



## Differential Pressure Controller DPC 200

### Low pressure sensor with analog output and PI controlling mode

- ☐ Diaphragm element with differential transformer
- ☐ Measuring ranges: 0...50 Pa, 0...500 Pa, 0...1000 Pa, 0...4000 Pa
- ☐ LCD-Display
- ☐ Analog output 0...10 V
- ☐ Controlling mode or measuring mode selectable
- ☐ Controlling mode with PI algorithm
- ☐ 2 setpoints adjustable
- ☐ Selectable measurements (differential pressure or volume flow)
- ☐ Selectable units (metric or imperial)
- ☐ Maximum output voltage adjustable
- ☐ Compact plastic housing IP 54
- ☐ Supply voltage 10...30 Vdc or 24 Vac (+/-15%)



### Description and operating

## Safety instructions



**Attention!** Read this instruction carefully, before you insert connect this item. Only qualified personal who is familiar with installation, construction and operating of the equipment should work around these sensors.

## Application

The differential pressure controller DPC200 measures low pressure of non-aggressive gases, particularly of air.

The customer can use an analog signal (0...10V). The device offers two different settings. On the one hand the output signal stands for a pressure proportional signal during measuring mode or volume flow square root signal.

And on the other hand the output signal stands for a PI control signal for differential pressure during controlling mode or volume flow during controlling mode.

This device is mainly for e.g. in air conditioning systems for fan controlling, for pressure control of rooms or filter controlling.

## Description

The to be measured differential pressure affects to both sides of a silicone diaphragm, which is displaced against a measuring spring. The displacing of the diaphragm is converted into an electrical output signal by a differential transformer with suitable electronics.

The DPC200 combines two functions:

**Measuring mode:** The differential pressure is shown on the LCD display, and it is given as a proportional 0...10V output signal.  
Or the calculated volume flow is shown on the LCD display, and it is given as a square root 0...10V output signal

**Controlling mode:** In the device software two setpoints can be entered.  
The user can switch between the setpoint via potential free contact input.  
The function of the device is to reach and maintain the setpoint.

To accomplish this, the measured sensor value is compared with the activated setpoint, and the output signal is calculated from the difference.

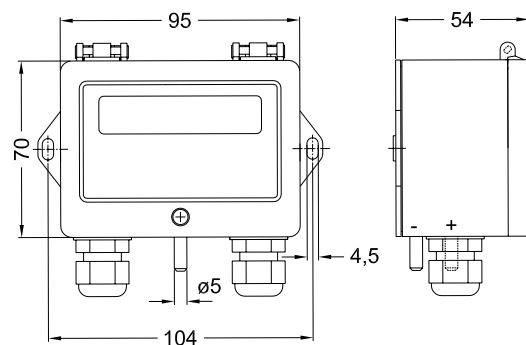
The PI controlling output signal is given as a 0...10V signal e.g. for activating directly a fan.

Additional adjustments are:

Maximum output voltage to limit the PI controlling signal.

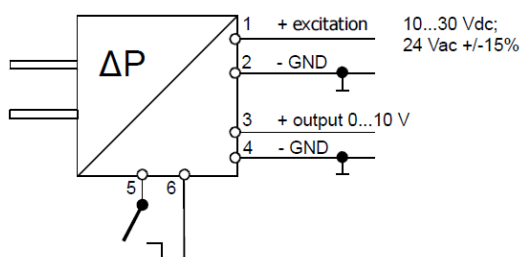
P- and I- parameter to adjust the control.

## Dimensions



## Electrical connection

After opening the front cover, the electrical connection is made by using screw terminals.



### Terminals:

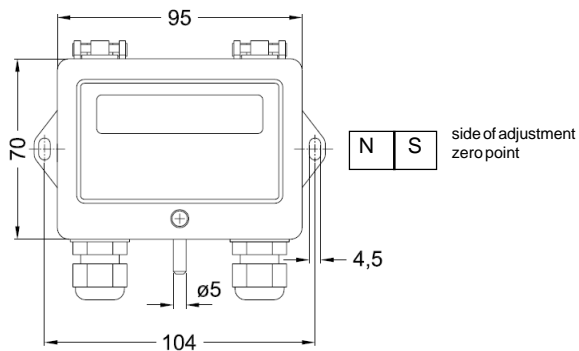
- |       |   |
|-------|---|
| 1+ 2- | Excitation 10...30 Vdc<br>or 24 Vac (+/-15%)  |
| 3+ 4- | Output 0...10 V                               |
| 5 6   | floating contact input for<br>setpoint 1 or 2 |

## Readjustment of the zero point

The zero point can be, regardless of the menu, readjust with a small bar magnet.

### Adjustment:

The device is not within the menu.  
Remove the pressure connections from the device.  
Touch with the bar magnet the side of the zero point adjustment.  
The new zero point will be stored.



## Mounting

The differential pressure controller DPC 200 is designed for wall mounting.

Installation must be done vertically.

The connection of the pressure lines is performed with plastic tubing, inner diameter  $\varnothing 5$  mm and  $\varnothing 6$  mm.

**Device is position depended, therefore it is important that the assembly is vertical.**

## Operation

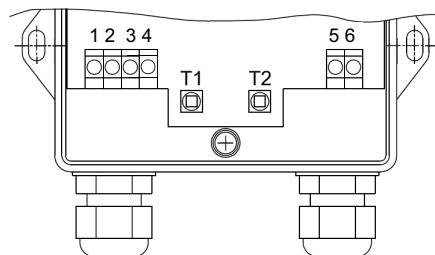
### Start up:

- The device must be mounted vertically.
- All connections must be connected in accordance with this manual.
- The supply voltage must be controlled.

### Factory setting in the delivered state:

The DPC200 is delivered with the following factory settings:

Operating mode:	measuring mode
Zero point:	adjusted to measuring range
End point:	adjusted to measuring range
Setpoint 1:	about 75% of the measuring range
Setpoint 2:	about 25% of the measuring range
Max. Voltage:	maximum output voltage: 10,0 V
P-parameter:	50
I-parameter:	3,15
k-factor:	70
controlling mode:	normal



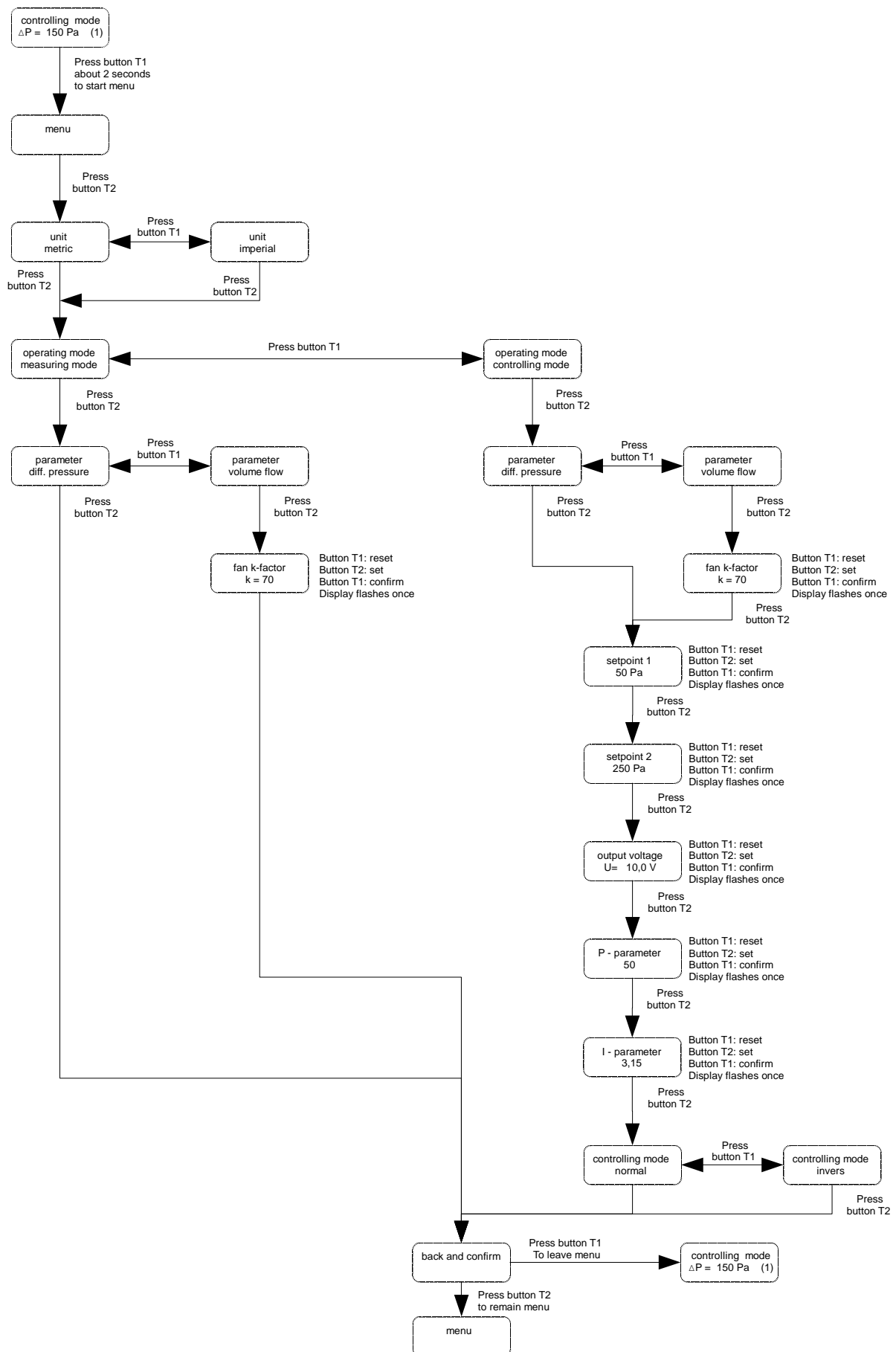
T1 - Button 1  
T2 - Button 2

## Adjustment:

### Menu structure:

unit:	The device can use metric or imperial units.
operation mode:	In the software menu two operating modes can be set. 'controlling mode' and 'measuring mode'.
parameter:	The device can use differential pressure (Pa or InH2O) or volume flow (m³/h or cfm)
k-factor:	For volume flow calculation, a k-factor can be entered. Range 1...1000, at higher measuring range maximum k-factor for 32.000 m³/h (18.800 cfm).  Measuring range 50 Pa: maximum k factor = 1000 Measuring range 500 Pa: maximum k factor = 1000 Measuring range 1000 Pa: maximum k factor = 1000 Measuring range 4000 Pa: maximum k factor = 500  Volume flow calculation:  $V = k \cdot \sqrt{\Delta p}$ with $V$ = volume flow (m³/h or cfm) $k$ = k-factor $\Delta p$ = diff. pressure (Pa or InH2O)
Setpoints:	Two setpoints can be set from 0% to 100% of the delivered measuring range. Volume flow setpoints depend on k-factor and at least 5% differential pressure.
maxUout:	Maximum output voltage can be set from 0,0 V to 10,0 V.
P-parameter:	P-parameter for PI-algorithm can be set 0...1000.
I-parameter:	I-parameter for PI-algorithm can be set 0,00...100,00
controlling mode:	The controlling mode can be changed in 'normal' or 'invers'.

## Adjustment:



## Technical data

**Differential Pressure controller DPC200-EP500**      Order No.    2567  
Measuring range: 500 Pa

**Differential Pressure controller DPC200-EP1000**      Order No.    2568  
Measuring range: 1000 Pa

**Differential Pressure controller DPC200-EP4000**      Order No.    2569  
Measuring range: 4000 Pa

**Differential Pressure controller DPC200-EP50**      Order No.    2559  
Measuring range: 50 Pa

**Mounting set M-DS**      Order No.    25110  
with screws, bleeders and 2m plastic tube

Measuring medium:      Air or non-aggressive gases  
Measuring principle:    Silicon diaphragm with spring and differential transformer  
Measuring ranges:      0...50 Pa, 0...500 Pa, 0...1000 Pa, 0...4000 Pa

Overpressure protection: 0,2 bar  
Static pressure:        Max. 0,2 bar  
Pressure connections:   Hose line ø5 mm and ø6 mm  
Case:                    Case polyamid, cover ABS

Supply voltage:        15...30 Vdc or 24 Vac  $\pm$  15 %  
Electronic protection against reversed polarization  
Current consumption:   Approx. 10 mA @ 10Vdc; 12 mA @ 24 Vdc  
Output:                0...10 V

Display:                LCD-Display, 2x16 characters  
Mode:                  Measuring mode or controlling mode  
Controlling algorithm:   PI algorithm  
Setpoints:            2 setpoints adjustable within software,  
Setpoints are selectable with floating contact input

Protection class:      IP 54 according EN 60529  
Ambient temperature:   -10...+50 °C  
Storage temperature:   -25...+60 °C  
Weight:                Approx. 250 g  
Mounting:              Vertical, position dependence by turning of 90°: approx. 25 Pa  
Interference emission: According EN 50081-2, EN 50082-2, CE

Influences limits:      Zero error:                     $\pm$  0,75 %  
Sum of linearity and hysteresis  
(depends on measuring range):     $\pm$  0,5 % ...  $\pm$  1 %  
Temperature drift, zero point:       $\pm$  0,3 % / 10 K  
Temperature drift, span:             $\pm$  0,2 % / 10 K