

CLIMATRAC

Model 200

Installation and Operation Manual

VAL
ENVIRONMENTAL
SYSTEMS

ClimaTRAC 200 Installation and Operation Manual

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IMPROVEMENTS: BEaR reserves the right to alter or improve this Product without notice and without incurring obligation to alter or improve existing Products.

LENGTH OF WARRANTY: This Product is warranted for a period of twelve (12) months from the date of installation. Sensors are warranted for a period of twelve (12) months from the date of manufacture or six (6) months from the date of installation.

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- 1) Damage, deterioration or malfunction resulting from, but not limited to: power fluctuations or surges, accident, misuse, abuse, neglect, fire, water, corrosion, lightning or other acts of nature, improper storage, unauthorized Product repair or modification, damage in shipment, removal or installation of this Product, or any other cause not related to a Product defect.
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- 2) Setup, calibration, adjustment or maintenance of this Product.
- 3) Shipping and insurance charges for returning this Product to BEaR.
- 4) Customer training.
- 5) Travel expenses.

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THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE IN THE UNITED STATES OF AMERICA.

PURCHASER AGREES THAT THE SALE OF THIS PRODUCT BEARS A REASONABLE RELATIONSHIP TO THE STATE OF MINNESOTA AND THE LAWS OF THE STATE OF MINNESOTA SHALL GOVERN THE VALIDITY, CONSTRUCTION AND ENFORCEABILITY OF THIS WARRANTY, WITHOUT GIVING EFFECT TO THE CONFLICT OF LAWS PRINCIPLES THEREOF.

THE PURCHASER OF THIS PRODUCT AGREES THAT ALL CLAIMS BROUGHT IN RESPECT OF THIS WARRANTY SHALL BE BROUGHT IN A COURT LOCATED IN THE STATE OF MINNESOTA.

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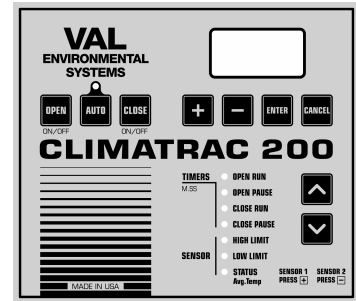
AS WITH ANY SOPHISTICATED CONTROL SYSTEM, THIS CONTROLLER CANNOT BE GUARANTEED TO PERFORM WITHOUT INCIDENT FOREVER. THERE ARE MANY CONDITIONS SUCH AS LIGHTNING STRIKES, PROGRAMMING ERRORS, AND EQUIPMENT FAILURE THAT COULD RESULT IN THIS CONTROLLER FAILING TO PERFORM ITS INTENDED FUNCTION. YOU MUST BE AWARE OF THIS AND BE WILLING TO TAKE THE NECESSARY PRECAUTIONS TO PREVENT FINANCIAL LOSS.

TO PROTECT AGAINST LOSS RELATED TO THE FAILURE OR MISBEHAVIOR OF THIS CONTROLLER, THE FOLLOWING SAFEGUARDS ARE REQUIRED:

1. A MANUAL BACKUP SYSTEM MUST BE INSTALLED. THIS SYSTEM MUST TAKE OVER IN THE EVENT OF A CONTROL SYSTEM MALFUNCTION.
2. AN ALARM SYSTEM MUST BE INSTALLED. THIS SYSTEM MUST PROVIDE A VISUAL INDICATION AND AUDIBLE WARNING OF ABNORMAL CONDITIONS.
3. A WEEKLY TEST OF THE MANUAL BACKUP SYSTEM AND ALARM SYSTEM MUST BE PERFORMED. THIS TEST CONFIRMS THAT THESE SYSTEMS ARE FUNCTIONING PROPERLY.
4. A DAILY CHECK OF THE CONTROL SYSTEM MUST BE PERFORMED. THIS CHECK CONFIRMS THAT THE SYSTEM IS OPERATING PROPERLY.
5. NON-FUNCTIONAL ALARMS OR BACKUPS MUST BE FIXED IMMEDIATELY.

Overview

Thank you for purchasing a ClimaTRAC 200 Ventilation Controller. The ClimaTRAC 200 provides a low cost method for controlling a curtain machine based on temperature or static pressure. Alternatively, it can be used to control two single-channel devices based on temperature.

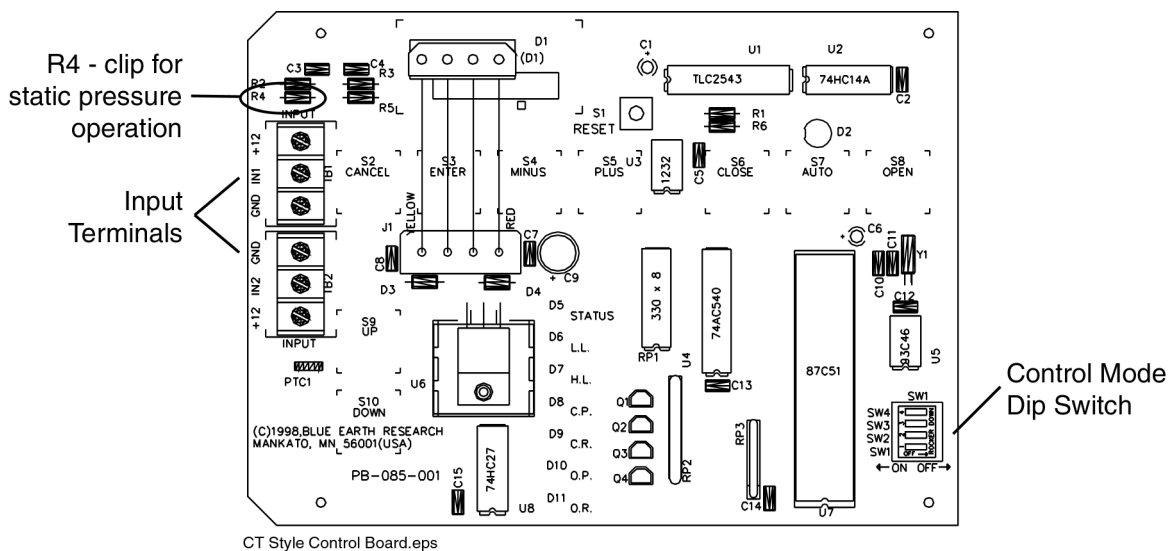


ClimaTRAC Control Modes

The ClimaTRAC 200's two output channels can easily be configured to meet your needs. The standard configurations are:

- Single curtain control based on temperature.
- Single curtain or inlet control based on static pressure.
- Two temperature-controlled channels (one cooling device and one heating device).

ClimaTRAC 200 Control Board Diagram



Installation

You've Heard It Before...

Do not connect or disconnect wires while the power is on. The warranty does not cover damage caused by improper handling.

Always touch a grounded surface before working on electronic equipment. Static shocks can destroy sensitive electronic circuits.

A good ground for your electrical system and the controller is essential. A good ground could be a water pipe or a buried copper rod. Electrical conduit is often **not** grounded.

When attaching wires to terminals, first strip about ¼" of insulation. If you attach more than one wire to a terminal, twist the leads together before securing them to the terminal.

Tighten terminal screws securely, being careful not to over tighten them. Gently tug on the wires to make sure they are tight.

Circuit Protection

The controller console should be wired to an independent circuit breaker. Ideally each equipment output channel should have its own breaker to insure that tripping one breaker will not affect other devices in the ventilation system.

Motors must have a thermal overload protection device or impedance protection. The overload should auto-reset for any essential part of your ventilation system.

Power Surges

The controller is protected against *normal* voltage surges, but lightning induced surges could damage the equipment. We recommend use of a surge protector to reduce damage from lightning. Lightning damage is not covered by the warranty.

Power Supply

The controller can be operated on 115 or 230 VAC. The input voltage is selected by changing the voltage selector switch located to the left of the transformer. Verify that this is properly set before connecting the power.

Make power connections to terminals labeled L1 and N. Ground goes to the ground ⊕ terminal.

Controller

The controller should be mounted indoors where the temperature will remain between 30 degrees Fahrenheit (- 1 degree Celsius) and 110 degrees Fahrenheit (43 degrees Celsius). Do not mount the unit in direct sunlight. Place the unit away from motors and relays/contactors that switch high current.

Remove the front panel to access the controller's mounting holes. The same holes used to attach the front panel are used to attach the controller to a wall.

Drill holes in the controller enclosure with care. Make sure you do not drill into circuit boards and cables.

Note: Unless absolutely necessary, do not remove the electrical boards. They are static sensitive and should always be handled with appropriate grounding.

Conduit and Connections

High voltage wires should enter the controller's enclosure from the bottom so they can be easily connected to the relay terminals.

To avoid electrical shorts or damage due to moisture, you should never run conduit openings through the top of the box. Conduit and hubs should be corrosion resistant plastic or fiberglass. Use only UL approved NEMA 4X rated conduit hubs. Connect hubs to conduit before connecting to the control enclosure. Use only liquid-tight strain-relief connectors to bring cables into the enclosure.

Sensor Wiring

Use shielded 16-24 gauge (.5-1.5mm) stranded wire, such as Carol[®] AWM style 2426, to connect sensors to input channels. Wire can be twisted pair or straight type.

Wire Spacing

If a sensor cable runs parallel to power cables, allow a separation of at least 12" (30cm) to avoid interference.

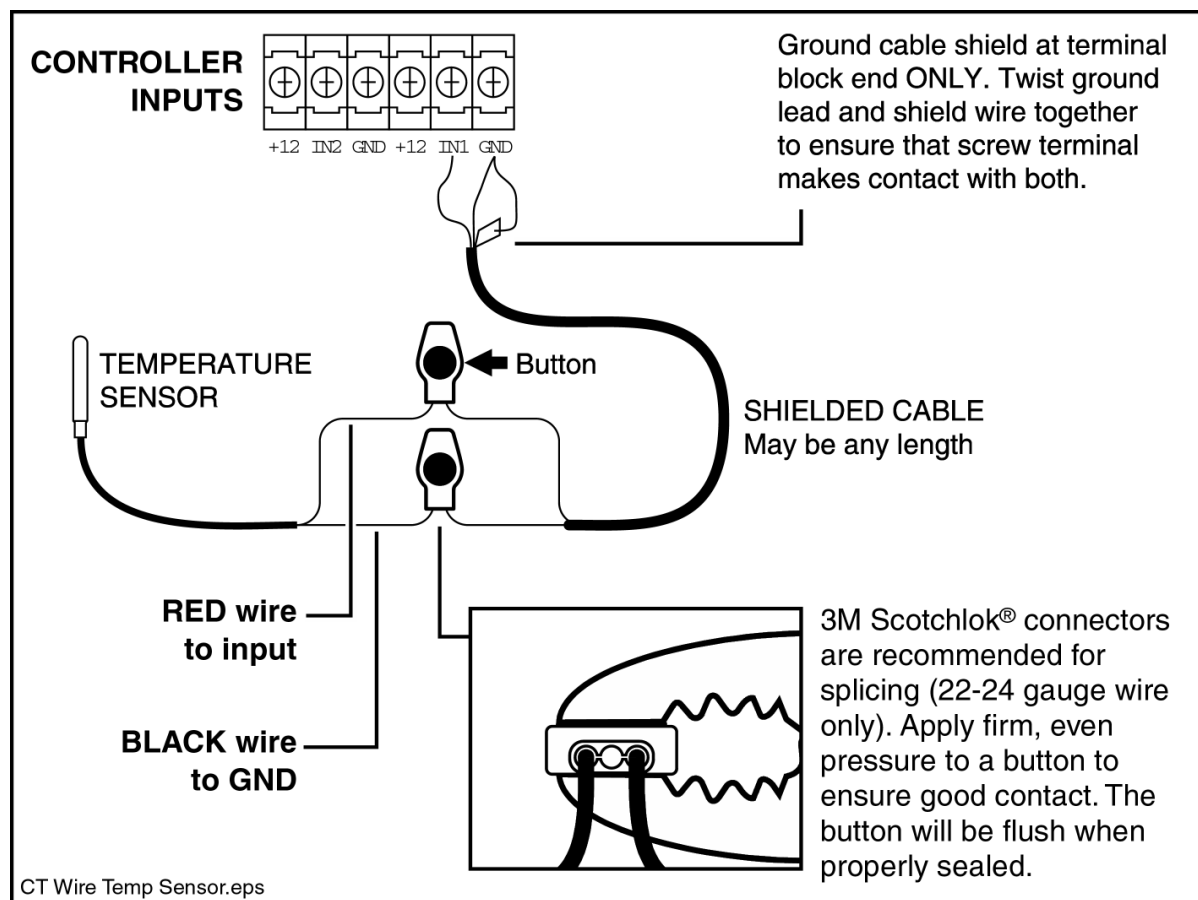
Note: Do not run sensor cables through conduit with power wires.

Sensor Placement

Hang temperature sensors above the animals. Leave enough wire so you can tie up several loops of slack to keep the sensor at the right height. If you must change a bad sensor in the future, the extra length allows you enough wire to cut off the old sensor and still have plenty to splice to the new sensor. Systems using two temperature sensors should have a sensor placed toward each end of the building.

Temperature Sensors

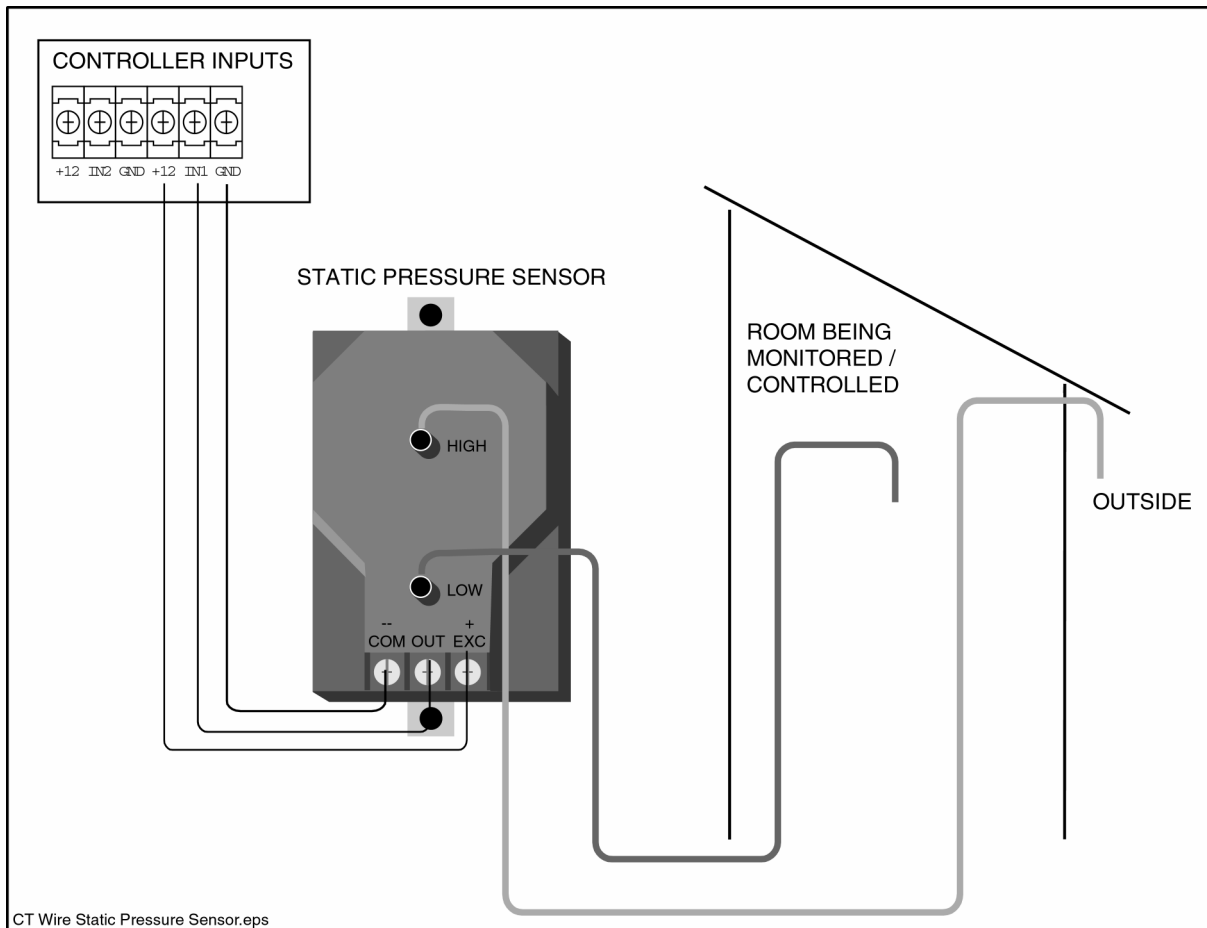
Connect the temperature sensor wires between the IN and GND terminals of the inputs.



If you are using only one temperature sensor, attach it to input one.

Static Pressure Sensor

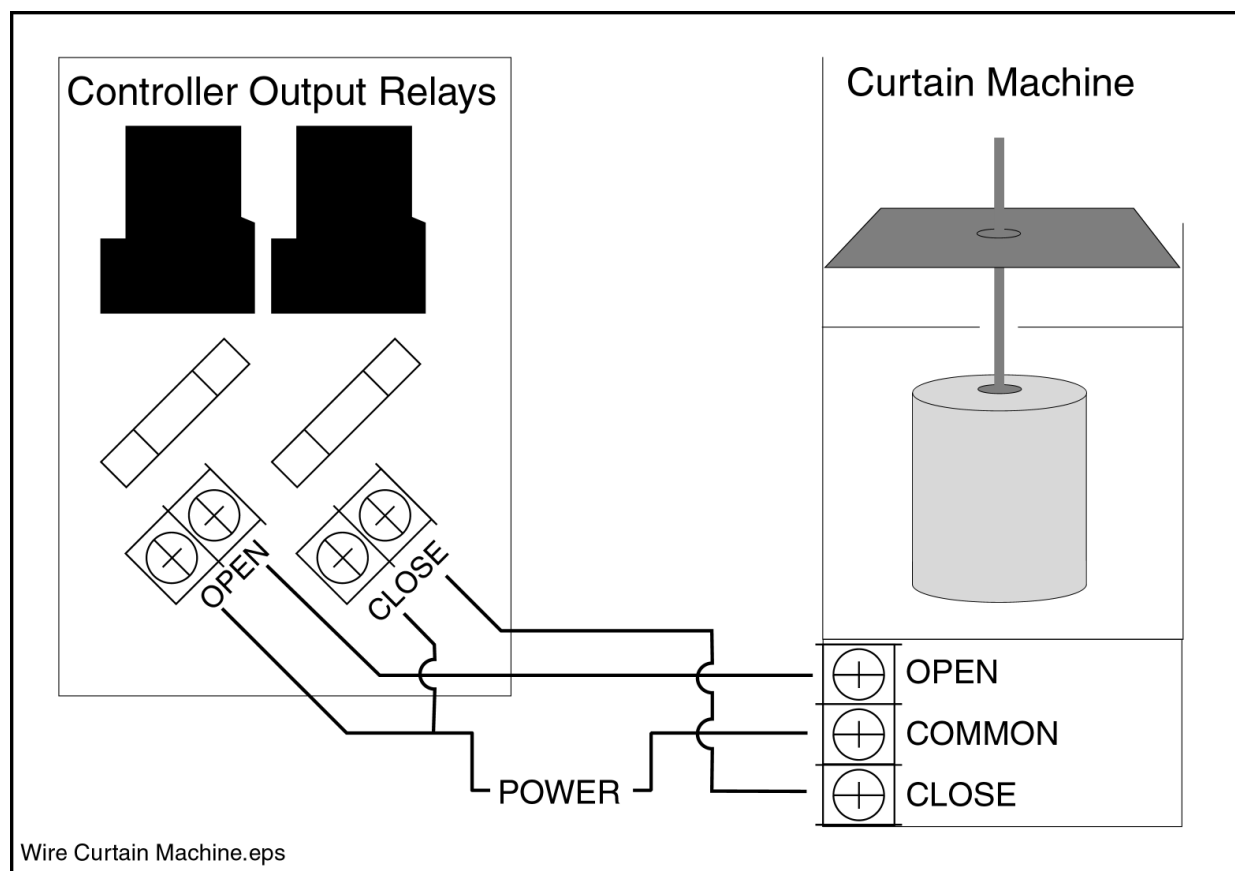
Connect the static pressure sensor to the +12, IN1 and GND input terminals. Refer to your Static Pressure Sensor manual for more information about installing the sensor.



Connecting Devices to Output Channels

Connect the controller between a device's power source (circuit breaker) and the device. The controller operates a device by opening or closing the relay contacts similar to a switch. When the relay closes, the two channel terminals have continuity, or are shorted together like a light switch in the ON position. When the relay opens, the "light switch" is turned OFF.

The controller has two output channels. They are labeled OPEN and CLOSE in relation to a curtain's open and close motion. The curtain device must have limit switches at the top and bottom of movement. This is required since the controller may continue to switch the curtain device OPEN or CLOSE even after it is fully opened or closed.



Refer to the *Specifications* section in this manual to determine the maximum load that can be connected to the output terminals.

Backup Systems

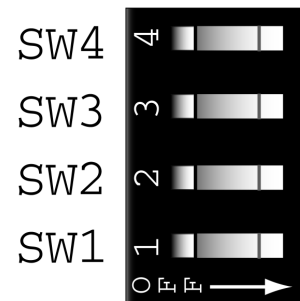
Setting backup devices that will allow cooling, heating and ventilation in case of a power failure or controller failure is essential for the safety of the animals.

Thermostats should be installed to backup the devices. Natural ventilation buildings need curtain drops. Thermostats can be wired to the devices they will operate. Wire them in parallel with the controller.

Selecting the ClimaTRAC 200 Control Mode

You can set the DIP switch located on the inside of the front cover to choose between temperature and static pressure mode as well as choose between American and Metric units of measure.

The DIP switch settings should be made with the power off. If the DIP switch settings are changed with the power on, the changes will not take effect until the unit is reset.

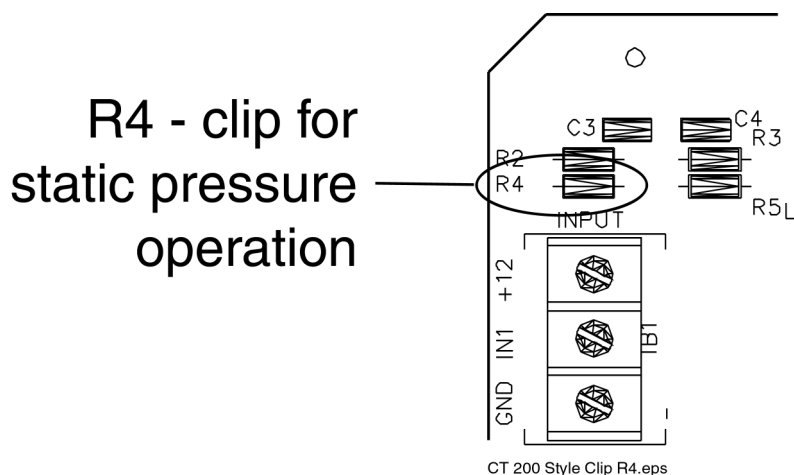


Temperature or Static Pressure

Set switch number one (SW1) to OFF if you want the ClimaTRAC 200 to control devices based on temperature. Set switch number one to ON if you want the ClimaTRAC 200 to control devices based on static pressure.

Clipping R4 for Static Pressure Use

You will need to clip one lead of the R4 resistor to allow the controller to accept input from a static pressure sensor. **With the power off**, clip only one of the leads and try to leave enough lead to allow the resistor to be re-soldered should you decide to use temperature sensors.



American or Metric Units of Measure

Set switch number four (SW4) to OFF if you want the ClimaTRAC 200 to use and display American units of measure. Set switch number four to ON if you want the ClimaTRAC 200 to use and display metric units of measure.

Note: Switches two and three are not used.

Operating

Power-Up Displays

When the unit powers up, the software exercises the front panel display.










The unit then displays the DIP switch settings for a very brief period. This display shows two digits which indicate the position of switches 1 and 4. The right digit is for the *American/metric* setting, and the left digit is for the *temperature/static pressure* setting. A zero indicates the switch is in the OFF position, and a one indicates the switch is in the ON position. For example, 11 means static pressure control with metric units of measure.

The software version number is then displayed (1.00, for example) very briefly.

The unit then displays the Status screen (current static pressure or temperature) and resumes the Auto or Manual control mode (whichever mode it was in when powered down last). If this is the first time a unit has been powered up, the control mode is Manual.

Note: The displayed temperature is *rounded*. The control will operate on the *actual* temperature. Devices will turn on when the exact temperature is reached. For example, the controller displays 80 degrees when the actual temperature is 79.5 to 80.4 degrees. So, if you have a channel set to turn on at 80.0 degrees, the display may indicate 80 degrees before the channel turns on since the *actual* temperature could be 79.5 degrees.

Front Panel Controls

 	<p>Select a function by pressing the up or down key (the lit LED will move to the selected function).</p>
 	<p>Change a function's value shown on the LED display by pressing the + or – keys.</p> <p>With STATUS selected, pressing + shows the reading from input one, pressing – shows the reading from input two.</p>
	<p>After changing a function's value shown on the LED display, press ENTER to accept the new value.</p>
	<p>Pressing CANCEL cancels the current edit.</p> <p>After looking at an individual sensor reading, pressing CANCEL returns the display to the average temperature reading.</p>
	<p>Pressing OPEN places the control in manual operation and turns on the OPEN relay; pressing the button again turns the OPEN relay OFF.</p>
	<p>Pressing CLOSE places the control in manual operation and turns on the CLOSE relay; pressing the button again turns the CLOSE relay OFF.</p>
	<p>Toggles between the AUTO and MANUAL mode. The LED above the button will illuminate when the control is in the auto mode.</p>

Function settings are changed using the + and – keys. Press ENTER to accept a change. Press CANCEL to abort a change. Pressing the UP or DOWN keys before pressing ENTER also aborts a change. After one minute of inactivity, the display will return to the status screen.

Single Curtain Control

The curtain control configuration uses either temperature sensors or a static pressure sensor for inputs, and has two outputs for curtain movement. In temperature control mode, input sensor one is a temperature sensor and input sensor two can be used for an optional second temperature sensor. If both temperature sensors are used, they are averaged to obtain a control temperature.

In static pressure control mode, input sensor number one is a static pressure sensor, and input sensor number two is not used.

Single Curtain Control: Temperature Control Mode

Inputs

IN1 – Temperature Sensor #1

IN2 – Temperature Sensor #2 (optional)

Outputs

Open – Curtain Open

Close – Curtain Close

Function Selection (Selected LED On)

Open Run (Minutes.Seconds)

When the curtain begins opening it will open for the duration you specify here, and then pause.

Open Pause (Minutes.Seconds)

When the curtain pauses after opening for the duration you specify above, it will pause for the duration you enter here. If there is a value entered in Open Run, leaving Open Pause set at zero will enable continuous operation. The controller checks the temperature at the end of the pause time and if it is still at or above the High Limit, the open cycle will continue.

Close Run (Minutes.Seconds)

When the curtain begins closing, it will close for the duration you specify here, and then pause.

Close Pause (Minutes.Seconds)

When the curtain pauses after closing for the duration you specify above, it will pause for this duration. If there is a value entered in Close Run, leaving Close Pause set to zero will enable continuous operation. The controller checks the temperature at the end of the pause time and if it is still below the Low Limit, the close cycle will continue.

High Limit

The curtain will begin to open when the temperature rises to a level at or above this limit.

Low Limit

The curtain will begin to close when the temperature drops below this limit.

Status

This function displays the current average temperature.

Individual sensor temperatures can be displayed with the + (for sensor one) or – (for sensor two) keys.

Single Curtain Control: Static Pressure Control Mode

Inputs

IN1 – Static Pressure Sensor

IN2 – Not Used

Outputs

Open – Curtain Open

Close – Curtain Close

Function Selection (Selected LED On)

Open Run (Minutes.Seconds)

When the curtain begins opening it will open for the duration you specify here, and then pause.

Open Pause (Minutes.Seconds)

When the curtain pauses after opening for the duration you specify above, it will pause for the duration you enter here. If there is a value entered in Open Run, leaving Open Pause set at zero will enable continuous operation. The controller checks the static pressure at the end of the pause time and if it is still at or above the High Limit, the open cycle will continue.

Close Run (Minutes.Seconds)

When the curtain begins closing, it will close for the duration you specify here, and then pause.

Close Pause (Minutes.Seconds)

When the curtain pauses after closing for the duration you specify above, it will pause for this duration. If there is a value entered in Close Run, leaving Close Pause set at zero will enable continuous operation. The controller checks the static pressure at the end of the pause time and if it is still below the Low Limit, the close cycle will continue.

High Limit

The curtain will begin to open when the static pressure rises to a level at or above this limit.

Low Limit

The curtain will begin to close when the static pressure drops below this limit.

Status

This function displays the static pressure.

Two Temperature-Controlled Devices Control

You can also use the controller to operate two temperature control devices. The outputs labeled OPEN and CLOSE can also be thought of as output one and output two.

Inputs

IN1 – Temperature Sensor #1

IN2 – Temperature Sensor #2 (optional)

Outputs

Open – Device 1 (Cooling)

Close – Device 2 (Heating)

Function Selection (Selected LED On)

Open Run (Minutes.Seconds)

When the OPEN relay turns on the connected cooling device, it will stay on for the duration you specify here, and then turn off for the duration specified below.

Open Pause (Minutes.Seconds)

When the cooling device is turned off after operating for the duration you specify above, it will remain off for the duration you specify here. If there is a value entered in Open Run, leaving Open Pause set at zero will enable continuous operation. The controller checks the temperature at the end of the pause time and if it is still below the High Limit, the open (cooling) cycle will continue.

Close Run (Minutes.Seconds)

When the CLOSE relay turns on the connected heating device, it will stay on for the duration you specify here, and then turn off for the duration specified below.

Close Pause (Minutes.Seconds)

When the heating device is turned off after operating for the duration you specify above, it will remain off for this duration. If there is a value entered in Close Run, leaving Close Pause set at zero will enable continuous operation. The controller checks the temperature at the end of the pause time and if it is still below the Low Limit, the close (heating) cycle will continue.

High Limit

The cooling device connected to the OPEN relay will turn on when the temperature rises to a level at or above this setpoint, and turn off when the temperature falls below this setpoint.

Low Limit

The heating device connected to the CLOSE relay will turn on when the temperature is equal to or drops below this setpoint, and turn off when the temperature rises above this setpoint.

Status

This function displays the current average temperature. Individual sensor temperatures can be displayed by pressing the + and – keys.

Specifications

Fuses:

Power Supply Input: .125 Amp

Output Channel: 15 Amp

Electrical Input: 120VAC or 240VAC

Electrical Output:

2 output circuits, 10 Amp maximum total

Output Circuit

120VAC, 1 HP or 240VAC, 1.5 HP

10A, 100/240VAC maximum general Purpose

120VAC, 8.3 Amp or 240VAC, 5.46 Amp tungsten rating

Sensor Inputs:

2 analog

Sensor Wire: 16-24 gauge (.5-1.5mm) stranded shielded cable, such as Carol AWM style 2426

Control Modes:

Single Curtain Control: Temperature Control

Single Curtain Control: Static Pressure Control

Two Temperature-Controlled Devices Control

Environmental: Type 4, 4X, 12, 13

Hardware Settings:

See the *Selecting the ClimaTRAC 200 Control Mode* section.

Service

For assistance, make sure you have checked the parameters in your controller and have reviewed the appropriate sections of this manual.

If you still need assistance, contact Val Environmental Systems.

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