



TI3220en

### Product Information



PDE1- Series (F)

**Air Flow Sensor  
with Active Output**

The PDE1- Series (F) is designed to measure the air flow, velocity and differential pressure in HVAC systems

The sensor has an air pressure and air flow output

The sensors coming with Zero- point calibration

Easy readable LCD Display with backlit

The control outputs are active



#### USE

- Compatible to all common HVAC DDC and Analog Controls systems, with/without Building Automation System
- Air flow, velocity and differential pressure measurements in HVAC systems
- Used in all common HVAC applications
- Used in Commercial and Industrial Buildings

#### Features

- Sensor with active outputs
- Programmable measuring range, units and fan manufacturer fan characteristics
- Sensor with Zero- Point calibration
- Professional and practical product design, withstands rough environmental conditions
- Easy to use, install and maintain

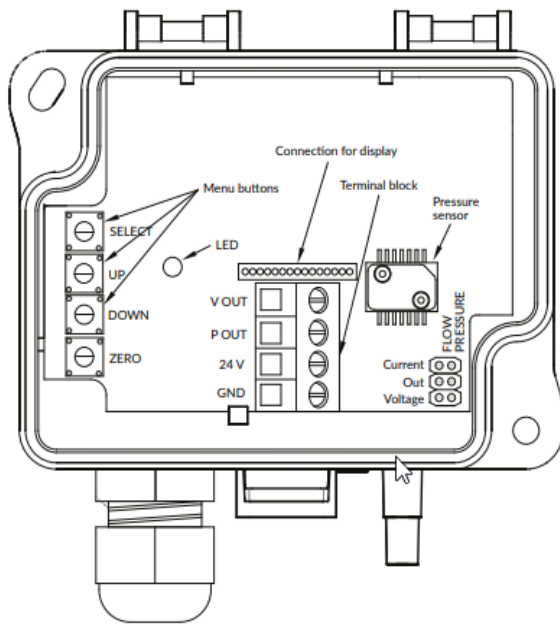
#### Product Range

Order Codes	Power Supply	Outputs	Measuring Range	Display Units	Over Pressure	Burst Pressure	Protection
PDE1.IA	AC/DC 24V (±10%)	0 ... 10V* or 4...20mA (air flow) and 0 ... 10V* or 4...20mA (dP)	0 ... 1000 Pa ; Ø0.25mm/second*	Air Flow (m3/sec* ; m3/h ; cfm ; l/s ; m/s l/min) Differential Pressure (Pa ; kPa ; mbar ; mmWC ; inWS)	25kPa	30kPa	IP54
PDE1.KA			0 ... 5000Pa ; 0.0025m3/second*				

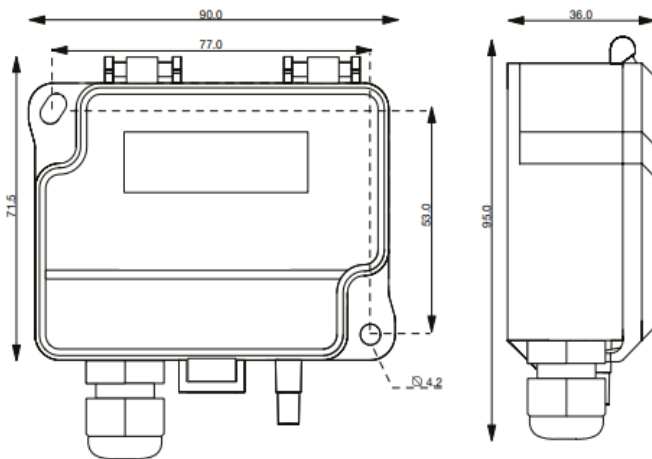
\* default settings

<b>Sensor Specification</b>	Sensor Specification	Measured	Air Flow / Differential Pressure	
		Sensor Characteristics	Active	
		Response Time	Selectable (1...20 sec)	
		Sensor Outputs (3-wire)	0...10V (min 1k Ω) or 4...20mA (min. 0.5kΩ)	
		Accuracy (dP ≤2500Pa)	<125Pa ; 1% ±2Pa	
			>125Pa ; 1% ±1Pa	
		Accuracy (dP ≥5000Pa)	<125Pa ; 1.5% ±2Pa >125Pa ; 1.5% ±1Pa	
Measuring Ranges, see next pages	see 1st page			
<b>Technical Information</b>	Electrical Information	Power Supply	AC/DC 24V (±10%)	
		Frequency	50 / 60 Hz at AC 24V	
		Terminal Clamp	Screw terminal, max. 1.5mm <sup>2</sup>	
		Power Consumption	max. <1.2W	
	Mechanical Information	Cable Entry	M16, Ø6...Ø8mm cables	
		Sensing Element Position	external, top of the immersion rod	
		Connection Nozzle	Ø5mmx6.3mm	
	User Interface	Display	LCD- backlit (45.7x12.7mm)	
		Display Values (Flow)	m <sup>3</sup> /sec* ; m <sup>3</sup> /h ; cfm ; l/s ; m/s l/min	
		Display Values (Pressure)	Pa ; kPa ; mbar ; mmWC ; inWS	
		Sensor Outputs	Removable Jumpers	
		Zeroing Button	Press button	
		Zeroing LED	Red LED	
		k- Factor Selection	Selection Buttons	
		Pressure Range Selection	Selection Buttons	
		Color and Materials	Housing Cover	PC, grey
	Housing Bottom		ABS, grey	
	Connection Nozzle		Grey ABS	
	Lock		Snap Connector	
	Cable Gland		Grey ABS	
	Gland Rubber Seal		Black Rubber	
	Environmental Conditions		Operation Temperature	0°C...+50°C
		Operation Humidity	<95% r.h., no condensation	
		Transport Temperature	-35°C...+70°C	
		Transport Humidity	< 95% r.h.	
		Storage Temperature	-10°C...+70°C	
		Storage Humidity	< 85% r.h., no condensation	
		Norms and Directives	IP- Rating	IP54 to IEC60529
			Safety Class	III to EN 60 730
	Product Standard 1		Automatic Electric. Controls for household and similar use	
	Product Standard 2		2009/EN 60 730-1	
	CE Conformities to		2004/108/EG Electromagnetic Compatibility EMV	
	LVD Directive		2014/35/EU	
	RoHS Compatibility		RoHS 3, Directive 2015/863	
	WEEE Directive		2012/19/EU	
	Operation Climatic Condition		IEC 60 721-3-3	
	Operation Mechanical Condition		IEC 60 721-3-2 to class2M2	
	Transport to Climatic Condition		IEC 60 721-3-2	
	Transport Mechanical Condition		IEC 60 721-3-2 to class2M2	
	Storage Climatic Condition		IEC 60 721-3-1	
	Storage Mechanical Condition		IEC 60 721-3-1 to class2M2	
	<b>Miscellaneous</b>		Accessories	Mounting Kit, Included in delivery
		Shipping & Handling	Minimum Order	1 box with 1 piece
Package Material			Rigid Cardboards Packaging	
Order Notes		Order Code	See Product Range, Page 1, e.g. PDE1.KA	

## SCHEMATICS



## DIMENSIONAL DRAWINGS



## INSTALLATION

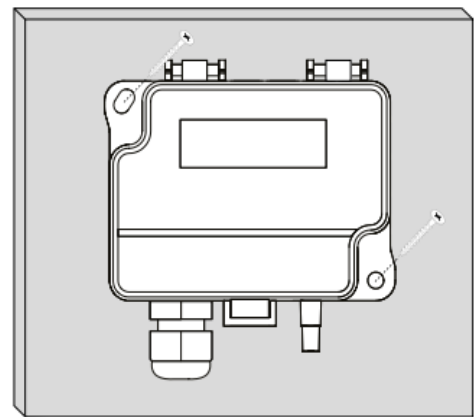
- 1) Mount the device in the desired location (see step 1).
- 2) Open the lid and route the cable through the strain relief and connect the wires to the terminal block(s) (see step 2).
- 3) The device is now ready for configuration.

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

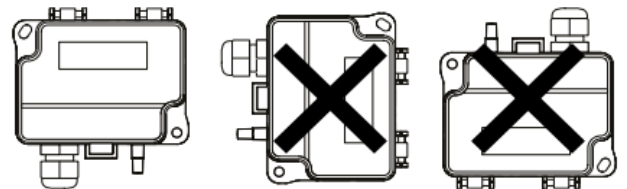
### STEP 1: MOUNTING THE DEVICE

- 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 1a - Surface mounting**



**Figure 1b - Mounting orientation**



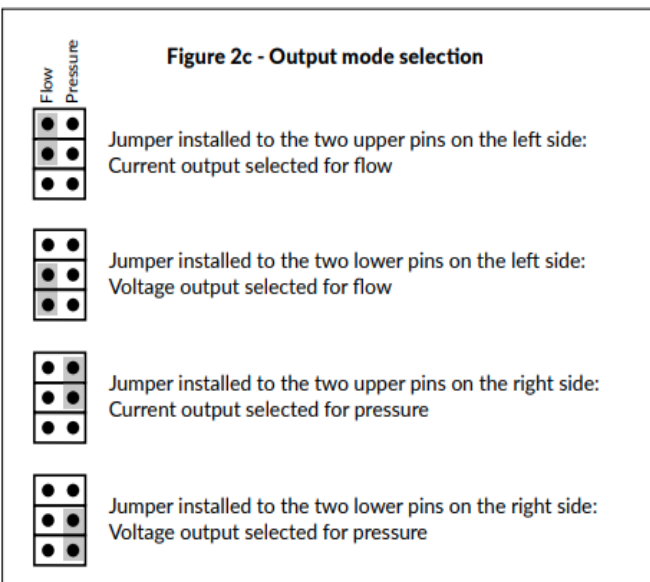
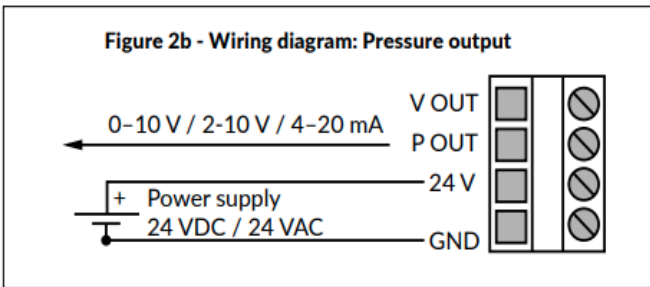
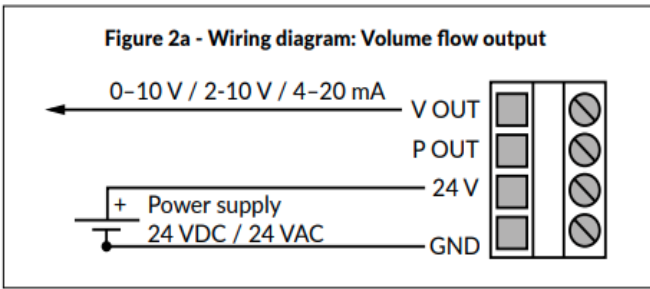
**Figure 1c - Application connections**

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

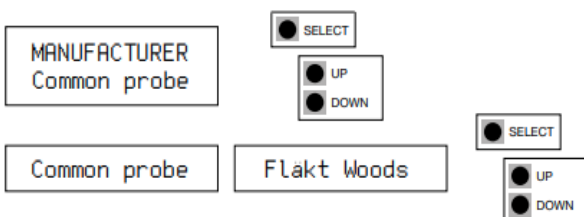
For CE compliance, a properly grounded shielding cable is required.

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



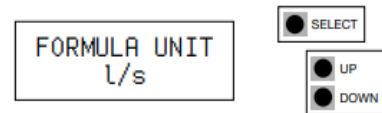
## STEP 3: CONFIGURATION

- 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 *Common probe* when using DPT-Flow with a common measurement probe that follows the formula:  $q = k \cdot \sqrt{\Delta P}$  (i.e. FloXact)



## CONFIGURATION CONTINUED

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



- 4) Select K-value

a. If manufacturer selected in step 1:

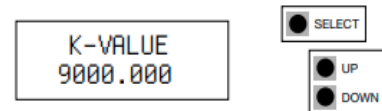
Each fan has a specific K-value. Select the K-value from fan manufacturer's specifications.

Manufacturer:	K-value:
Fläktwoods	k = 0,3...99
Rosenberg	k = 37...800
Nicotra	k = 10...1500
Comefri	k = 10...2000
Ziehl	k = 10...1500
Ebm-papst	k = 10...1500
Gebhardt	k = 50...4700

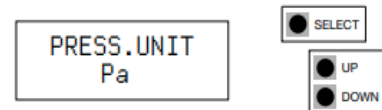
b. If *Common probe* selected in step 1:

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

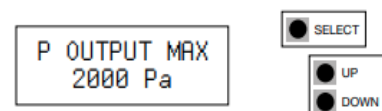


- 5) Select pressure unit for display and output: Pa, kPa, mbar, inWC or mmWC



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



- 7) Select flow unit for display and output:

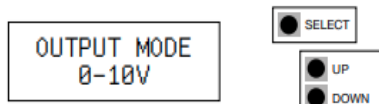
Flow volume: m<sup>3</sup>/s, m<sup>3</sup>/h, cfm, l/s, none

Velocity: m/s, f/min



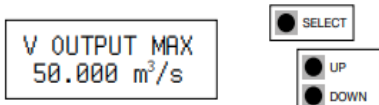
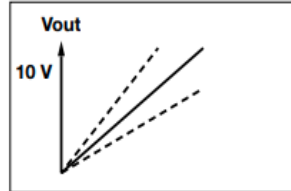
## CONFIGURATION CONTINUED

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.

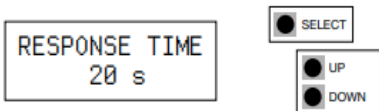


9) Flow output scale (V OUT): Select flow output scale to improve output resolution.

Unit:	Range:
m3/s	0.025-50
m3/h	100-200,000
cfm	50-100,000
l/s	25-50,000
m/s	1.0-100
f/min	200-20,000



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



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



## STEP 4: ZEROING THE DEVICE

**NOTE!** Always zero the device before use.

To zero the device two options are available:

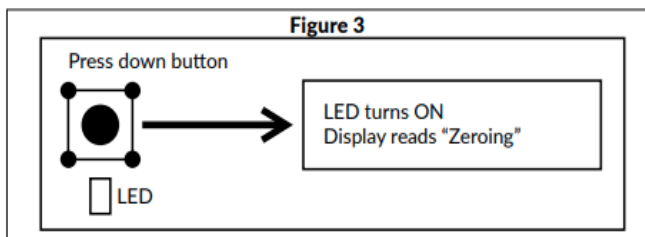
- 1) Manual Pushbutton zero point calibration
- 2) Autozero calibration

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 -.



## STEP 4: ZEROING THE DEVICE CONTINUED

- 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.

## -40C MODEL: OPERATION IN 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 in 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 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.