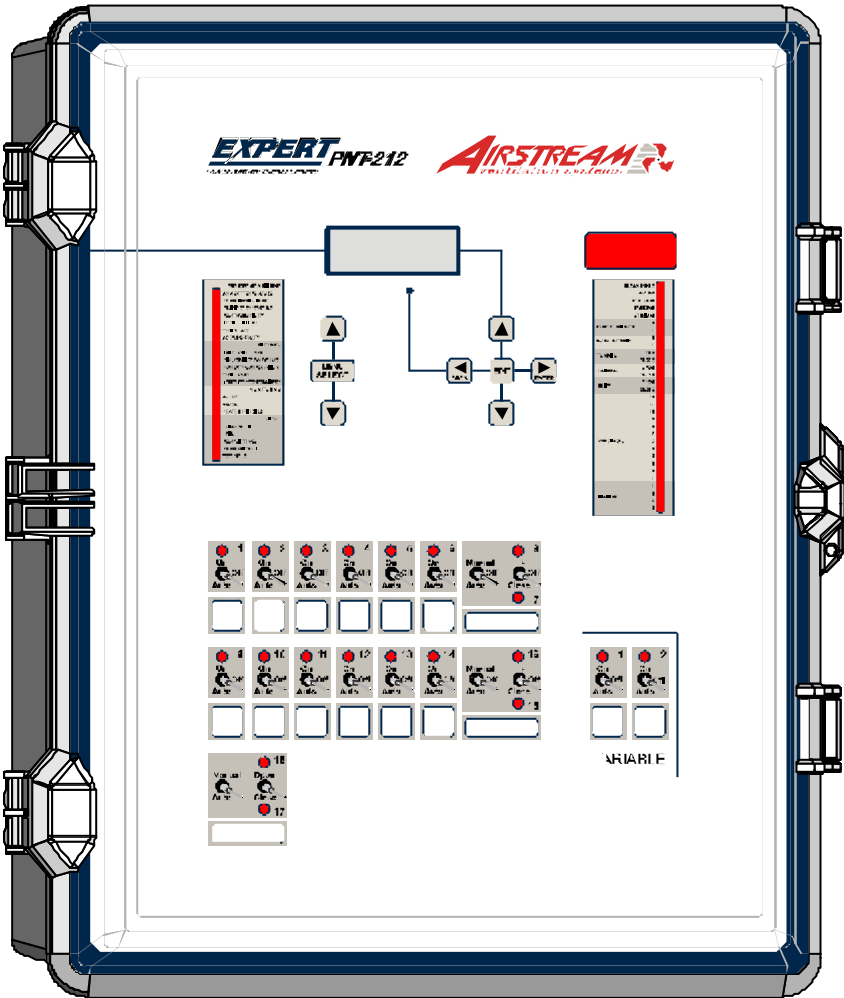


Temperature Controller

EXPERT PNT-212

USER'S MANUAL



NOTICE

Every effort has been made to ensure that this manual is complete, accurate and up-to-date. The information contained in it is however subject to change without notice due to further developments.

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ANNEX 1: CORE CARD 67

FOR CUSTOMER USE
Enter the serial number located on the side of the controller below for future reference.

Model number: **EXPERT-PNT-212**

Serial number: _____

1. PRECAUTIONS

We strongly recommend installing supplementary natural ventilation as well as a backup thermostat on at least one cooling stage (refer to the wiring diagram enclosed with this user's manual to connect the thermostat).

Although fuses at the input and outputs of the controller protect its circuits in case of an overload or overvoltage, we recommend installing an additional protection device on the controller's supply circuit.

The room temperature where the controller is located **MUST ALWAYS REMAIN BETWEEN 32° F AND 104° F (0° C TO 40° C)**.

To avoid exposing the controller to harmful gases or excessive humidity, it is preferable to install it in a corridor.

DO NOT SPRAY WATER ON THE CONTROLLER

2. CONTROLLER OVERVIEW

The EXPERT PNT-212 is an electronic device used for environmental control in livestock buildings. It allows the user to maintain a specified target temperature by controlling the operation of ventilation and heating equipment. The controller can control up to 4 heating stages, 12 fan stages, 1 cooling stage, 1 stir fan, 1 soaking output, 2 0-10V outputs, 1 air inlet, 1 natural ventilation curtain, 1 tunnel door and 2 clock outputs. Fan stages can be configured to activate cooling systems in timer mode. In all, the EXPERT PNT-212 has 18 on/off relays and 2 variable outputs.

Main Features:

LCD DISPLAY

An LCD display provides an efficient interface for displaying, monitoring and adjusting parameter values.

MINIMUM VENTILATION CYCLE

When ventilation is not required for reducing room temperature, variable-speed outputs or on-off outputs can be operated either continuously or intermittently to reduce the level of humidity and supply oxygen to the room.

TEMPERATURE AND MIN. VENTILATION CURVES

The controller can be set to automatically change the temperature set point and the minimum ventilation fan speed over a given period of time in accordance with the user's requirements by specifying a temperature curve and a minimum ventilation speed curve with ten different points each.

PROBE READINGS RECORDED FOR PAST DAYS

Minimum and maximum readings from temperature and humidity probes are recorded for the current day and the previous 7 days.

WATER MONITORING

A pulse input is provided for monitoring water consumption for the current days and the previous 7 days.

FEEDER AND HEATER RUN TIME MONITORING

Feeder and heater run times are kept in memory for the current day and for the previous 75 days.

ALARM MANAGEMENT

Alarms are provided for high-low temperatures, defective probes and other system functions. Alarm states are kept in memory until they are acknowledged even if alarm situation has been rectified.

HUMIDITY COMPENSATION

The minimum ventilation speed can be adjusted automatically as a function of relative humidity. Cooling units can be shut off when humidity levels are too high. In addition, heater outputs can be activated when humidity levels are too high.

SIX INDEPENDENT T° PROBE INPUTS

Up to six temperature probes can be connected to the controller in order to obtain a more accurate reading of the average room temperature and a faster reaction time. Probes can be configured to use zoned heaters.

STATIC PRESSURE CONTROL

A static pressure input is provided to control the static pressure level by opening and closing the inlet.

CONTROL OF AIR INLET MOVEMENT

An inlet output, used to control the air inlet movement, is included in the EXPERT PNT-212. This inlet opens and closes with a timer.

TUNNEL VENTILATION:

The controller can control one tunnel door output in tunnel ventilation.

NATURAL VENTILATION:

The controller has one output to control a natural ventilation curtain.

PASSWORD PROTECTION

A password feature is used to restrict access to the controller setup functions.

BACKUP BATTERY

A backup battery allows the unit to keep time in case of a power failure.

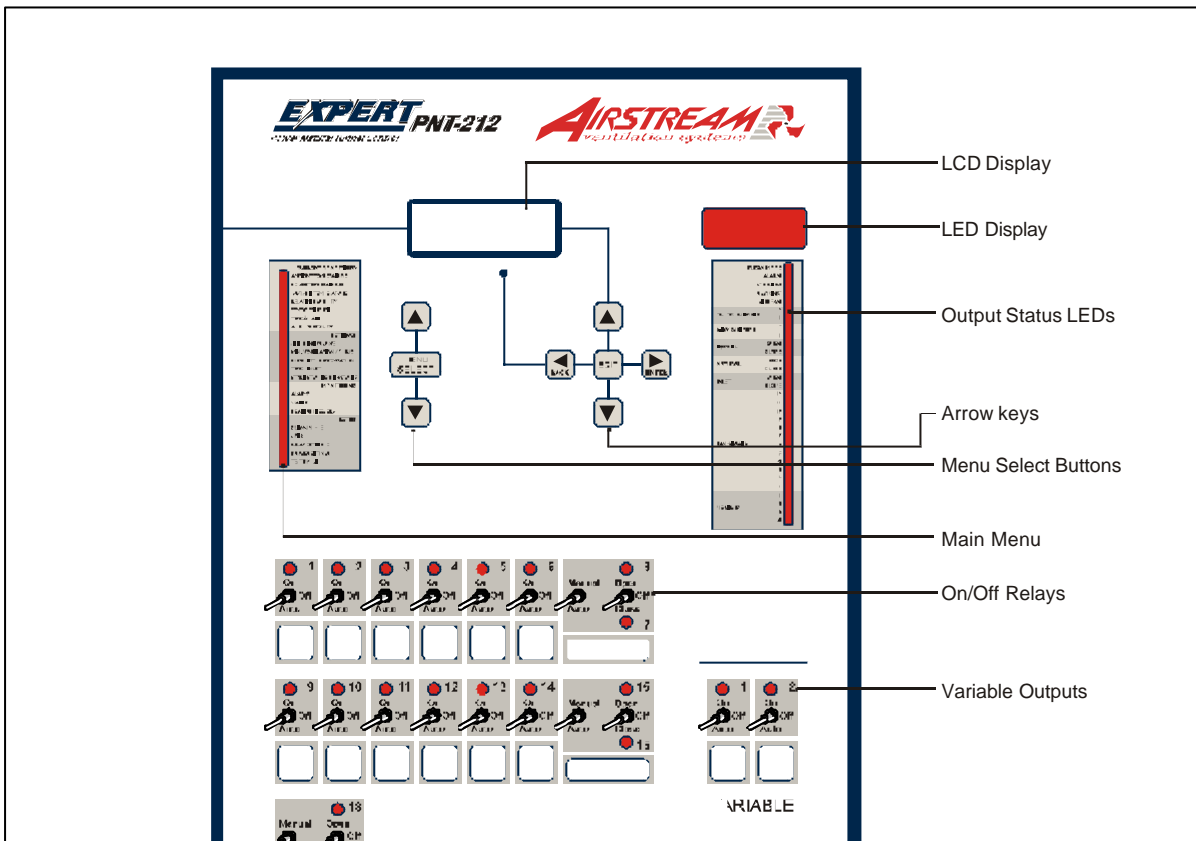
COMPUTER CONTROL

The controller can be connected to a computer, thus making it possible to centralize the management of information and diversify control strategies.

TEST MODE

A test mode allows you to simulate temperature changes and verify controller performance, as well as manually activate each output sequentially.

3. LOCATION OF THE CONTROLS



- **LCD Display:**

The LCD display gives the current readings and displays the parameters when you select a function. When the parameters for a given function cannot all be presented at once on the display, arrows are displayed on the right handside to indicate that additional parameters can be displayed using the arrow keys.

After 5 minutes of inactivity, the display returns to the **AMBIENT TEMPERATURE** display.

- **LED Display**

This display shows the current reading of chosen sensor(s). Refer to section 5.17.3 to select what information needs to be shown on the LED display.

- **Menu Select buttons:**

The up and down-arrow keys are used to scroll within the main menu located on the left side of the controller.

- **Arrow Keys:**

The up and down-arrow keys are used to scroll within a function menu. The right-arrow key is used to select a menu option; the left-arrow key is used to go back to the previous menu display.

- **Edit Button:**

The Edit key is used to modify a parameter value. Once you press the Edit key, the selected parameter starts flashing faster on the display. Use the up and down-arrow keys to adjust the parameter.

- Adjusting a Parameter:**
 A parameter can be adjusted when it is flashing on the LCD display. Press the Edit key once then use the arrow keys to change its value. Press the Edit key once again to validate the new value.

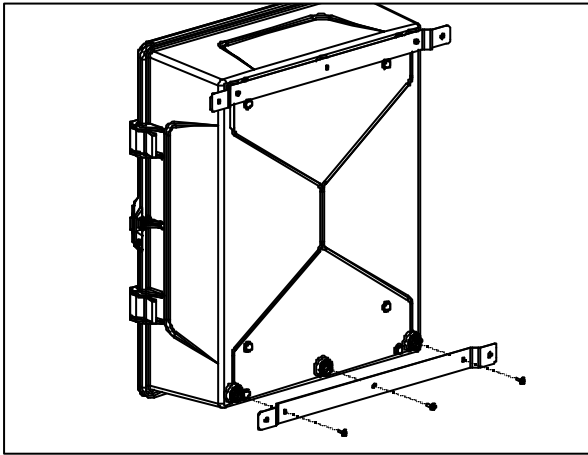
Output Status LEDs

LED	MEANING	
CLEAN MODE	URNS ON WHEN THE CONTROLLER IS IN CLEAN MODE.	
ALARM	URNS ON WHEN AN ALARM IS DETECTED FLASHES WHEN AN ALARM CONDITION OCCURED WAS RE-ESTABLISHED BY ITSELF.	
COOLING	URNS ON WHEN THE COOLING OUTPUT IS ACTIVE	
SOAKING	URNS ON WHEN THE SOAKING OUTPUT IS ACTIVE	
STIR FAN	URNS ON WHEN THE STIR FAN OUTPUT IS ACTIVE	
CLOCK OUTPUT 2	URNS ON WHEN CLOCK OUTPUT 2 IS ACTIVE	
CLOCK OUTPUT 1	URNS ON WHEN CLOCK OUTPUT 1 IS ACTIVE	
0-10V OUTPUT 2	URNS ON WHEN 0-10V OUTPUT 2 IS ACTIVE	
0-10V OUTPUT 1	URNS ON WHEN 0-10V OUTPUT 1 IS ACTIVE	
TUNNEL	OPEN	URNS ON WHEN THE TUNNEL CURTAIN IS OPENING.
	CLOSE	URNS ON WHEN THE TUNNEL CURTAIN IS CLOSING.
NATURAL	OPEN	URNS ON WHEN THE NATURAL VENTILATION CURTAIN IS OPENING.
	CLOSE	URNS ON WHEN THE NATURAL VENTILATION CURTAIN IS CLOSING.
INLET	OPEN	URNS ON WHEN THE INLET IS OPENING.
	CLOSE	URNS ON WHEN THE INLET IS CLOSING.
FAN STAGE 12	URNS ON WHEN FAN STAGE 12 IS ACTIVE	
FAN STAGE 11	URNS ON WHEN FAN STAGE 11 IS ACTIVE	
FAN STAGE 10	URNS ON WHEN FAN STAGE 10 IS ACTIVE	
FAN STAGE 9	URNS ON WHEN FAN STAGE 9 IS ACTIVE	
FAN STAGE 8	URNS ON WHEN FAN STAGE 8 IS ACTIVE	
FAN STAGE 7	URNS ON WHEN FAN STAGE 7 IS ACTIVE	
FAN STAGE 6	URNS ON WHEN FAN STAGE 6 IS ACTIVE	
FAN STAGE 5	URNS ON WHEN FAN STAGE 5 IS ACTIVE	
FAN STAGE 4	URNS ON WHEN FAN STAGE 4 IS ACTIVE	
FAN STAGE 3	URNS ON WHEN FAN STAGE 3 IS ACTIVE	
FAN STAGE 2	URNS ON WHEN FAN STAGE 2 IS ACTIVE	
FAN STAGE 1	URNS ON WHEN FAN STAGE 1 IS ACTIVE	
HEATER 1	URNS ON WHEN HEATER 1 IS ACTIVE	
HEATER 2	URNS ON WHEN HEATER 2 IS ACTIVE	
HEATER 3	URNS ON WHEN HEATER 3 IS ACTIVE	
HEATER 4	URNS ON WHEN HEATER 4 IS ACTIVE	

4. MOUNTING INSTRUCTIONS

4.1 Installing the Controller on the Wall

Fasten the two metal brackets on the mounting holes located behind the controller using six screws. Then, mount the enclosure on the wall using four other screws. Leave a clearance of at least 16" to the left of the enclosure to allow the cover to be removed for maintenance.



4.2 Connections

4.2.1 Main Wiring

Refer to the wiring diagram enclosed with this user's manual to connect the controller. Drill holes at the bottom of the enclosure to pass the wires and install watertight connectors to prevent water from entering in the enclosure. Do not make any holes at the side and top of the enclosure.



ALL WIRING MUST BE DONE BY AN AUTHORIZED ELECTRICIAN AND MUST COMPLY WITH APPLICABLE CODES, LAWS AND REGULATIONS. MAKE SURE POWER IS OFF BEFORE DOING ANY WIRING TO AVOID ELECTRICAL SHOCKS AND EQUIPMENT DAMAGE.

4.2.2 Alarm Connection

There are two types of alarms on the market. One type activates when current is cut off at its input; the other type of alarm activates when current is supplied at its input. For an alarm of the first type, use the NC terminal as shown on the wiring diagram. For an alarm of the second type, use the NO terminal.

4.2.3 Sensor Inputs

Sensors operate at low voltage and are isolated from the supply. Make sure that sensor cables remain isolated from all high voltage sources. In particular, do not route the sensor cables through the same electrical knockout as other cables. Do not connect the shield from the sensor cable to a terminal or a ground.

Extending a sensor: Each sensor can be extended up to 500 feet (150 meters).

To extend a sensor: Use a shielded cable of outside diameter between 0.245 and 0.260 in (6.22 and 6.60 mm) (the cable dimensions should not be under 18 AWG) to ensure the cable entry is liquid tight. **Do not ground the shielding.**

It is preferable to solder the cable joint to ensure a proper contact between the two cables.



Do not run sensor cables next to other power cables. When crossing over other cables, cross at 90°.

Defective sensors: An alarm is generated when a defective sensor is detected. Defective sensors are identified in the "Alarm Log" menu. Refer to chapter 12 for further information on the alarms.

4.2.4 0-10V Output Connection

It is recommended to use a 18 to 22 AWG wire to connect the devices to the 0-10V outputs. This type of output can be used to connect various devices such as heat mats or fans.

5. CONTROLLER SETUP

5.1 Current Conditions

The following menus give a quick view of the actual conditions in the barn as described below:

Ambient Temperature:

Set the function to **AMBIENT** main menu using the menu select buttons. The average room temperature of the activated probe is displayed.

Ambient Temperature			
Average:	76.9°	F	
Cur. SetP:	70.0°	F	
Pb1	On	Pb2	On

Probe Temperature:

Set the function to **PROBE TEMPERATURE** using the menu select buttons. The current readings of each temperature probe is displayed.

Probe Temperatures			
Pb1	75.4	Pb2	78.1
Pb3	75.4	Pb4	78.4
Pb5	75.5	Pb6	78.6

Outside Temperature:

Set the function to **OUTSIDE TEMPERATURE** using the menu select buttons. The current outside temperature is displayed.

Accessible if the outside temp. probe is enabled (sec. 5.17.4.2).

Outside Temperature			
Read Out:	72.3°	F	
Today's Min / Max			
Min	71.3	Max	74.2

Relative Humidity:

Set the function to **RELATIVE HUMIDITY** using the menu select buttons. The current humidity level in the room is displayed.

Accessible if the humidity probe is enabled (sec. 5.17.4.2).

Relative humidity			
Read Out:	85%		
Today's Min / Max			
Min	60	Max	80

Static Pressure:

Set the function to **STATIC PRESSURE** using the menu select buttons. The current static pressure is displayed.

Accessible if the static pressure sensor is enabled (sec. 5.17.4.2).

Static Pressure			
Read Out:	.193"	WC	
Today's Min / Max			
Min	.190	Max	.196

Time & Date:

Set the function to **TIME & DATE** using the menu select buttons. The actual time and date are displayed.

Time & Date			
	Y / M / D	■	■
Date	2001/03/29		
Time	11:21:15		

Animal Age & Count:

Set the function to **AGE & MORTALITY** using the menu select buttons and then use the arrow keys to scroll down the menu. Information about the animal age and count is displayed.

Age & Mortality		▲
Age:	10 days	■
New Dead	0	
Today's Dead	0	

Viewing the Current Set Point:

- Select the **SET POINT / CURVE** menu using the menu select buttons.
- Press the right-arrow key once to select the "**1. Set Points**" menu. The current set point is displayed.

Set Point		▲
Current	71.0°F	
Day	70.0°F	
Ni ght	77.0°F	

Adjusting LCD Contrast:

The LCD screen contrast can be adjusted from 10 to 100%.

- Select **USER** from the main menu using the menu select buttons.
- Press the right-arrow key once to select the "**1. LCD Contrast**" menu. The LCD contrast value is displayed.

LCD Contrast			
Value	100%		
Min	10	Max	100

- Press the Edit key then use the arrow keys to adjust the LCD contrast to the desired value. Press Edit once again to validate.

5.2 Set Point Settings

The set point is a target temperature in the room. The activation of most outputs of the controller is based on this reference temperature.



The set points can only be modified while the temperature curve is disabled.

Disabling the Temperature Curve:

Follow these steps if the temperature curve is enabled.

- Set the function to **SET POINT / CURVE** using the menu select buttons.
- Use the arrow key to select the "**2. Curve**" menu then press the right-arrow key. The curve status is displayed.
- **If the temperature curve is ON**, the set point, as calculated by the temperature curve is displayed. Press the down-arrow key and scroll the display until "**Curve Stat**" status flashes on screen. Press the Edit key then press the down-arrow key to disable the curve. Press Edit once again to validate the new curve status. Now that the curve is off, follow the instructions below.

Temperature Curve		■
Set point:	70.0°F	
Curve Stat	0n	

- **If the temperature curve is OFF**, follow instructions below.

Adjusting the Set Points:

- Set the function to **SET POINT / CURVE** using the menu select buttons.
- Press the right-arrow key to select the "**1. Set Point**" menu.
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

Current Set Point:

This is the current temperature set point in use. This value cannot be changed; to modify the set point, change the day or night set points below.

Current	71.0 °F
Day	70.0 °F
Night	77.0 °F
Clean Mode	35.0 °F
Outside	65.0 °F

Day Set Point:

Set the temperature set point that is used during the day (this set point is used all day long if the night set point is not enabled). The controller can also change the day set point automatically over time by using a curve (see section 5.15.2).

This parameter can only be modified while the temperature curve is inactive (sec. 5.2).

Night Set Point

A different temperature set point can be used at night. The night set point can be used to lower the target room temperature for instance. The night set point is relative to the day set point, which means that it is automatically adjusted when the day set point changes. Set the night set point to the desired value.

Accessible if the night set point is enabled (see section 5.17.6).

Clean mode Set Point:

Select what is the target room temperature while the controller operates in clean mode.

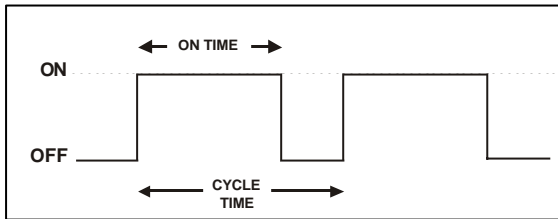
Outside Set Point:

The controller can adjust the moving speed of natural ventilation curtains as a function of outside temperature. When this function is used, the controller refers to the outside temperature set point to control the moving speed. Set the outside temperature to the desired value.

Accessible if the outside temperature sensor is enabled in section 5.17.4 and if the curtain compensation is enabled in the Installation Setup (section 5.17.3).

5.3 Minimum Ventilation

When the room temperature is below the set point, the fans can operate according to a minimum ventilation cycle. Running the fans even though ventilation is not required for reducing room temperature is useful to reduce humidity level and supply oxygen to the room. It also prevents the fans from freezing in winter.



Minimum ventilation cycles are ensured by the variable fan outputs. The fan speed can automatically adjusted over time by using a curve (see sec. 5.18.3).

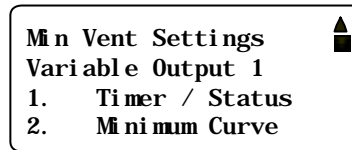


Note that the minimum ventilation curve must be turned off to adjust the minimum ventilation settings.

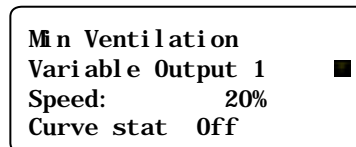
5.3.1 Minimum Ventilation Settings

5.3.1.1 Minimum Ventilation Fan Speed

- Set the function to **MINIMUM VENTILATION / CURVE** using the menu select buttons.
- Press the right-arrow key to select "**1. Variable 1**" menu.



- Use the arrow keys to select the "**2. Minimum Curve**" menu. The minimum speed of variable output 1 is displayed.
- **If the temperature curve is ON**, the minimum fan speed, as calculated by the curve, is displayed. Press the down-arrow key and scroll the display until "**Curve Stat**" status flashes on screen. Press the Edit key then press the down-arrow key to disable the curve. Press Edit once again to validate the new curve status. Now that the curve is off, follow the instructions below.



- **When the curve is OFF**, the minimum speed of variable output 1 flashes on the display. Press the Edit key then use the arrow keys to adjust the minimum speed to the desired value. Press the Edit key once again to validate.
- If it is used, proceed in similar fashion to adjust minimum speed the second variable output.

5.3.1.2 Minimum Ventilation Timer

This section explains how to use a variable fan output in minimum ventilation and how to set its minimum ventilation timer.

- Set the function to **MIN VENTILATION/CURVE**.
- Select the desired variable output with the arrow keys.
- Select the **"1. Timer/Status"** menu.
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

Variable 1 Settings		▲
Current	20%	■
Status:	On	
On Time	15sec	
Cycle Time:	120sec	

Status:

Select "On" for the variable output to be used in minimum ventilation.

On Time / Cycle Time:

If the variable output is used in minimum ventilation, set its minimum ventilation timer properly (On Time and Cycle Time).

5.3.2 Min Ventilation at Night

The controller can use different minimum ventilation settings at night.

- Set the function to **USER** from the main menu.
- Select the **"6. Day / Night"** menu using the arrow keys.
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

Day/Night Settings		▲
Night SetPoint?	No	
Night Min. Vent?	Yes	
DayTime	6:00	
DayTime	6:00	
NightTime	18:00	
Min. V1	10%	
Min. V2	25%	

Night Min. Vent:

Select "Yes" to use different minimum ventilation settings at night.

Min. V1-2:

Select the minimum ventilation night speed of each variable fan (in %).

5.4 Air Inlets

5.4.1 Principle of Operation

The controller can control the opening of a timer-based air inlet. To use this output, you must specify the total time that is required to open the actuator completely. Then, you must associate an inlet opening with the start-up of each fan stage (inlet openings are defined as a percentage of the total opening time). As the room temperature increases and new stages are activated, the inlet will open or close accordingly.

Inlet opening in minimum ventilation:

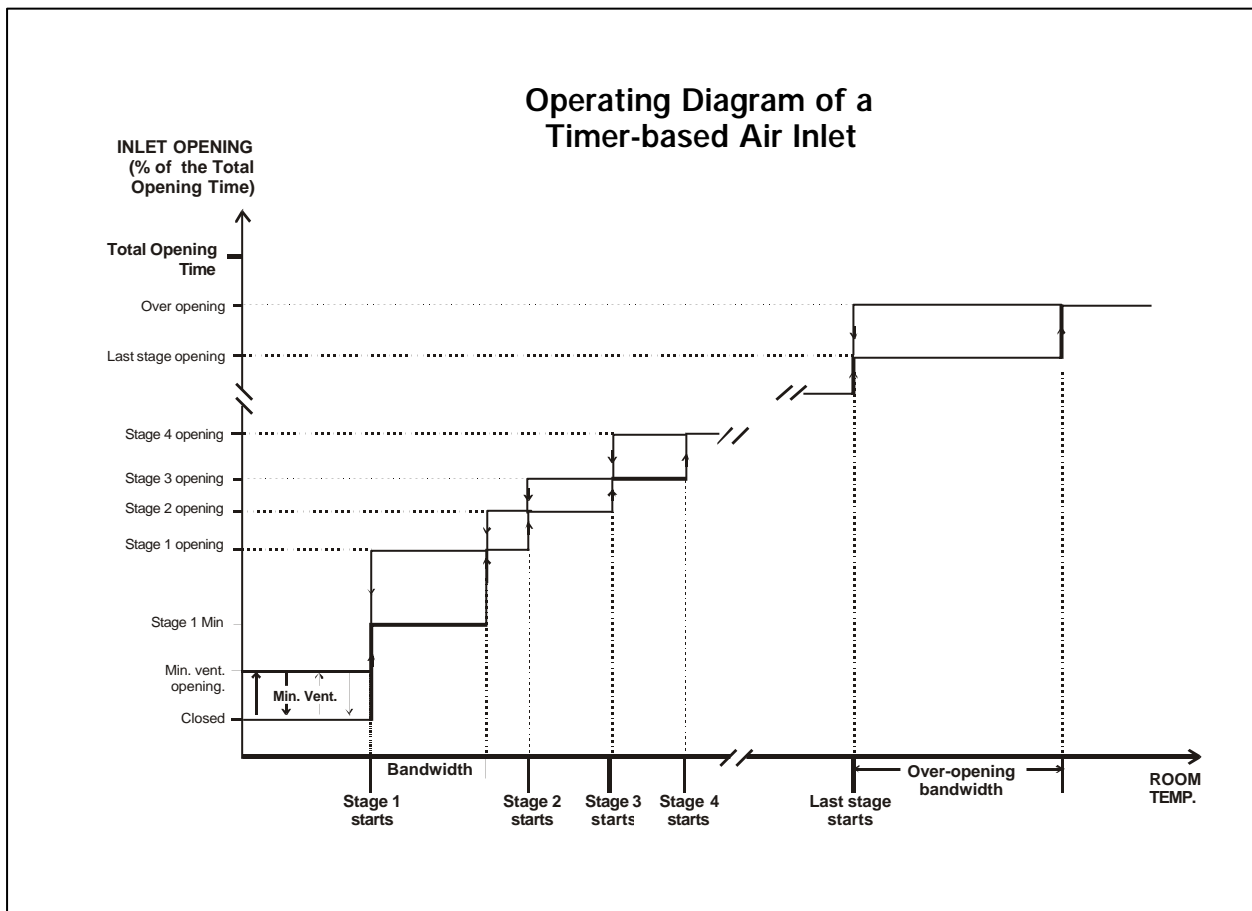
The inlet is at its "Closed" position during the Off Time portion of a minimum ventilation cycle and opens to its minimum ventilation position during the On Time.

Inlet opening in a variable fan stage:

2 different inlet openings must be assigned to each variable fan stage: the inlet opening reached at the beginning of the stage (Stage #x Min) and the opening reached at the end (Stage #x Max).

Over-opening of air inlets:

A supplementary stage can be defined in order to continue opening the air inlet beyond the activation temperature of the last ventilation stage. This over-opening stage is used to direct the airflow more efficiently during periods of warm weather. When all reference points of ventilation stages are defined, the user can specify the temperature at which air inlets reach their over-opening position (Start T° of the last stage + over-opening bandwidth).



5.4.2 Settings



Inlet openings are defined as a percentage of their total opening time.

- Select the **TIMED INLET** menu from the main menu.
- Select **"1. Stage Opening"** menu.
Accessible if the inlet is enabled (section 5.17.3).
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

Timed Inlet		
Position	0%	▲
Test Mode	44.0	■
Closed	0 %	
Min Vent.	5 %	
Stg. 1 Min	5 %	
Stage 2	20 %	
...		
Run Time	2:00 m s	
Overopening settings		
Opening	Off	
Bandwidth	5.0 °F	

Position:

This is the current position of the selected air inlet. This value cannot be modified.

Test Mode:

This is the room temperature used during the test mode. This value can only be modified in the "Test Mode" menu (see section 4.18.7).

Closed:

This is the position of the air inlet during the Off Time portion of a minimum ventilation cycle. Set this position to the desired value.

Min Vent:

This is the position of the air inlet during the On Time portion of a minimum ventilation cycle. Set this position to the desired value.

Stage #x Min:

Assign an inlet opening (in %) with the startup of each variable fan stage.

Stage #x (max):

Assign an inlet opening (in%) with each on/off fan stage and with the end of each variable fan stage.

Run Time:

Enter the exact amount of time required to reach the actuator's maximum limit switch. The controller will limit the opening of the inlet according to this parameter value.

Over-Opening Settings:

Opening:

Assign an inlet position with the over-opening stage.

Bandwidth:

Set the number of degrees above the start temperature of the last fan stage, at which the inlet opens to its over-opening position (see previous graph).

5.4.3 Reset the Actuator’s Position

Resetting the actuator’s position is used to clear accumulated time offsets caused by the frequent openings and closings of the inlet. The controller resets the actuator’s position at regular intervals to make sure the inlet position is always accurate. This reset is performed automatically according to one of these two methods:

- Reset the minimum position only (Close mode)**
 Each time a reset is performed, the inlet totally closes. Once the actuator’s position is reset, the inlet returns to its previous position. The “Close” pilot light of the inlet flashes while the controller closes the inlet.
- Reset toward the nearest position (Open/Close mode)**
 If the current inlet position is higher than 50% at the reset time, the controller fully opens the inlet to reset the actuator’s position; if the current inlet position is lower than 50%, the controller closes the inlet to perform the reset. This way, the inlet never closes when the room temperature already asks for a wide opening. The “Open” or “Close” pilot light of the inlet flashes while the controller moves the inlet.



Make sure limit switches are located at both ends of the actuators when using this resetting method.

- Select the **TIMED INLET** menu with the menu select buttons.
- Select **"2.Auto Reset"** with the menu select buttons.
Accessible if the inlet is enabled (section 5.17.3).
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

Auto Reset Settings		
Reset Mode	Op/Cl	▲
Day Time	06:00 am	■
Period	3	
Open/Close	02:00	
Reset Now?	No	

Reset Mode:

Select the desired reset mode: “Op/Cl” to reset the actuator toward its nearest position; select “Close” to reset the actuator toward its closed position only or select “Off” to disable the automatic reset.

Day Time:

Set the time at which resets are performed.

Period:

Enter the frequency of inlet resets. A reset can be performed once every 1-7 days.

Open/Close4:

During a reset, the controller opens or closes the inlet during this delay, or up until a limit switch is reached. The reset delay should be set to the same time value or higher than the total opening time (as defined in the previous section).

Inlet Reset Now? Select “Yes” to reset the actuator’s position now.

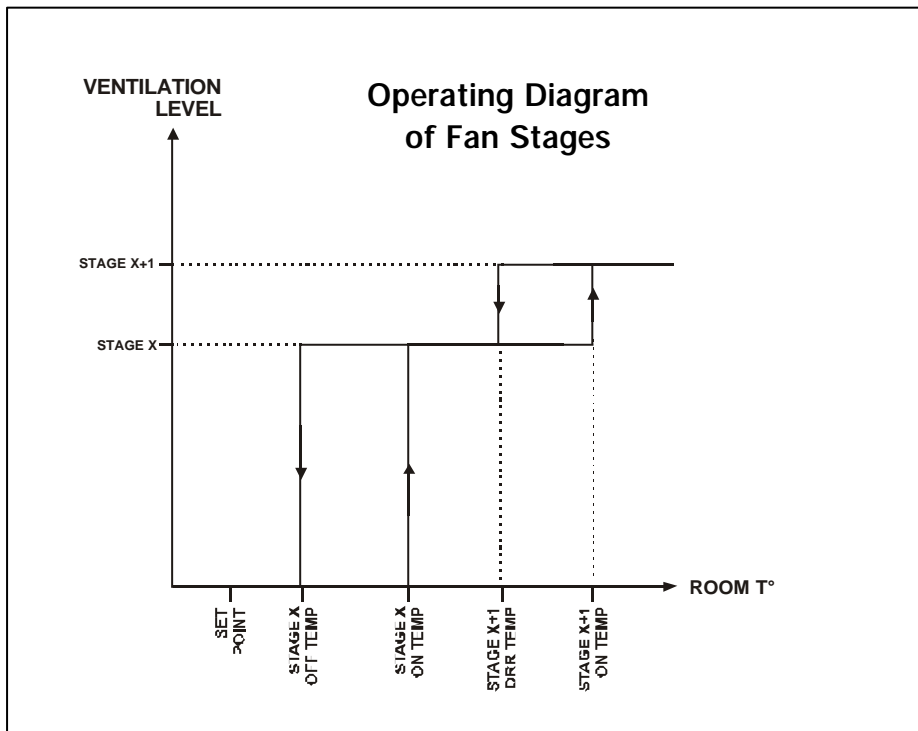
5.5 Fan Settings

The EXPERT-PNT-212 can control up to 12 ON-OFF fan stages. These stages operate in a sequence to increase the level of ventilation as the room temperature rises. Each stage can also activate two variable outputs for cooling. The user defines a start and a stop temperature for each stage. When the room temperature reaches this value, the stage is activated.

Start temperatures (ON TEMP) are defined with respect to the set point and with respect to each other. This means that when one of these values is adjusted, all the consecutive values are adjusted by the same amount. For example, if the set point is increased by 1°F, the start temperatures for all fan stages will be increased by the same amount.

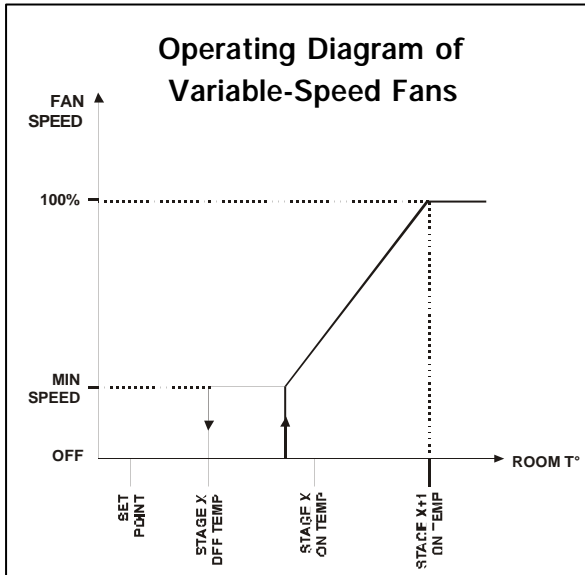
Timer-based relays in fan stages

Fan stages can activate relays that operate following a timer (On and Off Times). This is useful to activate misting units in timer mode while a specific fan stage is active. Refer to section 5.17.7 to enable timer-based relays.



Variable Outputs

A variable output is activated when the ON temperature of the stage that uses the variable output is reached. The variable output is activated at the absolute minimum speed (see sec. 5.17.3) and its speed increases up to full speed when room temperature reaches the ON temperature of the next stage.



Transition between fan stages 1 and 2

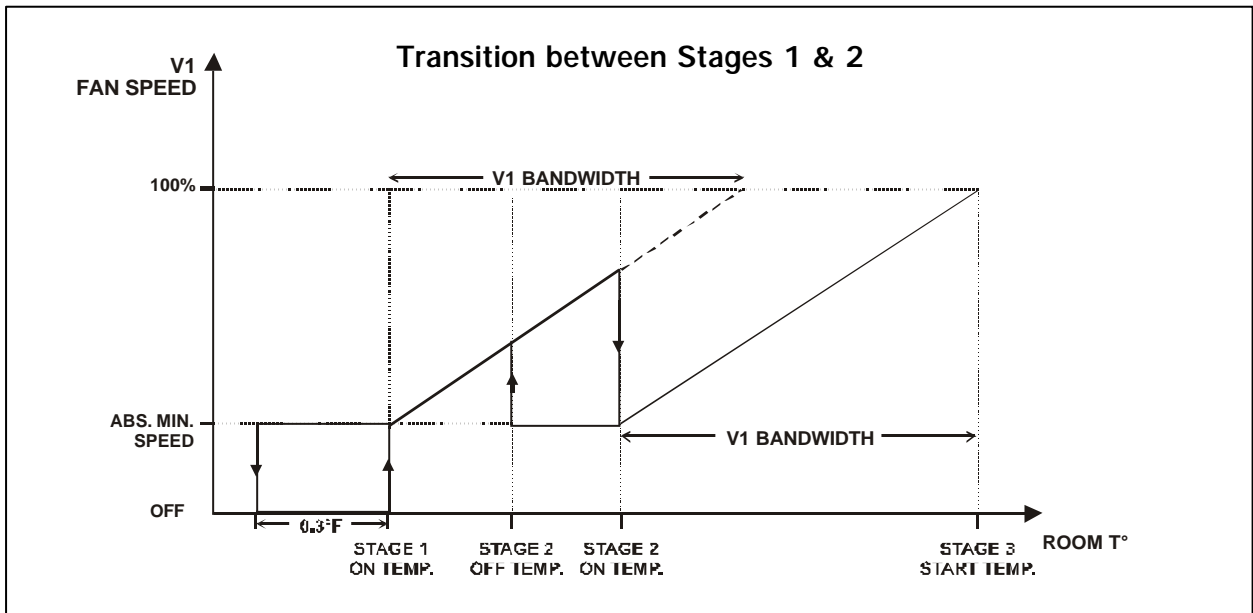
If the next stage is an ON/OFF fan stage, the variable output is deactivated when the new stage starts. If the next stage is another VARIABLE fan stage, the speed of the first variable stage is reduced to its minimum speed when the second variable stage starts. The graphic below illustrates this situation.

If the last fan stage uses variable outputs, it must be configured in ON-OFF mode (see sec. 5.17.7.2).

The bandwidth defines the interval over which the variable output goes from minimum to full speed. This is true even if full speed is never reached as in the example above. When the Stage 2 start temperature is reached, the variable output drops to its minimum speed value. The V1 bandwidth is then used to increase the speed as the temperature of stage 2 increases. When the temperature returns to the stage start temperature, the minimum speed is maintained until the stage stop temperature is reached.



If an outdoor temperature probe is used, it is possible to automatically adjust stages 1 and 2 bandwidths according to the outdoor temperature. Refer to section 5.18.5 in the advanced settings to use this feature.



5.5.1 Temperature Settings

This section explains how to set the temperature at which fan stages start and stop and how to set the bandwidth of variable fans.

Note that the start temperature of a fan stage is likely to change if the set point changes or if the bandwidth changes according to the outside temperature.

- Set the function to **START / STOP TEMPS.**
- Select the **"2. Fan Stages"** menu. The start temperature of stage 1 flashes on the display.
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

Ventilation	
Stage 1 On	70.0
Var1 bandwidth	2.0
Var2 bandwidth	2.0

Stage X On / Off

Select the start and stop temperature of each fan stage starts. Note that stage 1 stops when the room temperature gets 0.3° F (0.2°C) below the set point.

Bandwidth V1-V2:

Set the bandwidth of variable fan 1 and 2 to the desired value.

5.5.2 Timer Settings

A fan stage can include certain relays configured to operate in timer mode. Refer to section 5.17.7.2 to activate a fan stage in timer mode. Adjust the timer settings as follows:

- Set the function to **RELAY SETTINGS.**
A password is required to access this menu (see sec. 5.17.2).
- Select the **"2. Fan Stages"** then select the proper stage using the arrow keys.

Stage 1 Relays:		▲
Variable 1	Var(1)	■
Variable 2	Var(1)	
Relay 1	Off(1)	
Relay 2	timer(1)	
...		
Relay 15	Off (1)	
Relay 16	Off (1)	
On Time	15sec	
Off Time	0sec	

- Press the down-arrow key and scroll the display until the ON and OFF times are displayed.
- Press the Edit key the Edit key then use the arrow keys to adjust the ON and OFF times of the selected fan stage to the desired value.

5.6 Natural Ventilation

5.6.1 Principle of Operation

The controller enters in natural ventilation when the room temperature reaches the *Initial Opening Temperature* of the natural ventilation curtain. At that moment, the curtain opens during its *Initial Opening Time*.

When it operates in natural ventilation, the controller controls the natural curtain with a timer (*Open Time & Off Time*). The curtain opens in timer mode when the average temperature is above the *Start Open At* temperature and closes in timer mode when the temperature decreases below the *Start Close At* temperature.

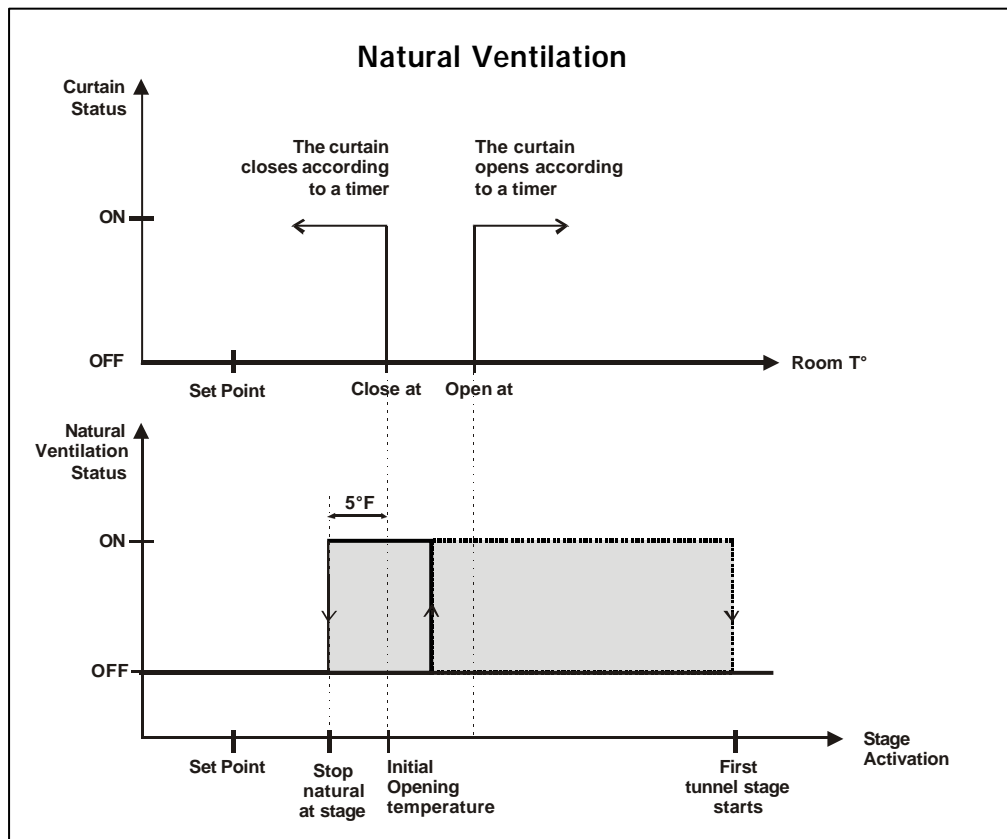
Natural ventilation is disabled when room temperature decreases of 5° F (2.8° C) below the curtain's *Start Close Temperature* or when tunnel ventilation starts (see below).

Transition from Tunnel to Natural mode:

When the temperature decreases below the start temperature of the first tunnel stage, the natural ventilation curtain opens continuously during the *Continuous Opening Delay*. When this delay has elapsed, the curtain becomes controlled according to its natural ventilation settings once again.

Transition from Natural to Tunnel mode:

When the natural ventilation curtain is opened and the room temperature reaches the start temperature of the first tunnel stage, the controller waits for the *Tunnel Close Delay* then fully closes the curtain.



5.6.2 Curtain Settings

This section explains how to adjust natural ventilation parameters. Refer to the previous section for further information on these parameters.

- Set the function to **START / STOP TEMPS.**
- Select the **"4. Natural"** menu.
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.



Refer to the previous sections of this manual to get further information about the following parameters.

Natural Settings	▲
Initial Open at	72.0
Start Close at	70.5
Start Open at	72.5
Open Time	215
Initial Time	20
Open Time	15
Close Time	15
Off Time	15
Wind Delay	10
Tun. Close Delay	300
Continuous Delay	100

Initial Open at:

Specify the room temperature at which the controller enters in natural ventilation and opens the curtain for the first time. The curtain opens during its respective "Initial Time" when this temperature is reached.

Start Close at:

Set the temperature below which the curtain closes in timer mode. This parameter can be adjusted from 0 to 20° F (0 to 11.1° C) above the set point.

Start Open at:

Set the temperature above which the curtain opens in timer mode. This parameter can be adjusted from 0.5 to 20° F (0.3 to 11.1° C) above the "Start Close at" parameter value.

Initial Time:

Set the initial opening time of the curtain. The curtain opens during this time when the controller first enters in natural ventilation. This parameter can be adjusted from 0 to 900 seconds (15 minutes).

Open & Close Times:

Set the Open, Close and Off time of the curtain's opening and closing cycles. Note that the Off time is common to both cycles.

Wind Delay:

When temperature decreases below the "Start Closing" point or when it increases above the "Start Opening" point, the curtain only starts moving after the wind delay has elapsed. This prevents the actuator from moving when wind drafts are causing fleeting temperature changes. Set the wind delay to the desired value.

Tunnel Close Delay
(Advanced Setting)

This delay is launched at the beginning of the first tunnel stage. Once it has elapsed, the controller closes the natural ventilation curtain.

This parameter is accessible from the factory mode only.

Continuous Delay
(Advanced Setting)

The natural ventilation curtain opens during this delay when tunnel ventilation ends and the controller returns in natural ventilation.

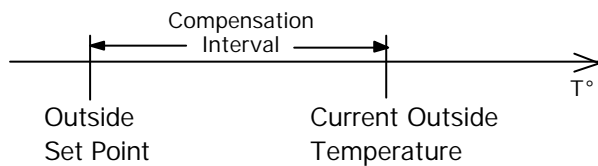
This parameter is accessible from the factory mode only.

5.6.3 Curtain Compensation

The controller can use the current outside temperature to adjust the opening and closing times of the curtains. As the outside temperature increases, the curtains' Opening ON Time is increased, causing the curtains to open faster. As the outside temperature decreases, the curtains' Closing ON Time is increased, causing the curtains to close faster. Note that the Curtain Compensation feature must first be enabled during the installation. Refer to section 5.2.4 to set the outside temperature set point.

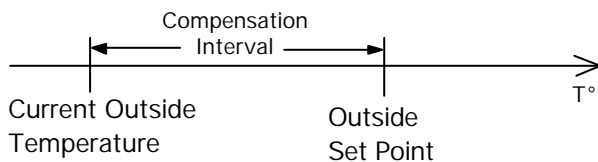
Temperature Rises:

When the curtains open, the controller increases the curtains' On Time by 4% for every 1° F (0.6° C) in the compensation interval (i.e. an interval of 3°F means a 12% increase). The curtains' Off Time is decreased by the same amount.



Temperature Falls:

When the curtains close, the controller increases the curtains' On Time by 4% for every 1° F (0.6° C) in the compensation interval (i.e. an interval of 3°F means a 12% increase). The curtains' Off Time is decreased by the same amount.



5.6.4 Stopping the Fans in Natural Ventilation

Fans can be stopped while the controller is in natural ventilation mode. Stopping the fans is made possible if a whisker switch is connected to the controller. This switch is used to detect the curtain opening over which the fans can stop. The graph on next page shows how it works.

The temperature increases

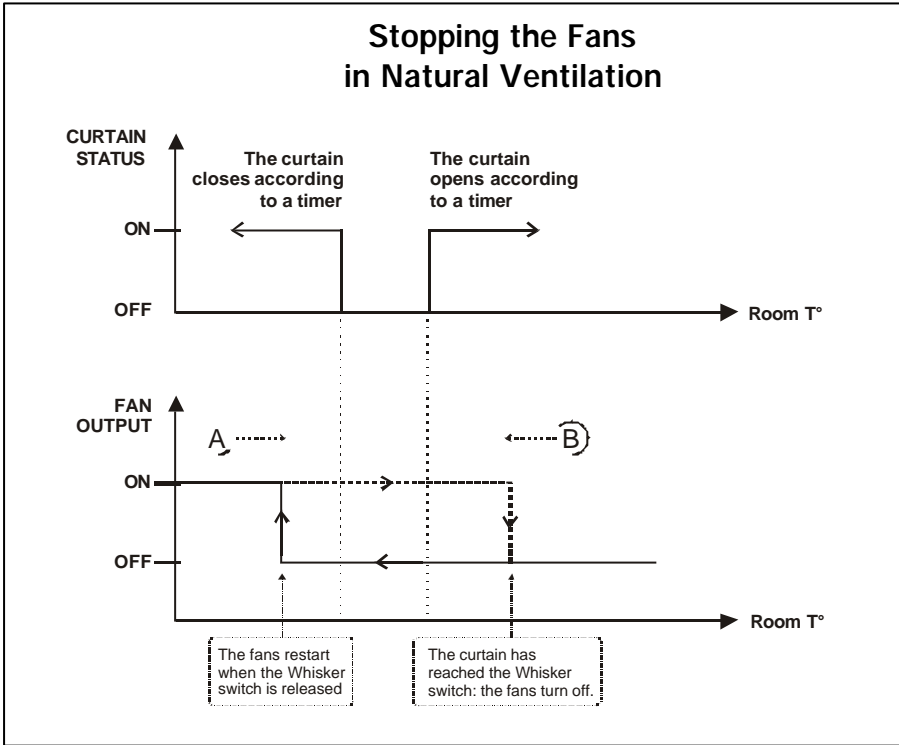
(from point A on the graph):

The curtain opens in timer mode when its opening temperature is reached. As the room temperature increases, the curtain keeps opening and reaches the Whisker switch. This means the chosen fans can now stop since the curtain is opened far enough.

The temperature decreases

(from point B on the graph):

At point B, the curtain is already opened and the fans are stopped. As the room temperature decreases, the curtain closes and releases the Whisker switch— the chosen fan outputs restart at that moment. If the temperature drops suddenly or if the Whisker switch is defective, the fans will restart when the temperature drops 5° F (3° C) below the lowest curtain's closing temperature. When this situation occurs, a defective Whisker switch alarm is posted to the alarm log.

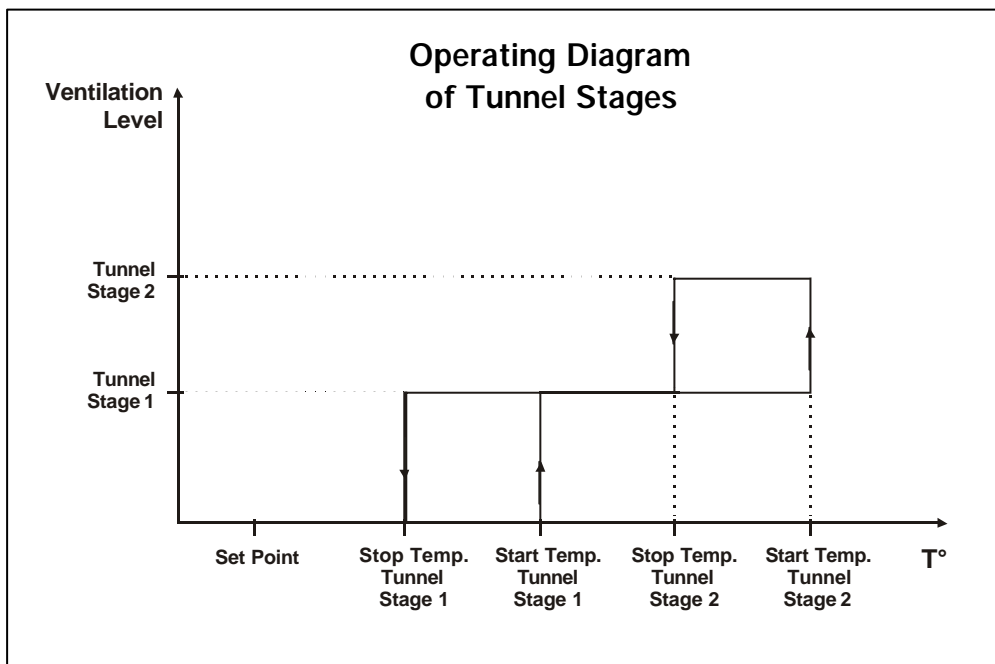


5.7 Tunnel Curtain

The controller can operate endwall curtains for tunnel ventilation. This ventilation mode starts at a user-defined fan stage. At the startup of a tunnel ventilation stage, the curtain opens during the opening time defined for that stage. When half of the opening time has elapsed, the stage's fans are activated. When the next tunnel stage is reached, the curtain opens during the opening time associated with that stage, etc. When the temperature decreases, the same sequence is executed in reverse order. The following diagram sums up the operation of the first two tunnel stages.

A minimum animal age is defined to avoid starting the tunnel ventilation when the animals are too young. The user must also define a minimum outside temperature: the tunnel ventilation is never activated unless the outside temperature is sufficiently warm. Take also note that the heating outputs cannot be enabled when the controller operates in tunnel mode.

Probe Sets: A new set of probe can be used when the controller enters in tunnel ventilation mode: the average room temperature reading becomes based on these probes when at a certain user-defined fan stage is reached.



Tunnel Curtain Settings

- Set the function to **START / STOP TEMPS.**
- Select "**3. Tunnel**" option using the arrow keys.
Accessible if the tunnel option is enabled in the installation menu (see sec. 5.17.3).
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.



Refer to the previous sections of this manual to get further information about the following parameters.

Tunnel Settings	
F irst Stage:	6
100% O pened:	7
P r. Set 2 at Stg	6
M i n. Outdoor T.	50.0
M inimum Age:	20
O pening Time	
Stage 6 :	30
Stage 7 :	40
Stage 8 :	60

First Stage:

The curtain starts opening at the startup of a specific fan stage. Select this stage. Note that all following fans stages will be considered as being fan stages as well.

100% Opened:

Select the fan stage at which the tunnel curtain fully opens.
This stage must be greater than the 1st tunnel fan stage.

Probe Set 2 at Stage:

Set the fan stage at which the second set of probes start being used.

Minimum Outdoor T° :

Set the outside temperature below which the tunnel curtain must remain closed. This parameter prevents the curtain from opening when it is too cold outside. Decrease the outside temperature to "Off" if you want to disable this temperature condition.

Accessible if the outside temperature probe is enabled (see sec. 5.17.4).

Minimum Age:

Set the animal age below which the tunnel curtain must remain closed. Adjustable from 1 to 250 days.

Opening Times:

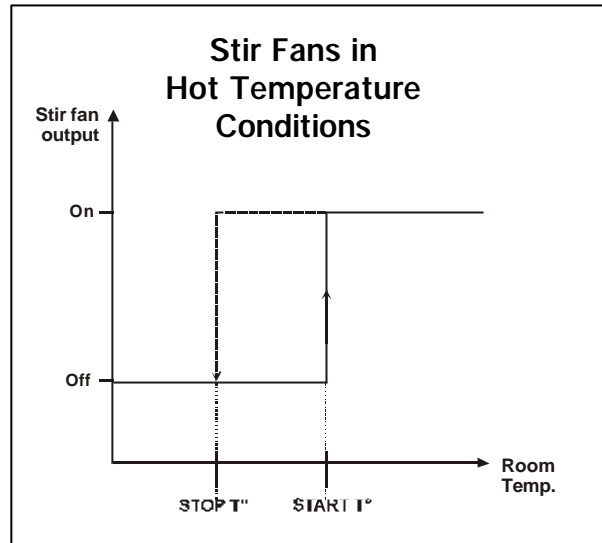
Assign a curtain opening time with the start-up of each tunnel fan stage. The opening time can be adjusted from 0 seconds to 900 seconds (15 minutes).

5.8 Stir Fans

The controller can control one stir fan output. This output can operate in three different ways:

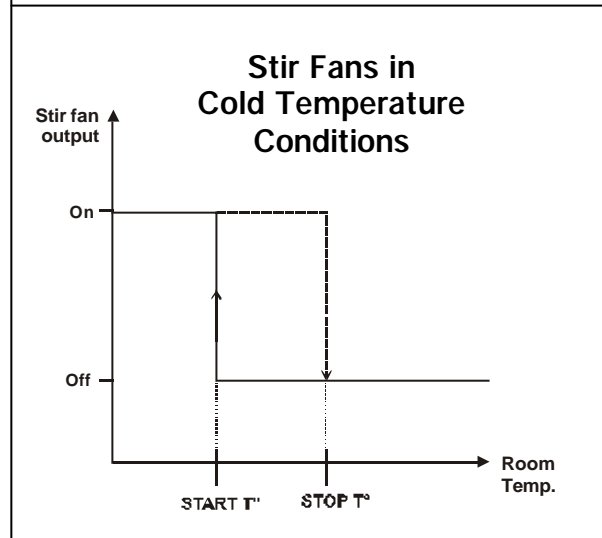
1. Stir fans in hot temperature conditions:

If the temperature in the room is too high, stir fans can be enabled to create an air draft to cool down the animals. When they are used for this purpose, stir fans start operating continuously when the room temperature reaches the output's start temperature. The output is disabled when the temperature falls below its stop temperature (see graph on the right).



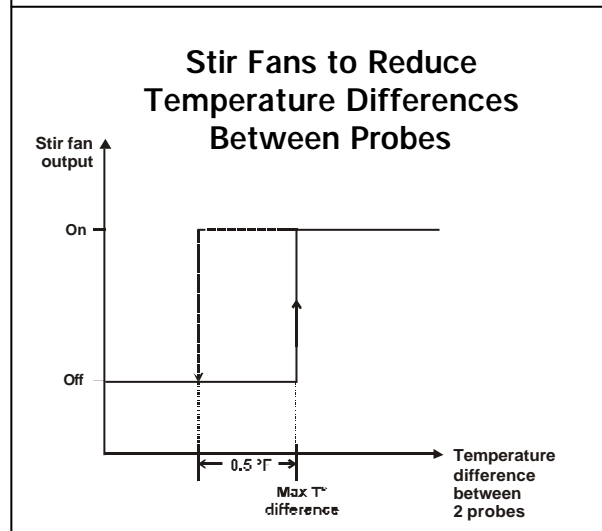
2. Stir fans in cold temperature conditions:

When the room temperature is too low, stir fans can be activated to disperse the warm air produced by heating units uniformly throughout the building. When they are used for this purpose, stir fans start running in timer mode when the room temperature falls below the output's start temperature. They are disabled when the room temperature rises and reaches the output's stop temperature (see graph on the right).



3. Stir fans used to reduce temperature differences between probes:

Stir fans can start running in timer mode when there is a considerable temperature difference between the reading of two probes. This function is used to ensure the uniformity of the temperature in the house. When they are used for this purpose, stir fans start running when the difference of temperature between two probes exceeds a user-defined temperature limit; they stop when the temperature difference between the probes gets 0.5° F (0.3° C) below the limit (see graph on the right).



Stir Fan Settings

- Set the function to **START / STOP TEMPS.**
- Select the "**6. Stir Fan**" menu.
Accessible if the stir fan output is enabled (sec. 5.17.3).
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.



Refer to the previous sections of this manual to get further information about the following parameters.

Stir Fan 1 Settings	
Hot Temp.	Yes
Cold Temp.	Yes
Probe Diff.	Yes
Hot Start Temp.	75.0
Hot Stop Temp.	74.5
Cold Start Temp	65.0
Cold Stop Temp.	65.5
Probe Diff. :	5.0
Cold & Probe Timer	
On Time	1:00(m s)
Off Time	1:00(m s)

Hot Temp.:

Select "Yes" to use the stir fans in warm temperature conditions.

Cold Temp.:

Select "Yes" to use the stir fans in cold temperature conditions.

Probe Diff.:

Select "Yes" to use the stir fans to reduce temperature differences between probes.

Hot Start Temp.:

If stir fans are used in warm temperature conditions, set the temperature at which the output starts. The start temperature ranges from 1° F to 20.0° F (0.6° C to 11.1° C) above the set point.

Accessible if the "Hot Temp." option is enabled above.

Hot Stop Temp.:

If stir fans are used in warm temperature conditions, set the temperature below which the output stops. The stop temperature ranges from 0.5° F to 19.5° F (0.3 to 10.3° C) above the set point and must be at least 0.5° F (0.3° C) lower than the start temperature.

Accessible if the "Hot Temp." option is enabled above.

Cold Start Temp.:

If stir fans are used in cold temperature conditions, set the temperature below which the output starts. The start temperature ranges from 0.5° F to 40.0° F (0.3° C to 22.2° C) below the set point.

Accessible if the "Cold Temp." option is enabled above.

Cold Stop Temp.:

If stir fans are used in cold temperature conditions, set the temperature at which the output stops. The stop temperature ranges from 35.5° F (19.7° C) below the set point to 10° F (5.6° C) above the set point and must be at least 0.5° F (0.3° C) greater than the start temperature.

Accessible if the "Cold Temp." option is enabled above.

Probe Diff.:

Stir fans start running when the difference of temperature between two probes exceeds a certain limit. Set this limit to the desired value. This parameter ranges from 0.5° F to 20° F (0.3° C to 11.1° C).

Accessible if the "Probe Diff" option is enabled above.

On/Off Time:

When they operate in cold temperature conditions and/or when there is a big temperature difference between two probes, stir fans run in timer mode. Set the On and Off Time of the stir fan timer.

5.9 Heating Stages

The controller can control 4 independent heating stages. These stages are independent from one another and each operate according to their own temperature settings and probe selection (see sec. 5.17.3 and 5.17.4).

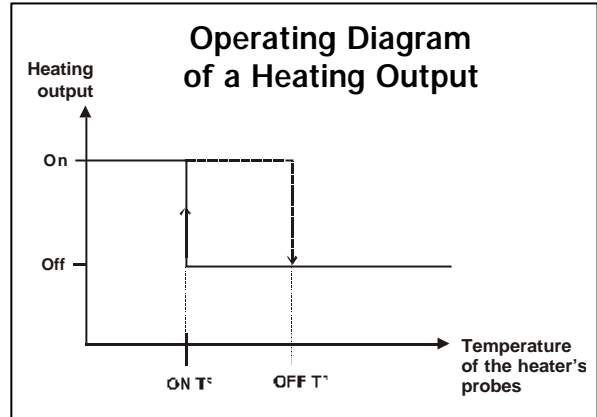
The stop temperature of an heating stage must be at least 0.5°F (0.3°C) higher than its start temperature. The start (On) temperature can be set from 0.5°F (0.3°F) below the set point to -40°F (-40°C).

- Set the function to **START / STOP TEMPS.**
- Select the "**1. Heaters**" menu.
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

Heaters		▲
Heater 2 On	67.0	
Heater 2 Off	68.1	
Heater 1 On	69.0	

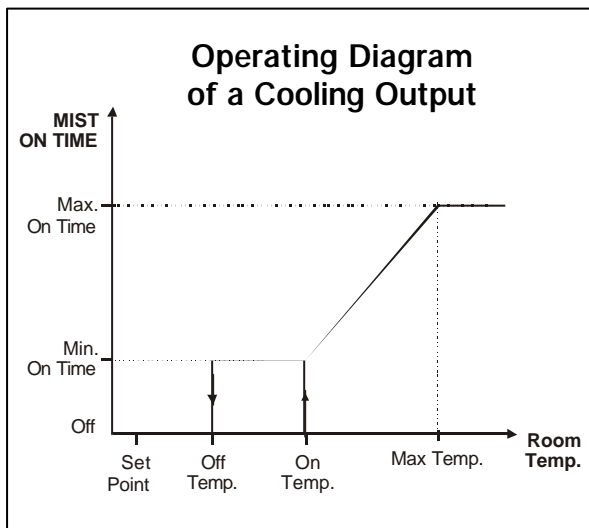
Heater X On/Off:

Set the temperature at which each heating stage starts and stops.



5.10 Mist Cooling

The controller can control 1 mist cooling output. When the room temperature reaches the start temperature of a cooling output, mist units are activated and run in timer mode according to their minimum timer (*On Time & Off Time*). As temperature rises, a gradual transition is made from the minimum timer towards the maximum timer (*Max On Time & Max Off Time*). The second mist timer is fully used when the room temperature reaches the *Maximum Temperature* parameter setting. The mist cooling output is disabled when the temperature falls below a user-defined value. It can also stop when the humidity level is too high (see RH Compensation in chapter 5.18.4).



Mist Cooling Settings

- Set the function to **START / STOP TEMPS.**
- Select the **"7. Cooling"** menu.
Accessible if the cooling output is enabled (sec 5.17.3).
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

Cooling		▲
On Temp	85.0	
Off Temp	83.0	
Min. OnTime	15sec	
Off Time	900sec	
Max. Temperature	87.0	
Max. OnTime	180sec	

On Temp. / Off Temp:

Select the temperature at which the cooling output starts and stops. Note that the start temperature must be greater than the set point.

Min/Max On Time:

Set the minimum and maximum On Time of the cooling timer.

Max Temperature:

Set the temperature at which the cooling output uses its maximum timer settings. The maximum temperature must be at least 0.5° F (0.3° C) greater than the ON TEMP.

5.11 Soaking

The soaking output is used to clean the room when it is empty. This output runs in timer mode when the controller is in clean mode.

- Set the function to **START / STOP TEMPS.**
- Select the **"9. Soaking"** menu.
Accessible if the soaking feature is enabled (sec. 5.17.3).
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

On Time:	60sec	▲
Off Time:	60min	■
#Soaking Cycle:	None	

On/Off Time:

Set the timer used by the soaking output.

Soaking cycles:

Select how many soaking cycles must be performed from the moment the controller enters in clean mode (1 to 99 cycles or select "Cont" for soaking cycles to be preformed continuously).

5.12 0-10V Outputs

The controller has two 0-10V outputs that can either be used to control heating units or fans.

Reference Temperature:

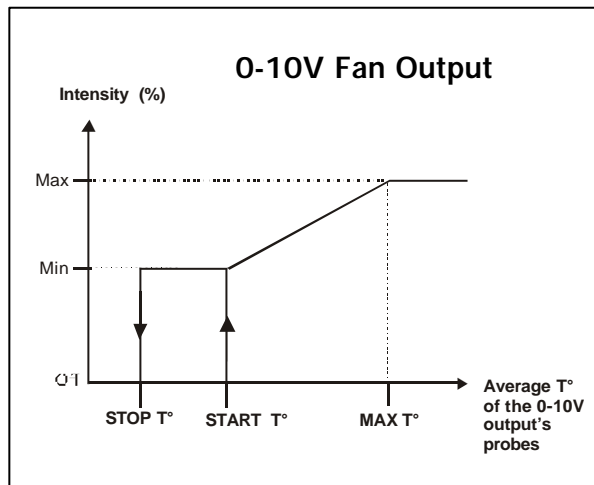
In order to control a 0-10V output, the controller refers to the average temperature of the probes that are assigned to the output. Refer to section 5.17.9 to make the probe assignment.

The controller can give a 10-0V signal instead of a 0-10V signal. This option is useful for safety reasons: if the main controller loses power and its 0-10V output falls to 0V, then the controller gives the maximum load to the module connected on the output.

0-10V Fan Outputs

The 0-10V fan output starts at its minimum intensity when the average temperature of its probes reaches the start temperature. The intensity of the fans then gradually increases as the temperature rises and the output reaches its maximum intensity when temperature reaches the *Maximum Output* parameter setting.

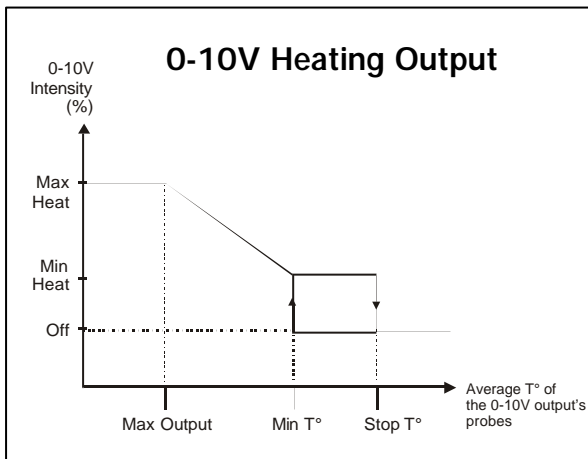
The 0-10V fan output stops when the temperature drops below the stop temperature.



0-10V Heating Outputs

The 0-10V heating output starts at its minimum intensity when the average temperature of its probes drops to the start temperature. The intensity of the 0-10V heater then gradually increases as the temperature decreases and reaches its maximum intensity when the temperature drops to the *Maximum Heat* parameter setting.

The 0-10V heater is disabled when the temperature increases to the output's stop temperature.



Refer to the installation section to set the 0-10V outputs operating mode : heating or ventilation (see sec 5.17.3).

0-10V Settings

- Set the function to **START / STOP TEMPS.**
- Select the "**5. 0-10V Outputs**" menu.
Accessible if a 0-10V output is enabled (sec. 5.17.3).
- Select the desired 0-10V output. The output's start temperature is displayed.

Start Temp 75.0°F
Min: 10 **Max:** 100
Max Output at: 72.5
Stop at: 70.0

- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit then use the arrow keys to modify its value. Press Edit again to validate the new value.

Start Temp.:

Set the temperature at which the 0-10V output starts.

Min / Max:

Set the minimum and maximum intensity of the 0-10V output.

Max Output at:

Select the temperature at which the 0-10V output reaches its maximum intensity.

Stop at:

Select the temperature at which the selected 0-10V output stops.

5.13 Animal Age & Count

Animal age

Some parameters of the controller can automatically change over time as the animals grow up (temperature curve for instance). For this reason, you must set the animal age as shown below.

Animal & mortality count

At the beginning of a batch, you must specify the initial number of animals. You will then be allowed to adjust the number of animals when mortality occurs.

- Set the function to **AGE & MORTALITY**.
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

Age & Mortality	
Age:	10 days
New Mortality	0
Today:	5
Total Mortality	25
Current Size	500
Initial Size	500

Age:

Set the animal age. It can be adjusted from 0 days to 450 days.



ALL histories of the controller are reset when a new group starts (i.e., the animal age switches from 0 to 1 day).

New Mortality:

Enter the number mortalities as it occurs. Once a value is posted, the parameter displayed on screen automatically goes back to "0". The posted value is then removed from the current animal count.

Today's Mortality:

The controller displays the number of animals that have died since the beginning of the day. This value cannot be changed.

Total Mortality:

The controller displays the number of animals that have died since the beginning of the batch. This value cannot be changed.

Current Size:

The current count is automatically adjusted when the number of mortalities, of culled animals and marketed animals changes.

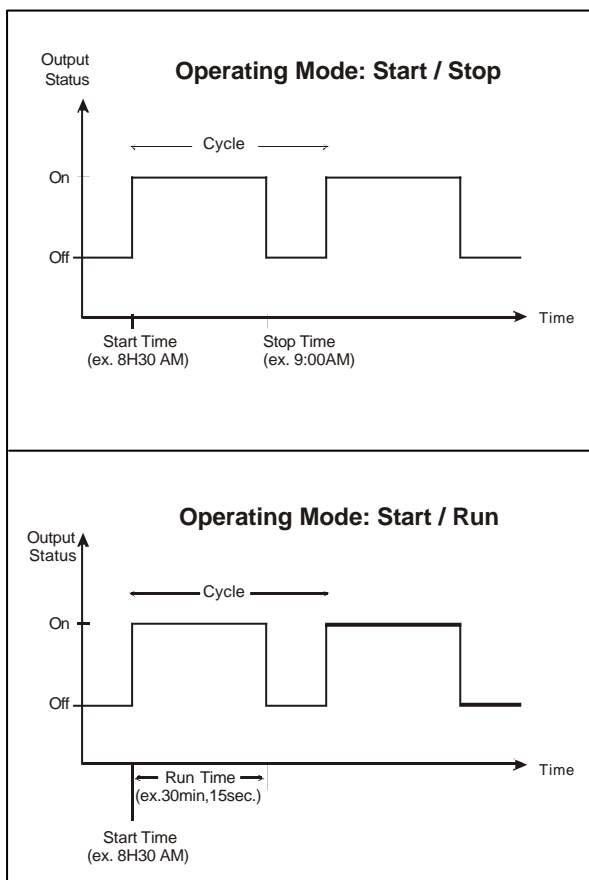
Initial Size:

Specify the initial number of animals in the room.

5.14 Clock Outputs

The controller has two outputs to control various devices using the real-time clock. These clock output can use up to 24 timer cycles.

A clock output starts when the *On Time* of a timer is reached; it either stops after a user-defined running time or at the *Off Time*, depending on chosen option. The following diagrams show both possibilities:



Settings

- Set the function to **START / STOP TEMPS.**
- Select the **"8. Clock Output"** menu.
Accessible if clock outputs are enabled (see sec. 5.17.3).

```

Clock 1 Mode S/Stop
On 1      13: 50 (1)
[or]
Run Time Hour      0
Min      0 Sec      0
Off 1      14: 30 (1)
    
```

- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit then use the arrow keys to modify its value. Press Edit again to validate the new value:

Clock Mode:

The clock mode allows stopping a clock output at a certain time of the day or after a certain run time. Select *"S/Stop"* to specify the time at which each cycle starts and stops or select *"S/Run"* to specify the running time of each cycle. Note that the *"Start/Run"* option allows stopping cycles with more precision since this mode allows adjusting the seconds.

On Time / Off Time or Run Time:

Set the time at which each cycle starts then set the moment at which each cycle ends.

5.15 History

5.15.1 Resetting Histories

The controller automatically resets all histories when the animal age goes from OFF to 1 day.

- Set the function to **AGE & MORTALITY**.

Age & Mortality	▲
Age:	Off days
New Mortality	0
Today's	0

- Press the Edit key then press the down-arrow key and decrease the animal age until letters "Off" are displayed. Press the Edit key again to validate.
- Press the Edit key one more time and then use the arrow keys to set the animal age to 1 day. Press Edit again to validate. All histories are now cleared, except for the Alarm Log History.

5.15.2 Average Temperature History

The **AMBIENT TEMPERATURE** menu gives the highest and lowest average temperature recorded today and for the past 7 days.

- Set the function to **AMBIENT TEMPERATURE**.
- Press the down-arrow key to scroll down the menu until today's minimum and maximum temperatures are displayed.

Today's Min / Max	
Min 67.8	Max 72.2
Yesterday	
Min 65.3	Max 71.7

- Keep scrolling down the display to look at the 7-day history.

5.15.3 Individual Probes History

The minimum and maximum temperature reading of each probe are displayed in the probe history menu (7-day history).

- Set the function to **PROBE TEMPERATURES**.

3 Days ago			
Pb1L 67.8	Pb1H 71.3		
Pb2L 65.2	Pb2H 69.7		
Pb3L 66.9	Pb3H 74.2		

- Press the down-arrow key to scroll down the display. The highest and lowest temperature recorded by each probe today are displayed.
- Keep scrolling down the display to look at the 7-day history.

5.15.4 Outside Temperature History

The controller keeps an history of the Hi and Lo temperature readings of the outside temperature probe for the current day and for the past 7 days.

- Set the function to **OUTSIDE TEMPERATURE**.
Accessible if the outside temperature probe is enabled (see sec 5.17.4.2).

- Press the down-arrow key to scroll down the display. The minimum and maximum outside temperatures recorded today are displayed.

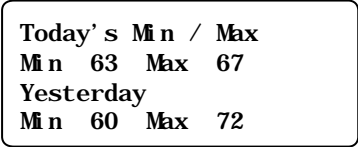
Today's Min / Max			
Min 71.3	Max 74.2		
Yesterday			
Min 64.2	Max 67.3		

- Keep scrolling down the display to look at the 7-day history.

5.15.5 Relative Humidity History

The minimum and maximum humidity readings are displayed in the relative humidity menu (this is a 7-day history).

- Set the function to **RELATIVE HUMIDITY**.
Accessible if the humidity probe is enabled (see sec. 5.17.4.2).
- Press the down-arrow key to scroll down the display. The highest and lowest humidity readings recorded today are displayed.

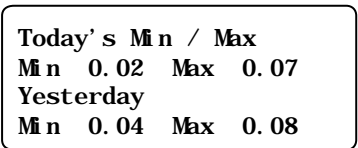


- Keep scrolling down the display to look at the 7-day history.

5.15.6 Static Pressure History

The minimum and maximum static pressure readings are displayed in the relative humidity menu (this is a 7-day history).

- Set the function to **STATIC PRESSURE**.
Accessible if a static pressure sensor is enabled (see sec. 5.17.4.2).

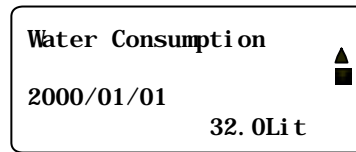


- Press the down-arrow key to scroll down the display. The highest and lowest pressure levels recorded today are displayed.
- Keep scrolling down the display to look at the 7-day history.

5.15.7 Water Consumption History

The controller provides a pulse input to monitor water consumption. The daily water consumption is recorded for the past 75 days. The controller also displays the total water consumption recorded since the beginning of the batch.

- Set the function to **WATER**.



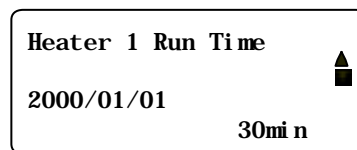
- Press the down-arrow key once. The total water consumption recorded since the beginning of the batch is displayed.
- Keep scrolling down the display to look at the 75-day history.

5.15.8 Heater Run Time History

The controller keeps a daily history of the heater run time. The daily heater run time is recorded for the past 75 days. The controller also displays the total run time of the heaters.

- Set the function to **HEATERS / FEEDERS**.
Accessible if heaters or feeders are enabled (s. 5.17.3).

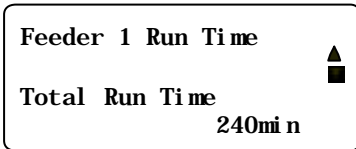
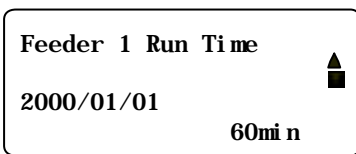
- Select the desired heating output. The run time of this output recorded today is displayed.
- Press the down-arrow key once. The total run time of the chosen heating output is displayed.
- Press the down-arrow key as required to scroll down the display and to look at the 75-day history.



5.15.9 Feeder Run Time History

The controller keeps a daily history of the feeder run time. The daily feeder run time is recorded for the past 75 days. The controller also displays the total run time of each feeders.

- Set the function to **HEATERS / FEEDERS**.
Accessible if heaters or feeders are enabled (s. 5.17.3).
- Select the "**2. Feeders**" menu.

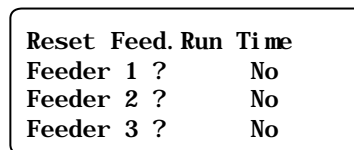


- Select the desired feeder. The run time of this feeder recorded today is displayed.
- Press the down-arrow key once. The total run time is displayed.
- Press the down-arrow key as required to scroll down the display and to look at the 75-day history.

RESET THE FEEDER RUN TIME HISTORY

The user can clear the total run time of the feeders. This function is useful to monitor the amount of feed in the bins.

- Set the function to **HEATERS / FEEDERS**.
Accessible if heaters or feeders are enabled (s. 5.17.3).
- Select the "**5. Reset Run Time**" menu.
Accessible if feeders are enabled (s. 5.17.3).



- Use the arrow keys to select the desired feeder.
- Press the Edit key then press the up-arrow key to reset the total running time of the selected feeder. Press the Edit key once again to validate. The "Yes" answer switches to "No" once again, this means the history has now been cleared.

5.16 Alarm Settings

5.16.1 Alarm Log

When an alarm occurs, the alarm led is turned on and the alarm is recorded in memory along with the time and date. To view the alarms in the alarm log, select the **ALARM** main menu using the menu select buttons and use the up and down-arrow keys to step through the recorded alarms. The alarm conditions are as follows:

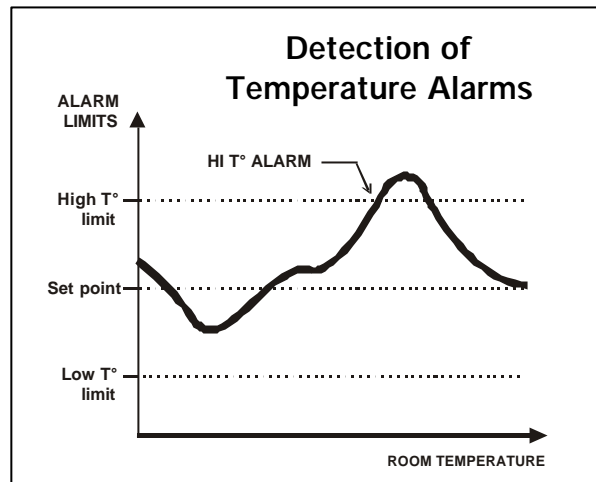
Another alarm situation occurs when power to the EXPERT-PNT-212 fails. In this case, the alarm relay is activated. When the alarm relay is activated, the normally open contact (—●—●) closes.

Display	Meaning
Low Temp Alarm	Low temperature alarm
High Temp Alarm	High temperature alarm
Low Pressure Alarm	Low static pressure Alarm
High Pressure Alarm	High static pressure Alarm
Probe #1-6 Defect	A temperature probe is defective
Outdoor Probe Defect	The outdoor probe is defective
Whisker Switch Defect	The Whisker switch is defective
Water Spill High	Water consumption too high
SP Probe Defect	The static pressure sensor is defective
RH Probe Defect	The humidity probe is defective

5.16.2 Alarm Conditions

The diagram below shows how temperature alarms are detected.

When the average room temperature exceeds the high temperature alarm setting, a high temperature alarm is generated. When the average room temperature drops below the low temperature alarm setting, a low temperature alarm is generated. Although these settings are entered by the user as absolute values, they are defined relative to the current set point and are automatically adjusted by the controller when the set point changes.



The situation is slightly different when the outside temperature is greater than the set point. In this case, the set point is replaced by the outside temperature as the reference point. This means an alarm is set off when the indoor temperature reaches Outside Temperature + High Alarm Offset (the offset being the difference between the high alarm temperature setting and the set point). A third parameter, called the critical temperature, is defined to continue monitoring the indoor temperature for high temperatures. When the indoor temperature reaches the critical high temperature (defined as an absolute value), an alarm is set off.

T° Alarms in Clean Mode

The controller can monitor low temperature alarms during the clean mode. If this alarm condition is used, the controller sounds an alarm when the temperature falls below the low clean mode alarm limit.

Static Pressure Alarms

The controller can sound an alarm when the static pressure (SP) level exceeds the high or low pressure limits for a too long period of time.

Water Spill Alarm

A water spill alarm sets off when the consumption of a water meter exceeds its respective consumption limit. This limit can be adjusted from 0 to 10,000 gallons or liters per 15 minutes.

5.16.3 Alarm Settings

- Set the function to **START / STOP TEMPS.**
- Select the "**11. Alarms**" menu.
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit then use the arrow keys to modify its value. Press Edit again to validate the new value:

Temperature Alarms		▲
Empty zone	32.0	■
Low Alarm	60.0	
High Alarm	90.0	
Critical Alarm	120.0	
Water Spill Limit		
	100 Gal	
Static Press Alarm		
Low Alarm	010"WC	
High Alarm	100"WC	
Delay	300sec	

- **Water Spill Limit:**
Set the maximum water consumption allowed per 15 minutes.
- **Static Pressure Limit:**
Accessible if a SP probe is enabled (sec. 5.17.4.2).

Low / High Alarm:
Set the pressure levels below and above which a pressure alarm sets off.

Delay:
The high or low pressure condition must be maintained on this period of time before the controller triggers a pressure alarm. Set the static pressure alarm delay to the desired value.

- **Temperature Alarms**

Clean Mode:
Set the temperature below which a temperature alarm sets off during the clean mode.

Lo/Hi Alarm:
Set the room temperature below and above which a temperature alarm sets off.

Critical Temperature Alarm:
Specify what is the absolute maximum temperature allowed in the house (ranges from 0.5 above the house set point to 120°F (48.9° C)).
Accessible if the outside temp. sensor is enabled (sec. 5.17.4.2).

5.17 Installation Setup

5.17.1 Step-by Step Installation Guide

These are the basic steps to start up your EXPERT-PNT-212 controller. Enter the Installer Password before starting the controller's installation this gives access to all menus.

- 1- Connect the controller according to the wiring diagram enclosed with this manual.
- 2- Turn the power ON.
- 3- Enter the installer password (see sec. 5.17.2).
- 4- Set the **Date and Time** (see sec. 5.17.5).
- 5- Step through the "**7. Installation**" menu from the **USER** main menu and answer all questions to customize the controller for your particular applications (see sec. 5.17.3).
- 6- Step through the "**3. Other Probes**" menu from the **USER** main menu and answer all questions to customize the controller for your needs (see sec. 5.17.4.2).
- 7- Assign relays to:

- Heater stages section 5.17.7.1
- Fan stages section 5.17.7.2
- Tunnel curtain section 5.17.7.3
- Natural curtain section 5.17.7.3
- Inlet section 5.17.7.4
- Stir fans section 5.17.7.5
- Cooling stage section 5.17.7.6
- Soaking stage section 5.17.7.7
- Clock outputs section 5.17.7.8

8. Assign temperature probes to

- Heating stages section 5.17.9.1
- Average Room T° . section 5.17.4.1
- 0-10V outputs section 5.17.9.2

9. Set the room T° set point (see sec. 5.2).
10. Adjust the start/stop temperatures of fan and heating stages (see sec. 5.5.1 & 5.9.1).
11. Set the min. ventilation timer (see sec. 5.3).
12. Assign an inlet position with the startup of each fan stage (see sec 5.4.2).
13. Adjust the parameter settings of the stir fan output (see sec. 5.8).
14. If the soaking feature is used, adjust the timer cycle used to operate soaking units. Refer to section 5.11.
15. If 0-10V outputs are used, adjust their start temperature. Refer to section 5.12.
16. Adjust start / stop times used by clock outputs. Refer to section 5.14.
17. Adjust the number and the age of animals in the barn. Refer to section 5.13.
18. Calibrate the water meter (see sec. 5.17.8).
19. Set required humidity compensation functions (see sec. 5.18.4).
20. Set the temperature curve (optional) to get an automatic adjustment of the temperature set point over time (see sec. 5.18.2)
21. Set the minimum ventilation curve (optional) to get an automatic adjustment of the minimum ventilation level over time (see sec. 5.18.3).

5.17.2 Setting Password

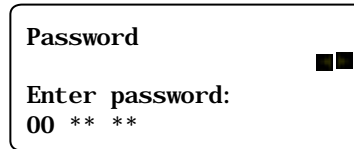
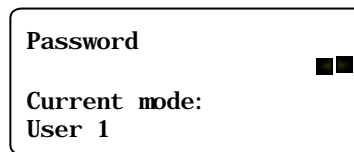
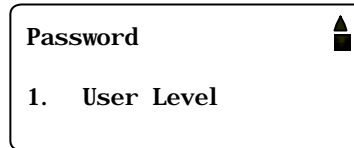
This function allows to identify 2 different user types. It is used to restrict access to certain parameter settings. The password is made up of three blocks of two digit numbers, for example: 13 44 21. When a correct password is entered, the current user is identified.

Installer Password: By default, the INSTALLER PASSWORD is set to "6-1-0". The installer mode gives the access to all functions of the EXPERT-PNT-212. By default, the controller returns to the user mode after 15 minutes of inactivity. The installer may return to user mode before that delay by entering the user password. The installer password can be modified.

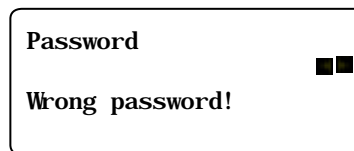
User Password: The user mode gives access to the basic functions of the EXPERT-PNT-212. By default this password is set to "1-2-3". Note that some menus will not be accessible on user mode. The user password cannot be modified. The control automatically returns to user mode after 15 minutes of inactivity.

Setting the Password:

- Set the function to **USER**.
- Select the "**8. Password**" menu. The current mode is displayed.



- Select the "**1. User Level**" menu. The current mode is displayed.
- Press the right-arrow key to enter a password. The first two-digit number flashes on the display. Press the Edit key once then use the arrow keys to set the first number. Press the right-arrow key once. The second two-digit number flashes on the display. Press the Edit then use the up and down-arrow keys to set the second number. Proceed in similar fashion to set the third two-digit number. Press the right-arrow key one last time to validate the complete password.
- If the password entered is incorrect, an error message "Wrong Password" is displayed.

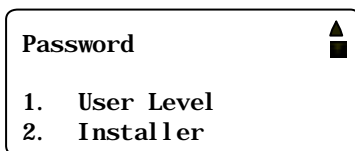


Modifying the Installer's Password

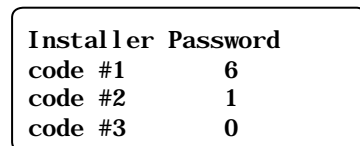
The installer's password must be entered before modifying it. Proceed as explained above to enter the installer password (6-1-0 by default).

Note : The password "1-2-3" is reserved for the user mode. Do not use the same number sequence for the installer password.

- Set the function to **USER**.
- Select the "**8. Password**" menu. The current mode is displayed.



- Select the "**2. Installer**" menu. The first number of the installer password flashes on the display.
Accessible if the installer password has been entered.



- Select the desired password number.
- Press the Edit key and then use the arrow keys to modify the number.
- Press Edit once again to validate the new number.

5.17.3 Installation Options

The following section describes how to customize the controller for your particular applications. Normally, this setup needs to be done only once.

- Set the function to **USER**.
 - Select the **"7. Installation"** menu.
A password is required to access this menu (sec. 5.17.2).
 - Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.
 - **Number of Feeders:**
Enable the proper number of feeders (0 to 4 feeders).
 - **Number of Heater Stages:**
Enable the proper number of heating stages (1 to 4 stages).
 - **Number of Fan Stages:**
Enable the proper number of fan stages (3 to 12 stages).
 - **Number of Variable Outputs:**
Enable the proper number of variable outputs (0 to 2 outputs).
 - **Number of Clocks:**
Enable the proper number of clock outputs (0 to 2 clock outputs).
 - **0-10V Outputs:**
Select the number of 0-10V outputs in use (0 to 2 outputs).
- 0-10V Output Signal:**
Select the signal used by each 0-10V output (0-10V or 10-0V).

Installation	▲
# Feeders	2 ■
# Heater stages	2
# Fan stages	8
# Variables	2
# Clocks	2
# 0-10V Outputs	1
Output 1	Vent.
Output 1	0-10
Use Inlet ?	Yes
Use Natural?	Yes
Natural Comp?	Yes
Use Tunnel ?	Yes
Use Cooling ?	Yes
Use Stir Fan ?	Yes
Use Soaking ?	Yes
V1 Min Speed %	20
V2 Min Speed %	20
V2 Motor Curve	4
Outdoor on Var?	Yes
Digit Display	T°

0-10V Output Use:

Select the function of each 0-10V output (Ventilation or heating).

- **Use Inlet ?**
Select "Yes" to enable the air inlet.
- **Use Natural?**
Select "Yes" to use the natural ventilation curtain.
- **Use Natural Comp.?**
Select "Yes" to use the curtain compensation.
- **Use Tunnel?**
Select "Yes" to use the tunnel ventilation curtain.
- **Use Cooling?**
The controller can control one cooling output. Select "Yes" to enable this output.

- Use Stir Fan?**
The controller can control one stir fan output. Select "Yes" to enable this output.
- Use Soaking?**
The controller can control one soaking output. Select "Yes" to enable this output.
- Variable-Speed Fan Minimum Speeds and Motor Curve:**
This is the minimum speed of the variable fans within regular fan stages. It does not apply to the minimum ventilation stage.

Set the minimum speed of each variable output and select the proper motor curve for each one of them.
- Use Outdoor Temperature Compensation on Variable Stages 1 and 2 ?**
Select "Yes" to use the outside temperature compensation function to influence the bandwidth of variable fan outputs.
Accessible if the outside temperature sensor is enabled (see sec. 5.16.4.2.)
- Digit Display:**
Select the information to be displayed on the red LED display:

- T° average temperature
- SP static pressure
- T° /SP avg temperature & static pressure
- T° /I1 avg temperature & inlet position
- SP/I1 static pressure & inlet position

Installation ▲	
# Feeders	2
# Heater stages	2
# Fan stages	8
# Variables	2
# Clocks	2
# 0-10V Outputs	1
Output 1	Vent.
Output 1	0-10
Use Inlet ?	Yes
Use Natural ?	Yes
Natural Comp?	Yes
Use Tunnel ?	Yes
Use Cooling ?	Yes
Use Stir Fan ?	Yes
Use Soaking ?	Yes
V1 Min Speed %	20
V2 Min Speed %	20
V2 Motor Curve	4
Outdoor on Var?	Yes
Digit Display	T°

5.17.3.1 *Selecting Measuring Units*

- Set the function to **USER**.
- Select the "**4. Units**" menu.
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

Time Display	24H
Temperature	°F
Water	Li t
Static Pressure	"WC

Time display
AM/PM / 24 hours.

Temperature units
Celsius (Deg C) or Fahrenheit (Deg F).

Water
Gallons / Liters.

Static Pressure
Inches of water ("WC) or Pascal (Pa).

5.17.4 Activating/Deactivating Probes

5.17.4.1 *Temperature Probes*

Select the temperature probes that are connected to the controller then, refer to section 5.17.9 to assign the activated probes to air inlets, to heating stages, to be part of the average room temperature etc. At least one temperature probe must be activated.

- Set the function to **USER**.
- Select the "**2. Temp Probes**" menu. Temperature probes are displayed.

Temp Probes Used	■ ■
123456	
√√√	

- Select the desired probe. Press the Edit key then use the up-arrow key to select the probe or the down-arrow key to deselect the probe. Press the Edit key once again to validate.

5.17.4.2 *Other Probes*

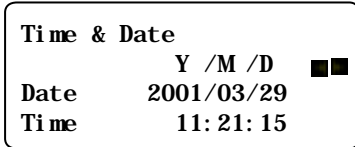
- Set the function to **USER**.
- Select the "**3. Other Probes**" menu.

Probe Selection	▲
Use RH?	Yes
Use Water?	Yes
Use Outdoor?	Yes
Use Stat. Press?	Yes

- Press the Edit key then use the up or down-arrow keys to enable or disable the following probes:
Relative Humidity Probe;
Water Meter;
Outdoor Temperature Probe;
Static Pressure Probe.

5.17.5 Setting the Time and Date

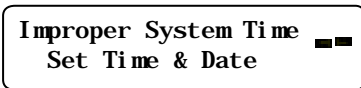
- Set the function to **TIME & DATE** from the main menu using the menu select buttons.



- Press the right-arrow key once. The year flashes. Press the Edit key then use the arrow keys to set the year. Press the right-arrow key once again, the month flashes. Press the Edit key then use the arrow keys to adjust the month. Press the right-arrow key. The day flashes. Press the Edit key then use the arrow keys to adjust the day to the appropriate value. Press the Edit key once again to validate the date.
- Press the right-arrow key once again, the hours flash. Press the Edit key then use the arrow keys to adjust the hours. Press the right-arrow key. The minutes flash. Press the Edit key then use the arrow keys to set the minutes. Press the right-arrow key. The seconds flash. Press the Edit key then use the arrow keys to adjust the seconds. Press the Edit key once again to validate the time.

5.17.5.1 Adjusting Improper System Time

When the notification message that follows is displayed onscreen you must set the correct time and date.



CAUTION: To ensure accurate feed data, history logs, and other important system information, you must set the correct time and date whenever prompted.

To adjust the time and date when the "Improper System Time" notification appears, follow the steps outlined in section 5.17.5.

Once the time and date has been adjusted, the notification message disappears, the system clock is set, and accurate data is ensured.

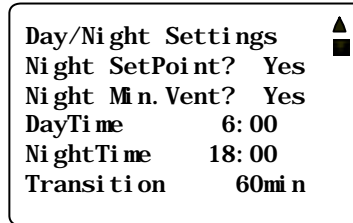


Note: The notification message repeatedly disappears and reappears until the time and date are set.

5.17.6 Adjusting Day and Night Times

The controller allows to use two separate set points and different minimum ventilation settings during night.

- Set the function to **USER**.
- Select the "6. Day / Night" menu.



- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

Night Set Point?

Select "Yes" to use a different target temperature at night; select "No" to disable this function.

Night Minimum Ventilation?

Select "Yes" to change the minimum ventilation fan speed at night; select "No" to disable this function.

Day Time:

Set the time at which day settings start being used.

Accessible if a night function is enabled above.

Night Time:

Set the time at which night settings start being used.

Accessible if a night function is enabled above.

Transition:

If the night set point is enabled above, a transition is made from one set point to the other. Set this transition time to the desired value.

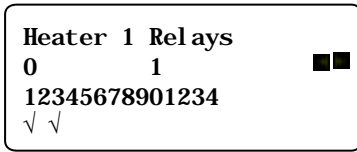
5.17.7 Relay Assignment

The EXPERT-PNT-212 can control up to 18 ON-OFF relay outputs and 2 variable relay outputs. The mapping between the stages and the relays must be determined by the user.



Note that relay assignment can only be by the installer (sec 5.17.2).

The relays with a mark below are assigned to the selected output. Use the up and down-arrow keys to scroll the display. The first number above the relay numbers stands as the first number of the relay. In this example, the relay 1 and 3 are assigned to Heater 1 stage. This means that when heater 1 stage operates, the units connected on those relays will be turned on.



Pressing the down-arrow key directly goes to the last relay and pressing the up-arrow key returns to the first relay. This makes it easier to step through the relays.

Use the template at the end of this manual to map the relays before assigning them from the front panel. Use the + push-button to assign a relay to an output or the - push-button to remove the assignment.

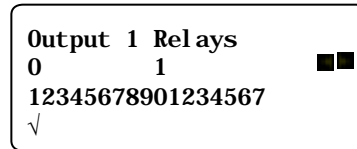
5.17.7.1 Regular On/Off Outputs

The following procedure show how to assign relays to the following type of outputs:

- heaters;
- clock outputs;
- stir fans;
- cooling output* ;
- soaking output* ;
- backup relay.

* It is possible to assign the same relays to the cooling and soaking outputs. Relays that are common to cooling and soaking outputs switch whenever one of these two outputs is activated.

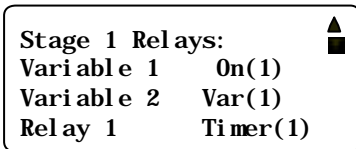
- Set the function to **RELAY SETTINGS**.
A password is required to access this menu (sec. 5.17.2).
- Select the desired output amongst those listed above.



- Select the desired relays with the arrow keys.
- Press the Edit key then use the arrow key to assign the relay. Press Edit to validate.

5.17.7.2 Fan Stage Relays

- Set the function to **RELAY SETTINGS**.
A password is required to access this menu (sec. 5.17.2).
- Select "**2. Fan Stages**" and then select the first fan stage. The ON/OFF status for each relay is displayed.
- Assign the proper relay(s) for fan stage 1 using the arrow keys. Press the Edit key then use arrow keys to set the relay status. Press the Edit key once again to validate.



- Proceed in similar fashion to assign relays to each fan stage in use.

Variable Output Assignment:

The EXPERT-PNT-212 has two variable outputs to operate variable-speed fans. Each fan stage can use these outputs in variable or on-off mode. Press the up or down arrow key and set the mode to 'Var' for variable, 'ON' for ON-OFF or 'OFF' to deactivate the output.



If the last fan stage uses a variable output, the output must use the on/off operating mode. DO NOT set the operating mode of the last fan stage in variable mode.

Timer-based Relays on Fan Stages:

Relays can be configured in timer mode for cooling while other relays operate in on-off mode. For example, a mist unit can operate according to a timer cycle in a fan stage while the fans assigned to this stage run at the same time. Timers can only operate on fan stages.

To assign relays in timer mode, proceed as described above and use the up-arrow key to set the relay to "Timer".

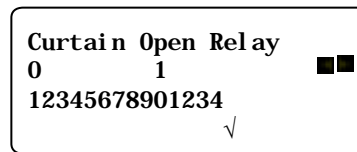
5.17.7.3 Air Intake Relays

This procedure show how to assign relays to the following air intakes:

- tunnel curtain;
- natural ventilation curtain;
- timed air inlet.

Relays 7-8 and relays 15-18 have specially been designed to connect actuators. When actuators are connected to these relays, their open and close relays can never be activated at the same time.

- Set the function to **RELAY SETTINGS**.
A password is required to access this menu (sec. 5.17.2).
- Select the desired type of air intake amongst those listed above. Only outputs that have been enabled in the installation are available.

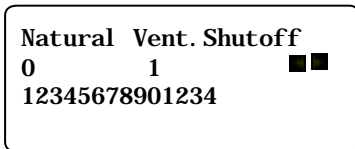
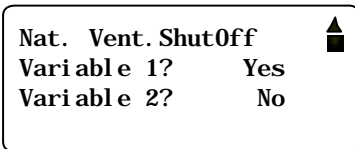


- Select the "**1. Opening**" menu of the selected air intake.
- Use the arrow keys to select which relay is used to open the selected air intake. Press Edit then use the arrow key to add or remove a relay.
- Press the left-arrow key to go back to the previous menu then choose the "**2. Closing**" menu of the selected air intake.
- Use the arrow keys to select which relay is used to close the selected air intake. Press Edit then use the arrow key to add or remove a relay.

5.17.7.4 Output Deactivation in Natural Vent.

The user can choose to deactivate some fan outputs (On/Off or variable outputs) when the curtains are opened and the controller is in the natural ventilation mode. Refer to section 5.6.5 for further information on the output deactivation.

- Set the function to **RELAY SETTINGS**.
A password is required to access this menu (sec. 5.17.2).
- Use the arrow keys to select "**11. Output Shutoff**" then select which type of fan output need to be stopped in natural ventilation : variable or on/off fans.
- Use the arrow keys to select the relays or variable outputs that need to be stopped when the controller is in natural ventilation.

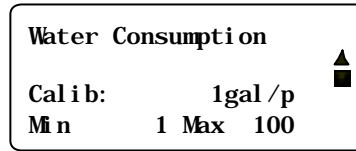


- Select the desired relay using the arrow keys.
- Press the Edit key then use the arrow keys to assign the relay. Press the Edit key once again to validate.

5.17.8 Calibrating the Water Counter

The EXPERT-PNT-212 provides a pulse input for monitoring water consumption. The user can modify the water flow per pulse. This value can be adjusted from 1 to 100 liters or gallons per pulse.

- Set the function to **WATER** from the main menu using the menu select buttons. The current day water consumption is displayed.



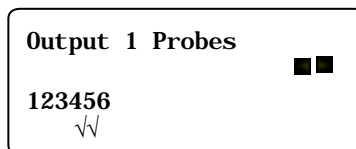
- Press the UP-arrow key. The water flow per pulse is displayed.
- Press the Edit key then use the arrow keys to set the water flow per pulse to the desired value. Press the Edit key once again to validate.

5.17.9 Probe Assignment

This section explains how to assign temperature probes to some outputs of the controller and the probes used to measure the average temperature.

Output Probe Assignment:

- Set the function to **PROBE SETTINGS**.
A password is required to access this menu (sec. 5.16.2).
- Select the desired output:
Heater 1-4
0-10V Output 1-2
Probe Set 2
Only the outputs that are enabled in the Installation Setup menu are available (see sec. 5.17.3).
- Use the arrow keys to select a probe on screen.
The probes displayed here are the ones that have been activated in section 5.17.4.

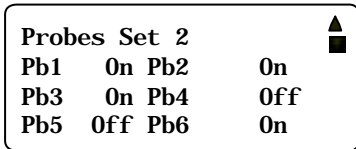
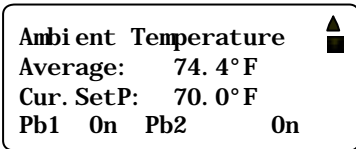


- Press the Edit key and then use the arrow keys to assign the probe to the selected output.
- Press the Edit key once again to validate.

Average T° Probe Assignment

Probes that have been enabled in the installation (sec. 5.17.4) must be assigned to be part of the average temperature reading.

- Set the function to **AMBIENT TEMPERATURE**.
- Press the down-arrow key in order to select the desired probe.



The probes displayed here are the ones that have been activated in section 5.17.4.

- Press the Edit key then use the arrow keys to select or deselect a probe to be part of the average room temperature. Press the Edit key once again to validate.

5.18 Advanced Settings

5.18.1 Motor Curve

The relationship between the voltage supplied to a motor and its operating speed is described by a motor curve. This curve varies with the make and capacity of the motor. The various motors available in the industry have been divided into ten categories and the controller has been programmed with a different motor curve for each of these categories. To ensure that the controller supplies the correct voltages, an appropriate curve must be selected according to the type of fan motors used.



Refer to section 5.17.3 to set the proper motor curve.

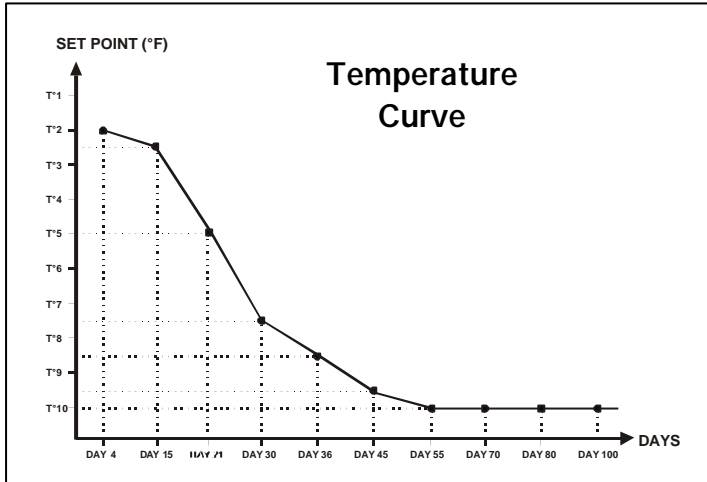
5.18.2 Setting the Temperature Curve

The user can define a temperature curve to automatically adjust the set point over a given time period.

A curve is defined using up to 10 points. Each point specifies a day number and a set point for that day. The animal age defines the current day number used by the curve. Once the points of the curve are defined, the curve must be activated. The controller will change the temperature set point every hour in a linear fashion between consecutive points of the curve. When the last point of the curve is reached, the temperature set point for that day is maintained until the animal age is set to Off or if the set point is adjusted manually.

NOTES:

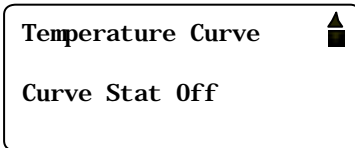
- i) All ten points of the curve must be specified. If ten points are not needed, repeat the last temperature value for each unnecessary point.
- ii) Certain restrictions apply to reduce the risk of errors:
 - The highest possible day number is 450.
 - Decreasing day numbers are not allowed.
 - Increasing temperatures are not allowed.



Note that the temperature curve must be turned off to adjust the points and days of the temperature curve. Use the down-arrow key to scroll each point of the curve. The curve status flashes on the display. Press the Edit key then press the down-arrow key to turn it Off.

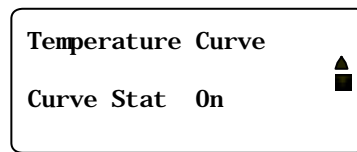
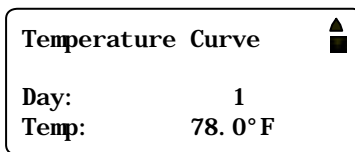
Setting the Temperature Curve:

- Set the function to **SET POINT / CURVE** from the main menu using the menu select buttons.
- Select **"2. Curve"** menu using the arrow keys. The current set point and the curve status is displayed.



- Press the Edit key then use the up and down-arrow keys to adjust the temperature for the first point of the curve to the desired value. Press the Edit key once again to validate the temperature value.
- Press the down-arrow key then proceed in similar fashion to modify the days and temperatures for each 10 points of the curve.
- Once all curve points have been defined, press the down-arrow key. The On/Off status of the curve now flashes on the display. Press the Edit key then press the up-arrow key to turn it on. Press the Edit key once again to validate.

- Press the down-arrow key once. The first day, corresponding to the first point of the curve flashes on the display.



- Press the Edit key then use the up and down-arrow keys to adjust the first day of the curve to the desired value. Press the Edit key once again to validate the first day of the curve.
- Press the down-arrow key. The temperature for the first point of the curve flashes on the display.

5.18.3 Min Ventilation Speed Curve

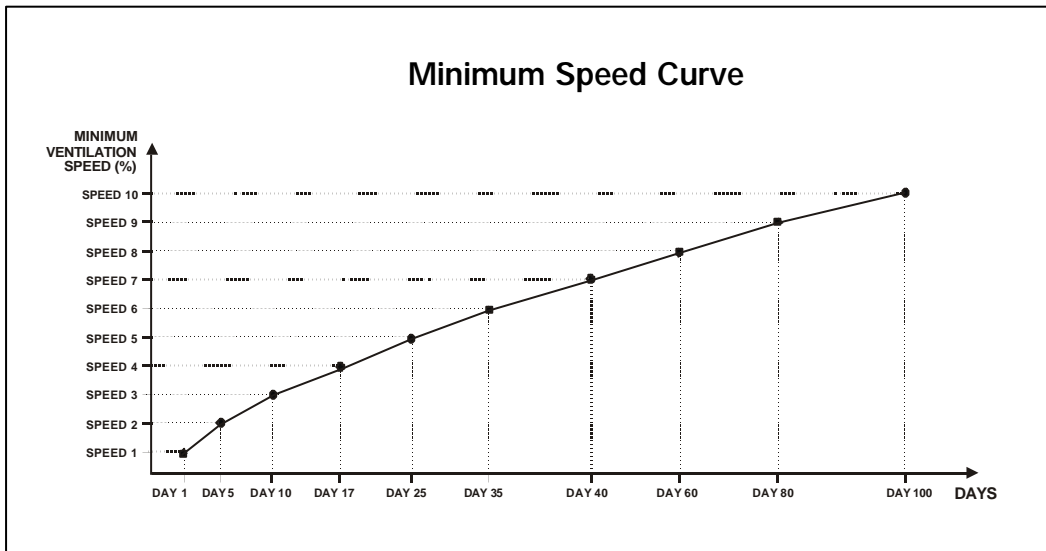
The user can define a minimum ventilation curve to adjust the minimum speed on both variable outputs automatically over a given time period. Each curve is defined by ten points. Each point specifies the day number and minimum speed for that day. The animal age defines the current day number used by the curve. Once the points are defined, the minimum ventilation curve must be activated. When the minimum ventilation curve is activated, the controller adjusts the minimum speed every hour in a linear fashion between two consecutive points.



Note that the minimum ventilation curve must be turned off in order to adjust the days and min. speeds of the curve. Use the down-arrow key to scroll each point of the curve. The curve state flashes on the display. Press the Edit key then use the down-arrow key to turn it Off.

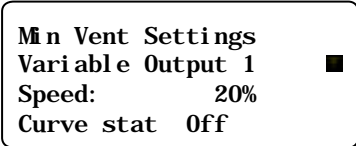
NOTES:

- i) All ten points of the curve must be specified. If ten points are not needed, repeat the last speed value for each unnecessary point.
- ii) Certain restrictions apply to reduce the risk of errors:
 - The highest possible day number is 450.
 - Decreasing day numbers are not allowed.
 - Decreasing minimum speeds are not allowed.

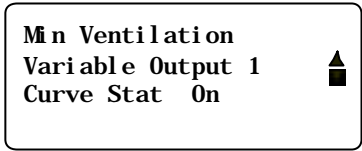


Setting the Minimum Ventilation Curve:

- Set the function to **MINIMUM VENTILATION / CURVE** from the main menu using the menu select buttons.
- Press the right-arrow key once to select "**1. Variable 1**" then select "**2. Minimum Curve**" menu using the arrow keys. The minimum speed for variable output 1 and the curve status are displayed.
- Press the down-arrow key once again. The first day corresponding to the first point of the curve flashes on the display.



- Once all the curve points are set, press the down-arrow key. The curve status flashes on the display. Press the Edit key then press the up-arrow key to turn it on. Press the Edit key once again to validate the curve status.



- Press the Edit key then use the arrow keys to adjust the first day of the curve to the desired value. Press the Edit key once again to validate the day number.
- Press the down-arrow key once again. The variable fan speed of the first point of the curve flashes on the display.
- Press the Edit key then use the arrow keys to adjust the speed to the desired value. Press the Edit key once again to validate the speed.
- Proceed the same way to adjust each points of the curve.

- Follow the same procedure to adjust the minimum ventilation curve of the second variable output.

5.18.4 Relative Humidity (RH) Control

The controller offers different ways to compensate for high and low relative humidity (RH) levels in the barn. This section shows how to enable the desired RH compensation functions.

- Set the function to **USER**.
- Select the "**5. RH Compensation**" menu.
Accessible if the humidity probe is enabled (sec. 5.17.4.2).
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

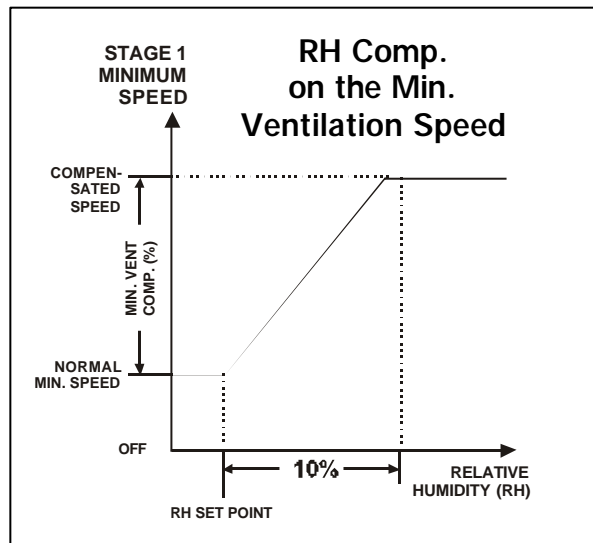
RH Compensation	▲
Minimum Vent ?	Yes
Heater ?	Yes
Mist Shutoff ?	Yes
Mist on Lo %RH?	Yes

- **Minimum Ventilation:**
The controller can compensate for high humidity levels by increasing the minimum ventilation intensity. Select "Yes" to use this compensation method.
- **Heater:**
The controller can compensate for high humidity levels by activating heating outputs in timer mode. Select "Yes" to use this compensation method.
- **Mist Shutoff:** The controller can deactivate the misting output when humidity levels are too high. Select "Yes" to use this compensation method.
- **Mist on Low % RH:** The controller can activate misting outputs when humidity levels are too low. Select "Yes" to use this compensation method.

5.18.4.1 RH Compensation Functions

RH Comp. on the Min. Ventilation Speed

The stage 1 minimum speed can be adjusted automatically as a function of relative humidity. As humidity increases, the stage 1 minimum speed increases proportionally to compensate for the change. At or below the humidity set point, stage 1 minimum speed is equal to the normal uncompensated speed. The user specifies the increase in minimum speed (%) for a relative humidity equal to the humidity set point + 10%. For example, if the minimum speed is 40% and the compensation adjustment is 30%, the minimum speed will be adjusted to 70% of full speed when the humidity rises 10% above the humidity set point. In addition to adjusting the minimum speed, the humidity compensation feature also changes the operation of the minimum ventilation cycle: if the controller is operating in minimum ventilation mode when the relative humidity exceeds the humidity set point, the minimum ventilation fans are operated continuously rather than cycled.



Mist Shutoff:

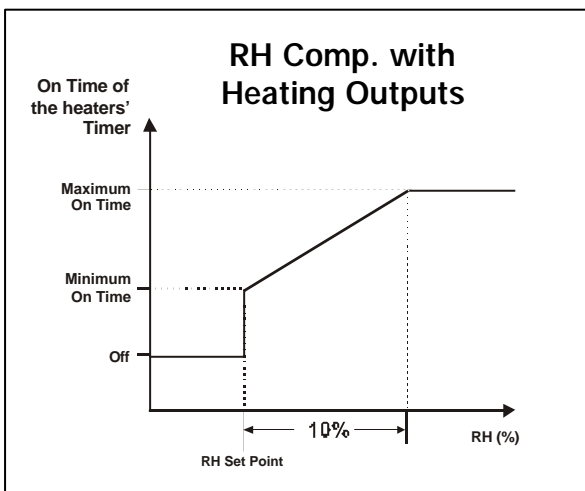
When the humidity level is too high, the mist units are shut off to avoid increasing the humidity level any further. This means that the cooling stage stops operating whenever the humidity level exceeds the mist shutoff limit. The mist shutoff limit ranges from 20% to 100% (Off) of humidity.

Mist on Low RH :

To compensate for low RH levels, the controller can activate the misting output in timer mode. The misting output starts when RH levels decrease below the *Low RH Set Point*. The Low Humidity Set Point can be adjusted from 0 to 60% of humidity level. The on and off times of the mist timer can be adjusted from 0 to 900 seconds.

RH Compensation with Heaters

When the RH level is too high, the controller can activate heating outputs in timer mode. As RH levels increase, the controller increases the On Time portion of the heating cycle to compensate for the change. The maximum compensated heating On Time is reached when RH levels are 10% above the RH Set Point.



5.18.4.2 RH Compensation Settings

- Set the function to **HUMIDITY COMPENS.**
Accessible if at least 1 RH compensation function is enabled (sec. 5.17.4).
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.

RH Compensation		▲
Min vent comp %	30	■
RH set point	65	
Heater Compensation		
Min On Time(s)	15	
Max On Time(s)	15	
Cycle Time	300sec	
Mist Shutoff	85	
Mist on Lo %RH		
Lo SetPoint	10	
On Time	30sec	
Off Time	240sec	

- **Minimum Ventilation Compensation**
Min Vent Comp %

Select by how much the minimum fan speed can be increased when the RH level is 10% above the RH Set Point.

Accessible if RH compensation on minimum ventilation is enabled at the beginning of this section.

RH Set Point:

This is the humidity level above which high RH compensation functions start. Adjustable from 20 to 99% of humidity.

- **Heater Compensation:**

The timer used by heating outputs is made of an On Time and of a Cycle Time. Heating outputs run during the On Time then stop until the end of the Cycle Time. The On Time portion of this cycle increases as RH levels increase.

Minimum & Maximum On Times:

Set the minimum and maximum On Times of the heating timer. The minimum On Time starts being used when indoor humidity levels reach the RH set point; the maximum On Time is used when humidity levels are 10% above the RH set point.

Accessible if RH compensation with heating outputs is enabled at the beginning of this section.

Cycle Time:

Set the cycle time of the heating timer.

Accessible if RH compensation with heating outputs is enabled at the beginning of this section.

- **Mist Shutoff:**

Set the humidity level above which the mist cooling output stops or select "Off" to disable this function.

Accessible if the mist shutoff compensation option is enabled at the beginning of this section.

- **Mist on Low RH Lo Set Point:**

Set the humidity level below which misting units start running in timer mode or select "Off" to disable this function.

Accessible if RH comp. on Low RH levels is enabled at the beginning of this section.

On & Off Times:

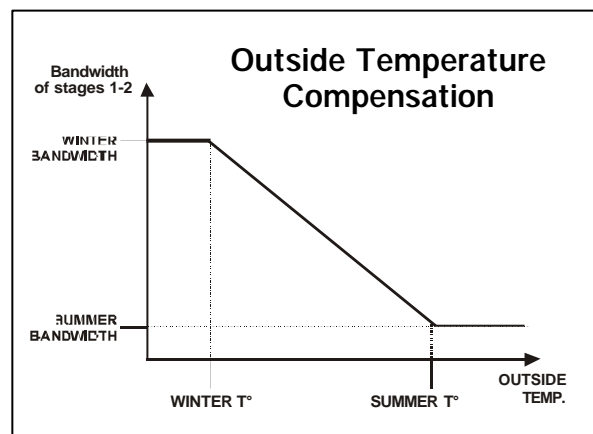
Set the On and Off Times of the misting timer.

5.18.5 Outdoor Comp. on Bandwidth 1-2

Stages 1 and 2 bandwidths can be adjusted automatically as a function of outdoor temperature compensation. As the outside temperature decreases, stages 1 and 2 bandwidths increase gradually to compensate for the change. The user specifies the bandwidth used in summer as well as the bandwidth used in winter for both variable outputs of stages 1 and 2. The bandwidths can be adjusted from 1 to 10° F (0.6 to 5.6° C). The winter's bandwidth must be even or greater than the summer's bandwidth.

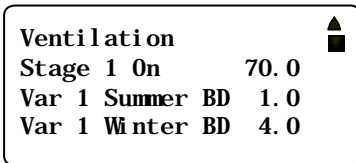


Note that the ventilation stages' start temperatures will be adjusted following the bandwidth fluctuations as the outside temperature changes.



5.18.5.1 Summer & Winter Bandwidths

- Set the function to **START / STOP TEMPS.**
- Select "**2. Fan Stages**" option using the arrow keys. The stage 1 start temperature flashes on the display.



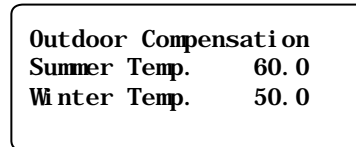
- Press the down-arrow key once. The summer bandwidth for the first variable output of stage 1 flashes on the display.
Accessible if the outside compensation feature is enabled (sec. 5.17.3).
- Press the Edit key then use the arrow keys to set the summer bandwidth for the first variable output of stage 1 to the desired value. Press the Edit key once again to validate.
- Press the down-arrow key once. The winter bandwidth for the first variable output of stage 1 flashes on the display.
- Press the Edit key then use the arrow keys to set the winter bandwidth for the first variable output of stage 1 to the desired value.
- Proceed in similar fashion to set summer and winter bandwidths for the second variable output of stage 1 as well as for the two variable outputs of stage 2.

5.18.5.2 Summer & Winter Temp.

When the temperature reaches the summer reference point, stages 1 and 2 bandwidths are at their minimum values. Bandwidths reach their maximum value when the temperature drops to the winter reference point.

- Set the function to **START / STOP TEMPS.**
- Select "**10. Outdoor Comp.**" option using the arrow keys. The summer and winter reference temperatures are displayed.

Accessible if the outside compensation on stages 1-2 is enabled (sec. 5.17.3).



- Press the Edit key then use the arrow keys to set the summer's reference temperature to the desired value.
- Press the down-arrow key. The winter's reference temperature flashes on the display.
- Press the Edit key then use the arrow keys to set the winter's reference temperature to the desired value.

5.18.6 Clean Mode

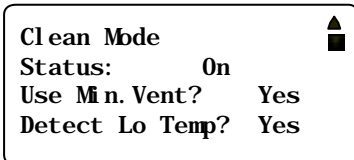
The clean mode is used to interrupt regular operations of the controller when the room is empty. When it is enabled, the controller simply provides a minimum level of heat in the house. In clean mode, the whole house is considered as being empty.

Soaking: Soaking cycles can be enabled when the controller enters in clean mode. These cycles are used to activate soaking devices to clean the room while it is empty (s. 5.11).

Minimum Ventilation in Clean Mode: To ensure good air circulation, minimum ventilation cycles can be activated while the controller operates in clean mode. In this case, the controller uses the same fans and settings as for the regular minimum ventilation cycles.

Low Temperature Alarm in Clean Mode: The controller can sound an alarm if the temperature gets too low while it operates in clean mode. Refer to section 5.16 to set this alarm limit.

- Set the function to **CLEAN MODE**.
- Use the arrow keys to select the parameters that are shown below. To adjust the value of a parameter, press Edit and then use the arrow keys to modify its value. Press Edit again to validate the new value.



Status: Select "Yes" to enable the clean mode.

Use Min. Vent:
Select "Yes" to enable the minimum ventilation cycles while the controller is in clean mode.

Detect Lo Temp?
Select "Yes" for the controller to monitor low temperature alarms during the clean mode
A password is required to change this parameter (see sec. 5.16.2).

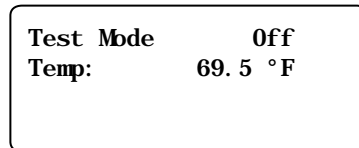
5.18.7 Test Mode

The test mode is used to simulate temperature changes and to verify the controller's performances. During the test, the room temperature probe inputs are turned off, allowing the user to change the temperature used by the controller to operate the stages. The controller operates as before using the new temperature settings.

Setting the Room Temperature


When the room temperature is adjusted, the controller bypasses the temperature probes inputs and uses the new value as a reference. The Test Mode is deactivated after 15 minutes of inactivity.

- Set the function to **TEST MODE**. The test mode status is displayed.



- Press the Edit key and select "ON" to enable the test mode. Press the Edit key once again to validate the test mode status.
- Press the down-arrow key to select the room temperature.
- Press the Edit key then use the arrow keys to set the room temperature to the desired value. Press the Edit key once again to validate.

6. TECHNICAL SPECIFICATIONS

Type	EXPERT PNT-212
Main supply fuse F1	 4A, slow blow
Mains supply/frequency	85-250V, 50/60Hz
0-10V outputs 1-2	0-10Vdc, 30mA source max.
Precision on 0-10V outputs	± 1 %
14Vdc output	14 Vdc ± 10%, regulated, 250mA max.
Alarm contact	ON/OFF output, 24VDC or AC, 0.15A
Housing	ABS, moisture and dust-tight.
Operating temperature	32 to 104° F (0 to 40° C)
Storage temperature	5 to 122° F (-15 to 50° C)
Ambient relative humidity	max. 95%
RH input	4-20mA
Pressure input	4-20mA
Whisker switch input	Dry contact
Feeder inputs	Dry contact
Temperature inputs	1K @ 77° F (25° C), NTC
Relays 1-18	Dry contact, 15A resistive
.....	Max Motor Load 1HP @ 120 VAC,
.....	2HP @ 240VAC
.....	Tungsten (Light Bulb):
.....	8.3A max at 120VAC
Variable outputs 1-2	10A mot. max, 250VAC
Fuse on variable outputs	15A slow blow

The room temperature where the controller is located must always remain between 32 °F and 104 °F (0 °C and 40 °C).

7. Update & Backup Process

The memory card allows upgrading the firmware or software of your controller without losing your parameter settings. The card can also be used to make a backup of your controller settings or to copy these settings on another controller of the same type.

By default, the controller comes with a classic memory card. This type of card can only contain 1 configuration file. Some models are also compatible with standard USB cards which can contain many configuration files.



NO USB card is provided with the system. You can purchase one in any good electronic store.

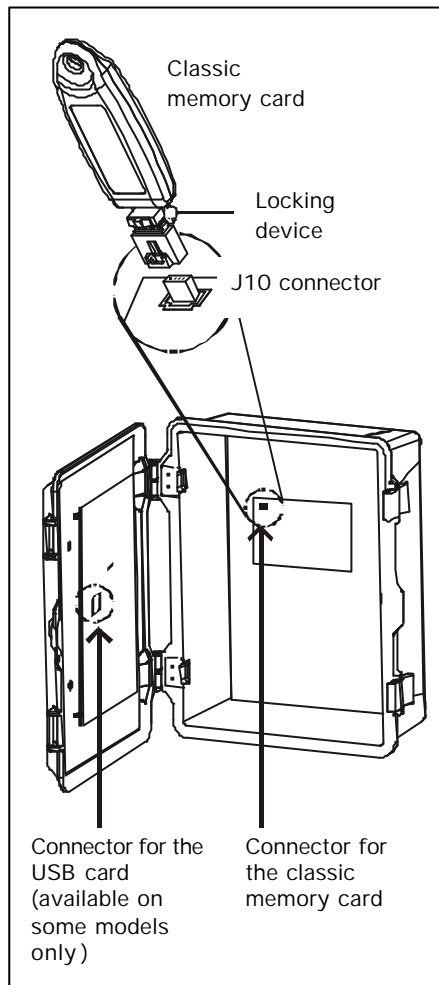
Making a Transfer

1. Lift the latches to open the front door of the controller.
2. Use a flat head screwdriver to loosen the two locks on the front plate and lift the plate.
3. Insert your memory card in the proper connector as shown on the picture.

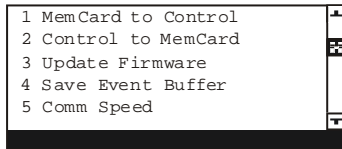


If you are using the classic memory card provided with the controller, be sure to position the card's locking device downwards as illustrated. Also make sure this device is at the "unlocked" position.

4. Close the front plate.
5. Simultaneously press and hold the up and down **MENU SELECT** buttons for 5 seconds to display the transfer menu.



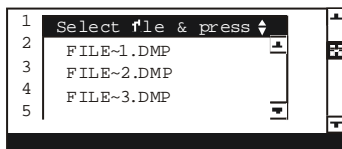
6. Select the desired option:



• **OPTION 1) MemCard to Control**

Select this option if you want to load a new configuration file into your controller. This transfer will update your controller's software and parameter settings.

When selecting this option, a list of all configuration files located on the card is displayed (*.DMP files). Select the desired file and then press and hold the up and down ADJUSTMENT button for 5 seconds to launch the transfer.



If you are using a USB card, please consider that the controller can only read the files that are located at the root of card. It cannot access any sub-directory!

• **OPTION 2) Control to MemCard**

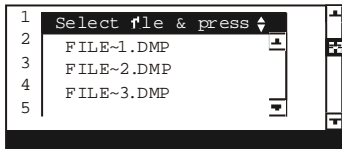
Select this option in order to save your controller settings on the memory card. The saving process will start as soon as you enter this menu.

2a) If using the classic memory card, the controller will save the configuration file on the card and this file will replace the previous one (the memory card can only contain 1 configuration file). For the transfer to work, please make sure the locking device of the memory card is at the unlocked position.

2b) If using a USB card, the controller will create a new CONTROLLER~ 1.DMP file at the root of the memory card. If this file name already exists, it will be saved under a different name ("CONTROLLER~ 2.DMP" for instance). This way, the controller will never erase a file on the card.

- **OPTION 3) Update Firmware**

(USB card only) — Select this option to download a new firmware file into your controller. This process will not affect your parameter settings.



When selecting this option, a list of all firmware files located on the card is displayed (*.PKG files). Select the desired file and then press and hold the up and down ADJUSTMENT button for 5 seconds to launch the transfer.



If you are using a USB card, please consider that the controller can only read the files that are located at the root of card. It cannot access any sub-directory!

- **OPTION 4) Save Event Buffer**

(USB card only) — Select this option if you want to save the event buffer of the controller on your USB card. The file will have a *.txt extension.

- **OPTION 5) Comm Speed**

Set the communication speed to the desired value: select the high speed mode if the controller uses the A-BOX communication system or select the low speed if it uses AGNET.

7. Press and hold the up and down MENU SELECT buttons for 5 seconds to exit from the transfer menu.



Remove the memory card from the connector when the transfer is over!

8. WORK SHEETS

CLIENT

Name: _____

Address: _____

City: _____

Tel.: _____

Fax: _____

E-mail: _____

INSTALLER

Name: _____

Address: _____

City: _____

Tel.: _____

Fax: _____

E-mail: _____

8.1 Probe Assignment Worksheet

Output	Probes					
	1	2	3	4	5	6
Heater 4						
Heater 3						
Heater 2						
Heater 1						
Room T°						
0-10V #1						
0-10V #2						
Probe set 2						

8.2 Relay Assignment Worksheet

RELAY ASSIGNMENT																
OUTPUTS / RELAYS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	V1	V2
Heater 4																
Heater 3																
Heater 2																
Heater 1																
Fan 1																
Fan 2																
Fan 3																
Fan 4																
Fan 5																
Fan 6																
Fan 7																
Fan 8																
Fan 9																
Fan 10																
Fan 11																
Fan 12																
Inlet Open																
Inlet Close																
Natural Curtain Open																
Natural Curtain Close																
Tunnel Curtain Open																
Tunnel Curtain Close																
Cooling output																
Soaking																
Stir Fan																
Clock 1																
Clock 2																
Backup relay box																
Natural Vent. Fan Shutoff																

8.3 Installation Setup Worksheet

INSTALLATION SETUP	
PARAMETER	SETTINGS
1. LCD CONTRAST (sec. 5.1)	
LCD Contrast value	_____ % (10 to 100%)
2. TEMPERATURE PROBES (sec. 5.16.4)	
Temperature probes used	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6
3. OTHER PROBES (sec. 5.16.4)	
Use relative humidity sensor (RH) ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Use water meter ?	<input type="checkbox"/> Lit <input type="checkbox"/> Gal
Use outdoor temperature probe ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Use static pressure probe ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
4. UNITS (sec. 5.16.3.1)	
Time display	<input type="checkbox"/> 24H <input type="checkbox"/> AM/PM
Temperature	<input type="checkbox"/> °C <input type="checkbox"/> °F
Water	<input type="checkbox"/> Lit <input type="checkbox"/> Gal
Static Pressure	<input type="checkbox"/> Pa <input type="checkbox"/> "WC (Inches of water)
5. RELATIVE HUMIDITY (RH) FUNCTIONS (sec. 5.17.4)	
RH compensation on min. ventilation speed?	<input type="checkbox"/> Yes <input type="checkbox"/> No
RH compensation with heaters ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Curtain purge on high RH levels only ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
RH compensation with mist shutoff ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
RH compensation with mist on low RH ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
6. DAY / NIGHT (sec. 5.16.6)	
Use day / night set point ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Use night Minimum Ventilation ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Day Time starts at:	_____ : _____
Night Time starts at:	_____ : _____
Transition Time between day / night	_____ min
Min. V1	_____ (0-100%)
Min. V2	_____ (0-100%)

INSTALLATION SETUP...	
7. INSTALLATION (sec. 5.16.3)	
Number of feeders	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
Number of heater stages	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
Number of fan stages	_____ (3-12)
Number of variable outputs	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2
Number of clock outputs	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2
Number of 0-10V outputs	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2
0-10V output 1 Signal	<input type="checkbox"/> 0-10V <input type="checkbox"/> 10-0V
0-10V output 2 Signal	<input type="checkbox"/> 0-10V <input type="checkbox"/> 10-0V
0-10V output 1 utility	<input type="checkbox"/> Ventilation <input type="checkbox"/> Heating
0-10V output 2 utility	<input type="checkbox"/> Ventilation <input type="checkbox"/> Heating
Use Inlet ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Use Natural?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Use Nat. Curtain compensation ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Use Tunnel ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Use Cooling ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Use Stir Fans ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Use Soaking ?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Variable output 1 Minimum Speed	_____ (10-100%)
Variable output 1 Motor Curve	_____ (1-10)
Variable output 2 Minimum Speed	_____ (10-100%)
Variable output 2 Motor Curve	_____ (1-10)
Outdoor compensation on variable outputs?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Digit display	<input type="checkbox"/> T° <input type="checkbox"/> Static Pressure (SP) <input type="checkbox"/> Inlet 1 (I1) <input type="checkbox"/> T° & SP <input type="checkbox"/> T° & I1 <input type="checkbox"/> SP & I1
8. PASSWORD (sec. 5.16.3)	
Installer password	_____

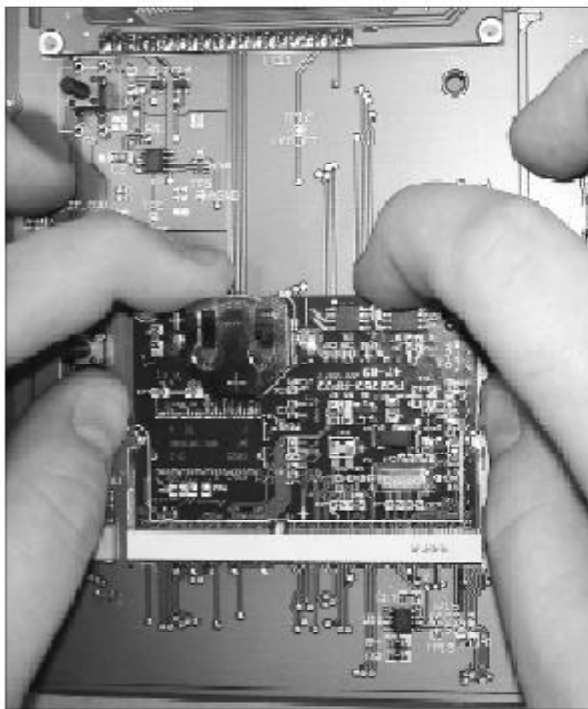
ANNEX 1: CORE CARD

Removing a Core Card

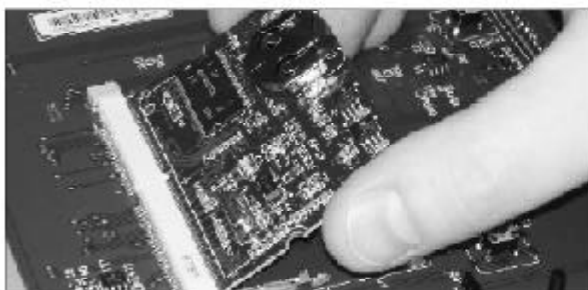


Before proceeding, switch power off at service panel and lock the switch disconnecting means to prevent power from being switched accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

1. Use your thumbs to move away the two metal arms that are retaining the card. While doing so, lift the card upwards with your index fingers.



2. Pull the card out of its connector.

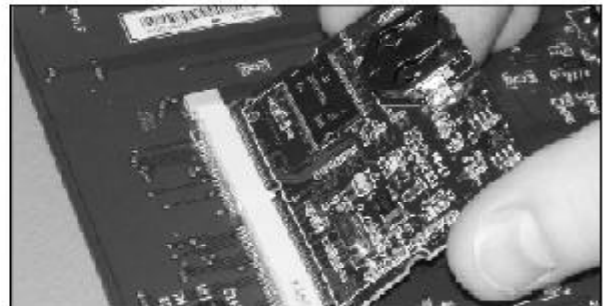


Inserting a Core Card

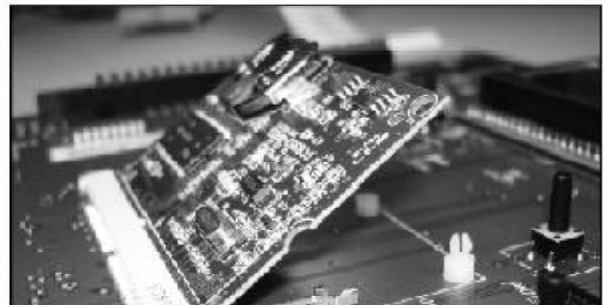


Before proceeding, switch power off at service panel and lock the switch disconnecting means to prevent power from being switched accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

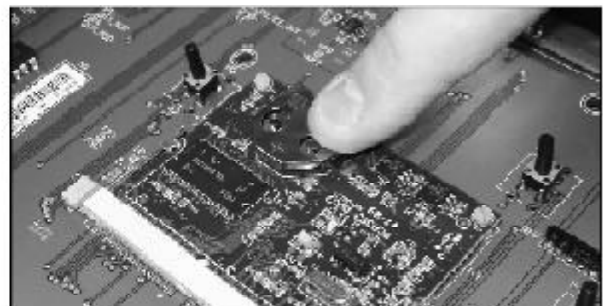
1. Give the card a 45-degree angle before inserting it in the connector.



2. Once it is inserted, the card will stand at the 45-degree position.



3. Push down the card and make it flip to the main board.



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