



hk instruments 40C AIR FLOW AND VELOCITY TRANSMITTERS DPT-Flow Series Installation Guide

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HK INSTRUMENTS

40C AIR FLOW AND VELOCITY TRANSMITTERS DPT-Flow Series
Installation Guide

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INTRODUCTION

Thank you for choosing an HK Instruments DPT-Flow series air flow transmitter. The DPT-Flow series is intended for use in commercial environments. The DPT-Flow measures airflow, velocity, and differential pressure. It is

designed to be used in combination with airflow measuring probes (i.e. FloXact), dampers, or with centrifugal fans that provide differential pressure connections and K-values.

The DPT-Flow series of airflow transmitters is comprised of DPTFlow-1000, DPT-Flow-2000, DPT-Flow-5000, and DPT-Flow-7000 with measurement ranges of 0–1000 Pa, 0–2000 Pa, 0–5000 Pa, and 0–7000 Pa respectively. All models come with a display and manual pushbutton zero point calibration. Optional autozero calibration is also available.

APPLICATIONS

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

- airflow monitoring across centrifugal fans and blowers
- in-duct air flow monitoring
- VAV applications

WARNING

- READ THESE INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE THIS DEVICE.
- Failure to observe safety information and comply with instructions can result in PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.
- To avoid electrical shock or damage to equipment, disconnect power before installing or servicing and use only wiring with insulation rated for full device operating voltage.
- To avoid potential fire and/or explosion do not use in potentially flammable or explosive atmospheres.
- Retain these instructions for future reference.
- This product, when installed, will be part of an engineered system whose specifications and performance characteristics are not designed or controlled by HK Instruments. Review applications and national and local codes to assure that the installation will be functional and safe. Use only experienced and knowledgeable technicians to install this device.

SPECIFICATIONS

Performance

Accuracy (from applied pressure):

Models 1000 and 2000:

Pressure < 125 Pa = 1 % + ± 2 Pa

Pressure > 125 Pa = 1 % + ± 1 Pa

Models 5000 and 7000:

Pressure < 125 Pa = 1.5 % + ± 2 Pa

Pressure > 125 Pa = 1.5 % + ± 1 Pa

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

Overpressure:

Proof pressure: 25 kPa

Burst pressure: 30 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

Pressure units (select via menu): Pa, kPa, mbar, inWC, mmWC, psi

Pressure output scale (select via menu):

	DPT-Flow-1000	DPT-Flow-2000	DPT-Flow-5000	DPT-Flow-7000
Pa	100-1,000	200-2,000	500-5,000	700-7,000
kPa	0.1-1.0	0.2-2.0	0.5-5.0	0.7-7.0
mbar	1-10	2.0-20	5.0-50	7.0-70
WC	10-100	20-200	50-500	70-700
inWC	0.4-4.0	0.8-8.0	2.0-20	2/5/30

Flow units (select via menu):**Volume:** m³/s, m³/hr, cfm, l/s, none**Velocity:** m/s, ft/min**Flow output scale (select via menu):**

Units	Range
m ³ /s	0.025-50
m ³ /hr	100-200,000
cfm	50-100,000
l/s	25-50,000
m/s	1-100
f/min	200-20,000

Measuring element:

MEMS, no flow-through

Environment:

Operating temperature: -20...50 °C,

-40C model: -40...50 °C

Models with autozero calibration: -5...50 °C

Temperature-compensated range 0...50 °C

Storage temperature: -40...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: Volume or velocity measurement
Line 2: Pressure measurement
Size: 46.0 x 14.5 mm

Electrical connections:

4-screw terminal block
Wire: 0.2–1.5 mm² (16–24 AWG)
Cable entry:
Strain relief: M16
Knockout: 16 mm
Pressure fittings
Male \varnothing 5.0 mm and 6.3 mm

Electrical

Voltage:

Circuit: 3-wire (V Out, 24 V, GND)
Input: 24 VAC or VDC, $\pm 10\%$
Output: 0–10 V / 2–10 V, selectable via jumper
Power consumption: <1.0 W
-40C model: <4.0 W when <0 °C
Resistance minimum: 1 k Ω

Current:

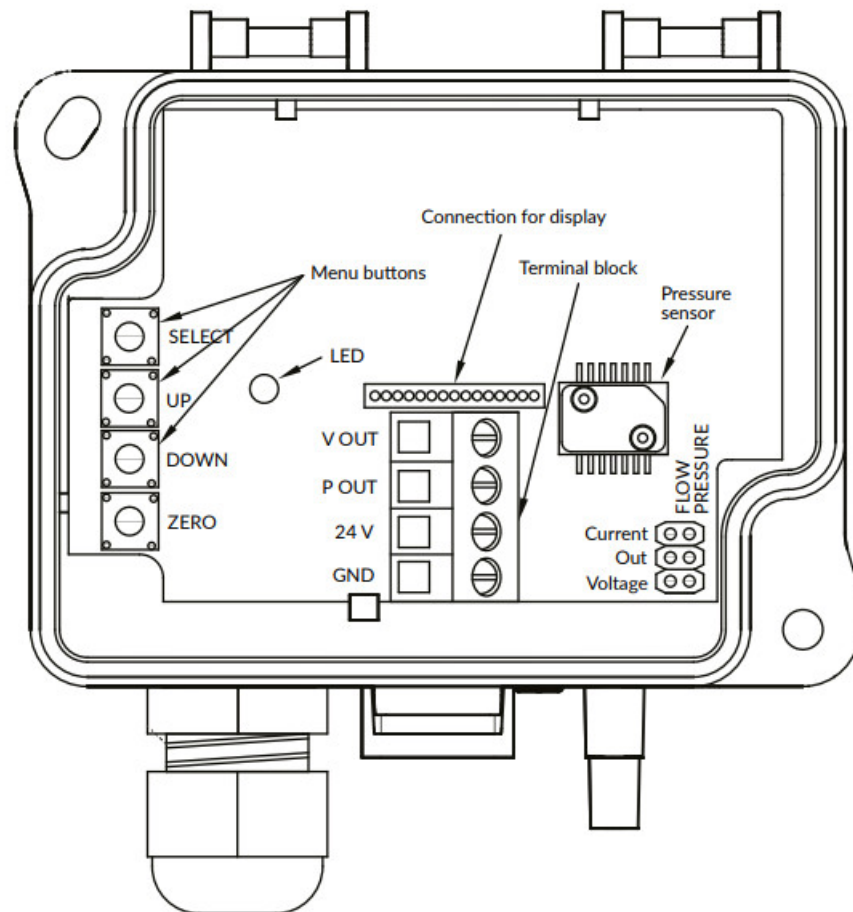
Circuit: 3-wire (mA Out, 24 V, GND)
Input: 24 VAC or VDC, $\pm 10\%$
Output: 4–20 mA, selectable via jumper
Power consumption: <1.2 W
-40C model: <4.2 W when <0 °C
Maximum load: 500 Ω
Minimum load: 20 Ω

Conformance

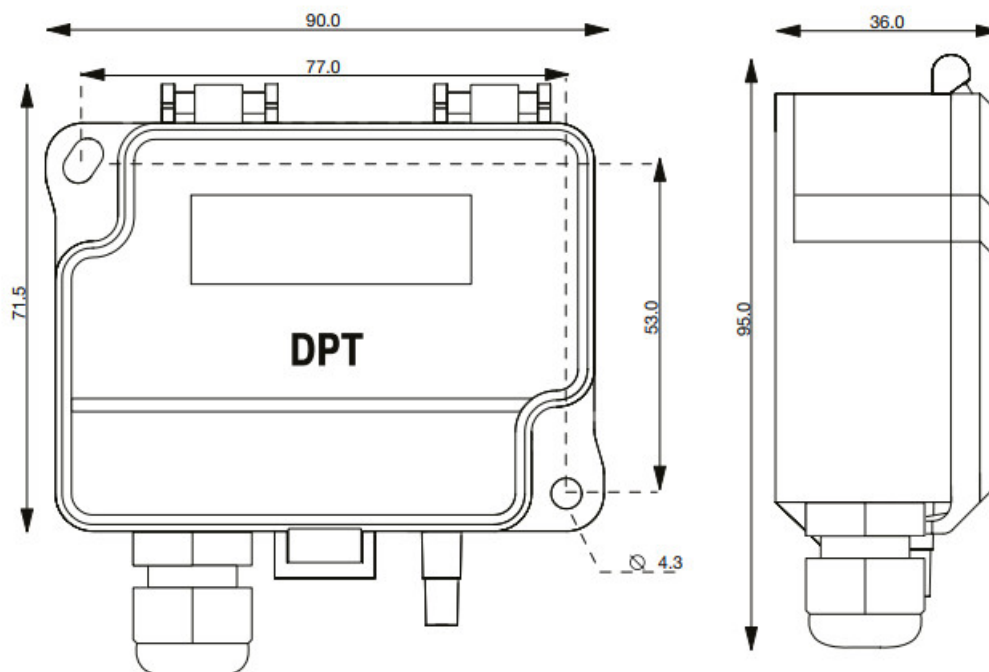
Meets requirements for:

	CE:	UKCA:
EMC:	2014/30/EU	S.I. 2016/1091
RoHS:	2011/65/EU	S.I. 2012/3032
WEEE:	2012/19/EU	S.I. 2013/3113

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.

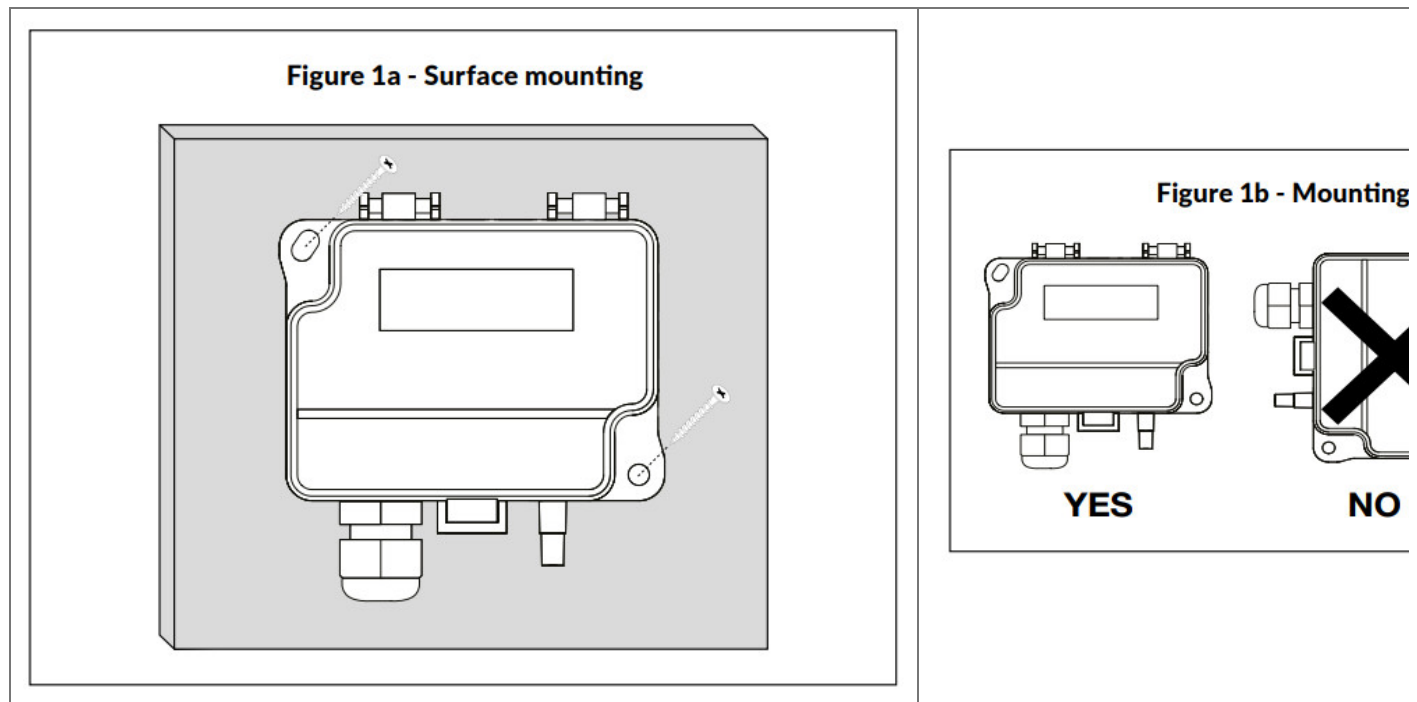


Figure 1c – Application connections

The pressure tubes are connected to a flow measurement probe (i.e. FloXact), or to the measurement ports specified by the fan manufacturer. Please see the FloXact installation guide or the fan manufacturer's technical specifications for more information.

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 Figures 2a and 2b.
3. Tighten the strain relief.

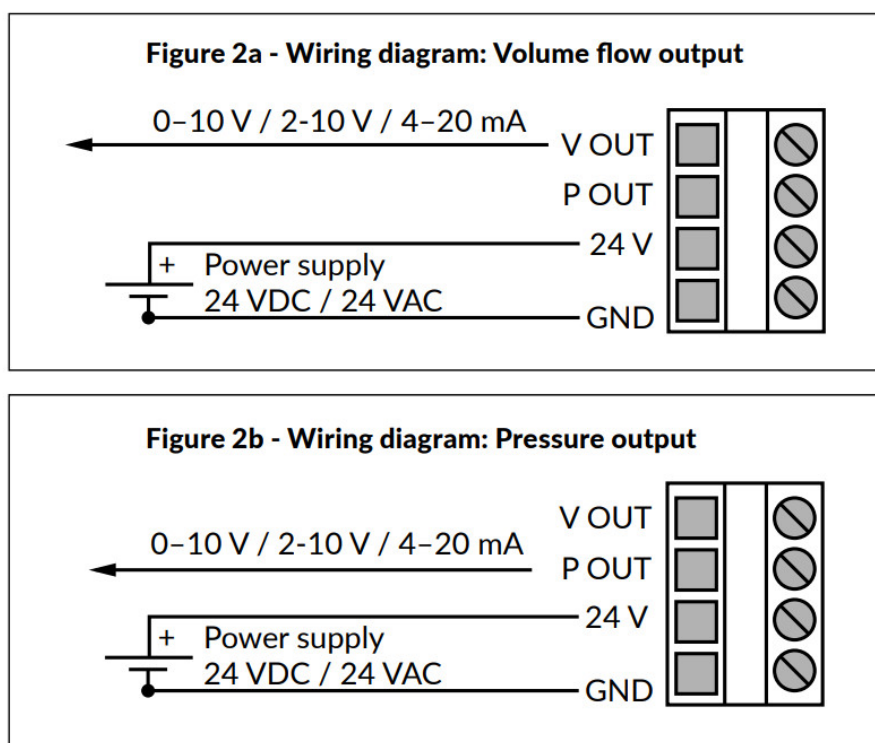


Figure 2c – Output mode selection

<div>Flow</div> <div>Pressure</div>	Jumper installed to the two upper pins on the left side: Current output selected for flow
	Jumper installed to the two lower pins on the left side: Voltage output selected for flow
	Jumper installed to the two upper pins on the right side: Current output selected for pressure
	Jumper installed to the two lower pins on the right side: Voltage output selected for pressure

STEP 3: CONFIGURATION

1. Activate the device Menu by pushing the select button for 2 seconds
2. Select the functioning mode of the flow meter:

- Select Manufacturer when connecting DPT-Flow to a fan with pressure measurement points
- Select a Common probe when using DPT-Flow with a common measurement probe that follows the formula:

$$q = k \cdot \sqrt{\Delta P} \text{ (i.e. FloXact)}$$

MANUFACTURER
Common probe

☒ SELECT

Common probe

Fläkt Woods

☒ UP
☒ DOWN

☒ SELECT

☒ UP
☒ DOWN

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

FORMULA UNIT
l/s

☒ SELECT

☒ UP
☒ DOWN

4. Select K-value

- a. If the manufacturer selected in step 2:

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

Manufacturer:	K-value:
Flaktwoods	k = 0.3...99
Rosenberg	k = 37...800
Nicotra-Gebhardt	k = 50...4700
Comefri	k = 10...2000
Ziehl	k = 10...1500
ebm-papst	k = 10...1500
Gebhardt	k = 50...4700
Nicotra	k = 50...5300

- b. If the Common probe is selected in step 1:

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

Available K-value range: 0.001...9999.000

K-VALUE
9000.000

☐ SELECT

☐ UP
☐ DOWN

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

PRESS.UNIT
Pa

☐ SELECT

☐ UP
☐ DOWN

6. Pressure output scale (p OUT). Select pressure output scale to improve output resolution.

DPT-Flow-1000	DPT-Flow-2000	DPT-Flow-5000	DPT-Flow-7000
100-1000 Pa 0.1-1.0 kPa 1.0-10 mbar 10-100 mm WC 0.4-4.0 inWC	200-2000 Pa 0.2-2.0 kPa 2.0-20 mbar 20-200 mm WC 0.8-8.0 inWC	500-5000 Pa 0.5-5.0 kPa 5.0-50 mbar 50-500 mm WC 2.0-20 inWC	700-7000 Pa 0.7-7.0 kPa 7.0-70 mbar 70-700 mm WC 2.5-30 inWC

P OUTPUT MAX
2000 Pa

☐ SELECT

☐ UP
☐ DOWN

7. Select flow unit for display and output: Flow volume: m³/s, m³/h, cfm, l/s, none Velocity: m/s, f/min

FLOW UNIT
m³/s

☐ SELECT

☐ UP
☐ DOWN

8. Output mode: Select output voltage 0-10 V or 2-10 V. By selecting 2-10 V you gain ability to detect if the wire is broken.

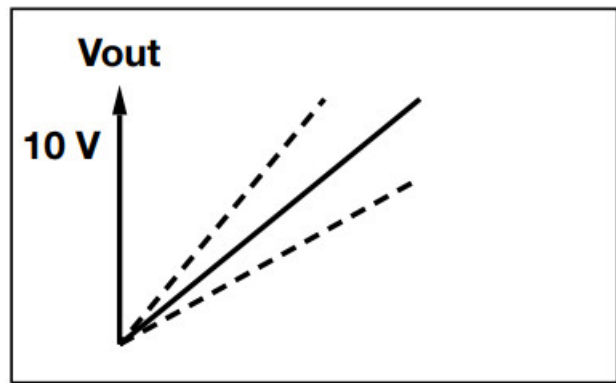
OUTPUT MODE
0-10V

☐ SELECT

☐ UP
☐ DOWN

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

<i>Unit:</i>	<i>Range:</i>
m ³ /s	0.025–50
m ³ /h	100–200,000
cfm	50–100,000
l/s	25–50,000
m/s	1.0–100
f/min	200–20,000



V OUTPUT MAX
50.000 m³/s

☐ SELECT

☐ UP
☐ DOWN

10. Response time: Select response time between 1.0–20 s.

RESPONSE TIME
20 s

☐ SELECT

☐ UP
☐ DOWN

11. Push the select button to save changes and exit the menu.

SELECT
EXIT MENU

☐ SELECT

STEP 4: ZEROING THE DEVICE

NOTE! Always zero the device before use.
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 3)
- 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

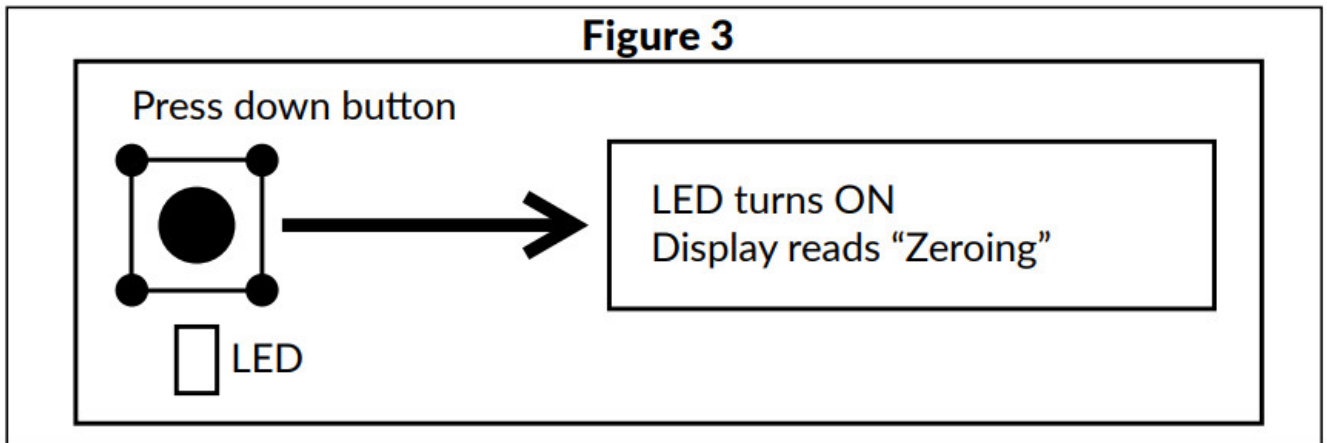
Low-pressure tube is connected to the port labeled –.

a) Disconnect both pressure tubes from the pressure ports labeled + and –.

b) Push down the zero button (joystick) until the LED light (red) turns on and the display reads “zeroing” (display option only). (see Figure 6)

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 the High-pressure tube is connected to the port labeled +, and the Low-pressure tube is connected to the port labeled –.



2) Auto zero 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 autozero calibration are virtually maintenance-free.

-40C MODEL: OPERATION IN A COLD ENVIRONMENT

The lid of the device has to be closed when the operation temperature is below 0 °C. The display needs 15 minutes to warm up if the device is started at a temperature below 0 °C.

NOTE! The power consumption rises and there can be an additional error of 0,015 volts when the operation temperature is below 0 °C

RECYCLING/DISPOSAL



■ The parts left over from installation should be recycled according to your local instructions. Decommissioned devices should be taken to a recycling site that specializes in electronic waste.

WARRANTY POLICY


The seller is obligated to provide a warranty of five years 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 the 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 another 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. 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 a warranty requires that the buyer has correctly fulfilled his/her duties arising 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.

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Documents / Resources

	<p>hk instruments 40C AIR FLOW AND VELOCITY TRANSMITTERS DPT-Flow Series [pdf] Installation Guide</p> <p>40C AIR FLOW VELOCITY TRANSMITTERS DPT-Flow Series, AIR FLOW VELOCITY TRANSMITTERS DPT-Flow Series, TRANSMITTERS DPT-Flow Series</p>
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[Manuals+](#)