



## Features and Benefits

- Field selectable multi-ranges
- Field selectable multi-output
- Simple 5 step set-up
- Duct fixing kit included
- IP65 Housing
- Long term stability

## Technical Overview

The PA-65-x range of multi-configurable pressure sensors are designed for differential pressure measurements of air and other neutral gases. The unit is especially suited for measurement and control in HVAC applications.

The PA-65-x pressure transducers sense differential or gauge (static) pressure and convert this pressure difference to a proportional electrical output for either field selectable unidirectional or bidirectional pressure ranges. The PA-65-x series is offered with field selectable ranges and analogue outputs of 0-5Vdc, 0-10Vdc, or 4-20mA.

The measurement cell uses an advanced design of capacitive element to ensure excellent linearity and zero stability. The differential pressure to be measured induces a movement of the stainless steel diaphragm which is converted to an electronic output signal by a capacitance measurement and a unique electronic circuit.

## Product Codes

<b>PA-65-0</b>	Selectable range; Uni-directional 0-50, 0-100, 0-150, 0-200Pa Bi-directional $\pm 50, \pm 100, \pm 150, \pm 200\text{Pa}$
<b>PA-65-1</b>	Selectable range; Uni-directional 0-250, 0-500, 0-750, 0-1000 Bi-directional $\pm 250, \pm 500, \pm 750, \pm 1000\text{Pa}$
<b>PA-65-2</b>	Selectable range; Uni-directional 0-750, 0-1500, 0-2250, 0-3000 Bi-directional $\pm 750, \pm 1500, \pm 2250, \pm 3000\text{Pa}$

*For options add suffix to the partcode (at extra cost):*

<b>-CL</b>	Clear lid (LCD visible)
<b>-S</b>	Static pressure probe

## Accessories

<b>DFK</b>	Duct fixing kit
<b>TEE</b>	Tee piece air pressure (pack of 10)
<b>PITOT</b>	Aluminium pitot tubes (pair)
<b>PA-TUBE-CLEAR</b>	Clear tube 8mm o/d x 1.5mm wall, 30m reel
<b>PA-TUBE-RED</b>	Red tube 8mm o/d x 1.5mm wall, 30m reel
<b>PA-TUBE-BLUE</b>	Blue tube 8mm o/d x 1.5mm wall, 30m reel

## Specification

Accuracy RSS*	$\pm 1.00\%$ fsd
(at constant temp)	
Linearity (BFSL)	$\pm 0.98\%$ fsd
Hysteresis	$\pm 0.10\%$ fsd
Repeatability	$\pm 0.05\%$ fsd
Thermal effects**	
Comp. range	0 to 50°C
Zero/span shift	0.054%FS/°C
Overpressure	68kPa
Long term stability	2% FS/yr max.
Pressure connections	Push fit for 6mm i/d tube
Output:	
Current	4-20mA, load = 0 to 800Ω
Voltage	0-10Vdc (o/p impedance 300Ω)
Power supply:	
Current output	13-30Vdc
Voltage output	13-30Vdc or 18-24Vac
Speed of reaction	Selectable
Electrical Connections	Screw terminals for 1.5mm <sup>2</sup> max.
Optional static probe	196 x 6mm dia.
Diaphragm	Stainless steel 304
Housing:	
Material	ABS (flame retardant type VO)
Dimensions	116 x 106 x 52mm
Ambient:	
Temp	0-50°C
Humidity	0-85% non-condensing
Protection:	
Snap-shut lid	IP54 IP65 (see installation notes)
Country of origin	UK
Conformity	EMC, CE & UKCA Marked

\* RSS of Non-linearity, non-repeatability & hysteresis  
\*\* Units calibrated at nominal 21°C

## 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.



## Installation



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

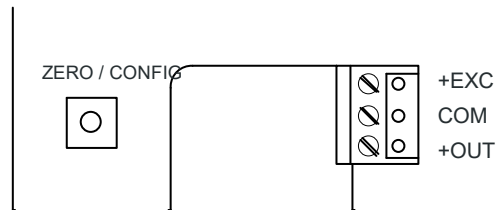
1. If the sensor is to be mounted outside, do not mount in direct sunlight and it is recommended that the unit be mounted with the cable entry at the bottom. If the cable is fed from above then into the cable gland at the bottom, it is recommended that a rain loop be placed in the cable before entry into the sensor.
2. In a suitable location, drill two holes at 92mm and fix the housing with appropriate screws.
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 (see below for details). Leaving some slack inside the unit, tighten the cable gland onto the cable to ensure water tightness.
4. Power the unit, depending output signal type.

4-20mA;

- +EXC 13-30Vdc only
- COM 4-20mA output
- +OUT No connection

0-5Vdc or 0-10Vdc;

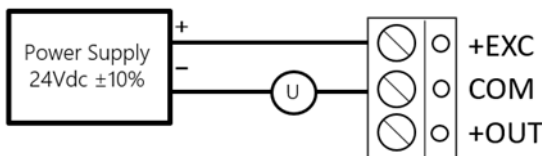
- +EXC 13-30Vdc or 18-24Vac
- COM Common 0V
- +OUT 0-5Vdc or 0-10Vdc output



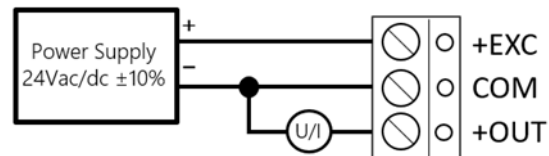
5. Select the pressure type, pressure range, output type and response time.
6. Push the pressure tubing onto the pressure ports on the unit. Ensure that the Hi and Lo ports have been correctly identified.
7. Snap shut the lid after the connections have been made if IP65 protection is required, secure the lid with two screws provided.
8. 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.

## Example Connections

4-20mA Loop Powered (2-wire)



0-10Vdc (3-wire)



### CAUTION



The PA-65-x will be damaged if subjected to excessive pressure. Do NOT test the unit by blowing into the inlet ports.

### Note:

PA-65-2 Display Range

The display can only show 4 digits, for the ranges 1500Pa, 2250Pa & 3000Pa these are shown as 1.50kPa, 2.25kPa & 3.00 kPa.

## Zero Adjustment & Mounting

Holding the Zero /Config button down for 2 seconds will do a zero or span operation depending on the differential pressure being at zero pressure or if the diff pressure is near full range pressure it will do a span adjust. If the button is held down for 5 seconds, the menu will be entered.

If the sensor cannot be re-zeroed in the following instances;

- A) If the sensor is configured as uni-directional and the displayed value is negative
- B) If the displayed value is more than 10% of the range

In the case of "A)", temporarily setting the direction to bi-directional should allow the sensor to be zeroed.

In the case of "B)", temporarily setting the span to 1000PA should allow the sensor to be zeroed.

Orientation sensitivity is intrinsic to the design of the sensor, so it is important to zero the sensor in its installed position. For example, if the sensor is zeroed while flat on a bench, the displayed value is likely to be at least 20Pa different if the sensor is subsequently installed in an up-right position.

If the sensors are to be installed in free outside air to measure static pressure, where wind gusts are a potential issue, then the open port should be connected to tubing that is routed to a protected area, as even moderate wind blowing across the open sensor port can result in measurement inaccuracies.

## -S Static Probe Option

1. Screw the optional static probe into the base of the housing (see fig.1) and release the snap-fit lid, by gently squeezing the locking tab.
2. Carefully remove the red pressure hose from the port marked "BASE PORT" and place on the "DUCT PROBE" pressure nipple (see fig. 2).
3. Fix the housing to the duct in a suitable location with appropriate screws then proceed with installation instructions from "4" from section "Connections" on previous page.

Fig. 1

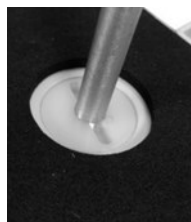


Fig. 2



## Programming Quick-start Guide

When the unit is first powered up unit will toggle through the following:

- Pressure range setting
- Analog output setting
- Unit will then revert back to normal operating mode.

All parameters are set in the following sequence;

- Uni or Bi directional setting (dlr)
- Pressure range setting (SPan)
- Analog output setting (OUP)
- Pressure unit (Unlt)
- Response time setting (FILt)
- Factory use only (- SP -)
- Factory use only (FCAL)

Unit will then revert back to normal operating mode.

Press on hold "ZERO/CONFIG" button for approx. 5 sec. the display will blink until CONF appears. After blinking the unit will stop on dlr which prompts you to set the directional range of the unit.

- Hold the ZERO/CONFIG button down for 2 sec. and the display will blink after blinking-unit will stop on previously selected direction range
- Push the ZERO/CONFIG button down quickly to toggle between BI and Uni
- Determine if you want Uni or bidirectional settings - after the determination is been made hold the ZERO/CONFIG button down for 2 sec. - until the display blinks
- BI or Uni will now blink verifying which mode was chosen
- dlr will reappear on the display signifying that the unit has been set for that parameter

## Programming Quick-start Guide (continued)

Push the ZERO/CONFIG button quickly. SPAn will appear which prompts you to set the pressure range of the unit.

- Hold the ZERO/CONFIG button down for 2 sec. and the display will blink after blinking-unit will stop on the previously selected pressure range
- Push the ZERO/CONFIG button down quickly to toggle between four different ranges available on the product
- Determine what pressure range is required- after the determination is been made hold the ZERO/CONFIG button down for 2 sec.
- The pressure range will now blink verifying which mode was chosen
- SPAn will reappear on the display signifying that the unit has been set for that parameter.

Push the ZERO/CONFIG button quickly. OUP will appear which prompts you to set the analog output of the unit.

- Hold the ZERO/CONFIG button down for 2 sec. and the display will blink after blinking-unit will stop on the previously selected analog output
- Push the ZERO/CONFIG button down quickly to toggle between three different output ranges available on the product
- Determine what analog output is required- after the determination is been made hold the ZERO/CONFIG button down for 2 sec.
- The output chosen will now blink verifying which mode was chosen
- OUP will reappear on the display signifying that the unit has been set for that parameter

Push the ZERO/CONFIG button quickly. FILt will appear which prompts you to set the response time of the product.

- Hold the ZERO/CONFIG button down for 2 sec. and the display will blink after blinking-unit will stop on the previously selected response time
- Push the ZERO/CONFIG button down quickly to toggle between four different response ranges available on the product  
Slow - 6 sec. Off - 0.3 sec. Fast - 1.5 sec. Normal - 3 sec.
- Determine what responsiveness is required- after the determination is been made hold the ZERO/CONFIG button down for 2 sec.
- The response time will now blink verifying which mode was chosen
- FILt will reappear on the display signifying that the unit has been set for that parameter

At this time, you have completed the selection of all settings for the product.

Push the ZERO/CONFIG button quickly. donE will appear which prompts you to set the completed settings

- Hold the ZERO/CONFIG button down for 2 sec. and the display will blink after blinking-unit will toggle through all the selections that have been made in sequence and will then revert back to normal operation

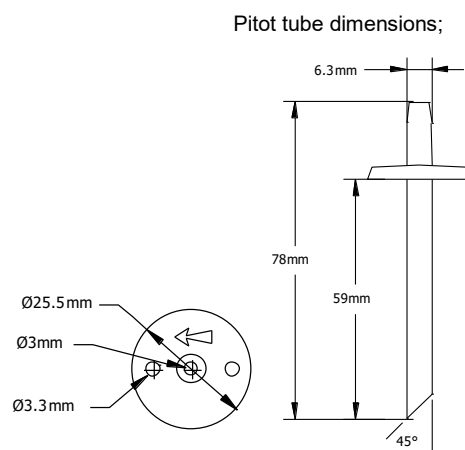
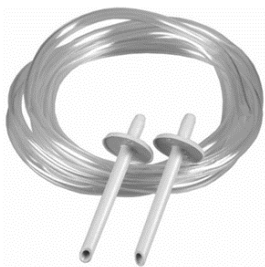
## Tubing

It is recommended for best results (shortest response times)

- 6mm i/d tubing lengths up to 30.5m
- 7mm i/d tubing lengths up to 91.5m
- 9.5mm i/d for tubing lengths up to 274m

## Duct Fixing Kit

A 'duct fixing kit' is supplied with the PA-65-x, 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.