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# Power Controller Troubleshooting Guide

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## *Warning: Electrical Shock Hazard*

Field service must be performed by qualified personnel. High voltages and currents are present, when troubleshooting this equipment, that can result in serious injury or death. Service personnel must assume this danger exists at all times, even if not specifically mentioned in the troubleshooting guide, and exercise proper caution and safety procedures.

## **Power Controller Operation**

Master power controllers receive an input signal from a temperature sensing device. This may be a room thermostat, building management system, digital controller, combination sensor and setpoint adjuster or other similar device. Based on this input signal, the power controller will be full on, full off or cycle on and off depending upon the amount of heat required. Slave power controllers receive their input signal from the master power controller and the output should mirror the master's output.

## **Troubleshooting Procedure**

- 1) Visually inspect the power controller, wiring and load for signs of discolored or burnt areas. If so, contact the factory for repair or replacement.
- 2) Identify the power controller and locate the spec sheet. A product code label should be attached to the unit. Contact the factory for power controllers that cannot be matched with catalog numbers or part numbers in the spec sheets. Spec sheets can be downloaded from the website or faxed from the factory.
- 3) Verify that the type of input signal matches the master power controller's circuit board (M-Series, H-Series or J-Series) or input switch setting (A-Series).
- 4) Verify proper wiring of the high voltage line and low voltage input, including polarity. If available, use the equipment's wiring diagram. If not, use the general wiring diagram for the power controller.
- 5) Obtain a multimeter (ohms, VDC and VAC) for troubleshooting the input and an ammeter for troubleshooting the output. VAC meters should not be used to troubleshoot the output, since the power controller's snubber circuits can cause false measurements.
- 6) Locate the LED on the input circuit board. The LED is visible through a hole in the sheetmetal hood of the M&S Series and H&J Series units. A-Series units have an LED mounted near the center of the circuit board. B-Series units manufactured prior to 2002 do not have an LED (refer to the master's LED). After 2002, B-Series units have an LED built into the solid-state relay case.
- 7) Choose one of the following symptoms:

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### **Symptom #1 - Too much heat.**

- 1) If the LED is off and the load is not off, contact the factory for repair or replacement.
- 2) If the LED is on, disconnect the low voltage input signal. If the LED and load do not turn off, contact the factory for repair or replacement.
- 3) If the LED is pulsing:  
Adjust the input signal to the low end of the input range. Verify the LED turns full off.  
Adjust the input signal to the high end of the input range. Verify the LED turns full on.  
If not, contact the factory for calibration, repair or replacement.
- 4) Troubleshoot the input device for proper operation and placement.

### **Symptom #2 - No heat or too little heat.**

- 1) If the LED is on or pulsing and the load is off, check the load and wiring for open circuits.  
If not, contact the factory for repair or replacement.
- 2) If the LED is off, verify the high voltage line to the power controller. In the case of an A-Series master, verify the 24VAC to L1 and L2 on the circuit board. If these voltages are not present, troubleshoot the wiring and safety devices such as fuses, thermal cutouts, airflow switches, etc.
- 3) Adjust the input signal to the high end of the input range. Verify the LED and load turn full on.  
If not, contact the factory for repair or replacement.
- 4) Adjust the input signal to the middle of the range. Verify the LED and load pulse on and off for equal amounts of time. If not, contact the factory for repair or replacement.
- 5) Troubleshoot the input device for proper operation and placement.

### **Symptom #3 - Slave unit not operating properly.**

- 1) Verify that the master power controller or step control is working properly per the appropriate troubleshooting guide and spec sheet. Slave power controllers should mirror the master power controller's high voltage output. Step controls drive slave power controllers in a vernier mode.
- 2) Verify the wiring between the master or step control for proper polarity and DC volts signal.  
If the load does not turn full on when the VDC signal is present, contact the factory for repair or replacement. If the load does not turn full off with no input voltage present, contact the factory for repair or replacement.