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USER GUIDE

DPT-Ctrl

Produal

Distributed by AKRIBIS





DPT-Ctrl - Differential pressure or airflow controller

User Guide

PRODUAL
measure-be sure.

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1 Safety precautions

The product is developed, manufactured and tested according to high quality standards. However, instructions for safe use shall be taken account when installing, using or disposing the product or parts of product.

Read this user guide carefully before commissioning, using or servicing this device. To avoid any kind of damage to people or property, follow the instructions carefully. Produal is not liable for any hazards or damages to people or property which are caused by ignoring the using or installation instructions.

To avoid electrical shock or damage to equipment, disconnect power before installing or servicing the product. Use only a proper wiring rated for the full operating voltage and maximum current in the system even in the event of a fault.

The product condition must be checked before installation. Do not drop the product or use excessive force during installation. Do not use the product if any damages are visible.

After installation the product will be part of a system whose specifications and performance characteristics are not designed or controlled by Produal. Refer to national and local authorities to ensure that the installation is functional and safe.

The product should only be used in professionally designed applications. Unauthorised modifications are not allowed. The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or property.

In this document, there are different kind of warnings and notes. The warning and note types are defined in the following table.

Sign	Description
WARNING:	The warning symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION:	The caution symbol indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
Important:	The important symbol indicates a potentially hazardous situation which, if not avoided, could result in damage to the device or property.
Note:	The note symbol indicates a useful tip or a recommended way to complete a task. These notes also provide information that is useful but not critical to the user.

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2 Commissioning

2.1 Mounting the product

WARNING: Handle the product with care. Dropping the product may cause internal damage and unwanted functions in the connected system.

1. Check that the product is not damaged during transportation.
2. Select the mounting location.

CAUTION: Place the product outside the reach of children and animals.

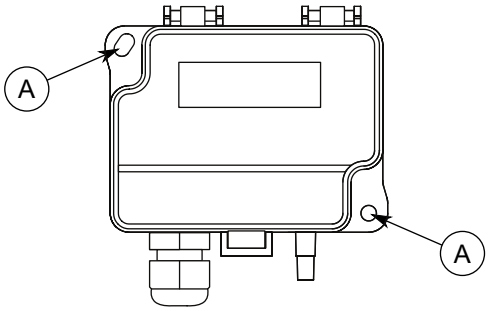
Important: The product may only be installed in a location where the ambient conditions meet the operating condition requirements.

Operating conditions	
Temperature	-20...50 °C
Temperature (-AZ models)	-5...50 °C
Temperature (-40C models)	-40...50 °C
Humidity	0...95 %rH (non condensing)

The cover of -40C models has to be kept closed when the operation temperature is below 0 °C. The display needs approximately 15 minutes to warm up if the device is started in temperature below 0 °C.

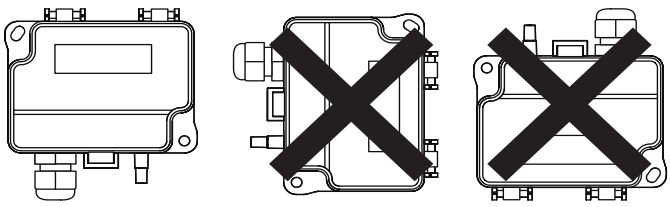
Note: In cold conditions the power consumption rises in -40C models. Additional output error of 0.015 V is possible when the operation temperature is below 0 °C.

3. Mount the product on flat surface using the mounting points.



A. Mounting point

Mounting orientation:

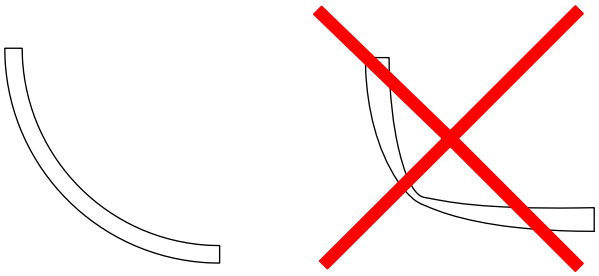


Select the mounting screws according to the mounting surface. The maximum screw diameter is 4.3 mm.

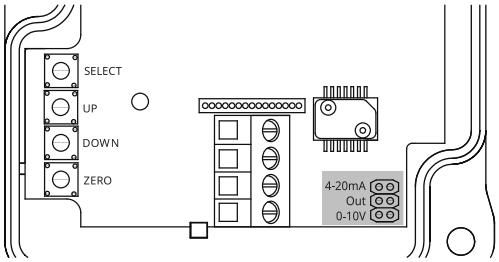
Important: Don't use excessive force when tightening the mounting screws.

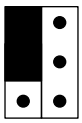
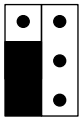
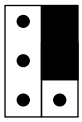
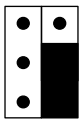
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4. Install the measuring hoses carefully so that the hoses don't bend too tightly. Too tight curves may prevent the air flow to the sensor.



2.2 Output settings



	Current output (4...20 mA) selected for control
	*Voltage output (0...10 V) selected for control
	Current output (4...20 mA) selected for pressure
	*Voltage output (0...10 V) selected for pressure
	* factory default

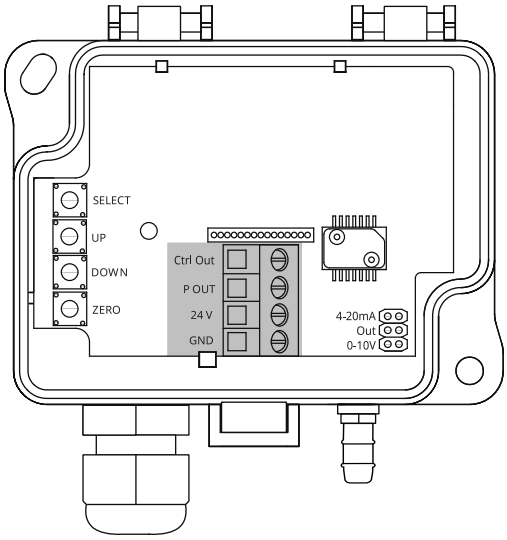
2.3 Wiring

WARNING: Device wiring and commissioning can only be carried out by qualified professionals. Always make the device wirings in de-energised electricity network.

WARNING: This product is appliance class III product according to IEC 60664-1. The product may only be connected to SELV (safety extra low voltage) electricity network.

CAUTION: The product may only be connected to overvoltage category III electricity network according to IEC 60664-1.

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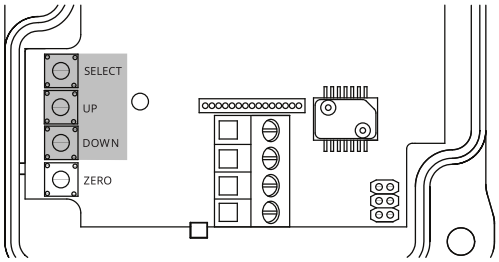
Ctrl Out	Control output (0...10 V / 4...20 mA)
P Out	Pressure output (0...10 V / 4...20 mA)
24V	24 Vac/dc supply
GND	0 V

The nominal wire terminal screw tightening torque is 0.6 Nm.

Important: Don't use excessive force when tightening the wiring terminal screws.

CAUTION: Ensure that all covers are closed before connecting supply voltage to the product. Don't remove the covers when the supply voltage is connected.

2.4 Configuring settings via device menu



1. Press the *SELECT* button for two seconds to activate device menu.
2. Press the *SELECT* button to activate a *Control unit* menu.
3. Use *UP* and *DOWN* buttons to select control mode.
   - Select *Pressure* to control pressure.
   - Select *Flow* to control air flow.
4. Press the *SELECT* button to accept the *Control unit* setting.
5. Use *UP* and *DOWN* buttons to navigate in the device menu.
   See the available settings in menus from the following chapters.
6. Press the *SELECT* button to activate a sub menu.
7. Press *UP* and *DOWN* buttons to select a value.
8. Press the *SELECT* button to accept the setting.
9. Navigate to *Exit menu* view and press *SELECT* button to save settings and exit the menu.

Note: If the buttons are not pressed for 50 seconds, the device returns to normal operation. In this case, the settings are not saved.

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2.4.1 Available settings for pressure control

2.4.1.1 Press unit menu

The display and output pressure unit is selected in *Press unit* menu

The following units are available:

- *Pa*
- *kPa*
- *NONE*
- *psi*
- *mbar*
- *"WC*
- *mmWC*

2.4.1.2 P output max menu

Pressure output scale is be selected via *P output max* menu. The values can be adjusted by 1 Pa steps.

-2500 models	-7000 models
200...2500 Pa	700...7000 Pa
0.2...2.5 kPa	0.7...7.0 kPa
2.0...25 mbar	7.0...70 mbar
20...250 mmWC	70...700 mmWC
0.8...10.0 inWC	2.5...30 inWC

2.4.1.3 Response time menu

The measurement response time is selected via *Response time* menu. The response time range is 1.0...20.0 s and the default value is 4 s.

2.4.1.4 Ref pressure menu

The controller setpoint is selected in *Ref pressure* menu. The value can be adjusted by 1 Pa steps.

2.4.1.5 P-value menu

The controller proportional gain is selected in *P-value* menu. The value can be adjusted by one unit steps.

2.4.1.6 I-value menu

The controller integral gain is selected in *I-value* menu. The value can be adjusted by 0.01 unit steps.

2.4.1.7 D-value menu

The controller derivative gain is selected in *D-value* menu. The value can be adjusted by 0.01 unit steps.

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2.4.2 Available settings for flow control

2.4.2.1 Manufacturer menu

Menu selection	Calculation equation	Description
Fläkt Woods	$q = \frac{1}{k}\sqrt{\Delta P}$	Select the fan manufacturer when connecting the device to a fan with pressure measurement points.
Rosenberg	$q = k\sqrt{\frac{2\Delta P}{\rho}}$	
Nicotra-Gebh	$q = k\sqrt{\frac{2\Delta P}{\rho}}$	
Comefri	$q = k\sqrt{\frac{2\Delta P}{\rho}}$	
Ziehl	$q = k\sqrt{\Delta P}$	
Ebm-Papst	$q = k\sqrt{\Delta P}$	
Gebhardt	$q = k\sqrt{\frac{2\Delta P}{\rho}}$	
Nicotra	$q = k\sqrt{\Delta P}$	
Common probe	$q = k\sqrt{\Delta P}$	Select this when connecting the device to a common measurement probe.

2.4.2.2 Formula unit menu

Formula unit menu is available if *Common probe* is selected in *Manufacturer* menu. The measurement unit used in the probe formula is selected in this menu.

The following units are available:

- *m3/h*
- *m3/s*
- *NONE*
- *f/min*
- *m/s*
- *l/s*
- *cfm*

2.4.2.3 K-Value menu

Each fan and measuring probe has a specific K-value. The K-value is selected via *K-Value* menu. See the manufacturer specification for the correct value.

See the following table for the equations used in flow calculations and typical K-values according to the fan manufacturer.

Manufacturer menu selection	Equation	Equation unit	Typical K-value range
Fläkt Woods	$q = \frac{1}{k}\sqrt{\Delta P}$	m^3/s	0.3...99
Rosenberg	$q = k\sqrt{\frac{2\Delta P}{\rho}}$	m^3/h	37...800

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Manufacturer menu selection	Equation	Equation unit	Typical K-value range
Nicotra-Gebh	$q = k\sqrt{\frac{2\Delta P}{\rho}}$	m^3/h	50...4700
Comefri	$q = k\sqrt{\frac{2\Delta P}{\rho}}$	m^3/h	10...2000
Ziehl	$q = k\sqrt{\Delta P}$	m^3/h	10...1500
Ebm-Papst	$q = k\sqrt{\Delta P}$	m^3/h	10...1500
Gebhardt	$q = k\sqrt{\frac{2\Delta P}{\rho}}$	m^3/h	50...4700
Nicotra	$q = k\sqrt{\Delta P}$	m^3/h	50...5300
Common probe	$q = k\sqrt{\Delta P}$	Selectable, m^3/h as a default	0.001...9999.000

q aif flow
k K-value
ΔP differential pressure
ρ air density

2.4.2.4 Flow unit menu

The display and output flow unit is selected in *Flow unit* menu

The following units are available:

- *m3/h*
- *m3/s*
- *NONE*
- *l/s*
- *cfm*

2.4.2.5 V output max menu

Flow output scale is be selected via *V output max* menu.

Formula unit menu selection	Value range
m3/s	0.025...50.000
m3/h	100...200000
cfm	50...100000
l/s	25...50000
m/s	1.0...100.0
f/min	200...20000

2.4.2.6 Response time menu

The measurement response time is selected via *Response time* menu. The response time range is 1.0...20.0 s and the default value is 4 s.

2.4.2.7 Ref flow menu

The controller setpoint is selected in *Ref flow* menu. The adjustment range depends on the selected flow unit.

3 Maintenance

3.1 Automatic zeroing

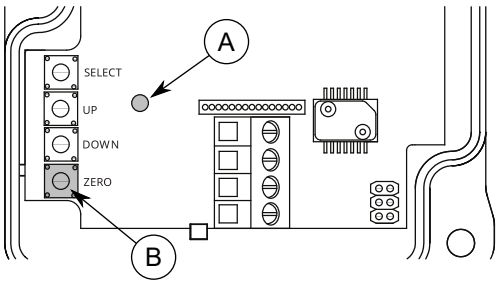
-AZ models include automatic zeroing function, which zeroes the pressure measurement every 10 minutes. The zeroing takes approximately 4 seconds after which the device returns to normal measuring mode. During the zeroing process, the output and display values are locked to the latest measured value.

3.2 Manual zeroing

The possible zero point drifting can be eliminated by using the zeroing button on the circuit board.

Note: Supply voltage must have been connected for one hour prior the zeroing.

1. Disconnect both pressure measurement hoses.
2. Push the zeroing button until the indicator light turns on and *Zeroing...* appears on the display.



A. Indicator light
B. Zeroing button

The zeroing is complete when the indicator light turns off.

3. Connect the pressure measurement hoses.

4 Disposal

The device is considered as electrical and electronic equipment for disposal in terms of the applicable European Directive. At the end of life the product must enter the recycling system at an appropriate collection point.

- The device must be disposed through channels provided for this purpose.
- The disposal must be completed according to the local and currently applicable laws and regulations.

Generally all metals can be recycled as material. Plastics and cardboard packaging material can be used in energy recovery. Printed circuit boards need selective treatment according to IEC 62635 guidelines. To aid recycling, plastic parts are marked with an appropriate identification code. Contact your local Produal distributor for further information on environmental aspects and recycling instructions for professional recyclers.



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