CC24-7 Elite Plus

Models:
890-00646 REV. 00

User Manual

895-00769
Version 00

Date: 11-29-16

Munters

Contents

NOTES

1 Getting Started

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General Safety and Precautions

The warranty is void if this product is used in a manner not specified by the manufacturer. Every effort has been made to ensure that this manual is complete, accurate and up-to-date. The information contained in this manual is subject to change without prior notice.

Precautions

To ensure proper functioning, only use the equipment in a manner specified by the manufacturer.

Carefully read and keep the following instructions for future reference.

Install additional natural ventilation and a backup thermostat on at least one cooling stage.

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

Keep the room temperature where the controller is located between 32°F and 104°F (0°C to 40°C), and only use the controller indoors.

Install the controller in a hallway or a in a room dedicated to electronics to avoid exposing it to harmful gases or excess humidity.

Do not spray water on the controller. To clean the controller, wipe it with a damp cloth.

Warning and symbols in the manual

⚠ **CAUTION**	*Before servicing or cleaning the unit, turn off the power and lock the service panel to prevent power from being switched on accidentally. If the service panel can't be locked, securely fasten a prominent warning device, such as a tag, to the service panel.*

⚡	*High Voltage. Hazard of electrical shock. Read the message and follow the instructions carefully.*
∼	*Both direct and alternating current (AC/DC).*

---	*Direct current (DC).*
∼	*Alternating current (AC).*
⏚	*Earth Ground Terminal* *Primarily used for functional earth terminals which are generally associated with test and measurement circuits. These terminals are not for safety earthing purposes but provide an earth reference point.*

Inputs and Outputs

The CC24-7 ELITE is an electronic device used for environmental control in livestock buildings. It allows to maintain a specified target temperature by controlling the operation of ventilation and heating equipment.

Outputs

- 100 On/Off relays located in external relay panels;
- 8 heating stages (and the possibility to simulate up to 16 stages);
- 16 fan stages;
- 8 clock outputs;
- 1 tunnel curtain;
- 4 natural ventilation curtains;
- 1 stir fan output;
- 4 cooling outputs;
- 2 inlet outputs to connect vent doors, attic vents or a supplementary tunnel curtain;
- 1 inlet output to connect up to 10 external inlet modules (SB modules);
- 4 0-10V outputs used to control on/off heaters, variable heaters, on/off fans, variable fans or lights;
- 1 soaking output

Inputs

- 8 inside temperature probes;
- 1 outside temperature probe;
- 1 static pressure sensor;
- 1 humidity sensor;
- 2 internal water meters;
- 16 external water meters (using DI-8 modules);
- 2 dry contact inputs to monitor: 2 feeders.

NOTE: *Refer to the appendix to connect the sensors and loads.*

Guidelines About Wiring

All wiring instructions are found in the wiring diagram included with this manual. A few additional guidelines are needed to wire your controller correctly and safely.

> ⚠️ **CAUTION** *All wiring must be done by an authorized electrician and must comply with applicable codes, laws and regulations. Make sure power is off before any wiring is done to avoid electrical shocks and equipment damage. All holes must be drilled at the bottom of the enclosure to pass the wires and watertight connectors must be used to prevent water from entering the enclosure. Do not make any holes on the sides and top of the enclosure.*

Alarm wiring

Two types of alarms exist. For the type of alarm that activates when current is cut off at its input, use the NC terminal as shown on the wiring diagram. For the other type of alarm that activates when current is supplied at its input, use the NO terminal.

Sensor input wiring

Sensors operate at low voltage and are isolated from the supply. Make sure that sensor cables remain isolated from all high voltage sources. If a sensor is defective, an alarm is generated. Defective sensors can be seen in the **Alarm** menu.

> ⚠️ **CAUTION** *Do not route the sensor cables through the same electrical knockouts as other cables.*
>
> *Do not connect the shield from the sensor cable to a terminal or a ground.*

Extending a sensor

Each sensor can be extended up to 500 feet (150 meters). Do not run sensor cables next to the other power cables. If the cables must cross, make them cross at a 90 degree angle.

IMPORTANT:

Use a cable of at least 18 AWG gauge.

Do not ground the shielding.

Using a shielded cable of an outside diameter between 0.245 and 0.260 inches (6.22 and 6.60 millimeters), solder the cable joints to ensure a proper contact between the two cables.

0-10V output wiring

0-10V outputs can be used to connect various devices such as heat mats or fans. Use a 18 to 22 AWG gauge wire to connect the devices to the 0-10V outputs.

Controller Functions

Controller programs	The controller has four programs to control room temperature. This function allows you to choose a program in accordance with the current age of the animals for instance.
Status LEDs	Pilot lights indicate the status of the controller outputs, allowing you to monitor the system's operation without having to enter the building.

Removable connectors	Allows you to remove the connectors from the main board to have more space to make the connections.
Minimum ventilation cycle	When ventilation is not required to reduce the room temperature, the fan outputs can run either continuously or intermittently to reduce the humidity level and supply oxygen to the room.
Probe past days readings recorded	The controller keeps a daily record of the minimum and maximum readings of the static pressure and humidity probes for the past 180 days. The minimum and maximum readings of each individual temperature probe is also recorded daily for the past 180 days.
Alarm management	Alarms can be configured for high limit and low limit temperatures, defective probes and other system failures. The controller keeps in memory the 25 previous alarm conditions.
Eight independent temperature probe inputs	Eight inside temperature probes can be connected to the controller in order to obtain an accurate reading of the average house temperature and a faster reaction time.
Humidity Control	The control offers many ways to compensate for high or low humidity levels.
0-10V outputs	Four 0-10V outputs can be used to activate additional fans, heat mats, or lights.
Control of the air inlet movement	If the controller is used in combination with one or more air inlet modules, the movement of air inlets can be coordinated with the operation of the fans, using a potentiometer located on the panel drive. This allows the air inlets to be adjusted correctly, without the influence of uncontrollable factors such as wind or air from adjoining rooms.
Recuperation of the warm air in the attic	In order to make energy savings, the controller can extract the warm air from the attic and send it back into the room.
Natural ventilation	The controller can control up to four curtains located in independent natural zones.
Tunnel curtain control	An endwall curtain can be controlled according to the room temperature or according to the static pressure level in the house.
Vent doors	The controller can open and close vent doors according to a timer at the start-up of each fan stage or it can coordinate the vent door operation with the static pressure level of the room.
Password protection	A password is used to restrict access to some of 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	Re-settable 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, making it possible to centralize the management of information and diversify control strategies.
Test mode	The test mode allows the user to simulate temperature changes and verify the performances of the controller.

Mounting the Enclosure

Correctly mounting the enclosure ensures it is stable and sturdy. It allows you to perform your controller operations with confidence.

1. Using three screws per bracket, fix the two metal brackets to the mounting holes on the back of the enclosure.
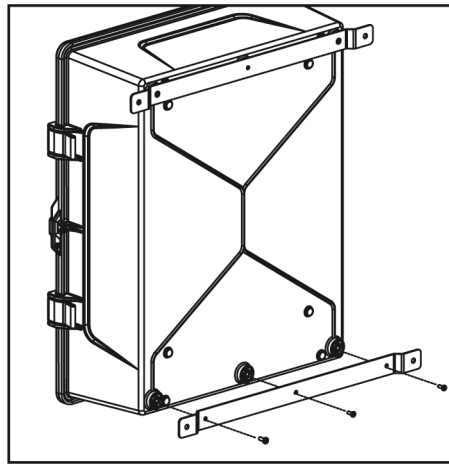
2. Using the four remaining screws, mount the controller onto the wall.

> ⚠️ **CAUTION** *Do not mount the controller directly onto the drywall. Mount it on the supporting structure behind the drywall. If this is not possible, fix pieces of metal or wood into the supporting structure behind the drywall and mount the enclosure onto the structure.*

NOTE: *Make sure to leave enough room to open the enclosure completely in order to service the controller.*

User Interface and LED Status Meaning

User interface
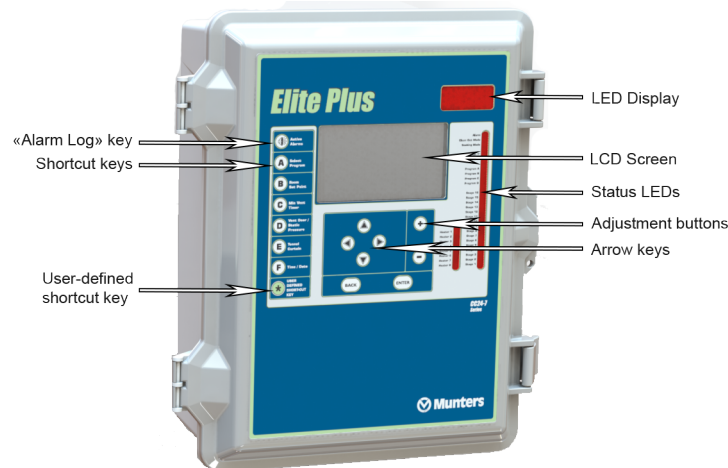
Main LCD screen	The large LCD screen is used to display the various parameters and menus. It automatically displays the Current Conditions menu after 15 minutes of inactivity and its contrast can be modified in the TRANSFER menu
Down arrow key simulator	Use this button to scroll down the current condition menu while the controller's cover is closed.
LED display	This display either shows the current average room temperature and/ or the static pressure level.

Status LED	The status pilot lights indicate the current status of the different stages and outputs. Refer to section 3.3 for further information about these LEDs.
Arrow keys	Use the arrow keys to select a parameter on screen. The right and left arrow keys can also be used to move through the display by pages in some menus (left=page-up, right= page-down).
Adjustment buttons	Press + or - to modify the value of a parameter.
Enter	Press Enter to access the selected menu.
Back	Press BACK to return to the previous menu.
Shortcut keys	Press a shortcut key to access a predefined menu of the controller.
Alarm log	Press this key to access the "Alarm Log" menu.
User defined short-cut key	Press and hold the "User-defined shortcut key" 3 seconds to associate the selected menu with the shortcut key. The destination of this key can be changed anytime.

Status LED

Alarm LED	Turns on when an alarm condition is detected. Flashes when an alarm condition occurred and was re-established by itself
Clean out mode	Turns on when the controller is in clean out mode
Soaking	Turns on when the soaking output is active (on time of the soaking timer)
Message center	Turns on when a message is signaled in the message log menu
Summer/Winter temperature	Indicates which seasonal parameters are currently in use
Program A-B	Indicates which program is currently in use
Clock 1-4	Turns on when a clock output is currently active
Stage 1-12	Turns on when the selected fan stage is active
Heater 1-4	Turns on when the heating output is active
Cooling 1-2	Turns on when the selected cooling output is on

Static Pressure Sensor Tubing: Reference Area

The integrated static pressure sensor is a very robust and reliable tool for controlling your vent door openings. The installation must be carefully done to make sure the controller functions correctly.

Ten feet of clear tubing and insect filters are provided with the controller.

- Insert a plastic insect filter at the end of each tube as illustrated.

- Leave a clearance between the end of the tube and the plastic filter to avoid obstructing the tube.

Clear tube

Insect filter

Free space
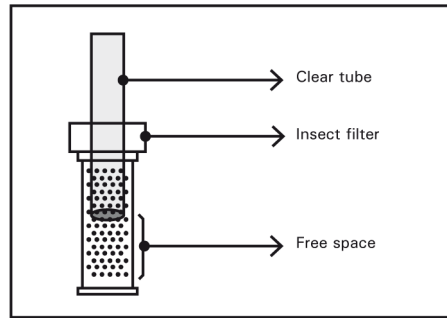
Using the attic as a reference area

The attic can be a good reference area for installing a static pressure sensor tube as long as certain conditions are met:

- The attic must have sufficient openings on all sides of the building to allow outside air to permeate it and ensure that no permanent pressure difference builds up between the attic and outside air (usually, an attic with openings covering 4% of its area is sufficient).

  To test the suitability of the attic as a reference, place the "reference" tube in the attic and the "room" tube outside or in a room with wide openings to the outside (for example, the entrance of a house with wide open doors so the pressure in the room is the outside pressure). The pressure difference must be near zero. You'll notice that the wind may induce a pressure difference for short periods of time (because of a "breathing" effect). This is the reason the pressure sensor has a time delay on any action.

- The attic must be airtight with respect to the adjacent livestock floor. This way, no pressure difference is induced between the reference (attic) and outside pressure due to the action of a fan.

  To test the airtightness of the attic with respect to the ventilated room, place the reference tube in the attic and the room tube outside or in a room with wide openings to the outside. There should be no sensitive pressure drop when you activate or deactivate the fans in the space next to the attic. No vacuum should build up in the attic.

Testing the suitability of the attic

Attic

Plastic insect filters

Air outlet (room)

Air inlet (reference)
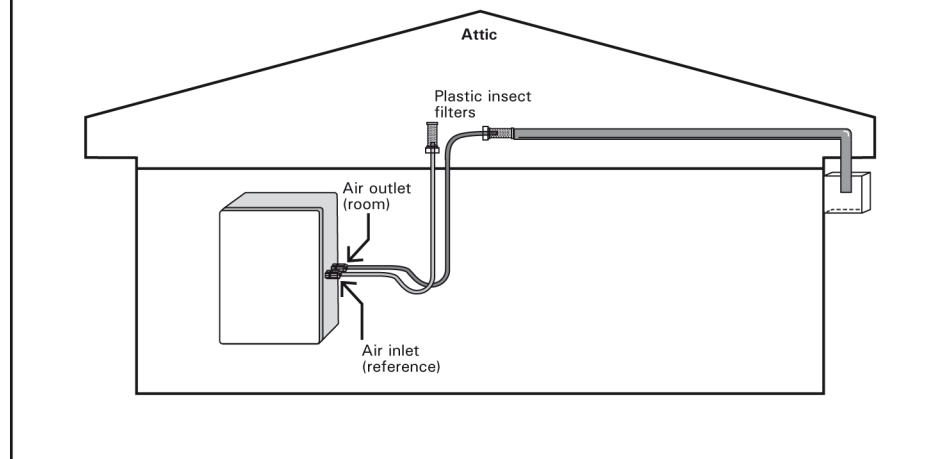
Testing the airtightness of the attic

Attic

Plastic insect filters

Air outlet (room)

Ventilated room

Air inlet (reference)

Fan
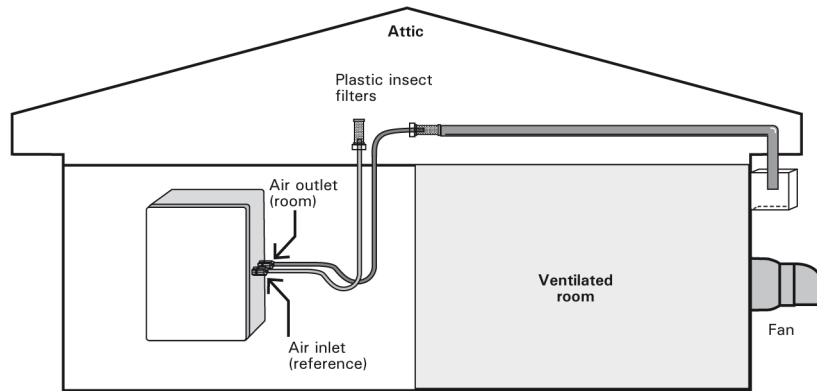
Choosing a good reference area

The purpose of the static pressure sensor is to maintain a slight vacuum inside the building as compared to the outside atmospheric pressure. This pressure difference (usually in the order of 0.03 to 0.09 inches of water) induces the desired air speed at the vent door for an optimum airflow distribution. It is important to understand that the pressure difference to be controlled is the one that exists between either side of the vent door wall. We must therefore be sure that the reference is representative of the current outside pressure.

Installation of an Extended Reference Tube into the Attic: It may happen that the supplied 10' of clear tubing isn't long enough to close the airflow circuit between the room and the attic (reference). In this case, we recommend installing the controller within 10' of the room to be controlled. Use the clear tubing to reach the room and extend the reference tube with a larger pipe or tube (1" pipe is good) to the location of the reference (see diagram). At the reference location, the opening of the pipe should be as large as its section. It should point downwards, using an elbow if necessary, and be protected from any direct airflow from the outside. The use of a coarse screen is recommended to stop insects from plugging up the pipe. Once the installation is completed, perform the above tests to validate the reference.

Installing an extended reference tube in the attic

Attic

1" pipe

insect screen

Air outlet (room)

loop to trap humidity

Plastic insect filter

Air inlet (reference)

Ventilated room
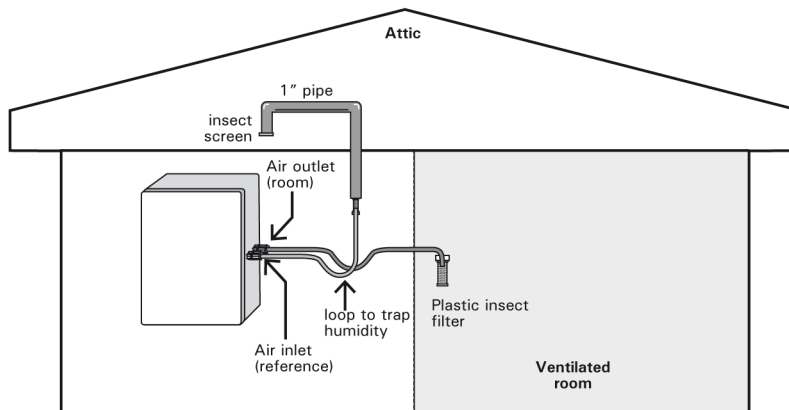
Averaging Two Sides of the Building: Some attics are not suitable as a reference because they have eave openings only on one side or they have only ridge openings. In this case, we recommend using a reference box in the attic connected to extended reference tubes. This box should be airtight and mounted in the center of the attic. It should be connected to two 1" tubes that extend to either side of the building at 25" from the building end. Connect the supplied clear tube to the reference side of the pressure sensor and make a loop close to the controller. Connect the extended reference tube to the box.
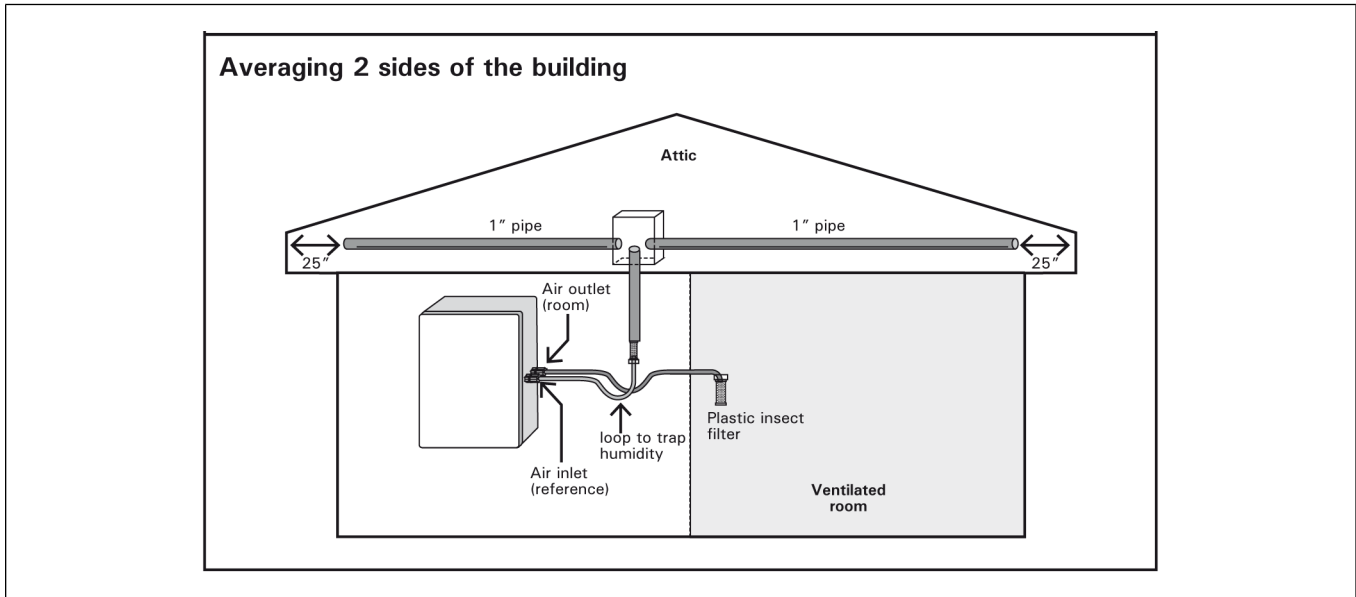
Using An Extended Outdoor Reference

If, for any reason, the attic fails to meet one or both of the above two conditions, or if the building does not have an attic, you should consider using an outside reference.

A good place to start is on the inlet side of the room, at a minimum distance of 25 feet from any corner of the building to avoid a wind vacuum effect. The tube should be installed in a box or a restricted space to avoid undesirable sun and wind effects. Avoid mounting the box in the airflow path into the building. Stay at least 2 feet from the inlet opening. The box should be filled with mineral wool Using an extended outdoor reference 2' Removable plug Attic Air inlet (reference) 1" pipe loop to trap humidity Air outlet (room) Plastic insect filter Ventilated room to absorb most of the fluctuations caused by the wind. Make at least thirty holes of ¼" on the sides and bottom of the box (do not make holes on the top).

Use the clear tube to reach the room and make a moisture trap loop. On the reference side, use the supplied clear tube, make a loop and join the extended reference tube. The extended reference tube should have a bigger diameter (1" is good). Run the extended tube to the location of the reference. Make a loop on the way to trap moisture if undesirable airflows occur. This trap should include a plug to drain the water. Try to run the pipe inside the building as much as possible.

Using an extended outdoor reference
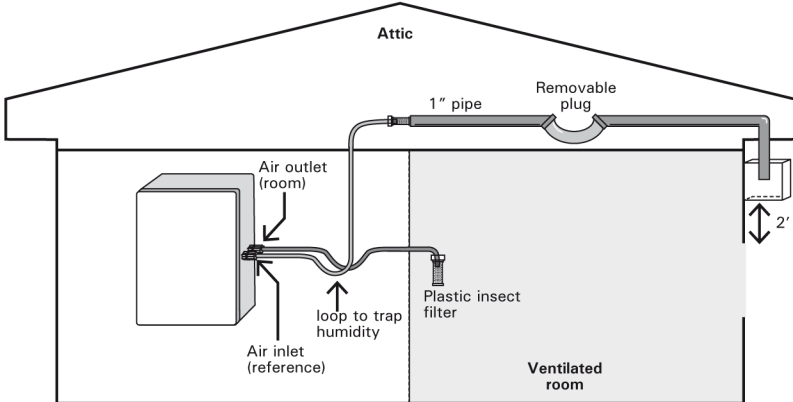
2   Controller Setup

Topics Covered in this Chapter

- Setting the Time and Date
- Setting Day and Night Start Times
- Modifying the Installer Password
- Using Controller Programs and Seasonal Settings
- Copying and Pasting a Program Configuration
- Selecting the Units of Measure
- Configuring the Installation
- Configuring 0-10V outputs
- Assigning Probes to Outputs
- Calibrating the Probes and Water Meters
- Relay Assignment
- Fan Stage Relay Assignment
- Assigning a Heater Relay
- Assigning a PI-Heater Relay
- Assigning Relays to Clock Outputs
- Assigning Cooling Output Relays
- Assigning Backup Box Relays
- Assigning Feeder Relays
- Assigning Soaker Relays
- Assigning Virtual Normally Closed Relays
- Assigning 2nd Room Relays
- Using Test Mode
- Viewing Controller Version
- Clean Mode

Setting the Time and Date

1. Using the arrow keys, navigate to **23. Controller Setup→4. Time and Date**, and press the **Enter** key to change into edit mode.

2. Use the +/- adjustment buttons to select and change the values in the popup window.

3. Once the correct value is selected, press the **Enter** key.

4. Repeat steps 2 and 3 until you have set all time and date fields.

Setting Day and Night Start Times

If night functions are used, you must specify at what time the day and night start and what is the transition time between both of them. The transition time is the interval of time over which the controller gradually switches from daytime to nighttime settings.

1. Using the arrow keys, navigate to **23. Controller Setup→6. Day/ Night Time**.

* Available if night functions are enabled

2. Set the day and night start times as well as the transition time.

Modifying the Installer Password

This function allows identifying 2 different types of users. The password is made up of 4 digits and it is used to restrict access to certain functions of the controller. When a correct password is entered, the current user is identified.

What You Should Know

Installer Password (default = 0-6-1-0) The installer password gives full access to all the controller functions. **User Password (default = 1-1-1-1 & 2-2-2-2)** The user passwords give access to the basic functions of the controller. The controller automatically returns to the user mode after 15 minutes of inactivity. **The user passwords cannot be modified.*

1. Navigate to **23. Controller Setup→7. Password**.

2. Press Enter to display the password pop-up window.

3. Use the +/- adjustment buttons to enter the first digit of the password.

4. Repeat step 2 to set all 4 numbers.

5. If you have entered the installer password, the option to **Change Password** is displayed.

6. Enter the new installer password using the +/- adjustment buttons besides both the **Change password** field and the **Confirm Password** field.

Using Controller Programs and Seasonal Settings

The controller has 4 programs of temperature settings. Each program has its own temperature set-point as well as its own probe and relay assignment to run fan stages 1-6 and heating stages (optional). Using programs is useful when different sections of the room are occupied in the course of a batch. The temperature at which fan and cooling stages are activated can be set separately for summer and winter. You must select the current season as explained below.

Before You Begin

IMPORTANT: *Make sure the right program & season are selected before adjusting any parameter.*

1. Navigate to **6. Program Selection or press A**.

2. Select the desired program. **Only the programs that have been enabled in the installation setup are available.*

3. Select the current season. The ventilation, heating and cooling outputs run according to the parameter settings that are associated with this season.

Copying and Pasting a Program Configuration

Use the copy-paste function to duplicate the selection of probes that are used to measure the average room temperature and the selection of relays (regular & timer-based relays), and variable outputs that are

used by fan stages 1 to 6 from a program onto another. This avoids repeating the same programming sequence several times.

1. Navigate to **22. Relay and Probe Assignment→21. Copy Paste**. *Menu only accessible with Installer password.*

2. Set the field **Select item to copy:** to Program.

3. Select the source program to be duplicated in the **Copy from:** field.

4. Select the target program to copy the program to in the **Paste to:** field.

5. Select **Yes** in the **Confirm** field to start the program copy.

   The message *Copy in progress* is displayed. The pasting is done once the message is no longer displayed.

Selecting the Units of Measure

1. Navigate to **23. Controller Setup→8. Units**.

2. Select the desired unit of measure for the following:

   Time display — AM/PM or 24 hours

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

   Water — Gallons or Liters

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

   Measuring units are common to all programs of the controller.

Configuring the Installation

Every installation is unique. There are a variety of features that you can enable of disable to customize you controller for your needs. Configuration of an installation is normally only done once.

1. Navigate to **23. Controller Setup→2. Installation**. *This menu is only accessible with the Installer password.*

2. Set the following parameters:

   Clear Alarms? — Select *Yes* to reset the Alarm Log.

   Number of sensors used — Select the number of temperature probes that are connected to the controller. This parameter ranges from 1 to 8 probes.

   Number of Water Meters — Select the number of water meters that are connected to the controller. This parameter ranges from 0 to 18 water meters. The first 2 water meters are directly connected to the main board of the controller; water meters 3 to 18 are connected to an external water meter module. Refer to the wiring diagram.

   Number of Relays — Select the total number of relays provided by the external relay panels (10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 16, 32, 48, 64, 40CS, 48CS, 80CS ,88CS, 96CS). *Select the CS option if your relay panel is compatible with the CS technology (current sensing relays).*

   Number of ventilation Stages — Select the number of fan stages. This parameter ranges from 1 to 16 stages. *The minimum number of fan stage is limited by the stage that is used to enter in tunnel ventilation.*

Number of Programs — Select the number of controller programs. This parameter ranges from 1 to 4 programs — None=1 program; ab=2 programs; abc=3 programs; abcd=4programs.

Number of Heater Stages — Select the number of heating stages. This parameter ranges from 0 to 8 stages.

Number of Naturals — Select the number of natural ventilation zones. This parameter ranges from 0 to 4 zones.

Number of Coolings (Mist) — Select the number of cooling outputs. This parameter ranges from 0 to 4 outputs.

Cooling Follow SetPoint — Select Yes if you want the Start/Stop temperatures of the Coolings to be referenced to the house set-point.

Number of Clocks — Select the number of clock outputs. This parameter ranges from 0 to 8 outputs.

Clock Increment — The start & stop times of clock outputs can either be adjusted in increments of 1, 5 or 10 minutes. Select the desired time increment.

Number of Feeders — Select the number of feeders.

Show Ration History — The ration history is displayed on screen.

Flow Rate Feeder — Select the flow rate of the feeders.

Use Night Set Point? — Select *Yes* to enable night settings.

Use Set Point Curve? — Select *Yes* to enable a curve to get an automatic adjustment of the set point over time.

Use Minimum Vent. Curve? — Select *Yes* to enable a curve to get an automatic adjustment of the minimum ventilation fan speed (or fan On Time) over time.

Use Heater Offset Curve? — Select "Yes to enable a curve to get an automatic adjustment of the heaters' start temperature over time.

Use Heater Programs? — Select *Yes* to use separate heat settings for each program (probe and relay assignment); select *"No"* if these settings are common to all programs. *This parameter is available if heaters & programs are enabled above.*

Use Heater Lo/Hi Fire? —
Select *Yes* to activate the heating outputs' Lo & Hi fire option. This function allows doubling the number of heaters. *This parameter is available if heaters are enabled above.*

Use Animal Age Function? — Select *Yes* to use functions that are based on the age of the animal age (curves, light programs, tunnel curtains, etc.) *This parameter is available if all curves are disabled above.*

Use Tunnel? — Select *Yes* to enable the tunnel curtain.

Tunnel Mode — The tunnel curtain operates according to the static pressure level or uses a timer? *This parameter is available if the static pressure probe is enabled below.*

Vent Door Transition — Select the transition mode between lateral and tunnel ventilation *This parameter is available if the tunnel curtain is enabled and if the vent door operation is based on the static pressure.* **Open:** vent doors fully open at the start-up of the first tunnel stage. **As is:** vent doors remain in position at the start-up of the first tunnel stage (only available if the curtain operates according to the static pressure level). **SP:** vent doors keep being controlled by the static pressure level during the transition (only available if the curtain operates in timer mode).

Tun. PreOpenType — Select at what moment the tunnel curtain starts being controlled by the static pressure level: right after the pre-opening delay (Normal Pre- Opening), or at the startup of the second tunnel stage (Tunnel Help mode). In tunnel help mode, the curtain opens during the pre-opening delay then remains in position; it starts being controlled by the static pressure when the following stage starts. *This parameter is available if the tunnel curtain's operation is based on the static pressure and if the curtain is not used in natural ventilation.*

Tunnel Pre open Time — This delay is used to open the curtain before activating the fans when the controller enters in tunnel ventilation. This parameter ranges from 0 to 60 seconds. *This parameter is available if the tunnel curtain's operation is based on the static pressure and if the curtain is not used in natural ventilation.*

Mult. Tun. Stg w/age — (Multiple Tunnel Stages with age) This parameter limits the use of tunnel stages according to the animal age. It allows specifying the maximum tunnel stage that can be performed at three different ages. *This parameter is available if the tunnel curtain and animal age functions are enabled.*

Tunnel Follow Natural? — Select *Yes* to keep using the tunnel curtain while the controller is in natural ventilation.

Use Stir Fans? — Set to *Yes* to use stir fan relays on stage 1 .

Var. 1-2 Minimum Speed — Set the absolute minimum speed of both variable outputs.

Use Ramping on Stage 1? — This function allows to smooth out the transition from the minimum ventilation cycles to the full operation of stage 1. Select *Yes* to enable this option. *This parameter is available if variable outputs are disabled.*

Use Ramp. Below SetP — With this function, the controller automatically adjusts the run time of stage 1 fans in minimum ventilation according to the outside temperature: as the weather gets colder, the fan run time decreases gradually to compensate for the change.

Stage 1 Ramp Delay (Advanced) — This delay is used when the outside temperature is greater than the outside set point (or if no outside temperature sensor is used). If the difference between the current On Time of stage 1 and the On Time calculated by the ramping algorithm is greater than this delay, the On Time becomes the new calculated value. *This parameter is available from the factory mode and if variable outputs are disabled.*

Stage 2 Ramp Delay (Advanced) — This delay is used when the outside temperature is lower than the outside set point. If the difference between stage 1's current On Time and the calculated On Time value is greater than this delay, the On Time becomes the new calculated value. *This parameter is available from the factory mode, if the ramping on stage 1 function is enabled above, and if the outside temperature probe is enabled below.*

Outside T° Set Point (Advanced) — The controller uses this value to calculate the ramping delay. *This parameter is available from the factory mode (dealer), if the ramping function on stage 1 is enabled, and if the outside temperature sensor is enabled below.*

Ramping Cycle (Advanced) — Frequency at which the ramping cycle is calculated. *This parameter is available from the factory mode (dealer), and if the ramping function on stage 1 is enabled above.*

Use Outside Temperature? — Select *Yes* if an outside temperature probe is connected to the controller.

Use Outside Temp. Influence? — Select Yes to use the outside temperature influence on the temperature alarms.

Use Relative Humidity?: — Select *Yes* if a humidity sensor is connected to the controller.

Use Static Pressure? — Select *Yes* if a static pressure (SP) sensor is connected to the controller.

SP Vent Set 2 — Select at what moment the second set of pressure set points start being used for the operation of vent doors: Select *"Stage"* to start using the second group of set points at the startup of a specific fan stage; select *"Out T°"* to start using it as the outside temperature decreases; select *"None"* to disable this function.*This parameter is available if the tunnel curtain operates according to the static pressure.*

Pre-Open Mode — In minimum ventilation, the controller slightly opens the vent doors before activating the fans. Select *"Auto"* to use an automatic pre-opening delay or select *"Man"* to set this delay. *This function applies to both the vent door outputs and the attic vent outputs.*

Pre-Open Vent Doors — The pre-opening of vent doors can be adjusted from 0 to 60 seconds.

Pre-Open Vent/Attic — The pre-opening of the attic vent ranges from 0 to 60 seconds. *This parameter is available if the second inlet is used as an attic vent (see below).*

Auto Pre-Open VDoor — This is a read-only parameter. Its initial value is that of "Pre- Open Vent Doors", but it will automatically change if the S.P. goes out of limits during the on-time part of the minimum ventilation cycle. *This parameter is available if the preopening mode is set to "Auto" above.*

Auto Pre-Open Vent/Attic — This is a read-only parameter. Its initial value is that of "Pre-Open Attic", but it will automatically change if the S.P. goes out of limits during the on-time part of the minimum ventilation cycle. *This parameter is available if the second inlet is used as a pressure-based attic vent and if the pre-opening mode is set to "Auto" above.*

SP Tunnel Set 2? — Select *"Stage"* if the tunnel curtain starts using a second group of static pressure set points at the start-up of a specific ventilation stage; select *"None"* if the tunnel curtain does not use a 2nd group of pressure settings. *This parameter is available if the tunnel operates according to the static pressure .*

1st Inlet Mode — Select the proper operating mode of the main vent door
SP: Select "SP" if the first inlet output is used to control pressure-based vent doors.
Time: Select "Time" if the first inlet output operates according to the room temperature and the position of the actuator is determined by a built-in timer of the controller.
None: Select "None" to disable the 1st inlet.

Sidewall Follow Natural? — Select *Yes* to use vent doors in Natural ventilation, or select *No* to disable it.

Use 2nd Inlet? — In order to enable the second inlet output, select the particular function of this output: it can either be used to control an attic vent (select *"Attic"*), or it can be used as a supplementary tunnel curtain or vent door output (in both cases, select *"2nd Inlet"*).

Attic Mode — Specify the operating mode of the attic vent: select *"SP"* if it moves according to the level of static pressure or select *"Time"* if it moves according to a timer. *This parameter is accessible if the second inlet output is used to control an attic vent and if the static pressure sensor is enabled above.*

2nd Inlet Type — If the second inlet <u>does not </u>control an attic vent, select its particular function: tunnel curtain or sidewall (sidewall = vent door). *This parameter is accessible if the second inlet output does not control an attic vent.*

2nd Inlet Mode — Specify the operating mode of the second inlet: select *"SP"* if it moves according to the level of static pressure or select *"Time"* if it moves according to a timer. *This parameter is accessible if the second inlet output does not control an attic vent and if the static pressure sensor is enabled above.*

Attic/2nd Inlet Probe — The controller allows you to specify the temperature probe that is used by the second air inlet output. Select *"Room"* if the output refers to the room temperature or select *"Indiv"* to specify a particular probe in the *"Probe Assignment"* menu. *Note that this parameter is displayed for consultation purpose only. It has no effect on the way the 2nd inlet operates.*

Use Ext. Inlets — Select *Yes* to use external inlets.

Number of Inlets — If the inlets are connected to external inlet modules such as the SB 3000 or SB 3500 modules, specify how many inlets (or modules) are connected to the first inlet output. This parameter ranges from 0 to 10 inlets. *This parameter is available if the Use Ext Inlets is set to "Yes" below.*

Use SP Comp. on Inlets? — Select *Yes* for the controller to adjust the opening of the air inlets when the static pressure level gets out of range. *This parameter is available if an air inlet and the static pressure sensor are enabled above. To enable an air inlet, set the "Use Ext. Inlets" to "Yes" below and then enable the proper number of inlets above.*

Use Temp Comp. on Inlets? — Select *Yes* for the controller to adjust the opening of the air inlets when the temperature reading of the inlets' probes differs from the average room temperature read by the controller. *This parameter is accessible if an air inlet is enabled above ("Use Ext. Inlets" is set to "Yes" and number of inlets is greater than 1).*

Monitor Breaker Temp.? — Select *Yes* to monitor the temperature of the main breaker. When this function is enabled, the controller sounds an alarm if the temperature of the sensor located near the breaker gets too high.

NOTE: *Install the breaker's probe close to the breaker box, not inside the box!*

Use 2nd Room? — Select Yes to enable the 2nd room.

Shown on Digit LED Display — Select *Yes* next to Static pressure and/or Inlet Position for them to be displayed on the LED

Configuring 0-10V outputs

The controller has two 0-10V outputs to control light stages, supplementary fans or heating devices.

The different output types are as follows:

Lights — This type will configure the 0-10V output to follow the changes in the current light program.

Variable — This type will configure the 0-10V output to behave as an additional variable output. It can be associated to one or more fan stages. See section Variable Outputs & Timer Settings to associate a 0-10V output configured as "Variable" to a fan stage. Refer to section Fan Stage Settings to configure the bandwidth of the 0-10V output configured as "Variable".

NOTE: *If you are using 0-10V outputs configured as "Variable", always use the first outputs orderly. Example, if you use only 2 variables, use output 1 and 2.*

Cooling/Heater — This type will configure the 0-10V output to behave as an additional output operating independently from the regular fan and heater stages. See chapter 4, section 0-10V Output Fan Settings and chapter 5, section 0-10V Output Heater Settings for a detail description.

PI-Heater — This type will prepare the 0-10V output to control a variable heater. See chapter 5 for a detailed description.

Not Used — The output is deactivated.

Assigning Probes to Outputs

Temperature probes are used to measure the room temperature. They are assigned to outputs in order to control and monitor the outputs of the controller.

1. Navigate to the desired probe assignment menu:

   »»14. Probes for Stages

   »»15. Probes for Heaters

   »»16. Probes for Coolings

   »»17. Probes for Naturals

   »»18. Probes for 2nd Room

   »»19. Probes for External Inlets

   »» 20. Probes for 0-10V Outputs

   »»21. Probes for Main Breaker

   »»22. Probes for 1st Inlet

   »»23. Probes for Attic/2nd Inlet**

   This menu is only accessible from the installer mode

   ** *This menu is accessible if the "Attic / Ven Doors Probes" parameter is set to "Indiv." in the installation menu*

2. Depending on the chosen output, assign the temperature probes as follows:

Probes for Stages (or Room Temperature)	All fan stages operate according to the average temperature in the room. Select what probes are used to measure the average room temperature. *Make this probe assignment separately for each program in use (if applicable).*
Probes for Heaters	Each heating output operates according to the average temperature reading of a chosen temperature probe set. Select what probes are used to control each one of them (regular & Hi Fire heating stages). *Make this probe assignment separately for each program in use (if applicable).*
Probes for Cooling Outputs	Each cooling output operates according to the average temperature of a chosen temperature probe set. Select what probes are used to control each one of them. Note that the outside temperature probe (probe 0) can also be part of the average temperature. That is to make sure the outside temperature is sufficient to permit the activation of the cooling output. *This parameter is available if cooling outputs are enabled in the installation setup.*
Probes for Naturals	Specify which temperature probes are located in each natural ventilation zone. When the controller operates in natural ventilation, the natural curtain

	will move as a function of the ambient temperature of its respective zone. Note that the outside temperature probe (probe 0) can also be part of the average temperature of a zone. That is to make sure the outside temperature is sufficient to permit the opening of the natural curtain. *This parameter is available if natural zones are enabled in the installation setup.*
Probes for 2nd Room	Specify which temperature probes are located in the 2nd room. The probes used here must be independent from those used in the main room. *This parameter is available if the 2nd room is enabled in the installation setup.*
Probes for External Inlets	Each inlet that is connected to a SB module operates according to the average reading of chosen temperature probes. Select what probes are used to control each one of them. *This parameter is available if inlets are enabled in the installation setup.*
0-10V Outputs	Each 0-10V output that is used for cooling or heating operates according to the average temperature reading of a chosen temperature probe set. Select what probes are used to control each one of them.
Main Breaker Probes	A probe can be used to monitor the temperature of the main breaker so that the controller can sound an alarm if the breaker's temperature gets too high. Select which probe is used for this purpose.
Probes for Attic/2nd Inlet	If the second air inlet output uses particular temperature probes, please select them in this table. *Note that this selection of probe is made for consultation purpose only. It has no effect on the way the 2nd inlet operates.*
Probes for 1st Inlet	If the first vent door output uses particular temperature probes, please select them in this table. *Note that this selection of probe is made for consultation purpose only. It has no effect on the way the vent door operates.*

Calibrating the Probes and Water Meters

You can slightly adjust the reading of each probe input in order to obtain accurate and uniform readings from all probes. In addition, if a water meter is used, you must calibrate its water flow rate.

1. Navigate to **23. Controller Setup→3. Probe Calibration**.

   * *This menu is only accessible with the Installer password*

2. Adjust the reading of the probes if required:

Inside Temperature Probe — The reading of the inside and outside temperature sensors can adjusted of ±5°F (±2.3°C).

Relative Humidity Probe — The reading of the humidity sensor can adjusted of ±3%.

Static Pressure (SP) Probe — The reading of the static pressure probe can adjusted of ± 0.030"WC (±7Pa).

Water Meters — Set the water flow per pulse of each water meter. This parameter ranges from 1 to 100 gallons (or liters) per pulse.

Relay Assignment

External relay panels can be connected to the controller. In all, the controller can monitor up to 100 external On/ Off relays and 2 variable outputs. Different relays can be hooked up to various fan stages or outputs. Refer to the wiring diagram enclosed with this manual to connect the relay panels to the controller and to wire the loads. Note that the relay assignment can only be done with the Installer password. Worksheets are available the end of this manual to write down your relay assignment settings. Use the arrow keys to navigate through the relay assignment window.

Fan Stage Relay Assignment

This section shows how to assign relays to fan stages, how to use variable outputs, and how to enable stir fans and timer-based relays in the stages.

Ventilation relays

Timer-based relays on fan stages timer-based relays run according to a timer as long as their associated fan stage is on. They are useful to run devices that need to follow the same progression as fan stages in timer mode.

Stir fan relays on fan stage 1: Stir fan relays of stage 1 run continuously in minimum ventilation and during stage 1. Using this type of relay allows activating stir fan outputs without interruption while minimum ventilation cycles are performed.

Variable outputs: Each fan stage can use two variable fan outputs. Specify the operating mode of the variable outputs for each fan stages as follows:

- Var.: When the fan stage starts, the variable outputs starts at its minimum intensity then gradually increases in speed as the fan stage progresses.

- On: The variable output acts as an On/ Off output: it is activated at its full capacity when its associated fan stage is on..

- Off: The variable output is not activated.

Configuring fan stage relay settings

Select the relays associated with each fan stage:

1. Navigate to **22. Relay and Probe Assignment*→1. Relays for Stages****

    * This menu is only accessible with the Installer password.

    ** Refer to the previous section to get further information about these parameters.

2. Select a fan stage and assign a relay to the selected stage. Put a check mark to assign an On/Off relay, select "TMR" to assign a timer-based relay, "STR" to assign a stir fan relay.

Timer-based relays are used to activate misting units. If cooling units are programmed to stop when the humidity level gets too high, timer-based relays will also stop running (except if the controller is in minimum ventilation.

Configuring variable outputs and timer settings

1. Navigate to **22. Relay and Probe Assignment*→1. Relays Timer/Variable Settings**

   * This menu is only accessible with the Installer password.

2. Select a fan stage:

   Variable 1-2 — Set the status of both variable outputs during the selected fan stage (On, Var. or Off). **This parameter is available if variable outputs are enabled*

   0-10V Output 1-4 — Set the status of both the 0-10V outputs configured as variables for the selected fan stage (On, Var. or Off). **This parameter is available if the 0-10V outputs are configured as variable outputs.*

   Relay Timer Mode — Select whether the relays' timer is set in seconds (0 to 900 seconds) or in hours (0 to 9:00 hh:mm).

   Relay On Time — This is the run time of timer-based relays for the selected fan stage. This parameter ranges from 0 to 900 seconds (or 0 to 9:00 hh:mm).

   Relay Off Time — This is the idle time of timer-based relays for the selected fan stage. This parameter ranges from 0 to 900 seconds (0 to 9:00 hh:mm).

NOTE: *You must assign relays to all fan stages in use. An alarm sets off when a fan stage that does not activate any relay is activated (this is true except for natural ventilation stages and for variable stages 1 and 2). When this type of alarm occurs, the controller keeps using the relays of the previous fan stage.*

NOTE: *The relay assignment for fan stages 1 to 6 must be done separately for each program in use. Press "A" to select a program.*

Copying and pasting fan stage relays

It is possible to duplicate the relay selection of a fan stage onto another stage by using the copy and paste function. This avoids repeating the same programming sequence several times.

1. Navigate to **22. Relay and Probe Assignment*→21. Copy Paste**

2. Set the following parameters:

   Select item to copy — Select the "Stg Relay" option.

   Copy From — This is the source fan stage. The one that will be duplicated.

   Relay On Time — This is the target fan stage. The one on which the copied relays will be pasted.

3. Once the source and the target stages have both been defined, the message "Confirm?" appears on the display. Select "Yes" to confirm the stage relays' duplication. The message " Copy in progress.... please wait.. " is displayed. Wait until the duplication process is over.

Assigning curtain, vent door and attic relays

Assign an opening and a closing relay to each output that uses an actuator (natural ventilation curtain, vent doors, 2nd air inlet output & tunnel curtain). Connect these outputs to the relays that have been designed for this purpose on the relay panels (Open/ Off/Close relay).

1. Navigate to **22. Relay and Probe Assignment***. Select the relay assignment menu ****3. Tunnel Curtain or 4. Vent Door or 5. Attic/2nd Inlet (for the 2nd tunnel curtain, 2nd sidewall vent or for the attic vent) or 9. Natural**

   * This menu is only accessible with the Installer password.

   ** Only the outputs that are enabled in the installation menu are available.

2. Select the output's opening relay and then put a check mark to assign the opening relay.

3. Select the output's closing relay and then put a check mark to assign the closing relay.

Assigning a Heater Relay

Assign relays to all heating outputs and to all high fire heating outputs (if applicable). If heater programs are enabled, assign relays separately for each program in use.

1. Navigate to **22. Relay and Probe Assignment→Relay for Heaters**.

   * This menu is only accessible with the Installer password

   ** This menu is accessible if heaters are enabled

2. Select the proper heating output amongst the ones that have previously been enabled.

3. Put a check mark to assign a relay.

Assigning a PI-Heater Relay

Assign relays to all 0-10V outputs configured as PI-Heaters. If heater programs are enabled, assign relays separately for each program in use.

1. Navigate to **22. Relay and Probe Assignment→Relay for PI-Heaters**.

   * This menu is only accessible with the Installer password

   ** Available if 0-10V outputs are configured as PI-Heaters

2. Put a check mark to assign a relay.

Assigning Relays to Clock Outputs

1. Navigate to **22. Relay and Probe Assignment*→6. Relay for Clocks**→1. Relay Assignment**

   *This menu is only accessible with the Installer password

   **Available if clock outputs are enabled

2. Select a clock output.

3. Put a check mark to assign a relay.

The following is an example of how to deactivate an output during the night:

Heater 4 uses relay 6

Clock output 1 also uses relay 6. Relay 6 is a common relay.

Clock output 1 is disabled during night.

 Result : Heater 4 operates normally as long as clock output 1 is active but cannot be enabled during the night while the clock output is off.

Selecting common relays

It is possible to match the activation of some outputs with the activation of clock outputs by using common relays. All outputs that share a common relay must be activated simultaneously for the relay to switch. This function may be used to deactivate an output during the night or on specific days of the week for instance. Devices that share common relays with clock outputs are thus stopped when the clock output is off. This is true for all types of outputs except for fan stages and cooling outputs: these output relays are not affected by common relays.

1. Navigate to **22. Relay and Probe Assignment*→6. Relay for Clocks**→2. Common Relays**.

    *This menu is only accessible with the Installer password

    **Available if clock outputs are enabled

2. Put a check mark to identify a common relay.

Assigning Cooling Output Relays

1. Navigate to **22. Relay and Probe Assignment*→Relays for Cooling****.

    *This menu is only accessible with the Installer password

    **This menu is accessible if cooling outputs are enabled

2. Select a cooling output.

3. Put a check mark to assign a relay.

Assigning Backup Box Relays

Select the backup box relay. This virtual normally closed relay opens when a controller or power failure occurs.

1. Navigate to **22. Relay and Probe Assignment*→Relays for Backup**.

    *This menu is only accessible with the Installer password

2. Put a check mark to assign a relay.

Assigning Feeder Relays

Feeder relays are virtual normally closed contact. This contact opens when a feeder run time alarm occurs, causing the stop of the feeder's motor.

1. Navigate to **22. Relay and Probe Assignment*→Relays for Feeder**.

    *This menu is only accessible with the Installer password

2. Put a check mark to assign a relay.

Assigning Soaker Relays

Soaker relays are virtual normally closed contact.

1. Navigate to **22. Relay and Probe Assignment*→Relays for Soaker**.

    *This menu is only accessible with the Installer password

2. Put a check mark to assign a relay.

Assigning Virtual Normally Closed Relays

Select the relays that have to behave like normally closed relays (N.C.) Note that from a hardware point of view, every relay in the relay panel is normally open (N.O.) This feature allows to invert the logic of the selected relays.

1. Navigate to **22. Relay and Probe Assignment*→13. Virtual Normally Closed Relays**.

   *This menu is accessible with the Installer password

2. Put a check mark to assign a relay.

Assigning 2nd Room Relays

Select the relays that are associated with the heater and cooling devices installed in the 2nd room as follows:

1. Navigate to **22. Relay and Probe Assignment*→7. Relays for 2nd Room****.

   *This menu is accessible with the Installer password.

   **This menu is accessible if the 2nd room is enabled

2. Select an 2nd room output.

3. Put a check mark to assign a relay.

Using Test Mode

The test mode is used to simulate temperature and static pressure changes to verify the controller's performance. The temperature probe and static pressure inputs are turned off while the test mode is on. This mode is automatically deactivated after 15 minutes of inactivity or when you disable it.

1. Navigate to **23. Controller Setup→9. Test Mode**.

2. Set the following parameters:

   Test Mode Status — Select "Yes" to enable the test mode,select "No" to exit from the test mode.

   Temperature — Enter the simulated room temperature. **This parameter can only be changed if the test mode status is enabled above.*

   Static Pressure — This is the current static pressure level in the room. This value is shown as a reference only; it cannot be modified. **This parameter is only shown if the static pressure sensor is enabled.*

Viewing Controller Version

This menu shows your controller's version number. This piece of information is useful to get technical support.

Navigate to **23. Controller Setup→10. Version**

The controller version is displayed on screen.

Clean Mode

The clean mode is used to interrupt regular operations of the controller when the room is empty. When this mode is enabled, the controller simply provides a minimum level of heat and a minimum level of ventilation (optional).

Cleaning the room

A soaking output can be activated to clean up the room. If this output is used, soaking cycles automatically start when the clean mode is on. Refer to chapter 11 of this manual to get further information about the soaking output.

Clean mode set point

When the clean mode is on, the controller ativates heating outputs when the room temperature falls below the clean mode set point.

NOTES

3 Temperature

Topics Covered in this Chapter

- Temperature Settings

Temperature Settings

Temperature setpoint

The set point is a target temperature; the activation and deactivation of the various stages is based on this reference temperature.

Night set point: A night set point can be enabled to lower the target room temperature during night. This set point is relative to the regular temperature set point, which means that if the regular set point changes with time, the night set point is adjusted accordingly. To use a night set point, enable the night set point function in the installation in section.

Clean out mode: Select Yes to enable clean out mode or No to disable clean out mode.

Soaking: Select Yes to enable the soaking output; select No to disable it.

Set point curves: Use a temperature curve to get an automatic adjustment of the set points over a given period of time. The target temperature is thus always adapted to the animals' needs as they grow.

Configuring the setpoint settings

1. Navigate to **7. Temperature SetPoint**.

   Tip

   Press B to access the Temperature SetPoint menu.

2. **NOTE:** *The setpoint can only be modified while the curve is off.*

3. Set the following parameters:

Curve Status — Shows the current status of the set point curve. This piece of information cannot be modified. Refer to section 5.1.2 to modify the curve status. *This parameter is available if the set point curve option is enabled .*

Temperature Set Point — This parameter ranges from -40°F to 100 °F (-40.0°C to 37.8°C).

Night Set Point — This parameter ranges from -40°F to 100 °F (-40.0°C to 37.8°C). *This parameter is available if the night set point function is enabled .*

NOTE: *Each controller program has its own temperature setpoint and setpoint curve.*

Curve setpoint

The set point curve allows an automatic adjustment of the target room temperature over time. The set point changes using 10 steps. Each step specifies a day number and a target temperature for that day. These steps are based on the animal age. Once all steps are defined, the curve must be activated. The controller then starts changing the temperature set point every hour in a linear fashion between

consecutive steps of the curve. When the last step is reached, the temperature set point for that day is maintained until a new animal batch starts and until the animal age is reset.
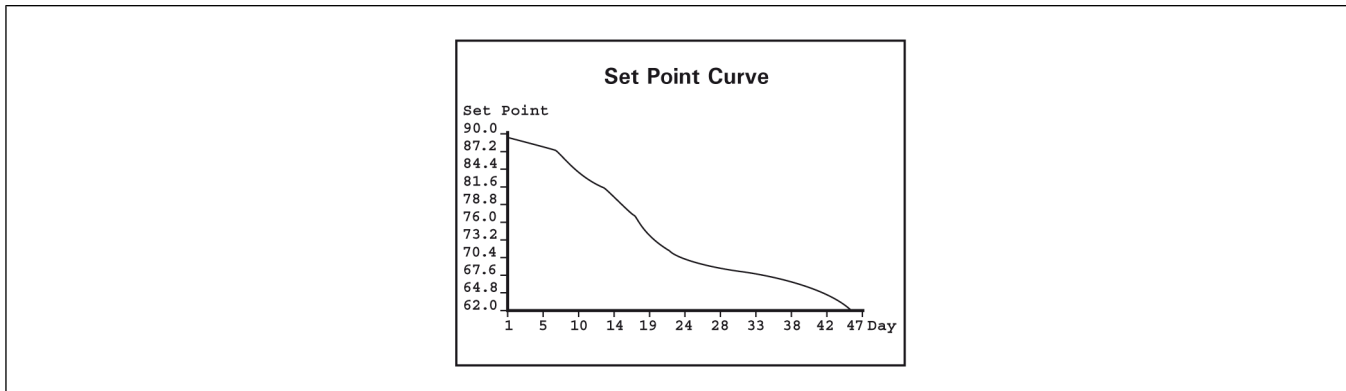
Night set point: If a night set point is used, the set point curve stops being used during night.

The following are restrictions that apply when configuring a curve:

- The highest possible day number is 450

- Decreasing day numbers is not allowed

- All ten steps must be specified. If you don't need ten different steps, repeat the last temperature for each unnecessary step

Configuring setpoint curve settings

1. Navigate to **9. Curve Settings*→1. Temperature SetPoint**.

    This menu s accessible if the setpoint curve is enabled

2. Set the following parameters:

Day Number — Set the day for each of the 10 steps. This number corresponds to the animal age and is adjustable from -5 to 450 days. Negative values are used to prepare the house before the letting the animals enter the building. *Can only be modified while the curve is disabled.

Temperature — Set the temperature associated with each step of the curve. *Can only be modified while the curve is disabled.

Curve Status — Select "Yes" to activate the curve. Once it is enabled, the set point automatically becomes adjusted between consecutive points of the curve; for this reason, the set point and curve steps cannot be modified while the curve is on.

4   Ventilation and Cooling

Topics Covered in this Chapter

- Ventilation and Cooling
- Setting Minimum Ventilation Cycles
- Minimum Ventilation Curve
- Configuring Minimum Ventilation Curves With Variable Outputs
- Configuring Minimum Ventilation Curves Without Variable Outputs
- Minimum Ventilation Ramp and Compensation
- Fan Stages
- Configuring 0-10V Output Fan Settings
- Setting Fan Stage Parameters
- Tunnel Curtain
- Setting Tunnel Curtain Parameters
- Inlets and Vent Doors
- Configuring External Inlet Parameters
- Pressure Based and Timer Based Inlets
- Setting Pressure Based and Timer Based Inlet Parameters
- Attic Vent
- Configuring Pressure and Timer Based Attic Vents
- Cooling Outputs
- Configuring Cooling Output Temperature Settings
- Natural Ventilation
- Configuring Natural Ventilation Temperature Settings

Ventilation and Cooling

Minimum Ventilation Cycles

Minimum ventilation cycles are used below fan stage 1. Running the fans even though ventilation is not required for reducing the room temperature is useful to reduce the humidity level and supply oxygen to the room. It also prevents the fans from freezing in winter. If variable fan outputs are enabled (this includes 0-10V outputs configured as variable), the controller activates these fans at a user-defined speed during the minimum ventilation cycles; if they are not used, the controller then uses stage 1 fans. Minimum Ventilation Timer: The minimum ventilation timer is composed of an "On Time" and of a "Cycle Time". The fans run during the "On Time" and then stop until the end of the "Cycle Time".
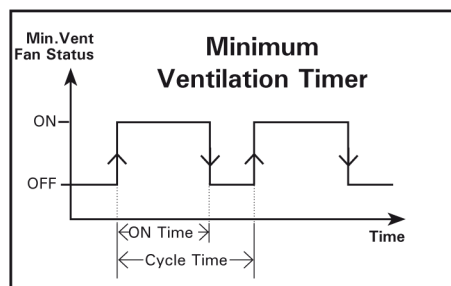
Stir Fans In Minimum Ventilation: Stir fan relays of stage 1 run continuously during the minimum ventilation cycles and on stage 1. This allows bypassing the minimum ventilation's timer.

Setting Minimum Ventilation Cycles

1. Navigate to **8. Minimum Ventilation**.

   Tip

   Press C to access the Minimum Ventilation menu.

2. Set the following parameters if configuring with variable outputs:

   Minimum Ventilation Mode — Variable outputs can be used in minimum ventilation in two different ways:
   Variable mode: minimum ventilation is provided exclusively by variable outputs. During minimum ventilation cycles, the speed of variable-speed fans alternates between 0% and a user-defined fan speed.
   On/Min mode: minimum ventilation is provided by variable outputs and by stage 1 fans. In minimum ventilation, the speed of the variable outputs alternates between a user-defined minimum speed and 100%.

   Curve Status — The minimum ventilation curve status is displayed but cannot be modified.

   On / Off Times — Set the minimum ventilation timer's On and Off times of both variable outputs. This parameter ranges from 0 to 900 seconds.

   Minimum Speeds — Set the speed of both variable outputs that is used in minimum ventilation. *Can only be modified if the curve is disabled .*

3. Set the following parameters if configuring without variable outputs or if Minimum Ventilation mode is set to "On/Min

   On / Cycle Times — Set the On & Cycle times of the minimum ventilation timer. These parameters range from 0 to 900 seconds. *The cycle time is limited by the pre-opening delay of the air intake that is used in minimum ventilation (attic vent or vent door); it must be greater than twice pre-opening delay + 10 seconds. In addition, the cycle time must be greater than the On Time. Finally, note that these parameters can only be modified if the curve is disabled .*

   Calculated On Time — If the minimum ventilation curve is enabled, the fans' on time in minimum ventilation is automatically adjusted over time. The calculated On Time is the current On Time, as defined by the curve. *This value cannot be modified.*

Minimum Ventilation Curve

A curve is composed of 10 steps. Each step specifies a day number and a minimum ventilation speed (or "On Time") for that day (the day number refers to the animal age). When the curve is activated, the

controller changes the minimum ventilation speed (or "On Time") every hour in a linear fashion between consecutive steps of the curve. When the last step is reached, the controller keeps using the speed (or "On Time") associated to that day.

If Variable Outputs are used: If variable-speed fans are used in minimum ventilation, the controller can automatically increase the minimum ventilation speed over time with a curve. The speed curve must be defined separately for each variable-speed fan.

Without Variable Outputs: If On/Off fans are used in minimum ventilation, the controller can automatically increase the *"On Time"* portion of the minimum ventilation cycle with time.
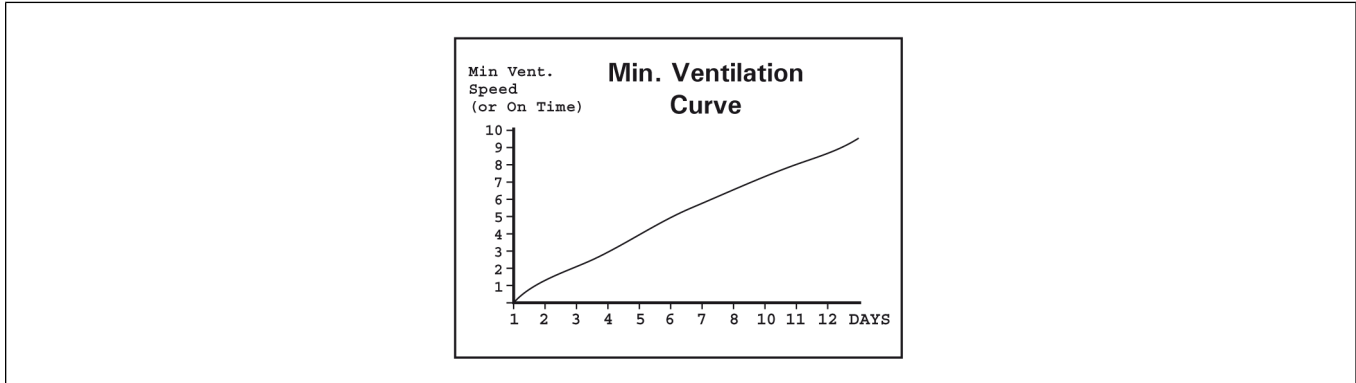
The following are restrictions when configuring a minimum ventilation curve to reduce the risk of errors:

- The highest possible day number is 450

- Decreasing day numbers is not allowed

- All ten steps must be specified. If you don't need 10 different steps, repeat the last speed (or "On Time") for each unnecessary step

Configuring Minimum Ventilation Curves With Variable Outputs

1. Navigate to **9. Curve Settings→2. or 3. Variable 1 or 2***.

   This menu is accessible if the minimum ventilation curve and variable outputs are enabled

   Only the variable outputs that are used in minimum ventilation are available

2. Set the following parameters:

   Day Number — Set the day for each of the 10 steps. This day number corresponds to the animal age, and is adjustable from -5 to 450 days. Negative values are used to prepare the house before the animals' arrival. **Can only be modified while the curve is disabled.*

   Speed — Set the fan speed associated with each step of the curve. **Can only be modified while the curve is disabled.*

   Curve Status — Select "Yes" to activate the minimum ventilation speed curve. Once it is enabled, the minimum ventilation fan speed is automatically adjusted between consecutive steps of the curve; for this reason, these steps cannot be modified while the curve is on.

Configuring Minimum Ventilation Curves Without Variable Outputs

1. Navigate to **9. Curve Settings→2. Minimum Vent. On Time Curve**.

This menu is accessible if variable outputs are disabled

2. Set the following parameters:

Day Number — Set the day for each of the 10 steps. This day number corresponds to the animal age, and is adjustable from -5 to 450 days. Negative values are used to prepare the house before the animals' arrival. *Can only be modified while the curve is disabled.*

On Time — Set the On Time of the minimum ventilation cycles for each step of the curve. *Can only be modified while the curve is disabled.*

Curve Status — Select *"Yes"* to activate the minimum ventilation curve. Once it is enabled, the running time of the fans, during the minimum ventilation, is automatically adjusted between consecutive steps of the curve; for this reason, these steps cannot be modified while the curve is on.

Minimum Ventilation Ramp and Compensation

Stage 1 on time ramp

The controller has a ramping function to smooth out the transition from minimum ventilation to the full operation of the stage 1 fans; the fans' running time can be automatically adjusted to achieve a gradual increase or decrease in the ventilation level. This function is used when stage 1 does not use variable fans.

When the room temperature is at or below the set point, the fans of stage 1 operate according to the minimum ventilation cycles. When the room temperature increases above the set point, a new On Time is calculated periodically as the temperature increases to allow a smooth progression (from point A to point B) up to full operation of the fans when the start temperature of stage 1 is reached. If the room temperature decreases to stage 1's stop temperature, the ON TIME value of the minimum ventilation cycle decreases gradually from a value equal to the total cycle time (point C) to the value defined by the ramping function.
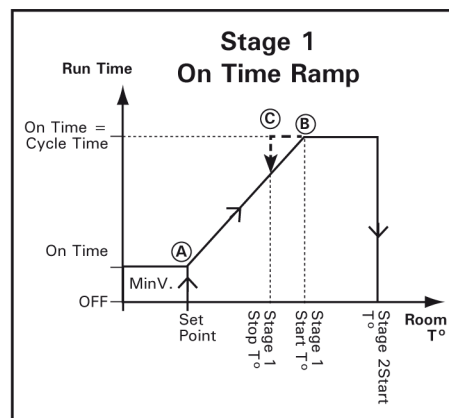
The controller uses two user-defined ramping delays to determine when to adjust the ramping cycle. Ramping delay 1 is used when the outside temperature is greater than the outside set point (it is also used permanently if no outside temperature probe is used); ramping delay 2 is used when the outside temperature is below the outside set point. If the difference between the current on time value and the on time value calculated by the ramping algorithm is greater than the ramping delay, the on time value becomes the calculated value.

On time compensation below the setpoint

The controller has the capability of automatically adjusting the running time of the minimum ventilation fans as a function of outside temperature. As the weather gets colder, the on time is decreased gradually

to compensate for the change. This can help reduce costs by reducing the ventilation when it is not required. A curve is used to calculate the required compensation as a percentage of current on time (see graph below). Only the running time is adjusted; the total cycle time remains unchanged. Example: In the first example, compensation is not needed when the outside temperature is greater than 50 °F. The fans operate according to their full running time. In the second example, the running time is decreased to 66.5% to compensate for the colder outdoor temperature. The cycle time remains unchanged.

Minimum Ventilation Compensation

Compensation Rate (%) vs Outside T°

Example of the On Time Compensation

Min.Vent Fan Status — Temperature > 50°F, Compensation = 100%

ON / OFF — ON Time, Cycle Time, Time

Min.Vent Fan Status — Temperature > 25°F, Compensation = 66.5 %

ON / OFF — ON Time, Cycle Time, Time
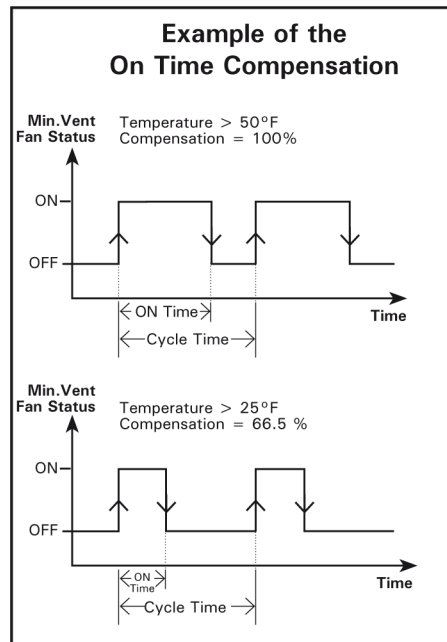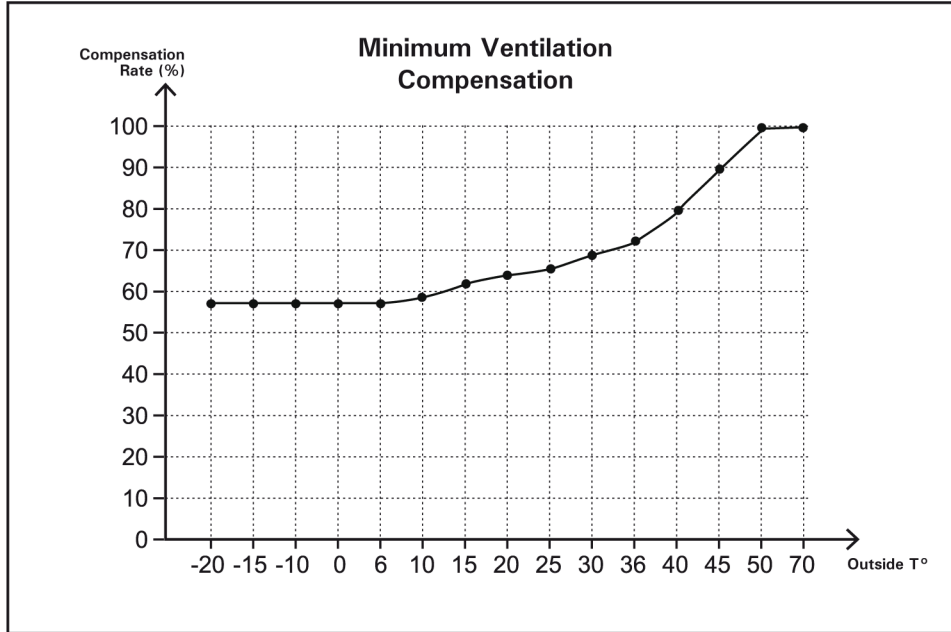
Fan Stages

On/off stages

The controller has 16 On/Off fan stages which operate in a sequence to increase the level of ventilation as the room temperature increases. Each stage can activate two variable outputs and a combination of timer relays for cooling purposes. A fan stage is activated when the room temperature reaches its start temperature; it is disabled when the room temperature decreases to its stop temperature.
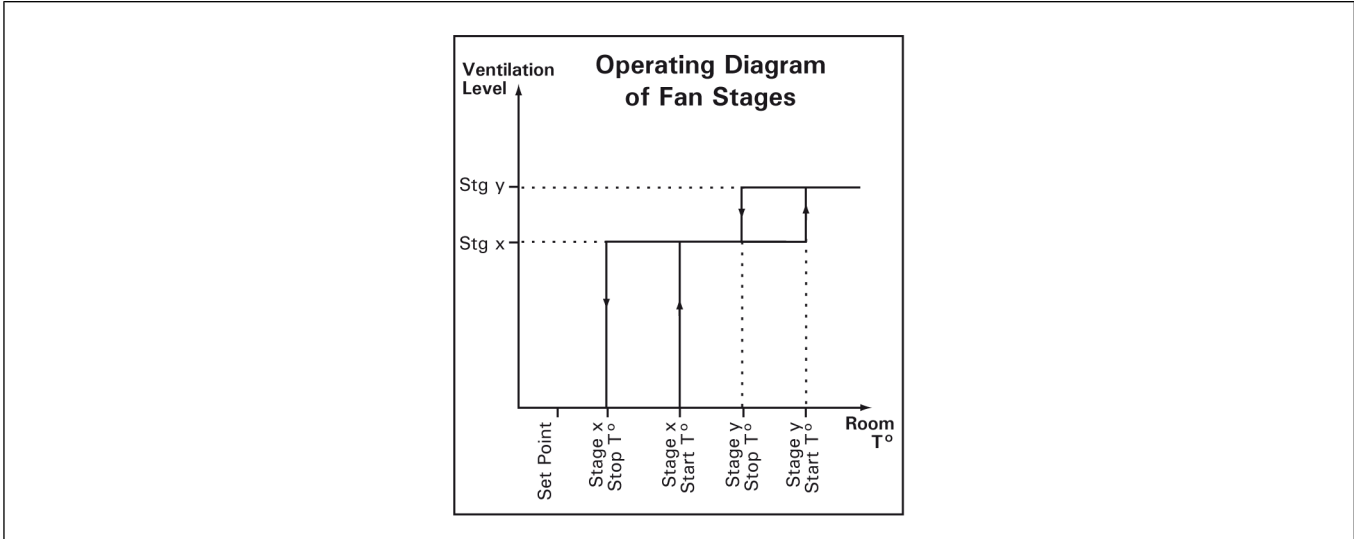
Fan stages' start temperatures are defined with respect to the set point and with respect to each other. This means that when one of these values is adjusted, all the consecutive values are adjusted by the same amount. For example, if the set point is increased by 1°F, the start temperature of all fan stages will be increased by the same amount.

NOTE: *The start and stop temperatures of all fan stages must be set separately for summer and winter. Press "A" to select a season.*

Timer Relays for Cooling Devices: Fan stages can activate relays that will run in timer mode. This option can be used to activate any kind of device that needs to follow the same progression as ventilation stages. The timer is made of an "On Time" and an "Off Time".
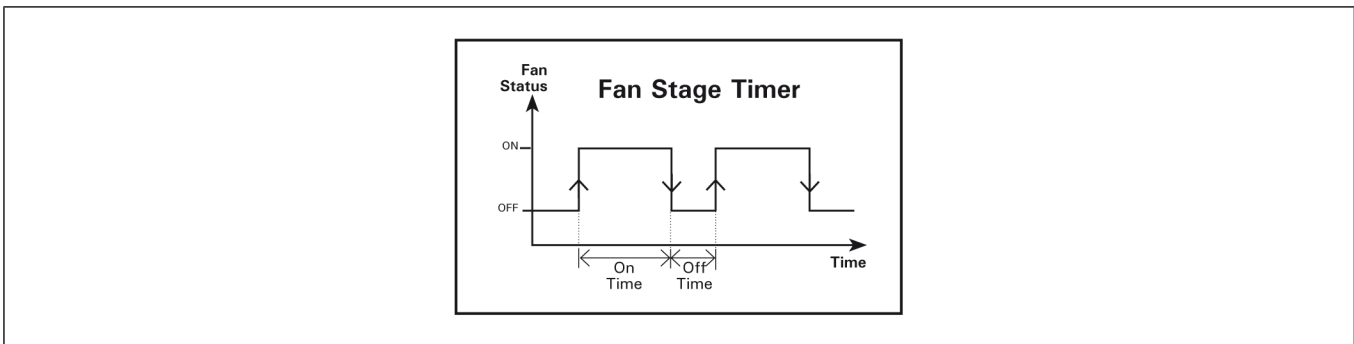
Configuring 0-10V Output Fan Settings

1. Navigate to **21. 0-10V Output Settings**.

2. Set the following parameters:

Show Settings of — Select the proper 0-10V output. One that will be used for ventilation or cooling purpose. *Note that the first 0-10V output is reserved to control lights if lights have been enabled during the installation.*

Output Type — Select Variable or Cooling for the output to operate as an independent fan stage. Press Enter to validate status.

Start temperature — this is the temperature at which the 0-10V output starts operating continuously at minimum speed. The start temperature can be adjusted of +/- 40°F (22.2°C) from the set point.

Stop Temperature — Temperature at which the 0-10V output is deactivated when the room temperature decreases. It can be adjusted from 0.5°F (0.3°C) below the start temperature to -40°F (22.2°C).

Bandwidth — Temperature interval over which the output goes from its minimum speed to its maximum speed (refer to the previous graph). The bandwidth can be adjusted from 0.5 to 10°F (0.3 to 11.1°C). *This feature applies only to stages 1 and 2.*

Min/Max Speeds — Minimum and maximum speeds of the selected 0-10V output. This parameter ranges from 0 to 100%. The maximum speed must be greater than the minimum speed.

Mode — Select the proper signal used by the selected output : 0-10V or 10-0V.

Setting Fan Stage Parameters

If seasonal settings are used, set the fan stage parameters separately for both seasons. Press "A" to select a season.

1. Navigate to **14. Fan/Cool./Nat. Temp Settings→1. Fan Temperature Settings**.

2. Set the following parameters:

   Current Temp. Set Point — This is the current temperature set point. It is displayed for consultation only and cannot be modified.

   Start & Stop Temperatures — Set the start and stop temperatures of each fan stage. The minimum temperature difference between two consecutive start temperatures is of 0.5°F (0.3°C). *These parameters must be set separately for winter & summer.

   V1-V2 Bandwidths — Set the number of degrees that is required for variable outputs to reach their full speed. This parameter ranges from 0.5 to 20.0°F (0.3 to 11.1°C). *These parameters must be set separately for winter & summer.. In addition, they are only accessible if variable outputs are enabled

   0-10V Bandwidth — This value defines the interval over which the 0-10V output goes from its minimum to its full speed.

Tunnel Curtain

The controller can control up to 2 endwall curtains for tunnel ventilation. These curtains can either controlled by the static pressure (SP) level or they can move according to a timer.

Static pressure curtains

The controller can control 2 pressure-based tunnel curtains. To enable the first tunnel curtain output, answer "Yes" to the "Use Tunnel" question in the installation menu and set the tunnel mode to "SP". To use the second inlet output as a pressure-based tunnel curtain, enable the 2nd inlet output in the installation menu and set it as being a tunnel curtain that works according to static pressure.

Chapter 4: Ventilation and Cooling

The tunnel curtains start opening when the fan stage that signals the beginning of tunnel ventilation is reached. At that moment, the curtains start being controlled according to the pressure level.

High / Low Pressure Limits: When the static pressure level exceeds the high pressure limit, the curtains open during the *"Open Time"* and then stay in place during the *"Off Time"*. This process is repeated up until the static pressure level goes back into the acceptable pressure range. The reversed process is performed when the static pressure decreases below the low pressure limit; the curtains close during the *"Close Time* and then stay in place during the *"Off Time"*. The *"Off Time"* is common for both the closing and opening cycles.

Animal Age: It is possible to limit the use of the tunnel ventilation stages according to the age of the animals: you can either specify the minimum age at which tunnel ventilation is allowed, or you can specify the maximum allowable tunnel stage for 3 different ages.

Static pressure Groups: Two groups of static pressure settings can be defined for the tunnel curtain. These groups allow using different high/low pressure limits as the room temperature changes. The second group of pressure settings starts being used at the start-up of a user-defined fan stage.
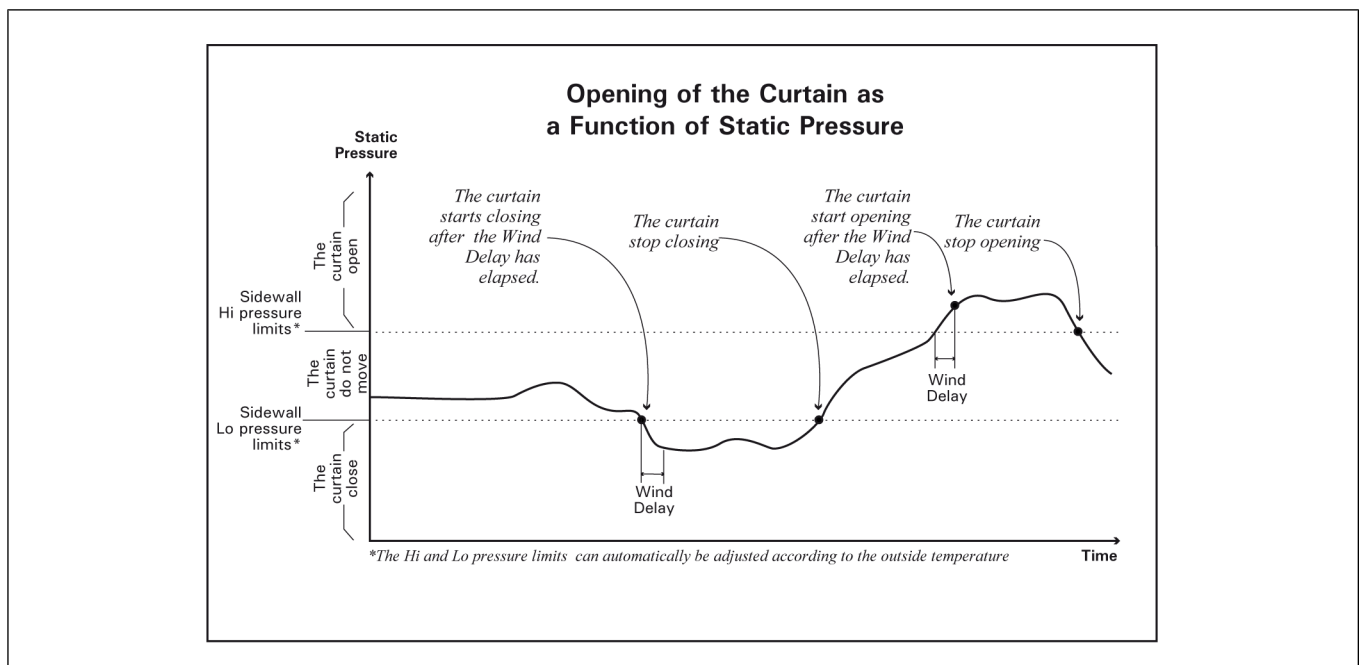
Example: When the start temperature of stage 7 is reached, the tunnel curtain starts using the second group of static pressure settings; in other words, new high and low pressure limits start being used. The initial group of parameters are used once again when the room temperature decreases below the stop temperature of stage 7.

Example: Transition between static pressure groups (according to fan stages)

Static pressure limits

Hi Set point2 (Open at)

Hi Set point1 (Open at)

Lo Set point2 (Close at)

Lo Set point1 (Close at)

Room T°

Fan Stage 5 Stop T°

Fan Stage 5 Start T°
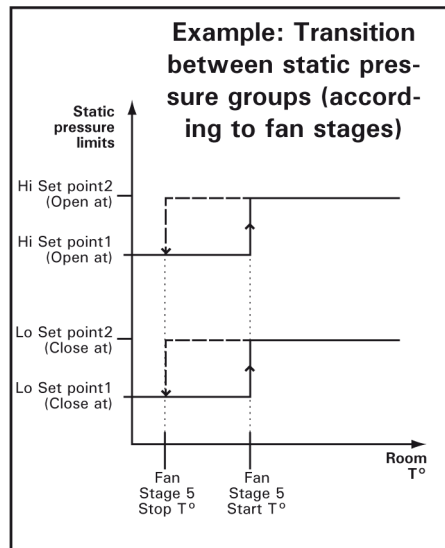
Timer based curtains

The controller can control 2 timer-based tunnel curtains. To enable the first tunnel curtain, answer "Yes" to the "Use Tunnel" question in the installation menu and set the tunnel mode to "Time". To use the second inlet output as a timer-based tunnel curtain, enable the 2nd inlet output in the installation menu and set it as being a tunnel curtain that works according to time.

The tunnel curtains start opening when the fan stage that signals the beginning of tunnel ventilation is reached. At that moment, the curtains open according to the opening time that is associated with that stage. When half of the opening time has elapsed, the stage's fans are activated. The activation of every consecutive fan stage causes the curtains to open further.

Animal Age: It is possible to limit the use of tunnel ventilation according to the age of the animals: you can either specify the minimum age at which tunnel ventilation can start being used, or you can specify the maximum allowable tunnel stage associated with three different ages.

Opening Times: The curtain's opening times are associated with the activation of the fan stages. When the start temperature of a stage is reached, the curtain opens according to the opening time associated with the stage.

**Opening of a Tunnel Curtain
as a Function of Temperature**

Fan Stage
Status

Stage
x + 1
ON

Startup of stage #x + 1:
The curtain opens accord-
ing to the opening time
associated to
fan stage #x + 1.

Stage x
ON

The curtain starts
opening and then
stage X fans start
running.

Off

Set Point   Fan   Fan stage #X   Fan   Fan stage   **Room T°**
             stage #X   Start T°   stage   #X + 1
             Stop T°   (first tunnel   #X + 1   Start T°
                          stage)   Stop T°
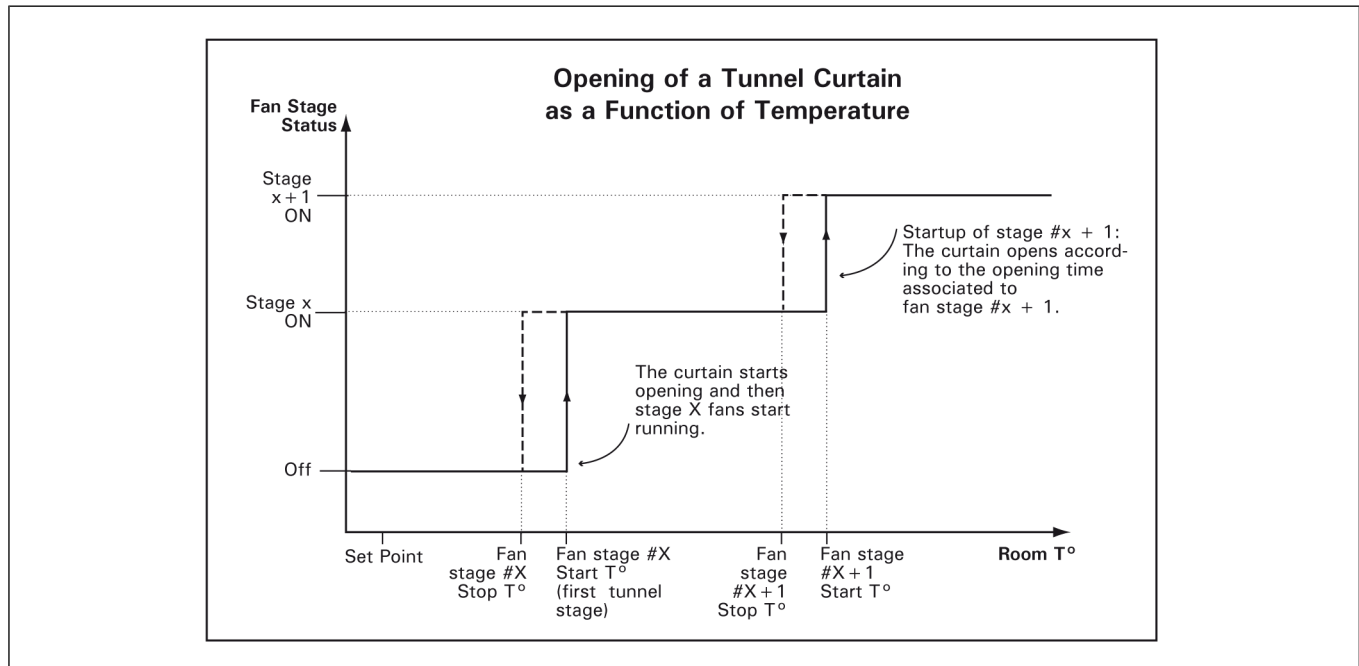
Setting Tunnel Curtain Parameters

1. Navigate to **11. Tunnel Curtain (or press E) or 12. Tunnel Curtain 2****.

   * This menu is accessible if the first tunnel curtain is enabled

   ** This menu is accessible if the 2nd inlet output is used as a tunnel curtain

2. If the tunnel curtain operates according to the **static pressure level,** set the following parameters:

   Tunnel Curtain starts at Stage — The curtain starts being used when the start temperature of this fan stage is reached.

   Minimum Age — Animal age below which the tunnel curtain remains closed. Tunnel ventilation can only be enabled when this age is reached. This parameter ranges from 1 to 450 days. Decrease the value to Off if you want to disable this function. *Accessible if the "Multiple Tunnel Stage w/ Age" function is disabled.*

   Animal Age #1-3 — This is the animal age below which tunnel ventilation is limited to the specified maximum tunnel stage. This parameter ranges from -5 to 450 days. Negative day values are used to prepare the room before letting the animals enter the building. Decrease the value to Off if you want to disable this function. *Accessible if the "Multiple Tunnel Stage w/ Age" function is enabled.*

   Maximum Tunnel Stage #1-3 — This is the maximum tunnel stage that can be performed when the animals are younger than the specified age. Note that maximum tunnel stage #3 is automatically set to the highest fan stage. *Accessible if the "Multiple Tunnel Stage w/ Age" function is enabled.*

   Open / Close Curtain at — Set the static pressure limits below/above which thetunnel curtain opens and closes according to a timer. This parameter ranges from 0 to 0.2 inches of water (0 to 50Pa).

Static Pressure Settings 2 — The following procedure shows how to set the tunnel curtain's second group of pressure settings. *Refer to the previous section for further information on these parameters. Note that the following menus are only accessible if the second group of pressure settings is enabled.*

Start at stage — Select the fan stage at which the controller switches from its regular pressure settings to the second group of pressure settings. This menu only is only shown if the "Stage" transition method between groups of pressure settings is selected.

Open/Close Limits (second settings) — Set the static pressure level below which the curtain closes and above which it opens when the second groups of static pressure settings is used. This parameter ranges from 0 to 0.2 inches of water (0 to 50Pa).

Open / Close / Off Times — Set the curtain's opening and closing times to the desired value. This timer is used when the static pressure level exceeds the high or low pressure limits and are common to both static pressure groups. This parameter ranges from 0 to 30 minutes.

3. Set the following parameters if the curtains are **timer based**:

Tunnel Curtain starts at Stage — The tunnel curtain starts opening when the start temperature of this fan stage is reached.

Minimum Age — Animal age below which the tunnel curtain remains closed. Tunnel ventilation can only be enabled when this age is reached. This parameter ranges from 1 to 450 days. Decrease the value to Off if you want to disable this function. *This parameter is accessible if the "Multiple Tunnel Stage w/ Age" function is disabled.*

Animal Age #1-3 — This is the animal age below which tunnel ventilation is limited to the specified maximum tunnel stage. This parameter ranges from -5 to 450 days. Negative day values are used to prepare the room before letting the animals enter the building. Decrease the value to Off if you want to disable this function. *Accessible if the "Multiple Tunnel Stage w/ Age" function is enabled.*

Maximum Tunnel Stage #1-3 — This is the maximum tunnel stage that can be performed when the animals are younger than the specified age. Note that maximum tunnel stage #3 is automatically set to the highest fan stage. *Accessible if the "Multiple Tunnel Stage w/ Age" function is enabled.*

Total Curtain Run Time — Set the total time that is required for the tunnel curtain to open totally. The sum of all opening times below cannot exceed this time limit. This parameter ranges from 0 to 99 minutes.

Curtain Opening Times — Select the opening time that is associated with the activation of each fan stage. This parameter ranges from 0 to 15 minutes.

Inlets and Vent Doors

First inlet output

The first inlet output can either be used to control vent doors (pressure or timer-based).

Second inlet output

The 2nd inlet output can either be used to control an attic vent, a sidewall vent (vent door) or a supplementary tunnel curtain. To enable the second inlet output, select the proper output function in the installation menu.

The air inlet that is connected to the second output can either operate according to the static pressure level or in timer mode, as a function of room temperature.

Using External SB Modules

The controller can communicate with up to 10 external air inlets. To program the air inlets that are connected to these SB modules, you must refer to the user's manual enclosed with your particular module (SB3000 or SB3500).

When external SB modules are used to define the position of the air inlets, the controller can still ask these modules to adjust the inlet opening when the static pressure or the room temperature gets out of range. This section explains how these opening compensation methods work.

No compensation is applied on the inlets at the startup of a new fan stage. When a fan stage starts, the controller resets the current compensation values and redefines them according to the pressure & temperature conditions measured at that time.

The SB3500 limits the compensation value that can be applied on the air inlets to 50% of their regular opening. If the controller sends a compensation request that exceed this limit the SB Module just won't consider it and won't move the inlet any further.

Static pressure compensation

A compensation can be used to ensure a certain uniformity in the static pressure level in the room. This static pressure compensation allows opening or closing inlets further when the static pressure level gets out of range.

When the static pressure level exceeds the normal range (above the Hi Pressure Set point or below the Lo Pressure Set Point), the controller waits for the Wind Effect Delay to make sure this unusual pressure condition is not temporary. If the pressure is still out of range after this delay has elapsed, the inlet compensation (%) is applied on the opening of all inlets: they close further by their respective compensation value (%) when the pressure level is too low [**point A** on the graph] or open further by their compensation value (%) when the pressure level is too high [**point C** on the graph]. The controller then waits for the Wind Effect Delay once again. If the pressure level is still out of range afterwards, the opening compensation is applied once more. This cycle is repeated up until the pressure gets back in the normal range or until a new stage starts. When the pressure level gets back to the normal range [**points B & D** on the graph], all inlets keep their compensated position until the beginning of a new stage. No compensation is applied on the inlet opening when a new stage starts.

Temperature compensation

A compensation can be activated to ensure a certain uniformity in the room temperature: the air inlet positions are automatically adjusted when the temperature reading of the inlets' probes differs from the average room temperature read by the controller.

The inlet temperature compensation is expressed as a percentage per degree difference between the average controller temperature and the average reading of the probes assigned to the inlet. It determines by how much the inlet must open or close to help reduce the temperature differences in the building. For each degree above or below the average temperature, the inlet will open or close using the compensation value assigned by the user. For example, if the compensation value is set to 2%/°F and the inlet's probes read 3°F above the average controller temperature, the inlet will open 6% further to help decrease the temperature in that zone.

If a temperature compensation has to be applied on the position of the air inlets, the controller only sends a compensation request of 1% at a time. Refer to the installation menu to specify the frequency at which the 1% compensation must be applied ("Send Compensation Each" parameter).

Static Pressure Compensation on the Inlet Opening
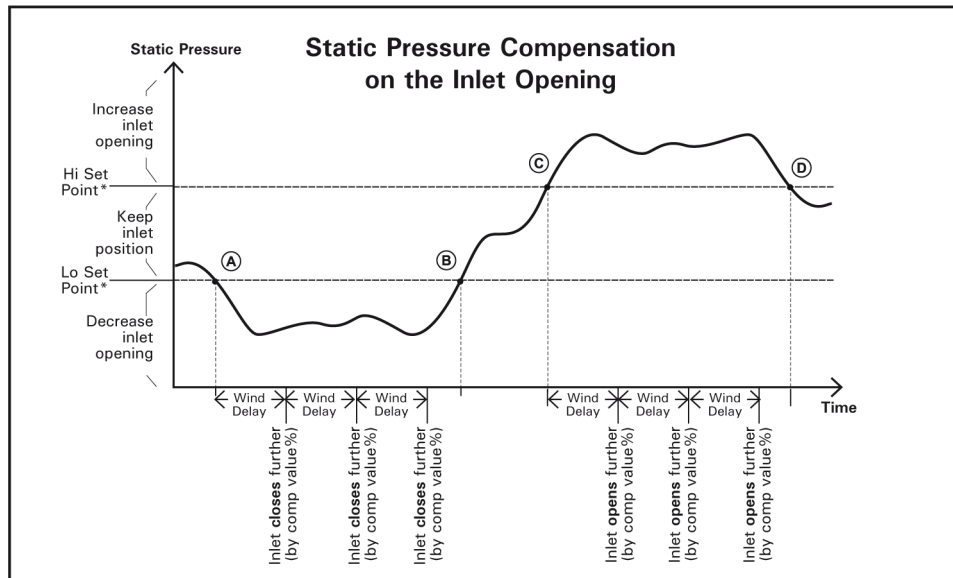
Configuring External Inlet Parameters

1. Navigate to **10. Inlet Compensation***.

   * This menu is accessible if External Inlets are enabled in the Installation menu and the number of External Inlets is 1 or greater.

2. Set the following parameters:

   Show Settings of — Select the proper inlet then set the compensation openings of each inlet separately

   T° Opening Compensation — Select the opening percentage that must be added or removed when the temperature compensation is applied on the inlet openings. This parameter ranges from 0 to 100%/°F. **This parameter is available if the temperature compensation function on air inlets is enabled.*

   SP Compensation — Select the opening percentage that must be added or removed when the static pressure compensation is applied on the inlet openings. This parameter ranges from 0 to 10% **This parameter is available if the static pressure compensation function on air inlets is enabled.*

   Low Set Point — The static pressure compensation starts when the pressure level decreases below this level. This parameter ranges from 0 to 0.40"WC. **This parameter is common to all inlets and is available if the static pressure compensation function is enabled.*

   High Set Point — The static pressure compensation starts when the pressure level increases beyond this level. This parameter ranges from 0 to 0.40"WC. Note that the high pressure limit must be greater than the low limit. **This parameter is common to all inlets and is available if the static pressure compensation function is enabled.*

   Wind Delay — Each time this delay has elapsed and the pressure exceeds the normal range, the static pressure compensation is applied on the opening of all air inlets. This parameter ranges from 30 to 900 seconds. **This parameter is common to all inlets and is available if the static pressure compensation function is enabled.*

Pressure Based and Timer Based Inlets

Pressure based Inlets

When an inlet operates according to the level of static pressure, it closes in timer mode when the pressure level gets lower than the Low pressure set point or opens in timer mode when the pressure level exceeds the Hi pressure set point.

The controller can control 2 pressure-based vent door outputs. To enable the first vent door output, set the *"1st Inlet Mode"* to *"SP"* in the installation menu. To use the second inlet output as a pressure-based vent door, enable the 2nd inlet output in the installation menu and set it as being a sidewall vent that works according to static pressure.

Pre-opening Delay: If the variables fans are not used during minimum ventilation, the inlets open during a pre-opening time before the fans start running. The same delay is used to close the inlets when the fans stop.

NOTE: *If an attic vent is used, the inlets will not open until the transitional fan stage is reached.*

Groups of static pressure settings: Two groups of high/low static pressure settings can be defined. The second group of settings either starts being used at the start-up of a chosen fan stage or when the outside temperature reaches a user-defined value. The following graphs sum both cases.
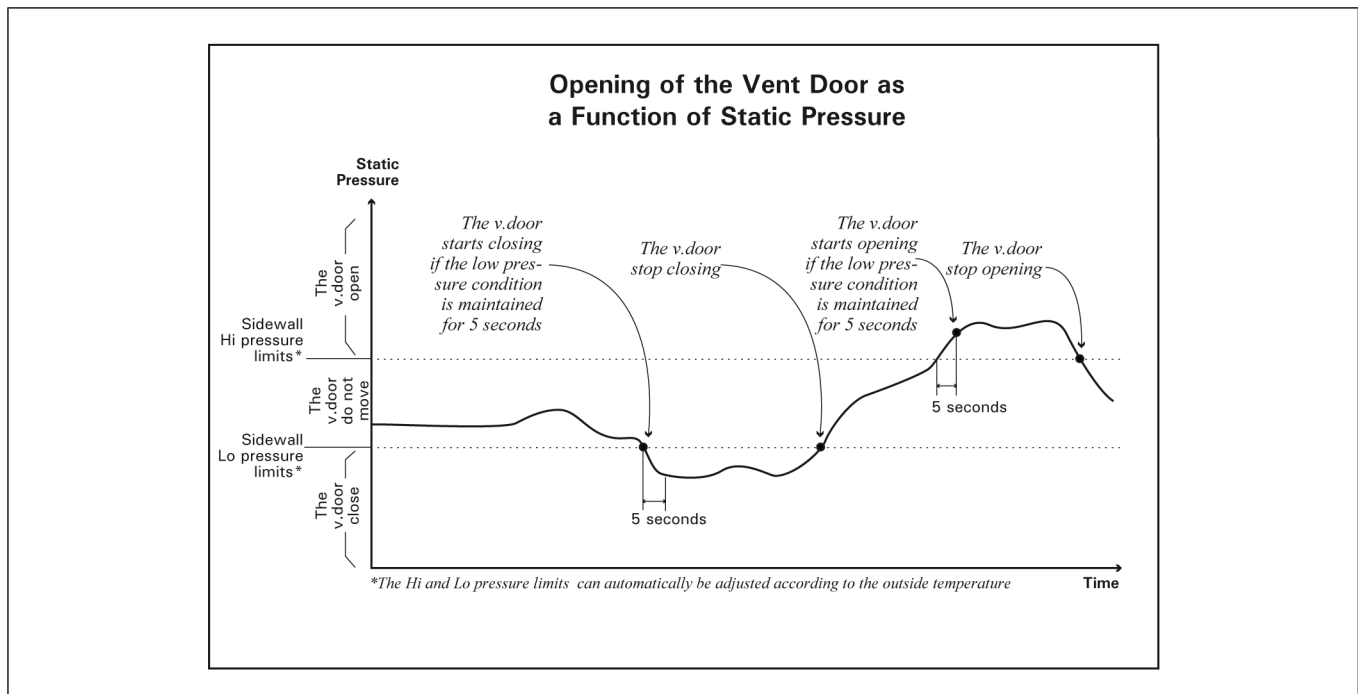
The following is an example of a transition between static pressure settings based on the ventilation stages:

When the start temperature of stage 5 is reached, the inlets start operating according to the second group of static pressure settings; therefore, new high and low pressure limits are used. The initial settings become used once again when the room temperature decreases below the stop temperature of stage 5.

Example: Transition between static pressure groups (according to fan stages)

Static pressure limits

Hi Set point2 (Open at)

Hi Set point1 (Open at)

Lo Set point2 (Close at)

Lo Set point1 (Close at)

Room T°

Fan Stage 5 Stop T°   Fan Stage 5 Start T°
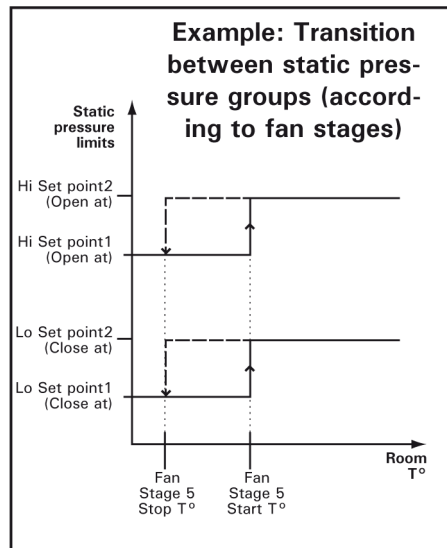
The following is an example of a transition between static pressure settings based on outside temperature:

When the outside temperature falls and reaches the outside temperature influence parameter value + 5°F (2.8°C), a gradual transition between the two groups of static pressure settings starts being done. The second group of settings is fully used when the outside temperature reaches the *"outside influence temperature"* value.

Example: Transition between static pressure groups (according to the outside temp.)

Static Pressure Set Points

Hi Set point2 (Open at)

Hi Set point1 (Open at)

Lo Set point2 (Close at)

Lo Set point1 (Close at)

50°F

5.0°F (outside T° influence)   55°F

Outside T°
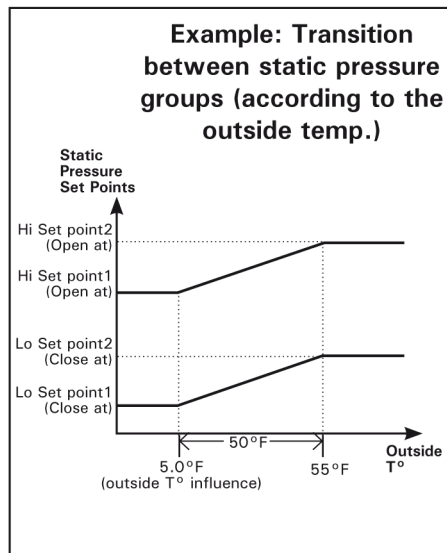
Timer based inlets

NOTE:

> *This section only applies to a vent door output that uses the built-in timer of the controller; if the vent door uses the timer of an external SB 3500 module.*

The controller can control 2 timer-based vent door outputs. To enable the firrst vent door output, set the *"1st Inlet Mode"* to *"Time"* in the installation menu. To use the second inlet output as a timer-based vent

door, enable the 2nd inlet output in the installation menu and set it as being a sidewall vent that works according to a timer.

When a vent door output works in timer mode, you must specify the total amount of time required to fully open the vent. You must then associate an opening with the startup of each fan stage (the opening is defined as a percentage of the total opening time). As the room temperature increases and new stages are activated, the inlets will open or close accordingly.

An opening step is also added when a variable fan stage starts (this applies to stages 1 and 2 only). This step is called *"Stage x Min"*. In the example above, *"Stage x Min"* represents the point where stage 1 fans start running at their minimum intensity. The regular opening of the vent door in stage 1 is reached when the fans reach their full intensity.

Inlets in Minimum Ventilation: During the *"Off Time"* portion of a minimum ventilation cycle, the Inlets close to their *"Stage 0"* position; during the *"On Time"*, they open to position associated with stage 1 (or Stage 1 Min – if variable fans are used).

NOTE: *If an attic vent is used, the inlets will not open until the transitional fan stage is reached.*

Automatic Reset of the inlet's Position: Resetting the actuator's position clears all accumulated time offsets caused by the frequent openings and closings of inlets. The controller resets the actuator's position at regular interval to make sure the inlet's position is always accurate. This reset is performed automatically according to one of these two methods:

- **Reset the minimum position only** *(Close mode)***:** Each time a reset is performed, the inlets totally close. Once the actuator's position is reset, they return to their previous position.

- **Reset toward the nearest position** *(Open/Close mode):* Each time a reset is performed, inlets fully open if their current opening already was higher than 25%; otherwise, the controller closes inlets to reset the actuator's position. This way, they do not close when the room temperature already asks for a large opening.

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

Setting Pressure Based and Timer Based Inlet Parameters

1. Navigate to **10. Inlets / Static Pressure*** or **12. Inlet 2 / Static Pressure****

   * This menu is accessible pressure-based Inlets are enabled

   ** This menu is accessible if the 2nd inlet output is used as a sidewall inlet

2. Set the following parameters for static **pressure based** Inlet opening:

   Open/Close Limits — Set the pressure level below which the Inlets close and above which they open. These parameters range from 0 to 0.2 inches of water column (0 to 50Pa).

   Static Pressure Settings 2 — The following procedure shows how to set the second group of pressure settings. **This parameter is accessible if the second group of pressure settings is enabled.*

   Start at stage — Select the fan stage at which the controller switches from its regular static pressure settings to the second group of static pressure settings. **This parameter is accessible if the second group of pressure settings uses the "Stage" transition mode.*

   Outside T° Influence — Set the outside temperature below which the controller fully switches to the second group of pressure settings. **This parameter is accessible if the second group of pressure settings uses the "Out T°" transition mode.*

Open/Close Limits (second settings) — Set the static pressure level below which the Inlets close and the temperature above which they open when the second groups of static pressure settings is used. The open and close limits can be adjusted from 0 to 0.2 inches of water column (0 to 50Pa). *This parameter is accessible if the second group of pressure settings is enabled.*

Open Time — When the static pressure exceeds the Hi pressure set point, the Inlets open during this delay. This parameter ranges from 0 to 900 seconds.

Close Time — When the static pressure level decreases below the Lo pressure set point, the Inlets close during this delay. This parameter ranges from 0 to 900 seconds.

Off Time — After they have moved, the Inlets have then stay still during the "Off Time". This delay ranges from 0 to 900 seconds.

Close Inlets at Stage — Select the fan stage at which the Inlets must close. Select a stage higher than the stage at which the tunnel curtains open. This option can be used to close the inlets at the startup of a tunnel inletilation for instance. Select *"None"* to deactivate this function.

3. Set the following parameters for **timer based** Inlet openings:

NOTE: *This procedure shows how to program the Inlets that are using the built-in timer of the controller and does not applies to Inlets that are using the timer of an external SB 3500 module.*

Stage 0 — This is the position of the Inlet when the fans are not running in minimum inletilation (*"Off Time"* portion of the minimum inletilation timer).

Stage x Min — Assign a Inlet position to the start-up of each variable-speed fan stage (for stages 1 & 2 only).

Stage x — Assign a Inlet position to each fan stage.

Inlet Run Time — Specify the exact time that is required to reach the actuator's maximum limit switch. The controller will limit opening of the Inlets inlet according to this time value.

Auto Reset Mode — Select the desired reset mode for the Inlet actuator: choose *"Open/Close"* to reset the actuator toward its nearest position; select *"Close"* to reset it towards its closed position only; select *"Off"* to disable the auto-reset function.

Auto Reset Time — Select the time at which the actuator reset is performed.

Auto Reset Every — Select the frequency at which the actuator is reset. This parameter ranges from 1 reset every 1 to 7 days. If this parameter is set to 1 day, three more reset times will appear to be able to reset the inlet more than once per day.

Open / Close Time (Advanced) — During a reset, the controller opens or closes the Inlets during this delay, or up until a limit switch is reached. By default, this value is equal to the total run time of the actuator. *Accessible from the factory mode only.

Start Manual Reset Now? — Select "Yes" to reset the Inlet position now.

Attic Vent

In order to extract the warm air from the ceiling, the attic vent can open prior to the opening of sidewall vents. The second inlet output of the controller can be used to control an attic vent (pressure or timer-

based vent). To enable this vent, set the status of the second inlet output to "Attic" in the installation menu and then select its operating mode: "Time" or "SP".

Pressure based attic vent

Opening of the Attic Vent: When it is based on the static pressure level, the attic vent moves according to the pressure variations in the building. This is the exact same principle as for the pressure-based vent door outputs.

Activation Period & Transition: When a pressure-based attic vent is used, the air intake inside the building is exclusively provided by the attic vent until the room temperature reaches the startup point of the fan stages that asks for a transition *("Attic transition stage")*. When this transition begins, the attic vent stops moving and the vent doors open during the *"Transition Pre-Open Time"*. After this delay, the attic vent either stops moving or opens completely (depending on the chosen option) and the vent doors start working normally. The attic vent will close when the room temperature rises and reaches a user-defined fan stage (*"Close at"* stage).

Pre-opening Delay: If the variables fans are not used during minimum ventilation, the attic vent opens during a pre-opening time before the fans start running. The same delay is used to close the attic vent when the fans stop.

Timer based attic vent

Opening of the Attic Vent: When an attic vent works in timer mode, you must specify the total time that is required to fully open the vent. You must then associate an opening time to the startup of each fan stage that precedes the transition stage. As the room temperature increases and new stages are activated, the attic vent will open or close accordingly.

Activation Period & Transition: When a timer-based attic vent is used, the air intake inside the building is exclusively provided by the attic vent until the room temperature reaches the startup point of the fan stages that asks for a transition *("Attic transition stage")*. When the transition begins, the vent doors start operating normally and the attic vent either stops moving or opens completely (depending on the chosen option). The attic vent finally closes when the room temperature reaches the fans stage that asks for it to close *("Close attic at stage")*. The air intake becomes exclusively provided by the vent doors at that moment.

Attic Vent in Minimum Ventilation: A pre-opening delay must be defined to open the attic vent when the fans are running in minimum ventilation (*"On Time"* portion of the minimum ventilation timer). Note that the pre-opening is made prior to the activation of the fans at the beginning of each cycle.

Configuring Pressure and Timer Based Attic Vents

1. Navigate to **12. Attic Settings***.

   * Available if the 2nd inlet output is used to control an attic vent

2. Set the following parameters for attic vents operating according to static pressure levels:

   Close Attic at Stage — Set the fan stage at which the attic vent must close. The air intake in the building is exclusively provided by the vent doors at the startup of this stage. The closing stage must be higher than the transition stage that is defined below.

   Attic Vent Transition Stage — The air intake in the building is exclusively provided by the attic vent up until the room temperature reaches the start temperature of the chosen fan stage. Select the fan stage at which the air intake must start being provided by the vent doors (fan stage 1 to 6).

   Attic State in Transition — Specify what the attic vent must do during a transition stage: it can either stay in place *("As is")* or it can open completely *("Open')*.

Transition Pre-Open — Select during how much time the vent doors must open prior to moving the attic vent when the transitional fan stage is reached. At the end of this delay, the air intake is provided by both the attic vent and the vent doors.

Attic Enable Offset — Select the addition of this offset to the outside temperature that determines if attic vents are to be opened. If the attic temperature is greater or equal than the sum of the outside temperature and the attic enable offset, the attic vents can then operate. Values may vary between 0 to 20°F and if the value is set to 0°F, the attic vents then operate with no regard as to the outside temperature. *This parameter is accessible if the second inlet is used as attic vent, the outside temperature sensor is enabled and the attic/vent doors probes are set to "Indiv" in the Installation menu.

Open/Close Limits — Set the pressure level below which the attic vent closes and above which it opens. These parameters range from 0 to 0.2 inches of water column (0 to 50Pa).

Open Time — When the static pressure exceeds the Hi pressure set point, the attic vent opens during this delay. This parameter ranges from 0 to 900 seconds.

Close Time — When the static pressure level decreases below the Lo pressure set point, the attic vent close during this delay. This parameter ranges from 0 to 900 seconds.

Off Time — After is has moved, the attic vent then stays still during the *"Off time"*. This delay ranges from 0 to 900 seconds.

3. Set the following parameters for attic vents operating according to a **timer**:

Close Attic at Stage — Set the fan stage at which the attic vent must close. The air intake in the building is exclusively provided by the vent doors at the startup of this stage. The closing must be higher than the transition stage defined below.

Attic Transition Stage — Select the fan stage at which a transition is made from the attic to the sidewall air intake. When this stage is reached, the attic vent either stops moving or opens for its total run time (depending on the transition state below) and the vent doors start operating normally.

Attic State in Transition — Specify what the attic vent must do during a transition stage: it can either stay in place *("As is")* or it can open for its total run time *("Open')*.

Total Attic Run Time — Specify the exact time that is required to reach the actuator's maximum limit switch. The controller will limit opening of the attic vent according to this time value.

Stage x Opening Time — Assign an opening time of the attic vent to all fan stages that precede the transition stage. **The sum of all stage openings must be shorter than the Total Attic Run time if the transition mode is set to "Open" above.*

Pre-Open Attic Delay — Assign the opening time of the attic vent for the minimum ventilation mode: the attic vent will open during this amount of time just before the fans start running and will stay in place until the fans stop during a minimum ventilation cycle.

Cooling Outputs

The controller has 4 cooling outputs that can be used to operate cooling devices such as mist units. The intensity of these outputs increases gradually as the house temperature increases. The following diagram illustrates the cooling outputs' operation.
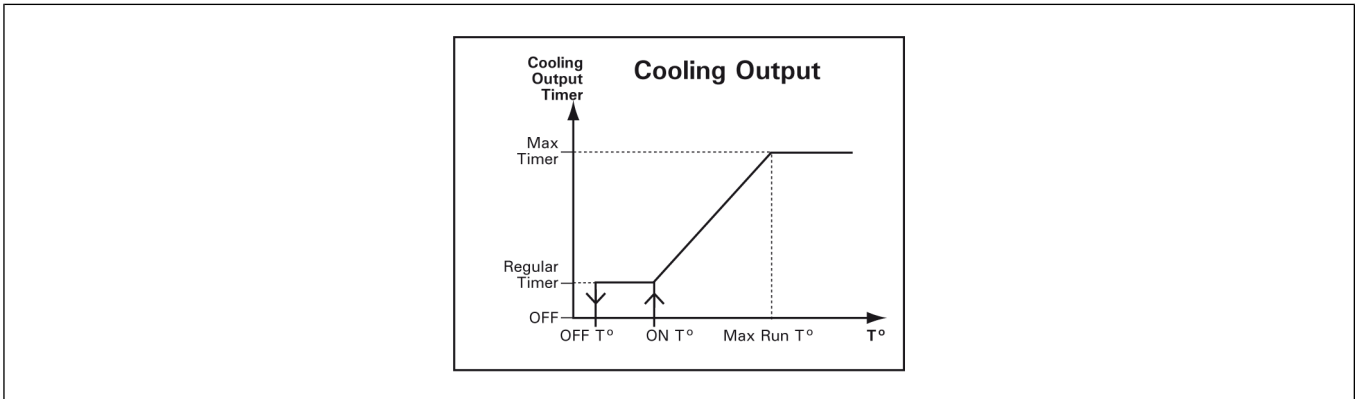
The cooling output starts operating according to a timer (On Time & Off Time) when its start temperature is reached. The output's timer gradually changes as the temperature increases. It reaches the max timer settings (Max On Time & Max Off Time) when the house temperature reaches the *Maximum Run Temperature*. If "Cooling Follow SetPoint" is set to "Yes" in the Installation menu, the Start and Stop temperatures of cooling outputs will be related to the house setpoint. This means that when the house setpoint changes, start and stop temperatures are adjusted consequently. On the contrary, if "Cooling Follow Set-Point" is set to "No", the Start and Stop temperatures will be absolute values, independent of the house setpoint.

NOTE: *You can specify an operating time range in order to stop cooling outputs during the night.*
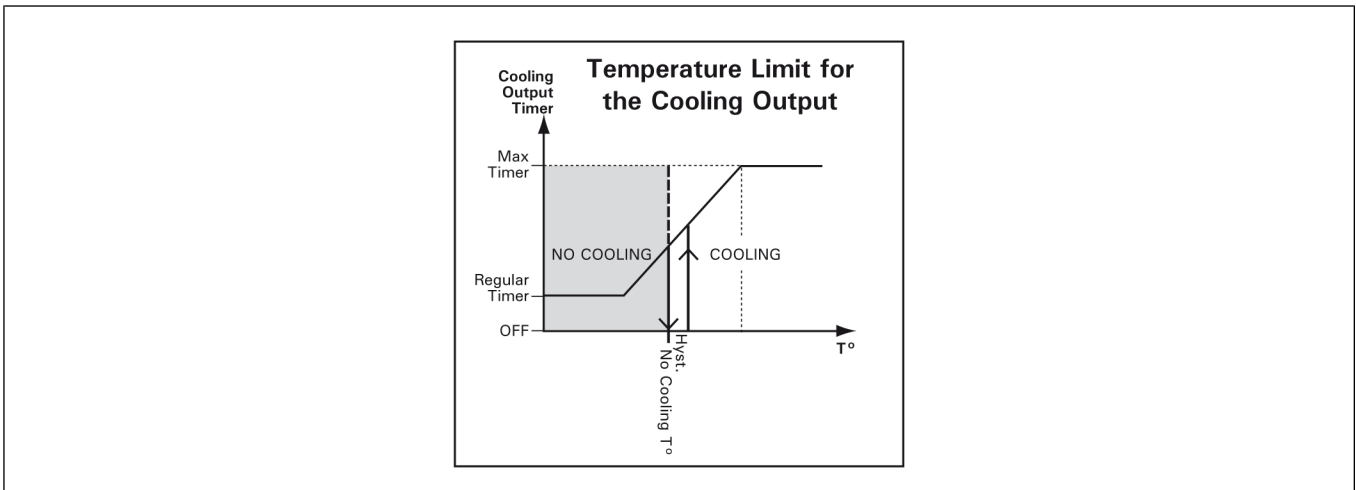
Configuring Cooling Output Temperature Settings

1. Navigate to **14. Fan/Cool./Nat. Temp. Settings→Cooling Temperature Settings***

   * *Available if cooling outputs are enabled*

2. Set the following parameters:

Start Temperature — Set the temperature at which the cooling output starts operating using the first timer. This parameter ranges from the set point to 120°F (48.9°C).

Stop Temperature — Set the temperature below which the cooling output stops. This parameter ranges from 0.5°F (0.3°C) below the start temperature to -40°F (-40°C).

Maximum Temperature — Set the temperature at which the cooling output switches to the second timer. This parameter ranges from 0.5°F (0.3°C) above the start temperature to 120°F (48.9°C).

On Time 1 & 2 — Set both timers' On and Off times to the desired values. This parameter ranges from 0 to 30 minutes.

Start / Stop at — Cooling outputs can only be activated over this period of time. This allows deactivating these outputs during night for instance.

No cooling under — The cooling output is automatically disabled when the average temperature of its probes falls below the *"No cooling under"* temperature. Set this parameter to the desired value (from -40.0°F to 85.0°F).

Hysteresis (Advanced) — An hysteresis is used to restart the cooling output when the temperature rises above the "No Cooling T°". By default, the hysteresis is set to 0.5°F. *This parameter is only accessible with the factory password.

Natural Ventilation

The curtains operate according to the average temperature in their respective zones. Their opening and closing temperatures are related to the room set point, which means they are adjusted consequently when a change in the set point occurs.

Natural ventilation begins when the room temperature reaches the start temperature of a user-defined fan stage *(Start Natural at Stage)*. At that moment, the controller opens all natural ventilation curtains during their respective *Initial Opening Time.*

Once the controller is in natural ventilation, the curtains start operating in timer mode: they open according to an opening cycle *(Open Time & Off Time)* when the average temperature in their respective zone is above the *Open At* temperature; they close according to the closing cycle *(Close Time & Off Time)* when the temperature in their zone is lower than the *Close At* temperature.

Natural ventilation is disabled at the startup of the first tunnel stage or when the room temperature decreases to the natural ventilation's stop temperature. When it stops, the controller fully closes all natural ventilation curtains.

Relation between Fan Stages & Natural Ventilation Curtains

Curtain Status

The curtain closes in timer mode

The curtain opens in timer mode

ON

OFF

Set Point   Close at   Open at   **Average T° of the curtain's probes**

Natural Ventilation Status

0.5°F

ON

OFF

Set Point   Stop Natural   Start Natural   First tunnel stage   **Stage Activation**
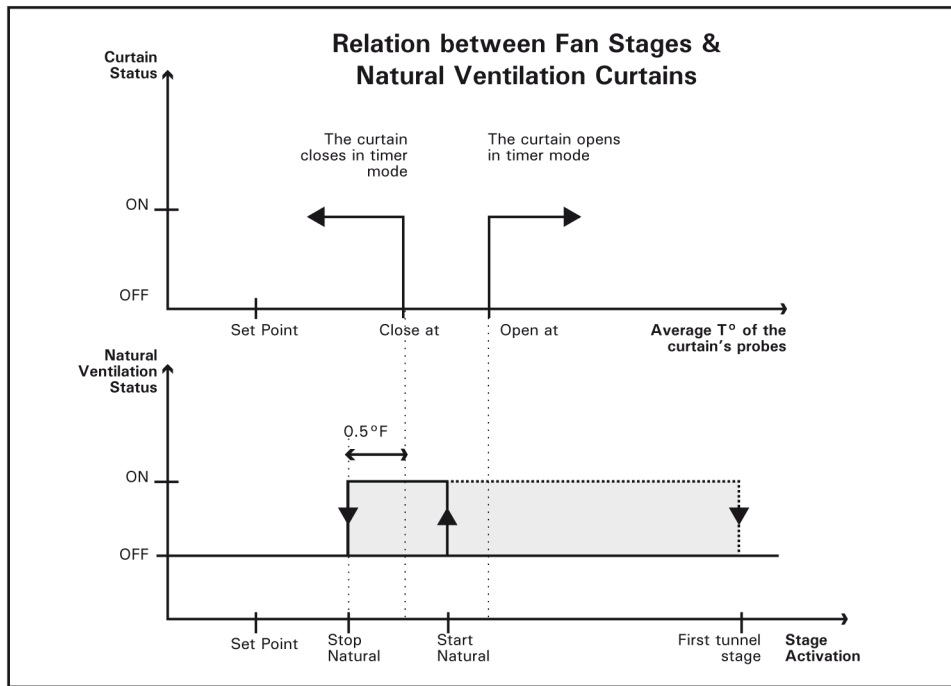
Transition from natural ventilation to tunnel ventilation

When the room temperature increases and reaches the Open at temperature of the natural ventilation curtain [point A on the picture], the curtain opens in timer mode [point B on the picture]. If the tunnel curtain is also used in natural ventilation, it will also open following this timer. When the room temperature reaches the start temperature of the first tunnel stage [point C on the picture], the natural ventilation curtain stays still during the Natural Close Delay (5 minutes by default) then fully closes. Here is what happens to the tunnel curtain when the first tunnel stage is reached:

Tunnel ventilation

Natural ventilation

C 1st tunnel stage

B

A (Open at)

(Close at)

Temperature rises

GRAPH 1
From natural to tunnel ventilation
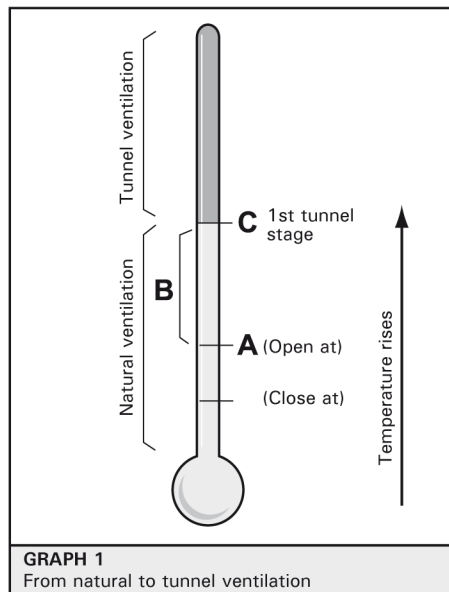
- **If the tunnel curtain is based on a timer**

If the tunnel curtain was not used in natural ventilation: The tunnel curtain opens to the position associated with the first tunnel stage. When it reaches half the opening of that stage, the fans start running.

If the tunnel curtain was used in natural ventilation: The tunnel curtain opens during its Total Run Time parameter value then repositions itself to the opening associated with the first tunnel stage. This allows resetting the curtain's position before moving on to the tunnel ventilation mode.

- **If the tunnel curtain is based on the static pressure**

If the tunnel curtain was not used in natural ventilation: The tunnel curtain opens during its Pre Open Time parameter value. When this delay has elapsed, the controller starts the fans and the opening of the curtain becomes based on the static pressure settings.

If the tunnel curtain was used in natural ventilation: The opening of the curtain becomes based on the static pressure settings at the start-up of the first tunnel stage.

Transition from tunnel ventilation to natural ventilation

If the tunnel curtain is not used in natural ventilation: When the room temperature falls and gets lower than the stop temperature of the first tunnel stage [point A], the controller reenters in natural ventilation: it opens the natural curtain during the Natural Open Delay (5 minutes by default) and closes the tunnel curtain. When the delay has elapsed, the natural curtain starts operating according to the natural ventilation timer [point B].

If the tunnel curtain is not used in natural ventilation: When the room temperature falls and gets lower than the stop temperature of the first tunnel stage [point A], the controller reenters in natural ventilation: it opens the natural curtain during the Natural Open Delay (5 minutes by default) and closes the tunnel curtain. When the delay has elapsed, the natural curtain starts operating according to the natural ventilation timer [point B].

GRAPH 2
From tunnel to natural ventilation

Configuring Natural Ventilation Temperature Settings

1. Navigate to **14. Fan/Cool./Nat Temp. Settings→3. Natural Temperature Settings**.

* This menu is accessible if natural zones are enabled

2. Set the following parameters:

IMPORTANT: *Make sure to select the right zone before adjusting these parameters. Press the down-arrow key to scroll the display and select the desired natural ventilation zone.*

Open Curtain — Set the temperature above which the curtain opens according to a timer when the controller is in natural ventilation. This parameter ranges from the set point to 120°F (48.9°C). **This parameter must be set separately for each season.*

Close Curtain — Set the temperature below which the curtain closes according to a timer when the controller is in natural ventilation. **This parameter must be set separately for each season.*

Open / Close / Off Times — Set the timer that is used to open and to close the curtains in each natural zone (the Off time is common to both the opening and closing cycles). This parameter ranges from 0 to 15 minutes.

Wind Delay — When the controller is in natural ventilation and the temperature in a natural zone decreases below the "Close At" temperature or increases above the "Open At" temperature, the curtain in that zone only starts moving after the wind delay has elapsed. This way, the controller does not open or close curtains when wind drafts cause temporary temperature variations. Set the wind delay to the desired value. This parameter ranges from 0 to 15 minutes.

Initial Open Time — Curtains of all natural zones open during their respective Initial Open Time when the controller enters in natural ventilation. This parameter ranges from 0 to 15 minutes.

Start Natural at Stage — Select the fan stage at which the controller enters in natural ventilation.

Tunnel/ Tunnel 2 Starts at Stage — This is the fan stage at which each tunnel curtain starts opening. This menu is shown for consultation purpose only and cannot be changed. **Refer to the tunnel ventilation chapter to modify the first tunnel stage.*

Natural Close Delay (Advanced) — This delay is launched at the beginning of the first tunnel stage. Once it has elapsed, the controller closes all curtains in natural zones. **Factory setting.*

Natural Open Delay (Advanced) — All natural ventilation curtains open during this delay when the controller switches from the tunnel mode to natural ventilation. **Factory setting.*

5 Heaters

Topics Covered in this Chapter

- Heaters
- Setting Heater Start and Stop Temperatures
- Configuring a Heater Curve
- Copying and Pasting a Heater Curve
- Configuring the 0-10V Heating Output

Heaters

The controller can operate up to 16 independent heating outputs. These outputs operate according to their start and stop temperature as illustrated below.

Heating stages

Heaters 1-8: These are the basic heating outputs of the controller.

Heaters High Fire: The high fire option allows adding a supplementary step to each activated heating output. Each heating output and high fire step operates according to its own settings: probe assignment, relay selection and start/stop temperatures. In other words the high fire option allows doubling the number of heating outputs.

Start Temperature: The start temperature of each heating output is related to the set point. This means that if the set point changes, the start temperature is adjusted consequently.

Stop Temperature: If the heating curve and the Hi/Lo Fire options are both disabled, the stop temperature of each heating output is related to the set point (this means that if the set point changes, the stop temperature is adjusted consequently). If the heating curve or the Hi/Lo Fire option is enabled, the stop temperature for a given heating output becomes based on the start temperature of the output (this means that if the start temperature of the output changes, the stop temperature is adjusted consequently).
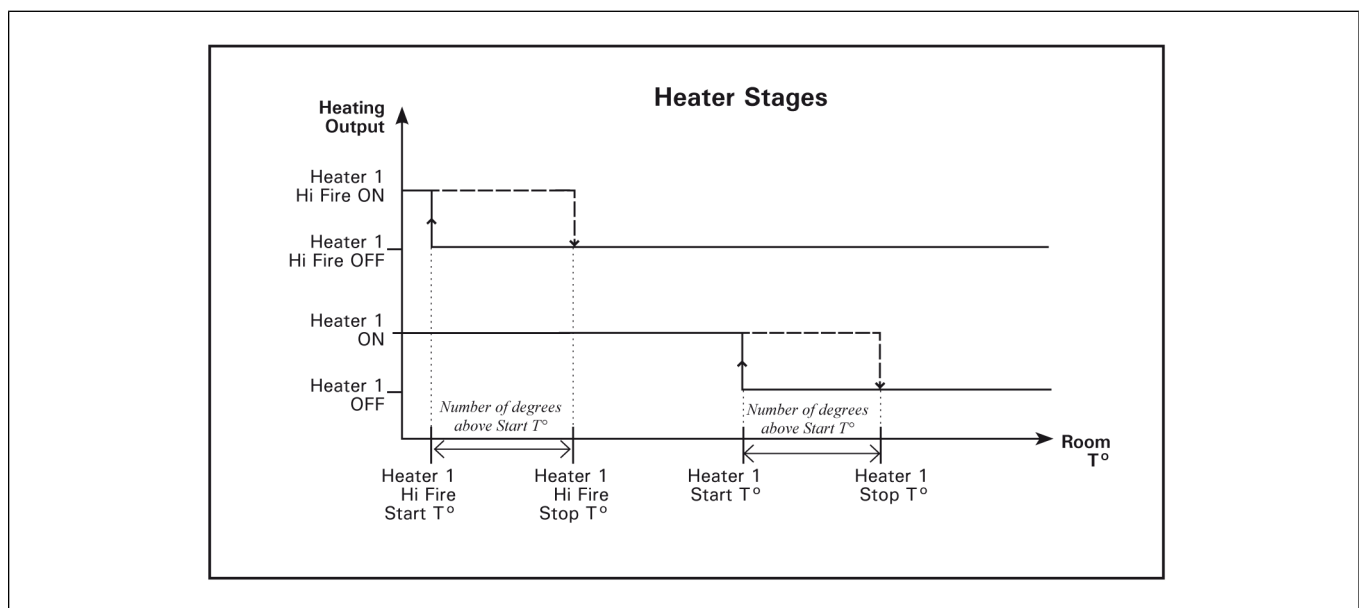
Heater curve

This curve allows an automatic adjustment of the heaters' start temperature over time. The heaters' start temperature changes using 10 steps. Each step specifies a day number and a start temperature for that day. The day number is based on the animal age. Once the 10 steps are defined, the curve must be activated. The controller then starts changing the heaters' start temperature every hour in a linear fashion between consecutive steps of the curve. When the last step is reached, the start temperature of the heaters for that day is maintained until a new batch starts and until the animal age is reset.

Heater Curve

```
Heater x
Start Temp.
78.0
76.0
74.0
72.0
70.0
68.0
66.0
64.0
62.0
60.0
      1   5   10  14  19  24  28  33  38  42  47 Day
```
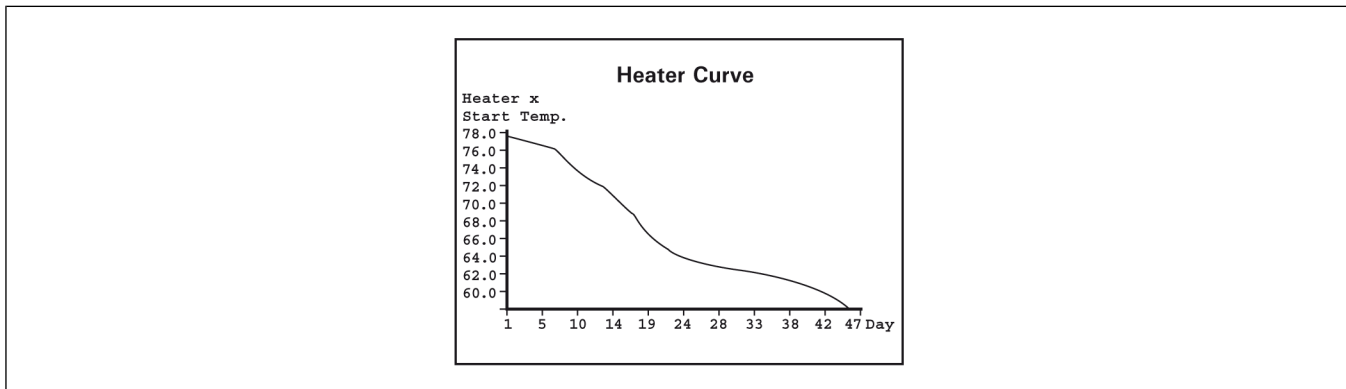
Setting Heater Start and Stop Temperatures

1. Navigate to **13. Heater Start / Stop Temperature**

   NOTE: *The start and stop temperatures of a heating output cannot be modified if the heater uses a heater curve.*

2. Set the following parameters:

   Heaters' Start / Stop Temperatures — Set the start and stop temperature of each heating output. The stop temperature must be at least 0.5°F (0.3°C) greater than the start temperature for a given heater.

   Hi Fires' Start / Stop Temperatures — Set the start and stop temperatures of each hi fire heating output. The stop temperature must be at least 0.5°F (0.3°C) greater than the start temperature for a given heater. *This parameter is available if the hi fire option is enabled.*

   NOTE: *Due to some technical limitations, the Stop Temperature of the heating outputs can either be expressed as an absolute value (e.g. 79.0°F) or as a relative value (e.g. Stop 1°F above the Start Temperature).*

Configuring a Heater Curve

1. Navigate to **9. Curve Settings→x. Heater x Start Temperature***.

   *Available if the heater offset curve is enabled.

2. Set the following parameters:

   NOTE: *The curve steps can only be modified while the curve is off.*

   Day Number — Set the day for each of the 10 steps. This number corresponds to the animal age and is adjustable from -5 to 450 days. Negative values are used to prepare the house before the letting the animals enter the building.

Start Temperature — Set the heater's start temperature for each step.

Curve Status — Select *"Yes"* to activate the curve. Once it is enabled, the heater's start temperature becomes automatically adjusted between consecutive points of the curve; for this reason the curve steps cannot be modified while the curve is on.

Copying and Pasting a Heater Curve

1. Navigate to **9. Curve Settings→20. Copy Paste Heater Curve***.

   *Available if the heater offset curve is enabled

2. Select the heating curve that needs to be duplicated and the target curve as follows:

   NOTE: *The curve steps can only be modified while the curve is off.*

   Copy From — This is the source curve. The one that will be duplicated.

   Paste To — This is the target curve. The one on which the copied curve will be pasted.

3. Once the source and the target curves are defined, the message "Confirm?" appears on the display. Select *"Yes"* to confirm the duplication.

   The message " Copy in progress.... please wait.. " is then displayed. Wait until the copying process is over.

Configuring the 0-10V Heating Output

The controller has four 0-10V outputs to control supplementary heater stages: Heaters and PI-heaters. The 0-10V output configured as PI-Heater is used to control heating device using a proportional-integral loop. Below the Start Temperature, the output is activated and modulated according to the difference between the Zone Temperature and the Control Temperature. The output is deactivated above the Stop Temperature or if the heater exceeds the maximum runtime. * The Zone Temperature is calculated using the Probes for 0-10V Outputs. ** A relay can be associated to a 0-10V output when configured as PI-Heater. The 0-10V output configured as a heater will behave as shown in the following graphic:
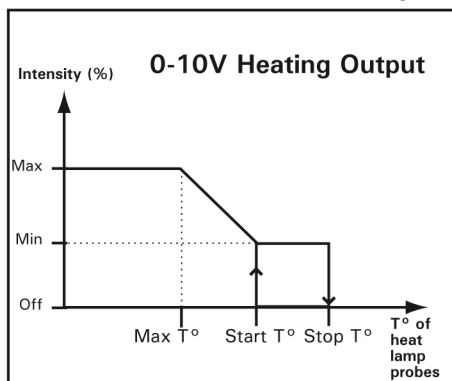
1. Navigate to **21. 0-10V Output Settings**.

2. Set the following parameters:

   Show Settings of — Select the proper 0-10V output. Note that the first 0-10V output is automatically reserved to activate additional lights if light programs are enabled.

   Output Type — Choose *"Heater"* to use the 0-10V output to operate an heating device.

   Start temperature — Set the temperature at which the 0-10V output starts operating continuously at its minimum speed. It can be adjusted of +/- 40°F (22.2°C) from the set point.

Stop Temperature — Select the temperature at which the output stops. It can be adjusted from 0.5° F (0.3°C) above the start temperature to 40°F (22.2°C).

Mode — Select the type of signal used by the output (0-10V or 10-0V).

6 Lights

Topics Covered in this Chapter

- Lights
- Configuring Light Programs
- Activating 0-10V Light Outputs

Lights

The controller has 8 daily light programs to control the light intensity on a daily basis. Each program is composed of up to 30 steps to vary the light intensity in the day and their activation is related to the animal age.

Configuring Light Programs

1. Navigate to **15. Light Settings*→x. Program x**.

   *Accessible if light programs are enabled.

2. Set the following parameters:

   Animal Age — This age is the day at which the selected light program starts being used.

   Lights on 24 Hours — When this function is enabled, lights always stay lit while the program is running.

   Number of Steps — Select the number of steps performed within the selected program. **This parameter is available if the "Lights on 24 Hours" function is disabled above.*

   Settings for Step #x — Select the proper step then set the following parameters: **This parameter is available if the "Lights on 24 Hours" function is disabled above.*

   Start Time — Select the time at which the selected step starts.

   Intensity — Select the intensity that is reached during the selected step.

   Transition — Select the time frame that is required for the lights to reach the specified light intensity.

**Daily Light Programs
(with 4 Steps)**
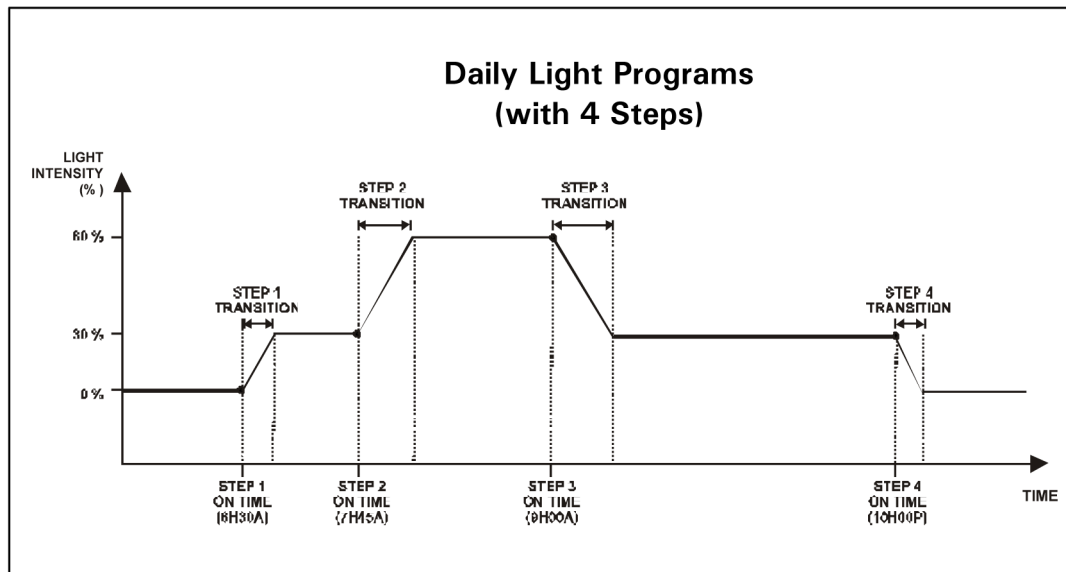
Activating 0-10V Light Outputs

The controller has four 0-10V outputs to control supplementary variable fan stages, lights, or heating devices. If light programs are enabled, the controller automatically reserves the first 0-10V output to control additional lights. The lights that are connected to 0-10V outputs follow the same variation as the ongoing light program.

1. Navigate to **21. 0-10V Output Settings***.

   Accessible if 0-10V outputs are enabled.

2. Set the following parameters:

   Show Settings of — Select the proper 0-10V output. Note that the first 0-10V output is automatically reserved to activate additional lights if light programs are enabled.

   Output Type — Select *"Light"* if lights are connected to the selected 0-10V output.**0-10V outputs* *can only control lights if light programs are enabled.*

   Mode — Select the type of signal that is used by the selected output: 0-10V or 10-0V.

7 Clock Outputs

Topics Covered in this Chapter

- Clock Outputs
- Setting Clock Start and Stop Times
- Setting Days of the Week for Clock Times

Clock Outputs

The controller has 8 outputs to control various devices using the real- time clock.

To run a clock output continuously, set all of its start and stop times to 12:00 am.

An alarm sets off if a clock program is not set properly. For example, if an activated program does not have a start time, an alarm is set off. This usually occurs when the start and stop times of a program are all set to the same value (other than 12:00 am). When this happens, the controller keeps using the previous clock program until the defective program is corrected.

Clock outputs 1 to 4 : Clock outputs 1-4 can use up to 4 programs each. Each of the 4 programs is composed of 10 start and stop times and the program selection is made as a function of the animal age. Note that program 1 automatically comes into effect once it is programmed.

Table 7-1 *Example of clock outputs 1-4*

Program 1	Program 2	Program 3	Program 4
On/Off 1	On/Off 1	On/Off 1	On/Off 1
On/Off 2	On/Off 2	On/Off 2	On/Off 2
On/Off 3	On/Off 3	On/Off 3	On/Off 3
On/Off 4	On/Off 4	On/Off 4	On/Off 4
On/Off 5	On/Off 5	On/Off 5	On/Off 5
On/Off 6	On/Off 6	On/Off 6	On/Off 6
On/Off 7	On/Off 7	On/Off 7	On/Off 7
On/Off 8	On/Off 8	On/Off 8	On/Off 8
On/Off 9	On/Off 9	On/Off 9	On/Off 9
On/Off 10	On/Off 10	On/Off 10	On/Off 10

Clock outputs 5 to 8 Clock outputs 5 to 8 do not use the programs but they can operate in 3 different ways:

- Start/Stop mode where clock outputs can operate according to 10 different start and stop times
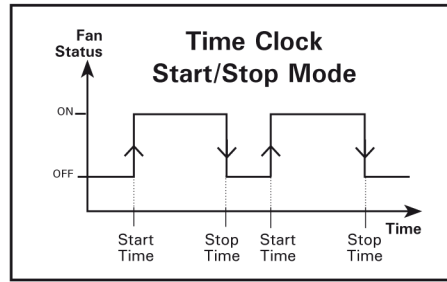
- Start/Run mode where clock outputs can operate according to 10 different start and run times
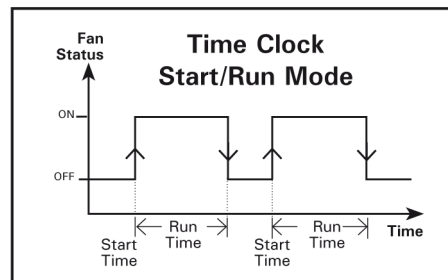
- Start/Repeat mode where the clock output operates according to a timer which is repeated at regular intervals. This timer is made of a start and run time.
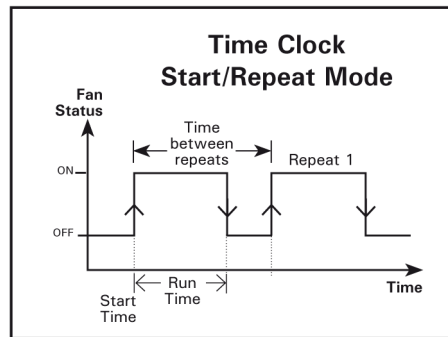
Setting Clock Start and Stop Times

1. Navigate to **16. Clock Times*→x. Clock x Start/Stop Time**.

   * Available if clock outputs are enabled

2. Set the following parameters:

   Show Settings of — Select a program (for clock outputs 1 to 4 only). The 10 cycles of the selected program are displayed.

Animal Age — Select the age at which the program starts (for clock outputs 1 to 4 only). This menu is not available for program 1 since this program automatically starts once it is programmed (day 0).

On / Off / Run Times — Set the start time and the stop time / or run time of each cycle. If 10 cycles are not required, set the start and stop times of unused cycles to the same value (other than 12:00 am) or set the run time to 0 min and 0 sec.

Number of repeats — If the chosen clock output uses the Start/Repeat operating mode, select how many times the cycle must be repeated over the day. The output starts running at its start time, performs the first cycle and then repeats it as required.

Time between repeats — If the chosen clock output uses the Start/Repeat operating mode, specify the period of time between cycles (this period of time must include the run time).

Setting Days of the Week for Clock Times

1. Navigate to **16. Clock Times*→9. Day of the Week**.

   * Available if clock outputs are enabled

2. Set the following parameters:

   Show Settings of — Select a clock output. The operating days of the selected clock output are displayed.

   Days — Put a check mark to identify on which day(s) the clock output must be used.

   Skip days — Select the number of days to skip. If it's set to zero, then the clock will be enabled during the days of the week checked on the list. On the contrary, the days of the week will be ignored and the clock will be enabled once every "Skip days".

   Elapsed days — Shows the number of days elapsed since the last time the clock was enabled. When "Elapsed days" becomes greater than "Skip days", it automatically resets to zero and restarts the clock output.

   Restart count? — Reset "Elapsed days" to zero. As soon as the count is restarted the clock becomes enabled again.

NOTES

8   2nd Room

Topics Covered in this Chapter

- 2nd Room Outputs
- Configuring 2nd Room Output Settings

2nd Room Outputs

The controller can activate 2 different types of outputs inside an 2nd Room: 1 Heating Output 1 Cooling Output All 2nd Room outputs operate according to the average temperature in that room, which is called a reference temperature.

2nd Room heating output

The 2nd Room heater starts when the temperature drops below the heater's "Start Temperature", and stops when the temperature reaches the heater's "Stop Temperature".
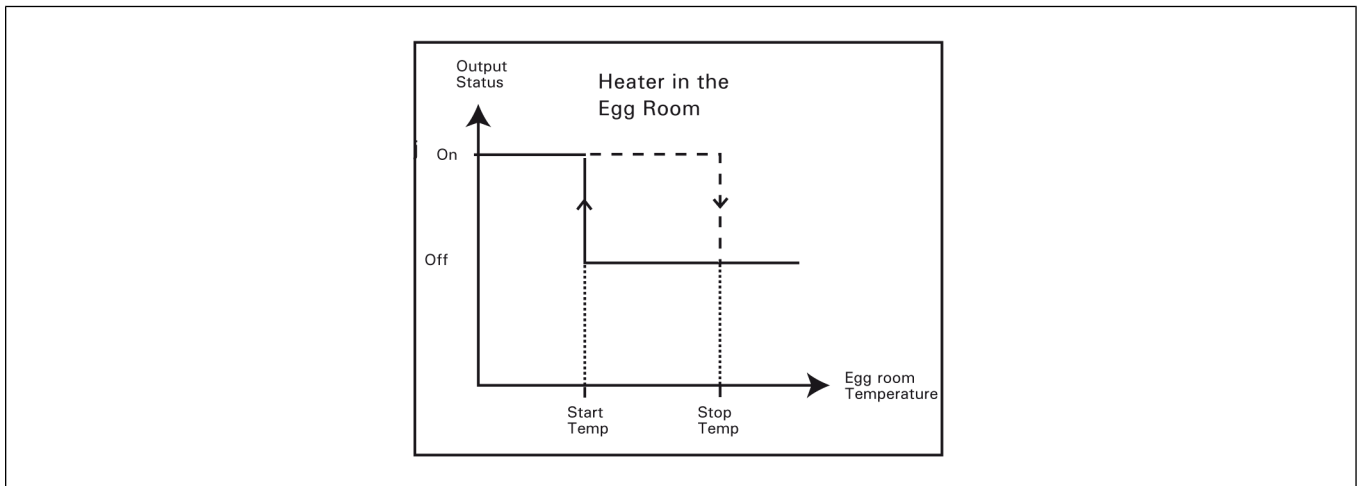
2nd Room cooling output

The 2nd Room cooling output starts when the temperature reaches the cooling output's "Start Temperature", and stops when the temperature drops below the cooling output's "Stop Temperature".

Cooling Output in the Egg Room
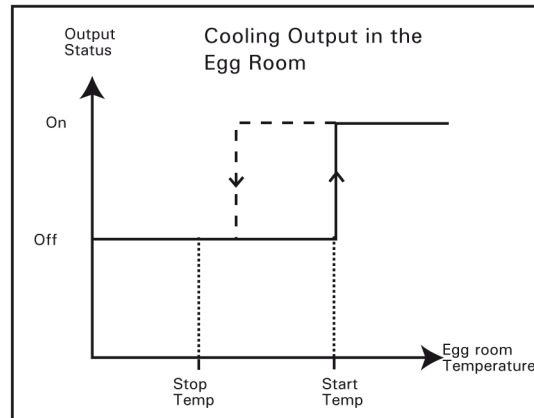
Configuring 2nd Room Output Settings

1. Navigate to **15. 2nd Room Settings**.

   * Accessible if the 2nd Room is enabled

2. Set the following parameters:

   2nd Room Set Point — Set the reference temperature for the 2nd Room. This temperature cooling stop temperature cannot be lower than the setpoint and the heater stop temperature cannot be greater.

   Heat Start/Stop — Set the temperature below which the 2nd Room heater starts and above which it stops. Note that start temperature cannot be equal to the stop temperature.

   Cool Start/Stop — Set the temperature at which the 2nd Room cooling output starts and below which it stops. Note that start temperature cannot be equal to the stop temperature.

9 Relative Humidity

Topics Covered in this Chapter

- Relative Humidity Control
- Setting Relative Humidity Compensation

Relative Humidity Control

The controller offers different options to compensate for high/low humidity levels in the room. This section describes the operation of each humidity control method.

RH Compensation on the minimum ventilation intensity

The humidity level can be decreased by increasing the fans' running time (or the fan speed) in minimum ventilation. If variable fans are used, their speed increases during the minimum ventilation cycles as the humidity level increases; if On/Off fans are used, their running time increases as the humidity level increases. The added fans' on time (or speed) is fully added when the humidity level exceeds the RH set point by 10%.
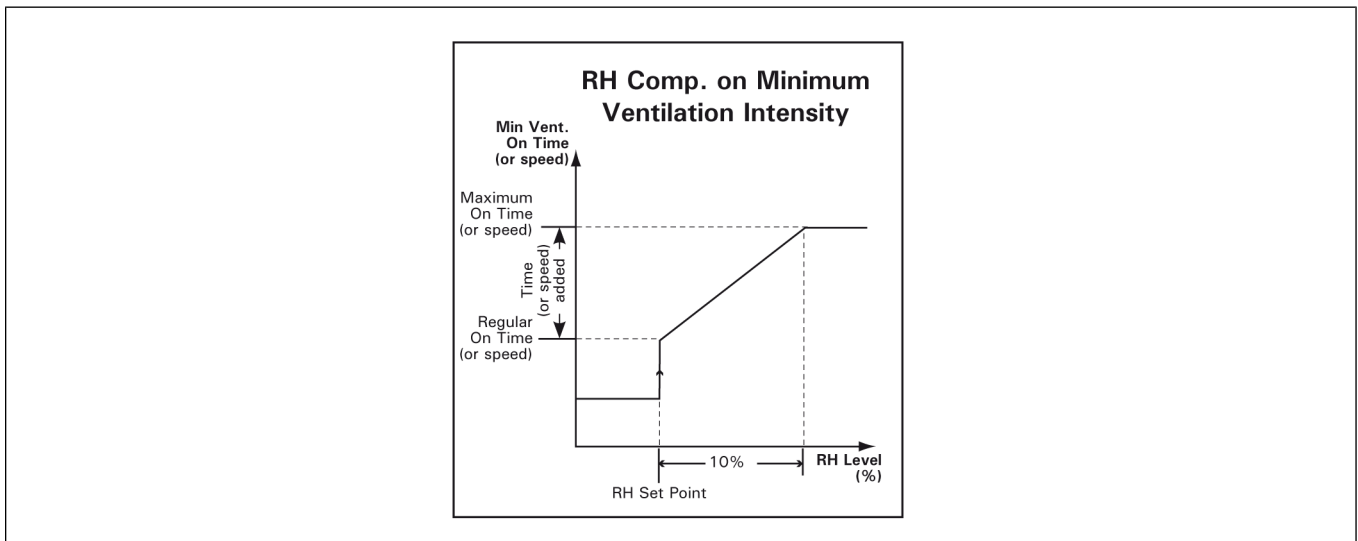
RH compensation with heating outputs

The controller can activate heating units in timer mode to decrease the humidity level. As the humidity level increases, the heaters' On- Time increases proportionally to compensate for the change. They reach their full On-Time when the humidity is at or above RH Set Point + 10% as shown on the following graph.
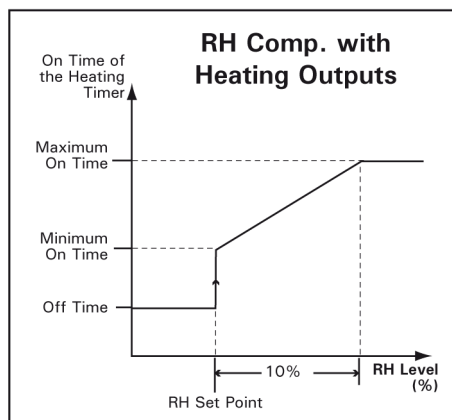
RH compensation on the mist output

The controller can stop mist units when the humidity level is too high. This applies to fan stages with timer-based relays and cooling stages. The mist shutoff occurs when the humidity level increases above the mist shutoff limit.

Setting Relative Humidity Compensation

1. Navigate to **23. Controller Setup→1. Relative Humidity Compensation***.

   * This menu is accessible if the humidity probe is enabled

2. Set the following parameters:

   Relative Humidity Set Point — This is the humidity level above which the compensation starts. This parameter ranges from 25 to 99%. Increase the value to *"Off"* to disable all humidity compensation functions.

   Use Minimum Ventilation Compensation — Select *"Yes"* to compensate high humidity levels with the fans' run time or speed in minimum ventilation.

   Stop Compensation Under — Select the house temperature below which the compensation on the minimum ventilation should stop. The valid range for this parameter goes from set-point – 40°F to set-point – 0.5°F.

   Added Speed — Speed that is added to the variable fans's during the minimum ventilation cycles. This parameter ranges from 1 to 100%. Select *"Off"* to deactivate this function. **This parameter is available if variable outputs are enabled.*

   Added On Time — Time that is added to the fans' run time during the minimum ventilation cycles. This parameter ranges from 0 to 900 seconds. **This parameter is available if the variable outputs are disabled.*

   Use Mist Shut Off? — Select *"Yes"* to disable mist units (fan stages' timer-based relays & cooling outputs) when the humidity level is too high.

   Stop Misting at — Set the humidity level above which the stages' timer-based relays and cooling stages stop. This parameter ranges from 25% to 99%. Increase the value to *"Off"* if you want to disable this function.

   Use Heater Compensation? — Select *"Yes"* to activate heating units in timer mode when the humidity level is too high.

Stop Compensation Above — Select the house temperature above which the compensation on heaters should stop. The valid range for this parameter goes from set-point –10°F to set-point +10° F.

Min / Max On Time — Set the minimum and maximum run times of the heaters' timer. This parameter ranges from 0 to 900 seconds.

Off Time — Set the off time of the heating cycle. This parameter ranges from 0 to 900 seconds.

NOTES

10 Soaking

Topics Covered in this Chapter

- Soaking

Soaking

The controller can control one soaking output to operate cleaning instruments. This output automatically starts running in timer mode when the controller enters in clean mode. You can specify the number of soaking cycles to be performed in clean mode or choose to enable them continuously.

Navigate to **7. Temperature Set Point** and set the following parameters:

Use Soaking — Select "Yes" to enable the soaking output; select "No" to disable it.

On & Off Times — The soaking timer is made of an On and Off Time. The On Time can be adjusted from 0 to 60 minutes; the Off Time can be adjusted from 0 to 240 minutes (4 hours). Set these parameters to the desired value.

# of Soaking Cycles — Select the number of soaking cycles that need to be performed. To activate these cycles continuously, increase the number of soaking cycle until you reach the continuous mode "cont."

NOTES

11 Alarms

Topics Covered in this Chapter

- Alarms
- Viewing the Alarm Log
- Alarm Conditions and Settings
- Configuring Temperature Alarm Settings
- Static Pressure Alarms
- Setting the High and Low Static Pressure Alarm Limits
- Setting the Static Pressure Low Alarm Relay
- Setting the Static Pressure High Alarm
- Configuring Water Spill Alarms
- Configuring Feeder Alarms
- Configuring 2nd Room Alarms

Alarms

When an alarm occurs, the alarm LED is turned on and the alarm is stored in the alarm log menu, along with the time and date. The controller keeps in memory the last 25 alarm conditions.

Viewing the Alarm Log

1. Navigate to **20. Alarm Log** or press the **Alarm Log** shortcut key.

2. Use the arrow keys to select an alarm. The date and the time at which the selected alarm condition occurred are displayed at the top of the display.

Alarm Conditions and Settings

The following sections describe how the alarms are set off and how to adjust the alarm limits. Refer to the table below to see all possible alarm conditions.

Table 11-1 *Alarm conditions*

Low Temp Alarm	Outside Probe Defective
High Temp Alarm	Relative Humidity probe Defective
Probe #x Low Temperature Alarm	Static Pressure Probe Defective
Probe #x High Temperature Alarm	Water Spill
Low Pressure Alarm	Water Module Com
High Pressure Alarm	Feeder run time
Var. Module comm	Power Failure
Inlet communication	Main Breaker Low Temperature
Relay communication	Main Breaker High Temperature
Relay Programming Fault	2nd Room Low Temp. Alarm

Table 11-1 *Alarm conditions (cont'd.)*

Clock 1-4 fault, Program #"x"	2nd Room High Temp. Alarm
Probe #x Defective	

Zero crossing

This alarm message is displayed when there is instability in the controller power supply:

- Make sure power supply is good.

- Make sure the flat cable is connected properly between the top and bottom boards inside the controller.

- Make sure both power cables are connected properly inside the controller (main power cord and power cable between main circuit board and upper circuit board).

- Another alarm situation occurs when power to the controller fails. In this case, the alarm relay is activated. When the alarm relay is activated, the normally open contact closes.

Temperature alarms

When the average room temperature exceeds the high temperature alarm setting (Set Point + Hi Offset), a high temperature alarm sets off. When the average room temperature decreases below the low temperature alarm limit (Set Point - Lo Offset), a low temperature alarm sets off.

The critical temperature is the absolute maximum allowable temperature in the room.

The Outside Temperature Influence on Alarms feature avoids false alarms due to warm weather: The room temperature can exceed the high temperature limit in the case where the outside temperature is warm enough. The room temperature must remain equal or lower than Outside T°+ Outside Influence or lower than the Set Point + Hi Offset, whichever is higher but in every case, it must remain below the critical temperature, regardless of the outside temperature.
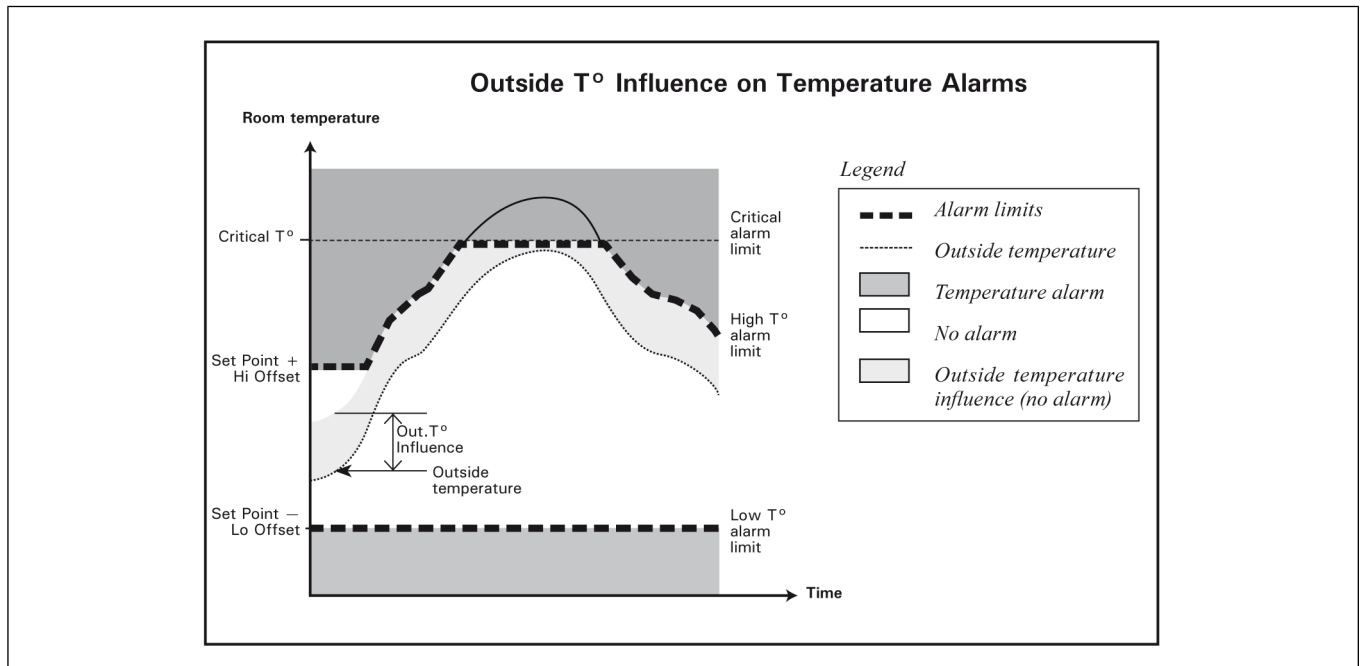
Configuring Temperature Alarm Settings

1. Navigate to **23. Controller Setup**→**5. Alarm Settings**→**1. Temperature**.

2. Set the following parameters:

   Low High Temperature Offset — The Hi and low offsets are the number of degrees below and above the set point at which a temperature alarm sets off. The low temperature limit ranges from 20° F to 0.5°F (11.1 to 0.3°C) below the set point (Lo Offset). The high temperature limit ranges from 0.5°F to 35°F (0.3 to 19.4°C) above the set point (Hi Offset).

   Low/High Probe Temperature Offset — The High and Low offsets are the number of degrees below and above the set point at which a temperature alarm is set off. These limits refer to individual temperature probes and not to the room temperature. For example, If any one temperature probe is outside these limits, an alarm set off.

   Outside Influence — The outside temperature influence is the number of degrees that are added to the outside temperature to avoid false alarms on warm days. Refer to the previous diagram. *Accessible only if "Use Outside Temperature Influence?" is set to Yes in the Installation menu.*

   Critical Temperature — The critical temperature is the absolute maximum temperature that is allowed in the room.

   Low/High Breaker Alarm — If the temperature of the main breaker is monitored by a probe, set the probe temperatures below and above which a breaker temperature alarm must sound. *Accessible if the breaker's monitoring function is enabled.*

   IMPORTANT: *Install the breaker's probe close to the breaker box, not inside the box.*

Static Pressure Alarms

The controller can generate an alarm if the static pressure decreases below the low pressure limit or if it exceeds the high pressure limit. The alarm condition must be maintained during a user-defined delay before the alarm sets off.

Low static pressure alarm

You can assign a relay that will be activated if a Low Static Pressure Alarm occurs. This relay may be used to activate a fan for instance. When a low static pressure alarm occurs, this relay turns on for a 15 minutes. If the static pressure level is still below the Low Pressure Limit after this delay has elapsed, the relay keeps running for another 15 minutes, up until the pressure level returns in the normal range.

Low static pressure alarm curve

The controller can automatically change the low static pressure alarm limit with time. With the low SP alarm curve, you can program 3 different low pressure alarm limits and the moment at which each limit starts being used is defined as a function of the animal age. Refer to the installation setup section of this manual to enable the Low SP Curve.

High static pressure alarm

When a high static pressure alarm occurs, the controller can open vent doors and the tunnel curtain. The curtain or vent doors open during a user-defined delay (Open-Time) and then stay still for 15 minutes (this time includes the Open-Time). If the pressure level still exceeds the Hi Static Pressure Limit after 15 minutes, the same cycle starts over again, up until the pressure level goes back in the normal range.

Setting the High and Low Static Pressure Alarm Limits

1. Navigate to **23. Controller Setup→5. Alarm Settings→2. Static Pressure*→1. Low and High Limits**.

   * This menu is accessible if the static pressure sensor is enabled

2. Set the following parameters:

   Low /High Pressure Alarm — Set pressure limits to the desired values (from 0.00 to 0.40"WC) or select "Off to disable the low pressure alarm. If the Low SP alarm curve is used, set all 3 low pressure alarm limits. **Low SP limits 2-3 are only accessible if the Low SP alarm curve is enabled in the Installation Setup.*

   Animal Age — If the Low SP alarm curve is used, set the animal age at which each low pressure alarm limit starts being used (note that the first alarm limit is used when the animals are younger than the age specified for alarm limit 2. **Accessible if the Low SP alarm curve is enabled in the Installation Setup.*

   Low/High Delay — Set the delay over which the alarm condition must be maintained for an alarm to set off. Set this delay separately for the High and Low static pressure alarms.

Setting the Static Pressure Low Alarm Relay

1. Navigate to **23. Controller Setup→5. Alarm Settings→2. Static Pressure*→1. Low Alarm Relay**.

   * This menu is accessible if the static pressure sensor is enabled

2. Put a check mark to identify the relay that is used in case of a low pressure alarm.

Setting the Static Pressure High Alarm

1. Navigate to **23. Controller Setup→5. Alarm Settings→2. Static Pressure*→3. High Alarm**.

   * This menu is accessible if the static pressure sensor is enabled

2. Select the moving time of the curtain and/ or vent doors* when a static pressure alarm occurs. The curtain or vent door opens or closes during this delay every 15 minutes, up until the static pressure returns in the normal range. **For static pressure-based vent doors and curtain only.*

Configuring Water Spill Alarms

A water spill alarm sets off when the water consumption exceeds a certain limit. This limit can be adjusted from 0 to 10,000 gallons or liters per 15 minutes. The alarm is activated if a greater amount of water is detected within the 15 minute interval.

1. Navigate to **23. Controller Setup→5. Alarm Settings→3. Water Consumption***.

   * This menu is accessible if water meters are enabled

2. Set each the maximum water consumption per period of 15 minutes of each water meter.

Configuring Feeder Alarms

An alarm sets off when the continuous feeder run time is too high. When this type of alarm occurs, the alarm relay switches and the controller opens the feeder relay to stop the feeder motor.

1. Navigate to **23. Controller Setup→5. Alarm Settings→4. Feeder**.

2. Set the following parameters:

Feeder Follow Clock? — Associate an existing clock to the feeder operation. When the feeder is assigned to a clock, the relay assigned to that feeder will be active only during the on-time part of the clock cycle.

Maximum Run Time — Set the maximum consecutive run time of the feeder motor. This parameter ranges from 0:00 to 23:59 h:m. *If "Feeder Follow Clock?" is active, then the internal feeder runtime counter will restart every time the assigned clock goes off.*

Stop at Max Run Time? — Select *"Yes"* to stop the feeder when a feeder run time alarm occurs (the feeder relay opens).

Restart Feeder — If a feeder alarm is currently active, the message *"Restart Feeder"* is displayed. Select *"Yes"* to reset the feeder alarm and to restart the feeder.

Configuring 2nd Room Alarms

When the 2nd Room temperature exceeds the high temperature alarm setting (2nd Room Set Point + Hi Offset), a high temperature alarm sets off. When the 2nd Room temperature decreases below the low temperature alarm limit (2nd Room Set Point - Lo Offset), a low temperature alarm sets off.

1. Navigate to **23. Controller Setup→5. Alarm Settings→5. 2nd Room**.

2. Set the following parameters:

    2nd Room Set Point — See the reference temperature for the 2nd Room. This is a read only parameter.

    Low/High Temperature Offset — The Hi and low offsets are the number of degrees below and above the 2nd Room set point at which a temperature alarm sets off. The low temperature limit ranges from 30°F to 0.5°F (11.1 to 0.3°C) below the set point (Lo Offset). The high temperature limit ranges from 0.5°F to 30°F (0.3 to 19.4°C) above the set point (Hi Offset).
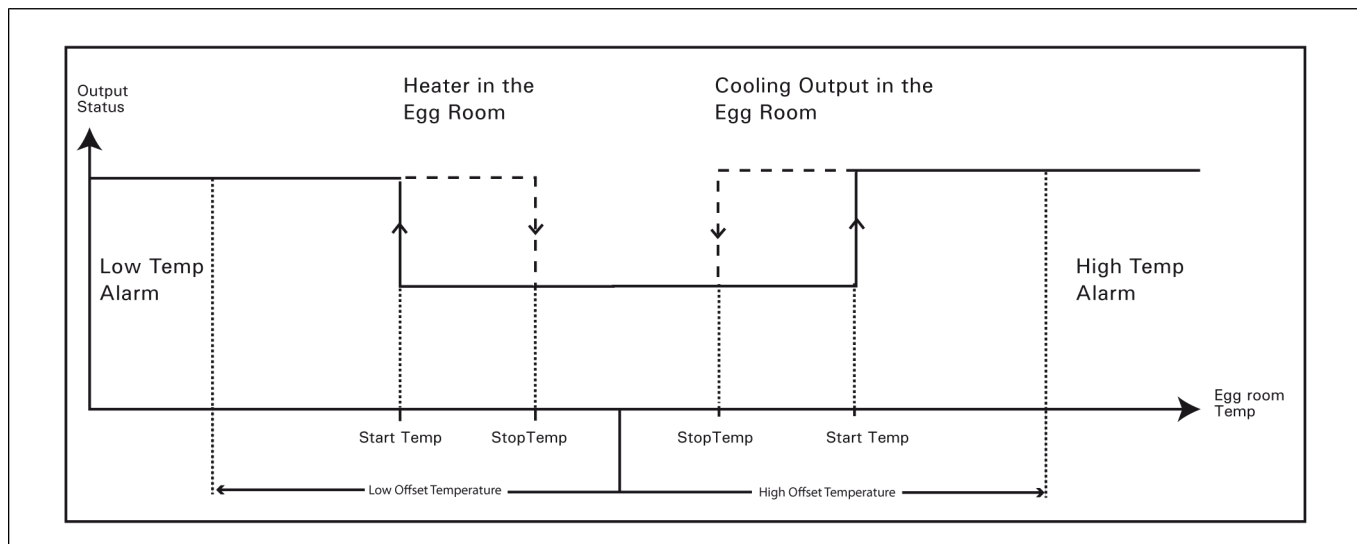
NOTES

12 Site Monitoring

Topics Covered in this Chapter

- Site Monitoring
- Viewing the History Log
- Viewing Current Conditions
- Viewing the Heater Run Time History
- Viewing or Clearing Relay Run Time History
- Viewing the Water Consumption History
- Monitoring the Animal Age and Number
- Viewing Animal Age and Mortality

Site Monitoring

Viewing the History Log

The input readings are logged in the history menus at midnight every day. These histories are reset when a new batch starts.

Navigate to one of the following parameters you want to view:

2. Average house T° — The daily minimum and maximum readings of the average room temperature are displayed for the past 180 days.

3. Individual probe temperature — The daily minimum and maximum temperature readings of each individual probe are displayed for the past 180 days.

4. Outside temperature — To see which relays are currently active. Select *"All"* to view all active relays; select *"Fan/Cool"* to see the relays of fan and cooling stages only.

5. Relative humidity — The daily minimum and maximum readings of the humidity probe are displayed for the past 180 days.

Viewing Current Conditions

The current condition menus give a quick view of the actual conditions in the barn.

1. Navigate to **1. Current Conditions**

2. Navigate to one of the following parameters you want to view:

Current Condition — To see the probe current readings, and to see other useful pieces of information. The controller automatically selects this menu after 4 minutes of inactivity.

Active Sensors — To see what temperature sensors are currently used to measure the average room temperature.

Stage Start/Stop Temperature — To see the current start and stop temperatures of fan stages.

Cooling Start/Stop Temperature — To see the current start and stop temperatures of cooling stages.

Heater Start/Stop Temperature — To see the current start and stop temperatures of heating stages.

PI-Heater Diagnostics — Gives the current state of the proportional/integral algorithm for the variable heaters.

Current Active Relays — To see which relays are currently active. Select *"All"* to view all active relays; select *"Fan/Cool"* to see the relays of fan and cooling stages only.

Viewing the Heater Run Time History

The daily run times of each heating outputs are displayed for the past 180 days. The total run time is displayed as well.

1. Navigate to **19. Heater Run Time**.

2. Select the desired heating stage you want to view.

Viewing or Clearing Relay Run Time History

1. Put a check mark to clear the run time history of the relay.

2. Select *"Yes"* to confirm.

Viewing the Water Consumption History

The daily water consumption of each water meter is displayed for the past 180 days. The total consumption is displayed as well.

1. Navigate to **18. Water Consumption**.

2. Select the desired water meter you want to view.

   * *This menu is accessible if water meters are enabled.*

Monitoring the Animal Age and Number

The controller uses the animal age as a reference to find its position in the various curves (minimum ventilation and set point curves). It also uses this age to activate the proper light program and to limit the tunnel ventilation level. At the beginning of a batch, you must specify what is the initial number of animals in the room. You must then post up every variation in the number of animals (mortalities & culled animals). This way, the controllers keeps track of the number of remaining and dead animal within a batch.

What You Should Know

> ⚠ **WARNING** | ***All histories are reset when a new batch starts.***

1. Navigate to **18. Animal Age and Mortality→1. Animal Age & Mortality**.

2. Set the following parameters:

   Animal Age — This parameter ranges from -5 to 450 days. Negative day values are used to prepare the house before the animals' arrival. **This parameter is available if the animal age function is enabled.*

   Initial Count — Enter the initial number of animals at the beginning of the batch.

New Mortality — Post up the mortalities as they occur. Once you have entered a value, the controller validates it and displays "0" afterwards. The controller then adds this value to the total number of mortalities and removes it from the remaining animal count.

Today Mortality — This is the total number of mortalities in the current day. This value is displayed as a reading and cannot be modified. It will reset at midnight.

Total Mortality — This is the total number of mortalities since the beginning of the batch. This value is displayed as a reading and cannot be modified.

Remaining Count — This is the total number of animals remaining in the house. Initial Count - Total Mortality.

Start New Batch — When a new batch starts the controller resets all histories. The remaining count goes back to the initial count and the total number of mortalities goes back to zero. Once you have answered *"Yes"* to the Start New Batch question, the controller validates the answer then displays *"No"* again meaning the new batch has just started.

Viewing Animal Age and Mortality

The controller keeps a record of daily mortalities for the past 180 days.

Navigate to **18. Animal Age and Mortality→2. Mortality — History Logs**.

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13 Message Center

Topics Covered in this Chapter

- Message Center
- Viewing the Message Log
- Scheduling Services in the Message Center
- Clearing the Message Log

Message Center

Use the message center as a reminder for the maintenance of your equipment. You must first enter the frequency at which your various servicing activities must be performed. The controller will then advise you when the servicing time has elapsed. When this happens, the controller turns on the Message Center status LED and posts a message telling the nature of the servicing activity that needs to be executed in the Message Center menu.

Viewing the Message Log

The Message Log menu tells which servicing activity need to be done. When the Message Center status LED is lit when a message is present in the Message Log menu. The controller keeps in memory the last 25 events.

Navigate to**24. Message Center→1. Message Log** or press **F**.

Scheduling Services in the Message Center

1. Navigate to**24. Message Center→3. Message Settings**.

2. Specify the frequency at which your servicing activities must be performed.

3. Set the following parameters:

   NOTE: *To disable a monitoring function, decrease the parameter until the word "Off" appears.*

   External Input — Select after how many hours of operation the external input must be checked.

   Adjust fan belts/Clean cooling pads/Flush cooling sump/Flush distribution pads — Select after how many hours of operation each of these operations needs to be performed. The controller monitors the run time of the relays associated with each of these outputs.

   Other servicing activities — Follow the prompts on screen and set the frequency at which each maintenance activity must be performed. The countdown starts from the moment the controller is powered up.

Clearing the Message Log

Once you have completed the servicing activities, clear the message logs.

1. Navigate to**24. Message Center→4. Clear Message Center**.

2. Select *"Yes"* to clear the messages that are currently present in the Message Log menu.

NOTES

14 Technical Specifications

⚠️ **CAUTION** | *To use the controller at 208Vac, set the voltage selector to 230Vac.*

Type	CC24-7 Elite
Main supply fuse F25	1A, fast blow
Main supply/frequency	120/240 Vac, 50/60Hz
0-10V outputs 1-4	0-10VDC, 30mA source max.
Precision on 0-10V outputs	±1 %
14VDC outputs	14 VDC ± 10%, regulated, 250mA max
Alarm Contact	On/Off output, 24VDC or AC, 0.15A
Enclosure	ABS, moisture and dust-tight
Operating temperature	32 to 104°F (0 to 40°C). Indoor use only
Storage temperature	5 to122°F (-15 to 50°C)
Ambient relative humidity	max. 95%
Relative humidity input	4-20mA
Pressure input	4-20mA
Temperature inputs	1K @ 77°F (25°C), NTC
Input supply	120/208/240 VAC, +6%/-8%, 50/60Hz, 20 W, 1 PHASE
Alarm output	24 VDC or AC, 0.150A max.
OUT1-OUT4	0-10 VDC, 0.03 A
14V Output	14 VDC, 0.25 A

15 Transfer Menu

Topics Covered in this Chapter

- Transfer Menu
- Adjusting Screen Contrast
- Adjusting Communication Speed
- Updating or making a Backup using a USB Key

Transfer Menu

Adjusting Screen Contrast

1. Simultaneously press and hold the right and left arrow keys for 5 seconds to display the transfer menu.

2. Navigate to **6. Contrast** and press **Enter**.

3. Set the screen contrast to the desired intensity then press **Enter** to validate.

4. Simultaneously press and hold the right and left arrow keys for 5 seconds to exit from the transfer menu.

Adjusting Communication Speed

1. Simultaneously press and hold the right and left arrow keys for 5 seconds to display the transfer menu.

2. Navigate to **5. Comm Speed** and press **Enter**.

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

4. Simultaneously press and hold the right and left arrow keys for 5 seconds to exit from the transfer menu.

Updating or making a Backup using a USB Key

The USB drive allows upgrading the firmware or software of your controller. It can also be used to make a backup of your controller settings or to copy these settings on another controller of the same type.

1. Turn off power to the controller.

> ⚠️ **DANGER** *Turn off power each time you open the controller's enclosure. This prevents accidental exposure to areas of high voltage.*

2. Lift the latches to open the front door of the controller.

3. Insert the USB drive in the connector behind the front door.

USB drive
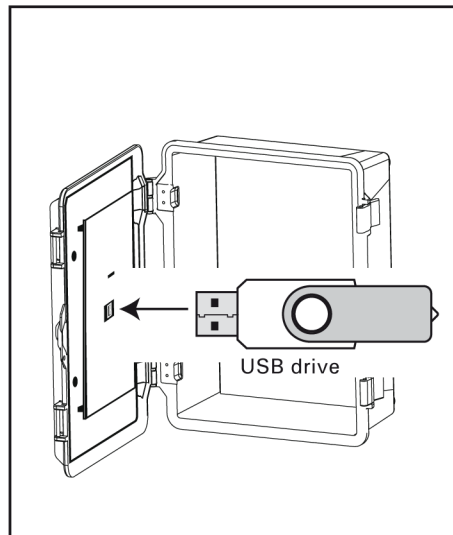
4. Close the front cover and reapply power to the controller.

5. Simultaneously press and hold the right and left arrow keys for 5 seconds to display the transfer menu.

6. Select one of the following:

   1. MemoryCard -> Control — to load a new configuration file into your controller. This transfer will update your controller's software and parameter settings. When selecting this option, a list of all configuration files located on the card is displayed (*.DMP files). Select the desired file and then simultaneously press the up and down arrow keys to start the transfer (or simply press the enter key).

   2. Control -> MemoryCard — to save your controller settings on the USB drive and press Enter. The saving process will start as soon as you enter this menu. The controller will create a file named CC24. DMP at the root of the USB drive. If this file name already exists, the controller will add a sub-index to new file name (CC24 _ 2.DMP, CC24 _ 3.DMP, etc.) The controller will never erase a file on the card.

   3. Update Firmware — to download a new firmware file into your controller. This process will not affect your parameter settings. When selecting this option, a list of all firmware files located on the USB drive is displayed (*.PKG files). Select the desired file and then simultaneously press the up and down arrow keys to start the transfer (or simply press the enter key).

   NOTE: *Note that the controller can only read the files that are located at the root of the USB drive. It cannot access any sub-directory!*

   4. Save Event Buffer — to save the event buffer of the controller on your USB card. The file will have a *.txt extension.

5. Save History Log — to save the hourly history for the last 180 days of the following list of parameters on your USB card. The file will have a .csv extension.

- Current set-point

- Average House T°

- Individual Temperature Probe

- Probes 1 to 8

- Outside Temperature

- Relative Humidity

- Static Pressure

- Water Consumption

- Water meters 1 to 18

- Heaters 1 to 8

- PI-Heaters 1 to 2

- Daily mortality

7. Simultaneously press and hold the right and left arrow keys for 5 seconds to exit from the transfer menu.

8. Remove the USB drive from the connector when the transfer is over.

NOTES

A Installation Report

CLIENT

Name: _____

Address: _____

_____

_____

City: _____

Phone: _____

Fax: _____

INSTALLER

Name: _____

Address: _____

_____

_____

City: _____

Phone: _____

Fax: _____

NOTES

B Installation Setup Worksheet

Parameter	Range	Your settings
Clear Alarms		
Number of T° Probes	1 to 8	
Number of Water Meters	0 to 10	
Number of Relays	10 to 100	
Number of Inlets	0 to 10	
Number of Fan Stages	1 to 16	
Number of Cooling	0 to 4	
Number of Programs	None / ab / abc / abcd	
Number of Light Programs	0 to 8	
Number of Heaters	0 to 8	
Number of Natural Zones	0 to 4	
Number of Clocks	0 to 8	
# of Programs - Clock Output 1	1 to 4	
# of Programs - Clock Output 2	1 to 4	
# of Programs - Clock Output 3	1 to 4	
# of Programs - Clock Output 4	1 to 4	
Clock Output 5 Mode	Start-Stop / Start-Run / Start-Repeat	
Clock Output 6 Mode	Start-Stop / Start-Run / Start-Repeat	
Clock Output 7 Mode	Start-Stop / Start-Run / Start-Repeat	
Clock Output 8 Mode	Start-Stop / Start-Run / Start-Repeat	
Clock Increments	1, 5 or 10 min	

Appendix B: Installation Setup Worksheet

Use Night Set Point ?	Yes / No	
Use Set Point Curve ?	Yes / No	
Use Minimum Ventilation Curve ?	Yes / No	
Use Heater Offset Curve ?	Yes / No	
Use Animal Age function ?	Yes / No	
Use Heater Programs ?	Yes / No	
Use Heater Hi / Lo Fire ?	Yes / No	
Use Tunnel ?	Yes / No	
Tunnel Mode :	Timed / Static Pressure	
1st Inlet Transition mode :	Open / Static Pressure / As is	
Tunnel Pre-opening Type	Normal / Tunnel Help	
Tunnel Pre-opening Time	n/a	_____seconds
Multiple tunnel stages with age ?	Yes / No	
Use tunnel curtain in natural ?	Yes / No	
Use Stir Fans ?	Yes / No	
Use Variables ?	Yes / No	
Variable 1 Minimum Speed :	n/a	_____%
Variable 2 Minimum Speed :	n/a	_____%
Use Ramping on Stage 1 ?	Yes / No	
Use Ramping below Set Point ?	Yes / No	
Stage 1 Ramping Delay (advanced)	n/a	_____seconds
Stage 2 Ramping Delay (advanced)	n/a	_____seconds
Outside T° Set Point (advanced)	n/a	_____°
Ramping cycle (advanced)	n/a	_____seconds
Use Outside Temperature ?	Yes / No	
Use Relative Humidity Probe ?	Yes / No	
Use Static Pressure (SP) Probe ?	Yes / No	

SP Set 2 - Vent Doors	None / Stage / Outside T°	
1st Inlet Pre-opening Mode	Auto / Manual	
Pre-opening delay for Vent Doors	n/a	_____seconds
Pre-opening delay for Attic Vents	n/a	_____seconds
SP Set 2 - Tunnel Curtain	None Stage	
Use SP Compensation on Inlets?	Yes / No	
Send Temperature Compensation each	n/a	
Use Curve on Low SP Alarms?	Yes / No	
Monitor breaker temperature ?	Yes / No	
1st Inlet Mode	SP / Potentiometer / Timer	
Use 2nd Inlet?	Attic / 2nd inlet	
Attic Mode	SP / Time	
2nd Inlet Type	Sidewall / Tunnel	
2nd Inlet Mode	SP / Time	
Attic/2nd Inlet Probe	Room / Indiv.	
Shown on LED Display	Temperature and: - Static pressure -Vent door position	

NOTES

C   Probe Assignment Worksheet

OUTPUTS		T° Probes 1	2	3	4	5	6	7	8
Avg Room T°	Program a								
	Program b								
	Program c								
	Program d								
Heater 8 Hi	Program a								
	Program b								
	Program c								
	Program d								
Heater 8	Program a								
	Program b								
	Program c								
	Program d								
Heater 7 Hi	Program a								
	Program b								
	Program c								
	Program d								
Heater 7	Program a								
	Program b								
	Program c								
	Program d								
Heater 6 Hi	Program a								
	Program b								
	Program c								
	Program d								
Heater 6	Program a								
	Program b								
	Program c								
	Program d								
Heater 5 Hi	Program a								
	Program b								
	Program c								
	Program d								
Heater 5	Program a								
	Program b								
	Program c								
	Program d								
Heater 4 Hi	Program a								
	Program b								
	Program c								
	Program d								
Heater 4	Program a								
	Program b								
	Program c								
	Program d								
Heater 3 Hi	Program a								
	Program b								
	Program c								
	Program d								

OUTPUTS		T° Probes 1	2	3	4	5	6	7	8
Heater 3	Program a								
	Program b								
	Program c								
	Program d								
Heater 2 Hi	Program a								
	Program b								
	Program c								
	Program d								
Heater 2	Program a								
	Program b								
	Program c								
	Program d								
Heater 1 Hi	Program a								
	Program b								
	Program c								
	Program d								
Heater 1	Program a								
	Program b								
	Program c								
	Program d								
Inlet 1									
Inlet 2									
Inlet 3									
Inlet 4									
Inlet 5									
Inlet 6									
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E Relay Assignment Worksheet

Figure E-1 *Heating outputs (relays 1 to 100)*

RELAY #		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
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Appendix E: Relay Assignment Worksheet

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Figure E-2 *Other outputs (relays 1 to 100)*

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Appendix E: Relay Assignment Worksheet

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NOTES

This equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.

Munters

2691 Ena Drive
Lansing, MI 48917