tightened with an open-end wrench (wrench size of steel: G1/4": approx. 5 Nm; G1/2": approx. 10 Nm; G3/4": approx. 15 Nm; G1": approx. 20 Nm; G1 1/2": approx. 25 Nm; wrench size of plastic: max. 3 Nm).

3.4 Installation steps for EN 837

- Use a suitable seal, corresponding to the medium and the pressure input (e. g. a cooper gasket).
- Ensure that the sealing surface of the taking part is perfectly smooth and clean.
- Screw the device into the corresponding thread by hand.
- Tighten it with a wrench (for G1/4": approx. 20 Nm; for G1/2": approx. 50 Nm).

3.5 Installation steps for NPT

- Use a suitable seal, corresponding to the medium and the pressure input (e. g. a PTFE-strip).
- Screw the device into the corresponding thread by hand.
- Tighten it with a wrench (for 1/4" NPT: approx. 30 Nm; for 1/2" NPT: approx. 70 Nm).

3.6 Installation steps for flare

- Cut the end at right angle to the piping and remove all internal and external burrs.
- Make the flare; depending on the usage, the device has to be tightened with max. 10 Nm.

3.7 Installation steps for internal threads M20x1.5 and 9/16" UNF (for DMP 334)

- Screw the high pressure connection into the internal thread of the DMP 334 according to the description of the manufacturer and tighten it properly.

STOP DANGER! The high pressure tube seals metal-to-metal in the chamber of the pressure port. No further seal is allowed with this high pressure connection. A wrong installation can cause enormous danger!

3.8 Installation steps for dairy pipe

- Check to ensure that the O-ring fits properly into the intended groove in the mounting part.
- Center the dairy pipe connection in the counterpart.
- Screw the cup nut onto the mounting part.
- Then tighten it with a hook wrench.

3.9 Installation steps for Clamp and Varivent

- Use a suitable seal corresponding to the medium and the pressure input.
- Put the seal onto the corresponding mounting part.
- Center the Clamp or Varivent connection on the fitting counterpart with seal.
- Then fit the device with a suitable fastening element (e. g. semi-ring or retractable ring clamp) according to the supplier's instructions.

3.10 Installation steps for connecting flanges

- Use a suitable seal corresponding to the medium and pressure input. (e. g. a fiber gasket).
- Put the seal between connecting flange and counter flange.
- Install the device with 4 resp. 8 screws (depending on flange version) on the counter flange.

4. Electrical Installation

STOP WARNING! Install the device in currentless condition only!

Establish the electrical connection of the device according to the technical data shown on the manufacturing label, the following table and the respective wiring diagram.

Pin configuration:

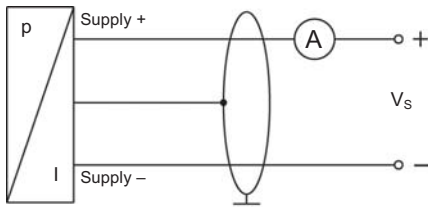
Electrical connections	ISO 4400	Binder 723 (5-pin)	M12x1 (4-pin)
Supply +	1	3	1
Supply -	2	4	2
3-wire: Signal +	3	1	3
Shield	ground contact	5	4

Electrical connections	Buccaneer (4-pin)	TRIM TRIO (4-pin)
Supply +	1	1
Supply -	2	2
3-wire: Signal +	3	3
Shield	4	4

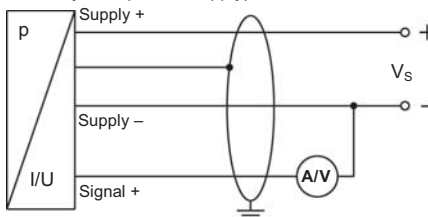
Electrical connections	field housing	cable colours (DIN 47100)
Supply +	IN +	white
Supply -	IN -	brown
3-wire: Signal +	OUT+	green
Shield	±	yellow / green

Wiring diagrams:

2-wire-system (current)



3-wire-system (current/supply)



! For devices with cable gland as well as cable socket, you have to make sure that the external diameter of the used cable is within the allowed clamping range. Moreover you have to ensure that it lies in the cable gland firmly and cleftlessly!

! For the installation of a device with cable outlet following bending radiuses have to be complied with:

cable without ventilation tube:
static installation : 5-fold cable diameter
dynamic application: 10-fold cable diameter

cable with ventilation tube:
static installation : 10-fold cable diameter
dynamic application: 20-fold cable diameter

! Please note for devices with ISO 4400 or Buccaneer plug, that the cable socket has to be mounted properly to ensure the ingress protection mentioned in the data sheet. Please check if the delivered seal is placed between plug and cable socket. After connecting the cable fasten the cable socket on the device by using the screw.

! On devices with field housings, the terminal clamps are situated under the metal cap. To install the device electrically, the cap must be screwed off. Before the cover is screwed on again, the O-ring and the sealing surface on the housing have to be checked for damages and if necessary to be changed! Afterwards screw the metal cap on by hand and make sure that the field housing is firmly locked again.

! Prevent the damage or removal of the PTFE filter which is fixed over the end of the air tube on devices with cable outlet and integrated air tube.

For the electrical connection a shielded and twisted multicore cable is recommended.

If a transition is desired from a transmitter cable with gauge tube to a cable without gauge tube, we recommend our terminal box KL 1 or KL 2.

5. Initial start-up

STOP WARNING! Before start-up, the user has to check for proper installation and for any visible defects.

STOP WARNING! The device can be started and operated by authorized personnel only, who have read and understood the operating manual!

STOP WARNING! The device has to be used within the technical specifications, only! (compare the data in the data sheet)

Devices with an accuracy of 0.1 % FSO have micro-controlled electronics for processing and improving the signal. Principally, the processing takes more time as for analogue sensors, which have only an amplifier. Due to this longer response time, the output signal follows the measured value discontinuously. For nearly stable measured values, this characteristic is secondary. Please compare the specification of the response time in the data sheet.

Intelligent devices with optional communication interfaces can also be configured by these electronics. Offset, span and damping are programmable within the limits given in the data sheet. For configuring the device, the programming kit CIS 510 consisting of Adapt 1, Windows compatible programming software P-Scale 510, power supply and connecting cable is necessary. This can be ordered additionally from DRUCK & TEMPERATUR Leitenberger GmbH, Germany.

6. Placing out of service

STOP WARNING! Disassemble the device only in current and pressure less condition! Check before disassembly, if it is necessary to drained off the media before dismantling!

STOP WARNING! Depending on the medium, it may cause danger for the user. Comply therefore with adequate precautions for purification.

7. Maintenance

In principle, this device is maintenance-free. If desired, the housing of the device can be cleaned using a damp cloth and non-aggressive cleaning solutions, in switched-off state.

Depending on the measuring medium, however, the diaphragm may be polluted or coated with deposit. Is there a pollution tendency of the medium, the user has to determine the appropriate cleaning interval. After placing the device out of service correctly, the diaphragm can usually be cleaned carefully with a non-aggressive cleaning solution and soft brush or sponge. If the diaphragm is calcified, it is recommended to send the device to LEITENBERGER for decalcification. Please note the chapter "Service/Repair" below.

! A false cleaning of the device can cause an irreparable damage on the diaphragm. Therefore never use pointed objects or pressured air for cleaning the diaphragm.

8. Service / Repair

8.1 Recalibration

During the life-time of a transmitter, the value of offset and span may shift. As a consequence, a deviating signal value in reference to the nominal pressure range starting point or end point may be transmitted. If one of these two phenomena occurs after prolonged use, a recalibration is recommended to ensure furthermore high accuracy.

8.2 Return

Upon every return of the device, no matter if for recalibration, decalcification, modifications or repair, it is necessary to contact us to guarantee a quick execution of your request.

Clean the device, pack it shatterproof and send it to DRUCK & TEMPERATUR Leitenberger GmbH, Germany.

9. Disposal

The device has to be disposed of according to the European Directives 2002/96/EG and 2003/108/EG (on waste electrical and electronic equipment). It is prohibited to place electrical and electronic equipment in domestic refuse!



STOP WARNING! Depending on the used medium, deposit on the device may cause danger for the user and the environment. Comply with adequate precautions for purification and dispose of it properly.

10. Warranty conditions

The warranty conditions are subject to the legal warranty period of 24 months from the date of delivery. In case of improper use, modifications of or damages to the device, we do not accept warranty claims. Damaged diaphragms will also not be accepted. Furthermore, defects due to normal wear are not subject to warranty services.

11. Declaration of conformity / CE

The delivered device fulfils all legal requirements. The applied directives, harmonised standards and documents are listed in the EC declaration of conformity, which is available on request.

Additionally, the operational safety is confirmed by the CE sign on the manufacturing label.