

Operating Manual



Differential pressure transmitter

DMD 331 and DMD 341



DMD 331

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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. BD SENSORS is not liable for any incorrect statements and their effects.

- Technical modifications reserved -

1.2 Symbols used

- ⚠ DANGER! – dangerous situation, which may result in death or serious injuries
- ⚠ WARNING! – potentially dangerous situation, which may result in death or serious injuries
- ⚠ 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

- ⚠ 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 differential pressure transmitters DMD 331, DMD 331_540 and DMD 341 are intended for industrial applications. For both sided pressure admission, the difference of the pressure between positive and negative side is established and converted into a proportional electrical signal. The DMD 331 is intended e.g. in engineering and plant construction for filter controlling and flow measurement as well as in hydraulic applications. The DMD 341 is intended for the application in the filter controlling and air conditioning technology.
- 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. BD SENSORS 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.bdsensors.com>)

- ⚠ 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:

- differential pressure transmitter
- mounting instructions

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.

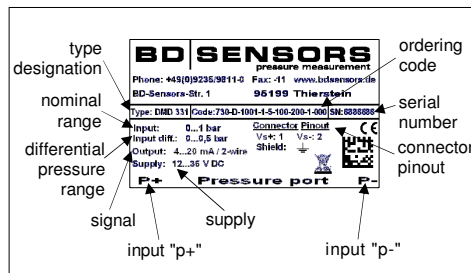


Fig. 1 manufacturing label

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

3. Mechanical installation**3.1 Mounting and safety instructions**

- ⚠ WARNING! Install the device only when depressurized and currentless!

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

- ⚠ 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 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.

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

- ⚠ Make sure that no mechanical stresses occur at the pressure port with low pressure ranges during installation, as this may cause a shifting of the characteristic curve.

- ⚠ For the connection of the pressure lines, a sealing has to be installed by the operator.

- ⚠ For the pipe assembly, a stress free installation must be observed.

- ⚠ Consider for the installation of a DMD 331 that the pressure ports must not be turned against the housing!

- ⚠ 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 socket 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.

- 🔧 Take note that no assembly stress occurs at the pressure port, since this may cause a shifting of the characteristic curve.

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

- 🔧 If installing the device outdoor and there is any danger of lightning or overpressure we suggest putting a overpressure protection unit between the supply/switch cabinet and the device to prevent damage.

3.2 General installation steps

- Carefully remove the pressure measuring device from the package and dispose of the package properly.
- Connect the reference pressures according to the following installation steps. Therefore, keep in mind that the higher pressure has to be connected with input "p+"; lower pressure has to be connected with input "p-".
- Fix the device according to your demands on the holder or holding angle intended for it. For mounting the device, mounting threads are provided. For DMD 341, in addition, the possibility is given to mount the device by using the two holes (∅ 4.5 mm). The exact position is defined in the data sheet.

3.3 Installation steps for G 1/2" acc. to EN 837 (DMD 331)

- Use suitable cooper gaskets for each pressure port, corresponding to the diameter of the threads which should be screwed in. (seals are not included in the scope of delivery)
- Ensure that the sealing surfaces are perfectly smooth and clean.
- Screw your fittings by hand onto the threads.
- To tighten the fittings properly, hold the DMD 331 on the spanner flat SW 22 of the respective pressure port with one hand and then tighten it (max. 50 Nm).

3.4 Installation steps for G 1/4" internal thread (DMD 331)

- Check to ensure that the o-rings fit properly into the grooves. (o-rings are included in the scope of delivery)
- Make sure that the sealing surfaces of the fittings are perfectly smooth and clean.
- Screw the fittings into the threads by hand.
- To tighten the fittings properly, hold the DMD 331 on the spanner flat SW 22 of the respective pressure port with one hand and then tighten it (max. 20 Nm).

3.5 Installation steps for G 7/16" UNF (DMD 331)

- Seal the pressure ports of the differential pressure transmitter in a way that is suitable for your application. (seals are not included in the scope of delivery)
- Screw your fittings by hand onto the threads.
- To tighten the fittings properly, hold the DMD 331 on the spanner flat SW 22 of the respective pressure port with one hand and then tighten it (max. 30 Nm).

3.7 Installation steps for G 1/8" internal thread (DMD 341)

- Seal the pressure ports of the differential pressure transmitter in a way that is suitable for your application. (seals are not included in the scope of delivery)
- Screw the fittings into the threads as far as possible
- Tighten the fittings properly (max. 10 Nm).

3.8 Installation steps for tube nozzle Ø 6.6x11 (DMD 341)

- Slip your flexible tubes (Ø 6 mm) onto the tube nozzles as far as possible.

4. Electrical installation

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

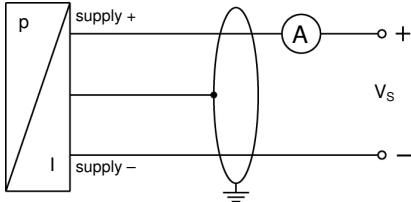
Establish the electrical connection of the device according to the technical data shown on the manufacturing label, the following table and the respective wiring diagram.

Pin configuration

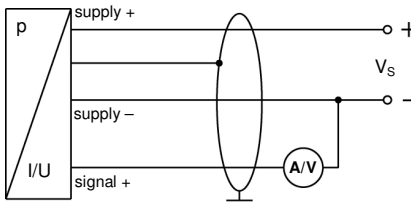
Electrical connections	ISO 4400	Brad Harrison®	M12x1, 4-pin	cable colours
2-wire-system				
supply+	1	A	1	wh (white)
supply-	2	B	2	bn (brown)
ground	ground contact	C	4	gn/ye (green/yell.) (shield)
3-wire-system				
supply+	1	-	1	wh (white)
supply-	2	-	2	bn (brown)
signal+	3	-	3	gn (green)
ground	ground contact	-	4	gn/ye (green/yell.) (shield)

Wiring diagrams

2-wire-system (current)



3-wire-system (current/supply)



! For a device with ISO 4400 plug and 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! To ensure the ingress protection mentioned in the data sheet, the socket has to be mounted properly. 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.

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

5. Initial start-up

Please note that for starting up, the device has to be stressed by pressure simultaneously at both pressure ports. Otherwise the sensor could be damaged. For one-sided pressure admission, the permissible static pressure (one-sided) must be attended. Please take this out of the current data sheet.

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

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

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

6. Placing out of service

⚠ WARNING! When dismantling the device, it must always be done in the depressurized and currentless condition! Check also if the medium has to be drained off before dismantling!

⚠ 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 when switched off using a damp cloth and non-aggressive cleaning solutions.

Depending on the measuring medium, however, the diaphragm may be polluted or coated with deposit. If the medium is known for such tendencies, the user has to set appropriate cleaning intervals. If necessary, it is recommended to send the device to BD SENSORS for cleaning. Please read therefore the chapter "Service/Repair" below.

! An incorrect cleaning can cause irreparable damages on diaphragm. Never use spiky 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

Before every return of your device, whether for recalibration, decalcification, modifications or repair, it has to be cleaned carefully and packed shatter-proofed. You have to enclose a notice of return with detailed defect description when sending the device. If your device came in contact with harmful substances, a declaration of decontamination is additionally required. Appropriate forms can be downloaded from our homepage www.bdsensors.com. Should you dispatch a device without a declaration of decontamination and if there are any doubts in our service department regarding the used medium, repair will not be started until an acceptable declaration is sent.

⚠ If the device came in contact with hazardous substances, certain precautions have to be complied with for purification!

9. Error handling

Malfuction	Possible cause	Error detection / corrective
no output signal	wrong connected	inspect the connection
	line break	inspect all line connections necessary to supply the device (including the connector plugs)
	defective ampere meter (signal input)	inspect the ampere meter (fine-wire fuse) or the analog input of the PLC
analog output signal too low	load resistance too high	verify the value of the load resistance
	supply voltage too low	verify the output voltage of the power supply
shift of output signal	defective energy supply	inspect the power supply and the applied supply voltage at the device
	diaphragm is contaminated or damaged	please send the device to BD SENSORS for repair
wrong or no output signal	electrical connection is damaged	check the connections
	reverse polarity of the pressure ranges	check if the higher pressure is connected with the input "p+"

If you detect an error, please try to eliminate it by using this table or send the device to our service address for repair.

! Improper action and opening can damage the device. Therefore repairs on the device may only be executed by the manufacturer!

10. Disposal

The device must be disposed according to the European Directives 2002/96/EG and 2003/108/EG (on waste electrical and electronic equipment) Waste of electrical and electronic equipment may not be disposed by domestic refuse!



⚠ WARNING! Depending on the measuring 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.

11. 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.

12. 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 online at: <http://www.bdsensors.com>. Additionally, the operational safety is confirmed by the CE sign on the manufacturing label.