MC2V3X and MC4V3X
With the ClimateBoss

Installation Manual

BARTLETT Instrument Co.
1032 Avenue H
Fort Madison, IA 52627
319-372-8366
www.bartinst.com

Contents

Overview 2
Installation Steps 3
Placement and Mounting 3
Connections 3
Motor and Controller Connections 4
Controller Wiring 5
Heat Outputs 5
Timer Outputs 5
Thermistor 5
Proportional Outputs 6
Wiring Diagrams 6
MC2 RWL Standard Wiring Diagram 7
MC2 GHK Standard Wiring Diagram 8
MC4 RWL Standard Wiring Diagram 9
MC4 GHK Standard Wiring Diagram 10

Overview

This box is a standard package that contains: (a) the environmental controller, (b) the relay cabinet and (c) the motor control box with override rotary switches. The MC units are 24VDC Power Supply. Power Input is 120VAC. Control Output is (2 – MC2V3X, 4-MC4V3X) 24VDC *outputs at 5A each*. The MC units are protected by resettable circuit breakers. They are pre-configured to use automatic control input signals but can utilize override switches for testing and troubleshooting.

A typical installation consists of a circuit breaker box and an MC unit. The circuit breaker box provides circuit protection to the MC Unit. The MC relay cabinet box switches line power to the appliances. The ClimateBoss controller part of the MC unit senses temperature and provides control signals.

BE SURE ALL POWER IS OFF BEFORE INSTALLATION!



INSTALLATION SHOULD BE DONE BY A LICENSED ELECTRICIAN.

BE SURE ALL WIRING AND EQUIPMENT IS INSTALLED ACCORDING TO LOCAL ELECTRICAL CODES.

THE CLIMATEBOSS IS A LOW VOLTAGE DEVICE. LIMITED TO 24V AC CONTROL VOLTAGES.

ENSURE NO DRILL HOLES ARE MADE AT THE TOP OF THE ENCLOSURE. THIS VOIDS THE PRODUCT WARRANTY AND CAN RESULT IN MOISTURE / CORROSION WITHIN THE UNIT.

CAUTION: The MC2V3X and MC4V3X is designed to be reliable but as with all equipment, failures do occur. Therefore, in situations where loss could result from the failure of the MC units, separate backup thermostat or alarm systems should be installed. The reliability and performance of the MC units can be compromised by locating the controller in direct sunlight or in direct water spray. All Wiring In and Out of the MC Unit should enter and exit the bottom of the enclosure.

Installation Steps

Utilize the following to install the MC unit.

1. Placement and Mounting
2. Connections
a. Motor and Controller Connections
b. Power Input Connections
3. ClimateBoss

Placement and Mounting

Mount the MC unit in an easy-access location. Usually close to the breaker box. Protect the ClimateBoss touchscreen control from direct sunlight for better reliability and readability. Moisture can cause corrosion and premature failure, so avoid direct water and have all wires enter and leave through liquid-tight connectors, waterproof conduit, or seal the wires with silicone sealant. All wires should enter and exit from the bottom of the controller.

If you are mounting more than one controller next to each other make sure to have about 2-3ft separation between them.

WARNING: Some sealants release acetic acid while curing. Be sure sealant is completely cured (up to 3 days) before closing control box to avoid corrosion damage. All openings for wiring should be in the bottom of the box when mounted.

To mount the CLIMATEBOSS, remove the front cover and unplug ribbon cable from the relay board. Insert the 4 self-drilling screws provided with the CLIMATEBOSS through the 4 screw-hole knockouts and fasten the box to the wall. Cover the screw heads with plastic cups provided. After all wiring is complete and any sealant cured, reattach the ribbon cable and screw on the front cover.

As an alternative, you can mount the CLIMATEBOSS with drywall screws placed through the corner holes of the box.

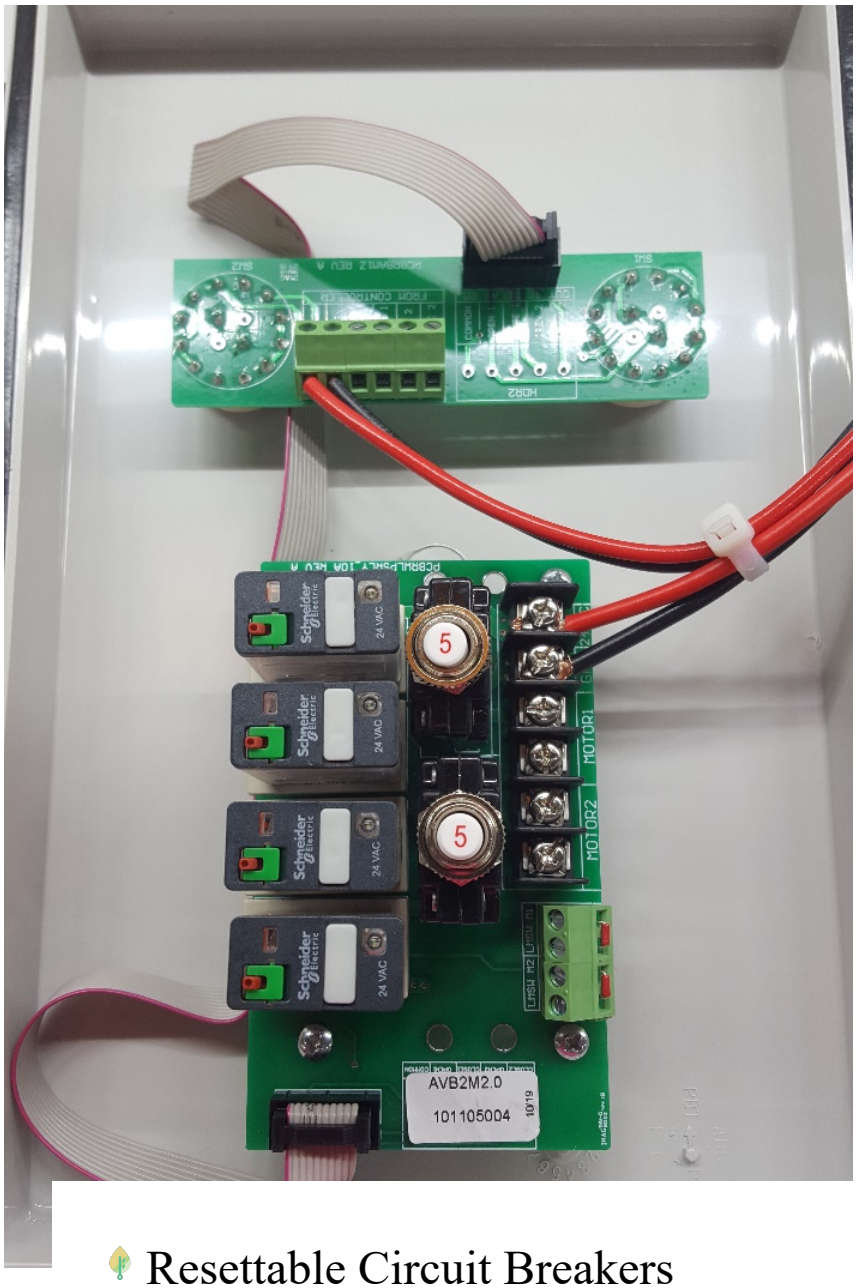
Connections

The following sections show pictures to outline the connections that need made from the MC Unit (either MC2V3X or MC4V3X). Primarily this is power input and outputs to equipment.

As opposed to our standalone motor control boxes, the MC units come pre-wired including the ClimateBoss controller. If you need to see the connections to the ClimateBoss, please refer to your ClimateBoss manual.

Motor and Controller Connections

See the diagram in your MC Unit for your specific wiring diagram.



- Resettable Circuit Breakers
- Motor Connections.
- Optional Controller Inputs.

Pictured: MC2V3X

See wiring diagram for further assistance

Controller Wiring

Important: Please refer to the wiring diagram found in your MC unit for most accurate wiring and set up. The following are standard configurations, and you may have a customized set up.

Please refer to the ClimateBoss manual for sensor connection diagrams.

Heat Outputs

The heat outputs can be configured as an open/closed contact like a thermostat (dry contact) or to source 24V AC to drive a relay. Open/closed contacts (DRY) is the factory setting.

When controlling more than one heater from one heat output, configure the output to source 24V AC to drive a relay(s) to keep the control loops separate.

Also, when controlling a line voltage heater, configure the heat output to source 24V AC to drive a relay of sufficient capacity to run the heater.

Timer Outputs

The 2 timer outputs sources 24V AC to drive a solenoid or relay(s). The solenoid should have a coil with less than a 24VA load.

Thermistor

The thermistor is the temperature sensor. The CLIMATEBOSS has two thermistor inputs labeled TH1 and TH2. In 1-zone mode, the readings are averaged and displayed. In the 2-zone mode, Heat 1 and Proportional Output 1 (Cool 1) work to keep TH1 at the correct temperature. Also, Heat 2 and Proportional Output 2 (Cool 2) work together to keep TH2 at the desired temperature.

The thermistors should be slightly above the plant height. To ensure proper readings, it should not be in direct sunlight or where it will be sprayed with water. It is generally placed closer to the cool air inlet and further from the heat. In 1 zone mode separate the thermistors across the width of the greenhouse to give the best average temperature.

The thermistors come with 100’ leads and can be connected directly to the two terminals for TH1 and to the two terminals for TH2. There is no special orientation to the thermistor leads.

Should you need to extend the leads of the thermistor, use the 3M Scotchlock™ sealed connectors provided. Use only wire size of 22-14 AWG to ensure proper

connection. A faulty connection will cause erroneous temperature readings. Up to 300’ of wire can be added without affecting the temperature reading.

Proportional Outputs

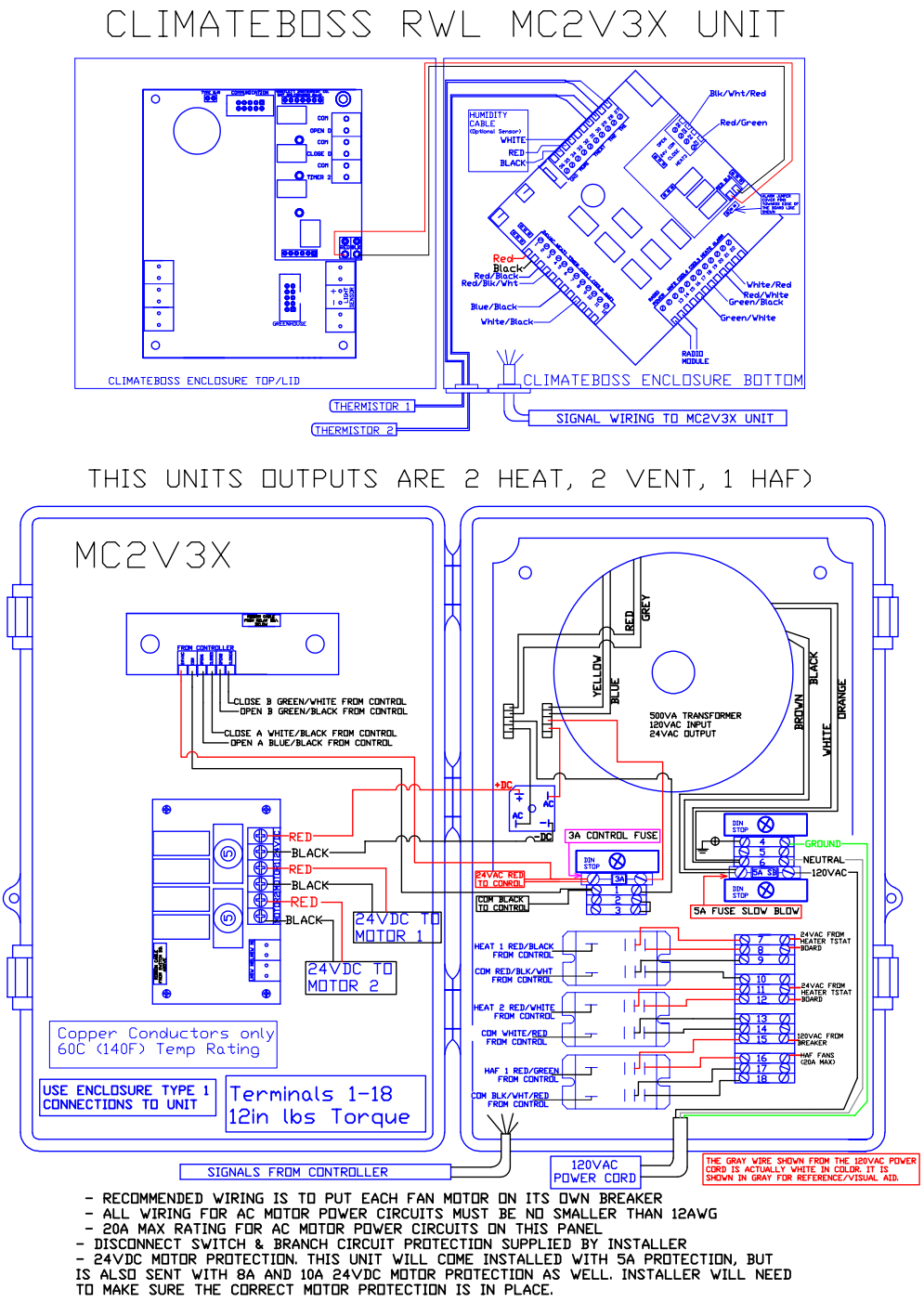
Each proportional output has an open and close signal to drive relays or contactors. It is best to use double-throw relays to ensure the power has been removed from the close contacts before energizing the open contact.

Wiring Diagrams

Standard wiring diagrams are shown on the following pages. The ClimateBoss controller comes prewired to the relay cabinet. The exact wiring diagram for your unit can be found inside your MC2 or MC4 unit.

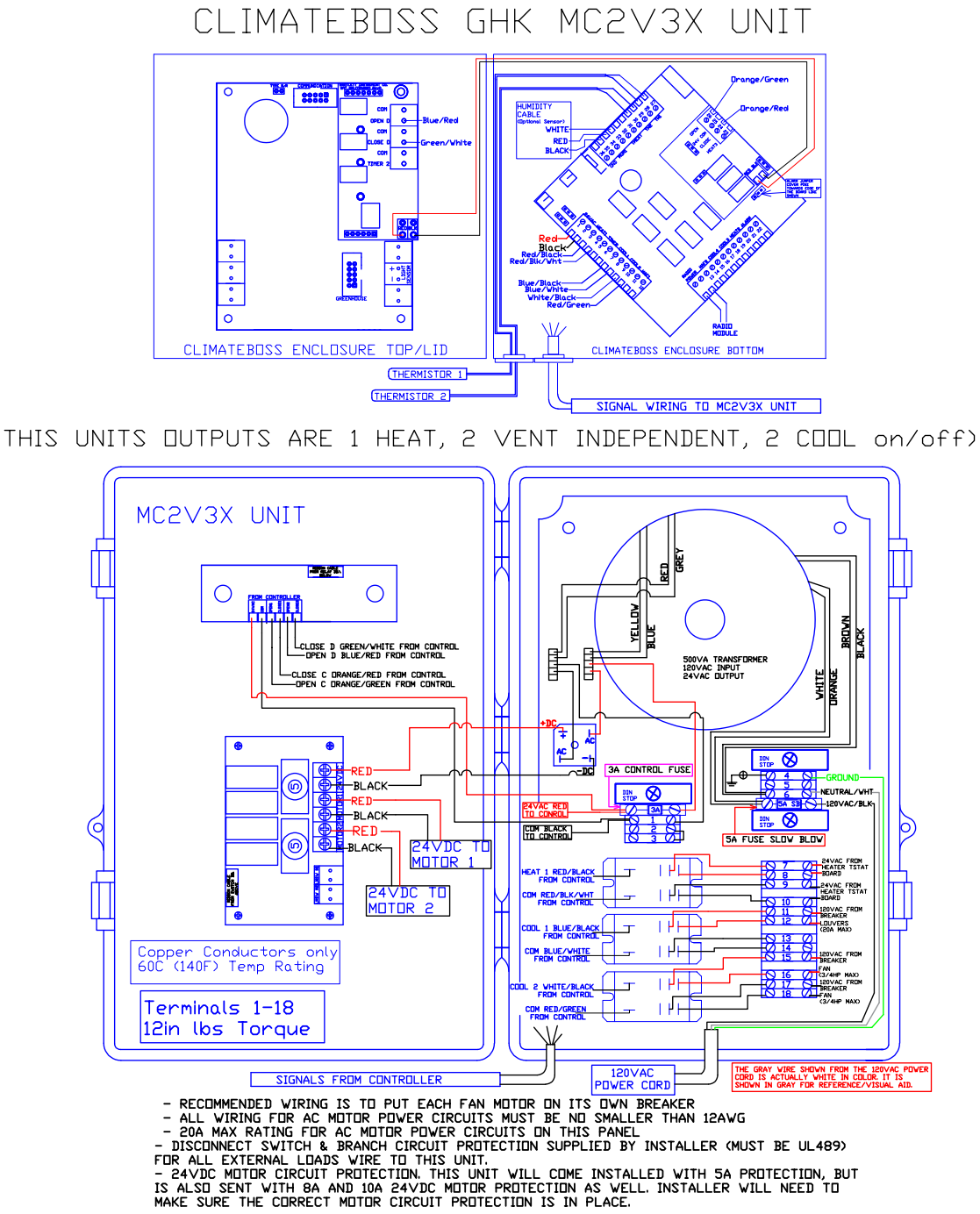
MC2 RWL Standard Wiring Diagram

RWL stands for rolling wall and the controls houses with only natural ventilation. The standard MC2V3X RWL wiring diagram outputs control 2 heat, 2 vent motors and 1 HAF fan.



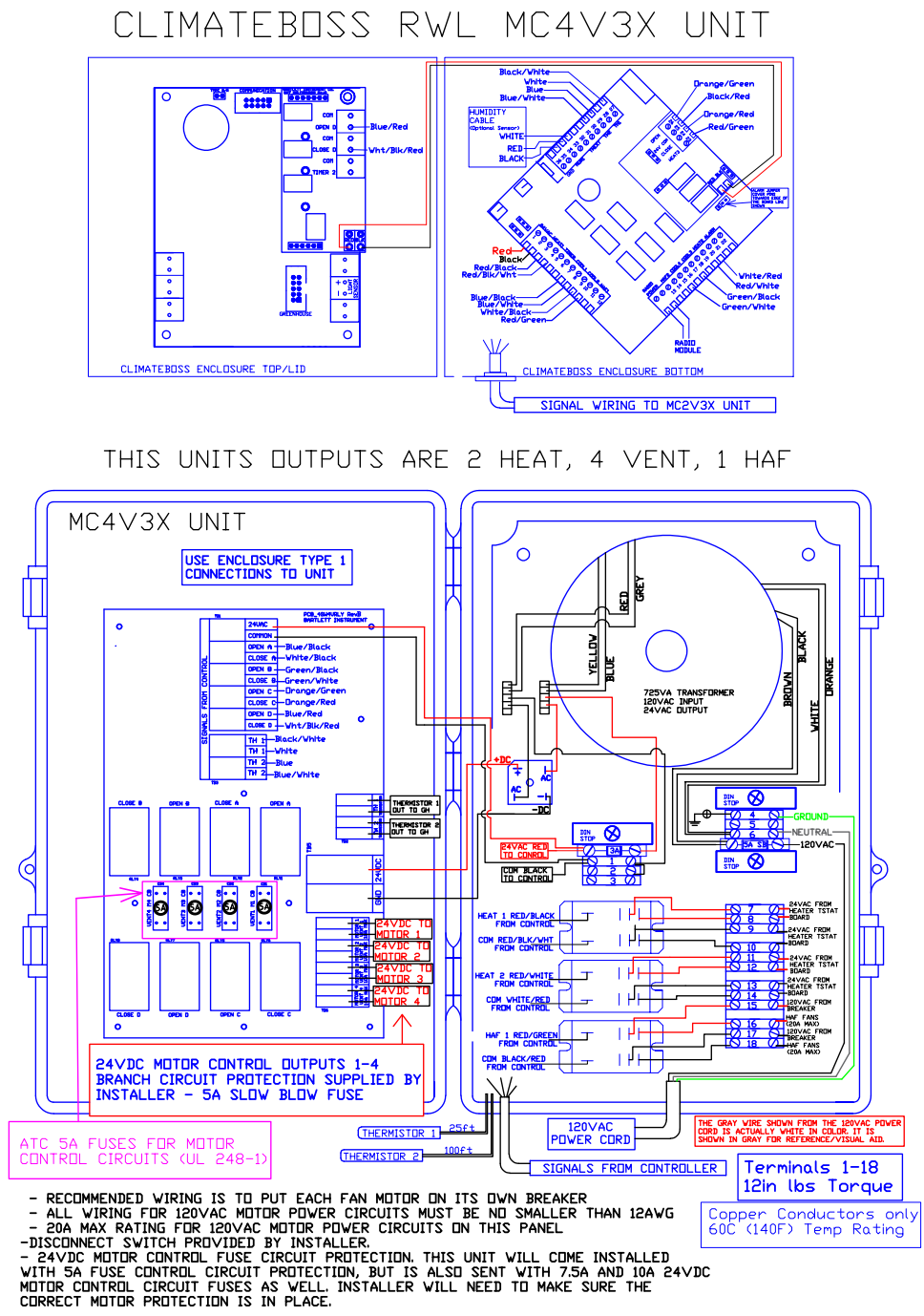
MC2 GHK Standard Wiring Diagram

GHK stands for greenhouse controller and controls houses with mechanical cooling and natural ventilation. The standard MC2V3X GHK wiring diagram outputs control 1 heat, 2 independent vent motors, 2 on/off mechanical cooling (fans).



MC4 RWL Standard Wiring Diagram

RWL stands for rolling wall and the controls houses with only natural ventilation. The standard MC4V3X RWL wiring diagram outputs control 2 heat, 4 vent motors and 1 HAF fan.



MC4 GHK Standard Wiring Diagram

GHK stands for greenhouse controller and controls houses with mechanical cooling and natural ventilation. The standard MC4V3X GHK wiring diagram outputs control 1 heat, 4 vent motors, 2 on/off mechanical cooling (fans).

