

Georgia Controls

FreezeCop™ HVAC Freeze Monitor & Controller P/N 236-801-3

<http://www.georgiacontrols.com>

Introduction

The FreezeCop™ HVAC freeze monitor and controller prevents a liquid-to-Freon heat exchanger in a heat pump, from freezing. It accomplishes this by accurately monitoring the Freon temperature and taking preemptive action. If a heat exchanger freeze is imminent the FreezeCop will reverse cycle the heat exchanger and if necessary turn off the compressor(s).

Specifications

General:

Accuracy	+/- 0.5 °C (0.9 °F) Max, +/- 0.25°C (0.45°F) Typical
Voltage	24 VAC 50/60 Hz
Current	50 mA Max
Sensors	5 Max



Inputs:

- 1 236-800-X Sensor Red Wire
- 2 236-800-X Sensor Black Wire
- 5 Temperature Select
- 6 Temperature Select
- 8 24 VAC Common
- 9 24 VAC Power

Outputs:

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

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:

Freeze Temperature	34 °F normally, 30 °F if 5 and 6 are connected together
Thaw Temperature	50 °F
Maximum Thaw Time	45 seconds
Reversing Delay	60 seconds after reaching Thaw Temperature
Fault Threshold	3 reverses / 30 minutes (fault on 4 th within 30 minutes)
Fault Delay	12 hours

Operational Description:

Power up:

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

Normal operation:

During normal operation, contact 7 is open. Contacts 3 & 4 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 7 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. Afterwards, contact 7 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 7 is opened to return the reversing valve to its normal state and contact 3 & 4 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 7 is opened to return the reversing valve to its normal state and contact 3 & 4 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 3 & 4 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.

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