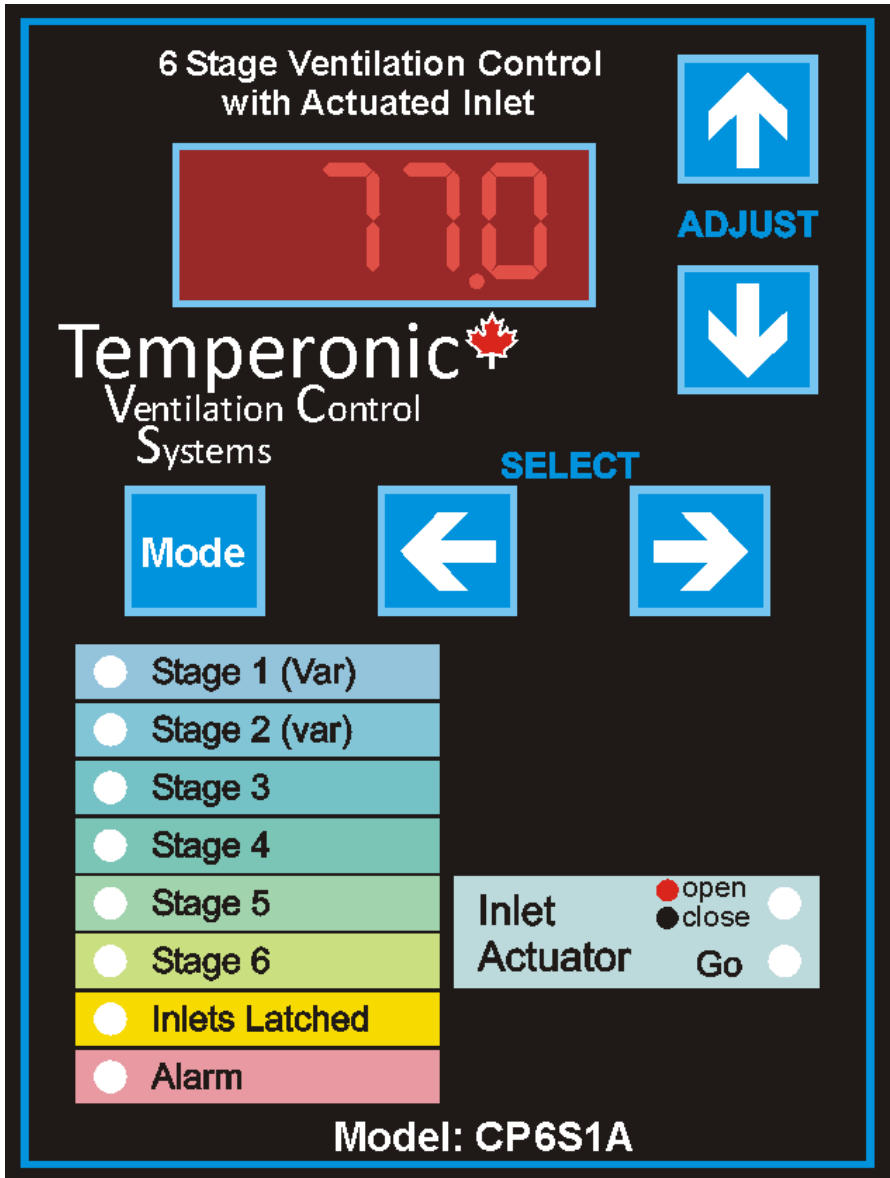


# Temperonic 6 Stage Actuated Inlet Controller



Operators Manual

21-Apr-2009

Version C6. A

## Controller Features:

- 2 Variable Speed Fans
- 4 On/Off Fan or Heat Stages with Timer.
- 1 Inlet Actuator Using Potentiometer Feedback.
- 2 Indoor Temperature Probes
- Select a Probe for each Heat Zone.
- LED Display of Temperature for Quick and Easy Reading Even From Far Away.
- 10 LED Indicators to Show Stage Status
- Growth Curve Allows Automatic Adjustment of Temperature and Minimum Ventilation rate.
- High and Low Temperature Alarms
- Records High and Low temperatures for Each Probe.
- 8 Fan Motor Curves for Fine-Tuning of Fan Speeds
- Records Run Times of On/Off Stages and Number of Times the Inlet has Moved.
- Can be configured for 4 Stage, 2 Actuator Zoned Operation

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# Controller Features

4 Digit  
Temperature  
Display.

6 Stage Ventilation Control  
with Actuated Inlet

77.0



ADJUST



Status Indicators. Indicators  
flash to warn of unusual  
conditions.

Mode

Stage 1 (Var)

Stage 2 (var)

Stage 3

Stage 4

Stage 5

Stage 6

Inlets Latched

Alarm

SELECT



5 Buttons used to easily  
modify and save  
parameters. Use the  
buttons to scroll through  
display information.

Inlet  open

Actuator  close

Go


Output indicators show  
when inlets or output  
stages are active.



Model: CF

## Control Operation




Under normal operating conditions, the control will show the average room temperature on the red LED display. Any Alarm codes will flash on the display.



The  button can be used to change from display mode to settings mode or even hidden settings mode.

The  and  buttons will scroll through the various display mode values. The  and  buttons will display additional information.


## Factory Settings

At times, it may be necessary to completely reset a control to the factory settings. This is accomplished by holding down the 3 buttons ,  and  as the power is turned on to the control.




The buttons must be held down until the display which indicates that the EEPROM settings have been loaded with the factory default values.

## Alarms

When the control encounters an alarm condition, an alarm code will flash on the LED display. The Alarm Output indicator will also flash. If an external alarm is connected, it will be activated (for any alarms other than Power Failure Reset). When the alarm condition has been cleared, the  button will reset the alarm.

The LED Display will normally show the average room temperature. In the event of an alarm condition, the LED display will flash alarm codes 4 times. The following codes may appear.

<i>LED Display</i>	<i>Alarm Description</i>
H 1 1	High temperature Probe 1
H 1 2	High temperature Probe 2
L 0 1	Low temperature Probe 1
L 0 2	Low temperature Probe 2
noPb	No valid probes are connected. The control will run the fan at minimum.
1 1CL	Inlet close alarm – Inlet is not moving when attempting to close it.
1 1OP	Inlet open alarm – Inlet is not moving when attempting to open it.
1 2CL	Inlet close alarm – Inlet is not moving when attempting to close it.
1 2OP	Inlet open alarm – Inlet is not moving when attempting to open it.
PF	Power Failure Reset. This appears after the controller has reset – usually due to a power failure.

When alarms have occurred, be sure you **do not press** the  button since this will clear all alarms. Once all the alarm codes have been noted, the mode button may be pressed to clear the alarms. The alarm condition must have been corrected in order to clear the alarm code.

# Display Mode:

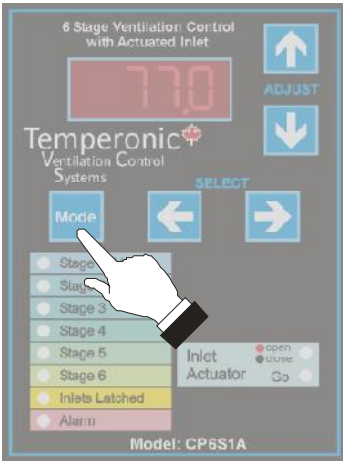
To return to the default display mode:

Press the **Mode** Button. If the display flashes **P i O I** then press the mode button again. The display will then show the average temperature of the connected sensors.

The **▲** arrow will show the high average temperature reading since the last reset and the **▼** arrow will show the low average temperature reading since the last reset.

**NOTE:** Control will automatically return to the default display mode 2 minutes after the last button press.

From the default display mode, use the select arrows **◀** and **▶** to display various values. These values are described in the following sections.



## **d 1** Fan 1 Speed

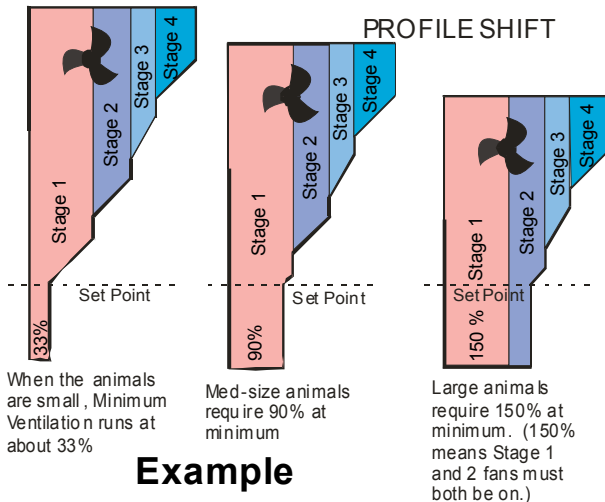
This display Parameter shows the speed of Fan 1.

## **d 2** Fan 2 Speed

This display Parameter shows the speed of Fan 2.

## **d 5** Profile Shift Due to Room Minimum.

This display Parameter shows how far the ventilation profile has been shifted to ensure the Room Minimum ventilation rate is in effect.





The control shifts the entire ventilation profile in order to meet the target room minimum. This ensures that the control will still respond to temperature changes properly and yet will maintain the desired minimum speed on both stages 1 and 2.



## Example






## **d 11** Probe 1 Temperature

This display Parameter shows the temperature at probe 1. Use the  arrow to show the highest reading on this probe since the last reset. The  arrow will show the lowest temperature. Press both arrows to reset the high/low readings for all the probes and the room average.





## **d 12** Probe 2 Temperature

This display Parameter shows the temperature at probe 2. Use the  arrow to show the highest reading on this probe since the last reset. The  arrow will show the lowest temperature. Press both arrows to reset the high/low readings for all the probes and the room average.

## **d 30** Time Since Last High/Low Reset

This display Parameter shows the time since the last high/low temperature reset. Usually, this value will be displayed in hours and minutes HH.MM. Use the  arrow to show the seconds. If the reset is not used for a long time, it is quite possible for the time since reset to be measured in days. When this happens, the value displayed will be in days (with 2 decimal places) and the display will flash **dAYS** to indicate that the measurement is in days instead of hours and minutes. Use both  and  to reset the high and low readings and reset this timer to 0. Be sure to record the high and low values before performing the reset.

## **d 33** Stage 3 Run Time

This display Parameter indicates how long Stage 3 has run since the last reset. This value is displayed as HH.MM. Press the  arrow to display the seconds portion of the run time. Press the  arrow to display the time since last reset. (The stage run-times are completely separate from the high/low temperature readings.) Pressing both  and  will reset the run time readings for all stages. Be sure to record all the run times before activating the stage run-time reset. These button functions are the same for display Parameters 33, 34, 35, 36 and 41. The maximum allowable value is 99.59 (or about 4 days). It is important to record and reset the run-time values daily.

## **d 34** Stage 4 Run Time

This display Parameter indicates how long Stage 4 has run since the last reset.

## **d 35** Stage 5 Run Time

This display Parameter indicates how long Stage 5 has run since the last reset.



## **d 36** Stage 6 Run Time

This display Parameter indicates how long Stage 6 has run since the last reset.



## **d 41** Number of Times the Inlet Moved

This display Parameter indicates how many times the inlet actuator moved since the last run-time reset. Up to 9999 movements can be counted. When Inlet 2 is activated by turning of Stage 5 and 6, **d 42** will appear for inlet 2.





## **d 50** Inlet Target

This display Parameter shows what the inlet target position is as a % from 0.0 to 100.0. In the event that the inlet function has not been activated by Hidden Parameter P213 then the display will show **idLE** instead of a %. Press  arrow to display the Inlet 1 target and press  arrow for Inlet 2 target.

## **d 51** Inlet Actual Position and Manually Move.

This display Parameter shows the actual inlet position. When the inlet has been activated and calibrated, then this value will show up as a value between 0.0 and 100.0%. When the inlet is being calibrated, the control will display the raw Analog to Digital reading as a value between 0 and 8191. Once the calibration is complete, then the position value will appear as a %. When the display is showing a %, the inlet actuator can be manually operated. Use the  arrow to close the inlet and  to open it. If the manual move button is held for about 10 seconds, the inlet will “Latch”. This is indicated by the flashing light “Inlets Latched”. Once latched, the inlet will continue to move in the selected direction even when the button is released. This is useful for those times when it is necessary to completely open the inlets. Note that pressing the opposite direction or pressing the mode button will cancel the latched condition and return the inlets to normal operation. Pressing both arrows will cause the inlet to be calibrated but only if Parameter 213 has been set to On. when Stage 5 and 6 are off, **d 52** will appear to allow manual movement of Inlet 2.

## **d 60** Growth Curve Display.

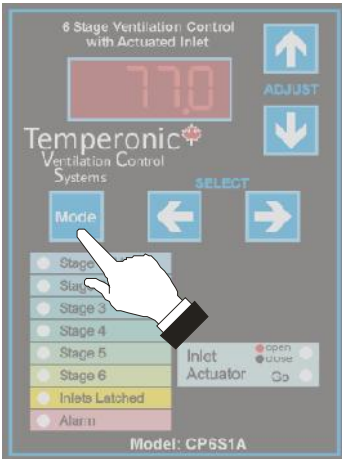
If the growth curve has been activated (by setting Parameter P182 to a value greater than 1 then this parameter will show the number of days into the growth curve. It is possible to manually adjust the number of days using Hidden Parameter P274. Pressing both the  and  arrows will reset the growth curve day to 0. If the  arrow is held, the target temperature will be displayed. If the  arrow is held, the target Room Minimum is displayed.

## **d 99** Version

Parameter 99 displays the controller firmware version information.

# Standard Settings:

To view or modify Standard Settings,



Press the **Mode** Button. If the display flashes **P 101** then you are in the Standard Settings Mode. You may need to press the **Mode** Button a second time to get **P 101** to appear on the display.

The **▲** arrow will increase Parameter values. The **▼** arrow will decrease Parameter values.

The control may show **SECU** when attempting to change a value. See Parameter 281 to turn off the security setting.

NOTE: Control will automatically return to the default display mode 2 minutes after the last button press.

Use the select arrows **◀** and **▶** to choose various parameters.

## **P 101** Set Point

This parameter is the reference temperature. Most other temperature settings are set up relative to this reference temperature. This means that a setting such as the Stage 2 turn-on **P 107** may be set at +3.0° above the Set Point and a heater may be set up to turn on at -1.0° below the Set Point. Then when the Set Point is raised or lowered, the point at which Stage 2 turns on and where the heater turns on will follow the change to the Set Point. If the growth curve is being used, it may not be possible to modify this value (the display will show **CUr** when an attempt is made to change the value with the arrow buttons.)

## **P 102** Room Minimum

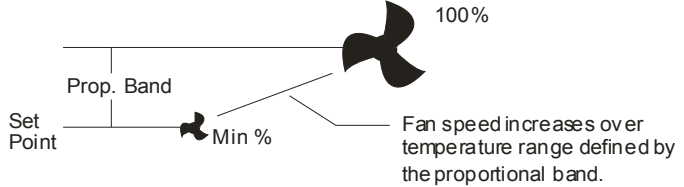
The Room Minimum controls the minimum rate of ventilation. This can be anywhere from about 40% up to 200%. When a value above 100% is used, the control will ensure that Stage 1 and Stage 2 will always be running (See Parameter **d 5** in display mode). This allows Stage 2 to be used as part of the minimum ventilation rate. If the growth curve is being used, this value can not be modified.

*If security settings are set, it may not be possible to adjust anything other than settings 101 and 102. (See Parameter **P281**)*

## **P 104** Stage 1 Minimum

The Stage 1 Minimum (in %) controls how slowly the Stage 1 fan will be allowed to run. This setting must be set high enough to provide the fan motor with sufficient cooling (louvers should always be open at least 1").

The proportional band is usually between 1.0°F and 3.0°F. It may be lower for small rooms and higher for large rooms.



## **P 105** Stage 1 Prop. Band

The Stage 1 Proportional Band defines a temperature range. This range begins at the Set Point. If the room temperature is the same as the Set Point, the Stage 1 fan will run at minimum speed. When the room temperature reaches Set Point + the value of this setting (Stage 1 Prop. Band) the fan will be running at full speed.

## **P 107** Stage 2 Turn-On

Set this value to indicate when Stage 2 is to turn-on. Stage 2 should turn on about 0.2°F to 0.6°F above the point where Stage 1 is running at full speed. This setting should be set slightly higher than the value specified in Parameter 105. Note that when Stage 2 does turn on, Stage 1 will slow down to match the speed of Stage 2 and they will both increase in speed together. Hidden parameter 202 can be used to change this if Stage 1 is used as a pit fan and should not slow down. (This setting is relative to the Set Point).

## **P 108** Stage 2 Minimum

The Stage 2 Minimum controls how slowly the Stage 2 fan will run. This setting will usually be the same or higher than the Stage 1 minimum. When Stage 2 first turns on, both Stage 1 and Stage 2 will run at the speed specified here. Be sure the fans are not running too slowly leading to overheating. This setting is usually between 45% and 70%. When speed match is on (Parameter 202), this value should be set such that Stage 1 at full speed moves the same CFM as Stage 1 and 2 running at the Stage 2 Minimum Rate.

## **P 109** Stage 2 Prop. Band

The Stage 2 Proportional Band defines a temperature range in much the same way as parameter 105. This time, however, the range begins at the Set Point + Stage 2 Turn On (Parameter 107). This proportional band usually specifies a larger range than the Stage 1 proportional band since both Stage 1 & 2 increase in speed together and Stage 2 usually involves fans that are larger than the Stage 1 fans. The typical range for this parameter is between 1.5°F and 4.0°F

### **P 111** Stage 3 Turn-On Cool

Stage 3 turns on a single speed fan. Usually this fan is larger than the fans on the variable speed stages. Set this value to turn on the Stage 3 fan after Stage 2 has reached full speed (this can be calculated by adding parameters 107 and 109). Note that when Stage 3 does turn on, Stage 1 & 2 will slow down to the value (in %) entered in the Hidden parameter 238. If Stage 1 & 2 slow down is not desired, then enter a value of 100 in Hidden parameter 238. (This setting - Parameter 111 - is relative to set point). Note that it is possible to configure Stage 3 as a Heat Stage using Parameter 203 in the Hidden Settings.

### **P 112** Stage 3 Turn-On Heat

If Stage 3 is configured to turn on as a heater, the value in this parameter (usually a negative value) indicates at what temperature Stage 3 will turn on as a heater. This value specifies a temperature relative to the Set Point.

### **P 113** Stage 3 On Time

Stage 3 can also be configured to use a timer. This timer can specify the time (in minutes) that Stage 3 will be on. The range is from 0.0 to 25.5 minutes. The timer function is typically used when Stage 3 controls a misting system or controls the open or close function of a curtain.

### **P 114** Stage 3 Off Time

This specified the time that Stage 3 will turn Off when using a timer on Stage 3.

### **P 117** Stage 4 Turn-On Cool

Stage 4 turns on a single speed fan. This parameter is usually set to a value about 1.0°F to 3°F higher than parameter 111 (Stage 3 Turn On). Note that when Stage 4 does turn on, Stage 1 & 2 will slow down to the value (in %) entered in the Hidden parameter 239. If Stage 1 & 2 slow down is not desired, then enter a value of 100 in Hidden parameter 239. (This setting - Parameter 117 - is relative to set point)

### **P 118** Stage 4 Turn-On Heat

Stage 4, like Stage 3, can be configured to turn on as a heater. The value specified here (usually a negative value relative to the Set Point) indicates at what temperature Stage 4 will turn on at.

### **P 119** Stage 4 On Time

Stage 4 can be configured to use a cycle timer. The value here indicates how many minutes Stage 4 will be **On** for.

### **P 120** Stage 4 Off Time

When using the cycle timer on Stage 4, this parameter indicates how long the Stage will be **Off** for.

### **P 123** Stage 5 Turn-On Cool

Stage 5 turns on a single speed fan. This parameter is usually set to a value about 1.0°F to 3°F higher than parameter 117 (Stage 4 Turn On). This Parameter is relative to the Set Point.

### **P 124** Stage 5 Turn-On Heat

Stage 5, like Stage 4, can be configured to turn on as a heater. The value specified here (usually a negative value relative to the Set Point) indicates at what temperature Stage 5 will turn on.

### **P 125** Stage 5 On Time

Stage 5 can be configured to use a cycle timer. The value here indicates how many minutes Stage 5 will be **On** for.

### **P 126** Stage 5 Off Time

When using the cycle timer on Stage 5, this parameter indicates how long the Stage will be **Off** for.

### **P 129** Stage 6 Turn-On Cool

Stage 6 turns on a single speed fan. This parameter is usually set to a value about 1.0°F to 3°F higher than parameter 123 (Stage 5 Turn On). This Parameter is relative to the Set Point.

### **P 130** Stage 6 Turn-On Heat

Stage 6, like the other on/off stages, can be configured to turn on as a heater. The value specified here (usually a negative value relative to the Set Point) indicates at what temperature Stage 6 will turn on at.

### **P 131** Stage 6 On Time

Stage 6 can be configured to use a cycle timer. The value here indicates how many minutes Stage 6 will be **On** for.

### **P 132** Stage 6 Off Time

When using the cycle timer on Stage 6, this parameter indicates how long the Stage will be **Off** for.

### **P 165** High Temp. Alarm

The high temperature alarm will activate if any either of the 2 probes exceeds the temperature specified here. Again, this temperature is relative to the set point so a value of 15°F would activate the alarm if the set point was 70°F and the room temperature reached 85°F. Note that the High Temp. Alarm will likely be set higher during the summer months and should be lowered as soon as the weather cools and the fans and inlet systems can maintain a more steady temperature.

## **P 166** Low Temp. Alarm

The low temperature alarm will activate if either of the 2 probes drops below the temperature specified here. This parameter is relative to the Set Point and will usually be in the range of -3.0°F to -6.0°F. It is not usually necessary to change this setting during different seasons. This alarm will indicate heating system failures.

## **P 169** Inlet Position when Fans Off

This parameter specifies how far open the inlets should be when all of the fans connected to the controller are turned off. Usually this parameter is set to 0.0%.

## **P 170** Inlet Position when Stage 1 is at Maximum

This parameter specifies how far open the inlets should be when the Stage 1 Fan has reached maximum. To properly set this parameter, calculations may be made to determine the amount of inlet required to match the CFM put out by the fan. Using the figure of 1 square foot per 1000 CFM works well for this calculation. Note that the actuator position is measured in %. Actuators may be installed with a double-pulley system so that the inlets move at ½ the speed, increasing the capacity and resolution of the inlet positioning. It is also possible to use a static pressure gauge to determine the optimal opening. To use the static pressure gauge, set the control so that stage 1 is running at 100%. Then manually adjust the actuator till the static pressure is acceptable (usually between 0.03" and 0.1" of water). Record the inlet position and enter this value into parameter 169.

## **P 171** Inlet Position when Stage 2 is at Maximum

This parameter specifies how far open the inlets should be when Stages 1 and 2 fans are both running at full speed. Again, calculations may be used to determine inlet position at this point or the static pressure method as described above can be used. Changes to the settings may need to be made to get the fans both running at 100%.

## **P 172** Inlet Position when Stage 3 Fan is on.

This parameter specifies how far open the inlets should be when Stages 1 - 3 fans are all running at full speed. Calculations may be used to determine inlet position at this point or the static pressure method as described for parameter 169 can be used. Changes to the settings may need to be made to get all fans running at 100%.

### **P 173 Inlet Position when Stage 4 fan is on.**

This parameter specifies how far open the inlets should be when Stages 1 - 4 fans are all running at full speed. Calculations may be used to determine inlet position at this point or the static pressure method as described for parameter 169 can be used. Changes to the settings may need to be made to get all fans running at 100%.

### **P 174 Inlet Position when Stage 5 fan is on.**

This parameter specifies how far open the inlets should be when Stages 1 - 5 fans are all running at full speed. Calculations may be used to determine inlet position at this point or the static pressure method as described for parameter 169 can be used. Changes to the settings may need to be made to get all fans running at 100%. Also note that it is very important to set values for un-used stages. If your control only has fans connected to stages 1-4, be sure to set the inlet position for stage 5 and 6 to the same value as stage 4. Also be sure to set the turn-on point for stage 5 and 6 above the turn-on point for stage 4.

### **P 175 Inlet Position when Stage 6 fan is on.**

This parameter specifies how far open the inlets should be when Stages 1 - 6 fans are all running at full speed. Calculations may be used to determine inlet position at this point or the static pressure method as described for parameter 169 can be used. Changes to the settings may need to be made to get all fans running at 100%. Also note that it is very important to set values for un-used stages. If your control only has fans connected to stages 1-5, be sure to set the inlet position for stage 6 to the same value as stage 5. Also be sure to set the turn-on point for stage 6 above the turn-on point for stage 5.

### **P 182 Number of Points on Curve**

This parameter (and the next 17 parameters) are used to define a growth curve. The growth curve instructs the controller to change the set point by a small amount each day. The controller can automatically reduce the temperature as the animals in the barn get larger. On the growth curve, it is possible to increase the minimum speed each day since larger animals expel more moisture. Use this setting to determine how many points are to be used in the growth curve. 0 points turns the curve off. 2 or more points specify that the control will use the growth curve settings to obtain temperature set point and minimum idle speed.

### **P 183- 187 Days between Points**

These settings determine how many days there are between the points on the growth curve. (range 0.....127)



## **P 188- 193** Curve Temperatures

These settings specify the target temperature (Set Point) at each of the points on the growth curve. e.g. If Point 1 has a (Set Point) of 80°F and Point 2 has a (Set Point) of 75°F and there is 10 days set between these 2 Points (Parameters 183 - 187), then the control will decrease the temperature in the barn by 5°F over a period of 10 days automatically.



## **P 194- 199** Curve Minimums

These settings indicate the minimum ventilation for the points in the growth curve. It is actually possible to set this value from 0 to 200%. Any setting above 100% works such that both Stage 1 and Stage 2 will be running. This provides a very broad range of minimum ventilation control on the curve.

# Hidden Settings:

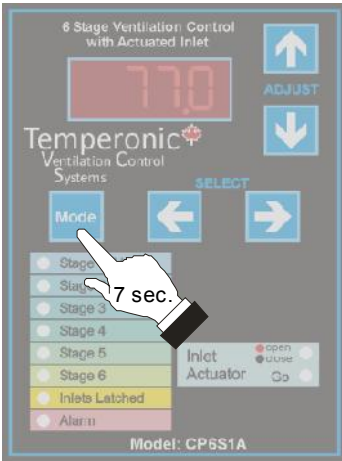
To view or modify Hidden Settings,

Press and hold the **Mode** Button until the display flashes **P20 !** (about 7 seconds) then you are in the Hidden Settings Mode.

The  arrow will increase Parameter values. The  arrow will decrease Parameter values.

NOTE: Control will automatically return to the default display mode 2 minutes after the last button press.

Use the select arrows  and  to choose various parameters.



## **P20 !** Ventilation On / Off

Whenever there are animals in the room, this setting must be set to “On”. When the room is empty, this setting may be set to “Off” so that the fans will no longer operate. The heater will continue to run to keep the room warm so it may be necessary to reduce the set point, as well as turning off the ventilation. This way the heater will only run when the room is in risk of freezing.

## **P202** Stage 1 & 2 Speed Match

When the Stage 2 fan first starts up, the Stage 1 fan will reduce speed to match the speed of Stage 2. This allows for a smooth transition from Stage 1 to Stage 2. If, however, Stage 1 is a pit fan and it is important that it not slow down when Stage 2 starts, set this parameter to “Off”. When the speed match has been turned off, Stage 1 will continue to run at 100% when Stage 2 turns on.

## **P203** Stage 3 Off / Fan / Heat / Timer

This setting allows Stage 3 to be:

1. **OFF** - The stage will not turn on when this setting is selected.
2. **HEAT** - This stage is now set to come on as a heating stage
3. **COOL** - This stage is now set to come on as a cooling stage.
4. **HEAT** - This stage is now set as a heating stage with a timer. Most often this would be used with a curtain operation.
5. **COOL** - This stage is now set as a cooling stage with a timer. Most often this would be used with a mister or curtain operation.

## **P204 , 205 , 206 Stage 4,5,6 Off / Fan / Heat / Timer**

These parameters have the same options as parameter 203

## **P213 Inlet Configure**

If an inlet actuator is connected to the control, this Parameter allows the inlet to be activated by setting to ON. Also, when the inlet needs to be calibrated, this parameter can be set to CAL. As soon as the calibration begins, the control automatically, changes Parameter 213 from CAL to ON. When Stage 5 and 6 are both set to off, P214 will appear to allow calibration and turn on of Inlet Actuator 2.

## **P224 °F / °C Selection**

This parameter allows selection of temperature units between °F and °C.

## **P226 Stage 1 Motor Curve**

Different fan motor and blade combinations react differently to the variable voltages generated by the controller. It is important to match the control and the fan as closely as possible. The easiest way to set up the motor speed curve is to set the speed at 30 to 40%. Select different motor speed curves until the fan is running near the allowable minimum (where louvers are open about 1" to 1.5").

## **P227 Stage 1 Prot. Minimum**

When the correct motor speed curve has been determined, use this setting to specify a "protected minimum". This setting will be used to ensure that the fan does not set the fan to run at a speed so slow that the motor will burn out.

## **P228 Stage 1 Timer Offset**

This parameter (along with the next 3) is used to configure the Stage 1 fan for On and Off Cycling. Under certain conditions, it is desirable to move less air than is possible with the minimum fan running at low speed. This setting indicates at what temperature the controller should begin cycling the minimum speed fan. Any time that the temperature drops below the value specified here (relative to the Set-Point), then the controller will use the next 2 settings to operate the minimum speed fan.

## **P229 Stage 1 Timer On-Time**

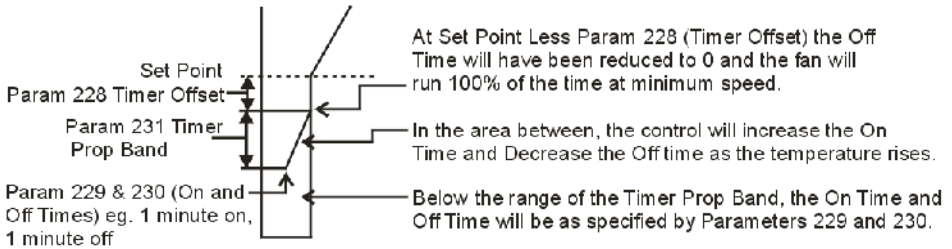
This parameter specifies how long the minimum speed fan should run for (how long it will stay on).

## **P230 Stage 1 Timer Off Time**

This parameter indicates the "off" time. Use caution when using the Cycle Timer. If the fan "Off" time is too long (more than 1.5 minutes), the fan may freeze up in cold weather due to the fact that the fan is usually exhausting warm, moist air. If it is allowed to cool for too long, this air will condense and form ice on the motor up to the point where freeze-up may occur.

## **P231** Stage 1 Timer Prop. Band

This added feature allows specification of a timer proportional band.



## **P234** Stage 2 Motor Curve

This setting allows specification of the motor speed curve for the second stage fans. It is set in a similar manner as the motor speed curve for Stage 1 (Parameter 226).

## **P235** Stage 2 Prot Minimum

This setting allows specification of the protected minimum for Stage 2. It is used to prevent the farmer from setting the speed of the fans too slow leading to motor burn-out and over-heating.

## **P238** Stage 3 Idle Back

When the Stage 3 fan first starts up, the Stage 1 & 2 fan will reduce its speed to the value (in %) specified here. If this parameter is set to 100 then Stage 1 & 2 fan will not reduce speed.

## **P239** Stage 4 Idle Back

When the Stage 4 fan first starts up, the Stage 1 & 2 fan will reduce its speed to the value (in %) specified here. If this parameter is set to 100 then Stage 1 & 2 fan will not reduce speed.

## **P243** Stage 3 Probes to Average

It is possible for the on/off stages to use individual probes or to use an average. This is useful if 2 heaters are used on opposite ends of a larger room. Use this Parameter to select which probes are used for Stage 3.

## **P244** Stage 4 Probes to Average

Use this Parameter to select which probes are used for Stage 4.

## **P245** Stage 5 Probes to Average

Use this Parameter to select which probes are used for Stage 5.

## **P246** Stage 6 Probes to Average

Use this Parameter to select which probes are used for Stage 6.

### **P263** Inlet Hysteresis

Position feedback from the inlets is reported in % open. The inlets will not move unless the difference between the target position and the current position exceeds the value of this parameter. If the inlets move far too often (in warmer weather), then this value should be increased. If the inlets don't move often enough (in cooler weather) then this value should be decreased.

### **P264** Inlet Coast

When an inlet is stopped, it will often move just a bit further due to coasting. This Parameter can be used to specify an inlet coast amount. This parameter must always be less than Parameter 263 and it should be set to less than ½ of Parameter 263. Typically it will be set in the 0.1 to 0.3% range.

## **P253** Inlet 1 Probes to Average

## **P254** Inlet 2 Probes to Average

## **P261** Inlet Maximum % Difference

## **P262** Inlet Different Proportional Band

When using 2 inlets, it is beneficial to have the inlets on the cool side of the barn closed more than the inlets on the warm side of the barn. Parameters 253 and 254 need to be set properly so that the inlet 1 reads the temperature in the area of the barn that gets air from actuator 1 and inlet 2 probes read the air temperature from the actuator 2 area. The control calculates how far the inlets should be open on average and then applies a calculation based on the numbers in Parameters 261 and 262. Parameter 262 specifies a temperature difference limit. If it is 3.6° warmer in the inlet 1 area then inlet 1 will be open further than inlet 2. The number in Parameter 261 specifies how much further inlet 1 will be open than inlet 2. As a guideline, when set to 50, Inlet 1 can be as much as twice as far open as inlet 2. When set to 100, inlet 1 can be as much as 3 times as far open as inlet 2. When set to 25, inlet 1 can only be as much as 1.5 times the opening of inlet 2. If the temperature difference exceeds the value in Parameter 262 (3.6° in this case) then the inlets will remain open at the same ratio as if the temperature difference was the value in Parameter 262.

## **P263** Inlet Hysteresis

Position feedback from the inlets is reported in % open. The inlets will not move unless the difference between the target position and the current position

exceeds the value of this parameter. If the inlets move far too often (in warmer weather), then this value should be increased. If the inlets don't move often enough (in cooler weather) then this value should be decreased.

### **P264 Inlet Coast**

When an inlet is stopped, it will often move just a bit further due to coasting. This Parameter can be used to specify an inlet coast amount. This parameter must always be less than Parameter 263 and it should be set to less than ½ of Parameter 263. Typically it will be set in the 0.1 to 0.3% range.

### **P267 Wall Fan Hysteresis**

When a fan turns on, it is important that the fan does not immediately shut off again when the temperature drops a slight amount. This Parameter specifies just how much the temperature must drop before the fan shuts off. For example. If a fan turns on at 79° and this parameter is set to 1.0°, the fan will continue to run until the temperature drops below 78°. This value is usually set to between 0.3° and 1.8°F (0.2 and 1.0°C)

### **P268 Heat Hysteresis**

When a heater turns on, it is important that the heater does not immediately shut off again when the temperature rises a slight amount. This Parameter specifies just how much the temperature must rise before the heater shuts off. For example. If a heater turns on at 73.2° and this parameter is set to 1.0°, the heater will continue to run until the temperature rises above 74.2°. This value is usually set between 0.5° and 2.7° (0.3 and 1.5°C).

### **P276 Sequence Fans on Start**

When this parameter is set to ON the fans will come on in a timed sequence after a power failure. (e.g. Main power fails - When power is restored Stage 1 and 2 Fans will turn on right away. then about 6 seconds later Stage 3 Fan will turn on, 6 seconds later Stage 4 Fan will turn on, etc). This eliminates the huge power surge needed to start all fans simultaneously. When this parameter is set to OFF, all fans will turn on simultaneously after a power failure.

### **P278 High Temp Alarm Inhibit**

This Parameter is useful when a room is cleaned out, the ventilation is disabled by setting Parameter 201 to Off and the set point is dropped below 50°F (10°C) then this control will inhibit the high temperature alarm. This eliminates annoying alarm conditions as the room cools down.

### **P280 Room Number**

This Parameter is used to identify the Room Number of this control.

### **P281 Security Status**

When set to On, this parameter prevents the operator from adjusting Standard Settings other than 101 and 102.

# Standard Settings Chart:

Param	Description	Units	Factory Default	Range	Record Settings
P 101	Set Point	°F °C	77.0 25.0	-40.0 to 120.0 -40.0 to 51.0	
P 102	Room Minimum	%	35	12 to 200	
P 104	Stage 1 Minimum	%	35	12 to 100	
P 105	Stage 1 Prop. Band	°F °C	1.8 1.0	0.0 to 36.0 0.0 to 20.0	
P 107	Stage 2 Turn-On	°F °C	3.6 2.0	0.0 to 36.0 0.0 to 20.0	
P 108	Stage 2 Minimum	%	35	12 to 100	
P 109	Stage 2 Prop. Band	°F °C	1.8 1.0	0.0 to 36.0 0.0 to 20.0	
P 111	Stage 3 Turn-On Cool	°F °C	5.4 3.0	-36.0 to 36.0 -20.0 to 20.0	
P 112	Stage 3 Turn-On Heat	°F °C	-3.6 -2.0	-36.0 to 36.0 -20.0 to 20.0	
P 113	Stage 3 On Time	Mins	0.0	0.0 to 25.5	
P 114	Stage 3 Off Time	Mins	0.0	0.0 to 25.5	
P 117	Stage 4 Turn-On Cool	°F °C	7.2 4.0	-36.0 to 36.0 -20.0 to 20.0	
P 118	Stage 4 Turn-On Heat	°F °C	-3.6 -2.0	-36.0 to 36.0 -20.0 to 20.0	
P 119	Stage 4 On Time	Mins	0.0	0.0 to 25.5	
P 120	Stage 4 Off Time	Mins	0.0	0.0 to 25.5	
P 123	Stage 5 Turn-On Cool	°F °C	9.0 5.0	-36.0 to 36.0 -20.0 to 20.0	
P 124	Stage 5 Turn-On Heat	°F °C	-3.6 -2.0	-36.0 to 36.0 -20.0 to 20.0	
P 125	Stage 5 On Time	Mins	0.0	0.0 to 25.5	
P 126	Stage 5 Off Time	Mins	0.0	0.0 to 25.5	
P 129	Stage 6 Turn-On Cool	°F °C	10.8 6.0	-36.0 to 36.0 -20.0 to 20.0	
P 130	Stage 6 Turn-On Heat	°F °C	-3.6 -2.0	-36.0 to 36.0 -20.0 to 20.0	
P 131	Stage 6 On Time	Mins	0.0	0.0 to 25.5	
P 132	Stage 6 Off Time	Mins	0.0	0.0 to 25.5	

## Standard Settings Continued...

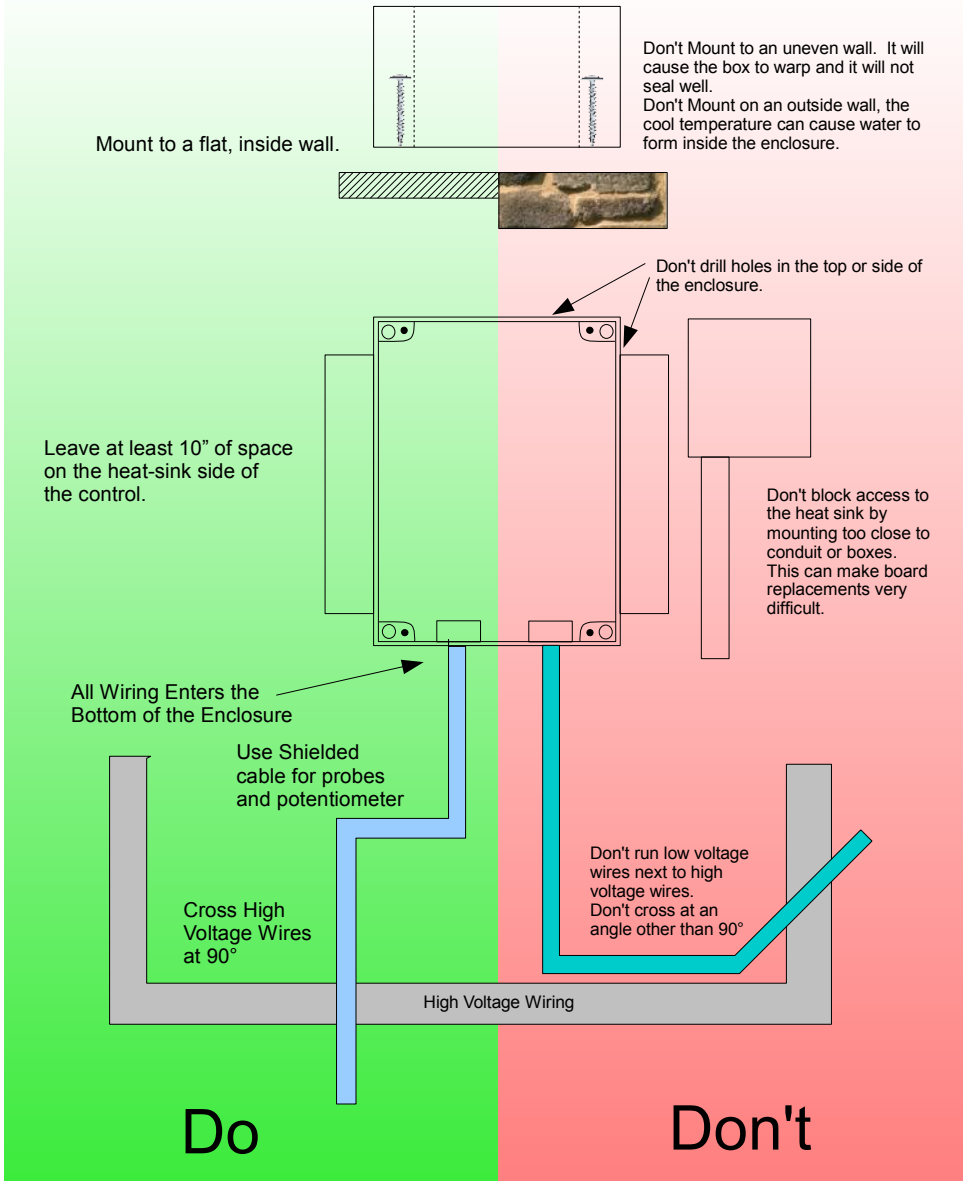
Param	Description	Units	Factory Default	Range	Record Settings
P 165	High Temp. Alarm	°F °C	12.6 7.0	-36.0 to 36.0 -20.0 to 20.0	
P 166	Low Temp. Alarm	°F °C	-7.2 -4.0	-36.0 to 36.0 -20.0 to 20.0	
P 169	Inlet Pos. Fans Off	%	0	0 to 100	
P 170	Inlet Stg 1 at Max.	%	15	0 to 100	
P 171	Inlet Stg 2 at Max.	%	30	0 to 100	
P 172	Inlet Stg 3 at Max.	%	50	0 to 100	
P 173	Inlet Stg 4 at Max.	%	70	0 to 100	
P 174	Inlet Stg 5 at Max.	%	100	0 to 100	
P 175	Inlet Stg 6 at Max.	%	100	0 to 100	
P 182	Points on Growth Curve	Pnts	0	0 to 6	
P 183	Days from Points 1 to 2	Days	28	0 to 127	
P 184	Days from Points 2 to 3	Days	28	0 to 127	
P 185	Days from Points 3 to 4	Days	28	0 to 127	
P 186	Days from Points 4 to 5	Days	28	0 to 127	
P 187	Days from Points 5 to 6	Days	63	0 to 127	
P 188	Temperature at Point 1	°F °C	77.0 25.0	-40.0 to 120.0 -40.0 to 51.0	
P 189	Temperature at Point 2	°F °C	77.0 25.0	-40.0 to 120.0 -40.0 to 51.0	
P 190	Temperature at Point 3	°F °C	77.0 25.0	-40.0 to 120.0 -40.0 to 51.0	
P 191	Temperature at Point 4	°F °C	77.0 25.0	-40.0 to 120.0 -40.0 to 51.0	
P 192	Temperature at Point 5	°F °C	77.0 25.0	-40.0 to 120.0 -40.0 to 51.0	
P 193	Temperature at Point 6	°F °C	77.0 25.0	-40.0 to 120.0 -40.0 to 51.0	
P 194	Room Min. at Point 1	%	40	12 to 200	
P 195	Room Min. at Point 2	%	40	12 to 200	
P 196	Room Min. at Point 3	%	40	12 to 200	
P 197	Room Min. at Point 4	%	40	12 to 200	
P 198	Room Min. at Point 5	%	40	12 to 200	
P 199	Room Min. at Point 6	%	40	12 to 200	



# Hidden Settings Chart:

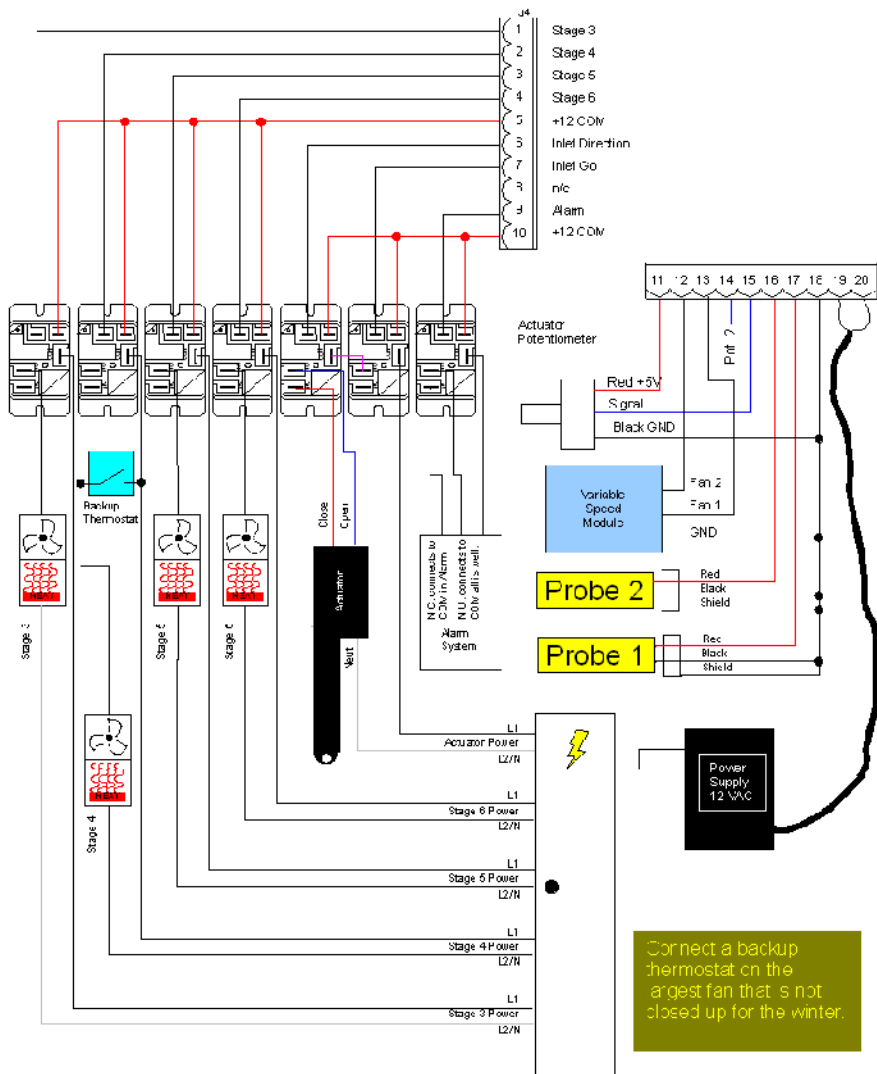
Param	Description	Units	Factory Default	Range	Record Settings
P201	Ventilation On/Off		On	On / Off	
P202	Stage 1 & 2 Speed Match		On	On / Off	
P203	Stage 3 Configure		Cool	Off, Heat, Cool, Heat+Timer, Cool+Timer	
P204	Stage 4 Configure		Cool		
P205	Stage 5 Configure		Cool		
P206	Stage 6 Configure		Heat		
P213	Inlet 1 Configure		Off	Off, On, Cal	
P224	°F / °C Selection		°F	°F / °C	
P226	Stage 1 Motor Curve		2	1 to 8	
P227	Stage 1 Prot. Minimum	%	35	12 to 100	
P228	Stage 1 Timer Offset	°F	0.0	0.0 to 36.0	
		°C	0.0	0.0 to 20.0	
P229	Stage 1 Timer On-Time	Mins	0.0	0.0 to 25.5	
P230	Stage 1 Timer Off-Time	Mins	0.0	0.0 to 25.5	
P231	Stage 1 Timer Prop. Band	°F	0.0	0.0 to 36.0	
		°C	0.0	0.0 to 20.0	
P234	Stage 2 Motor Curve		2	1 to 8	
P235	Stage 2 Prot. Minimum	%	35	12 to 100	
P238	Stage 3 Idle Back	%	100	12 to 100	
P239	Stage 4 Idle Back	%	100	12 to 100	
P243	Stage 3 Probes to Avg.		12	1, 2, 12	
P244	Stage 4 Probes to Avg.		12	1, 2, 12	
P245	Stage 5 Probes to Avg.		12	1, 2, 12	
P246	Stage 6 Probes to Avg.		12	1, 2, 12	
P253	Inlet 1 Probes to Avg.		12	1, 2, 12	
P254	Inlet 2 Probes to Avg.		12	1, 2, 12	
P261	Inlet Max % Diff	%	50	12 to 100	
P262	Inlet Diff Prop. Band	°F	3.6	0.0 to 36.0	
		°C	2.0	0.0 to 20.0	
P263	Inlet Hysteresis	%	1.0	0.0 to 10.0	
P264	Inlet Coast	%	0.3	0.0 to 10.0	
P267	Wall Fan Hysteresis	°F	0.9	0.0 to 36.0	
		°C	0.5	0.0 to 20.0	
P268	Heat Hysteresis	°F	0.9	0.0 to 36.0	
		°C	0.5	0.0 to 20.0	
P274	Day in Growth Curve	Day	0	0 to 768	
P276	Sequence Fans on Start		On	On / Off	
P278	High Temp Alarm Inhibit		Off	On / Off	
P280	Room Number		0	0 to 127	
P281	Security Status		Off	On / Off	

# Control Mounting Instructions



**Be sure to connect a backup thermostat to the largest fan that does not get closed up for the winter.**

# CP6S1A Wiring Diagram



Connect a backup thermostat on the largest fan that is not closed up for the winter.

## **Limited Warranty**

Veldhuis Digital Engineering Ltd. hereby warrants that should this unit prove defective, Veldhuis Digital Engineering Ltd. will repair the unit free of charge but subject to the following conditions and a time period of 1 year at 100% coverage of parts and labour to repair or replace the unit as determined by Veldhuis Digital Engineering Ltd.. Veldhuis Digital Engineering Ltd. assumes no responsibility for losses resulting directly or indirectly from the use of this control unit beyond the replacement or repair of the control unit.

1. The unit must have been installed in accordance with the installation instructions contained in this manual, such that the contents of the control are protected from moisture and dust using liquid tight connections on all wiring into the control housing. Any holes cut into top or side of control enclosure void warranty of controller.
2. No modification of the control has been done by anyone other than qualified Veldhuis Digital Engineering Ltd. personnel.
3. The control unit must not have been subject to abuse, misuse or accident or operated other than as specified in this manual. Any decision on this condition by Veldhuis Digital Engineering Ltd. will be final.
4. Warranty will only be provided to the original purchaser of this product and proof of purchase must be provided at the time of a warranty request. Warranty period begins at date of manufacture as found on the control unit unless date of sale and serial numbers are clearly indicated on proof of purchase documents.
5. This warranty is only applicable to control unit CP6S1A
6. All shipping charges are the responsibility of the purchaser.
7. For best warranty service, return a defective control unit to your local dealer along with proof of purchase of the unit.

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