# Constant Air Pressure Controller


The TPAPC-500 Constant Air Pressure Controller with integrated pressure measurement sensor is designed to provide a compact low cost solution for air pressure control.

Operating on a 24V AC/DC supply the controller action is PI and caters for multiple pressure ranges (0-100Pa, 0-200Pa, 0-300Pa, 0-400Pa and 0-500Pa) which are set by the operating pressure range option switches.

The TPAPC-500 employs a solid state temperature compensated pressure cell with microprocessor to provide superior linearity, measurement accuracy and control.

The TPAPC-500 incorporates 3 potentiometers for the controller setpoint (SP), the proportional band (Pb) and the minimum control voltage output (MV). In addition to the setting potentiometers there is a 4 way option switch that can be used for setting the control output response time (slew rate). The controller incorporates a red LED for power on and loss of pressure fault indication.

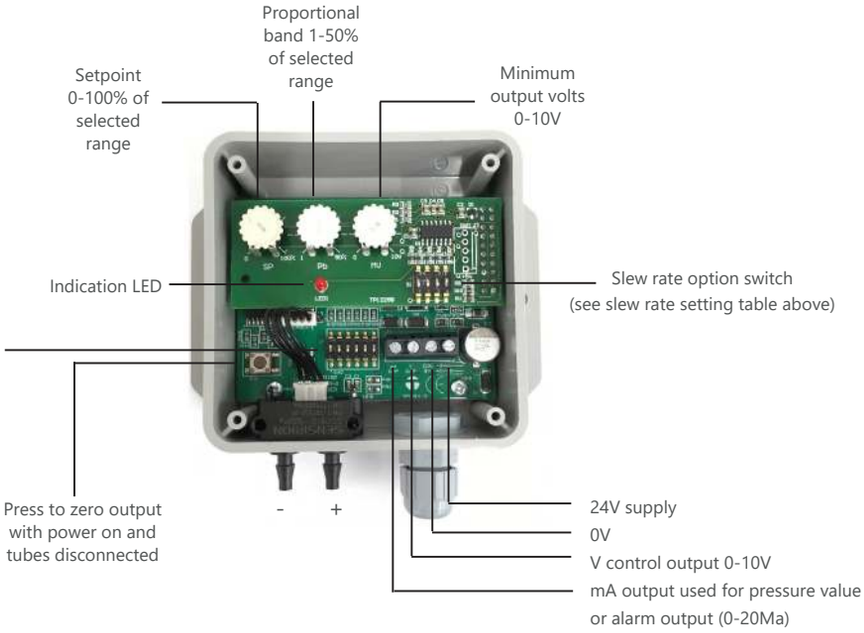
The controller comes fully calibrated and incorporates a push button to calibrate to zero pressure.

## Specification

| | |
|---|---|
| Material: | Flame retardant ABS (IP51) |
| Power Supply: | 24V AC/DC +/- 10% |
| Power Consumption: | 30mA maximum |
| Control Output: | 0-10V |
| Accuracy: | (@ 25°C) +/- 5Pa |
| Operating Temperature: | -10°C to +70°C |
| Operating Humidity: | 0-80% RH non condensing |
| Selectable Ranges: | 0-100Pa, 0-200Pa, 0-300Pa, 0-400Pa, 0-500Pa |
| Pressure Cell Hysteresis: | +/- 5Pa |
| Dimensions: | 95mm (h) x 107mm (w) x 34mm (d) |
| Country of Origin: | UK |
| Product Code: | TPAPC-500 |

## Connections

| Range | SW1 | SW2 | SW3 |
|---|---|---|---|
| 0-100 | Off | Off | Off |
| 0-200 | On | Off | Off |
| 0-300 | Off | On | Off |
| 0-400 | Off | Off | On |
| 0-500 | On | On | On |
| SW4 | Off = standard 4-20mA monitoring or pressure (default)<br>On = alarm output (0-20mA). See alarm section | | |
| SW5 | Is not used | | |
| SW6 | Is not used | | |

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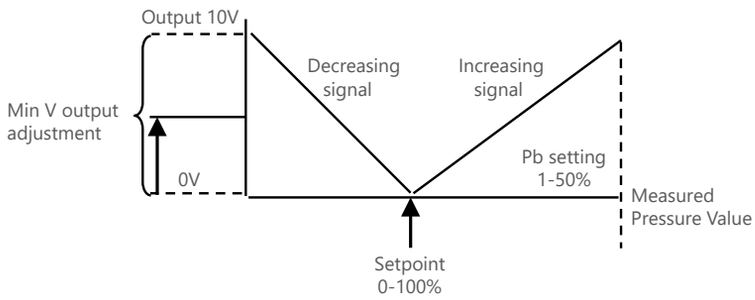
| Switch | Selection | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | Off | On | Off | Off | On | On | Off | On |
| 2 | Off | Off | On | Off | On | Off | On | On |
| 3 | Off | Off | Off | On | Off | On | On | On |
| Time (sec) | 10 | 25 | 50 | 75 | 100 | 125 | 150 | 175 |
| 4 | On= Decrease Output with Increase Pressure<br>Off= Increase Output with Increase Pressure | | | | | | | |

Option switch 4 on the setting board sets the output operation.




**Alarm Action (Range SW4 on)**

The constant pressure controller normally operates with a minimum of 2v output and can go up to a maximum of 10V dependant on the ventilation demand.
If the fan fails to run then the pressure controller will measure a drop in duct pressure and automatically increase the fan voltage control output to try and speed up the fan.

The controller outputs a fan fail alarm signal based on the duct pressure and using the mA output for alarm signalling the following actions take place:

• The controller monitors the actual differential pressure and if the duct pressure falls below 5% of the selected pressure range for +2 minutes then the controller detects that the fan is not running and the controller will output a 12mA signal for an alarm indication of fan failure (no duct pressure).
• Should the fan start up in the above alarm state then the pressure sensor will detect an increase in duct pressure and the controller automatically clears the alarm condition by changing the mA output to the minimum value (zero) when the measured pressure rises above 5% of the set range for 10 sec.
• Using the mA output for the alarm trigger the controller output changes the values to:-
  - No pressure (below 5% of the range) for 2 min go to alarm state output = 12mA
  - Duct pressure above 5% of the range after 10 seconds clear alarm output = 0mA
• From a power cycle the controller will inhibit the alarm state (no pressure on start-up) for the alarm delay period of 2min. Should there be no increase in duct pressure from a power up state then the controller will output the alarm state after a delay of 2 min.
• If from a power up the pressure increases above 5% of the range for the required 10 seconds then any alarm state from power up will be cleared.