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41-VCU2-24

Environmental Controller

User Manual
v2019-01



"All Electrical Connections Must Be Made by a Licensed Electrician and in Accordance with State and Local Codes."

INTRODUCTION

Thank you for purchasing the 41-VCU2-24 environmental controller. The VCU 2-24 is designed for ease of installation and operation, as well as addressing the unique challenges of greenhouse environmental control. The system can coordinate and control ventilation curtains, heaters and fans.

Freestanding Greenhouse Application

The 41-VCU2-24 provides climate control for a single greenhouse zone with crop quality control features. It's ideal for high tunnel and stand-alone greenhouses. This manual's purpose is to assist you in utilizing the controller to its fullest potential, for your specific application. Thermostatic control of your ventilation curtains, heaters, louvers, and fans are just a setpoint away when connected to the VCU2-24 . When combined with our optional humidity sensor and AC contactor box the VCU2-24 provides relative humidity overrides for ventilation, fans, and louvers.

Main Features

- Manual override
- Simple to program set points, vent drive run times, and sensor reading intervals.
- Provides power for two(2) 24V DC vent motors.
- Controls motors, fans, heaters, or alarms.
- Dry contact inputs for heaters.
- Aspirated humidity sensor option.
- Resettable circuit breaker for motor protection.
- Includes 100' temperature sensor.

WARNINGS



Read instructions completely before beginning your installation. Familiarize yourself with this unit and compare what you received with these instructions.



Always wear eye and ear protection. Always use gloves and other necessary safety equipment. Metal can be sharp, handle with care to avoid injury.



All electrical connections must be made by a qualified, licensed electrician. All connections must be made in accordance with all state and local codes.

If you have any questions during installation, contact
Technical Support for assistance. **877.546.2257**

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INSTALLATION

Locating the 41-VCU2-24

Consider the following before installing the 41-VCU2-24:

- Protect the enclosure from moisture—mount it in a secure and dry place.
- Use watertight cable glands and only drill holes in the bottom of enclosure.
- Drilling holes into the top or sides of the enclosure will void the warranty.
- Secure using the included mounting brackets and properly sized screws or bolts.
- Place in a location where sensor and motor wires can be easily connected

Locating the Temperature Sensor

Place the temperature sensor in the middle of the structure and at a height that best represents the average temperature at crop level. Secure temperature sensor wire to perlines or trusses using cable ties.

Do not splice temperature sensor wires! If the 100' temperature sensor is not long enough to reach the desired location we have 150' sensors available for purchase, (46-TS150).

Keep the temperature sensor wire away from high voltage wires by at least 1 foot.

Locating the Humidity Sensor

Place the humidity sensor in the middle of the structure and at a height that best represents the average relative humidity of the air. Avoid placing the humidity sensor in a warm air current, for example in front of a heater. Air within a warm air current is dryer than the average air and produces an inaccurate humidity reading.

Avoid spraying the humidity sensor with water or chemicals.

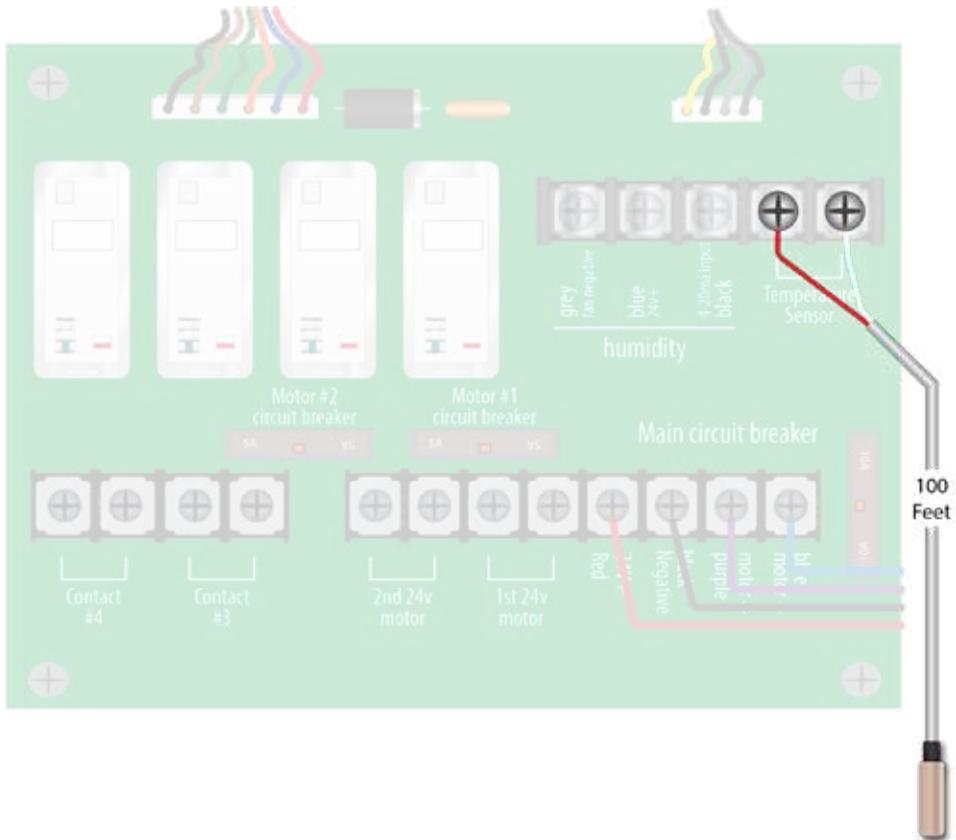
Keep the humidity sensor wire away from high voltage wires by at least 1 foot.

INSTALLATION

Connecting the Temperature Sensor

Connect the temperature sensor wires to the terminals labeled “Temperature Sensor” on the circuit board. The temperature sensor has two wires, (1) red and (1) white. Either wire can be connected to either terminal if they are both secured at the proper location. Test the connection by powering up the 41-VCU2-24. The LED will display the temperature if a proper connection has been made. See the troubleshooting section of this manual if the temperature is not displayed.

Do Not Overtighten, 4in lb of torque is enough.



INSTALLATION

Connecting the Heater(s)

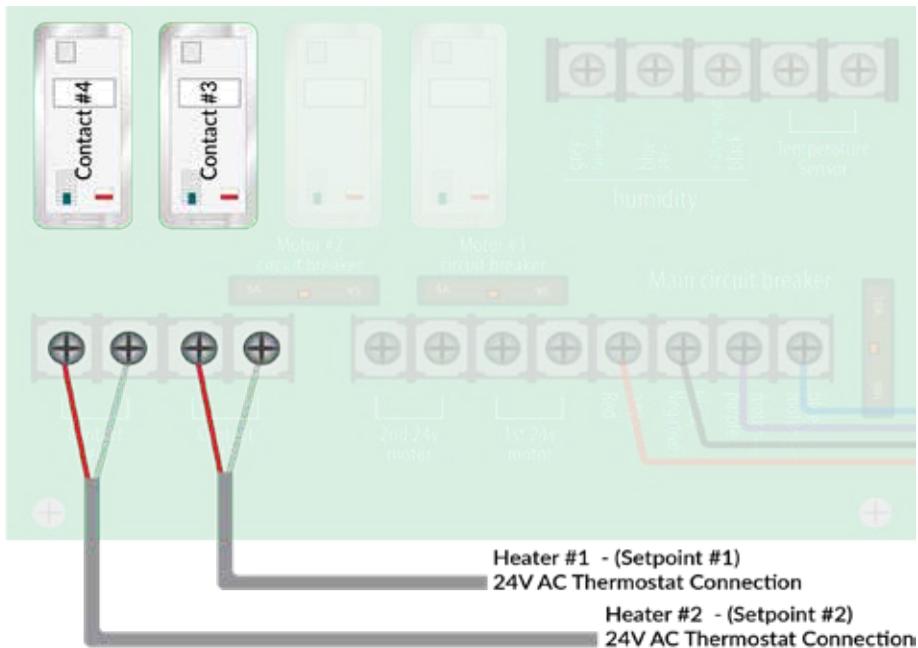
The 41-VCU2-24 environmental controller provides 2 dry contacts for low voltage, 24VAC, heater connections. **Do not connect the 110/220 V AC heater power supply to the controller terminals.** The controller sends an operation signal to the heaters. The heaters are powered independently of the controller. The VCU2-24 is intended to replace existing thermostatic heater controls.

A qualified, licensed electrician must make all heater electrical connections. Connections required must follow all state codes, local codes, and heater manufacturer instructions.

Failure to have a qualified person complete the install voids the warranty and could result in severe injury or death.

Connect the heater thermostat wires to the dry contact terminals as shown below – two conductor wire is required for each heater connection. Either wire can be connected to either terminal if they are both secured to the proper location.

Do Not Overtighten, 4in lb of torque is enough.



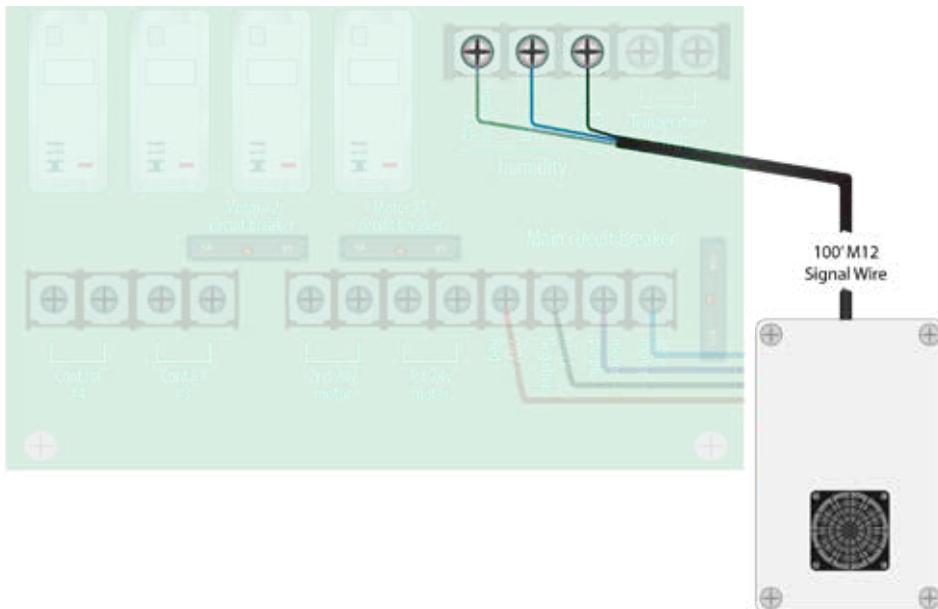
INSTALLATION

Connecting the Humidity Sensor

Place the humidity sensor in the middle of the structure and at a height that best represents the average relative humidity of the air. Avoid placing the humidity sensor in a warm air current, for example in front of a heater. Air within a warm air current is dryer than the average air and produces an inaccurate humidity reading. Avoid spraying the humidity sensor with water or chemicals. Keep the temperature sensor wire away from high voltage wires by at least 1 foot.

The humidity sensor includes an M12 pigtail and a 100-foot M12 extension cable. Do not cut the 100-foot extension cable. Connections to the controller are made using the M12 pigtail connector. The M12 cable is a 5 conductor cable, grey, blue, black, brown, and white. The humidity sensor only uses 3 of the 5 conductors, the grey, blue, and black, the brown and white can be cut off.

Connect the grey, blue and black wires to the humidity sensor terminals. *Do Not Overtighten, 4in lb of torque is enough.* The humidity sensor includes an aspiration fan used to sample new air continually. If you would like to disable the humidity sensor aspiration fan remove the blue wire from the center terminal.



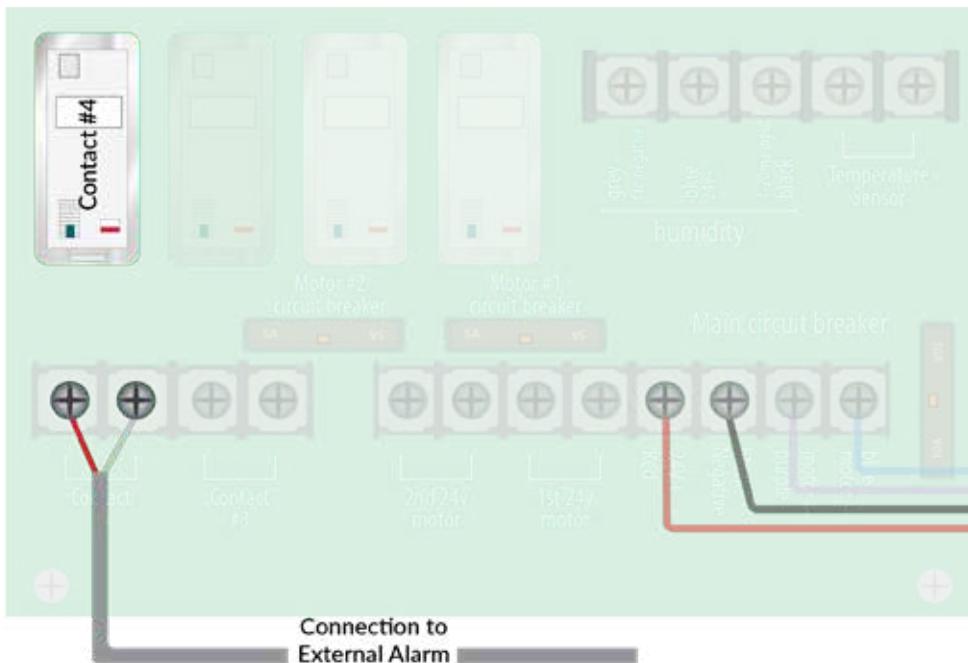
INSTALLATION

Connecting the External Temperature Alarm

The 41-VCU2-24 can connect and send a high and low-temperature signal to an existing external alarm system. The temperature alarm signal is always configured to dry contact #4. Depending on the alarm manufacturer the type of signal required varies between constant or signaled when an alarm condition is present. Refer to the manufacturer’s documentation to determine what type of signal is required.

The VCU2-24 configuration settings provide for both signal conditions. Signal condition configuration and alarm limit settings are in the “Configuration Setup” and “Zone Parameter Setup” sections of this manual. Setting C16 to #1, normally closed, provides a constant signal and setting to #2, normally open, provides a signal only when an alarm condition is present.

Connect the alarm sensor wires to dry contact #4 terminals as shown below – two conductor wire required for alarm connection. Either wire can be connected to either terminal if they are both secured to the proper location. *Do Not Overtighten, 4in lb of torque is enough. Do not connect the 110/220 V AC alarm power supply to the controller terminals.*



INSTALLATION

Connecting the Fans

The 41-VCU2-24 can provide thermostatic control of fans and louvers by sending an operational signal to an optional AC contactor box, (42-CIBAC-1F1L, 42-CIBAC-2F2L, 42-CB2, 42-CB4). Do not connect the 110/220 V AC fan power supply to the controller terminals. Additional wiring is required to power the dry contact which provides a signal to activate the AC contactor. If connecting only 1 fan/louver, make all connections to contact #4 terminals. Contact #3 remains free for a heater connection.

Disconnect controller power supply before making any connections. Install a jumper wire between the red wire, 24V DC positive, and the first terminal of contact #4. Two conductor signal wire is required, 18 - 22 ga is sufficient, to activate the AC contactor coil. Connect one of the signal wire conductors to the clean power supply black wire, 24V DC negative, and the other to the remaining terminal at contactor #4 as shown below.

All remaining AC/DC connections are made inside the AC contactor box. See instructions included with the contactor box to complete the installation.

A qualified, licensed electrician must make all fan electrical connections. Connections required must follow all state codes, local codes, and fan manufacturer instructions.

Failure to have a qualified person complete the install voids the warranty and could result in severe injury or death.

To properly configure the VCU2-24 for the number of heaters, fans and enable setpoints please see the “Configuration Setup” and “Zone Parameter Setup” sections of this manual.

INSTALLATION

Connecting the Low Voltage Ventilation Motors

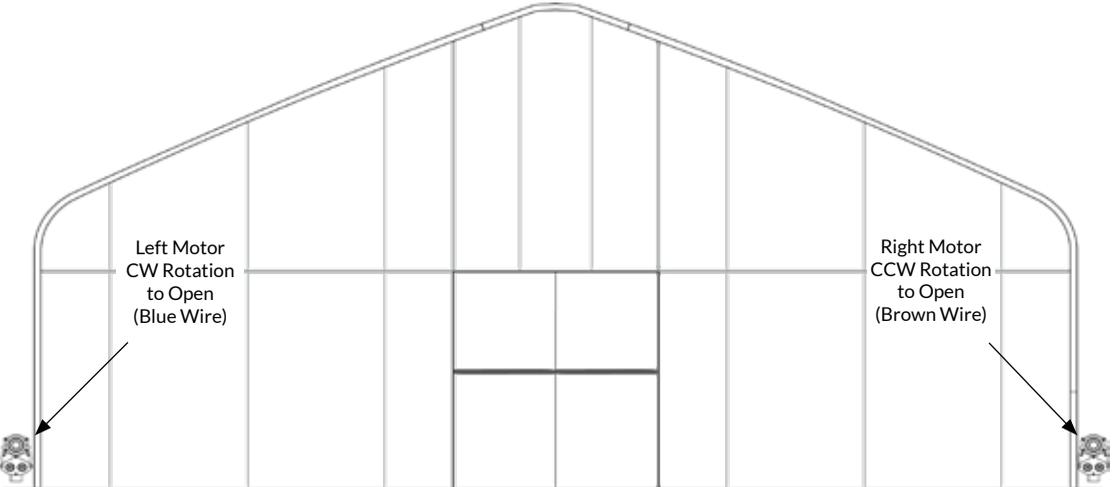
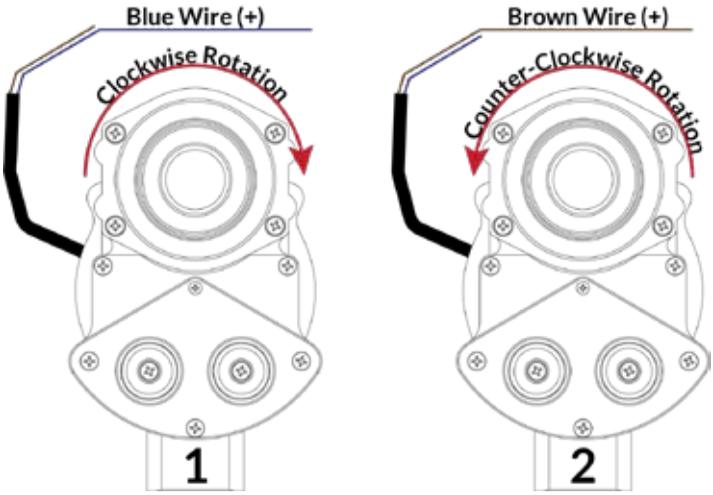
The 41-VCU2-24 provides the 24V DC power required to operate up to two 100Nm Low Voltage Motors (LVM). The LVMs operate simultaneously at one setpoint. The motors connect to the controller using the attached motor wire. Instances where the motor wire is not long enough to reach the controller a watertight junction box is required to make the necessary splice. Make a note when creating a splice to extend the motor wire on which new color wire connects to the blue and brown wires. i.e., if the extension wire has (1) black and (1) white conductor and you connect the blue motor wire to the black and white to the brown make a note of this for later reference. We strongly recommend using an SJEOOW rated wire to extend the connection to the controller. Connections of 199 feet or less require a 14 ga / 2c, flexible, standard cable. Connections of 200 feet or more require a 12 ga / 2c, flexible, standard cable. Undersized wire causes over amp conditions that trips the inline breaker as well as shortens the lifespan of the motor.

Each motor wire has two conductors, (1) blue and (1) brown. The install location dictates what direction of rotation, clockwise or counter-clockwise, the motor shaft is required to turn to open or close the vent. One conductor provides the clockwise rotation of the motor shaft with the other providing the counter-clockwise rotation. **Shaft rotation is determined from the rear of the motor looking at the internal limit switches as shown below.**

i.e., Standing at the gable end of the greenhouse, where LVMs are installed: Motor #1 is installed to operate the left-hand sidewall of the greenhouse. Motor #1 needs to turn the rollbar clockwise to open the ventilation curtain. Motor #2, installed on the right-hand side, needs to turn the rollbar in a counter-clockwise rotation to open the ventilation curtain.

INSTALLATION

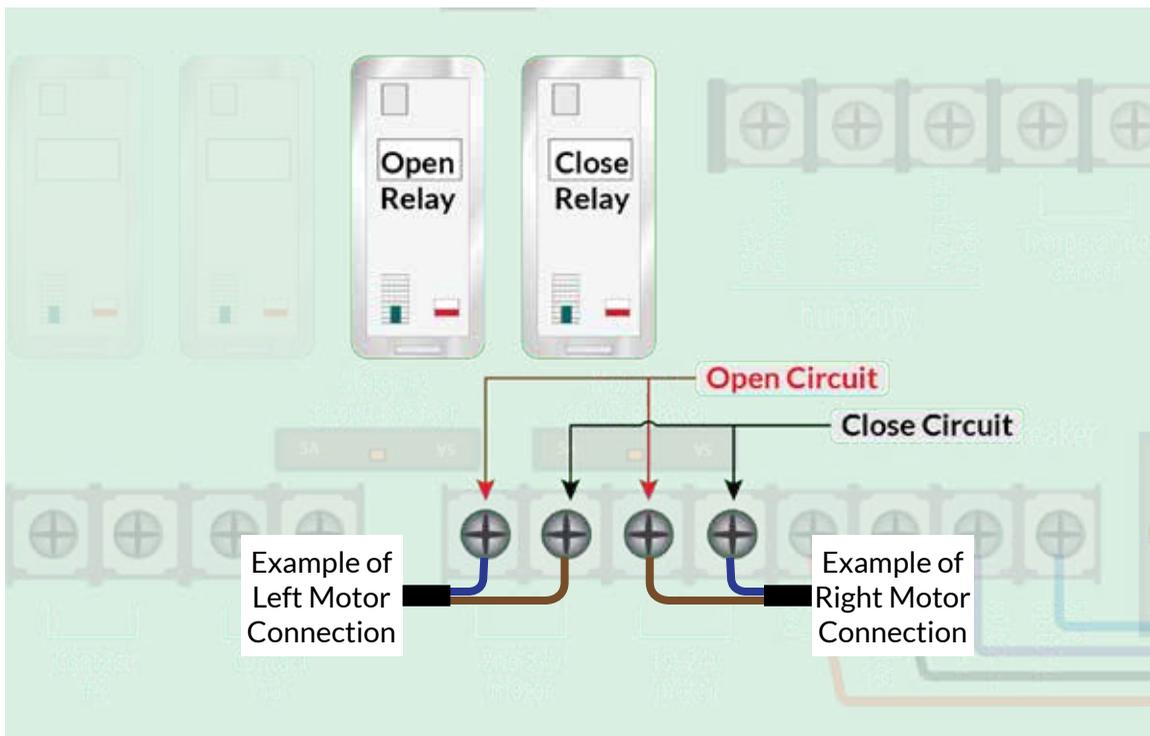
Connecting the Low Voltage Ventilation Motors



INSTALLATION

Connecting the Low Voltage Ventilation Motors

The motor wires connect to the lower relay board at the terminals labeled “1st 24v motor” and “2nd 24v motor.” Relay #1 (close circuit) and Relay #2 (open circuit) provide the signal for the motors. Connect the motor wires to the circuit board using the rotation guide to determine which wire should connect to the “Open” relay. If the motor operates in the opposite direction after connection; simply switch the terminals of the blue and brown wires for that motor.



CONFIGURATION

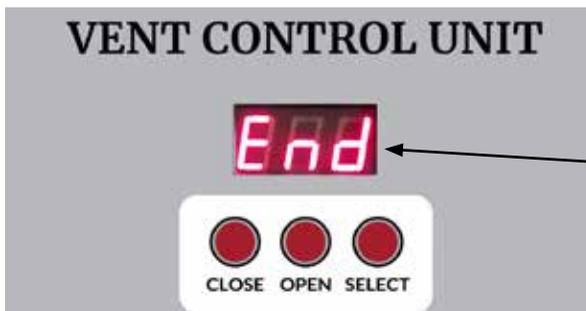
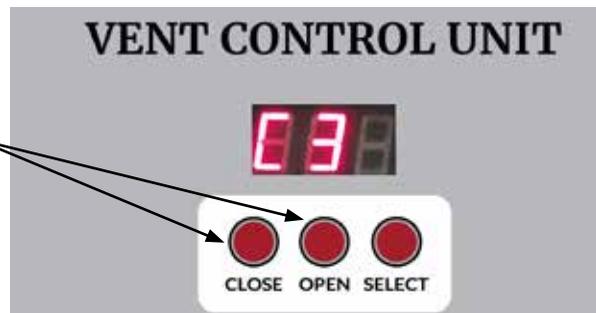
Configuration Setup

To enter the configuration menu, remove power from the 41-VCU2-24. Press and hold "SELECT" and repower the controller. Release "SELECT" after approximately 3 seconds of power. Upon release, the controller LED should read "C3".



- Power down VCU2-24
- Power Up, Hold "SELECT"
- Release after 3 Seconds

- Press "SELECT" to Cycle Menu
- Press "OPEN" to increase value
- Press "CLOSE" to decrease value



- Configuration Values Set
- Press "SELECT" to Cycle Menu
- "END" Displayed on LED

CONFIGURATION SETUP

Configuration Menu

Press and release “SELECT” to cycle through the configuration menu. To change configuration menu item values, press and release either “CLOSE” (-) or “OPEN” (+). When values are at the desired setting, press “Select” again to continue through the configuration menu until “END” appears on the LED readout.

ID	Description	Default	Min	Max
C3	Manual Override Latch	1	0	1
C4	Temperature Scale: 0 = Fahrenheit 1 = Celsius	0	0	1
C11	Humidity Sensor: 0 = Disabled 1 = Enabled	0	0	1
C12	Temperature Sensor Failure: Override Temperature	70	0	150
C16	Alarm Enabled: <i>Relay State</i> 0 = Disabled 1 = Normally Closed 2 = Normally Open	0	1	2
C19	Number of Heaters	2	0	2
C20	Heater and Ventilation Interlock	5.0°	0.0°	20.0°

CONFIGURATION SETUP

Configuration Menu - User Settings

This page is provided for the grower to record the desired configurations values. Use this section as a future reference guide or an aid in troubleshooting.

ID	Description	Default	User Setting
C3	Manual Override Latch	1	
C4	Temperature Scale: 0 = Fahrenheit 1 = Celsius	0	
C11	Humidity Sensor: 0 = Disabled 1 = Enabled	0	
C12	Temperature Sensor Failure: Override Temperature	70°	°
C16	Alarm Enabled: <i>Relay State</i> 0 = Disabled 1 = Normally Closed 2 = Normally Open	0	
C19	Number of Heaters	2	
C20	Heater and Ventilation Interlock	5.0°	°

CONFIGURATION SETUP

Configuration Settings Description

C3 - Manual Override Latch

Set default to 1 allows the user to press and release the “OPEN” or “CLOSE” button and the manual override activate. Press the button again to deactivate manual override and return to “Auto” mode.

Set to 0 the user must press and hold the “OPEN” or “CLOSE” button for the manual override to be active. Releasing the button returns the control to “Auto” mode.

During manual override, the LED displays “OPE” or “CLO.” In “Auto” mode the LED displays the temperature.

C4 - Temperature Scale

Set default to 0 the vent control unit measures and displays temperature using the Fahrenheit scale.

Set to 1 the vent control unit measures and displays temperature using the Celsius scale.

C11 - Humidity Sensor

Set default to 0 disables the humidity sensor functions of the vent control unit.

Set to 1 to enable the humidity sensor functions of the vent control unit. A humidity sensor must be connected to the control when humidity function overrides are active.

During humidity, override period LED displays “H1.”

C12 - Temperature Sensor Failure: Override Temperature

The LED display flashes “F1” and this temperature setting, “70”, on temperature sensor failure. The vent control unit uses this as a default temperature until the failure is corrected. This setting should change per season. During warmer seasons this temperature should be set higher, and cooler seasons the temperature should be set lower.

i.e., A temperature sensor fails during the summer months, and the override temperature is “85°.” The ventilation curtains setpoint is “70°.” The vent control unit operates using the 85° temperature reading. The 85° temperature is higher than the 70° setpoint for the ventilation curtains. The vent control unit activates and opens the ventilation curtains. Opening the ventilation curtains prevent crop damage from extremely high temperatures.

The default 70° temperature is a baseline setting. The crops and season determine the ideal temperature setting.

CONFIGURATION SETUP

Configuration Settings Description

C16 - Alarm Enabled: Relay State

The type of signal required varies by alarm manufacturer. See the manufacturer's documentation to determine what type of signal is required. When enabled, the external alarm function uses contact #4 to send and receive signals.

Set default to 0 the external alarm signal is disabled.

Set to 1 the alarm relay is "Normally Closed" – Continuous Signal Sent

Set to 2 the alarm relay is "Normally Open" – Signal only when an alarm condition is present.

C19 – Number of Heaters

The VCU2-24 has a maximum of 2 heater setpoints. Setpoint #1 corresponds to contact #3, and setpoint #2 corresponds to contact #4. Setting to a value lower than 2 activates the cooling functions for the remaining contact(s).

Set to 0 enables two cooling setpoints for louvers and fans (AC Contactor Box Required).

Set to 1 enables one heating setpoint and one cooling setpoint. Heating setpoint uses contact #3, and cooling setpoint uses contact #4.

Set default to 2 enables two heating setpoints.

Set to 0 will enable two cooling setpoints. Louvers/Fans will use contacts #3 & #4.

(Fans/louvers require an AC Contactor Box: 42-CIBAC1F1L, 42-CIBAC-2F2L, 42-CB2, 42-CB4)

C20 – Heater and Ventilation Interlock

The interlock function provides a safe zone between the ventilation curtain opening, fan startup, and heater startup. The interlock degree setting prevents the ventilation setpoint from being set to close to the heater setpoint.

i.e., Ventilation curtain setpoint is 70° with a 5.0° differential. Curtains open at 70° and close at 65°. The interlock function setting is 5.0°. The heater setpoint temperature is locked and cannot exceed a 64° setpoint.

Set default to 5.0°

ZONE PARAMETER SETUP

Parameter Menu

Press and release the “SELECT” button to enter the Parameter Menu. Press “SELECT” to cycle through the menu, “OPEN” to increase values, and “CLOSE” to decrease values.

ID	Description	Default	Min	Max
P1	Ventilation Curtain Setpoint	70°	1°	99°
P2	Ventilation Curtain Runtime: Seconds	20	5	50
P3	Ventilation Curtain Idle time: Minutes	3.0	.1	25.4
P4	Ventilation Curtain Temperature Differential	3.0°	1.0°	10.0°
P5	Heater or Fan Setpoint: Contact #3	60°	35°	99°
P6	Heater or Fan Setpoint: Contact #4	60°	35°	99°
P7	Heater Hysteresis / Fan Differential	1.8°	0.1°	25.5°
P8	Ventilation Curtain Humidity Override: RH%	80%	30%	101%
P9	Humidity Override Curtain Runtime: Seconds	20	1	200
P10	Humidity Low-Temperature Override	32°	0°	99°
P11	Fan #1 Humidity Override: RH%	78%	20%	101%
P12	Humidity Deadspan	3%	1%	20%
P13	Alarm: Low-Temperature Setpoint	32°	0°	200°
P14	Alarm: High-Temperature Setpoint	95°	1°	200°

ZONE PARAMETER SETUP

Parameter Menu - User Settings

This page is provided for the grower to record the desired configurations values. Use this section as a future reference guide or an aid in troubleshooting.

ID	Description	Default	User Setting
P1	Ventilation Curtain Setpoint	70°	°
P2	Ventilation Curtain Runtime: Seconds	20	
P3	Ventilation Curtain Idle time: Minutes	3.0	
P4	Ventilation Curtain Temperature Differential	3.0°	°
P5	Heater or Fan Setpoint: Contact #3	60°	°
P6	Heater or Fan Setpoint: Contact #4	60°	°
P7	Heater Hysteresis / Fan Differential	1.8°	°
P8	Ventilation Curtain Humidity Override: RH%	80%	%
P9	Humidity Override Curtain Runtime: Seconds	20	
P10	Humidity Low-Temperature Override	32°	°
P11	Fan #1 Humidity Override: RH%	78%	%
P12	Humidity Deadspan	3%	%
P13	Alarm: Low-Temperature Setpoint	32°	°
P14	Alarm: High-Temperature Setpoint	95°	°

ZONE PARAMETER SETUP

Parameter Settings Description

P1 - Ventilation Curtain Setpoint

Set default to 70° the ventilation curtains begin the cooling cycle when the temperature rises above this setpoint. The cooling cycle ends when the temperature has decreased by the value of P4, set default to 3.0°. Opening cycle begins at 70° and closing cycle at 67°.

P2 - Ventilation Curtain Runtime: Seconds

Set default to 20 seconds the ventilation curtains run this amount of time between idle times and beginning open/close cycles. Ventilation curtains pause for the value of P3 set default to 3.0 minutes. Ventilation curtains open/close 20 seconds, idle 3.0 minutes then repeat the cycle until the vent control unit ends the cycle.

P3 - Ventilation Curtain Idle time: Minutes

Set default to 3.0 minutes the ventilation curtains pause, “idle,” between runtime cycles. The vent control unit continually measures temperature during this idle period. If the temperature has decreased below the P4 value, the cycle ends, and the curtain begins the closing cycle. If the temperature has not decreased the curtain enters another run cycle. The process continues until the ventilation curtains are either fully open or closed.

P4 - Ventilation Curtain Temperature Differential

Set default to 3.0° this is the amount the temperature must decrease below the P1 setpoint for the ventilation cooling cycle to end. The ventilation curtains begin opening at the P1 setpoint, operating on the run (P2) and idle time (P3) cycle. The cooling cycle ends when the temperature decreases by the value of P4.

i.e., (P1) 70° - (P4) 3.0° = (End Cycle) 67°

P5 - Heater or Fan Setpoint: Contact #3

P6 - Heater or Fan Setpoint: Contact #4

Set default to 60° the heater begins a warming cycle when the temperature decreases below this setpoint. The heating cycle ends when the temperature has increased by the value of P7.

A cooling cycle initiates if the C19 value is 0. The fan/louver end the cooling cycle when the temperature has decreased by the value of P7.

ZONE PARAMETER SETUP

Parameter Settings Description

P7 - Heater Hysteresis / Fan Differential

Set default to 1.8° this is the amount the temperature must increase in degrees above the P5/P6 setpoints for the heating cycle to end.

A cooling cycle also initiates if the C19 value is 1. The fan/louver end the cooling cycle when the temperature has decreased by the value of P7.

If the set value of C19 is 1, then the heater must be connected to contact #3 and the AC contactor box for the fan/louver to contact #4. Contact #3 initiates a heating cycle and contact #4 a cooling cycle.

i.e., (P5) 60° - (P7) 1.8° = (End heat cycle) 61.8° (P6) 60° - (P7) 1.8° = (End cool cycle) 58.8°

P8 - Ventilation Curtain Humidity Override: RH%

The use of P8 - P12 requires the optional humidity sensor be connected. (46-HUMID)
Set default to 80% the vent control unit initiates a humidity override when the humidity rises above this setpoint. The ventilation curtains open for the value of P9 in seconds and remain open until the humidity decreases by the value set at P12. The vent control unit returns to auto mode only after the override condition has cleared.

P9 - Humidity Override Curtain Runtime: Seconds

Set default to 20 seconds the ventilation curtains open when the humidity override initiates. The curtains remain open until the relative humidity has decreased below the P12 setting. The ventilation curtains close the same amount of time when the override condition has cleared.

P10 - Humidity Low-Temperature Override

Set default to 32° the humidity override clears if the inside temperature falls below this setpoint. The vent control unit returns to the auto mode.

P11 - Fan #1 Humidity Override: RH%

Set default to 78% the vent control unit initiates a humidity override when the humidity rises above this setpoint. Fan #1 starts a cooling cycle and continues to run until the humidity for the value of P9 in seconds and remain on until the humidity decreases by the value set at P12. The vent control unit returns to auto mode only after the override condition has cleared. Fan#1 is the only fan controlled by the humidity override. *To disable fan humidity override function set the value to 101.*

ZONE PARAMETER SETUP

Parameter Settings Description

P12 - Humidity Deadspan

Set default to 3.0% this is the amount the relative humidity must decrease below the P8/P11 setpoint for the ventilation air exchange cycle to end.

The ventilation curtains open for the number of seconds set at P9. The curtains remain open until the relative humidity has decreased below the P8 setpoint by the value set here. i.e., (P8) 78% - (P12) 3.0% = (End cycle) 67%.

If more than one fan/louver is enabled only fan/louver #1 initiates the air exchange cycle. The fan/louver startup and continue operating until the relative humidity has decreased below the P11 setpoint by the value set here. i.e., (P11) 78% - (P12) 3.0% = (End cycle) 67%.

The ventilation curtains will open for the number of seconds set at P9. The curtains remain open until the relative humidity has decreased below the P8 setpoint by the value set here. i.e., (P8) 78% - (P12) 3.0% = (End cycle) 67%.

P13 - Alarm Low-Temperature Setpoint

Set default to 32° this is the setpoint the temperature must fall below for vent control unit to send a low-temperature signal. The signal is sent continually to the external alarm system until the alarm condition has cleared. The value of this setting is structure and crop dependent. The grower should set the value to the required temperature. The temperature alarm function requires contact #4 to send the signal and limits the number of heaters or fans/louvers that can be enabled.

P14 - Alarm High-Temperature Setpoint

Set default to 95° this is the setpoint the temperature must rise above for the vent control unit to send a high-temperature signal. The signal is sent continually to the external alarm system until the alarm condition has cleared. The value of this setting is structure and crop dependent. The grower should set the value to the required temperature. The temperature alarm function requires contact #4 to send the signal and limits the number of heaters or fans/louvers that can be enabled.

TROUBLESHOOTING

Temperature Sensor

LED Flashing F1 and Temperature:

LED Flashing F1 and Temperature - F1 is the fault code for a disconnected temperature sensor. Check to ensure the red, and white sensor wires are in the correct location and securely connected, see page 6. The wires may appear to be connected but not making good contact. Disconnecting and reconnecting the sensor wires clears the fault in most occurrences.

LED Flashing F2:

The F2 fault code indicates a damaged or short-circuit of the temperature sensor. Temperature sensor failures are rare and usually caused by improper splicing or physical damage. If an F2 fault condition is present, please contact Technical Support - 877.546.2257.

Temperature Reading Fluctuates:

The LED temperature reading continually indicates large swings in temperature. Temperature fluctuations occur when the sensor wire runs parallel to power lines, (120/220V AC). Do not run temperature sensor wire inside of conduit alongside power lines. Make all sensor wire crossings at 90° to power lines.

Humidity Sensor

Humidity Sensor Aspirator Fan Not Running:

The humidity sensor's aspirator fan continuously runs when connected to the relay board. The aspirator fan receives power from the grey sensor wire. Inspect the relay board to ensure the sensor wires are securely connected and in the correct location. Check all barrel connections for proper alignment at the sensor; extension cable ends, and at the vent control unit.

Check the configuration setting C11 to verify it is set to a value of 1, enabling the humidity sensor.

Ventilation Curtains and Fan/Louver #1 Not Responding to Humidity Override:

Check the configuration setting C11 to verify it is set to a value of 1, enabling the humidity sensor. Check parameter settings P8 - P12 is set to the desired setpoints, runtimes and deadspan.

TROUBLESHOOTING

Heater(s)

Heater Does Not Come On at Setpoint:

Check the configuration setting C19 to verify it is set to a value of at least 1 to enable the heater. The heater thermostat wires must be connected to contact #3 when only 1 heater is present. Verify parameter settings P5 – P7 is set to the desired setpoints and hysteresis. Check heater manufacturer documentation to confirm thermostat wires correct installed.

Heater Starts Above the Assigned Setpoint:

Heaters starting above the desired setpoint is an indication that a cooling cycle, not a heating cycle, has been configured. Check the configuration setting C19 to verify it is set to a value of at least 1 to enable the heater. If two heaters are present set C19 to a value of 2. The heater thermostat wires must be connected to contact #3 when only 1 heater is present, and contacts #3 & #4 when two heaters are present.

Heater Cycles Frequently:

Verify parameter setting P7 is set to a hysteresis higher than the average temperature swing of the structure. The hysteresis is the value in degrees the temperature must rise for the heating cycle to end. A low P7 value causes the heater to cycle on and off more frequently than a higher setting.

Fan(s) or Louver(s)

Fan/Louver Does Not Come On or Starts Below Setpoint:

Check configuration setting C19 is set to a maximum value of 1 to enable the fan/louver. The fan/louver must be connected to the vent control unit via an AC contactor box. Do not connect fans/louvers directly to the relay board. Confirm the AC contactor box connection is at contact #4 and the additional wiring required corresponds to the diagram on page 11. Check parameter setting P6 is set to the desired setpoint.

Fan/Louver Cycles Frequently:

The parameter setting P7 functions as both the heater hysteresis and fan differential if one heater and one fan/louver are enabled. Verify parameter setting P7 is set to a hysteresis/differential higher than the average temperature swing of the structure.

TROUBLESHOOTING

External Alarm Function

Low or High-Temperature Did Not Signal Alarm:

Check the values of P13 (Low-Temperature) and P14 (High-Temperature) are at the desired setpoints. Verify configuration setting C16 is at any value other than 0. The next steps require information obtained from the external alarm manufacturers documentation. Determine the type of signal required by your external alarm, continuous or signal sent during an alarm condition. The alarm function sends a continuous signal when C16 is set to the value of 1 (Normally Closed). The alarm function sends a signal during an alarm condition when the C16 value is set to 2 (Normally Open).

The external alarm must be connected to contact #4. Confirm the external alarm connection is at contact #4 and the wiring required corresponds to the diagram on page 9.

Relays and Fuses

Circuit Protection:

The 41-VCU2-24 includes several different points of overload protection, all resettable – (1) 5A circuit breaker on the bottom right, (1) 10A circuit breaker on the bottom left, (1) 10A main fuse on the right of the relay board, and (2) 5A fuses on relay board for motor protection.

No display on LED:

If the LED display is blank first check, the primary power source to vent control unit. If power is present inspect the 10A circuit breaker on the bottom right of the enclosure. Pressing in on the button resets the circuit breaker, and the display returns to normal. If the 10A circuit breaker trips immediately again contact an electrician for further diagnosis.

No Power at the Relay Board:

There are two points of protection for the relay board, (1) 10A circuit breaker and (1) 10A ATO fuse. Verify the 10A circuit breaker located on the bottom left has not tripped. Pressing in on the button resets the circuit breaker and power returns. If power has not returned, disconnect the vent control unit from the primary power source. Open the enclosure and inspect the 10A ATO main fuse located on the right of the relay board. Pressing in on the red center tab resets the fuse, and normal function returns.

TROUBLESHOOTING

Low Voltage Motors

Motor(s) Operate in Opposite Direction:

Low voltage motors operating in the opposite direction are an indication of reversed polarity. i.e., the ventilation curtain opens when you press the close button. Reversing the position of the blue and brown, within the terminals sets resolves this condition.

Remove the primary power source from the vent control unit before opening the enclosure lid. Identify which motor is operating in the reverse direction and connection location at the relay board. i.e., Motor #1 or Motor #2 terminal set. Disconnect the blue and brown wires noting their current location. Reconnect the blue wire to the location where the brown wire previously was connected and repeat this process for the brown wire. Close the enclosure lid and power up the unit. Press the “OPEN” or “CLOSE” button, and the motor operates in the proper direction.

Motor(s) Do Not Operate:

Low voltage motors not operating at setpoint, or in manual override, could be an indication of one of several situations. The first step in the troubleshooting process is to check the 10A circuit breaker located on the bottom right of the enclosure. If this has tripped, press in to reset and power is restored. The second step is to disconnect the primary power supply and open the enclosure lid to inspect the 10A main fuse and the two 5A motor fuses located on the relay board. Pressing in on the red tab of each fuse resets that fuse and restores the connection. Close the enclosure lid and repower the unit. Motor power is restored. The last step is to verify the internal limit switches located on the motors have not reached their limit. Refer to the documentation included with the low voltage motors for further instructions on how to set the limit switches.

If none of the above has resolved the situation contact Technical Support – 877.546.2257.

Motor(s) Do Not Open or Close at Desired Setpoint:

Verify vent control unit is not lock in manual override. In manual override a “CLO” or “OPE” will be displayed on the LED. In auto mode the LED will display the current temperature or “H1” if in humidity override. Confirm the parameter settings P1 – P4 are properly configured. A desired ventilation setpoint of 70° will have parameter settings similar to the following: (P1) 70° setpoint, (P2) 20s runtime, (P3) 1.0m idletime, (P4) 3.0° temperature differential. Ventilation curtain opens for 20s when temperature reaches 70°, pauses 1 minute, if temperature decreases to 67° curtain closes, if not the cycle repeats.

SPECIFICATIONS

Description	Default
Part Number	41-VCU2-24
Series	Vent Control Unit
Enclosure Type	Waterproof, Metal Latch
Mounting Type	Chassis Mount
Size / Dimension	13" x 9.50" x 6.50"
Input Voltage	110 ~ 240 VAC,
Max Amps	5A
Voltage - Isolation	5kA
Output Voltage	24V DC
Power (Watts)	300W
Operating Temperature	-25°C ~ 70°C (w/derating)
Number of Outputs	4
Number of Setpoints	3
Number of Inputs	2



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Thank you for choosing Advancing Alternatives for your greenhouse needs. Our customers are our top priority, and our goal is 100% customer satisfaction. If we did not meet this goal, please contact us today so we can make it right.

Thank you for your business. We look forward to serving you again.

Sincerely,

The Advancing Alternatives Team