

Differential Pressure Transmitter DPS 300



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BA_DPS300_E_SRO

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1 General information

⚠ Do not blow into the pressure ports! This causes damage to the device.

- This operating manual contains important information on the 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. It must be kept near its location and always be accessible to all employees.
- This operating manual is copyrighted. The contents of this operating manual reflect the version available at the time of printing.

⚠ WARNING! To avoid operator hazards and damage to the device, the following instructions may only be carried out by qualified technical personnel.

⚠ Limitation of liability: In case of non-observance of the operating manual, inappropriate use, modifications or damage, no liability is assumed and warranty claims will be excluded.

Symbols used:

⚠ : Warning

! : Caution

⚠ : Note

– Technical modifications reserved –

2 Product identification**2.1 Intended use**

- The DPS 300 differential pressure transmitter has been developed for the measurement of pressure difference of dry, non-aggressive gases and pressurized air and can be used for a wide range of different HVAC applications. Its robust design means it can be used in the laboratory and under industrial conditions. Preferred areas of use are in heating, ventilation and air conditioning systems; clean room and medical technology, filter technology and draft metering checks.
- 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 use. BD SENSORS is not liable for any incorrect selections and their effects!
- 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.de>).

⚠ WARNING! – Danger by inappropriate use!

2.2 Identification

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

Nominal pressure range	Type designation	Ordering code	Serial number
BD SENSORS pressure measurement			
DPS 300	815-1000-3-G-C-1-Y00-M-600	SN: 1432455000	
Eingang: 0...100 mbar diff.	BD-Sensors-Str. 1 95199 Thierstein, Germany www.bdsensors.de	Anschlußblenden: Ub+; Ub+; Ub -; Ub-	
Ausgang: 0...20 mA/3-Leiter		S+; Iout / Vout	
Versorgung: 19...32 VDC / 24 VAC +/-10%			

Fig. 1: Manufacturing label- example

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

2.3 Package contents

Please verify that all listed parts are included in the delivery undamaged and comply with your order:

- 1 Differential Pressure Transmitter DPS 300
- 1 Operating manual

2.4 Transport and storage

Permissible temperature for storage: -10 °C to + 70 °C
For transport make sure that both pressure inputs of differential pressure sensors are open. The air transport of absolute pressure sensors should only be done in a pressure compensated cabin.

2.5 Declaration of conformity / CE

The delivered device fulfils all legal requirements. The applicable directives, harmonised standards and documents are listed in the EC declaration of conformity, which is available online (<http://www.bdsensors.cz>). The operational safety is additionally confirmed by the CE sign on the manufacturing label.

3 Installation**3.1 Mounting and safety instructions**

- ⚠ WARNING!** This device may only be installed by qualified technical personnel who have read and understood the operating manual!
- ⚠ WARNING!** Install the device only when depressurized and current-free!
- !** Handle this device with care, both in packaged and unpackaged condition!
- !** No modifications/changes should be made on the device.
- !** Do not throw the device!
- !** Do not use any force when installing the device, to prevent damage of the device and the plant!
- !** Avoid sources of interference (transformers, transmitters, motors etc.) or sources of heat in the surrounding area.
- !** Shocks or vibrations at the mounting connection can cause distortions to the output signals.

3.2 Installation steps

- Carefully remove the pressure measuring device from its package and dispose of the package properly.
- Mount the device in a suitable location using both straps. The corresponding dimensions are provided under "6".
- Connections should be vertical, i. e. the pressure connections should point downwards. The sensors are calibrated in the factory for these mounting conditions. In addition, the formation of condensation in the pressure tubing of the sensor is also reduced.
- Use the appropriate hoses for the connection.

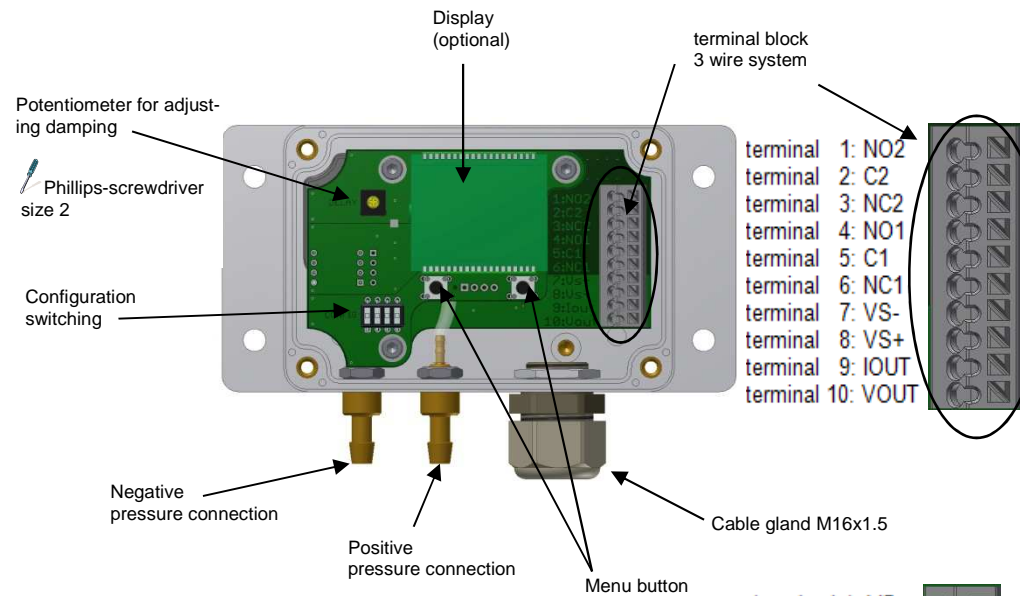


Fig. 2: DPS 300

3.3 Electrical installation

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

- Open the top cover and establish the electrical connection of the device according to the following description. Screw the top cover onto the box again.
- Guide externally the power supply line through the right cable fitting so that the wires can be connected with the right terminal block (SUPPLY) without any problem.
- Next, tighten the cable gland by hand. Make sure, however, that the cable is strain-relieved.

3.4 Pressure port

- Connect the hose with the higher pressure to the right hand (positive) pressure port.
- Connect the hose with the lower pressure to the left hand (negative) pressure port.

Electrical connections (conductor cross-section)	
without ferrule: 1.5 mm ²	with ferrule: 1 mm ²
3-wire-system (current / voltage) supply -: terminal 7: VS- supply +: terminal 8: VS+ signal: terminal 9: IOUT signal: terminal 10: VOUT	3-wire-system (current / voltage) with two outputs Output 2 NO2: terminal 1: NO2 Output 2 C2: terminal 2: C2 Output 2 NC2: terminal 3: NC2 Output 1 NO1: terminal 4: NO1 Output 1 C1: terminal 5: C1 Output 1 NC1: terminal 6: NC1 supply -: terminal 7: VS- supply +: terminal 8: VS+ signal: terminal 9: IOUT signal: terminal 10: VOUT
2-wire-system (current) supply +: terminal 1: VS+ supply -: terminal 2: VS-	2-wire-system (current) with two outputs supply +: terminal 1: VS+ supply -: terminal 2: VS- output 1: terminal 3: S1 output 2: terminal 4: S2

4 Initial start-up

After switching on the power supply, the output signal can be measured. Variations in the output signals may have two possible causes:

1. The warm-up time of the sensor is about 30min. After this period, the sensor signal should be stable for zero differential pressure and constant ambient temperature.
2. For small pressure ranges, a slight deviation in the zero point due to ambient conditions can occur. This error can be corrected by adjusting the zero-point potentiometer of the sensor after the warm-up time. (Set the output signal of the sensor with both pressure inputs open to the nominal value.)

5 Operation**5.1 General information**

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

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

⚠ WARNING! The device may only be used within the technical specifications (see the data in the data sheet)!

⚠ WARNING! Do not touch the bonding wires – this can destroy the device.

5.2 Setting of damping

Potentiometer for setting the damping is located adjacent to the display on the left (see image 2). The damping of the device can be set by turning a size 2 Phillips screwdriver in the area of 0 to 5000ms.

5.3 Menu buttons

Zeroing: push left menu button for at least 1 second

5.4 Configuration switch**3-wire-system:**

1	2	3	4	
Off	Off	Off	Off	0 ... 10 V / 0 ... 20 mA
On	Off	Off	Off	0 ... 5 V / 4 ... 20 mA
Off	Off	Off	Off	Automatic zero adjustment off
On	Off	Off	Off	Zero adjustment active at start and for 24h
Nominal pressure range				
Off	Off	Off	Off	1,6 4 10 40 250 1000
Customized ranges				
On	Off	Off	Off	1,0 2,5 6 25 60 400
Off	On	Off	Off	160 600

2-wire-system:

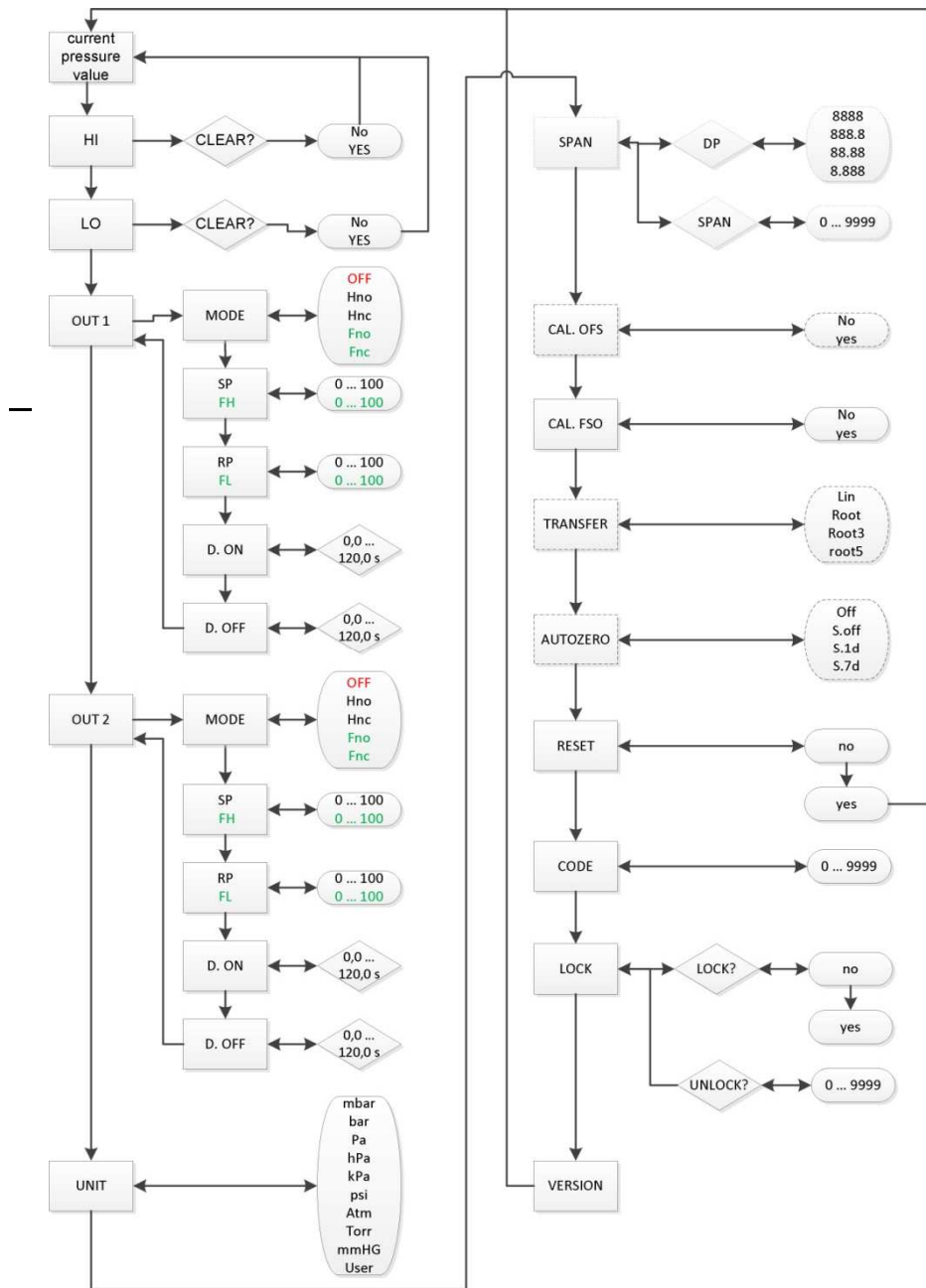
1	2	3	4	
Off	Off	Off	Off	Automatic zero adjustment off
On	Off	Off	Off	Zero adjustment active at start
Off	On	Off	Off	Zero adjustment active at start and for 24h
On	On	Off	Off	Zero adjustment active at start, then every 7 days
Nominal pressure range				
Off	Off	Off	Off	1,6 4 10 40 250 1000
Customized ranges				
On	Off	Off	Off	1,0 2,5 6 25 60 400
Off	On	Off	Off	160 600

⚠ The switches 1 and 2 don't have any function at special pressure ranges.

5.5 Performance of display

- two-line LC-Display
- visible range 32.5 x 22.5 mm
- 5-digit 7-segment-main display
- digit size 8 mm
- range of indication: ±9999 8-digit 14-segment-additional display
- digit size 5 mm
- 52-segment-bargraph

5.6 Structure of menu system (from version 3.01)



5.7 Menu list

Switch on	Activate the menu with the right key.
Menu HI	Displays the maximum value since the last start Possible option: Delete value (CLEAR no / yes) (deletes the upper and lower maximum value) To delete the value: Press the left hand key → "CLEAR?" flashes in the lower line, in the upper line "no" is displayed; you can select between "yes" and "no" with the right hand key. Confirm the selection with the left hand key.
Menu LO	Displays the minimum value since the last start Possible option: Delete value (CLEAR no / yes) (deletes the upper and lower minimum value) To delete the value: Press the left hand key → "CLEAR?" flashes in the lower line, in the upper line "no" is displayed; you can select between "yes" and "no" with the right hand key. Confirm the selection with the left hand key.
Menu OUT 1 / OUT 2	Menu only activated with contacts → Off Deactivated → Hno Hysteresis, normally open → Hnc Hysteresis, normally closed → Fno Window, normally open → Fnc Window, normally closed OUT flashes in the lower line, in the upper line the current setting is displayed, e.g. "Hno"; the contacts can be selected with the right hand key. Confirm the selection with the left hand key.
Menu SP FH	Values for set points in % Setting the set points: press the left hand key → "SP %" flashes in the lower line, the current value is displayed in the upper line; it is possible to change the value with the right hand key. Confirm the selection with the left hand key.
Menu RP FL	Values for reset points in % Setting the reset points: press the left hand key → "SP %" flashes in the lower line, the current value is displayed in the upper line; it is possible to change the value with the right hand key. Confirm the selection with the left hand key.
Menu D. ON	Turn-on delay in s Setting the turn-on delay: press the left hand key → "D. ON s" flashes in the lower line, the current value is displayed in the upper line; it is possible to change the value between 0.0 ... 120.0 with the right hand key. Confirm the selection with the left hand key.
Menu D. OFF	Return switching delay in s Setting the return switching delay: press the left hand key → "D. OFF s" flashes in the lower line, the current value is displayed in the upper line; it is possible to change the value between 0.0 ... 120.0 with the right hand key. Confirm the selection with the left hand key.
Menu UNIT	Setting the pressure unit Units which can be set: [mbar], [bar], [Pa], [hPa], [kPa], [psi], [Atm], [torr], [mmHG], or [user] (if the USER unit is selected, the maximum display value that is shown can be set under the menu item span) Setting the unit: press the left hand key → "unit" flashes in the lower line, the currently set unit is displayed in the upper line; the unit can be selected with the right hand key. Confirm the selection with the left hand key.
Menu SPAN	Span value for display can be set when the user unit is selected Setting DP / SPAN: press the left hand key → "SPAN" is displayed in the lower line, the currently set value is displayed in the upper line; if you press the left hand button again, "DP" flashes in the lower line, 8.888, e.g. is displayed in the upper line, the decimal point can be adjusted with the right hand key, 88.88 e.g. Confirm the selection with the left hand key. "SPAN" now flashes in the lower line, the currently set value is displayed in the upper line; the position can be selected with the left hand key, the corresponding numerical value can be changed with the right hand key, the selection is confirmed with the left hand key.
Menu Cal. OFS	Calibration of the Offset to the current value (basic version ordering code -000) Calibration of the Offset: Press the left hand key → "CAL. OFS?" flashes in the lower line, in the upper line "no" is displayed; you can select between "yes" and "no" with the right hand key. Confirm the selection with the left hand key.
Menu Cal. FSO	Calibration of the endpoint (display and analogue output) to the current pressure level. Calibration of the endpoint: Press the left hand key → "CAL. FSO?" flashes in the lower line, in the upper line "no" is displayed; you can select between "yes" and "no" with the right hand key. Confirm the selection with the left hand key.
Menu TRANSFER	Square-root extraction output signal (special version ordering code -600) → Lin Standard - Linear → root $y = x^{0.5}$ → root3 $y = x^{1.5}$ → root5 $y = x^{2.5}$ } cut off 0 ... 10 %
Menu AUTOZERO	Menu only visible if zeroing valve is visible (Value is read-only! Setting only possible via configuration switch.) (ordering code -600) → Off no automatic zero adjustment → S. upon switching the device on → S. 1d upon switching on and after 24 hours → S. 7d upon switching on and after 7 days
Menu RESET	Resets all menu settings to the factory setting Reset: Press the left hand key → the message "RESET" flashes in the lower line, in the upper line "no" is displayed; you can select between "yes" and "no" with the right hand key. Confirm the selection with the left hand key.
Menu CODE	Activate locking code set all values not equal to zero and confirm. Menu point "LOCK" is displayed
Menu LOCK	Lock / UNLOCK menu LOCK? you can select between "yes" and "no" with the right hand key. Confirm the selection with the left hand key. → With YES the menu is closed immediately, measured value is displayed. (Locking code is deactivated if all values are put on 0 – otherwise the device automatically closes after 2 minutes or after cutting of the electrical connection or UNLOCK? Enter the right code to unlock.
Menu VERSION	Displays the current firmware version.

5.6 Taking out of service and disposal

WARNING! When dismantling the device, it must always be carried out in a depressurized and currentless condition! Also check if it is necessary to drain off the medium before dismantling!

WARNING! The medium may pose a danger to the user. Therefore comply with adequate precautions for purification.

The device must be disposed of 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 of with domestic waste!

WARNING! Depending on the measuring medium, deposits on the device may pose a danger to the user and the environment. Comply with adequate precautions for purification and dispose of it properly.



7 Maintenance

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

8 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.cz. 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.

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

9 Warranty conditions

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

6. Dimensions / fixing

DPS 300 with display

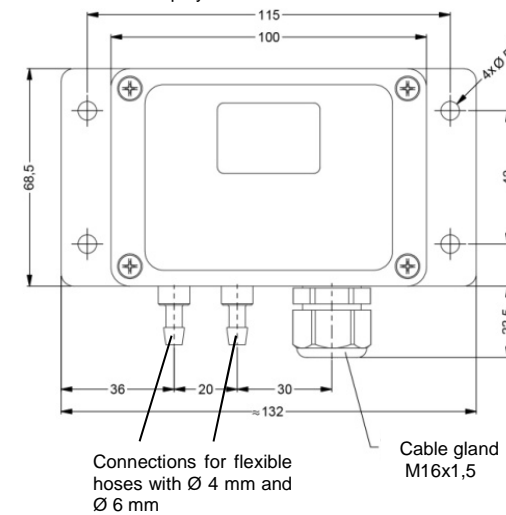


Abb. 3: dimension drawing DPS 300 with display

DPS 300 without display

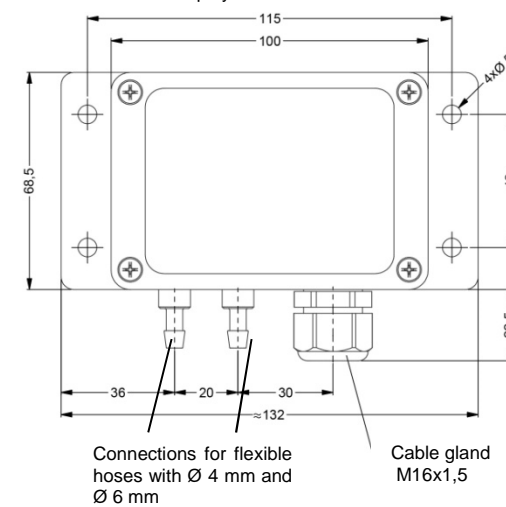


Abb. 4: dimension drawing DPS 300 without display