

### INTRODUCTION

Thank you for choosing an HK Instruments DPT-Ctrl series air handling controller with differential pressure or airflow transmitter. The DPT-Ctrl series PID controllers are engineered for building automation in the HVAC/R industry. With the built-in controller of the DPT-Ctrl it is possible to control the constant pressure or flow of fans, VAV systems or dampers. When controlling air flow, it is possible to select a fan manufacturer or a common measuring probe that has a K-value.

### APPLICATIONS

DPT-Ctrl series devices are commonly used in HVAC/R systems for:

- Controlling differential pressure or air flow in air handling systems
- VAV applications

### SPECIFICATIONS

#### Performance

**Accuracy** (at applied pressure):

Ranges < 125 Pa =  $\pm 2$  Pa

Ranges 125 Pa =  $\pm 1,5$  % Pa

(Accuracy specifications include: general accuracy, temperature drift, linearity, hysteresis, long term stability, and repetition error)

**Thermal effects:**

Temperature compensated across the full spectrum of capability

**Overpressure:**

Proof pressure: 25 kPa

**Zero point calibration:**

Automatic autozero or manual pushbutton

**Response time:**

1.0–20 s, selectable via menu

#### Technical Specifications

**Media compatibility:**

Dry air or non-aggressive gases

**Controller parameter (selectable via menu):**

Setpoint 0...2500/7000 Pa

P-band 0...100 000

I-time 0...1000 s

D-factor 0...100

**Pressure units (select via menu):**

Pa, kPa, mbar, inWC, mmWC

**Flow units (select via menu):**

Volume: m<sup>3</sup>/s, m<sup>3</sup>/hr, cfm, l/s

Velocity: m/s, ft/min

**Measuring element:**

Piezoresistive

**Environment:**

Operating temperature:

-10...50 °C

with autozero (-AZ) calibration -5...50 °C

Storage temperature:

-20...70 °C

Humidity:

0 to 95 % rH, non condensing

#### Physical

**Dimensions:**

Case: 90.0 x 95.0 x 36.0 mm

**Weight:**

150 g

**Mounting:**

2 each 4.3 mm screw holes, one slotted

**Materials:**

Case: ABS

Lid: PC

**Protection standard:**

IP54

**Display**

2-line display (12 characters/line)

Line 1: Direction of control output

Line 2: Pressure or air flow measurement, selectable via menu

Size: 46.0 x 14.5 mm

**Electrical connections:**

4-screw terminal block

Wire: 12–24 AWG (0.2–1.5 mm<sup>2</sup>)

**Cable entry:**

Strain relief: M16

Knockout : 16 mm

**Pressure fittings**

5.2 mm barbed brass

+ High pressure

– Low pressure

#### Electrical

**Voltage:**

Circuit: 3-wire (V Out, 24 V, GND)

Input: 24 VAC or VDC,  $\pm 10$  %

Output: 0–10 V, selectable via jumper

Power consumption: <1.0 W

Resistance minimum: 1 k $\Omega$

**Current:**

Circuit: 3-wire (mA Out, 24 V, GND)

Input: 24 VAC or VDC,  $\pm 10$  %

Output: 4–20 mA, selectable via jumper

Power consumption: <1.2 W

Maximum load: 500  $\Omega$

#### Conformance

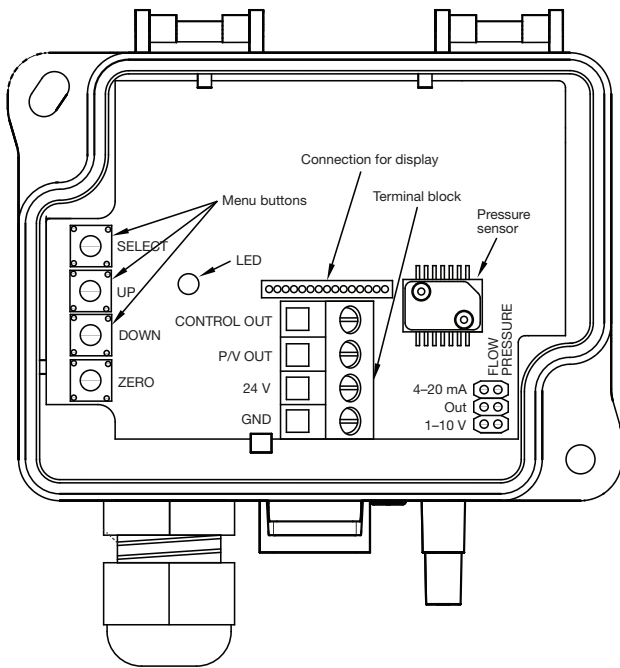
Meets requirements for CE marking:

EMC Directive 2004/108/EY

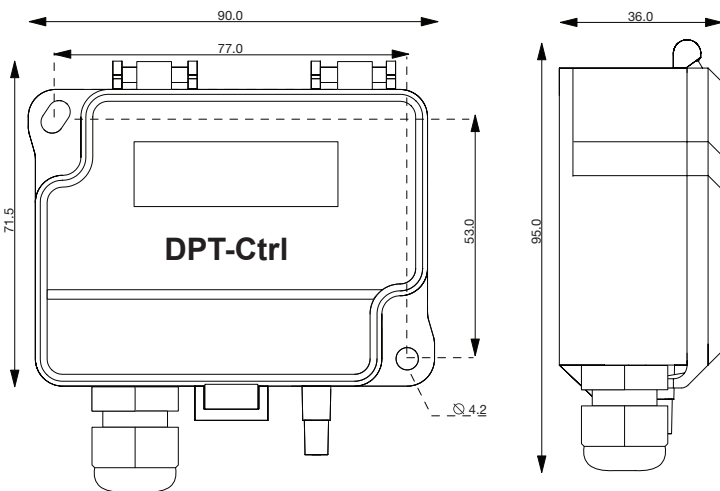
RoHS Directive 2002/95/EY



## SCHEMATICS



## DIMENSIONAL DRAWINGS



## INSTALLATION

- 1) Mount the device in the desired location (see step 1).
- 2) Open the lid and route the cable through the strain relief and connect the wires to the terminal block(s) (see step 2).
- 3) The device is now ready for configuration.

**WARNING!** Apply power only after the device is properly wired.

## STEP 1: MOUNTING THE DEVICE

- 1) Select the mounting location (duct, wall, panel).
- 2) Use the device as a template and mark the screw holes.
- 3) Mount with appropriate screws (not included).

Figure 1a - Surface mounting

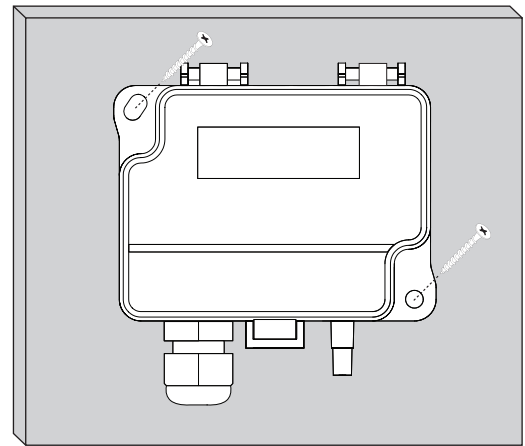
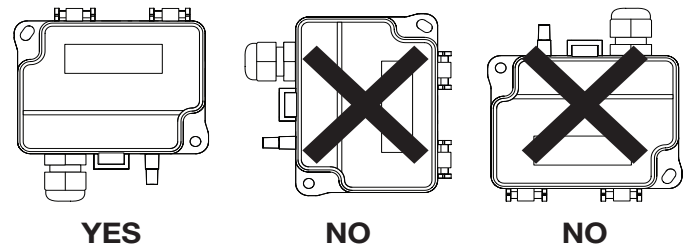


Figure 1b - Mounting orientation

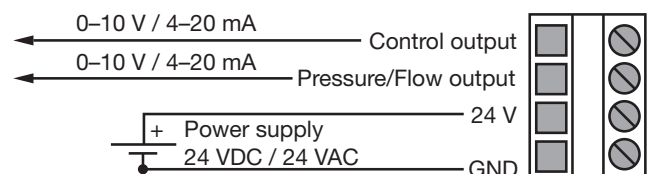


## STEP 2: WIRING DIAGRAMS

For CE compliance, a properly grounded shielding cable is required.

- 1) Unscrew the strain relief and route the cable.
- 2) Connect the wires as shown in figure 2.
- 3) Tighten the strain relief.

Figure 2 - Wiring diagram



## STEP 3: CONFIGURATION

Select the functioning mode of the controller: PRESSURE or FLOW.

**Select PRESSURE when controlling a differential pressure.**

CONTROL UNIT  
PRESSURE

☒ SELECT  
☐ UP  
☐ DOWN

1) Select pressure unit for display and output: Pa, kPa, mbar, inWC or mmWC.

PRESS. UNIT  
Pa

☒ SELECT  
☐ UP  
☐ DOWN

2) Pressure output scale (P OUT). Select pressure output scale to improve output resolution.

P OUTPUT MAX  
2000 Pa

☒ SELECT  
☐ UP  
☐ DOWN

3) Response time: Select response time between 1.0-20 s.

RESPONSE TIME  
20 s

☒ SELECT  
☐ UP  
☐ DOWN

4) Select a setpoint of the controller.

REF PRESSURE  
100 Pa

☒ SELECT  
☐ UP  
☐ DOWN

5) Select proportional band according to your application specifications.

P-VALUE  
206

☒ SELECT  
☐ UP  
☐ DOWN

6) Select integration time according to your application specifications.

I-VALUE  
4.00

☒ SELECT  
☐ UP  
☐ DOWN

7) Select derivation time according to your application specifications.

D-VALUE  
1.00

☒ SELECT  
☐ UP  
☐ DOWN

8) Push select button to exit menu and to save changes.

SELECT  
EXIT MENU

☒ SELECT

## CONFIGURATION CONTINUED

**Select FLOW when controlling an air flow.**

CONTROL UNIT  
FLOW

☒ SELECT  
☐ UP  
☐ DOWN

1) Select the functioning mode of the controller

- Select *Manufacturer* when connecting DPT-Ctrl to a fan with pressure measurement taps
- Select *Common probe* when using DPT-Ctrl with a common measurement probe that follows the formula:  
 $q = k \cdot \sqrt{\Delta P}$  (i.e. FloXact)

MANUFACTURER  
Common probe

☒ SELECT  
☐ UP  
☐ DOWN

Common probe

Flakt Woods

☒ SELECT  
☐ UP  
☐ DOWN

2) If *Common probe* selected: select measurement units used in the formula (aka Formula unit) (i.e. l/s)

FORMULA UNIT  
l/s

☒ SELECT  
☐ UP  
☐ DOWN

3) Select K-value

a. If manufacturer selected in step 1:

Each fan has a specific K-value. Select the K-value from fan manufacturer's specifications.

b. If *Common probe* selected in step 1:

Each common probe has a specific K-value. Select the K-value from common probe manufacturer's specifications.

Available K-value range: 0.001...9999.000

K-VALUE  
9000.000

☒ SELECT  
☐ UP  
☐ DOWN

4) Select flow unit for display and output:

Flow volume: m³/s, m³/h, cfm, l/s

Velocity: m/s, f/m

FLOW UNIT  
m³/s

☒ SELECT  
☐ UP  
☐ DOWN

5) Flow output scale (V OUT): Select flow output scale to improve output resolution.

V OUTPUT MAX  
50.000 m³/s

☒ SELECT  
☐ UP  
☐ DOWN

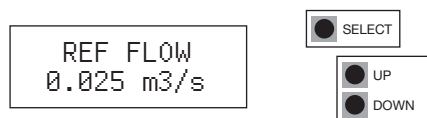
6) Response time: Select response time between 1.0-20 s.

RESPONSE TIME  
20 s

☒ SELECT  
☐ UP  
☐ DOWN

## CONFIGURATION CONTINUED

7) Select a setpoint of the controller.



8) Select proportional band according to your application specifications.



9) Select integration time according to your application specifications.



10) Select derivation time according to your application specifications.



11) Push select button to exit menu.



## STEP 4: ZEROING THE DEVICE

To zero the device two options are available:

- 1) Manual Pushbutton zero point calibration
- 2) Autozero calibration

Does my transmitter have an autozero calibration? See the product label. If it shows -AZ in the model number, then you have the autozero calibration.

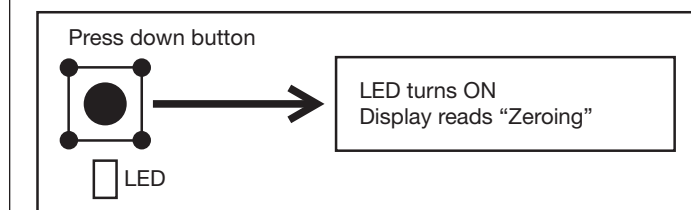
- 1) Manual Pushbutton zero point calibration

NOTE: Supply voltage must be connected at least one hour prior to zero point adjustment.

- a) Disconnect both pressure tubes from the pressure ports labeled + and -.
- b) Push down the zero button until the LED light (red) turns on and the display reads "zeroing" (display option only). (see figure 4)
- c) The zeroing of the device will proceed automatically. Zeroing is complete when the LED turns off, and the display reads 0 (display option only).
- d) Reinstall the pressure tubes ensuring that the High pressure tube is connected to the port labeled +, and the Low pressure tube is connected to the port labeled -.

## ZEROING THE DEVICE CONTINUED

Figure 4



2) Autozero calibration

If the device includes the optional autozero circuit, no action is required.

Autozero calibration (-AZ) is an autozero function in the form of an automatic zeroing circuit built into the PCB board. The autozero calibration electronically adjusts the transmitter zero at predetermined time intervals (every 10 minutes). The function eliminates all output signal drift due to thermal, electronic or mechanical effects, as well as the need for technicians to remove high and low pressure tubes when performing initial or periodic transmitter zero point calibration. The autozero adjustment takes 4 seconds after which the device returns to its normal measuring mode. During the 4 second adjustment period, the output and display values will freeze to the latest measured value.

Transmitters equipped with the autozero calibration are virtually maintenance free.

## WARRANTY POLICY

The seller is obligated to provide a warranty of 24 months for the delivered goods regarding material and manufacturing. The warranty period is considered to start on the delivery date of the product. If a defect in raw materials or a production flaw is found, the seller is obligated, when the product is sent to the seller without delay or before expiration of the warranty, to amend the mistake at his/her discretion either by repairing the defective product or by delivering free of charge to the buyer a new flawless product and sending it to the buyer. Delivery costs for the repair under warranty will be paid by the buyer and the return costs by the seller. The warranty does not comprise damages caused by accident, lightning, flood or other natural phenomenon, normal wear and tear, improper or careless handling, abnormal use, overloading, improper storage, incorrect care or reconstruction, or changes and installation work not done by the seller or his/her authorized representative. The selection of materials for devices prone to corrosion is the buyer's responsibility, unless otherwise is legally agreed upon. Should the manufacturer alter the structure of the device, the seller is not obligated to make comparable changes to devices already purchased. Appealing for warranty requires that the buyer has correctly fulfilled his/her duties arisen from the delivery and stated in the contract. The seller will give a new warranty for goods that have been replaced or repaired within the warranty, however only to the expiration of the original product's warranty time. The warranty includes the repair of a defective part or device, or if needed, a new part or device, but not installation or exchange costs. Under no circumstance is the seller liable for damages compensation for indirect damage.