



FreezeCop™

HVAC Freeze Monitor & Controller

P/N 236-801-5 (V5.0)

www.georgiacontrols.com

Introduction

The FreezeCop™ HVAC freeze monitor and controller prevents a liquid-to-Freon heat exchanger in a heat pump from freezing. This is accomplished by accurately monitoring refrigerant temperature and taking preemptive action. Should a heat exchanger freeze be imminent, FreezeCop will reverse cycle the heat pump and if necessary disable the compressor(s).

Inputs

- 236-800-X Sensor Black Wire
- 236-800-X Sensor Red Wire
- Temperature Select
- Temperature Select
- 24 VAC Common
- 24 VAC Power

Outputs

- Reversing Valve 24VAC
- NC Freeze Limit Contact #1
- NC Freeze Limit Contact #2
- LED Green – Power Indicator
- LED Red – Reversing Valve Indicator
- LED Red – Fault Indicator

Pin 1 is in the upper-right corner when the FreezeCop is viewed with connector pin-latch up and the label at the top.

Pin Connections					
	236-800-X Sensor Black Wire	1	9	24VAC Common	
	236-800-X Sensor Red Wire	2	10	24 VAC Power	
	Temperature Select	3	11	Reversing Valve 24VAC	
	Temperature Select	4	12		
TOP	Factory use only	5	13		
	Factory use only	6	14		
	Factory use only	7	15	NC Freeze Limit Contact #1	
	Factory use only	8	16	NC Freeze Limit Contact #2	
				BOTTOM	

NOTE: Pins 1, 3, and 9 are tied together within the controller.

Operational Information

Power up:

When power is first applied to the FreezeCop, all three LEDs will illuminate for 2 seconds.

Normal operation:

During normal operation, contact 11 is open. Contacts 15 & 16 are closed to provide power to the compressor contactor and the Fault Indicator LED & the Reverse LED are off.

Reversing:

Initially, when the temperature drops below the freeze temperature, contact 11 supplies 24 VAC to the reversing valve and the Reverse LED is illuminated.



Returning to normal:

Assuming the temperature reaches the thaw temperature in less than the maximum thaw time, the controller enters the reversing delay period where the reversing valve remains energized even though the exchanger has thawed out. Afterward, contact 11 returns to an open state and the Reverse LED goes off.

Fault from not thawing out:

If the temperature does not reach the thaw temperature in less than the maximum thaw time, contact 11 is opened to return the reversing valve to its normal state and contact 15 & 16 are opened to break power to the compressor contactor. The Reverse LED goes off and the Fault Indicator LED goes on solid. The controller enters a fault delay and nothing is done during the fault delay.

Fault from too many reverses:

If the number of reverses exceeds the fault threshold, contact 11 is opened to return the reversing valve to its normal state and contact 15 & 16 are opened to break power to the compressor contactor. The Reversing LED goes off and the Fault Indicator LED goes on solid. The controller enters a fault delay and nothing is done during the fault delay.

Returning to normal operation:

Assuming the temperature is above the *freeze temperature* at the end of the fault delay, the controller will close contacts 15 & 16 to close the power circuit to the compressor contactor and the Fault Indicator LED will begin a 1 blink sequence.

Extreme freeze fault:

If the temperature is at or below the freeze temperature at the end of the fault delay, the relays will remain unchanged, the Fault Indicator LED will begin a 2 blink sequence, and the FreezeCop will “lock” in this condition until the unit’s power is cycled.

Other fault indicator functions:

1. During normal, reversed, and 1 blink operation, if the sensor becomes disconnected, the signal becomes illegible, or the temperature reported is considered to be absurd, the Fault Indicator LED will blink 3, 4, or 5 times to indicate the condition respectively. As soon as the fault is corrected, the 3, 4, or 5 blink indication will stop being displayed, and if there are no other faults, normal operation will be resumed immediately.
2. Two faults can be stacked. That is to say for example, if running in the 1 blink mode (a fault has previously occurred) and the sensor becomes disconnected, the Fault Indicator LED will blink once, pause, then blink three times, pause, and then repeat.



Fault Indicator has the following modes:

- Off OK
- On System currently in a fault timeout
- 1 Blink Fault happened at some point
- 2 Blink Extreme Freeze Fault, maintenance required
- 3 Blink No sensor present
- 4 Blink Noisy sensor, reroute hookup wires
- 5 Blink Sensor temperature out of range (above 212 °F or below -4 °F)

Definitions

The definitions change based on pins 3 and 4 being open or being connected together (shorted).

Definition	Normal Operation (3 & 4 open)	Alternate Operation (3 & 4 shorted)
Freeze Temperature	40 °F	36 °F
Thaw Temperature	50 °F	50 °F
Maximum Thaw Time	45 seconds	45 seconds
Reversing Delay (after reaching Thaw Temperature)	60 seconds	60 seconds
Fault Threshold	Lock out on first fault after reversing delay	1 reverse / 30 minutes*
Fault Delay	Lock out	12 hours

* Fault on 2nd within 30 minutes

Specifications

Operating Specifications (Ta=25C)

Power Requirement	
Voltage	24VAC
Current	50mA Max
Accuracy	
Temperature	+/- 0.5 °C (0.9 °F) Max
	+/- 0.25°C (0.45°F) Typical
Sensors	
236-800-X	5 Max
Relays	
Current	10A Max



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