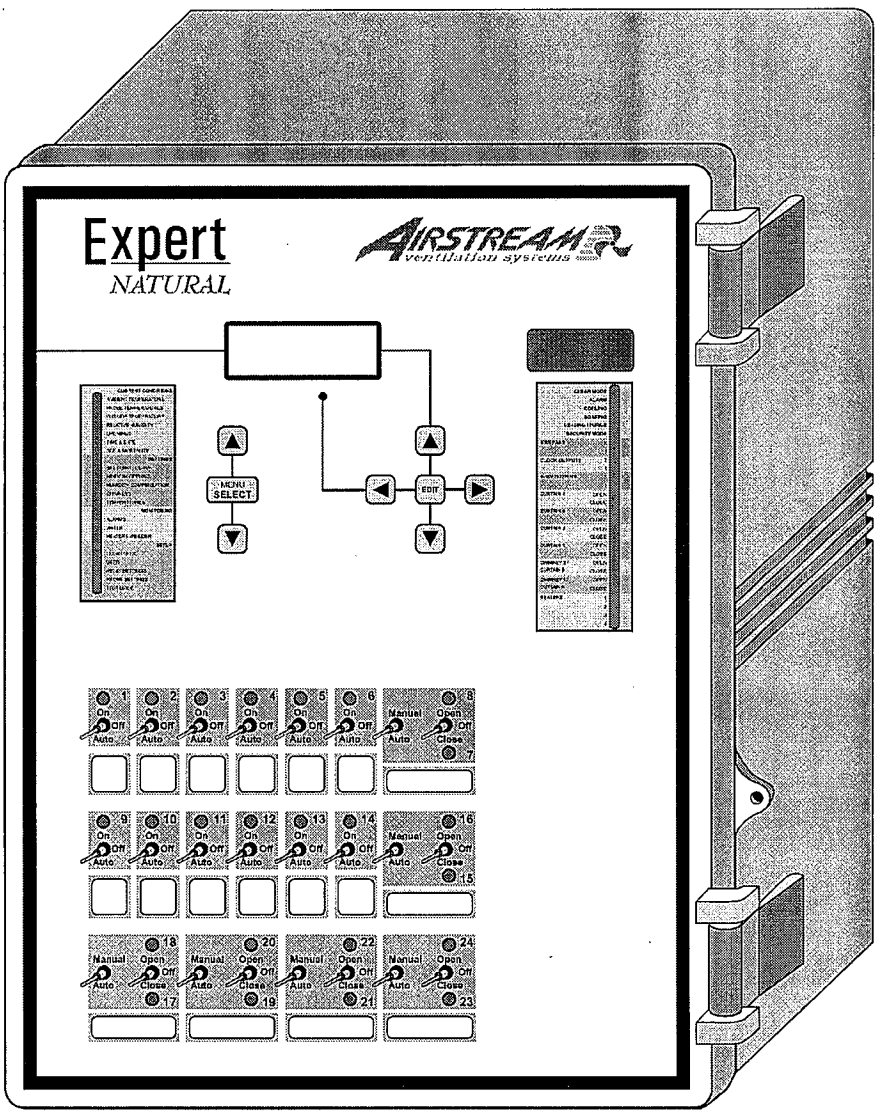
Temperature Controller

EXPERT-NATURAL

USER'S MANUAL



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1. PRECAUTIONS

We strongly recommend installing curtain drops to ensure a certain level of ventilation in the case of a power failure.

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

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

Model number: **EXPERT-NATURAL**

Serial number: _____

2. FEATURES

The EXPERT-NATURAL 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 monitor the following inputs & outputs:

OUTPUTS :

- 24 internal On/Off relays to control:
  - 6 natural ventilation tunnel curtains (using timers or potentiometers);
  - 2 chimneys actuators using potentiometers;
  - 2 0-10V outputs to control additional heating or cooling devices;
  - 4 heater stages;
  - 2 clock outputs;
  - 2 stir fan outputs;
  - 1 soaking output;
  - 1 cooling stage.

INPUTS:

- 8 inside temperature probes;
- 1 outside temperature probe;
- 4 feeders;
- 1 humidity sensor;
- 1 water meter.

MAIN FEATURES:

LCD DISPLAY

An LCD display provides an efficient interface to display, adjust and to monitor parameter values.

FOUR-DIGIT DISPLAY

A four-digit display provides a high level of accuracy, allowing the user to specify a temperature to within one tenth of a degree (in Fahrenheit or Celsius units).

PROBE READINGS RECORDED FOR PAST DAYS

Minimum and maximum readings of the inside temperature probes, outside temperature probe and humidity probe are recorded for the current day and for the previous 7 days.

TEMPERATURE AND MINIMUM OPENING CURVES

The minimum opening of the chimney and the temperature set point can automatically be adjusted over time using curves.

WATER MONITORING

A pulse input is used to monitor water consumption of the current days and of the previous 75 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. The alarm conditions are kept in memory until they are acknowledged even if alarm situation has been rectified.

HUMIDITY COMPENSATION

The controller offers many different functions to compensate for high or low humidity levels.

EIGHT INDEPENDENT TEMPERATURE PROBES INPUTS

Up to eight 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.

OUTDOOR TEMPERATURE COMPENSATION ON CURTAINS

The curtains' maximum openings and maximum opening temperatures can be adjusted automatically according to the outside temperature.

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.

OVERLOAD AND OVERVOLTAGE PROTECTION

Resettable fuses are provided at low-voltage inputs and outputs of the controller to protect its circuitry in the case of an overload or overvoltage.

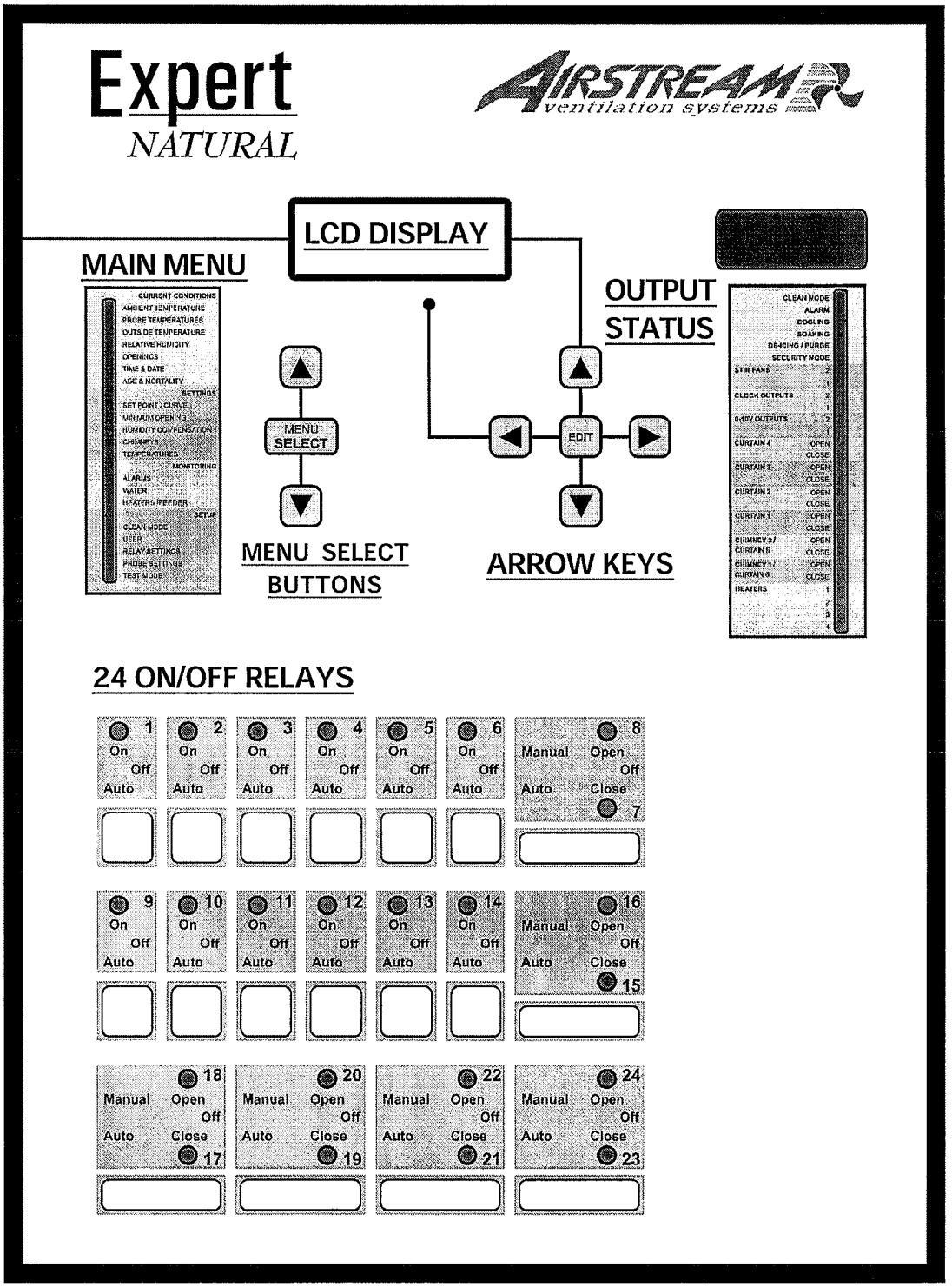
COMPUTER CONTROL

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 parameters to be adjusted when a function is selected. When the parameters for a given function cannot all be presented at once on the display, arrows are shown on the right hand side of the screen to indicate that additional parameters can be displayed using the arrow keys.

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

MENU SELECT BUTTONS:

The up and down-arrow keys are used to scroll within the main menu located at the left hand 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 change the value of a parameter. Once it is pressed, the selected parameter starts flashing faster on the display. Use the arrow keys to adjust the parameter then press EDIT once again to validate the new value.

ADJUSTING A PARAMETER:

A parameter can be adjusted while it flashes on screen. Press EDIT once then use the arrow keys to change its value. Press EDIT once again to validate the new value.

CONTROLLER STATUS LEDS		
STATUS LED		**MEANING**
CLEAN MODE		TURNS ON WHEN THE CONTROLLER IS IN CLEAN MODE.
ALARM		TURNS ON WHEN AN ALARM IS DETECTED. FLASHES WHEN AN ALARM CONDITION OCCURRED AND WAS RE-ESTABLISHED BY ITSELF.
COOLING		TURNS ON WHEN THE COOLING UNITS ARE OPERATING.
SOAKING		TURNS ON WHEN THE CONTROLLER IS IN SOAKING MODE
DE-ICING/PURGE		TURNS ON WHEN A CURTAIN IS OPERATING IN DE-ICING/PURGE MODE
SECURITY MODE		TURNS ON WHEN THE OUTSIDE TEMPERATURE DECREASES BELOW THE SECURITY TEMPERATURE
STIR FAN 1		TURNS ON WHEN STIR FAN 1 IS RUNNING.
STIR FAN 2		TURNS ON WHEN STIR FAN 2 IS RUNNING.
CLOCK OUTPUT 1		TURNS ON WHEN CLOCK OUTPUT 1 IS ACTIVE.
CLOCK OUTPUT 2		TURNS ON WHEN CLOCK OUTPUT 2 IS ACTIVE.
0-10V OUTPUT 1		TURNS ON WHEN 0-10V OUTPUT # 1 IS ACTIVE.
0-10V OUTPUT 2		TURNS ON WHEN 0-10V OUTPUT # 2 IS ACTIVE.
CURTAIN 4	CLOSE	TURNS ON WHEN CURTAIN 4 IS CLOSING.
	OPEN	TURNS ON WHEN CURTAIN 4 IS OPENING.
CURTAIN 3	CLOSE	TURNS ON WHEN CURTAIN 3 IS CLOSING.
	OPEN	TURNS ON WHEN CURTAIN 3 IS OPENING.
CURTAIN 2	CLOSE	TURNS ON WHEN CURTAIN 2 IS CLOSING.
	OPEN	TURNS ON WHEN CURTAIN 2 IS OPENING.
CURTAIN 1	CLOSE	TURNS ON WHEN CURTAIN 1 IS CLOSING.
	OPEN	TURNS ON WHEN CURTAIN 1 IS OPENING.
CHIMNEY 2 / CURTAIN 5	CLOSE	TURNS ON WHEN CHIMNEY 2 OR CURTAIN 5 IS CLOSING.
	OPEN	TURNS ON WHEN CHIMNEY 2 OR CURTAIN 5 IS OPENING.
CHIMNEY 2 / CURTAIN 5	CLOSE	TURNS ON WHEN CHIMNEY 1 OR CURTAIN 6 IS CLOSING.
	OPEN	TURNS ON WHEN CHIMNEY 1 OR CURTAIN 6 IS OPENING.
HEATER 1		TURNS ON WHEN HEATER 1 IS ACTIVE.
HEATER 2		TURNS ON WHEN HEATER 2 IS ACTIVE.
HEATER 3		TURNS ON WHEN HEATER 3 IS ACTIVE.
HEATER 4		TURNS ON WHEN HEATER 4 IS ACTIVE.

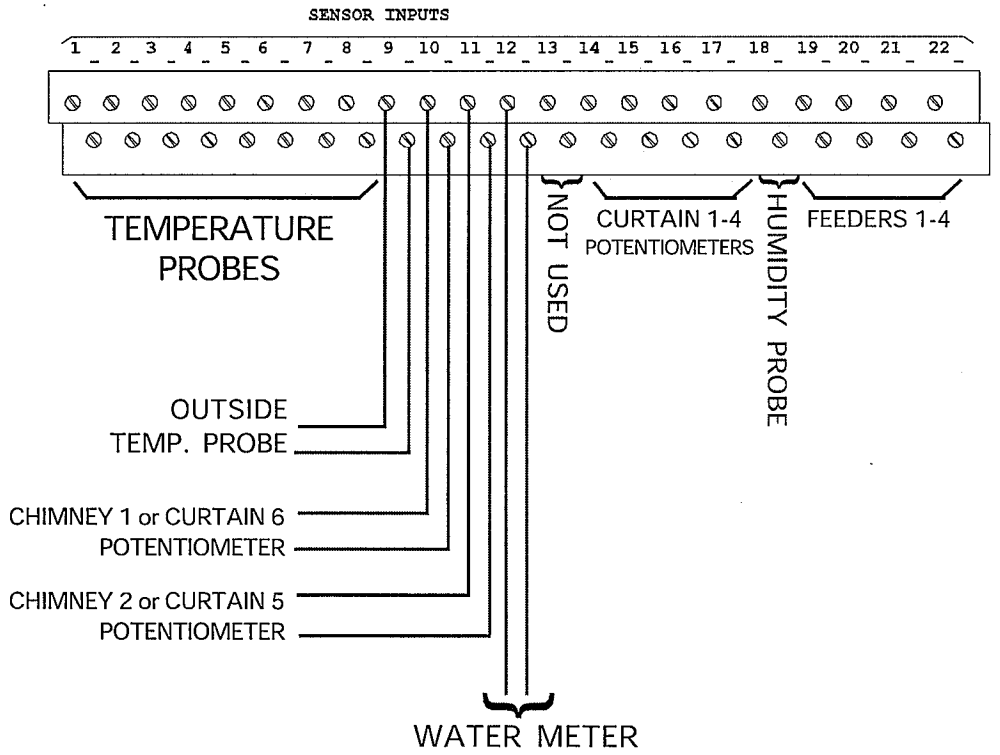
4. MOUNTING INSTRUCTIONS

Fasten the four metal brackets on the mounting holes located behind the controller using the four screws included with the controller. Mount the enclosure on the wall using four other screws. Be sure the electrical knock-outs are at the bottom of the enclosure in order to prevent water from entering the controller. The enclosure must be mounted in a location that will allow the cover to be completely opened right up against the wall.

4.1 CONNECTIONS

To connect the controller, refer to the wiring diagram enclosed with this user's manual. Use the electrical knockouts provided at the bottom of the enclosure. Do not make additional holes in the enclosure, particularly on the side of the enclosure when using a computer communications module.

1. PROBE INPUTS



WARNING

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

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

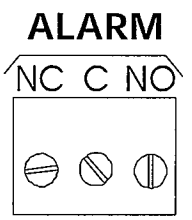
Extending a probe: Each probe can be extended up to 500 feet (150 meters). To extend a probe:

- 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.

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

Defective temperature probes: An alarm is generated when a defective probe is detected. The defective temperature probes are identified in the **"Alarm"** menu.

2. ALARM AND POWER SUPPLY



There are two types of alarms on the market. One type activates when current is cut off at its input, whereas the other 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.

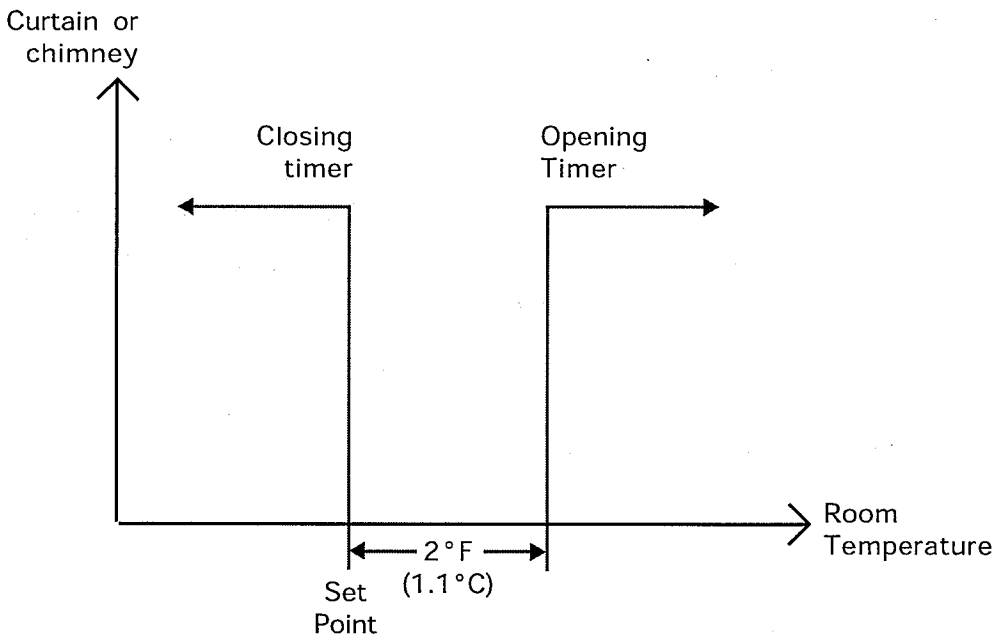
3. DEFECTIVE POTENTIOMETER

If a defective potentiometer is detected on a curtain or chimney, an alarm is set off and the security mode is enabled as follows:

A) If the room temperature is at least 2°F (1.1°C) above the set point:
The curtain or chimney opens according to the following cycle:
15 seconds ON & 120 seconds OFF.

B) If the room temperature is below the set point:
The curtain or chimney closes according to the following cycle:
5 seconds ON & 120 seconds OFF.

The defective potentiometer is identified in the **"ALARMS"** main menu.

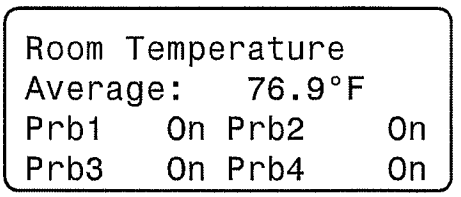


5. CONTROLLER SETUP

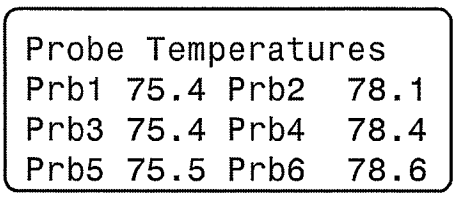
5.1 CURRENT CONDITIONS

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

AMBIENT TEMPERATURE:
Set the function to *AMBIENT* main menu using the menu select buttons. The average room temperature is displayed.

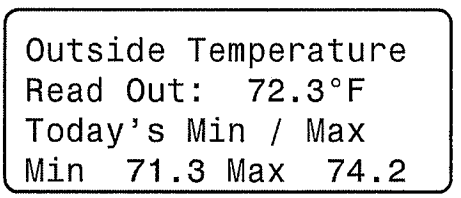


PROBE TEMPERATURE:
Set the function to *PROBE TEMPERATURE* using the menu select buttons. The current reading of each temperature probe is displayed.



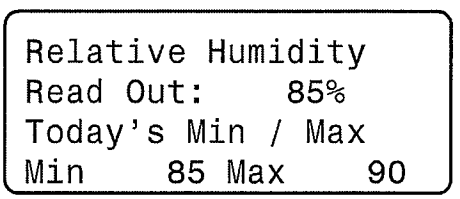
OUTSIDE TEMPERATURE:
Set the function to *OUTSIDE TEMPERATURE* using the menu select buttons. The current outside temperature readout is displayed.

Accessible if an outside temperature probe is enabled (sec. 5.14.4.2).



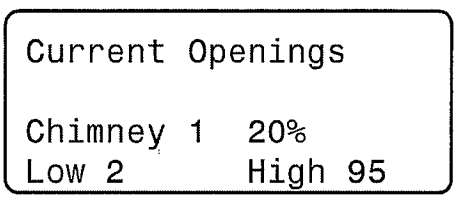
RELATIVE HUMIDITY:
Set the function to *RELATIVE HUMIDITY* using the menu select buttons. The current humidity readout is displayed.

Accessible if a humidity probe is enabled (see sec. 5.14.4.2).



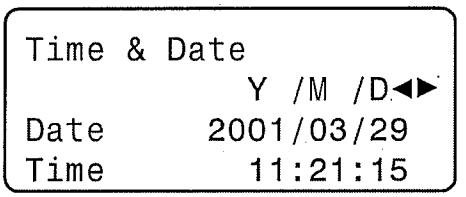
OPENINGS:
Set the function to *OPENINGS* using the menu select buttons. The current chimney and curtain openings are displayed. Note that the message "Calib" is displayed while the curtain or chimney are being calibrated. Press the down-arrow key to scroll the display.

Accessible if the curtains use a potentiometer.



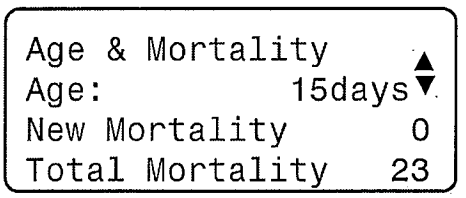
TIME & DATE:

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



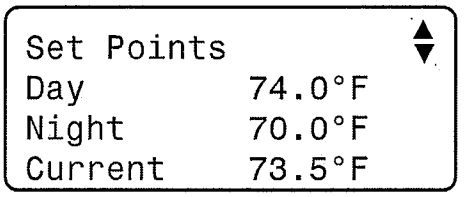
AGE & MORTALITY:

Set the function to *AGE & MORTALITY* using the menu select buttons. The current animal age and the number of mortality are displayed.



VIEWING CURRENT SET POINT:

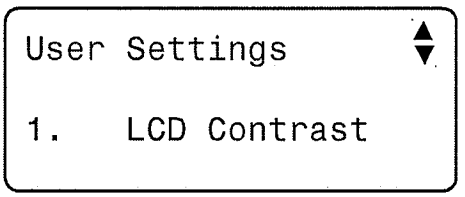
Select the *SET POINT / CURVE* menu using the menu select buttons. Press the right-arrow key once to select the **"1. Set Points"** menu. The current temperature set points are displayed.



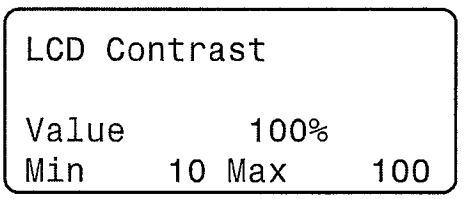
ADJUSTING THE SCREEN CONTRAST

The 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 contrast value is displayed.



- Press EDIT then use the arrow keys to set the contrast to the desired value. Press EDIT once again to validate.



5.2 TEMPERATURE SET POINTS

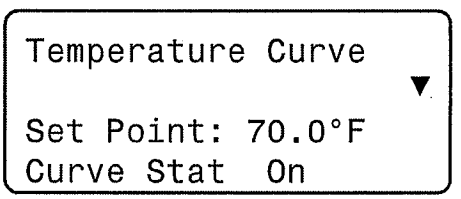
The temperature set point is the target room temperature. It can be adjusted from -40.0°F to 120°F (-40.0°C to 48.9°C). The controller can operate according to 3 different set points: a day set point, a night set point and a clean mode set point; the clean mode set point is used when the room is empty. Refer to section 5.16.6 to activate the night set point and to section 5.17.6 for further information about the clean mode.

Temperature 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:

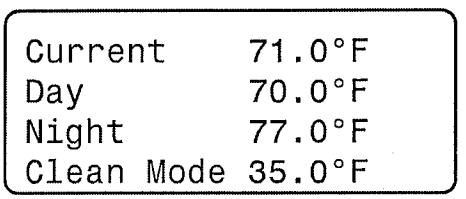
- Set the function to **SET POINT / CURVE** using the menu select buttons.
- Use the arrow key to select the "**2. Curve**" menu. The curve status is displayed.
- **If the temperature curve is ON**, the set point, as calculated by the temperature curve is displayed. Press the down-arrow key and scroll the display until **"Curve Stat"** status flashes on screen. Press EDIT 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.



- Once the temperature curve is disabled, follow the 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.
- Select the day or main set point (depending if the night set point is enabled or not). The set point flashes on the display. Note that the parameter value does not flash and cannot be adjusted if the curve is still on.



- Press EDIT then use the arrow keys to adjust the day or main set point to the desired value. Press EDIT once again to validate.
- Press the down arrow-key to select the night set point.
  Accessible if the night set point function is enabled (see sec. 5.14.6).
- Press EDIT then use the arrow keys to adjust the night set point to the desired value. Press EDIT once again to validate.
- Press the down arrow-key to select the clean mode set point.
- Press EDIT then use the arrow keys to adjust the clean mode set point to the desired value. Press EDIT once again to validate.

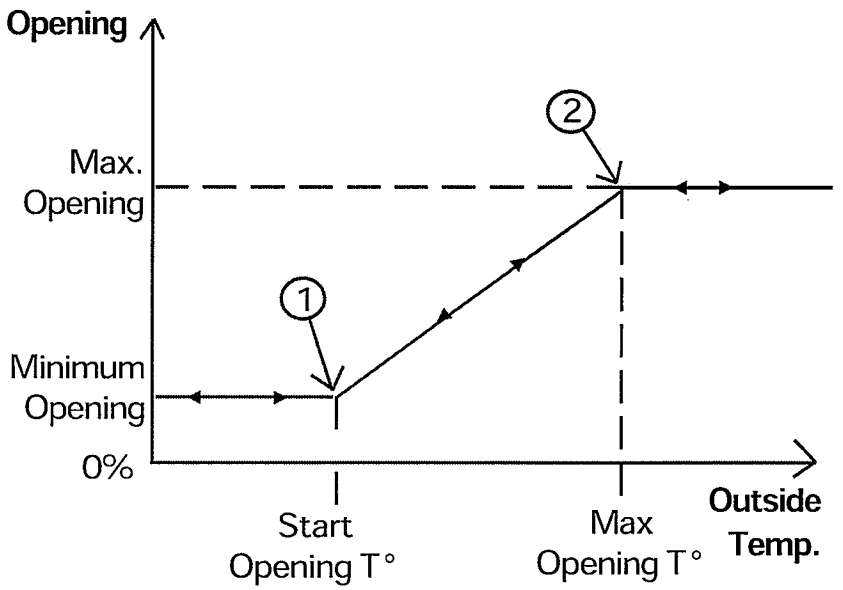
5.3 CHIMNEYS

The controller can control up to two chimney dampers. The dampers' operation can either be based on the inside temperature or on the outside temperature. Both operating principles are explained below. Refer to section 5.14.3 to select the proper operating mode.

PRINCIPLE OF OPERATION:

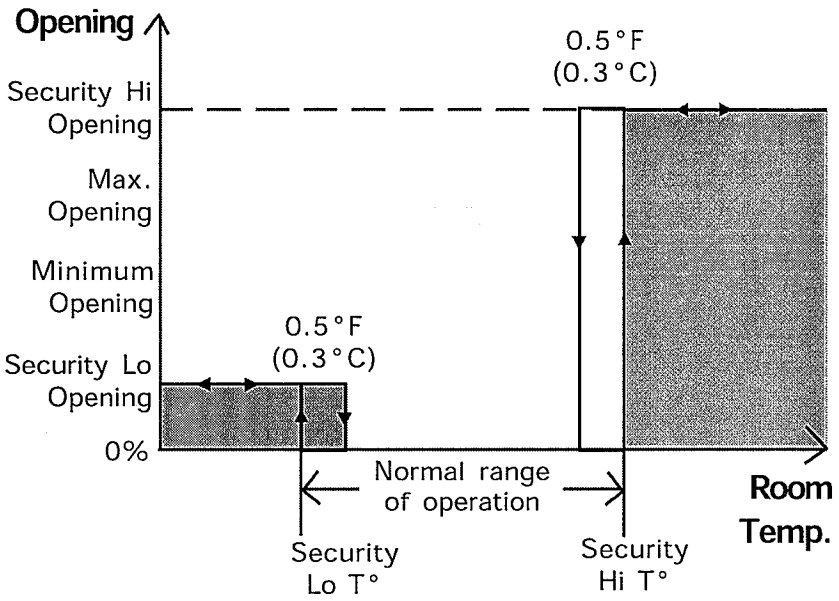
1- CHIMNEY USING AN OUTSIDE TEMPERATURE PROBE:

The chimney damper is at its minimum opening when the **outside** temperature is lower than the *Start Opening Temperature* (point 1 on the graphic below). The damper opens gradually in a linear fashion as the **outside** temperature increases; it reaches its maximum opening when the **outside** temperature is at *Maximum Opening Temperature* (point 2 on the graphic). Note that the damper's minimum opening can automatically be adjusted over time by using curves. Refer to section 5.15.2 for further information on this function. The minimum opening can also be set separately for day and night.



Security override:

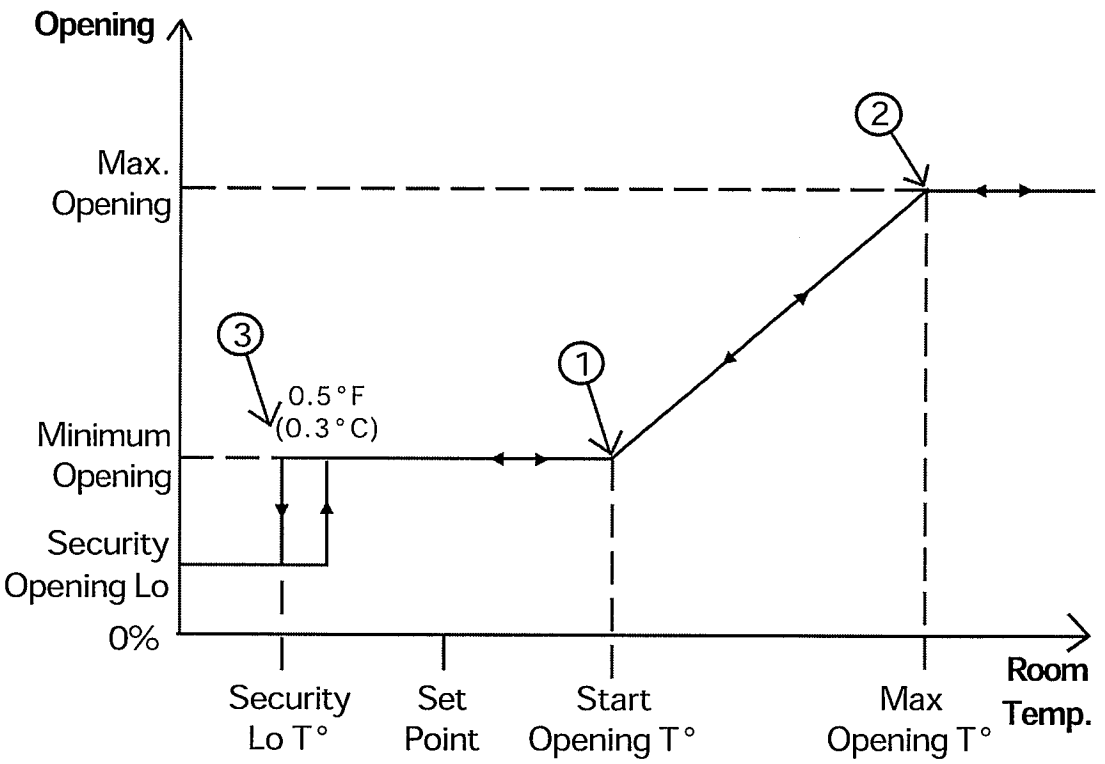
The security override function allows to bypass the regular operation of the chimneys in the case where the room temperature gets too high or too low. The user must define the room temperature above and below which the override function is enabled. The chimneys then reach their respective override positions without taking into account the outside temperature. The chimneys' regular operation is resumed when the room temperature goes back into the normal range (see graphic below).



2- CHIMNEY USING AN INSIDE TEMPERATURE PROBE:

The chimney damper is at its minimum opening when the room temperature is lower than the *Start Opening Temperature* (point 1 on the graphic below). The damper opens gradually in a linear fashion as the **inside** temperature increases; it reaches its maximum opening when the **inside** temperature reaches the *Maximum Opening Temperature* (point 2 on the graphic). Note that the damper's minimum opening can automatically be adjusted over time by using curves. Refer to section 5.15.2 for further information on this function. The minimum opening can also be set separately for day and night.

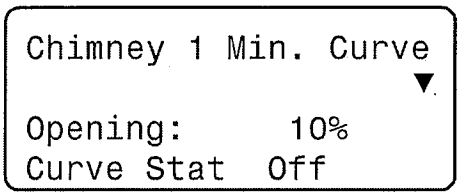
When the room temperature is at or below the *Security Lo Temperature*, the damper closes further to its **security opening** (point 3). A fixed hysteresis of 0.5 °F (0.3 °C) is used to reopen the chimney when the room temperature starts increasing once again.



5.3.1 Adjusting the Minimum Opening of the Chimneys

Note that the curve must be disabled to adjust the minimum opening.

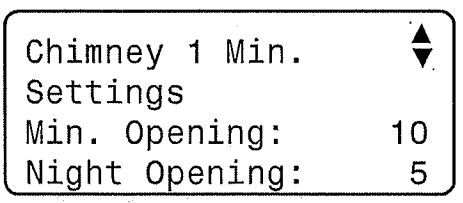
- Set the function to **MINIMUM OPENING** from the main menu.
- Use the arrow keys to select the **"1. Chimneys"** menu.
  Accessible if chimneys are enabled (sec. 5.14.3).
- Use the arrow keys to select the desired chimney then select the **"2. Min Curve"** menu. The minimum opening of the selected chimney is displayed.



- **If the curve is ON**, press the down-arrow key to scroll all the points of the curve. The curve status then flashes on the display. Press EDIT then press the down-arrow key to disable the curve. Press EDIT once again to validate then follow the instructions below.
- **If the curve is OFF**, the minimum opening of the selected chimney flashes on the display. Press EDIT then use the arrow keys to set the minimum opening to the desired value.

5.3.2 Adjusting the Night Minimum Opening of the Chimneys

- Set the function to **MINIMUM OPENING** from the main menu.
- Use the arrow keys to select the **"1. Chimneys"** menu.
  Accessible if chimneys are enabled (sec. 5.14.3).
- Use the arrow keys to select the desired chimney then select the **"1. Min Opening"** menu.
- Use the arrow keys to select the night's minimum opening.
  Accessible if chimneys' night functions are enabled (see sec. 5.14.6).



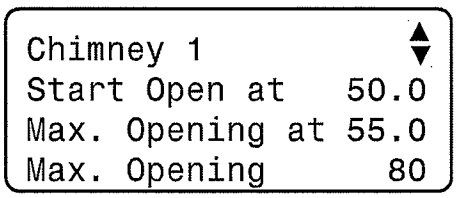
- Press EDIT then use the arrow keys to set the night's minimum opening to the desired value. Press EDIT once again to validate.

5.3.3 Adjusting the Maximum Opening

If the chimneys' operation is based on the inside temperature, the maximum opening of the chimney damper is automatically set to 100 % and cannot be modified. If the chimneys' operation is based on the outside temperature, the maximum opening of the chimney damper can be adjusted from 0 to 100%.

- Set the function to **CHIMNEYS** using the menu select buttons then use the arrow keys to select the desired chimney.

- Use the arrow keys to select the **Max. Opening** menu.
  Accessible if the chimney's operation is based on the outside temperature.



- Press EDIT then use the arrow keys to adjust the maximum opening of the selected chimney. Press EDIT once again to validate.

5.3.4 Adjusting Start and Maximum Opening Temperatures

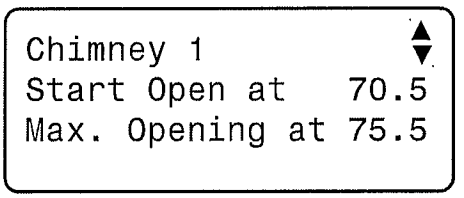
The damper starts opening when the **Start Temperature** is attained; it reaches its maximum position at the **Maximum Opening Temperature**.

If chimneys operate according to the **INSIDE** temperature, the start temperature ranges from 0 to 20°F (0 to 11.1°C) above the set point. The maximum opening temperature ranges from 0.5 to 40°F (0.3 to 22.2°C) above the start temperature.

If chimneys operate according to the **OUTSIDE** temperature, the start temperature ranges from -40 to 120°F (-40 to 48.9°C); the maximum opening temperature ranges from 0.5 to 40°F (0.3 to 22.2°C) above the start temperature.

- Set the function to **CHIMNEYS** using the menu select buttons then use the arrow keys to select the desired chimney. The temperature at which the chimney starts opening flashes on the display.

- Press EDIT then use the arrow keys to set the start temperature to the desired value. Press EDIT once again to validate.



- Press the down-arrow key. The temperature at which the chimney reaches its maximum opening flashes on the display. Press EDIT then use the arrow keys to adjust it to the desired value. Press EDIT once again to validate.

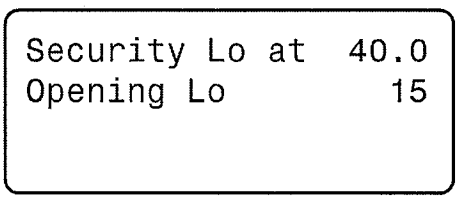
5.3.5 Adjusting the Low Security Parameters

The low security temperature is the room temperature below which the damper closes further to its security opening. It ranges from 1 to 40°F (0.6 to 22.2°C) below the set point. The Security Lo Opening ranges from 0 to 100%.

- Set the function to **CHIMNEYS** using the menu select buttons then use the arrow keys to select the desired chimney.

- Press the down-arrow key to select the **"Security Lo at"** menu.

- Press EDIT then use the arrow keys to adjust the temperature below which the chimney closes to its security position. Press EDIT once again to validate.



- Press the down-arrow key to select the **"Opening Lo"** menu.

- Press EDIT then use the arrow keys to set the chimney's low security position. Press EDIT once again to validate.

5.3.6 Adjusting Security Hi Parameters

The Hi Security Temperature is the room temperature above which the damper opens further to its security opening. It ranges from 1 to 40°F (0.6 to 22.2°C) above the set point. The Security Hi Opening ranges from 0 to 100%.

- Set the function to **CHIMNEYS** using the menu select buttons then use the arrow keys to select the desired chimney.

- Press the down-arrow key in order to select the **"Security Hi at"** menu.

- Press EDIT then use the arrow keys to adjust the temperature above which the chimney reaches its security opening. Press EDIT once again to validate.

```
Security Hi at  80.0
Opening Hi       100
Status    Auto / Man
```

- Press the down-arrow key to select the **"Opening Hi "** menu.

- Press EDIT then use the arrow keys to set the chimney's hi security opening. Press EDIT once again to validate.

5.3.7 Manual Operation of the Chimney

- Set the function to **CHIMNEYS** using the menu select buttons then use the arrow keys to select the desired chimney.

- Press the down-arrow key to select the **"Status"** menu.

- Press EDIT then press the up-arrow key to select the manual status **"Man"**. Press EDIT once again to validate.

5.4 NATURAL VENTILATION CURTAINS

The controller controls up to six independent curtains for natural ventilation. Curtains can either operate according to a timer or according to a potentiometer. Refer to section 5.14.3 to select which operating mode is used by your curtains.

5.4.1 Curtains Using a Potentiometer

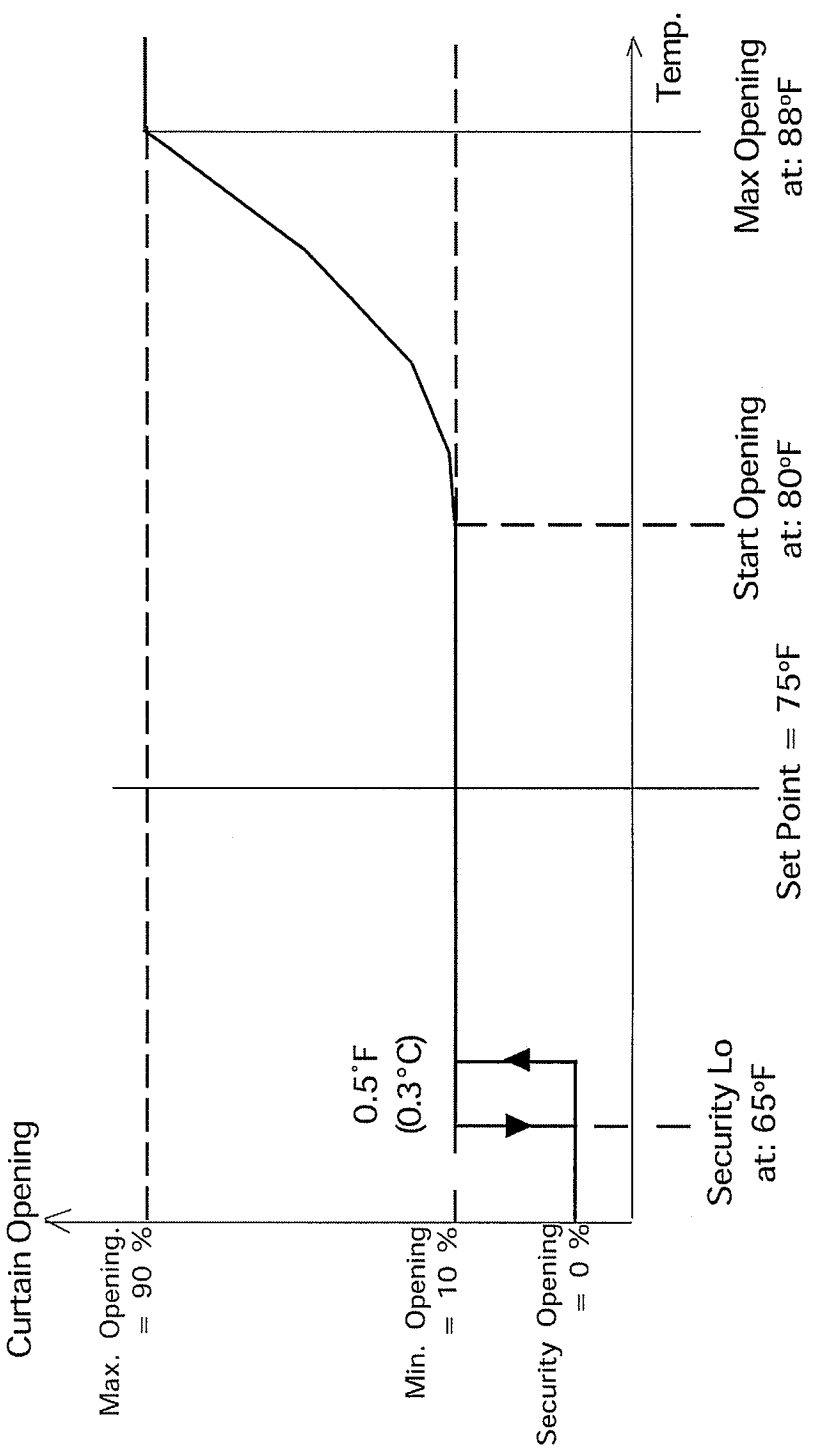
Curtains open and close according to the temperature in their respective zone, following a nonlinear progression. When the temperature remains near the set point, the curtain opens or closes slightly. If the temperature departs significantly from the set point, the curtain is opened or closed by a greater amount. The opening curve of each curtain is bounded by two points defined by the user: the minimum and maximum opening values. The minimum opening is normally used to provide minimum ventilation in the building.

The diagram on the following page illustrates how the curtains operate. At the set point, the curtain is at its minimum opening. At the "**Start Opening at**" temperature, the curtain opens gradually up to its **Maximum Opening**. The **Maximum Opening** is reached at the "**Max Opening at**" temperature. If the temperature decreases below the **Set Point** and reaches the "**Security Lo at**" temperature, the curtain closes further to its **Security Opening** position. A fixed hysteresis of 0.5 °F (0.3 °C) is used to reopen the curtain when the temperature rises again.

In the example illustrated in the following diagram, the openings are calculated as follows:

— at 82°F, the curtain is open at 17%
— at 85°F, the curtain is open at 41%
— at 86°F, the curtain is open at 56%
— at 87°F, the curtain is open at 69%

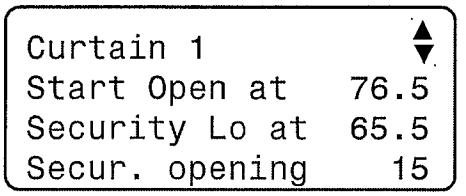
CURTAIN OPERATING DIAGRAM
(curtains using a potentiometer)



5.4.1.1 Adjusting the Curtains' Start Opening Temperature

This is the temperature at which curtains start to open from their minimum position to reach their maximum position as the temperature increases. This temperature ranges from 0 to 20.0°F (0 to 11.1 °C) above the set point.

- Set the function to **TEMPERATURES** using the menu select buttons then use the arrow keys to select the **"2. Curtains"** menu.
- Use the arrow keys to select the desired curtain. The temperature at which the curtain starts opening flashes on the displayed.

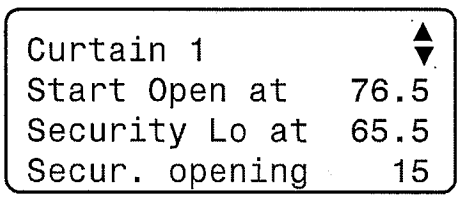


- Press EDIT then use the arrow keys to set the start temperature to the desired value. Press EDIT once again to validate.

5.4.1.2 Adjusting the Low Security Parameters

The low security temperature is the room temperature below which curtains close further to their security opening. It ranges from 1 to 40°F (0.6 to 22.2°C) below the set point. The security opening ranges from 0 to 100%.

- Set the function to **TEMPERATURES** using the menu select buttons then select the **"2. Curtains"** menu, using the arrow keys.
- Use the arrow keys to select the desired curtain.
- Press the down-arrow key in order to select the **"Security Lo at"** menu.
- Press EDIT then use the arrow keys to adjust the temperature below which the curtain closes to its security position. Press EDIT once again to validate.



- Press the down-arrow key to select the **"Secur. opening"** menu.
- Press EDIT then use the arrow keys to set the curtain's low security position. Press EDIT once again to validate.

5.4.1.3 Adjusting the Curtains' Minimum Opening

The curtains' minimum opening is reached when the room temperature is at or below set point. It ranges from 0 to 100%.

- Select the **MINIMUM OPENING** menu using the menu select buttons then select the **"2. Curtains"** menu, using the arrow keys. The minimum opening of each curtain is displayed.
  Accessible if curtains are using a potentiometer (see sec. 5.14.3).

- Use the arrow keys to select the desired curtain.

- Press EDIT then use the arrow keys to set the curtain's minimum opening to the desired value. Press EDIT once again to validate.

```
Min Opening Curtains
                    ▲
                    ▼
Curtain 1:    20%
Curtain 2:    18%
```

5.4.1.4 Adjusting the Curtains' Maximum Opening

The curtains reach their maximum opening when the room temperature increases to the *Maximum Opening Temperature*. This temperature ranges from 0.5 to 20°F (0.3 to 11.1 °C) above the set point and must be greater than the *Start Opening Temperature*. The maximum opening can be adjusted from 0 to 100%.

- Set the function to **TEMPERATURES** using the menu select buttons then select the **"2. Curtains"** menu using the arrow keys.

- Use the arrow keys to select the desired curtain.

- Press the down-arrow key in order to select the **"Max. Opening"** menu.
  Accessible if the outside temperature compensation is disabled (see sec. 5.14.4).

```
Status              Auto

Max Opening          100
Max Opening at      96.0
```

- Press EDIT then use the arrow keys to set the maximum opening of the selected curtain to the desired value. Press EDIT once again to validate.

- Press the down-arrow key in order to select the **Max. Opening At** menu.

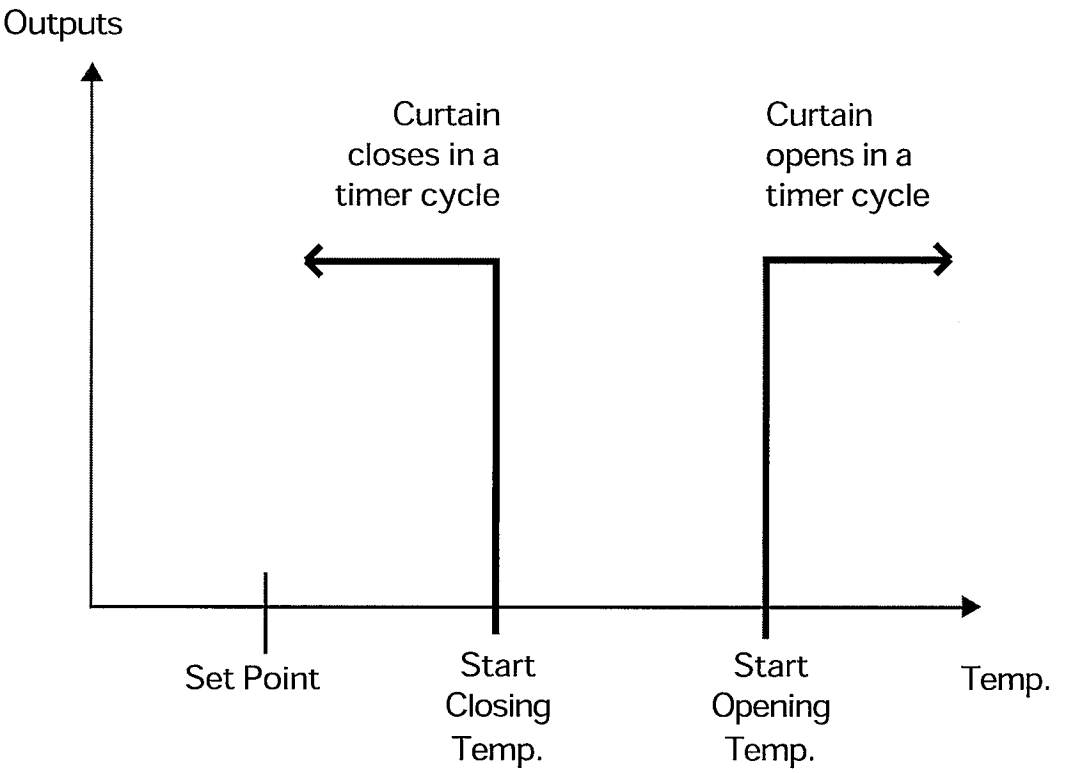
- Press EDIT then use the arrow keys to set the temperature at which the curtain reaches its maximum opening. Press EDIT once again to validate.

5.4.2 Curtains Using a Timer

Curtains open and close according to the temperature in their respective zone: they open according to their **Opening Cycle** when the temperature increases above the *Start Opening Temperature*; they close according to their **Closing Cycle** when the temperature decreases below the *Stop Closing Temperature*.

Each curtain operates according to the average temperature of its assigned probes. Refer to section 5.14.11 to make the curtains' probe assignment.

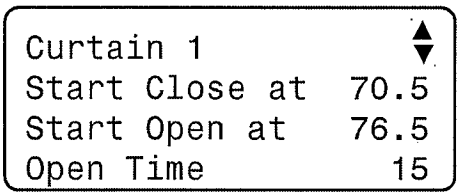
The following diagram illustrates the operation the curtains with a timer.



5.4.2.1 Adjusting the Opening & Closing Temperatures

The following procedure shows how to set the temperature above/below which the curtain opens/closes according a timer. The temperature below which the curtain starts closing can be adjusted from 0 to 20°F (0 to 11.1°C) above the set point; the temperature above which the curtain starts opening can be adjusted from 0.5 to 20°F (0.3 to 11.1°C) above the *Start Closing Temperature*.

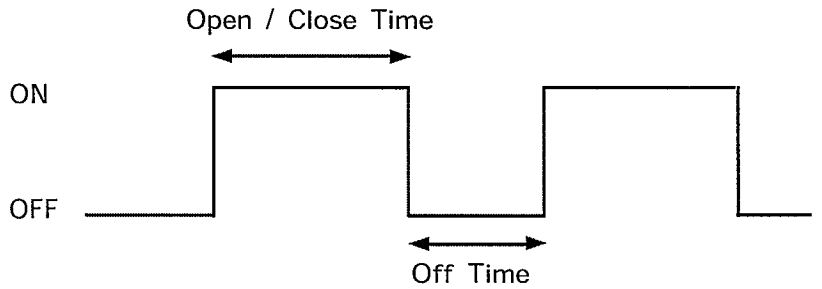
- Set the function to **TEMPERATURES** using the menu select buttons then select the **"2. Curtains"** menu, using the arrow keys.
- Use the arrow keys to select the desired curtain.
- Press the down-arrow key to select the **"Start Close at"** menu.



- Press EDIT then use the arrow keys to adjust the temperature to the desired value. Press EDIT once again to validate.
- Press the down-arrow key to select the **"Start Open at"** menu.
- Press EDIT then use the arrow keys to adjust the temperature to the desired value. Press EDIT once again to validate.

5.4.2.2 Adjusting the Curtains' Timer

OPENING CYCLE:
During the opening cycle, the curtains open during the **Open Time** then they stay still during the **Off Time**. During the closing cycles, the curtains close during the **Close Time** then stay still during the **Off Time.** Note that the Off Time is common to both the opening and closing cycles.



- Set the function to **TEMPERATURES** using the menu select buttons then select the **"2. Curtains"** menu.
- Use the arrow keys to select the desired curtain.
- Press the down-arrow key to select the **"Open Time"** menu.
- Press EDIT then use the arrow keys to adjust the Open Time to the desired value (in seconds). Press EDIT once again to validate.

```
Start Open at   76.5
Open Time         15
Close Time        15
Off Time          15
```

- Press the down-arrow to select the **"Close Time"** menu. Press EDIT then use the arrow keys to adjust it to the desired value (in seconds). Press EDIT once again to validate.
- Press the down-arrow to select the **"Off Time"** menu. Press EDIT then use the arrow keys to adjust it to the desired value (in seconds). Press EDIT once again to validate.

5.4.3 De-icing/Purge

The de-icing/purge function allows opening the curtain on a short period of time to purge the air continuously.

De-icing / Purge with curtains using a timer:
Curtains open during the *Purge Moving Time* then stay still until the *Purge Time Delay*. When the Purge Delay has elapsed, the curtains return to their initial position until the end of the Purge Cycle.

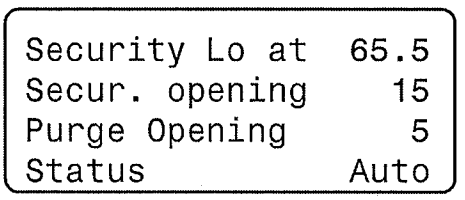
Note that purge cycles are not performed while the tunnel ventilation mode is enabled (above the cutain's opening temperature).

De-icing / Purge with curtains using a potentiometer:
The curtains reach their *Purge Opening Position* when a *Purge Cycle* starts. If curtains are already opened beyond that position at the beginning of the cycle, they will not open any further. The purge position is maintained during the *Purge Delay* then curtains return to their initial position until the end of the *Cycle*.

5.4.3.1 Adjusting De-icing / Purge Opening

The **Purge Opening** is the position that is reached during the de-icing/purge cycles. The de-icing/purge opening can be adjusted from 0 to 100 % and must be set separately for each curtain.

- Set the function to **TEMPERATURES** using the menu select buttons then select the **"2. Curtains"** menu, using the arrow keys.
- Use the arrow keys to select the desired curtain.
- Press the down-arrow key to select the **"Purge Opening"** menu.
  Accessible if the curtain uses a potentiometer (sec. 5.14.3).

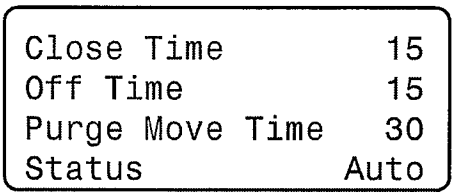


- Press EDIT then use the arrow keys to adjust the Purge Opening position to the desired value (in %). Press EDIT once again to validate.

5.4.3.2 Adjusting the De-icing Purge Move Time

The **Purge Move Time** is the delay during which curtains open to purge the air within a purge cycle. It can be adjusted from 0 to 900 seconds and must be set separately for each curtain.

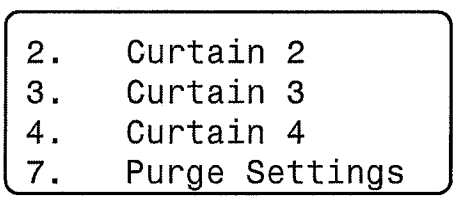
- Set the function to **TEMPERATURES** using the menu select buttons then use the arrow keys to select the **"2. Curtains"** menu.
- Use the arrow keys to select the desired curtain.
- Press the down-arrow key to select the **"Purge Move Time"** menu.
  Accessible if the curtain uses a timer (see sec. 5.14.3).
- Press EDIT then use the arrow keys to adjust the purge move time to the desired value (in seconds). Press EDIT once again to validate.



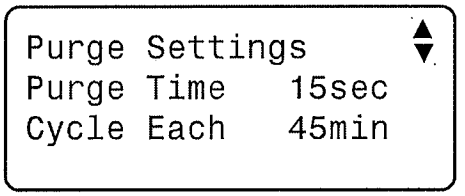
5.4.3.3 Adjusting the Purge Cycles

The *Purge Cycle* duration includes the curtains' moving time (or purge opening position if curtains use a potentiometer) and the purge time. At the beginning of a purge cycle, the curtains open during the Moving Time (or reach their Purge Opening position) then stay still during the *Purge Time*. Curtains return to their initial position until the end of the cycle.

- Set the function to **TEMPERATURES** using the menu select buttons then use the arrow keys to select the **"2. Curtains"** menu.
- Press the down-arrow key in order to select the **"7. Purge Settings"** menu. The purge time flashes on the display.
  Accessible if the purge function is enabled (see sec. 5.14.3).
- Press EDIT then use the arrow keys to adjust the **Purge Time** to the desired value.



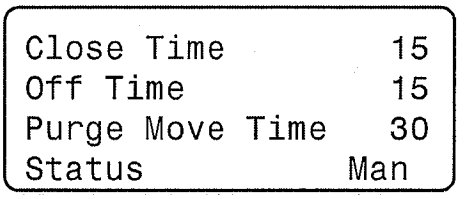
- Press the down-arrow key to select the **Cycle Each** menu.



- Press EDIT then use the arrow keys to adjust the purge cycle delay to the desired value. Press EDIT once again to validate.

5.4.4 Manual Operation of the Curtains

- Set the function to **TEMPERATURES** using the menu select buttons then use the arrow keys to select the **"2. Curtains"** menu.
- Use the arrow keys to select the desired curtain.
- Press the down-arrow key to select the **"Status"** menu.



- Press EDIT then press the up-arrow key to select the manual status **"Man"**. Press EDIT once again to validate.

5.5 STIR FANS

Stir fans can operate in three different ways. These operating modes must be enabled separately and can operate simultaneously:

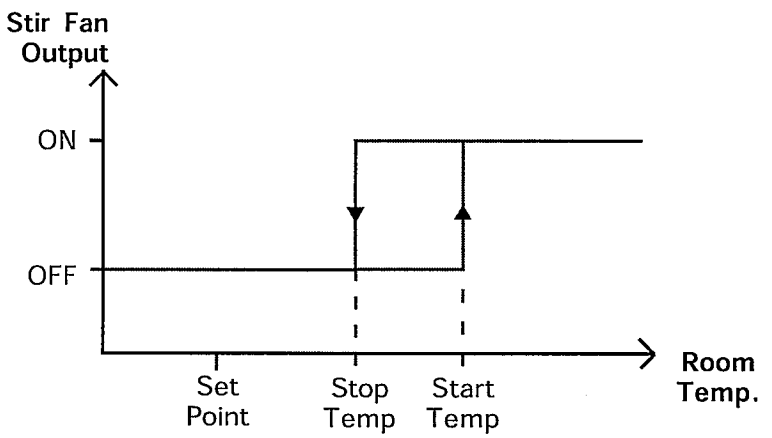
1. HOT TEMPERATURE:
When the inside temperature is too high, stir fans can be enabled in order to create an air draft to cool down the animals. In this case, stir fans operate continuously until the air cools down.

2. COLD TEMPERATURE:
When the inside temperature is too low, stir fans can be activated to disperse warm air that is generated by the heating units evenly in the building. When used for this purpose, the stir fans operate according to a timer.

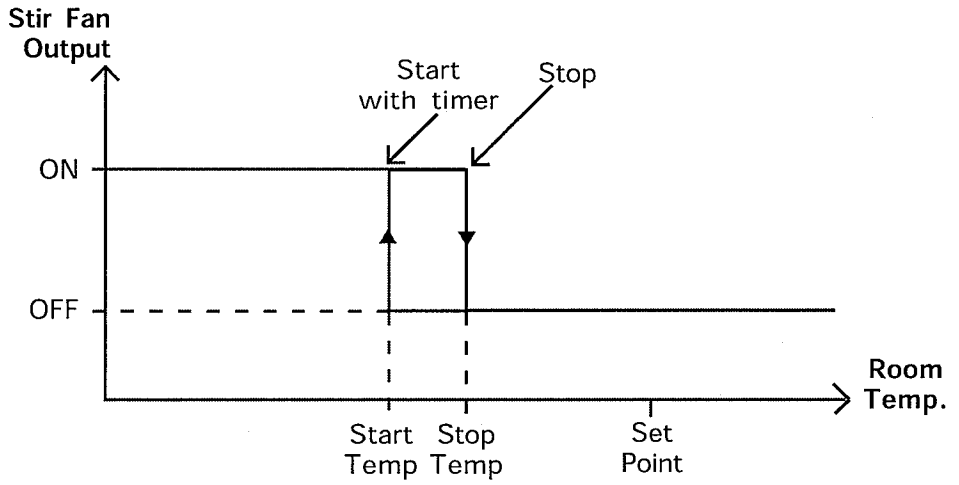
3. PROBE DIFFERENCE:
The stir fans can be enabled according to a timer whenever the temperature difference between two probe exceeds a user-defined value. This is used to ensure the uniformity of the temperature in the house.

PRINCIPLE OF OPERATION :

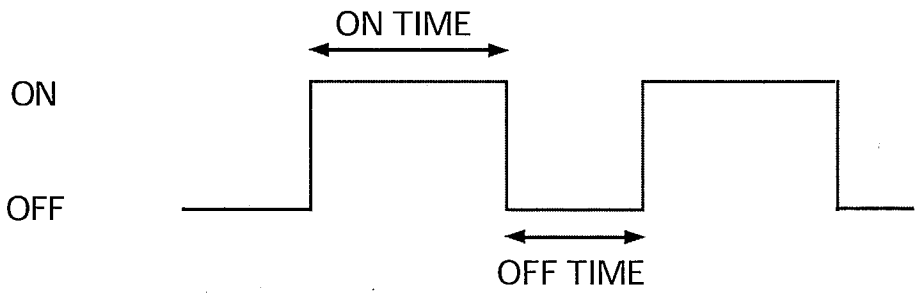
1. Hot Temperature :
Stir fans start operating continuously when the room temperature reaches their start temperature. The output is deactivated when the temperature decreases below their stop temperature as shown on the diagram below.



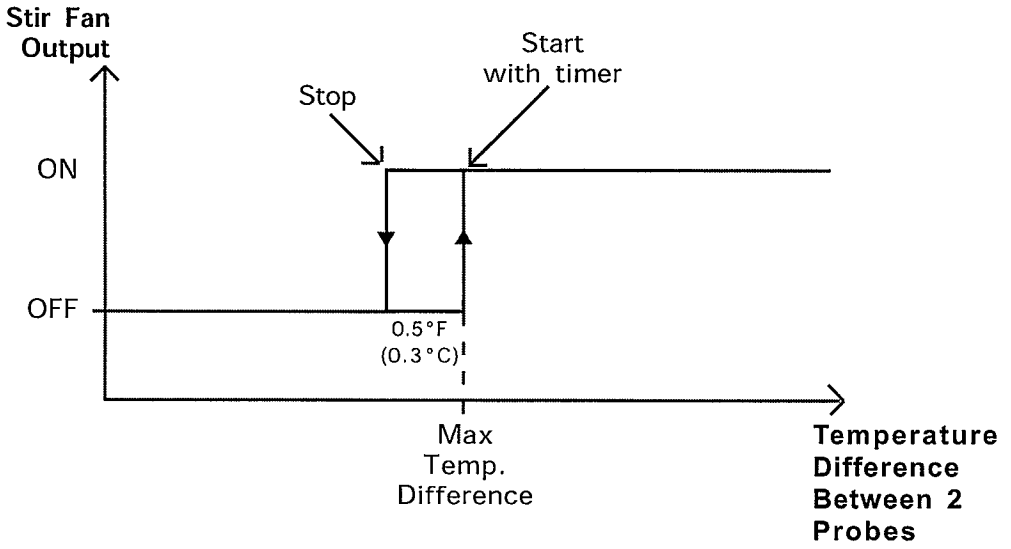
2. Cold Temperature :
Stir fans operate according to a timer when the room temperature decreases below their start temperature. The output is deactivated when the room temperature increases and reaches their stop temperature. The graphic below sums the operation this situation:



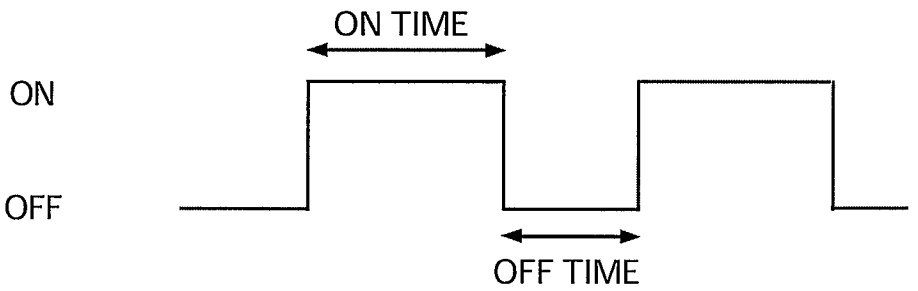
Timer's operation :
The stir fan output is activated according to a timer when the room temperature is too low. The stir fan timer is defined by a running time (On time) and an Off time as illustrated below.



3. Probe Difference :
Stir fans operate according to a timer when the temperature difference between two probes is higher than the user-defined value. The stir fan output is deactivated when the temperature difference between the probes decreases below *Maximum temperature difference - 0.5 °F (0.3 °C)*. The following sums up the situation.



Timer's operation :
The stir fan output is activated following a timer when the difference of temperature is too high. The stir fan timer is defined by a running time (On time) and an Off time as illustrated below.



5.5.1 Selecting the Stir Fan Usage

- Set the function to **USER** from the main menu, using the menu select buttons, then use the arrow keys to select the **"7. Stir Fan Options"** menu.
  Accessible if stir fans are enabled (see sec. 5.14.3).

```
Stir Fan 1 Settings
Hot Temp.        Yes
Cold Temp.       Yes
Probe Diff.      Yes
```

- Use the arrow keys to select the desired stir fan output.
- The status of the stir fan's hot temperature function flashes on the display. Press EDIT then use the arrow keys to enable this function. Press EDIT once again to validate.
- Press the down-arrow key once. The status of the stir fan's cold temperature function flashes on the display. Press EDIT then use the arrow keys to enable this function. Press EDIT once again to validate.
- Press the down-arrow key once. The status of the stir fan's probe difference function flashes on the display. Press EDIT then use the arrow keys to enable this function. Press EDIT once again to validate.

5.5.2 Stir Fans' Hot Temperature Parameters

If the *Hot Temp.* function is enabled, the temperature at which the stir fan output starts and stops must be defined. The start temperature ranges from 1°F to 20.0°F (0.6°C to 11.1°C) above the set point. The stop temperature ranges from 0.5°F to 19.5°F (0.3 to 10.3°C) above the set point. The stop temperature must be 0.5°F (0.3°C) lower than the start temperature.

- Set the function to **TEMPERATURES** using the menu select buttons, then use the arrow keys to select the **"4. Stir Fan"** menu.
  Accessible if stir fans are enabled (see sec. 5.14.3).
- Use the arrow keys to select the desired stir fan output.

- Press the down-arrow key to select the **"Hot Start Temp."** menu.
  Accessible if the stir fan's hot temperature function is enabled above.

```
Cold Temp.        Yes
Probe Diff.       Yes
Hot Start Temp.  75.0
Hot Stop Temp.   74.5
```

- Press EDIT then use the arrow keys to set the start temperature to the desired value. Press EDIT once again to validate.

- Press the down-arrow key. The stop temperature flashes on the display. Press EDIT then use the arrow keys to set it to the desired value. Press EDIT once again to validate.

5.5.3 Stir Fans' Cold Temperature Parameters

If the *Cold Temp.* function enabled, the temperature at which the stir fan output starts and stops must be defined. The start temperature ranges from 0.5°F to 40.0°F (0.3°C to 22.2°C) below the set point. 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. The stop temperature must be 0.5°F (0.3°C) greater than the start temperature.

- Set the function to **TEMPERATURES** using the menu select buttons, then use the arrow keys to select the **"4. Stir Fan"** menu.
  Accessible if stir fans are enabled (see sec. 5.14.3).

- Press the down-arrow key to select the **"Cold Start Temp."** menu.
  Accessible if the stir fan's cold temperature function is enabled above.

```
Hot Start Temp.  75.0
Hot Stop Temp.   74.5
Cold Start Temp  65.0
Cold Stop Temp.  65.5
```

- Press EDIT then use the arrow keys to set the start temperature to the desired value. Press EDIT once again to validate.

- Press the down-arrow key. The stop temperature flashes on the display. Press EDIT then use the arrow keys to set the stop temperature to the desired value. Press EDIT once again to validate.

5.5.4 Temperature Differences between Probes

If stir fans are enabled when the temperature difference between two probes is too high, the user must define the maximum allowable temperature difference between the probes. Whenever the temperature difference between two probes exceeds this value, stir fans start running following a timer. The temperature difference ranges from 0.5°F to 20°F (0.3°C to 11.1°C).

- Set the function to **TEMPERATURES** using the menu select buttons, then use the arrow keys to select the **"4. Stir Fan"** menu.
  Accessible if stir fans are enabled (see sec. 5.14.3).

- Press the down-arrow key to select the **"Probe Diff."** menu.
  Accessible if the probe difference function is enabled above.

```
Probe Diff. :    5.0
Cold & Probe Timer
On Time     1:00(m:s)
Off Time    1:00(m:s)
```

- Press EDIT then use the arrow keys to set the maximum allowable temperature difference between two probes. Press EDIT once again to validate.

5.5.5 Setting the Stir Fans' Timer

If the *Cold Temperature* and/or *Probe Difference* functions are enabled, stir fans will run according to a timer. These two functions share the same timer. The timer's On and Off times can be adjusted from 0 minutes, 0 seconds to 60 minutes, 0 seconds.

- Set the function to **TEMPERATURES** using the menu select buttons, then use the arrow keys to select the **"4. Stir Fan"** menu.
  Accessible if stir fans are enabled (see sec. 5.14.3).

- Press the down-arrow key to select the **"On Time"** menu.
  Accessible if the stir fans' cold temperature and/or probe difference functions are enabled above.

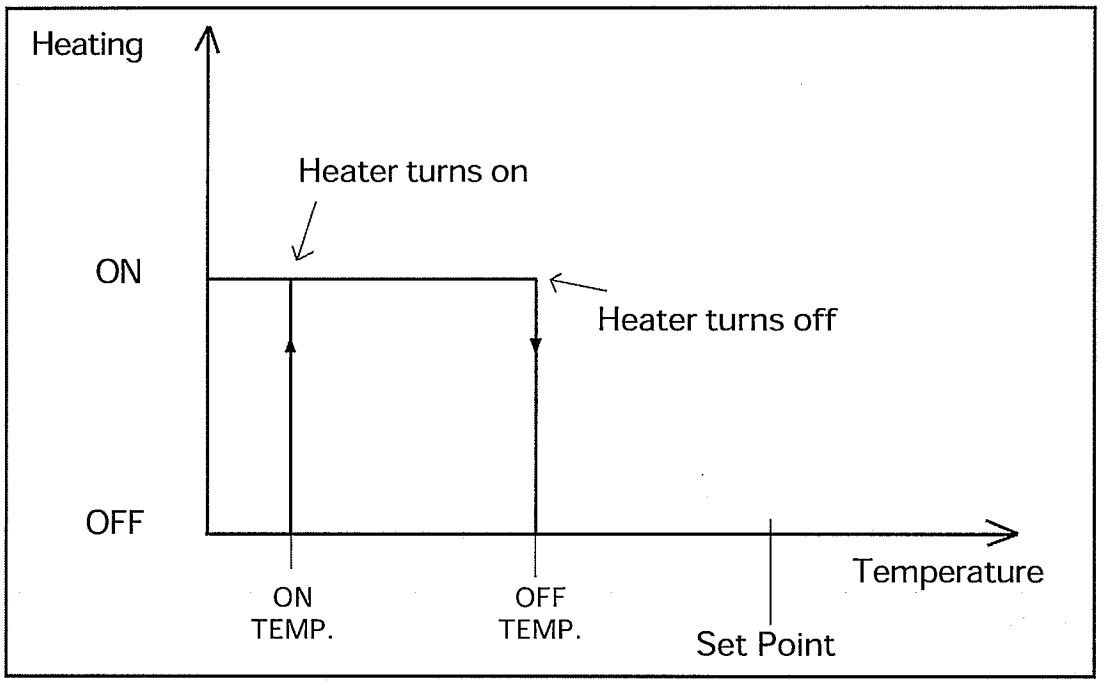
```
Probe Diff. :    5.0
Cold & Probe Timer
On Time     1:00(m:s)
Off Time    1:00(m:s)
```

- Press EDIT then use the arrow keys to set the On Time to the desired value. Press EDIT once again to validate.

- Press the down-arrow key once. The Off Time flashes on the display. Press EDIT then use the arrow keys to set it to the desired value. Press EDIT once again to validate.

5.6 HEATER SETTINGS

The EXPERT-NATURAL has four independent heater stages. A start and stop temperatures are defined for each stage. The heater stages's activation and probe assignment are performed in the installation (see sec.5.14.3 and 5.14.11). The following diagram shows the operation of a heating stage.

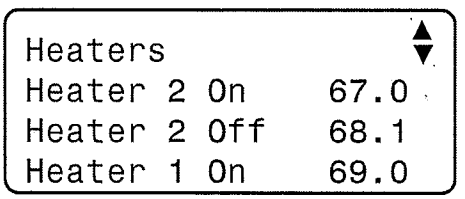


5.6.1 Adjusting Heater Start and Stop Temperatures

- Set the function to **TEMPERATURES** from the main menu using the menu select buttons. Press the right-arrow key to select the **"1. Heaters"** menu.

- Use the arrow keys to select the start or stop temperature of the desired heater.

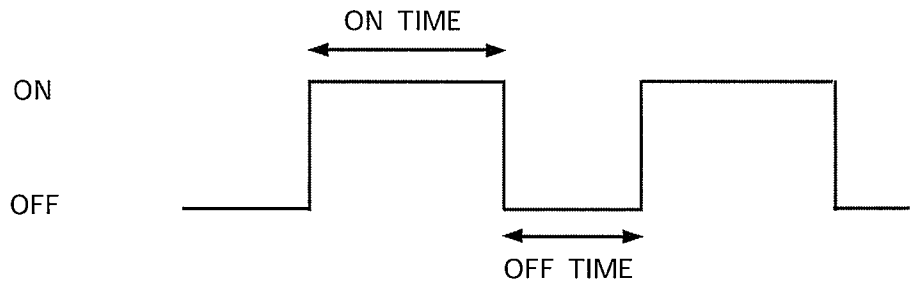
- Press EDIT then use the arrow keys to adjust the temperature to the desired value. Press EDIT once again to validate.



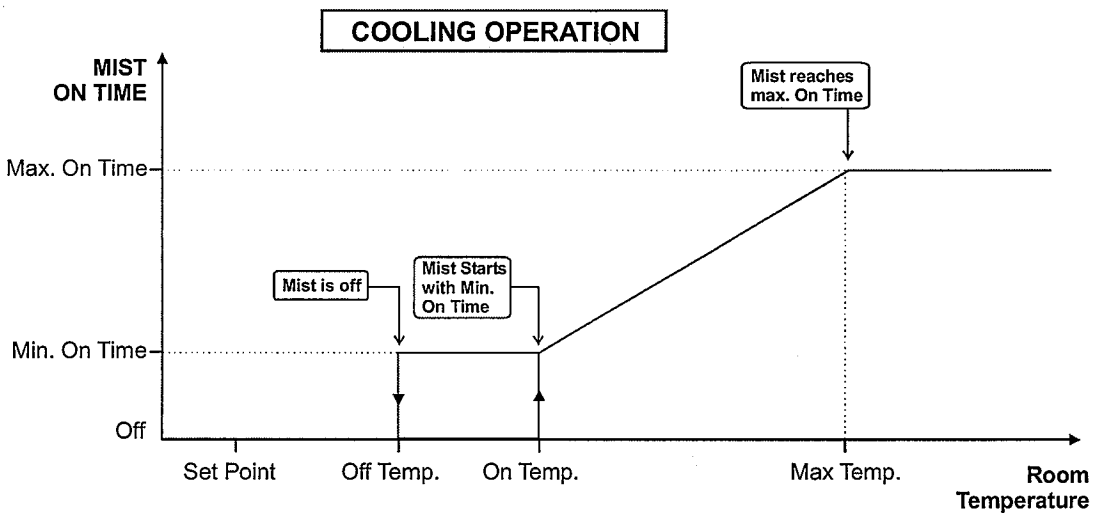
5.7 COOLING

The controller has one cooling stage to control mist units. The cooling stage is independent from other stages and can thus be activated at any temperature above the set point.

The cooling stage starts running according to a timer when the room temperature reaches its start temperature. The timer is composed of On and Off times.



When the cooling cycle starts (**On Temp**), the output is activated using the **minimum ON time**. The ON time gradually increases as the room temperature increases. The **maximum ON time** is reached when the room temperature reaches the output's Max Temperature (**T° Max**). The Off Time never changes. The following graphic illustrates the situation:

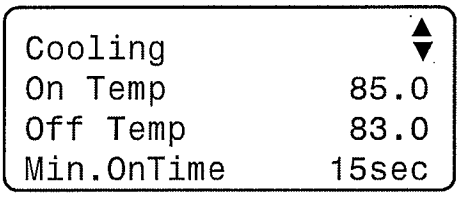


5.7.1 Adjusting Cooling Parameters

The temperature at which the cooling output starts (On Temp) must be greater than the set point. It can be adjusted from the set point to 120°F (48.9°C). The temperature at which the output fully uses its maximum timer must be at least 0.5°F (0.3°C) greater than the output's On Temp.

- Set the function to **TEMPERATURES** using the menu select buttons.

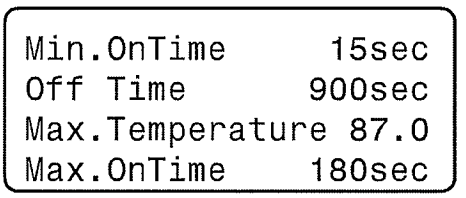
- Select **"5. Cooling"** menu using the arrow keys. The output's start temperature (On Temp.) flashes on the display.
  Accessible if the cooling output is enabled (see sec 5.14.3).



- Press EDIT key then use the arrow keys to adjust it to the desired value. Press EDIT once again to validate.

- Press the down-arrow key. The output's stop temperature (Off Temp.) flashes on the display. Press EDIT then use the arrow keys to adjust it to the desired value. Press EDIT once again to validate.

- Press the down-arrow key. The temperature at which the output fully uses its maximum timer (Max. Temperature) flashes on the display. Press EDIT then use the arrow keys to adjust it to the desired value. Press EDIT once again to validate.

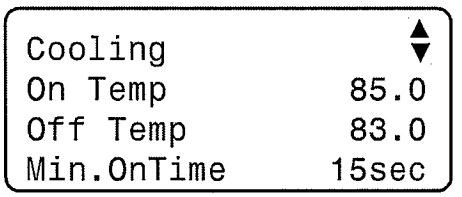


- Press the down-arrow key. The maximum running time of the timer (Max. On Time) flashes on the display. Press EDIT then use the arrow keys to adjust it to the desired value. Press EDIT once again to validate.

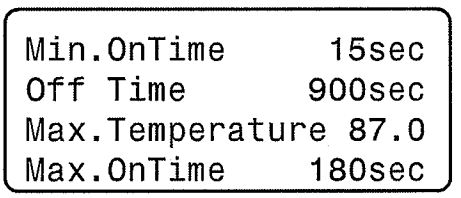
5.7.2 Adjusting the Cooling Outputs' Timer

Minimum and maximum running times (On Times) of the cooling output's timer can be adjusted from 0 to 900 seconds. The maximum On Time must greater than the minimum On Time. The Off can be adjusted from 0 to 3600 seconds (1 hour).

- Set the function to **TEMPERATURES** using the menu select buttons.
- Select "**5. Cooling**" menu using the arrow keys.
  Accessible if the cooling output is enabled (see sec 5.14.3).
- Press the down-arrow key to select the "**Min On Time**" menu.



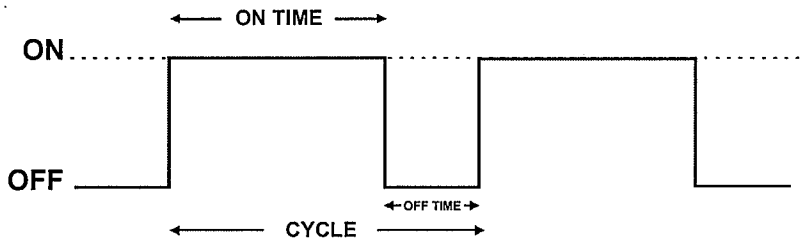
- Press EDIT key then use the arrow keys to adjust the minimum On time to the desired value. Press EDIT once again to validate.
- Press the down-arrow key once again. The timer's Off Time flashes on the display. Press EDIT then use the arrow keys to adjust it to the desired value. Press EDIT once again to validate.



- Press the down-arrow key to select the timer's Maximum On Time. Press EDIT then use the arrow keys to adjust it to the desired value. Press EDIT once again to validate.

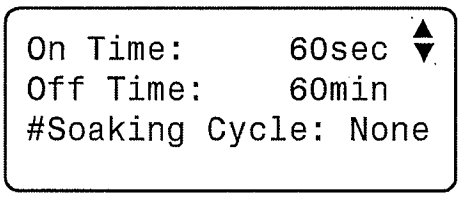
5.8 SOAKING

Soaking cycles can be activated while the controller is in clean mode. These cycles are used to activate soaking devices to clean the room when it is empty. Soaking devices are activated following a timer: the timer's ON TIME can be adjusted from 0 to 3600 seconds (1hour), the OFF TIME can be adjusted from 0 to 240 minutes (4 hours). These cycles start being performed when the controller enters in clean mode; up to 100 soaking cycles can be executed.



Settings:

- Set the function to **TEMPERATURES** using the menu select buttons.
- Select **"7. Soaking"** menu using the arrow keys. The ON TIME flashes on the display.
  Accessible if the soaking function is enabled (see sec 5.14.3).



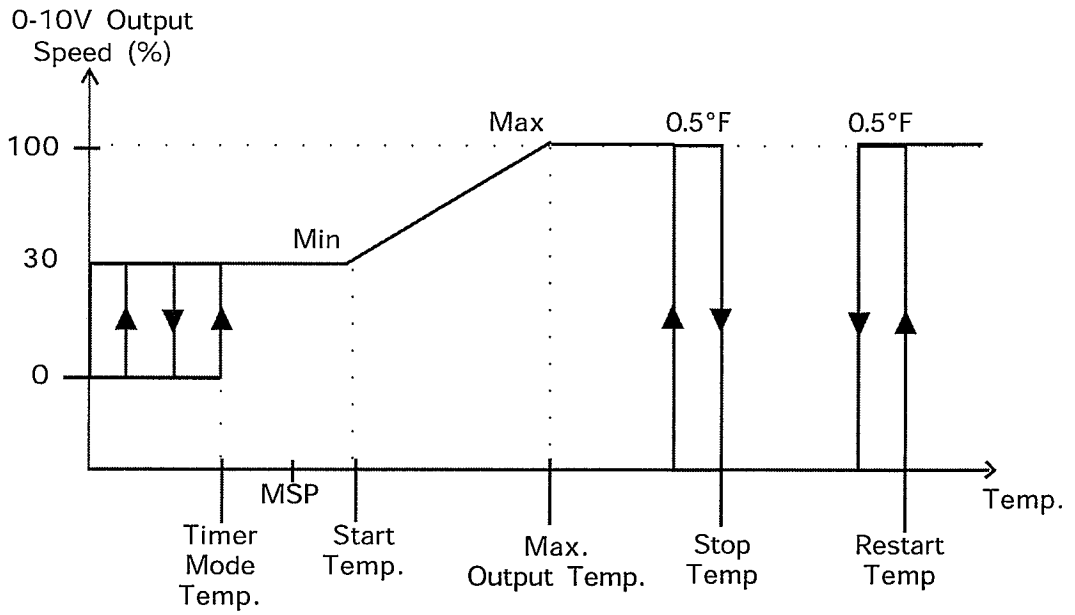
- Press EDIT key then use the arrow keys to adjust the ON TIME to the desired value. Press EDIT once again to validate.
- Press the down-arrow key. The OFF TIME flashes. Use the arrow keys to adjust it to the desired value. Press EDIT once again to validate.
- Press the down-arrow key. The number of soaking cycles flashes. Use the arrow keys to set the number of soaking cycles that are performed once the controller enters in clean mode. Press EDIT once again to validate.

5.9 0-10V OUTPUTS

The controller can control up to two 0-10V outputs. These outputs are used as supplementary outputs for heating or ventilation. Refer to section 5.14.3 to select the usage of each 0-10V output. These outputs are independent from the other stages. They may be connected to a Slave 0-10V to control heat lamps, heaters, variable fans, chimney damper, etc.

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 maximum load is provided to the module that is connected to the output.

A) 0-10V OUTPUTS USED FOR VENTILATION:



If the room temperature rises :

When **Room Temperature < Timer Mode Temperature**: The output operates in timer mode.

At **Timer Mode Temperature**: The output stops operating in timer mode and operates continuously at its minimum speed.

At **Start Temperature**: The output increases in speed as the room temperature increases.

At **Maximum Output Temperature**: The output operates continuously at its maximum speed.

At **Stop Temperature**: The output is deactivated

At **Restart Temperature**: The output restarts at full speed.

If room temperature decreases:
At **Restart Temperature - 0.5 °F (0.3 °C)** : the output is deactivated

At **Stop Temperature -0.5 °F (0.3 °C)**, the output restarts at its max. speed.

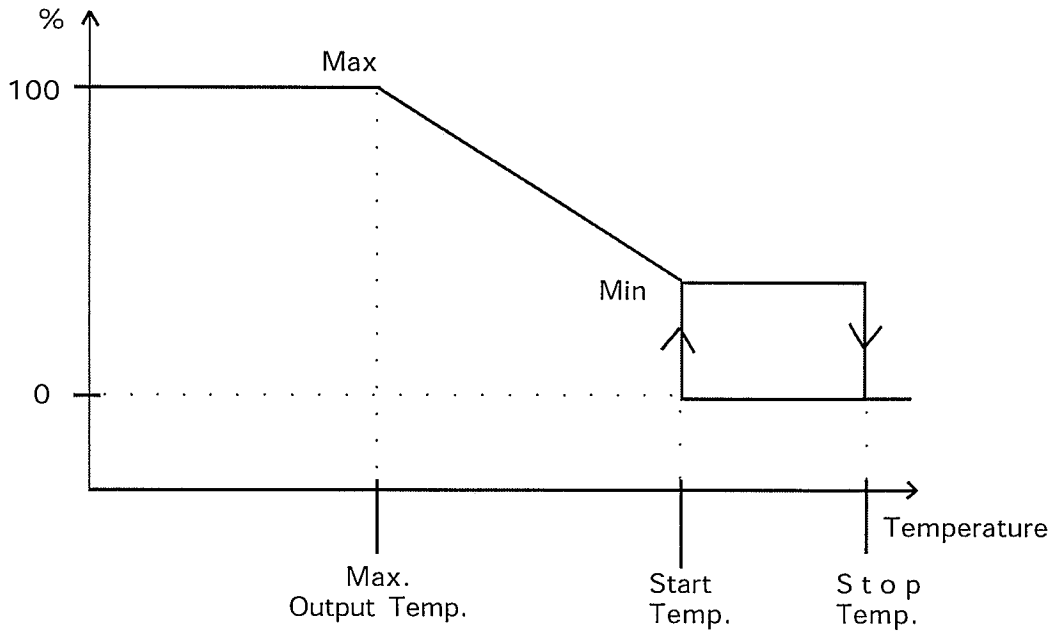
At **Maximum Output Temperature** : the output decreases in speed as the room temperature decreases.

At **Start Temperature**: the output operates at its minimum speed.

Below **Timer Mode Temperature**: the output operates in timer mode.

B) 0-10V OUTPUTS USED FOR HEATING:

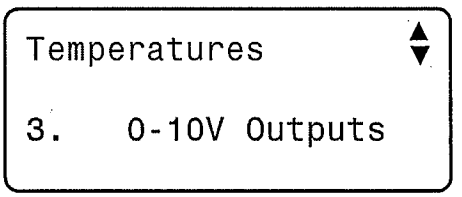
Heating units that are connected to the 0-10V output are activated at their minimum intensity when the output's start temperature is reached. They increase in intensity as the temperature decreases. Their maximum intensity is reached when the temperature decreases to the *Maximum Output Temperature*. The 0-10V output is deactivated when the temperature increases to the output's *Stop Temperature*.



5.9.1 Adjusting the Start Temperature of 0-10V Outputs

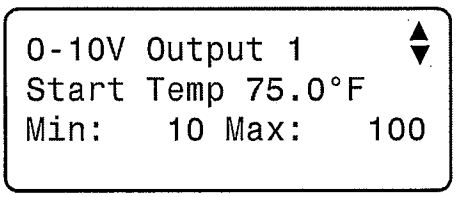
- Set the function to **TEMPERATURES** from the main menu, using the menu select buttons.

- Use the arrow keys to select the **"3. 0-10V Outputs"** menu.
  Accessible if a 0-10V output is enabled (see sec. 5.14.3).



- Use the arrow keys to select the desired 0-10V output.

- Press the down-arrow key. The Start Temperature of the selected output flashes on the display.



- Press EDIT then use the arrow keys to adjust it to the desired value. Press EDIT once again to validate.

5.9.2 Adjusting the Min./Max Operation of 0-10V Outputs

- Set the function to **TEMPERATURES** from the main menu, using the menu select buttons.
- Use the arrow keys to select the **"3. 0-10V Outputs"** menu.
  Accessible if a 0-10V output is enabled (see sec. 5.14.3).
- Use the arrow keys to select the desired 0-10V output.
- Press the down-arrow key to select the **"Min"** menu. Press EDIT then use the arrow keys to set the minimum intensity of the selected 0-10V output. Press EDIT to validate.

```
Start Temp 75.0°F
Min:   10 Max:   100
Max. Output at  80.0
```

- Press the down-arrow key. The maximum intensity of the 0-10V output is displayed. Press EDIT then use the arrow keys to adjust it to the desired value. Press EDIT once again to validate.

5.9.3 Adjusting Max. Temperature of 0-10V Outputs

- Set the function to **TEMPERATURES** from the main menu, using the menu select buttons.
- Use the arrow keys to select the **"3. 0-10V Outputs"** menu.
  Accessible if a 0-10V output is enabled (see sec. 5.14.3).
- Use the arrow keys to select the desired 0-10V output.
- Press the down-arrow key to select the **"Max. Output at"** menu. This is the temperature at which the 0-10V output reaches its maximum intensity. Press EDIT then use the arrow keys to adjust the max. output temperature to the desired value. Press EDIT once again to validate.

```
Start Temp 75.0°F
Min:   10 Max:   100
Max. Output at  80.0
```

5.9.4 Adjusting the Stop Temperature

- Set the function to **TEMPERATURES** from the main menu, using the menu select buttons.
- Use the arrow keys to select the **"3. 0-10V Outputs"** menu.
  Accessible if a 0-10V output is enabled (see sec. 5.14.3).
- Use the arrow keys to select the desired 0-10V output.
- Use the arrow keys to select the **"Stop Temp"** menu.
- Press EDIT then use the arrow keys to adjust the stop temperature to the desired value. Press EDIT once again to validate.

```
Start Temp 75.0°F
Min:   10 Max:   100
Max. Output at  80.0
Stop Temp       73.0
```

5.9.5 Adjusting the Restart Temperature

When a 0-10V output is used for ventilation, the output restarts at its full intensity when its restart temperature is reached.

- Set the function to **TEMPERATURES** from the main menu, using the menu select buttons.
- Use the arrow keys to select the **"3. 0-10V Outputs"** menu.
  Accessible if a 0-10V output is enabled (see sec. 5.14.3).
- Select a 0-10V output that is used for in ventilation then select the **"Restart Temp."** menu.
- Press EDIT then use the arrow keys to adjust the restart temperature to the desired value. Press EDIT once again to validate.

```
Stop Temp.:     95.0
Restart Temp.: 115.0
On Time :  1:00(m:s)
Off Time : 1:00(m:s)
```

5.9.6 Adjusting the Timer Settings

0-10V outputs that are used for ventilation operate in timer mode when the room temperature is below the reference temperature. This allows using 0-10V outputs for minimum ventilation.

- Set the function to **TEMPERATURES** from the main menu, using the menu select buttons.

- Use the arrow keys to select the **"3. 0-10V Outputs"** menu.
  Accessible if a 0-10V output is enabled (see sec. 5.14.3).

- Select a 0-10V output that is used for in ventilation then select the **"In Timer Under"** menu.

```
Start Temp 75.0°F
Min:   10 Max:   100
Max. Output at  80.0
In Timer Under  73.0
```

- Press EDIT then use the arrow keys to set the temperature below which the 0-10V output operates in timer mode. Press EDIT once again to validate.

- Press the down-arrow key once again. The timer's ON time flashes on the display. Press EDIT then use the arrow keys to it to the desired value. Press EDIT once again to validate.

```
Stop Temp.:     95.0
Restart Temp.: 115.0
On Time :  1:00(m:s)
Off Time : 1:00(m:s)
```

- Press the down-arrow key once again. The timer's OFF time flashes on the display. Press EDIT then use the arrow keys to set it to the desired value. Press EDIT once again to validate.

5.9.7 Adjusting the Minimum Night Speed

0-10V outputs that are used for ventilation can use a different minimum fan speed during night time. The minimum night speed is consequently adjusted if changes occur in the daytime minimum speed.

- Set the function to **MINIMUM OPENING** from the main menu then use the arrow keys to select the "**3. 0-10V Outputs**" menu.
  Accessible if a 0-10V output is enabled (sec. 5.14.3).

- Select a 0-10V output that is used for in ventilation then select the "**1. Min Speed**" menu.

```
Out 2 Min. Speeds
Min. Speed:        30
Night Min.Spd:     20
```

- Press the down-arrow key once. The minimum night speed is displayed.
  Accessible if the Night feature on 0-10V outputs is enabled (see sec. 5.14.6).

- Press EDIT then use the arrow keys to set the night minimum speed to the desired value. Press EDIT once again to validate.

5.9.8 Using 0-10V Output #1 for Ventilation in Clean Mode

It is possible to activate ventilation cycles while the controller is in clean mode. This type of ventilation is provided by the first 0-10V output, on condition that this output is used for ventilation. The fan speed can be adjusted from 0 to 100%, the timer's On and Off times can be adjusted from 0 to 60 minutes.

- Set the function to **TEMPERATURES** from the main menu, using the menu select buttons.
- Use the arrow keys to select the **"3. 0-10V Outputs"** menu.
  Accessible if a 0-10V output is enabled (see sec. 5.14.3).
- Use the arrow keys to select the first 0-10V output.
- Press the down-arrow key to select the ventilation speed of the 0-10V output that is used when the controller is in clean mode **"Cln. Vent. Speed"**.
  Accessible if ventilation is enabled during the clean mode in section 5.15.6.

```
Cln.Vent.Speed   80
Cln V. On  1:00(m:s)
Cln V. Off 1:00(m:s)
```

- Press EDIT then use the arrow keys to set the output's speed that is used while the controller is in clean mode. Press EDIT once again to validate.
- Press the down-arrow key to select the clean mode's ventilation timer.
- Press EDIT then use the arrow keys to set the timer's On and Off times to the desired value. Press EDIT once again to validate.

5.10 AGE AND MORTALITY

The animal age is used as the reference day number to determine the position in the different curves that are used by the controller (temperature curve, minimum opening curve, chimney's minimum opening curve etc.) The animal age ranges from 1 to 450 days.

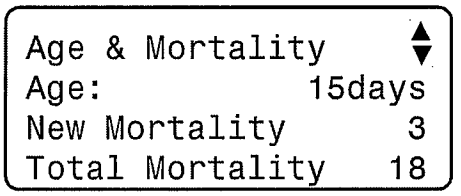
This function also allows the user to keep a tally of animal deaths. Every time a new mortality is posted, it becomes added to the total number of mortalities and removed from the initial number of animals. The animal mortality history is reset when the animal age goes from OFF to 1 day.

Note that all histories will be cleared once the animal age goes from OFF to 1 day (except for the Alarm Log history).

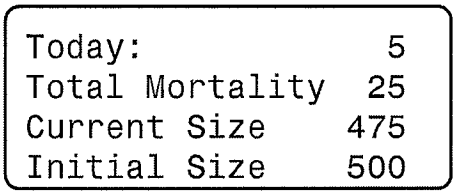
5.10.1 Posting the Initial Number of Animals

The controller allows monitoring the exact number of animals in the barn. To do so, the user must enter the **initial number** of animals in the barn and must indicate every change in the animal number as **new mortality** occur. This way, the controller can display the actual number of animals in the barn.

- Set the function to **AGE & MORTALITY** from the main menu using the menu select buttons. The current animal age is displayed.



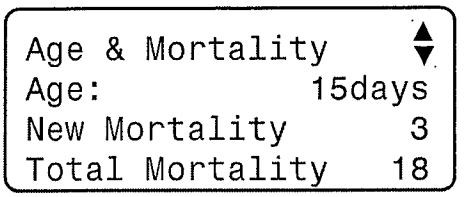
- Press the down-arrow to select the "**Initial Size**" menu. Note that this menu can only be modified if the "**Age**" menu above is set to "Off".



- Press EDIT then use the arrow keys to set the initial number of animals to the desired value. Press EDIT once again to validate.

5.10.2 Setting the Animal Age

- Set the function to **AGE & MORTALITY** from the main menu using the menu select buttons. The current animal age is displayed.

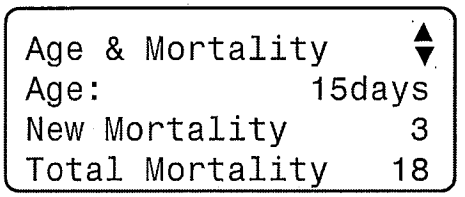


- Press EDIT then use the arrow keys to set the animal age to the desired value. Press EDIT once again to validate.

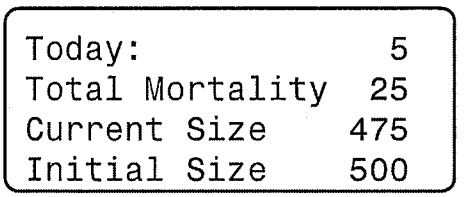
5.10.3 Entering New Mortalities

- Set the function to **AGE & MORTALITY** from the main menu using the menu select buttons. The current animal age is displayed.

- Press the down-arrow key to select the "**New Mortality**" menu.

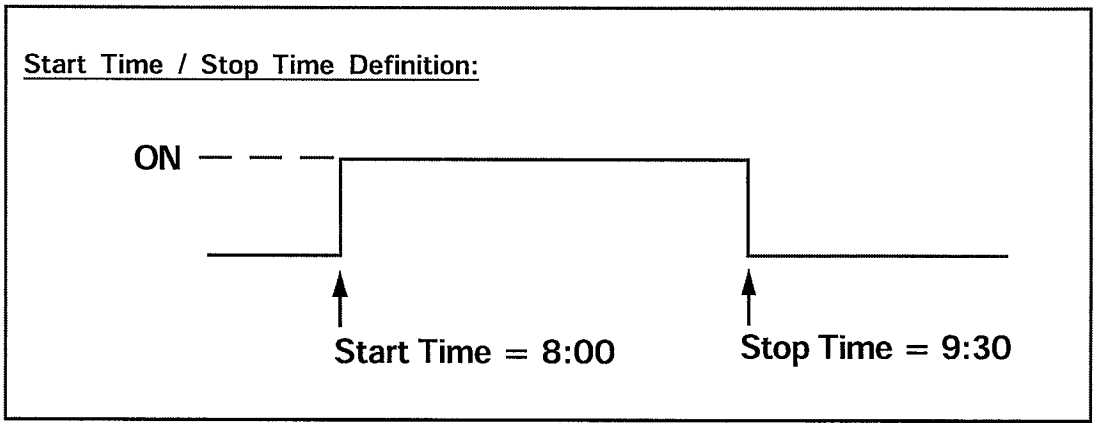


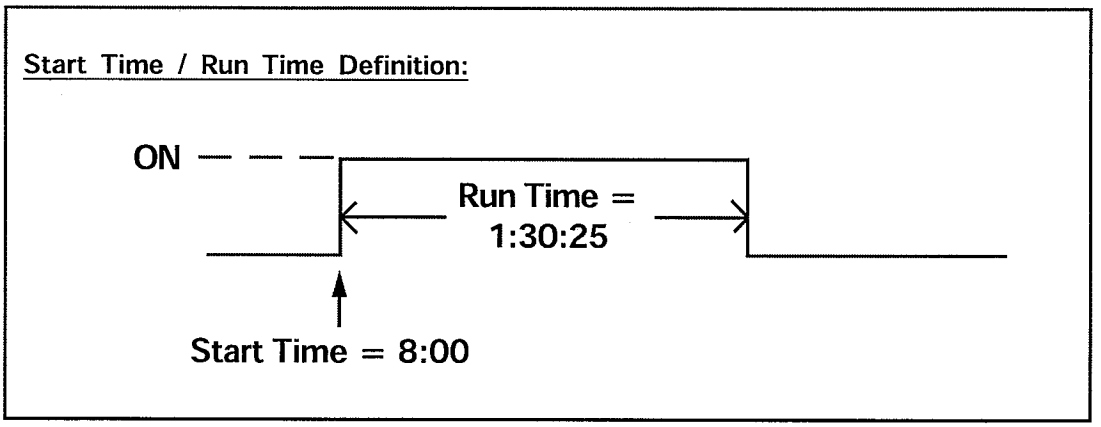
- Press EDIT then use the up-arrow key to enter the number of new mortalities. Press EDIT once again to validate: the **new mortality** menu then returns to 0 and the entered value is added to the **Total** and to **Today's mortality** menus. The total number of animals in the barn is then adjusted consequently.



5.11 PROGRAMMING CLOCK OUTPUTS

The EXPERT-NATURAL has two timers for controlling various devices using the real-time clock. Each timer has 20 cycles defined using start/stop times or a start / run times. The difference between those 2 operating modes is that it is possible to adjust the time in a more precise way by using the start / run mode.





5.11.1 Adjusting Clock Outputs in Start/Stop Time

Each clock output has up to 20 clock cycles. Start and stop times can be adjusted to any clock time.

- Set the function to **TEMPERATURE** from the main menu using the menu select buttons.
- Select the **"6. Clock Output"** menu using the arrow keys.
  Available if clock outputs are enabled (see sec. 5.14.3).
- Select the desired clock using the arrow keys.
- Press EDIT then press the up-arrow key to select the Start/Stop mode. Press EDIT once again to validate.

```
Clock 1 Mode    S/Stp
Start 1    13:50  (1)
Stop 1     14:30  (1)
Start 2    16:25  (1)
```

- Press the down-arrow key once. The clock output's first start time flashes on the display. Press EDIT then use the arrow keys to adjust it to the desired value. Press EDIT once again to validate.
- Press the down-arrow key once. The clock output's first stop time flashes on the display. Press EDIT then use the arrow keys to adjust it to the desired value. Press EDIT once again to validate.
- Proceed in similar fashion to adjust all Start and Stop Times of all clock outputs in use.

5.11.2 Adjusting Clock Outputs in Start/Run Time

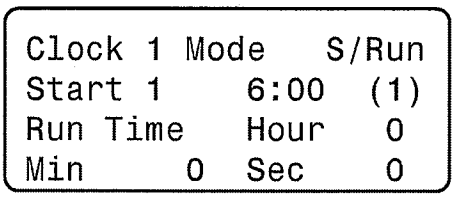
Each clock output has up to 20 clock cycles. Start and run times can be adjusted to any clock time.

- Set the function to **TEMPERATURES** from the main menu using the menu select buttons.

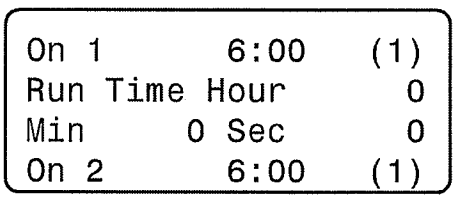
- Select the **"6. Clock Output"** menu using the arrow keys.
  Available if clock outputs are enabled (see sec. 5.14.3).

- Select the desired clock using the arrow keys.

- Press EDIT then use the up-arrow key to select the Start/Run mode. Press EDIT once again to validate.



- Press the down-arrow key once. The clock output's first start time flashes on the display. Press EDIT then use the arrow keys to adjust it to the desired value. Press EDIT once again to validate.



- Press the down-arrow key once. The clock output's run time hours flash on the display. Press EDIT then use the arrow keys to adjust them to the desired value. Press EDIT once again to validate.

- Press the down-arrow key once again. The Run Time minutes flash on the display. Press EDIT then use the up-arrow key to adjust them to the desired value. Press EDIT once again to validate.

- Press the down-arrow key once again. The Run Time seconds flash on the display. Press EDIT then use the up-arrow key to adjust them to the desired value. Press EDIT once again to validate.

- Proceed in similar fashion to adjust all Start and Run Times of all clock outputs in use.

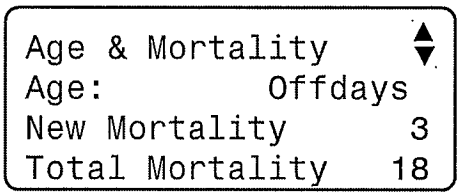
5.12 HISTORY

5.12.1 Resetting Probe Histories

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

- Set the function to **AGE & MORTALITY** from the main menu using the menu select buttons. The animal age flashes on the display.

- Press EDIT then use the down-arrow key to decrease the animal age until you reach the Off position. Press EDIT once again to validate the Off status.



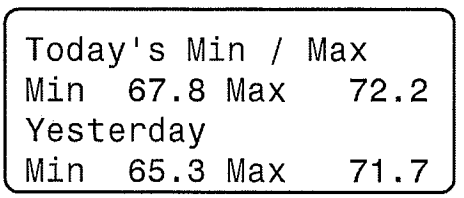
- Press EDIT once again then set the animal age back to 1 day Press EDIT to validate. All histories are now cleared except for the Alarm Log History.

5.12.2 Average Temperature History

The controller has a history in which the minimum and maximum room temperature readings are logged in for the past 7 days.

- Set the function to **AMBIENT TEMPERATURE** from the main menu using the menu select buttons. The current average room temperature is displayed.

- Today's minimum and maximum room temperature readings are displayed. Press the down-arrow key to scroll the display and look at the minimum and maximum room temperature readings for the past 7 days.



5.12.3 Individual Temperature Probe History

The controller has a history in which the minimum and maximum temperature readings of each temperature probe are logged in for the past 7 days.

- Set the function to **PROBE TEMPERATURES** main menu using the menu select buttons. The current probe temperature reading is displayed.

- Today's minimum and maximum temperature readings of each individual probes are displayed. Press the down-arrow key to scroll the display and look at the minimum and maximum temperature readings of the past 7 days.

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

5.12.4 Outside Temperature History

The controller has a history in which the minimum and maximum outside temperature readings of are logged in for the past 7 days.

- Set the function to **OUTSIDE TEMPERATURE** main menu using the menu select buttons. The current temperature reading of the outside probe is displayed.
  Accessible if an outside temperature probe is enabled (see sec. 5.14.4.2).

- Today's minimum and maximum outside temperature readings are displayed. Press the down-arrow key to scroll the display and look at the minimum and maximum outside temperature readings for the past 7 days.

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

5.12.5 Relative Humidity History

The controller has a history in which the minimum and maximum relative humidity levels of are logged in for the past 7 days.

- Set the function to **RELATIVE HUMIDITY** from the main menu using the menu select buttons. The current relative humidity level is displayed as well as the minimum and maximum humidity levels recorded for the current day.
  Accessible if a humidity probe is enabled (see sec. 5.14.4.2).

- Today's minimum and maximum relative humidity readings are displayed. Press the down-arrow key to scroll the display and look at the minimum and maximum humidity readings for the past 7 days.

```
Today's Min / Max
Min  63  Max  67
Yesterday
Min  60  Max  72
```

5.12.6 Chimney & Curtain Openings' History

The controller has a history in which the minimum and maximum openings of chimneys and curtains are logged in for the past 7 days.

- Set the function to **OPENINGS** from the main menu using the menu select buttons. The current opening of chimney 1 is displayed.

```
Current Openings

Chimney 1      50%
  Low   0   High  70
```

- Press the down-arrow key once, the high and low opening of chimney 1 for the current day are displayed. Keep pressing the down-arrow key to look at all high and low openings of the other chimneys.

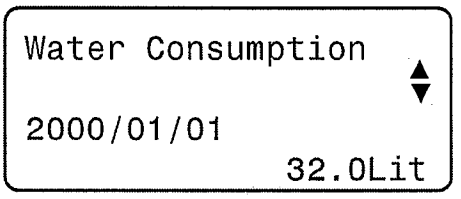
- Press the down-arrow again to display the curtains' hi and lo openings.

5.12.7 Water Consumption History

The controller provides a pulse input to monitor water consumption. Those values are kept in memory for the past 75 days. The controller also displays the total water consumption value since the beginning of the batch.

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

- Press the down-arrow key once. The total water consumption since the beginning of the batch is displayed.



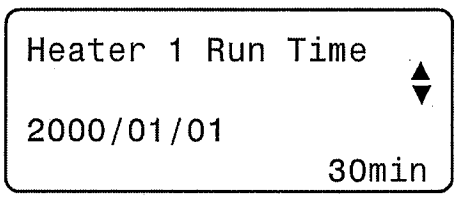
- Press the down-arrow key once again. The water consumption history is displayed starting with the oldest recorded value.

5.12.8 Heater Run Time History

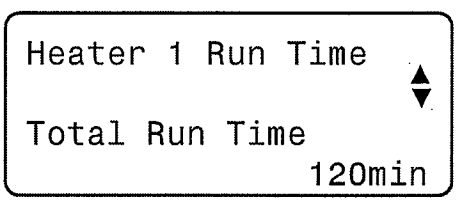
The controller keeps a daily history of the heater run time. These values are kept in memory for the past 75 days since the beginning of the batch. The controller also calculates the total time the heaters have been running.

- Select **HEATERS/FEEDERS** using the menu select buttons.
  Accessible if heaters or feeders are enabled (see sec. 5.14.3).

- Select the "**1.Heaters**" menu, using the arrow keys, then select the desired heater. The current Run Time of the selected heater is displayed.



- Press the down-arrow key. The heater's total run time is displayed.



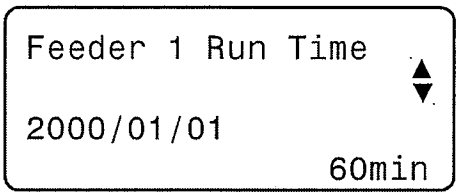
- Keep pressing the down-arrow key to look at the heater run times of the past 75 days.

5.12.9 Feeder Run Time History

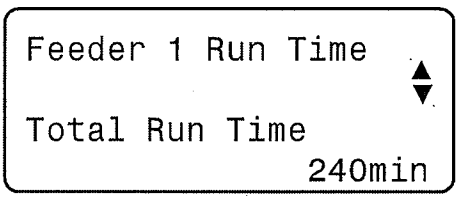
The controller keeps a daily history of the feeder run time. These values are kept in memory for the past 75 days since the beginning of the batch. The controller also calculates the total time the feeders have been running.

- Select **HEATERS/FEEDERS** using the menu select buttons.
  Accessible if heaters or feeders are enabled (see sec. 5.14.3).

- Select the "**2.Feeders**" menu, using the arrow keys, then select the desired feeder. The current Run Time of the selected feeder is displayed.



- Press the down-arrow key. The feeder's total run time is displayed.



- Keep pressing the down-arrow key to look at the feeder run times of the past 75 days.

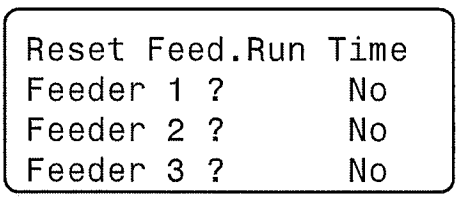
CLEARING THE FEEDERS' TOTAL RUN TIME HISTORY

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

- Select **HEATERS/FEEDERS** using the menu select buttons.
  Accessible if heaters or feeders are enabled (see sec. 5.14.3).

- Select the "**5. Reset Run Time**" menu using the arrow keys.

- Use the arrow keys to select the desired feeder.



- Press EDIT then press the up-arrow key to reset the total running time of the selected feeder. Press EDIT once again to validate. The "Yes" answer switches to "No" once again, meaning that the history has been cleared.

5.13 ALARM SETTINGS

5.13.1 Alarm Log

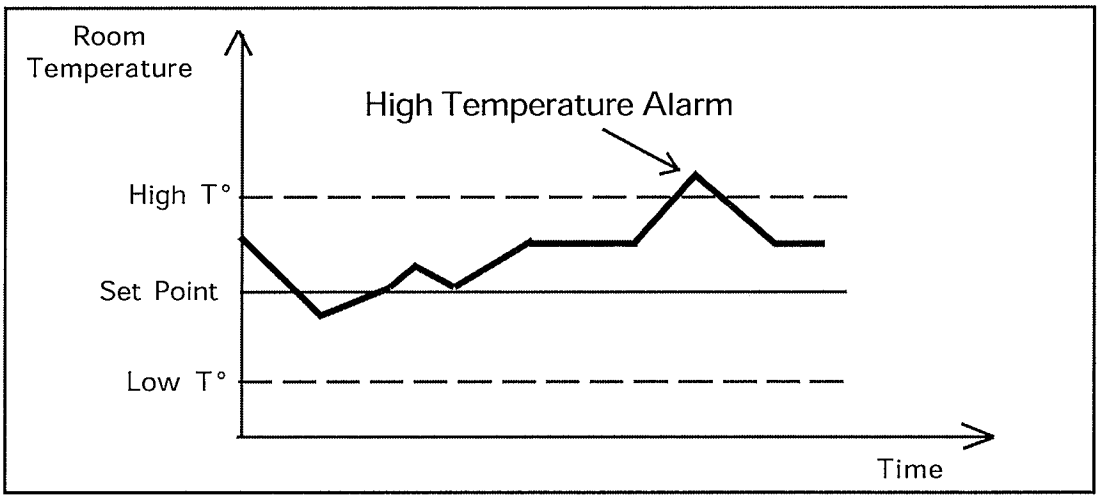
When an alarm occurs, the alarm led is turned on and the alarm is recorded in memory along with the time and date. To view the alarms in the alarm log, select the **ALARM** main menu using the menu select buttons and use the arrow keys to step through the recorded alarms. The alarm conditions are as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

Display	Meaning
Lo Temp Alarm	Low temperature alarm
Hi Temp Alarm	High temperature alarm
Probe #1-8 Defect	A temperature probe is defective
Outdoor Defect	The outdoor probe is defective
Pot. Chimney x Def	The potentiometer of chimney x is defective
Pot Curtain x Def	The potentiometer of curtain x is defective
Water Spill	The water consumption too high
RH Probe Defect	The humidity probe is defective
Feeder x Defect	Feeder x is defective

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

5.13.2 Setting the Alarm Limits

The following diagram explains how temperature alarms are detected:



The controller can use the average temperature of all probes or the temperature reading of each individual probe to monitor the temperature alarms. When the average room temperature or the reading of a single probe exceeds the high temperature alarm setting, a high temperature alarm is generated. In the case of a high temperature alarm, the 0-10V outputs configured in ventilation mode are activated at their full capacity (see sec. 5.9.4). When the average room temperature or the reading of a single probe 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.

Other Alarms

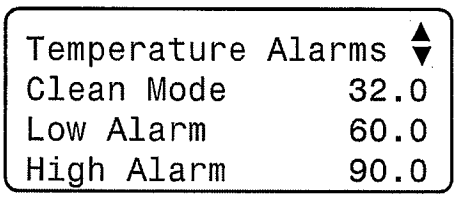
The controller also detects water spills by monitoring water consumption levels.

5.13.2.1 Adjusting Clean Mode Temperature Alarms

When the zones are empty and the controller operates in clean mode, an alarm will be generated whenever the temperature drops below a user-defined value. Refer to section 5.15.6 for more information about the Clean Mode.

- Set the function to **TEMPERATURE** from the main menu, using the menu select buttons then use the arrow keys to select the **"8. Alarms"** menu. The Clean Mode's minimum temperature flashes on the display.

- Press EDIT then use the arrow keys to set the Clean Mode's minimum temperature to the desired value. Press EDIT once again to validate.



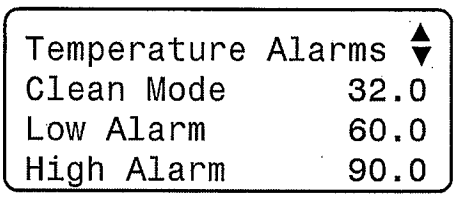
5.13.2.2 Adjusting High / Low Temperature Alarms

The low temperature alarm can be adjusted from 20°F to 0.5°F (11.1°C to 0.3°C) below the set point. The high temperature alarm can be adjusted from 0.5°F to 20°F (0.3 to 11.1°C) above the set point. A change in the set point will change these values by the same amount.

- Set the function to **TEMPERATURE** from the main menu, using the menu select buttons then use the arrow keys to select the **"8. Alarms"** menu.

- Press the down-arrow key to select the Low Alarm menu.

- Press EDIT key then use the arrow keys to adjust the Low Temperature Alarm to the desired value. Press EDIT once again to validate.



- Press the down-arrow key to select the High Temperature Alarm.

- Press EDIT key then use the arrow keys to adjust the High Temperature Alarm. Press EDIT once again to validate.

5.13.2.3 Adjusting the Critical Temperature

The critical temperature is the absolute maximum temperature that is allowed in the room. It can be adjusted from 0.5 °F (0.3 °C) above the set point to 120 °F (48.9 °C).

- Set the function to **TEMPERATURE** from the main menu, using the menu select buttons then use the arrow keys to select the **"8. Alarms"** menu.
- Use the arrow keys to select the critical temperature alarm limit.
- Press EDIT then use the arrow keys to adjust the critical temperature alarm to the desired value. Press EDIT once again to validate.

```
Empty Zone        32.0
Low Alarm         60.0
High Alarm        90.0
Critical Alarm   120.0
```

5.13.2.4 Alarm Detection Probes

Temperature alarms can either be based on the temperature reading of each probe or on the average temperature reading of all probes.

- Set the function to **TEMPERATURE** from the main menu using the menu select buttons. Select the **"8. Alarms"** menu using the arrow keys.
- Use the arrow keys to select the **"Temp Alarm on"** menu.
- Press EDIT then use the arrow key to select alarm detection mode: based on the average temperature or based on a the reading of each individual probe.

```
Low Alarm         60.0
High Alarm        90.0
Critical Alarm   100.0
Temp. Alarm on:Aver.
```

5.13.2.5 Adjusting Water Spill Alarm

A water spill alarm is set off when the water consumption monitored by the controller exceeds a user-defined limit. The water consumption for a water spill alarm can be adjusted from 0 to 10000 gallons per 15 minutes.

- Set the function to **TEMPERATURES** from the main menu using the menu select buttons. Select the **"8. Alarms"** menu using the arrow keys.
- Use the arrow keys to select the **"Water Spill Limit"** menu.
  Accessible if water meter is enabled (see sec. 5.14.4.2).

```
Water Spill Limit
             1000Lit
```

- Press EDIT then use the arrow keys to adjust the water spill limit to the desired value. Press EDIT once again to validate.

5.13.2.6 Feeder Alarms

An alarm sets off if the feeder run time exceeds the allowable run time limit without interruption. When this type of alarm occurs, the alarm relay switches and the relay associated with the problematic feeder opens. This alarm condition is optional and must be enabled in the installation (sec. 5.14.3). The maximum feeder run time can be adjusted from 5 to 1,080 minutes (18 hours).

Reset Alarms: Resetting the alarm disables the run time alarm and clears the current run time of all feeders.

- Set the function to **USERS** from the main menu using the menu select buttons. Select the **"10. Feeder Alarms"** menu using the arrow keys.
  Accessible if the feeders' Max Run Time alarm option is enabled in the installation (sec. 5.14.3).

```
Feeder Max Run Time▲▼
AlarmDelay     60 min
Reset Alarm?      No
```

- Press EDIT then use the arrow keys to adjust the maximum feeder run time to the desired value. Press EDIT once again to validate.
- If an alarm is active, select the "Reset Alarm" menu. Press EDIT then use the arrow keys to select "Yes". Press EDIT once again to reset the active alarm.

5.14 INSTALLATION

5.14.1 Step-by Step Guide Installation Guide

These are the basic steps to start up your EXPERT-NATURAL controller. Enter the Installer Password before you begin.

1. Connect the controller according to the wiring diagram enclosed with your manual.

2. Turn the power ON.

3. Enter the installer password (see sec. 5.15.2).

4. Set the **Date and Time** (see sec. 5.15.5).

5. Step through the **"6. Installation"** menu from the **USER** main menu and answer all questions (see sec. 5.14.3).

6. Step through the **"3. Other Probes"** menu from the **USER** main menu and answer all questions (see sec. 5.14.4.2).

7. Assign relays to each of the following outputs:

   - Heaters (see sec. 5.14.7.1);
   - Chimneys (see sec. 5.14.7.2);
   - Curtains (see sec. 5.14.7.3);
   - Stir fans (see sec. 5.15.7.4);
   - Cooling outputs (see sec. 5.15.7.5);
   - Soaking output (see sec. 5.15.7.6);
   - Clock outputs (see sec. 5.15.7.7);
   - Feeders (see sec. 5.15.7.8);

8. Determine which of the activated temperature probes are used to control/monitor the:

   - Ambient Temp. (see sec. 5.14.4.1);
   - Heaters (see sec. 5.14.11.1);
   - Chimneys (see sec. 5.14.11.2);
   - Curtains (see sec. 5.14.11.3);
   - 0-10V outputs (see sec. 5.14.11.4).

9. Adjust the temperature set point (see sec. 5.2).

10. Adjust the start/stop temperatures of the following outputs:
    - Heaters (see sec. 5.6);
    - Cooling output (see sec. 5.7);
    - Stir fans (see sec. 5.5);

11. If curtains are used:
    - Calibrate the open and close positions (see sec. 5.14.10)
    - Set the curtain parameters (see sec. 5.4).
    - Adjust the de-icing/purge cycles (if applicable) (see sec. 5.4.3).
    - If the curtains have potentiometers, set the compensation parameters (see sec. 5.15.4).

12. If chimneys are used:
    - Calibrate the open and close positions (see sec. 5.14.9)
    - Set the chimney parameters (see sec. 5.3).

13. If the soaking output is used, adjust the output's timer (see sec. 5.8).

14. Adjust 0-10V output parameters (sec. 5.9).

15. Adjust the clock output timers (see sec. 5.11).

16. Calibrate the water meter (see sec. 5.14.8).

17. If a humidity probe is used, enable and adjust the desired humidity compensation features (see sec. 5.15.5).

18. Set the temperature curve (optional). The curve provides an automatic adjustment of the temperature set point over time (see sec. 5.15.1).

19. Set the chimney's minimum opening curve (optional). The curve provides an automatic adjustment of the chimney's minimum opening over time (see sec. 5.15.2).

20. Adjust the initial number of animals in the barn then set the animal age (see sec. 5.10).

5.14.2 Passwords

This function allows identifying 3 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.

USER 1: This user level gives reading and writing access to the basic parameters of the controller. By default, this password is set to **"1-2-3"** and can be modified by the installer as explained below. The controller automatically returns to this user level after 15 minutes of inactivity when the Locked Option is disabled.

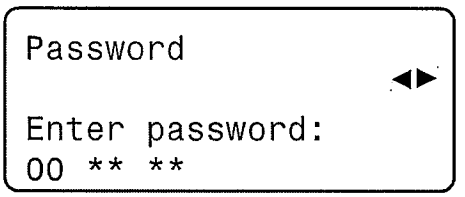
USER 2 (Optional): This user level only gives reading access to the basic parameters of the controller. By default, this password is set to **"0-0-1"** and cannot be modified. This password level is optional and must be enabled in the installation "**Locked Option**" (refer to section 5.14.3). The controller automatically returns to this user level after 5 minutes of inactivity when the Locked Option is enabled.

INSTALLER LEVEL: The installer level gives unrestricted access to all parameters of the controller. The installer password can be modified as explained below. By default, it is set to **"6-1-0".**

ENTERING A PASSWORD:

- Set the function to **USER** from the main menu using the menu select buttons. Use the arrow keys to select the **"11. Password"** menu.

- Press the right-arrow key to access 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 EDIT once then use the arrow keys to set the first number. Press the right-arrow key to select the second number of the password. Press EDIT then proceed the same way to set the second and third numbers of the password.

- The message "Wrong Password" is displayed when an incorrect password is entered.

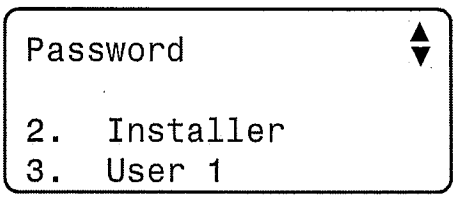
CHANGING THE INSTALLER & USER 1 PASSWORDS:

The installer password must first be entered as shown above to be modified.

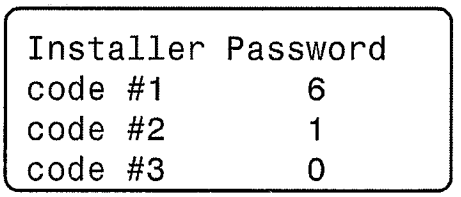
- Set the function to **USER** from the main menu using the menu select buttons. Use the arrow keys to select **"11. Password"** menu. The current mode is displayed.

- Use the arrow keys to select the **"2. Installer"** or **"3. User 1"** menu. The first number of the password flashes on the display.

  Accessible if the installer password has previously been entered.



- Press EDIT then use the arrow keys to adjust the first number of the password to the desired value. Press EDIT once again to validate.



- Press the right-arrow key once. The password's second number flashes on the display.

- Press EDIT then use the arrow keys to adjust the password's second number to the desired value. Press EDIT once again to validate

- Proceed in similar fashion to modify the password's third number.

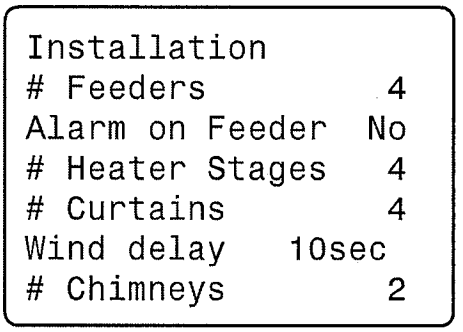
5.14.3 Installation Options

The following section describes how to customize the controller for your particular applications. Normally, this setup needs to be done only once. The parameters are presented below in the order they appear on the display. Press EDIT then use the arrow keys to adjust the value of a parameter. When the parameter is adjusted, Press EDIT to validate then press the down-arrow key to move to the next parameter. The user should step through all the parameters at least once.

- Set the function to **USER** from the main menu using the menu select buttons. Use the arrow keys to select **"6. Installation"** menu.
  Accessible from the installer mode only (see sec. 5.14.2).

Number of Feeders:
Select the number of feeders in use (0 to 4 feeders).

Alarm on Feeder?
Select "Yes" if an alarm needs to be set off when the running time of a feeder exceeds a user-defined value. Refer to section 5.13.2.6 to set the maximum allowable feeder run time.
Accessible if a feeder is enabled above.



Number of Heater Stages:
Select the number of heating stages in use (0 to 4 stages)

Number of Curtains:
Select the proper number of curtains. Up to 6 curtains can be used. Note that curtain 5 and 6 share the same input as chimneys; therefore, no chimney can be enabled if all 6 curtains are being used and 1 chimney can be enabled if 5 curtains are used.

Wind Delay:
A temperature condition that asks for a movement of the curtain must be maintained over the wind delay before the curtain starts moving. This avoids moving the curtain as wind drafts cause temporary temperature changes. The wind effect delay can be adjusted from 0 to 240 seconds (4 minutes).
Accessible if the operation of the curtains is based on a timer. See below.

Number of Chimneys: select the proper number of chimneys. Up to 2 chimneys can be used. Note that curtain 5 and 6 share the same input as the chimneys; therefore, if no chimney can be used if all 6 curtains are used and 1 chimney can be used if 5 curtains are enabled.

Stir Fans: select the number of stir fans in use (0 to 2 stir fans).

Number of Clocks: select the number of clock outputs in use (0 to 2 outputs).

```
# Chimneys          2
# Stir Fans         2
# Clocks         None
# 0-10V Outputs    1
Output 1        0-10V
Output 1        Heat.
Use Cooling ?    Yes
Use Soaking?     Yes
Locked Options? Yes
Chimney probe   Indr
Curtain Mode   Timer
Use Purge ?      Yes
```

0-10V Outputs: select the proper number of 0-10V outputs. Up to two 0-10V outputs can be enabled.

0-10V Output Signal: select the signal that is used by each 0-10V output (0-10V or 10-0V).

0-10V Output Usage: Select the usage of each 0-10V output: ventilation or heating.

Use Cooling? select "Yes" to enable the cooling output.

Use Soaking? select "Yes" to enable the soaking output.

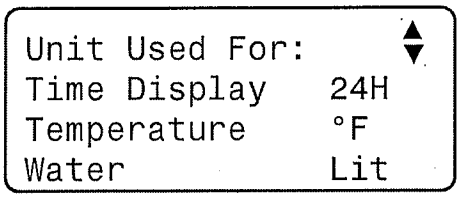
Locked Options: select "Yes" to prevent users from editing the parameters.

Chimney Probe: select on which kind of probes the chimney's operation is based on: inside or outside temperature probe.

Curtain Mode: select whether the curtain position is defined by a potentiometer or if it is based on a timer.
Accessible if the curtain is enabled above.

Use Purge? select "Yes" to enable the de-icing/purge feature.

5.14.3.1 Selecting the Measuring Units



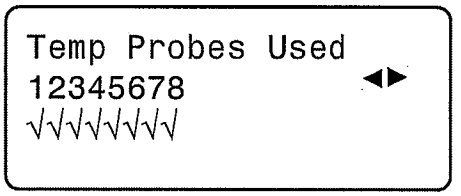
- Set the function to **USER** from the main menu using the menu select buttons. Use the arrow keys to select the **"4. Units"** menu. The time format flashes on the display.
- Press EDIT then use the arrow keys to select the desired time format: 24H or AM/PM. Press EDIT once again to validate.
- Press the down-arrow key. Temperature units flash on the display.
- Press EDIT then use the arrow keys to select the desired temperature units: °C or °F. Press EDIT once again to validate.
- Press the down-arrow key. The water's units of measurement flash on the display.
- Press EDIT then use the arrow keys to select the desired units: liters or gallons. Press EDIT once again to validate.
- Press the down-arrow key. The static pressure's units of measurement flash on the display.
- Press EDIT then use the arrow keys to select the desired static pressure units: inches of water ("WC) or Pascal (Pa). Press EDIT once again to validate.

5.14.4 Activating/Deactivating the Probes

5.14.4.1 Activating/Deactivating Temperature Probes

The controller uses the average reading of all activated probes to calculate the ambient temperature. At least one temperature probe must be enabled.

- Set the function to **USER** from the main menu using the menu select buttons. Use the arrow keys to select the **"2. Temp Probes"** menu. The probes are displayed.

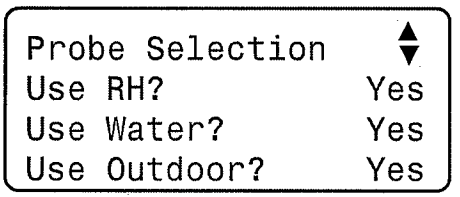


- Select the desired probe. Press EDIT then use the arrow keys to enable/disable the selected probe. Press EDIT to validate.

5.14.4.2 Activating/Deactivating Other Probes

- Set the function to **USER** from the main menu using the menu select buttons. Use the arrow keys to select the **"3. Other Probes"** menu.

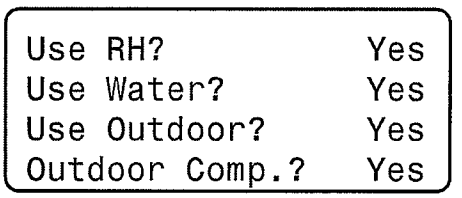
1. Relative Humidity Probe
Press EDIT then use the arrow keys to enable /disable the humidity probe.



2. Water Meter
Press EDIT then use the arrow keys to enable /disable the water meter.

3. Outdoor Temperature Probe
Press EDIT then use the arrow keys to enable /disable the outside temperature probe.

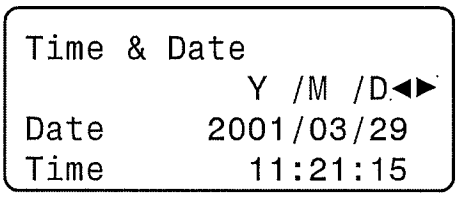
4. Outdoor Compensation
Press EDIT then use the arrow keys to activate or deactivate the Outdoor Compensation feature (see sec. 5.15.4).
Available if the outdoor probe is activated.



5.14.5 Setting the Time and Date

- Set the function to **TIME & DATE** from the main menu using the menu select buttons. The current time and date are displayed.

- Press the right-arrow key once. The year flashes. Press EDIT then use the arrow keys to set the year. Press the right-arrow key once again, the month flashes. Press EDIT then use the arrow keys to adjust the month. Press the right-arrow key. The day flashes. Press EDIT then use the arrow keys to adjust the day to the appropriate value. Press EDIT once again to validate the date.



- Press the right-arrow key once again, the hours flash. Press EDIT then use the arrow keys to adjust the hours. Press the right-arrow key. The minutes flash. Press EDIT then use the arrow keys to set the minutes. Press the right-arrow key. The seconds flash. Press EDIT then use the arrow keys to adjust the seconds. Press EDIT once again to validate the time.

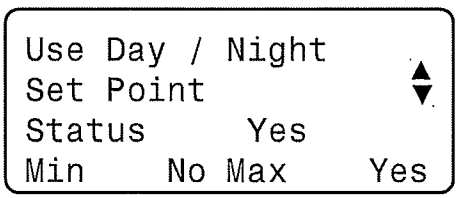
5.14.6 Adjusting Day and Night Times

The controller can operate with two set points: a day set point and a night set point. The user must specify at what time the day and night set points come to effect. transition delay between the day and the night must also be specified. The chimneys' minimum opening can also use different settings during night (see sec. 5.3.2).

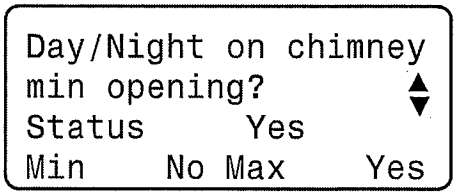
- Set the function to **USER** from the main menu using the menu select buttons.

- Select the **"9. Day / Night"** menu using the arrow keys. The Day/Night Set Point Status flashes on the display.

- Press EDIT then use arrow keys to enable the day/night set point. Press EDIT once again to validate.

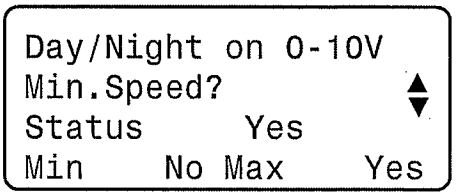


- Press the down-arrow key. The status of day/night set point on the chimneys' minimum opening flashes on the display.



- Press EDIT and set to "Yes" to use a different minimum opening of the chimney during night (see sec 5.3.2).

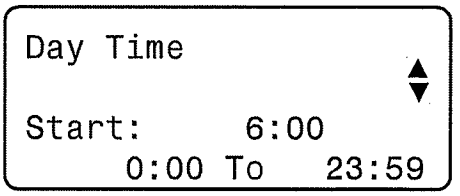
- Press the down-arrow key. The status of the night settings on the minimum speed of 0-10V outputs flashes on the display.



- Press EDIT and set to yes to use a different minimum speed on the 0-10V outputs during night (see sec 5.9.8).

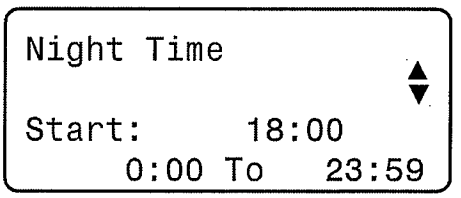
- Press the down-arrow key. The day start time flashes on the display.

- Press EDIT then use the arrow keys to set the day start time to the desired value. Press EDIT once again to validate.

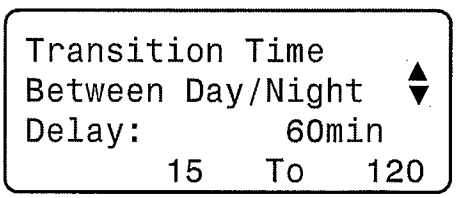


- Press the down-arrow key once. The night start time flashes on the display.

- Press EDIT then use the arrow keys to set the night start time to the desired value. Press EDIT once again to validate.



- Press the down-arrow key once. The transition delay between day and night set points flashes. It ranges from 15 to 120 min.



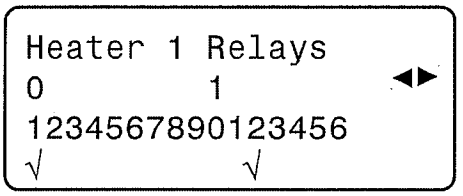
- Press EDIT then use the arrow keys to set the transition time to the desired value. Press EDIT once again to validate.

5.14.7 Relay Assignment

The controller has 24 integrated ON-OFF relay outputs. The mapping between the stages and the relays must be done by the user.

Note that relay assignment can only be done from the installer mode (see sec 5.14.2).

A check mark identifies relays that are assigned to an output. Use the arrow keys to scroll the display. The number standing above the relay numbers stands for first the first number of the relay. In this example, relays 1 and 12 are assigned to heating stage 1.

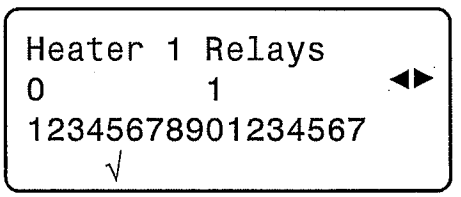


Pressing the down-arrow key directly goes to the last relay and pressing the up-arrow key returns to the first relay. This makes it easier to step through the relays.

Use the template at the end of this manual to map the relays before assigning them to the front panel.

5.14.7.1 Assigning Heater Relays

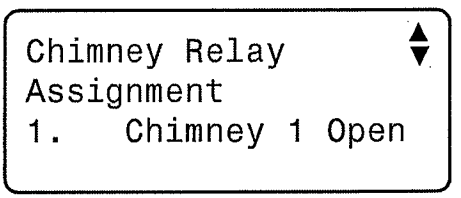
- Set the function to **RELAY SETTINGS** using the menu select buttons.
  This menu is only accessible from the installer mode.
- Select the desired heating stage from the **"1. Heaters"** menu.
- Use the arrow key to select the proper relay.
- Press EDIT then use the arrow keys to assign the selected relay. Press EDIT once again to validate.

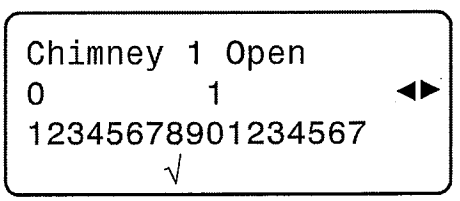


5.14.7.2 Assigning Chimney Relays

Relays 7-8 and relays 15 to 24 have specially been designed for the opening & closing of chimneys and curtains. They prevents activating simultaneously the Open and Close relays.

- Set the function to **RELAY SETTINGS** using the menu select buttons.
  This menu is only accessible from the installer mode.
- Use the arrow keys to select the **"2. Chimneys"** menu.
  Accessible if chimneys are enabled (sec. 5.14.3).
- Select the Opening or Closing menu of the desired chimney.
- Use the arrow key to select the proper relay.
- Press EDIT then use the arrow keys to assign the selected relay. Press EDIT once again to validate.

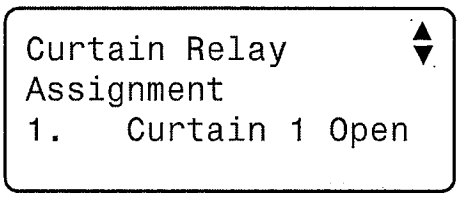


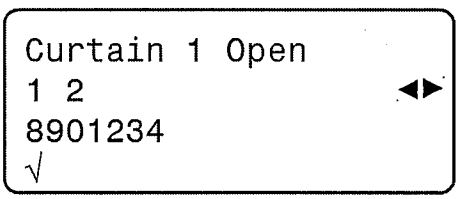


5.14.7.3 Assigning Curtain Relays

Relays 7-8 and relays 15 to 24 have specially been designed for the opening & closing of chimneys and curtains. They prevents activating simultaneously the Open and Close relays.

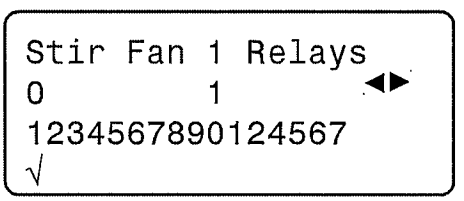
- Set the function to **RELAY SETTINGS** using the menu select buttons.
  This menu is only accessible from the installer mode.
- Use the arrow keys to select the **"3. Curtain"** menu.
  Accessible if curtains are enabled (sec. 5.14.3).
- Select the Opening or Closing assignment menu of the desired curtain.
- Use the arrow key to select the proper relay.
- Press EDIT then use the arrow keys to assign the selected relay. Press EDIT once again to validate.





5.14.7.4 Assigning Stir Fan Relays

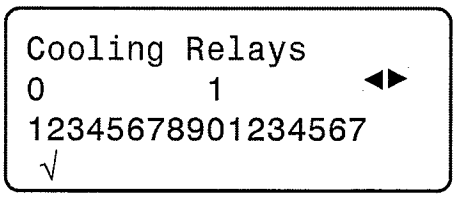
- Set the function to **RELAY SETTINGS** using the menu select buttons.
  This menu is only accessible from the installer mode.
- Use the arrow keys to select the **"4. Stir Fan"** menu.
  Accessible if stir fans are enabled (sec. 5.14.3).
- Use the arrow key to select the proper relay.
- Press EDIT then use the arrow keys to assign the selected relay. Press EDIT once again to validate.



5.14.7.5 Assigning Relays to the Cooling Output

If the cooling and the soaking outputs use all the same relays, the relays are then activated whenever the one of the two outputs is running.

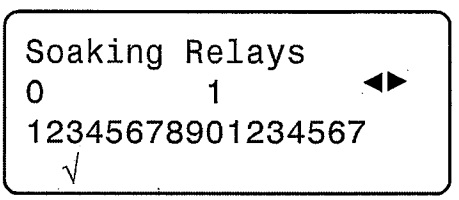
- Set the function to **RELAY SETTINGS** using the menu select buttons.
  This menu is only accessible from the installer mode.
- Use the arrow keys to select the **"5. Cooling"** menu.
  Accessible if the cooling output is enabled (sec. 5.14.3).
- Use the arrow key to select the proper relay.
- Press EDIT then use the arrow keys to assign the selected relay. Press EDIT once again to validate.



5.14.7.6 Assigning Relays to the Soaking Output

If the cooling and the soaking outputs use all the same relays, the relays are then activated whenever the one of the two outputs is running.

- Set the function to **RELAY SETTINGS** using the menu select buttons.
  This menu is only accessible from the installer mode.
- Use the arrow keys to select the **"6. Soaking"** menu.
  Accessible if the soaking output is enabled (sec. 5.14.3).
- Use the arrow key to select the proper relay.
- Press EDIT then use the arrow keys to assign the selected relay. Press EDIT once again to validate.



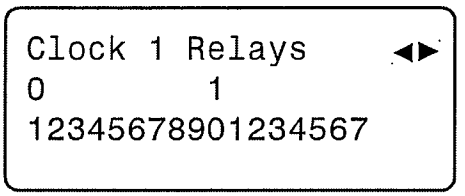
5.14.7.7 Assigning Relays to the Clock Outputs

- Set the function to **RELAY SETTINGS** using the menu select buttons.
  This menu is only accessible from the installer mode.

- Use the arrow keys to select the **"7. Clock Output"** menu.
  Accessible if clock outputs are enabled (sec. 5.14.3).

- Use the arrow key to select the proper clock output.

- Use the arrow key to select the proper relay.



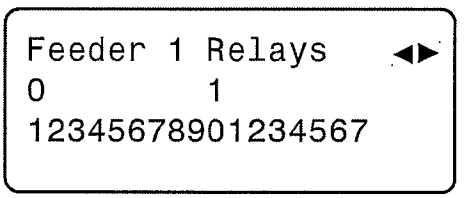
- Press EDIT then use the arrow keys to assign the selected relay. Press EDIT once again to validate.

5.14.7.7 Assigning Relays to the Feeders

Feeder relays use a Normally Closed contact. This type of relay opens when a feeder run time alarm occurs, causing a stop of the feeder motor.

- Set the function to **RELAY SETTINGS** using the menu select buttons.
  This menu is only accessible from the installer mode.

- Use the arrow keys to select the **"8. Feeder Outputs"** menu.
  Accessible if feeders are enabled (sec. 5.14.3).



- Use the arrow key to select the proper feeder.

- Use the arrow key to select the proper relay.

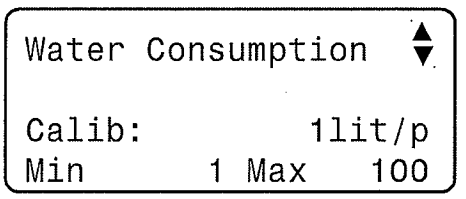
- Press EDIT then use the arrow keys to assign the selected relay. Press EDIT once again to validate.

OUTPUTS / RELAYS	RELAY ASSIGNMENT EXAMPLE																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Heater 4	X																							
Heater 3		X																						
Heater 2			X																					
Heater 1				X																				
Chimney 1 or Curtain 6 - Open							X																	
Chimney 1 or Curtain 6 - Close							X																	
Chimney 2 or Curtain 5 - Open																X								
Chimney 2 or Curtain 5 -Close															X									
Curtain 1 - Open																		X						
Curtain 1 - Close																	X							
Curtain 2 - Open																				X				
Curtain 2 - Close																			X					
Curtain 3 - Open																						X		
Curtain 3 - Close																					X			
Curtain 4 - Open																								X
Curtain 4 - Close																							X	
Stir Fan 1					X																			
Stir Fan 2									X															
Cooling output																								
Soaking																								
Clock 1						X																		
Clock 2																								
Feeder 1									X															
Feeder 2										X														
Feeder 3											X													
Feeder 4													X											

5.14.8 Calibrating the Water Counter

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

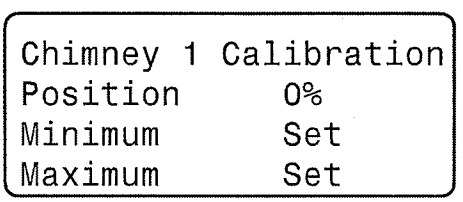
- Set the function to **WATER** from the main menu using the menu select buttons. Today's water consumption is displayed.
- Press the UP-arrow key. The meter's water flow per pulse is displayed.
- Press EDIT then use the arrow keys to set the water flow per pulse to the desired value. Press EDIT once again to validate.

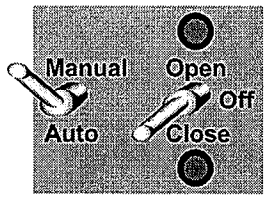


5.14.9 Calibrating the Chimneys

This calibration allows controlling the chimney's actuator with accuracy. The minimum and maximum positions of each chimney must be calibrated.

- Set the function to **USER** from the main menu using the menu select buttons.
- Select the **"8. Calibration"** menu using the arrow keys.
  Accessible from the installer mode only (sec. 5.14.2).
- Use the arrow keys to select the desired chimney.
  Accessible if chimneys are enabled (sec. 5.14.3)
- Press the down-arrow key to select the minimum position. The word "**Set**" flashes on the display.
- Manually close the selected chimney to its minimum position using the chimney's manual switch located on the front panel of the controller.

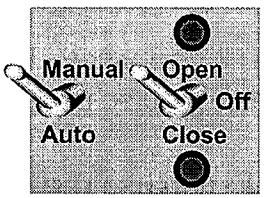




- Once the chimney has reached its minimum position, press EDIT then press the up-arrow key to save the position. The word "**Save**" is displayed for a 5 second delay and then returns to "**Set**". The minimum opening is now saved.

```
Chimney 1 Calibration
Position      0%
Minimum       Save
Maximum       Set
```

- Proceed in similar fashion to set the chimney's maximum opening. Manually open the chimney using the manual switch then save the position into the controller.



5.14.10 Calibrating the Curtains

This calibration allows controlling the curtains's actuator with accuracy. The minimum and maximum positions of each curtain must be calibrated.

- Set the function to **USER** from the main menu using the menu select buttons.

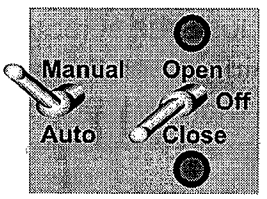
- Select the **"8. Calibration"** menu using the arrow keys.
  Accessible from the installer mode only (sec. 5.14.2).

- Use the arrow keys to select the desired curtain.
  Accessible if curtains that are using potentiometers are enabled (sec. 5.14.3)

- Press the down-arrow key to select the minimum position. The word "**Set**" flashes on the display.

```
Curtain 1 Calibration
Position      0%
Minimum       Set
Maximum       Set
```

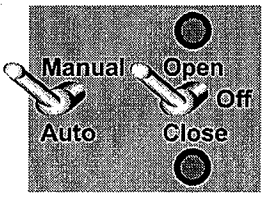
- Manually close the selected curtain to its minimum position using the curtain's manual switch located on the front panel of the controller.



- Once the curtain has reached its minimum position, press EDIT then press the up-arrow key to save the position. The word "**Save**" is displayed for a 5 second delay and then returns to "**Set**". The minimum opening is now saved.

```
Chimney 1 Calibration
Position      0%
Minimum       Save
Maximum       Set
```

- Proceed in similar fashion to set the curtain's maximum opening. Manually open the curtain using the manual switch then save the position into the controller.



5.14.11 Probe Assignments

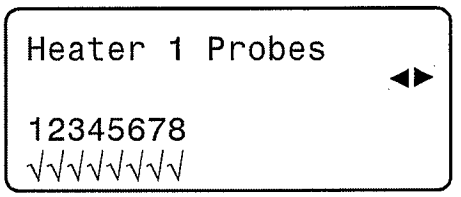
Heaters, chimneys, curtains and 0-10V outputs operate according to the temperature reading of their assigned probes.

5.14.11.1 Assigning Heater Probes

- Set the function to **PROBE SETTINGS** from the main menu using the menu select buttons. Note that this menu is only accessible in installer mode (see sec. 5.14.2).

- Use the arrow keys to select the desired heater.
  Accessible if heaters are enabled (see sec. 5.14.3).

- Use the arrow keys to select the desired probe. Press EDIT then use the arrow key to assign the desired probe(s). Press EDIT once again to validate the chosen probe(s).

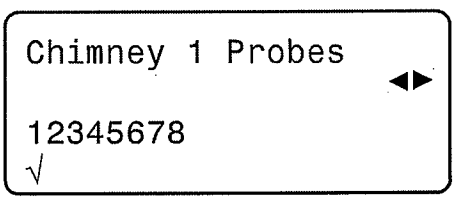


5.14.11.2 Assigning Chimney Probes

- Set the function to **PROBE SETTINGS** from the main menu using the menu select buttons. Note that this menu is only accessible in installer mode (see sec. 5.14.2).

- Use the arrow keys to select the desired chimney.
  Accessible if chimneys that operate according to the inside temperature are enabled (see sec. 5.14.3).

- Use the arrow keys to select the desired probe. Press EDIT then use the arrow key to assign the desired probe(s). Press EDIT once again to validate the chosen probe(s).

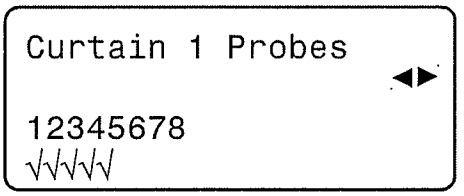


5.14.11.3 Assigning Curtain Probes

- Set the function to **PROBE SETTINGS** from the main menu using the menu select buttons. Note that this menu is only accessible in installer mode (see sec. 5.14.2).

- Use the arrow keys to select the desired curtain.
  Accessible if curtains are enabled (see sec. 5.14.3).

- Use the arrow keys to select the desired probe. Press EDIT then use the arrow key to assign the desired probe(s). Press EDIT once again to validate the chosen probe(s).

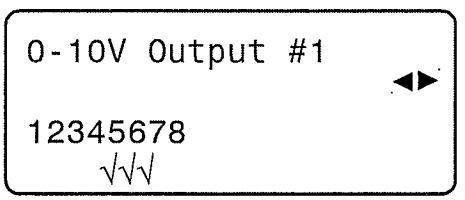


5.14.11.4 Assigning 0-10V Output Probes

- Set the function to **PROBE SETTINGS** from the main menu using the menu select buttons. Note that this menu is only accessible in installer mode (see sec. 5.14.2).

- Use the arrow keys to select the desired 0-10V output.
  Accessible if 0-10V outputs are enabled (see sec. 5.14.3)

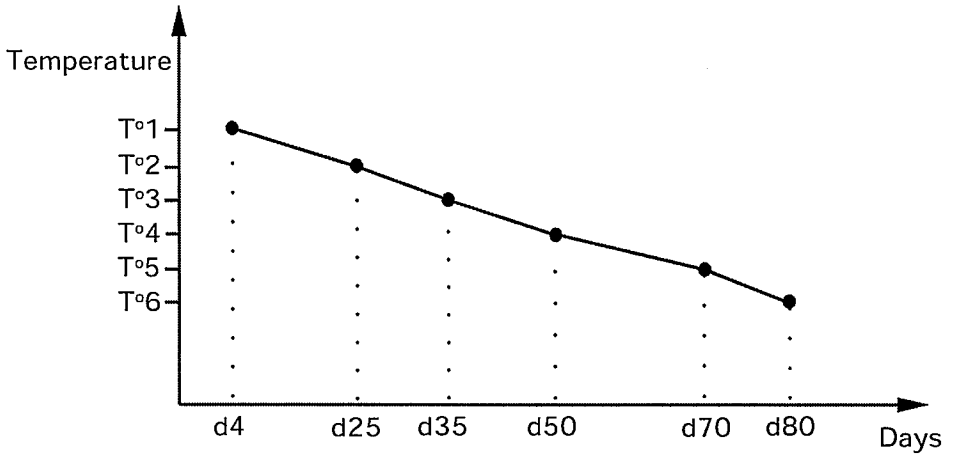
- Use the arrow keys to select the desired probe. Press EDIT then use the arrow key to assign the desired probe(s). Press EDIT once again to validate the chosen probe(s).



5.15 ADVANCED SETTINGS

5.15.1 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 refers to the day number in use by the curve. Once the points of the curve are defined, it must be enabled. 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 adjusted from Off to 1 day (see sec 5.10.1) or the set point is adjusted manually.

NOTES:

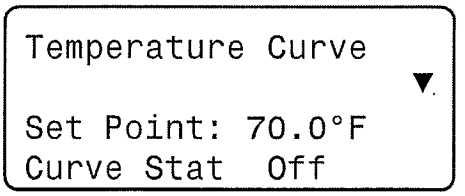
i) All ten points of the curve must be specified. If ten points are not needed, repeat the last temperature value for each unnecessary point.

ii) Certain restrictions apply to reduce the risk of errors:

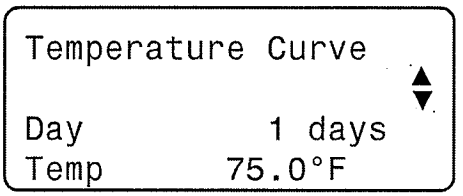
- The highest possible day number is 450.
- Decreasing day numbers are not allowed.
- Increasing temperatures are not allowed.

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

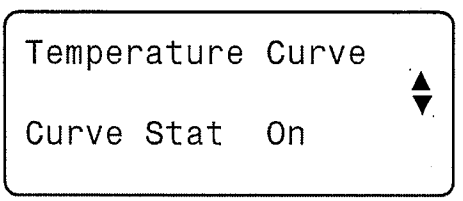
- Set the function to **SET POINT / CURVE** from the main menu using the menu select buttons.
- Select "**2. Curve**" menu using the arrow keys. The current set point and the curve status are displayed.



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

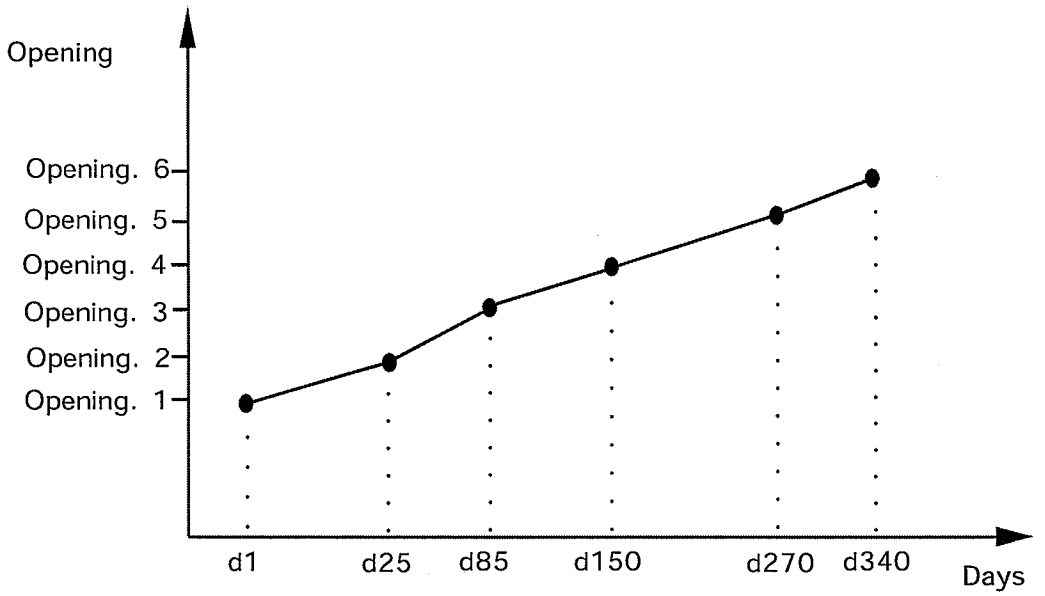


- Press EDIT then use the arrow keys to adjust the first day of the curve to the desired value. Press EDIT once again to validate.
- Press the down-arrow key. The temperature associated with the first point of the curve flashes on the display.
- Press EDIT then use the arrow keys to adjust the temperature for the first point of the curve to the desired value. Press EDIT once again to validate.
- Press the down-arrow key then proceed in similar fashion to set the days and temperature values for all 10 points of the curve.
- Once all curve points have all been defined, press the down-arrow key. The On/Off status of the curve flashes on the display. Press EDIT then press the up-arrow key to activate the curve. Press EDIT to validate.



5.15.2 Chimney Minimum Opening Curve

The minimum opening of the chimneys can automatically be adjusted over time by using a curve.



A curve is defined using up to ten points. Each point specifies a day number and a minimum opening for that day. Once the points of the curve are defined, the curve must be activated. The controller will change the minimum opening value every hour in a linear fashion between consecutive points of the curve. When the last point of the curve is reached, the minimum opening for that day is maintained until the curve is reactivated.

NOTES:

i) All ten points of the curve must be specified. If ten points are not needed, repeat the last opening value for each unnecessary point.

ii) Certain restrictions apply to reduce the risk of errors:

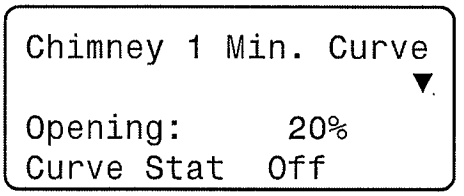
- The highest possible day number is 450.
- Decreasing day numbers are not allowed.
- Decreasing openings are not allowed.
- The minimum opening variation cannot exceed 10% per day.

- Set the function to **MINIMUM OPENING** from the main menu then use the arrow keys to select the Chimneys menu.

- Use the arrow keys to select the desired chimney.
  Accessible if chimneys are enabled (see sec. 5.14.3).

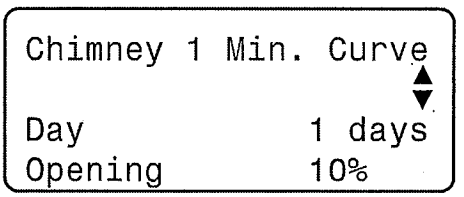
- Select the **"2. Min. Curve"** menu using the arrow keys.

If the Curve Status is ON: press the down-arrow key to scroll all points of the curve. The Curve Status menu then flashes on the display. Press EDIT then press the down-arrow key to disable the curve. Press EDIT to validate then follow the instructions below.



If the Curve Status is Off: the minimum opening of the selected chimney flashes on the display.

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

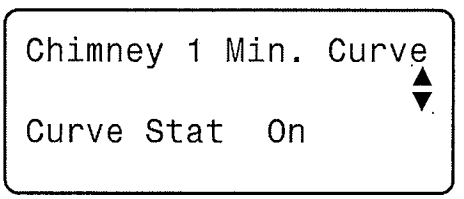


- Press EDIT then use the arrow keys to set the first day of the curve to the desired value. Press EDIT once again to validate.

- Press the down-arrow key once again. The chimney opening associated with the first point of the curve flashes on the display. Press EDIT then use the arrow keys to set it to the desired value. Press EDIT once again to validate.

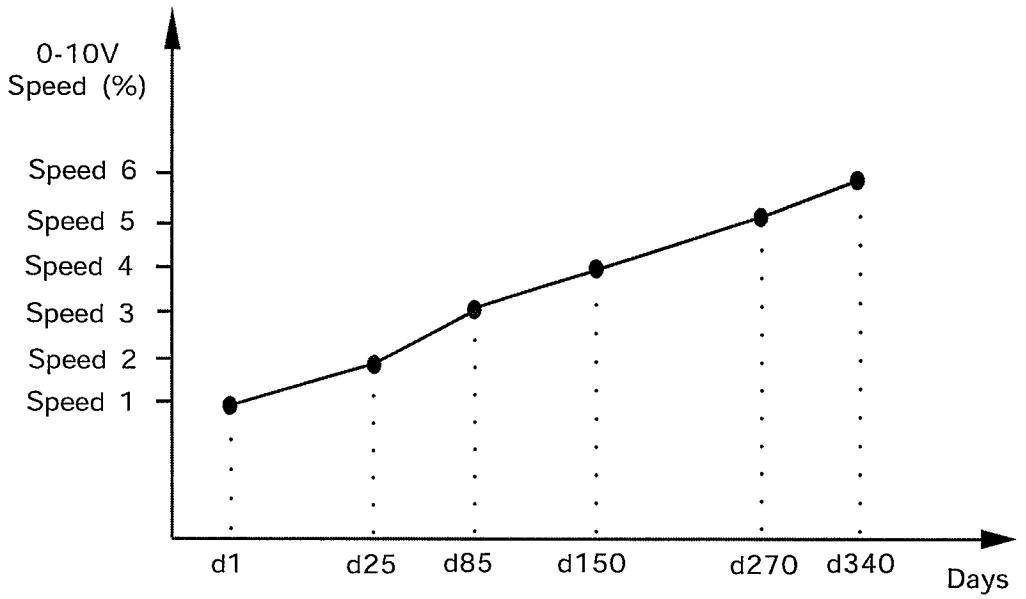
- Proceed in similar fashion to set the days and minimum openings associated with each point of the curve. Once it is done, press the down-arrow key. The Curve Status flashes on the display.

- Press EDIT then press the up-arrow key to enable the curve.



5.15.3 0-10V Output Minimum Speed Curve

The minimum speed of 0-10V outputs can automatically be adjusted over time by using a curve.



A curve is defined using up to ten points. Each point specifies a day number and a minimum speed for that day. Once the points of the curve are defined, the curve must be activated. The controller will change the minimum speed value every hour in a linear fashion between consecutive points of the curve. When the last point of the curve is reached, the minimum speed for that day is maintained until the curve is reactivated.

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 speeds are not allowed.
- The minimum speed variation cannot exceed 10% per day.

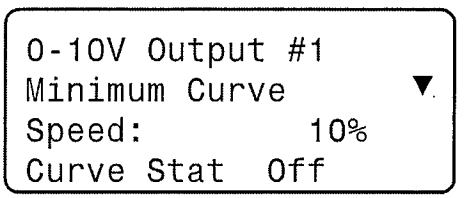
- Set the function to **MINIMUM OPENING** from the main menu then use the arrow keys to select the Chimneys menu.

- Use the arrow keys to select the **"3. 0-10V Outputs"** menu.
  Accessible if 0-10V outputs are enabled (see sec. 5.14.3).

- Use the arrow keys to select the desired 0-10V output.

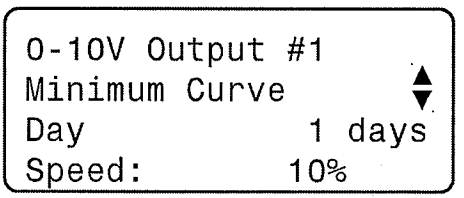
- Select the **"2. Min. Curve"** menu using the arrow keys.

If the Curve Status is ON: press the down-arrow key to scroll all points of the curve. The Curve Status menu then flashes on the display. Press EDIT then press the down-arrow key to disable the curve. Press EDIT to validate then follow the instructions below.



If the Curve Status is Off: the minimum speed of the selected 0-10V output flashes on the display.

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



- Press EDIT then use the arrow keys to set the first day of the curve to the desired value. Press EDIT once again to validate.

- Press the down-arrow key once again. The minimum speed associated with the first point of the curve flashes on the display. Press EDIT then use the arrow keys to set it to the desired value. Press EDIT once again to validate.

- Proceed in similar fashion to set the days and minimum speeds associated with each point of the curve. Once it is done, press the down-arrow key. The Curve Status flashes on the display.

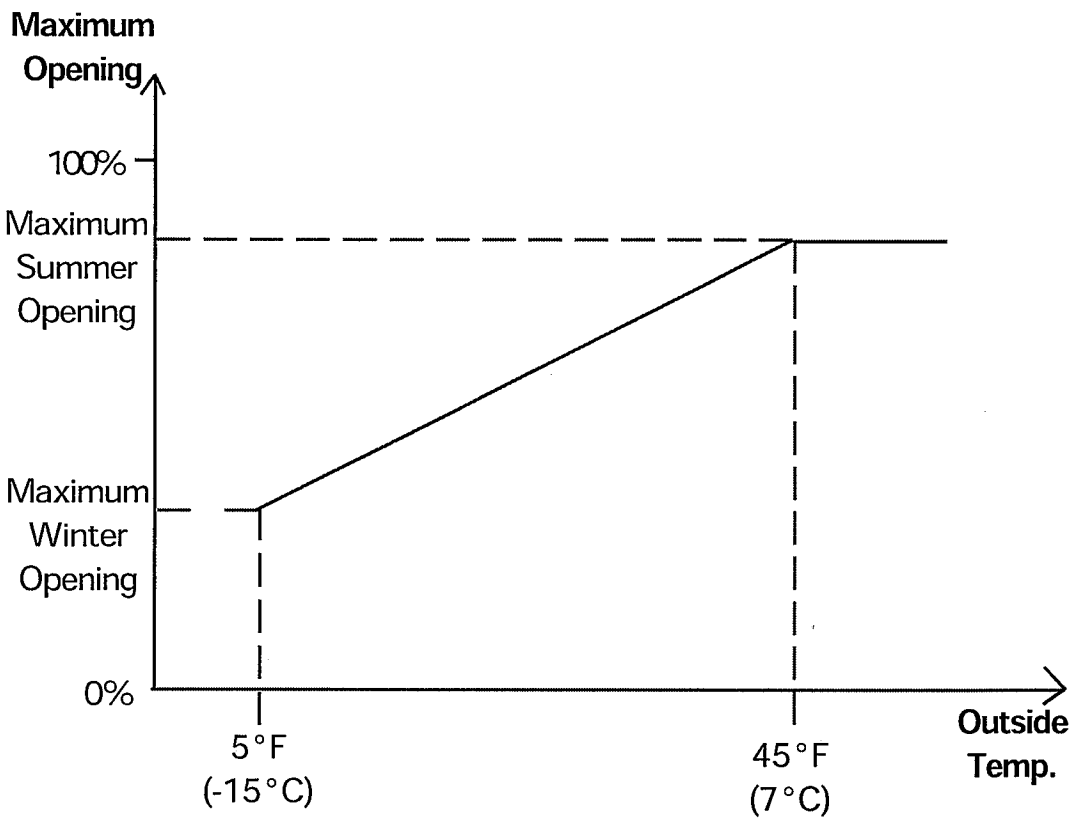
- Press EDIT then press the up-arrow key to enable the curve.

5.15.4 Outside Temperature Compensation

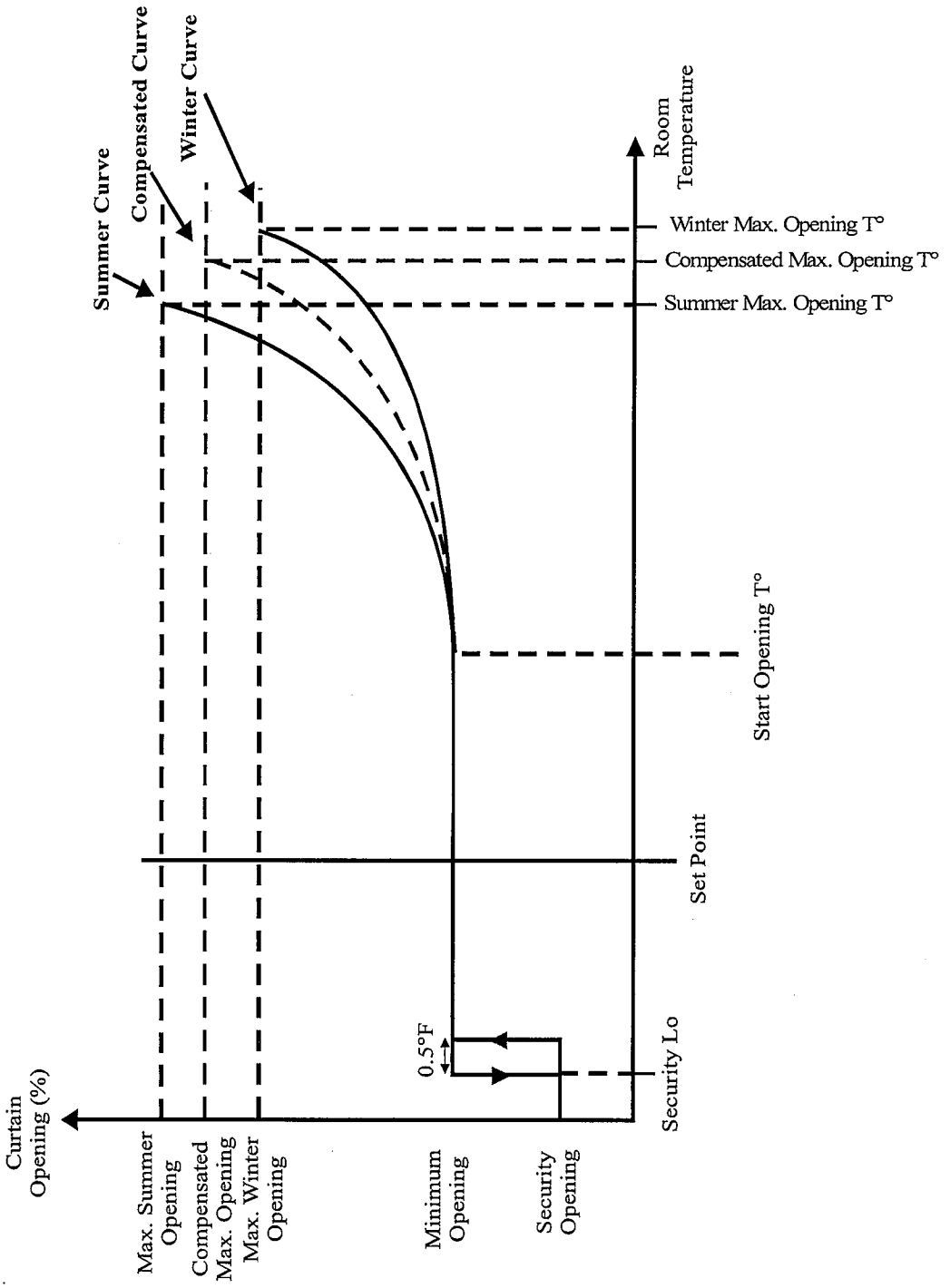
If the curtains operate using a potentiometer, the EXPERT-NATURAL can adjust the curtains' maximum position and the temperature at which this position in relation with the outside temperature. Two parameter sets are defined: one for the summer season and one for the winter season. The curtains operate according to these parameter sets when outside temperature compensation is activated. The chart below explains how the compensation works:

OUTSIDE TEMPERATURE	COMPENSATION
T° < 5°F (-15°C)	Use the maximum opening position and maximum opening temperature values for the winter season.
5°F (-15°C) < T° < 45°F (7°C)	Use interpolated values between the summer and winter parameter values.
T° > 45°F (7°C)	Use the maximum opening position and maximum opening temperature values for the summer season.

The graphic below illustrates how the maximum opening of the curtains is calculated when using the outside temperature compensation.



CURTAIN COMPENSATION



Refer to section 5.14.4 to enable the outside temperature compensation functions.

5.15.4.1 Adjusting Seasonal Openings & Temperatures

The curtains' maximum summer and winter openings range from 0 to 100%.

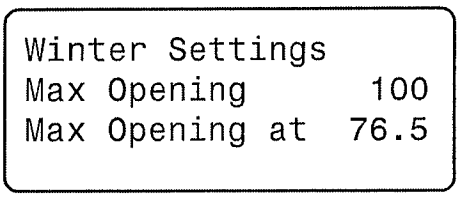
The maximum opening temperature is the temperature at which the curtains reach their maximum opening. It can be adjusted from 0.5 to 20°F (0.3 to 11.1°C) above the temperature at which the curtains start opening.

- Set the function to **TEMPERATURES** using the menu select buttons
- Use the arrow keys to select the **"2. Curtains"** menu.
  Accessible if curtains that are using potentiometers are enabled (sec. 5.14.3).
- Use the arrow keys to select the desired curtain.
- Use the arrow keys to select the **"Summer Settings Maximum Opening"** menu.
  Accessible if the outdoor compensation is enabled (sec. 5.14.4.2).

```
Summer Settings
Max Opening      100
Max Opening at  76.5
```

- Press EDIT then use the arrow keys to set the curtain's maximum opening in summer. Press EDIT once again to validate.
- Press the down-arrow key to select the **"Summer Settings Max Opening at"** menu.
- Press EDIT then use the arrow keys to set the outside temperature at which the selected curtain reaches its maximum opening in summer. Press EDIT once again to validate.

- Use the arrow keys to select the **"Winter Settings Maximum Opening"** menu.



- Press EDIT then use the arrow keys to set the curtain's maximum opening in winter. Press EDIT once again to validate.

- Press the down-arrow key to select the **"Winter Settings Max Opening at"** menu.

- Press EDIT then use the arrow keys to set the outside temperature at which the selected curtain reaches its maximum opening in winter. Press EDIT once again to validate.

5.15.5 Humidity Control

If a humidity probe is used, the EXPERT-NATURAL has different mechanisms to control the humidity level in the barn.

If relative humidity is too high:

- Heater outputs can be activated in timer mode whenever the relative humidity exceeds a user-defined limit.
- The minimum opening of the chimney can be increased;
- Mist units are shut off whenever the relative humidity exceeds a user-defined maximum limit
- The minimum speed of 0-10V outputs increases proportionally to the humidity level.
- If curtains are used in timer mode, the purge feature is enabled whenever the humidity level is too high.
- If curtains operate using a potentiometer, their minimum opening can increase as the humidity level increases.

If relative humidity is too low:

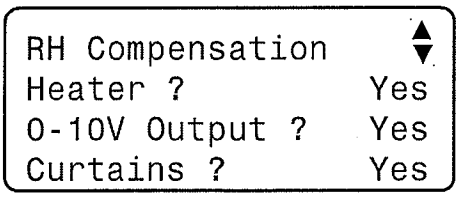
- Mist units can operate according to an independent cycle to increase the humidity level in the barn.

All these mechanisms must be enabled separately as explained below.

5.15.5.1 Activating Relative Humidity (RH) Compensation

■ Select the **"5. RH Compensation"** menu from the **USER** main menu.
Accessible if the relative humidity probe is enabled (see sec. 5.14.4.2).

Heater Timer: Press EDIT and select "Yes" to activate the heating output in timer mode when the humidity level is too high.

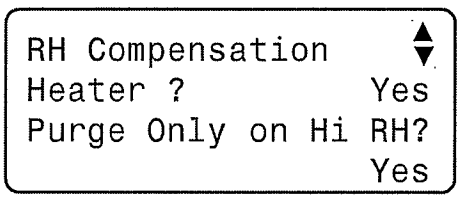


0-10V Output: Press EDIT and select "Yes" to allow an automatic adjustment of the 0-10V output's minimum speed to help reducing high humidity levels (see sec. 5.15.5.6).

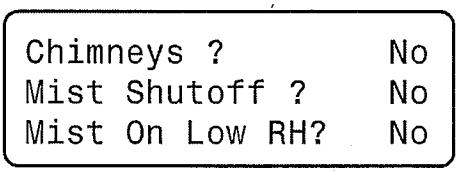
Curtains (potentiometer): Press EDIT and select "Yes" to allow an automatic adjustment of the curtains' minimum opening to help reducing high humidity levels. (see sec. 5.15.5.8)

Curtains (timer mode): Press EDIT and select "Yes" to use the de-icing/purge function only when the humidity level is too high; select "No" to use the de-icing-purge function continuously.

Accessible if the de-icing/purge feature is enabled and if curtains are using a timer (see sec. 5.14.3). Refer to section 5.15.5.8 to set the curtains' humidity compensation functions).



Chimneys: Press EDIT and select "Yes" to allow an automatic adjustment of the chimney's minimum opening to help reducing high humidity levels (see sec. 5.15.5.7).



Mist Shutoff: Press EDIT and select "Yes" to stop the mist units whenever the humidity level is too high. (see sec. 5.15.5.5).

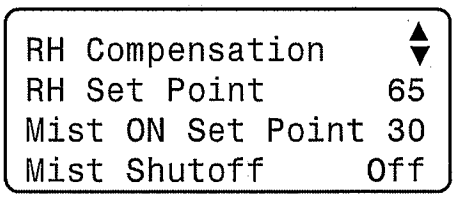
Mist On Low RH: Press EDIT and select "Yes" to activate mist units according to the cooling stage's timer when the humidity level is too low (see sec. 5.15.5.3).

5.15.5.2 Adjusting the Relative Humidity Set Point

- Set the function to **HUMIDITY COMPENSATION** from the main menu using the menu select buttons. The RH Set Point flashes on the display.
  Accessible if at least one humidity compensation function is enabled (see sec. 5.15.5.1).

- Select the RH Set Point menu using the arrow keys.

- Press EDIT then use the arrow keys to adjust the relative humidity set point to the desired value. Press EDIT once again to validate.

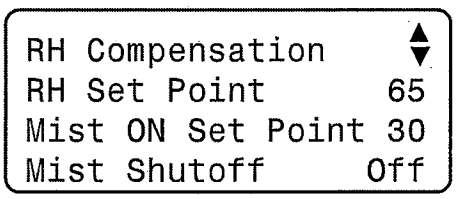


5.15.5.3 Adjusting the Low Relative Humidity Set Point

Mist units are enabled according to the cooling stage's timer when the humidity level decreases below the Mist Set Point.

- Set the function to **HUMIDITY COMPENSATION** from the main menu using the menu select buttons. The RH Set Point flashes on the display.
  Accessible if at least one humidity compensation function is enabled (see sec. 5.15.5.1).

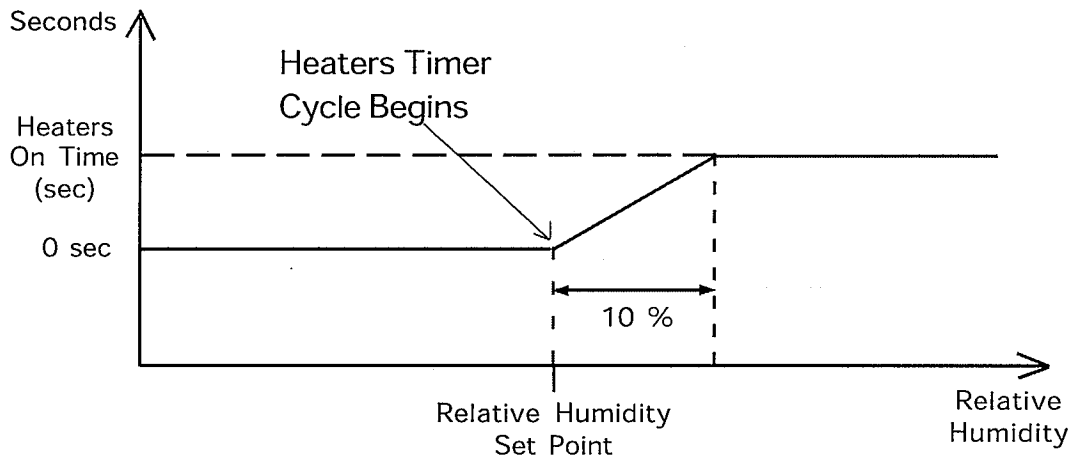
- Press the down-arrow key once to select the **"Mist ON Set Point"** menu.
  Accessible if the "Mist on Low RH" feature is enabled (see sec. 5.15.5.1).



- Press EDIT then use the arrow keys to adjust the Mist Set Point to the desired value. Press EDIT once again to validate.

5.15.5.4 Adjusting Heater Timer Cycle for RH Compensation

Heaters can be activated following a timer mode to compensate for high humidity levels. As the humidity increases, the heaters' ON TIME increases proportionally to compensate for the change. The heaters reach their full running time when the humidity level increases above RH Set Point + 10% as shown below. The cycle time can be adjusted from 0 to 900 seconds.



- Set the function to **HUMIDITY COMPENSATION** from the main menu using the menu select buttons. The RH Set Point flashes on the display.
  Accessible if at least one humidity compensation function is enabled (see sec. 5.15.5.1).

- Select the **"OnTime"** parameter using the arrow keys.
  Accessible if the compensation function using heaters is enabled (see sec. 5.15.5.1).

```
Heater Compensation
On Time       15sec
Cycle Time   300sec
```

- Press EDIT then use the arrow keys to set the heaters' On Time to the desired value. Press EDIT once again to validate.

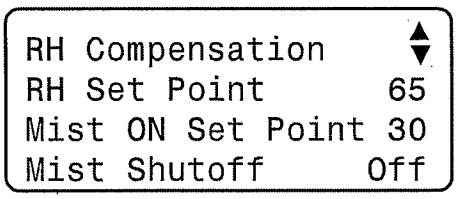
- Press the down-arrow key once again. The heaters' Cycle Time flashes on the display. Press EDIT then use the arrow keys to set it to the desired value.

5.15.5.5 Adjusting Mist Shutoff for RH Compensation

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.

- Set the function to **HUMIDITY COMPENSATION** from the main menu using the menu select buttons. The RH Set Point flashes on the display.
  Accessible if at least one humidity compensation function is enabled (see sec. 5.15.5.1).

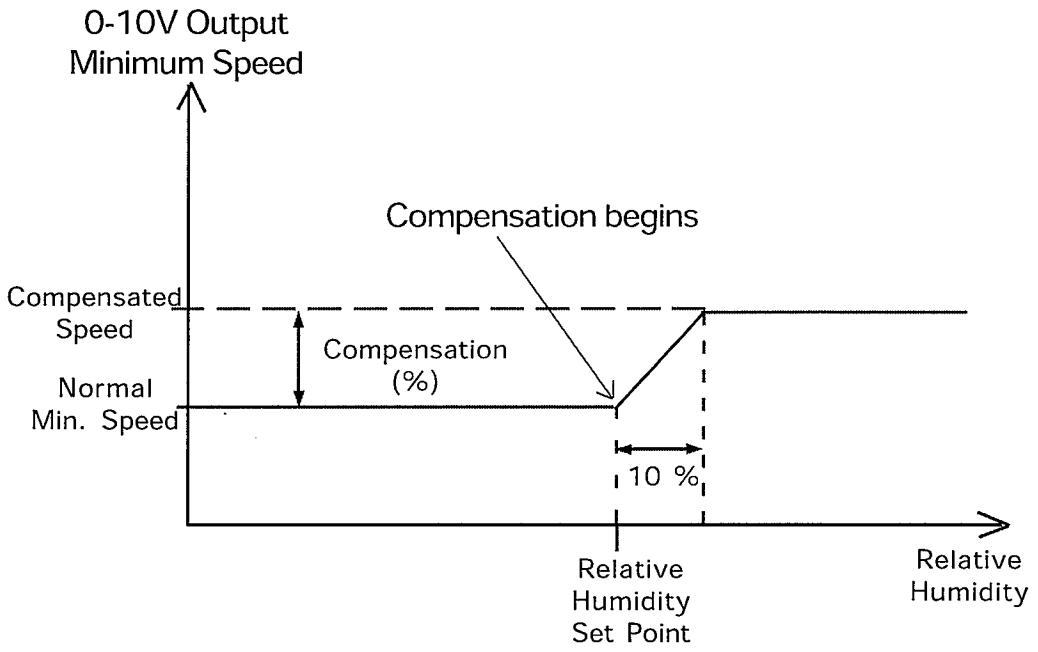
- Use the arrow keys to select the "**Mist Shutoff**" display.
  Accessible if the mist shutoff option is enabled (see sec. 5.15.5.1).



- Press EDIT then use the arrow keys to set the humidity level above which mist units are disabled. Press EDIT once again to validate the value.

5.15.5.6 Adjusting 0-10V Outputs for RH Compensation

The minimum speed of 0-10V outputs can be adjusted automatically as a function of relative humidity. As the humidity level increases, the minimum speed increases proportionally to compensate for the change. When the humidity level is at or below the humidity set point, the 0-10V output's minimum speed is equal to the normal uncompensated speed. The user specifies by how much the minimum speed can increase 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 maximum 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 0-10V output fans are operated continuously rather than cycled.



- Set the function to **HUMIDITY COMPENSATION** from the main menu using the menu select buttons. The RH Set Point flashes on the display.
  Accessible if at least one humidity compensation function is enabled (see sec. 5.15.5.1).

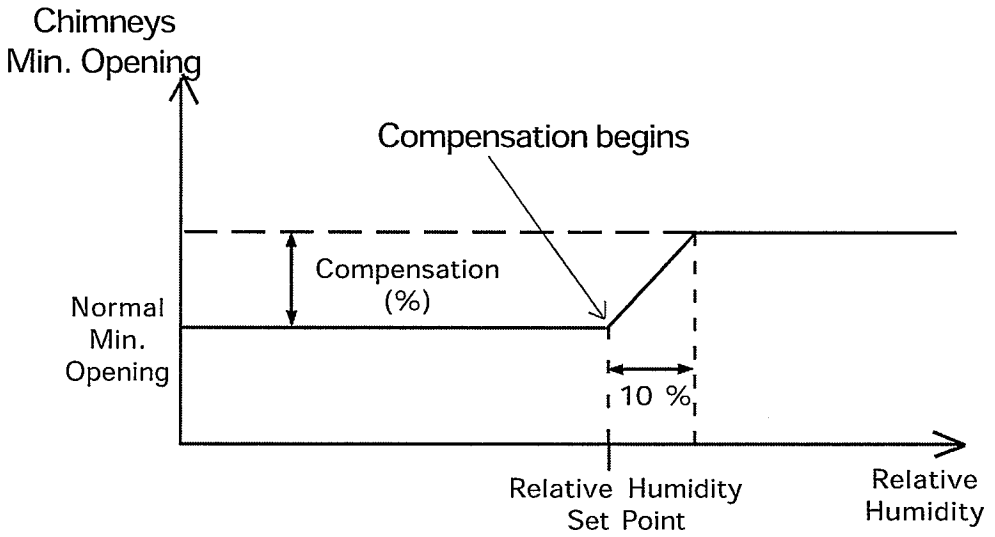
- Use the arrow keys to select the **"0-10V Comp.Spd"** (Compensation Speed) menu.
  Accessible if the humidity compensation is enabled on a 0-10V output (see sec. 5.15.5.1).

RH SetPoint	65
0-10V Comp.Spd	40
MistON SetPoint	30
Mist Shutoff	Off

- Press EDIT then use the arrow keys to set the speed that can be added to the output's minimum speed. Press EDIT once again to validate.

5.15.5.7 Adjusting Chimneys for RH Compensation

The minimum opening of chimneys can automatically be adjusted as a function of relative humidity. As the humidity level increases, the chimneys' minimum opening increases proportionally to compensate for the change. At or below the humidity set point, chimneys' minimum opening is equal to the normal uncompensated opening. The user specifies an opening percentage that is added to the minimum opening for a relative humidity equal to the humidity set point + 10%. For example, if the minimum opening is 30% and the compensation adjustment is 20%, the minimum opening will be adjusted to 50% of full opening when the humidity rises 10% above the humidity set point.



- Set the function to **HUMIDITY COMPENSATION** from the main menu using the menu select buttons. The RH Set Point flashes on the display.
  Accessible if at least one humidity compensation function is enabled (see sec. 5.15.5.1).

- Use the arrow keys to select **"Chimneys Add Min Opening"** menu.
  Accessible the humidity compensation function using chimneys is enabled (see sec. 5.15.5.7).

```
Add Min Opening
Chimneys        20%
```

- Press EDIT then use the arrow keys to set the opening that can added to the chimneys' minimum opening. Press EDIT once again to validate.

5.15.5.8 Adjusting Curtains for RH Compensation

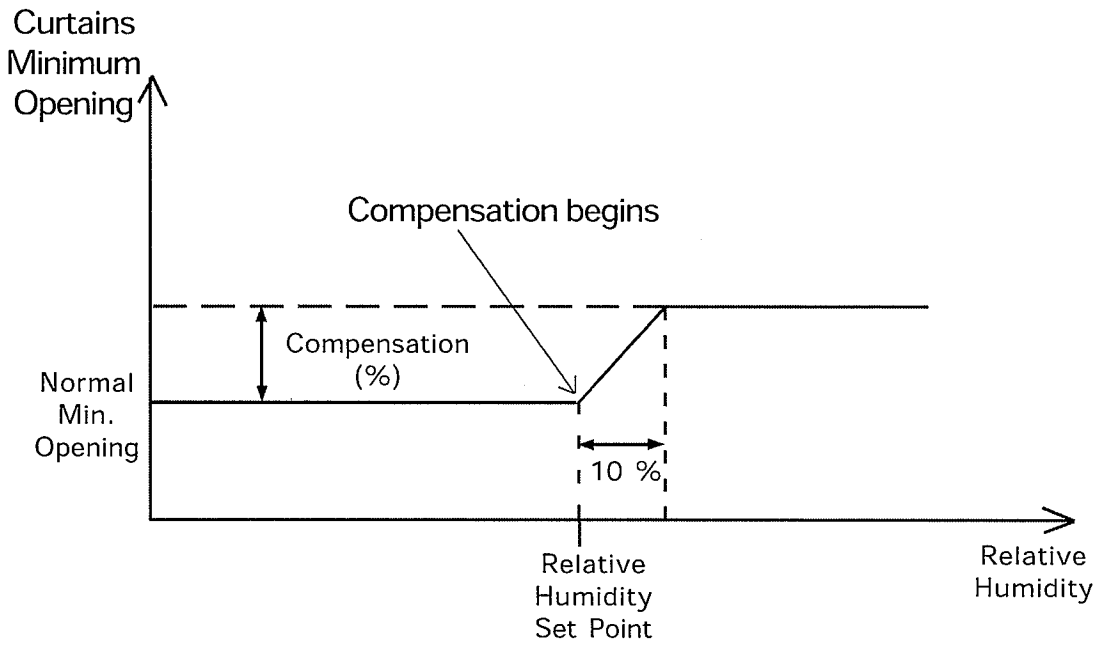
The curtains have two different ways to compensate for high humidity levels, depending if they use a timer or a potentiometer.

Curtain operating in timer mode:

If the curtains operate in timer mode, the purge feature can be activated to decrease the humidity level whenever the humidity level exceeds the humidity set point. Refer to sec. 5.15.5.1 to activate curtains' de-icing/ purge feature on high humidity levels only.

Curtains operating using a potentiometer:

The curtains' minimum opening can be adjusted automatically as a function of relative humidity compensation. As the humidity level increases, the curtains' minimum opening increases proportionally to compensate for the change. At or below the humidity set point, curtains' minimum opening is equal to the normal uncompensated opening. The user specifies an opening percentage that will be added to the minimum opening for a relative humidity equal to the humidity set point + 10%. For example, if the minimum opening is set to 30% and the compensation adjustment is set to 20%, the minimum opening will be adjusted to 50% of full opening when the humidity rises 10% above the humidity set point as shown on diagram below:



- Set the function to **HUMIDITY COMPENSATION** from the main menu using the menu select buttons. The RH Set Point flashes on the display.
  Accessible if at least one humidity compensation function is enabled (see sec. 5.15.5.1).

- Use the arrow keys to select the **"Add Min Opening"** menu.
  Accessible if curtains use a potentiometer and if the humidity compensation function using curtains is enabled (see sec 5.14.3 & 5.15.5.1).

```
Add Min Opening
Curtain 1    20%
Curtain 2    20%
Curtain 3    20%
```

- Press EDIT then use the arrow keys to set the opening percentage that can be added to the curtains' minimum opening. Press EDIT once again to validate the value.

5.15.6 Clean Mode

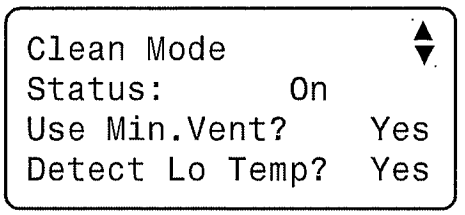
The clean mode is mainly used to operate heaters at low levels when the room is totally empty. A set point is defined to indicate the minimum allowable temperature in the room while it is empty (s. 5.2). If required, an alarm can be set off if the room temperature decreases a user-defined temperature limit. Refer to section 5.15.2.1 to fix the temperature limit.

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. 5.10).

VENTILATION IN CLEAN MODE:
To ensure good air circulation, ventilation cycles can be activated while the controller operates in clean mode. In this case, the controller uses the fans of the first 0-10V output (on condition that the first 0-10V output is used for ventilation). Refer to section 5.9.8 to set the 0-10V output's clean mode timer.

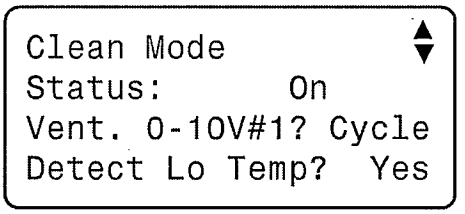
5.17.6.1 *Activating the Clean Mode*

- Set the function to **CLEAN MODE** from the main menu using the menu select buttons. The clean mode status flashes on the display.
- Press EDIT and set the clean mode status to "On". Press EDIT once again to activate the clean mode.



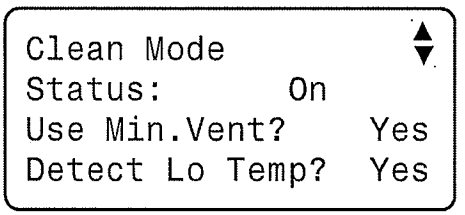
5.17.6.2 *Ventilation in Clean Mode*

- Set the function to **CLEAN MODE** from the main menu using the menu select buttons.
- Use the arrow keys to select the **"Vent. 0-10V #1"** menu.
  Accessible if the first 0-10V output is used for ventilation.
- Select "Cycle" to enable cycled ventilation, "Cont" to use continuous ventilation or select "No" to disable this function.



5.17.6.3 *Activating Low Temp. Alarm in Clean Mode*

- Set the function to **CLEAN MODE** from the main menu using the menu select buttons. The clean mode status flashes on the display.
- Use the arrow keys to select the **"Detect Lo Temp?"** menu.
- Press EDIT then press use the arrow key to select the low temperature alarm status in clean mode.



5.15.7 Test Mode

A test mode allows to simulate temperature changes and verify controller performance. In test mode, 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.

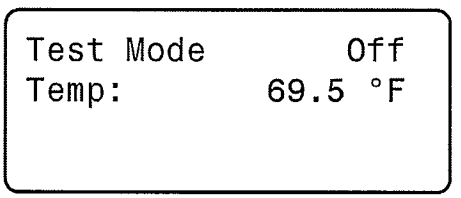
Adjusting the Room Temperature

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** from the main menu using the menu select buttons. The on/off Test Mode state is displayed. Press EDIT and set it to ON using the up-arrow key. Press EDIT once again to validate the test mode status.

- Press the down-arrow key to select the room temperature.

- Press EDIT then use the arrow keys to set the room temperature to the desired value.



6. TECHNICAL SPECIFICATIONS

Type	EXPERT-NATURAL
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	10mA to 2A, 24 Vac or dc max.
Housing	IP54, plastic casing
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%
Pot + output	3.0V, 20mA max.
Potentiometer inputs	1-20K pot., linear
RH input	4-20mA
Temperature inputs	1K @ 77°F (25°C), NTC
Relays 1-24	Dry contact, 10A resistive, 120VAC (1/4HP) / 240VAC (1/2HP) Tungsten (Light Bulb): 8.3A max at 120VAC

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

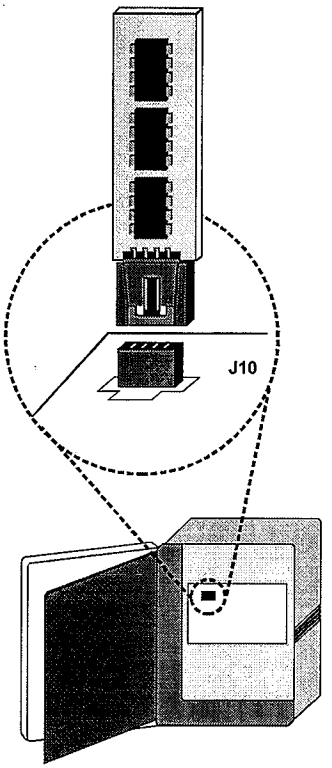
7. FACTORY SETTINGS

PARAMETER		FACTORY SETTING	RANGE OF VALUES
Temperature Set Point	Day Set Point	70°F (21.0°C)	-40 to 120°F (-40 to 48.9°C)
	Night Set Point	65°F (18.3°C)	-40 to 120°F (-40 to 48.9°C)
	Clean Mode Set Point	35°F (1.7°C)	-40 to 120°F (-40 to 48.9°C)
Animal Age		OFF	1 to 450 days
Curtains (Potentiometer)	Offset	0.5°F (0.3°C)	0 to 20°F (0 to11.1°C)
	Security Offset	4.5°F (2.5°C)	0 to 20°F (0 to11.1°C)
	Security Opening	15%	0 to 100%
	Minimum Opening	20%	0 to 100%
	Maximum Opening	100%	0 to 100%
	Differential	6°F (3.3°C)	0 to 20°F (0 to11.1°C)
	Purge Opening	50%	0 to 100%
Curtains (Timer Mode)	Offset	0.5°F (0.3°C)	0 to 20°F (0 to11.1°C)
	Open Time	15s	1 to 900s
	Close Time	15s	1 to 900s
	Off Time	15s	0 to 900s
	Purge Move Time	30s	0 to 900s
Chimneys	Minimum Opening	20%	0 to 100%
	Differential	6°F (3.3°C)	0 to 20°F (0 to11.1°C)
	Security Offset	4.5°F (2.5°C)	0 to 20°F (0 to11.1°C)
	Security Opening	15%	0 to 100%
Cooling	On Time	15s	0 to 900s
	Off Time	15s	

PARAMETER		FACTORY SETTING	RANGE OF VALUES
Stir Fans	Hot Start Temperature	75°F (23.9°C)	1 to 20°F (0.6 to 11.1°C) above the set point
	Hot Stop Temperature	74.5°F (23.6°C)	0.5 to 19.5°F (0.3 to 10.3°C) above the set point
	Cold Start Temperature	65.0°F (18.3°C)	0.5 to 40°F (0.3 to 22.2°C) below the set point
	Cold Stop Temperature	65.5°F (18.6°C)	35.5°F (19.7°C) below the set point to 10°F (5.6°C) above the set point
	Probe Temperature Diff.	5.0°F (2.8°C)	0.5 to 20°F (0.3 to 11.1°C)
	On Time	1m:00s	0m:00s to 60m:00s
	Off Time	1m00s	0m:00s to 60m:00s
Clock Outputs	Running Time	0	0 to 8h:59m:59s
Alarms	Critical Alarm Temperature	100.0°F (55.6°C)	0.5 to 120°F (0.3 to 66.7°C) above the set point
	High Alarm Temperature	90°F (50°C)	0.5 to 40°F (0.3 to 22.2°C) above the set point
	Low Alarm Temperature	60°F (33.3°C)	0.5 to 40°F (0.3 to 22.2°C) below the set point
	Clean Mode Minimum Temperature	32°F (17.8°C)	0.5 to 40°F (0.3 to 22.2°C) below the set point

8. USING THE MEMORY STICK

8.1 Loading a Configuration into the Controller



1- Insert the memory stick into the J10 connector located at the upper left corner of the board, with the components facing DOWN.

2- Simultaneously press the **MENU SELECT** up and down-arrow keys during a 5 second delay. The following message is displayed : "**MemStick to Control. Press ▲▼ to start**"

3- Simultaneously press the **ADJUSTMENT** up and down-arrow keys. The configuration starts to load. Wait until it is completely loaded.

4- Once the transfer has reached 100%, simultaneously press the **MENU SELECT** up and down-arrow keys simultaneously to exit this menu.

```
MemStick to Control▲▼
Press ▲▼ to start
```

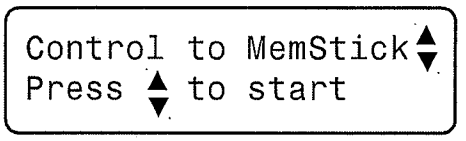
5- The new configuration is now loaded into the controller. Remove the memory stick from the connector.

8.2 Saving a Configuration on the Memory Stick

1- Insert the memory stick into the J10 connector located at the upper left corner of the board, with the components facing DOWN.

2- Simultaneously press the **MENU SELECT** up and down-arrow keys during a 5 second delay. The following message is displayed:
"**MemStick to Control. Press ▲▼ to start**"

3 - Press the up-arrow key once. The following message is then displayed:
"**Control to MemStick. Press ▲▼ to start**"



4- Simultaneously press the **ADJUSTMENT** up and down-arrow keys. The configuration starts being saved on the memory stick. Wait until it is completely saved.

5- Once the transfer has reached 100%, press the **MENU SELECT** up and down-arrow keys simultaneously to exit this menu.

6- The new configuration is now saved into the memory stick. Remove the memory stick from the connector.

9. INSTALLATION REPORT

CLIENT

Name: _____

Address: _____

_____

_____

City: _____

Phone: _____

Fax: _____

E-mail: _____

INSTALLER

Name: _____

Address: _____

_____

_____

City: _____

Phone: _____

Fax: _____

E-mail: _____

PROBE ASSIGNMENT	
OUTPUT	PROBES
Heater 1	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8
Heater 2	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8
Heater 3	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8
Heater 4	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8
Chimney 1	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8
Chimney 2	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8
Curtain 1	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8
Curtain 2	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8
Curtain 3	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8
Curtain 4	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8
Curtain 5	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8
Curtain 6	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8
0-10V Output #1	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8
0-10V Output #2	(√) ___1 ___2 ___3 ___4 ___5 ___6 ___7 ___8

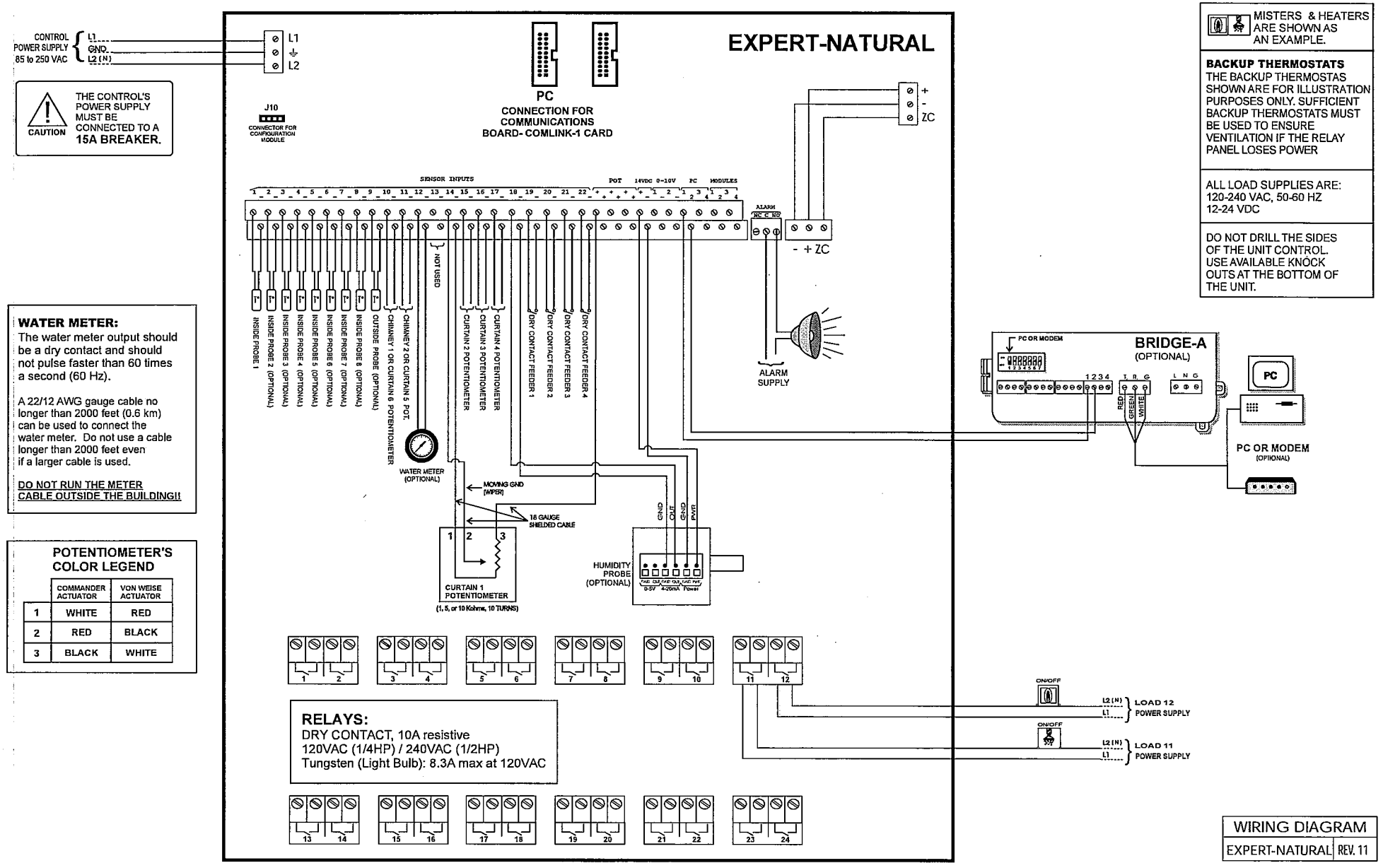
INSTALLATION SETUP	
PARAMETER	**SETTINGS**
1. LCD CONTRAST (sec. 5.1)	
LCD Contrast value	_____ % (10 to 100%)
2. TEMPERATURE PROBES (sec. 5.14.4)	
Temperature probes used	☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐8
3. OTHER PROBES (sec. 5.14.4)	
Use relative humidity sensor (RH) ?	☐Yes ☐No
Use water meter ?	☐Lit ☐Gal
Use outdoor temperature probe ?	☐Yes ☐No
Use outdoor temperature compensation ?	☐Yes ☐No
4. UNITS (sec. 5.14.3.1)	
Time display	☐24H ☐AM/PM
Temperature	☐°C ☐°F
Water	☐Lit ☐Gal
5. RELATIVE HUMIDITY (RH) FUNCTIONS (sec. 5.15.5)	
RH compensated by heaters ?	☐Yes ☐No
RH compensated by 0-10V outputs ?	☐Yes ☐No
RH compensated by curtains ?	☐Yes ☐No
RH compensated by chimneys ?	☐Yes ☐No
RH compensated with mist shutoff ?	☐Yes ☐No
RH compensated using mist on low RH ?	☐Yes ☐No

INSTALLATION SETUP													
6. INSTALLATION (sec. 5.14.3)													
Number of feeder units	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4								
Use Max Feeder Run Time alarm condition ?	☐ Yes	☐ No											
Number of heater stages	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4								
Number of curtains	☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6						
Wind Delay	_____ seconds												
Number of chimneys	☐ 0	☐ 1	☐ 2										
Number of stir fans	☐ 0	☐ 1	☐ 2										
Number of clock outputs	☐ 0	☐ 1	☐ 2										
Number of 0-10V outputs	☐ 0	☐ 1	☐ 2										
0-10V output 1 Signal	☐ 0-10V	☐ 10-0V											
0-10V output 2 Signal	☐ 0-10V	☐ 10-0V											
0-10V output 1 utility	☐ Ventilation	☐ Heating											
0-10V output 2 utility	☐ Ventilation	☐ Heating											
Use Cooling ?	☐ Yes	☐ No											
Use Soaking ?	☐ Yes	☐ No											
Use Locked Options ?	☐ Yes	☐ No											
Chimney temperature probe reference	☐ Inside T°	☐ Outside T°											
Curtain operation mode (pot/timer)	☐ Timer	☐ Potentiometer											
Use Purge ?	☐ Yes	☐ No											
7. STIR FANS (sec. 5.5)													
Stir fans on hot temperature	Stir fan 1	☐ Yes	☐ No	Stir fan 2	☐ Yes	☐ No							
Stir fans on cold temperature	Stir fan 1	☐ Yes	☐ No	Stir fan 2	☐ Yes	☐ No							
Stir fans when probe T° difference	Stir fan 1	☐ Yes	☐ No	Stir fan 2	☐ Yes	☐ No							
8. CALIBRATION (sec. 5.14.9 & 5.14.10)													
9. DAY / NIGHT (sec. 5.146)													
Use day / night set point ?	☐ Yes	☐ No											
Day/night on 0-10V Min. Speed ?	☐ Yes	☐ No											
Day/night on chimney min. opening ?	☐ Yes	☐ No											
Day Time starts at:	_____ : _____												
Night Time starts at:	_____ : _____												
Transition Time between day / night	_____ min												
10. FEEDER ALARMS (sec. 5.13.2.6)													
Max Run Time Alarm Delay	_____ min												
11. INSTALLATION (sec. 5.14.2)													
Installer password	_____ _____ _____												

RELAY ASSIGNMENT EXAMPLE

OUTPUTS / RELAYS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Heater 4																								
Heater 3																								
Heater 2																								
Heater 1																								
Chimney 1 or Curtain 6 - Open																								
Chimney 1 or Curtain 6 - Close																								
Chimney 2 or Curtain 5 - Open																								
Chimney 2 or Curtain 5 -Close																								
Curtain 1 - Open																								
Curtain 1 - Close																								
Curtain 2 - Open																								
Curtain 2 - Close																								
Curtain 3 - Open																								
Curtain 3 - Close																								
Curtain 4 - Open																								
Curtain 4 - Close																								
Stir Fan 1																								
Stir Fan 2																								
Cooling output																								
Soaking																								
Clock 1																								
Clock 2																								
Feeder 1																								
Feeder 2																								
Feeder 3																								
Feeder 4																								

EXPERT-NATURAL



WATER METER:
The water meter output should be a dry contact and should not pulse faster than 60 times a second (60 Hz).

A 22/12 AWG gauge cable no longer than 2000 feet (0.6 km) can be used to connect the water meter. Do not use a cable longer than 2000 feet even if a larger cable is used.

DO NOT RUN THE METER CABLE OUTSIDE THE BUILDING!!

POTENTIOMETER'S COLOR LEGEND

	COMMANDER ACTUATOR	VON WEISE ACTUATOR
1	WHITE	RED
2	RED	BLACK
3	BLACK	WHITE

MISTERS & HEATERS ARE SHOWN AS AN EXAMPLE.

BACKUP THERMOSTATS
THE BACKUP THERMOSTAS SHOWN ARE FOR ILLUSTRATION PURPOSES ONLY. SUFFICIENT BACKUP THERMOSTATS MUST BE USED TO ENSURE VENTILATION IF THE RELAY PANEL LOSES POWER

ALL LOAD SUPPLIES ARE:
120-240 VAC, 50-60 HZ
12-24 VDC

DO NOT DRILL THE SIDES OF THE UNIT CONTROL. USE AVAILABLE KNOCK OUTS AT THE BOTTOM OF THE UNIT.

WIRING DIAGRAM	
EXPERT-NATURAL	REV. 11