



Features and Benefits

- IP65 Housing
- Duct fixing kit included
- Re-zero facility

Technical Overview

The PA-DPT-MOD differential pressure transmitter is ideal for measuring filter conditions, as well as many other applications in ventilation/air conditioning systems in buildings, laboratory's and clean rooms (air and non- corrosive gases).

The multifunctional transmitter can be used for measuring volume flow, velocity, and static and differential pressure. The measurements can be read and the configuration done via Modbus communication.

It can also be used with several different measurement probes such as FloXact™ or pitot tube, and air dampers.

Product Codes

PA-DPT-MOD	Modbus Air DP transmitter bi-directional -250 to +2500Pa
Suffixes (add to above part code)	
-LCD	Clear led (LCD visible)
<i>Accessories</i>	
DFK	Duct fixing kit
TEE	Tee piece air pressure (pack of 10)
PITOT	Aluminium pitot tubes (pair)
PA-TUBE-CLEAR	Clear tube 8mm o/d x 1.5mm wall, 30m reel
PA-TUBE-RED	Red tube 8mm o/d x 1.5mm wall, 30m reel
PA-TUBE-BLUE	Blue tube 8mm o/d x 1.5mm wall, 30m reel

A 'duct fixing kit' is supplied with the PA-DPT, consisting of 2m of 6mm ID plastic tubing, 2 x pitot tubes and 4 x fixing screws.

Specification

Power supply	24Vac/dc $\pm 10\%$
Consumption	<1.3W
Communication	Modbus RTU RS485
Byte format (11 bits)	
Coding system	8-bit binary
Bits per byte	1 start bit
	8 data bits, least sug. bit sent first
	1 bit for parity
	1 stop bit
Baud rate	9k6, 19k2, 38k4
Electrical connections	Terminals to suit 0.2-1.5mm ² (12-24 AWG) cables
Accuracy (from applied pressure):	
	<125Pa = 1% + ± 2 Pa
	>125Pa = 1% + ± 1 Pa
Overpressure:	
Proof pressure	25kPa
Burst pressure	30kPa
Response time	1.0 to 20s selectable
Pressure units (selectable)	Pa, kPa, mbar, "WC & "WG
Flow units (selectable):	
Volume	m ³ /s, m ³ /hr, cfm, l/s
Velocity	m/s, ft/min
Measuring element	MEMS, no flow though
Pressure connections	5mm ID tubing
Housing:	
Material	PC/GF (Halogen free, flame retardant & UV stabilized)
Dimensions	125 x 105 x 85mm
Environmental:	
Operating temp.	-20 to +50°C
Storage:	-40 to 70°C
	0 to 95% non-condensing
Temp. compensated range	0 to 50°C
Protection	IP65
Country of origin	UK
Conformity	EMC, CE & UKCA Marked

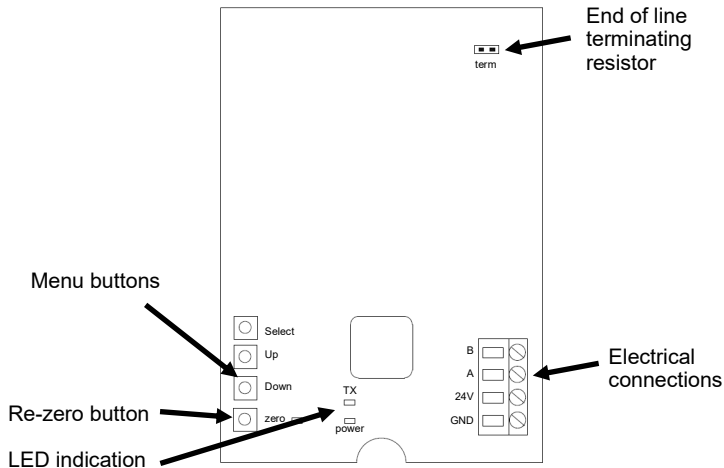
WEEE Directive:



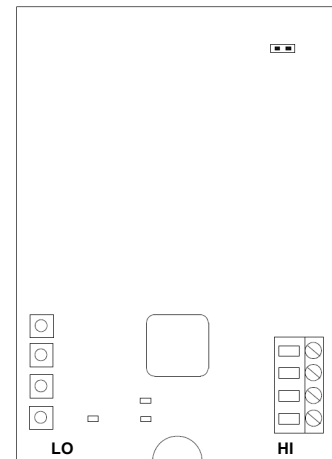
At the end of the products useful life please
dispose as per the local regulations.
Do not dispose of with normal household waste.
Do not burn.



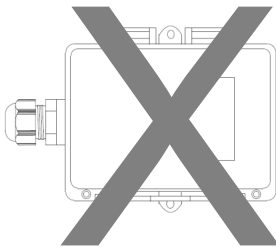
PCB Layout



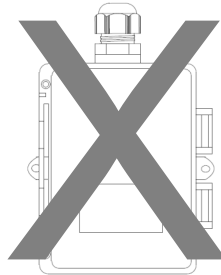
Pressure Connections



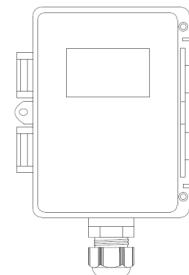
Mounting The Sensor



NO



NO



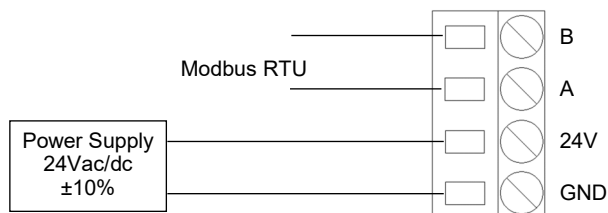
YES

Installation



Antistatic precautions must be observed when handling these sensors. The PCB contains circuitry that can be damaged by static discharge.

1. If the sensor is to be mounted outside, it is recommended that the unit be mounted with the cable entry at the bottom. If the cable is fed from above then into the cable gland at the bottom, it is recommended that a rain loop be placed in the cable before entry into the sensor.
2. In a suitable location, drill two holes at 92mm $\varnothing$ and fix the housing with appropriate screws (see mounting positions above).
3. Release the snap-fit lid by gently squeezing the locking tab and feed the cable through the waterproof gland & terminate the cores at the terminal block.



Installation (continued)

4. Configuration:

The flow unit *none* is selected by default and the display only shows the pressure reading.

If using with flow meter follow instructions below, if using as a DP sensor please skip to e)

Flow meter

- a) Push the SELECT button for 2 seconds
- b) Select function mode if the flow meter:
 - Select *Manufacture* when connection to a fan with pressure measurement points
 - Select *Common* probe when using with a common measurement probe with the formula:
 $q = k \cdot \sqrt{\Delta P}$ (i.e. FlowXact)
- c) If *Common probe* selected: select measurement units used in formula (aka Formula unit) (i.e. l/s)
- d) **K-value**
 - i) If manufacture selected in step a. Each fan has a specific k-value. Select k-value from fan manufacture turer's spec.

Manufacture	k-value
Flaktwoods	k = 0,3...99
Roseberg	k = 0,37...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
 - ii) If common probe selected in step a. Each common probe has a specific k-value. Select the k-value from common probe manufactures specifications.
Available k-range: 0.001...9999.000.
- e) **Pressure Unit** Select pressure unit for display: Pa, kPa, mbar, mmWC, "WC, psi or none.
- f) **Flow Unit** Select flow unit for display: Flow volume, m³/s, m³/h, cfm, l/s none (default)
Velocity, m/s, f/min, none
- g) **Response Time** Select response time between 1.0 & 20 seconds
- h) **Address** Select address for Modbus, 1 to 247
- i) **Baud Rate** Select baud rate, 9600/19200/38400
- j) **Parity Bit** Select parity bit, None/Even/Odd
- k) **Select Exit** Push select button to save changes and to exit menu

5. Manual Push button zero point calibration NOTE: Supply voltage must be connected at least one hour prior to zero point adjustment

- i) Disconnect both pressure ports.
- ii) Press the zero button until the LED (red) turns on and the display reads "zeroing".
- iii) The Zeroing of the device will proceed automatically. When complete the LED turns off and the display reads 0.
- iv) Re-install the pressure tubes ensuring that the high pressure tube is connect to the port labelled as + & the low pressure tube is connect to the port labelled as -.

7. Ensure the tubing is cut square and push the pressure tubing firmly over the barb and thread of the pressure ports on the unit. Ensure that the Hi and Lo ports have been correctly identified (see PCB for identification)

6. Snap shut the lid. Leaving some slack inside the unit, tighten the cable gland onto the cable to ensure water tightness.

It is recommended that screened cable be used and that the screen should be earthed at the controller only. Care should be taken not to lay control signal wiring in close proximity to power or other cables which may produce significant electromagnetic noise.



CAUTION

The PA-DPT-MOD will be damaged if subjected to excessive pressure. Do NOT test the unit by blowing into the inlet ports.

End of Line Termination

The PA-DPT-MOD is fitted with a end of line terminating resistor. This should ONLY be used at both ends of the network.

It is situated at the top of the PCB on the right hand side (see PCB layout on previous page). Fit jumper if required.

Modbus Registers

Function code 04 - Read input register

Register	Parameter description	Data type	Value	Change
3x0001	Program version	16 bit	0...9900	0,00...99,00
3x0002	Pressure Reading	16 bit	-250...2500/7000	-250...250/7000Pa
3x0003	Flow m³/s	16 bit	0...10000	0...100 m³/s
3x0004	Flow m³/h	16 bit	0...30000	0...30000 m³/h
3x0005	Flow cfm	16 bit	0...30000	0...30000 cfm
3x0006	Flow l/s	16 bit	0...3000	0...3000 l/s
3x0007	Velocity m/s	16 bit	0...1000	0...100 m/s
3x0008	Velocity f/min	16 bit	0...5000	0...5000 f/min

Function code 06 - Write single register

Register	Parameter description	Data type	Value	Change
4x0001	Manufacture	16 bit	0...7	0...7
4x0002	Formula unit (Manufacture =7)	16 bit	0...5	0: m³/s, 1: m³/h, 2: cfm 3: l/s, 4: m/s, 5: f/min
4x0003	K-factor Integer	16 bit	0...9999	0...9999
4x0004	K-factor decimal	16 bit	0...999	0...999
4x0005	Response time	16 bit	1...20	1...20 s

Function code 016 - Write multiple register

Register	Parameter description	Data type	Value	Change
4x0001	Manufacture	16 bit	0...7	0...7
4x0002	Formula unit (Manufacture =7)	16 bit	0...5	0: m³/s, 1: m³/h, 2: cfm 3: l/s, 4: m/s, 5: f/min
4x0003	K-factor Integer	16 bit	0...9999	0...9999
4x0004	K-factor decimal	16 bit	0...999	0...999
4x0005	Response time	16 bit	1...20	1...20 s

Function code 05 - Write single coil

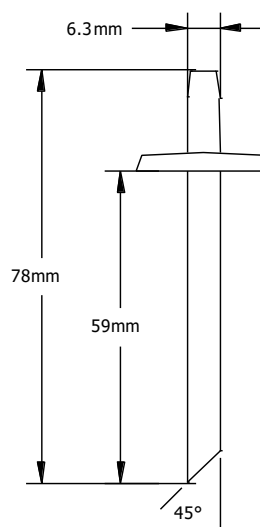
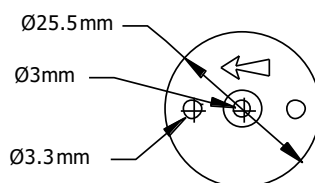
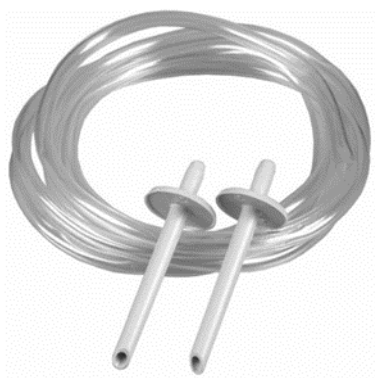
Register	Parameter description	Data type	Value	Change
0x0001	Zero point calibration	Bit 0	0...1	On - Off

Function code 03 - Read input holding register

Register	Parameter description	Data type	Value	Change
4x0001	Manufacture	16 bit	0...7	0...7
4x0002	Formula unit (Manufacture =7)	16 bit	0...5	0: m³/s, 1: m³/h, 2: cfm 3: l/s, 4: m/s, 5: f/min
4x0003	K-factor Integer	16 bit	0...9999	0...9999
4x0004	K-factor decimal	16 bit	0...999	0...999
4x0005	Response time	16 bit	1...20	1...20 s

Duct Fixing Kit

A 'duct fixing kit' is supplied with the PA-DPT-MOD consisting of 2m of 5mm i/d plastic tubing, 2 x pitot tubes and 4 x fixing screws.



Whilst every effort has been made to ensure the accuracy of this specification, Sontay cannot accept responsibility for damage, injury, loss or expense resulting from errors or omissions. In the interest of technical improvement, this specification may be altered without notice.