

**CLIMATEBOSS**  
**Controller**  
**(Louver & Fan/GHK Mode)**

**Installation Manual**

***BARTLETT* Instrument Co.**

1032 Avenue H  
Fort Madison, IA 52627  
319-372-8366  
[www.bartinst.com](http://www.bartinst.com)



## Installation Overview

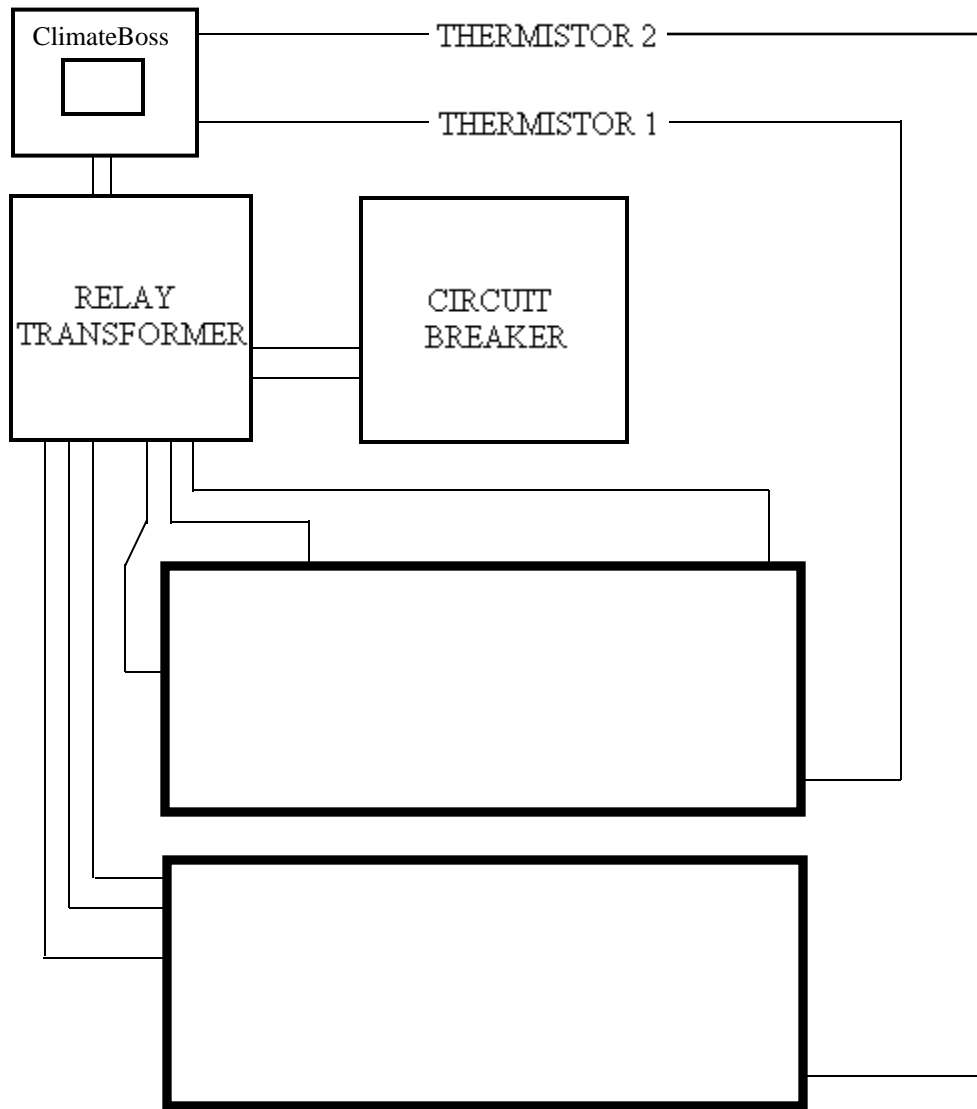


Figure 1

A typical installation consists of a circuit breaker box, relay/transformer box and a ClimateBoss. The circuit breaker box provides overload protection. The relay/transformer box switches line power to the appliances. And, the ClimateBoss 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.

**CAUTION:** The ClimateBoss 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 ClimateBoss, separate backup thermostat or alarm systems should be installed.

The reliability and performance of the ClimateBoss can be compromised by locating the controller in direct sunlight or in direct water spray.

## PLACEMENT AND MOUNTING

Mount the ClimateBoss in an easy-access location. Usually close to the breaker box and relay box. Protect it 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.

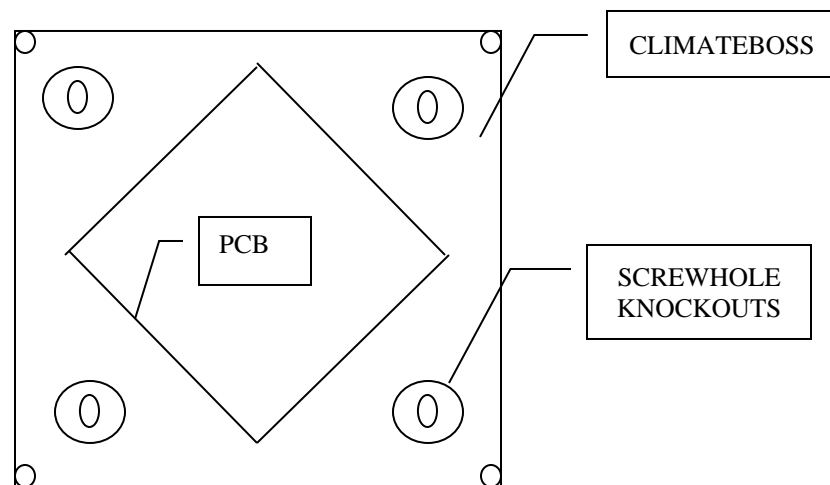


Figure 2

# CLIMATEBOSS OUTPUTS

## OUTPUT SPECIFICATIONS

OUTPUT	CONTACT TYPE	VOLTAGE RATING	CURRENT RATING
HEAT	OPEN/CLOSED OR SOURCE 24V AC	24V AC	2A RESISTIVE LOAD
COOL OPEN CLOSE HAF TIMER	SOURCE 24V AC	24V AC	2A RESISTIVE LOAD
ALARM	OPEN/CLOSED	24V AC	2A RESISTIVE LOAD

All cool, horizontal airflow (HAF), and timer outputs, source 24V AC to drive a relay or contactor. The CLIMATEBOSS's drive relays are rated at 2A when driving a resistance load. For reliability, snubber circuits are on each output. For even greater reliability, load currents on the CLIMATEBOSS's relays should be less than 1A (24 VA load or less).

## OUTPUT CONFIGURATION

Each 24 VAC output has a contact that is common to 24VAC input line 2 (24L2) and a contact that is 24VAC line 1 switched through a relay.

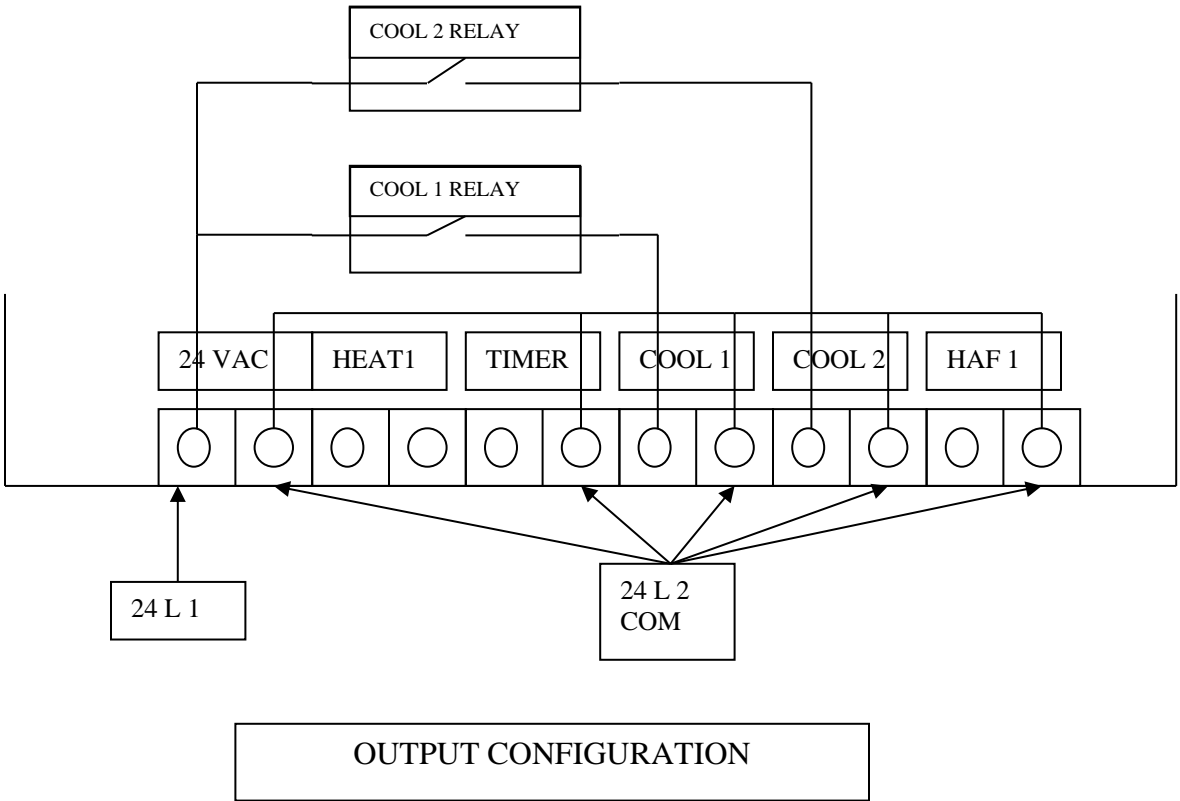
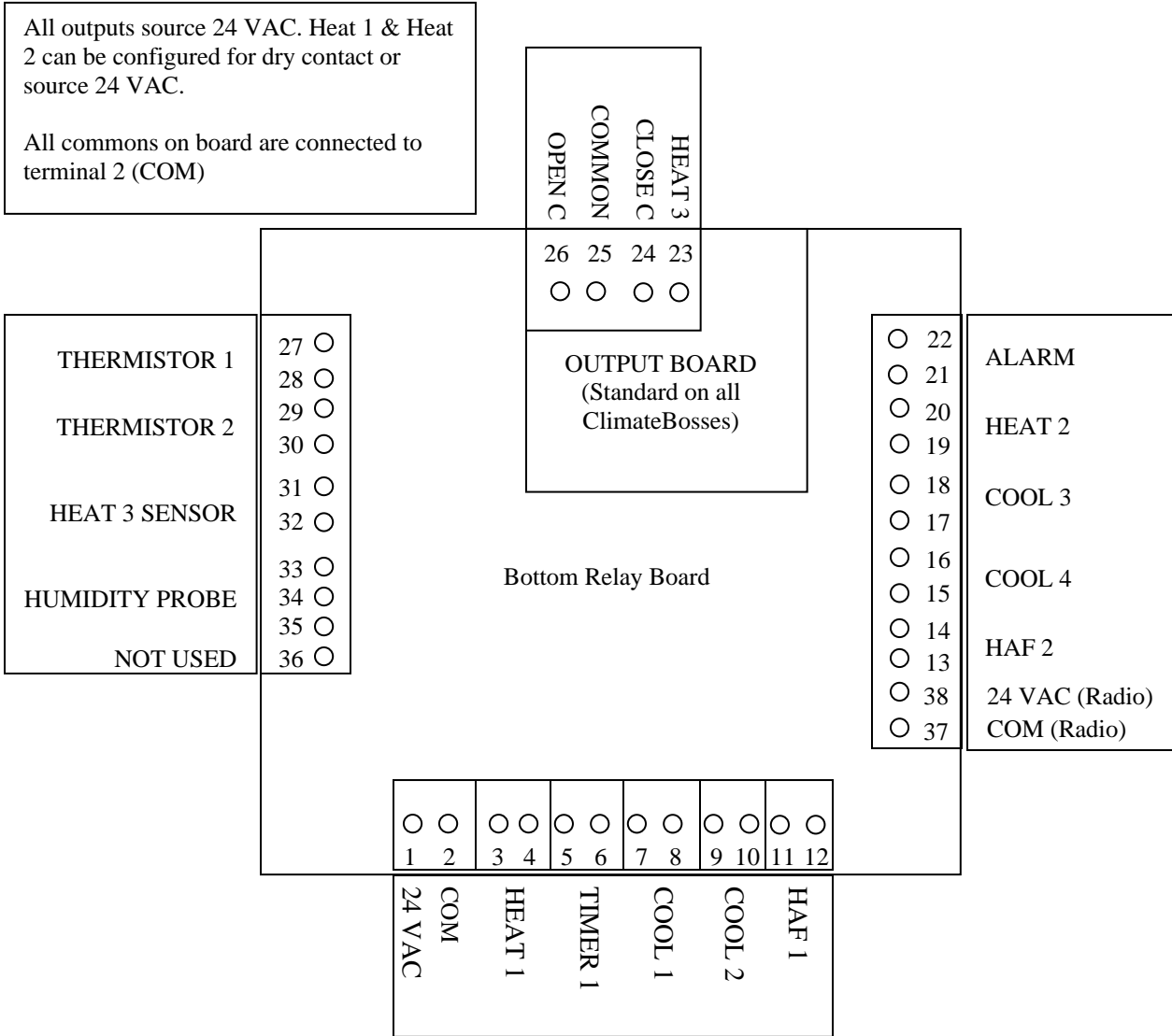


Figure 3

### CONNECTION LOCATIONS

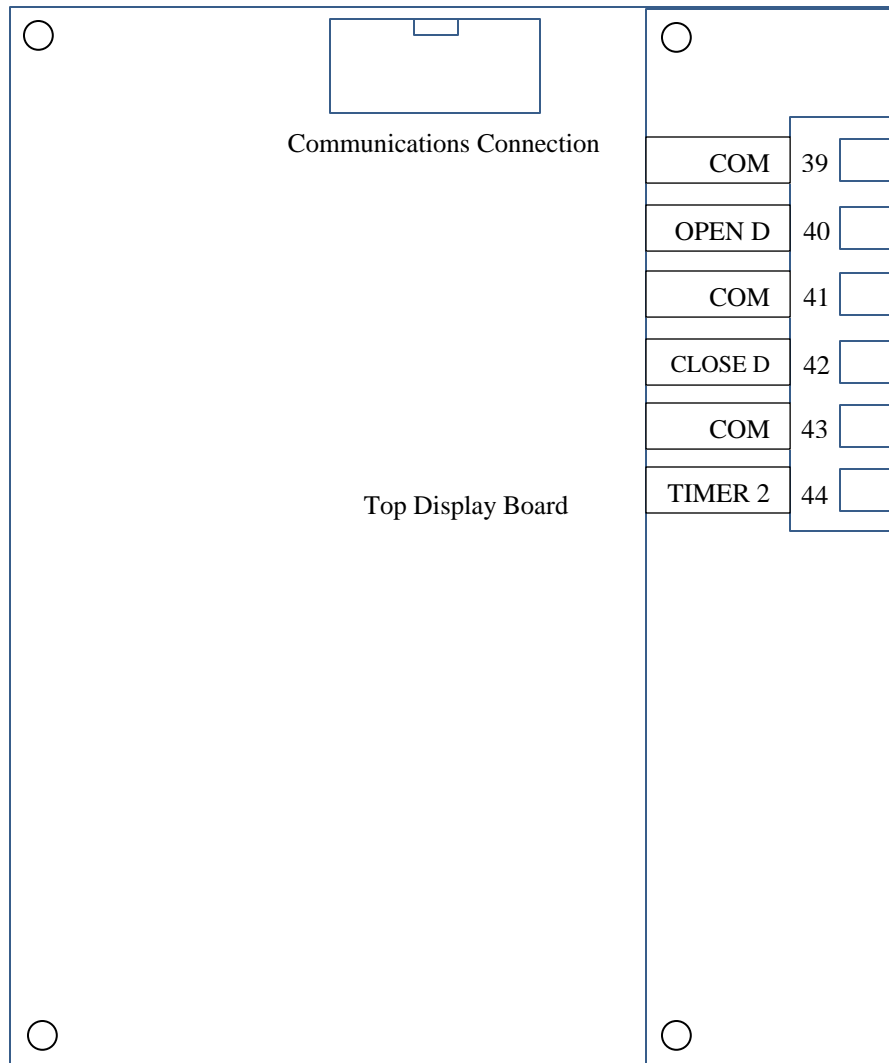


TERMINAL	DESCRIPTION
1	24 VAC
2	COM
3	HEAT 1 OUT
4	HEAT 1 COM
5	TIMER OUT
6	TIMER COM
7	COOL 1 OUT
8	COOL 1 COM
9	COOL 2 OUT
10	COOL 2 COM
11	HAF 1 OUT
12	HAF 1 COM
13	HAF 2 OUT

TERMINAL	DESCRIPTION
14	HAF 2 COM
15	COOL 4 OUT
16	COOL 4 COM
17	COOL 3 OUT
18	COOL 3 COM
19	HEAT 2 OUT
20	HEAT 2 COM
21	ALARM
22	ALARM
23	HEAT 3 OUT
24	CLOSE C
25	COM
26	OPEN C

TERMINAL	DESCRIPTION
27	THERMISTOR 1
28	THERMISTOR 1
29	THERMISTOR 2
30	THERMISTOR 2
31	THERM. HEAT 3
32	THERM. HEAT 3
33	HUM. IN
34	HUM. POWER 5V
35	HUM. GROUND
36	EXTRA GROUND
37	COM (Radio)
38	24 VAC (Radio)

Figure 4



TERMINAL	DESCRIPTION
39	COM
40	OPEN D
41	COM
42	CLOSE D
43	COM
44	TIMER 2

**Figure 5**



## COOL OUTPUTS

In 2-zone mode, outputs Cool 1 and Cool 3 are designed to open the louver/shutters. Outputs Cool 2 and Cool 4 control the fans. The controller has a 30 second delay between Cool 1 (Cool 3) activating and Cool 2 (Cool 4) coming on to ensure the louvers/shutters are open before the fans start. In 1-zone mode, Cool 1 is used to open louvers/shutters, Cool 2 and Cool 3 for fans and Cool 4 for additional fans or pad cooler.

## PROPORTIONAL OUTPUTS

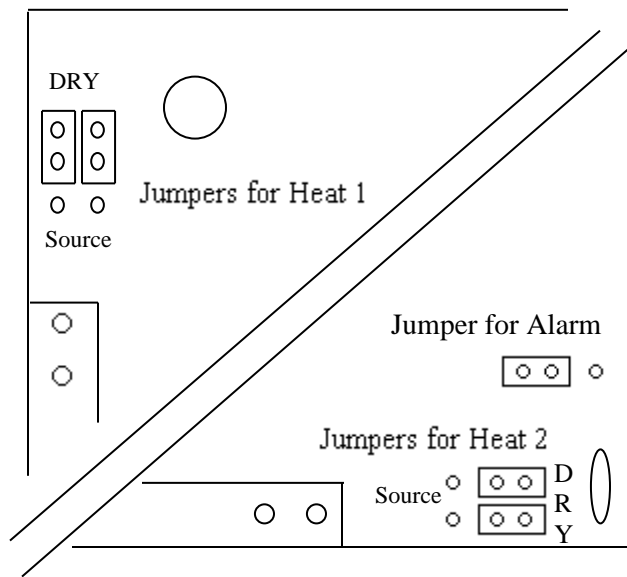
Vent C and Vent D are proportional output. They both have an open and close signal to drive relays or contactors. It is best to use double-throw relays to ensure the power has been removed from the close contacts before energizing the open contact. When set to 2-zone mode, Vent C is for Zone 1 and Vent D is for Zone 2

## HAF OUTPUTS

The HAF 1 output is the normally closed side of the Cool 2 relay and HAF 2 is the normally closed side of the Cool 4 relay. Therefore HAF 1 (HAF 2) is off when the Cool 2 (Cool 4) fan is on and HAF 1 (HAF 2) is on when Cool 2 (Cool 4) is off.

## HEAT OUTPUTS

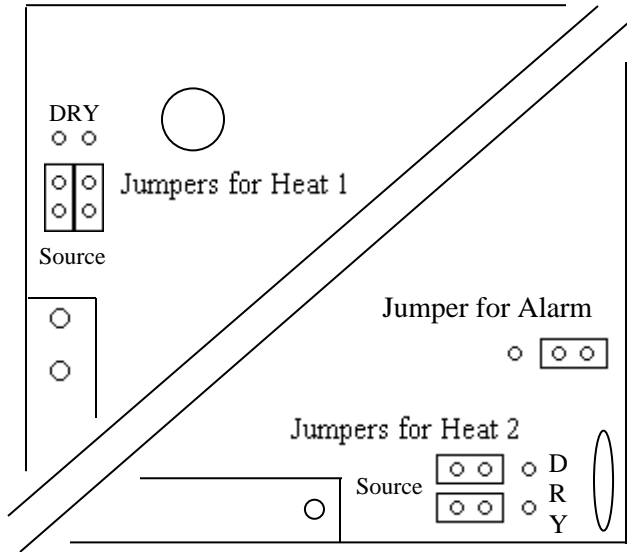
The heat outputs can be configured as an open/closed contact like a thermostat (dry contact) or to source 24V AC to drive a relay. Open/closed contact (DRY) is the factory setting.



Jumpers shown for Heat 1 and Heat 2 are configured as OPEN/CLOSED contacts.

Jumper for Alarm is showing a normally open configuration.

Figure 6



Jumpers shown for Heat 1 and Heat 2 are configured to SOURCE 24VAC.

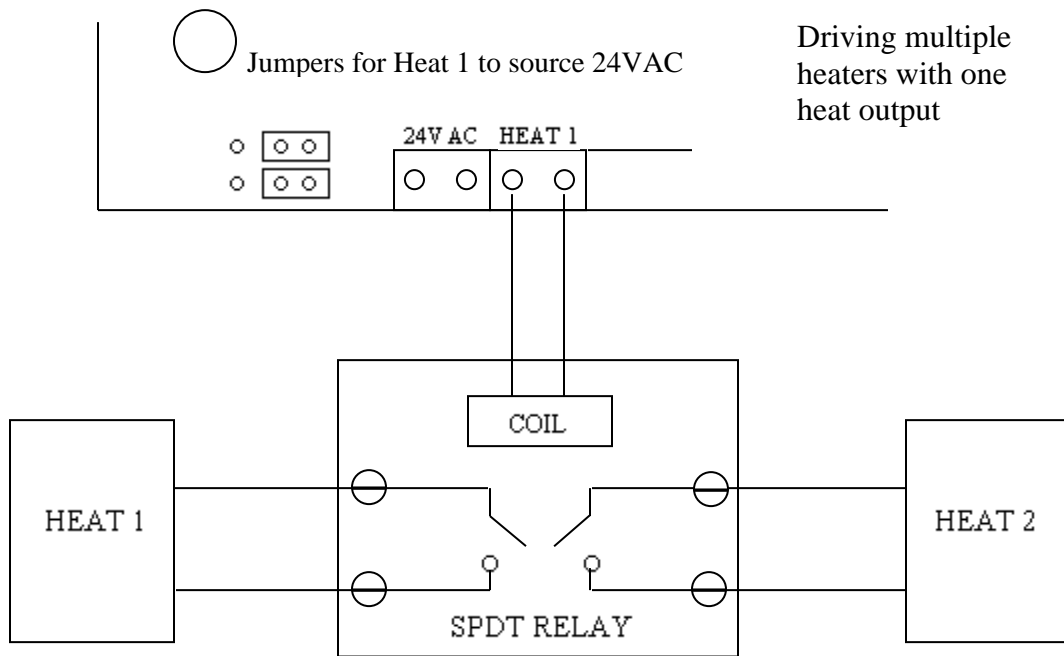
Jumper for Alarm is showing a normally closed configuration.

Figure 7

HEAT OUTPUTS cont.

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.



Driving multiple heaters with one heat output

Figure 8

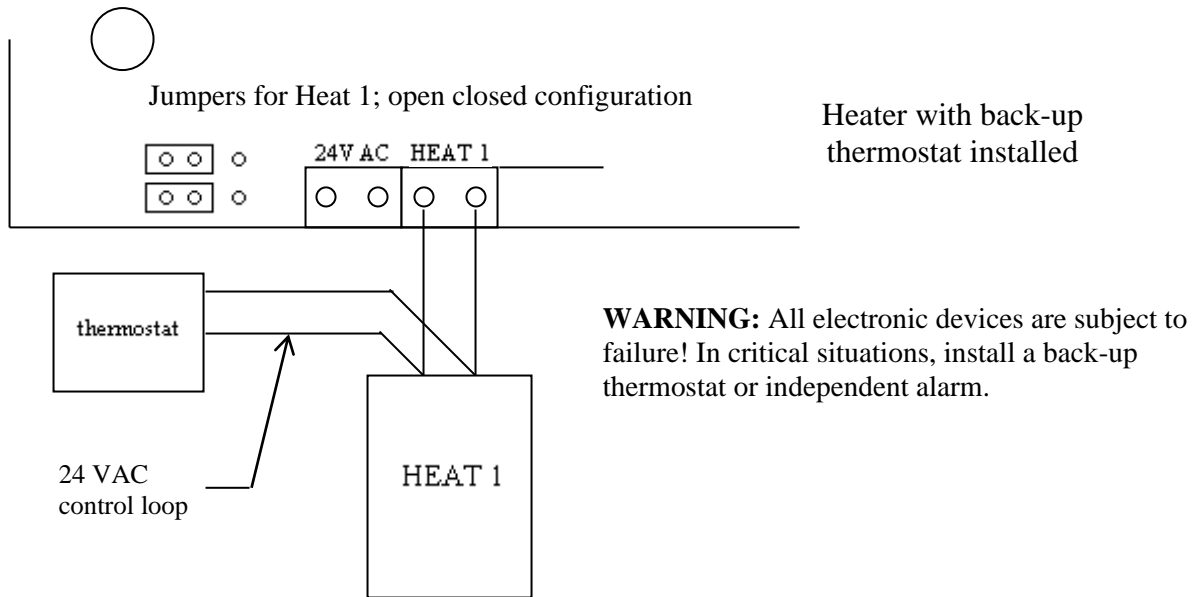


Figure 9

## TIMER OUTPUT

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

## ALARM OUTPUT

The alarm is an open/closed contact. When the CLIMATEBOSS is powered and operating properly the contacts are CLOSED. The contacts OPEN when power is lost or when the high or low alarm is triggered. The alarm output can be configured for either normally open or normally closed by changing the jumper for the alarm output. See **Figure 6** and **Figure 7** for jumper placement.

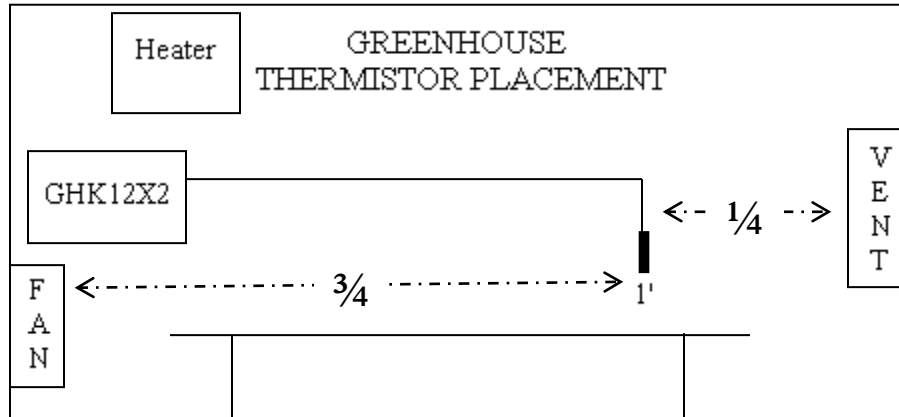
## THERMISTOR

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, Cool 1, and Cool 2 work to keep TH1 at the correct temperature. Also, Heat 2, Cool 3, and Cool 4 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. See **Figure 10**.

The thermistors come with 24' 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.



**Figure 10**

# CLIMATEBOSS SENSOR CONNECTIONS

- THERMISTOR #3 IS AN ADD ON FOR A THIRD HEAT OPTION (ONLY AVAILABLE FOR CLIMATEBOSS GHK VERSIONS)
- HUMIDITY IS AN ADD ON TO THE CONTROLLER
- LIGHT SENSOR IS AN ADD ON, WHITE POSITIVE & BLACK NEGATIVE

