

Protocol Controller Troubleshooting

Most of the items listed below are typically included within the equipment's original operating instruction manual.

- Controller's error message(s)
- Controller's operation and functionality
- Controller's calibration
- Controller's specification data

The operating instruction manual contains:

- Equipment's specification data
- Equipment's operating instructions
- Vendor documentation
- Electrical schematic(s)

In addition, we have a supplemental controller manual (E-72) available for the Protocol controller and an Addendum explaining how to calibrate the controller.

Replacement operating instruction or supplemental manual(s) are available through our Parts Department at 1-800-473-7373 Option #2.

A Troubleshooting Guide For PROTOCOL Controller has been included as follows.

PROBLEM/SYMPTOM	PROBABLE CAUSE	SUGGESTED CORRECTIVE ACTION
Erratic temperature control		<p>The controller typically has a proportion band (pb) of 5°F.</p> <ul style="list-style-type: none"> • If the heater is not cycling ON when the process displayed temperature is 3°F or more below the setpoint temperature, check: <ul style="list-style-type: none"> ○ Defective Controller (will not gate SSR) ○ Open Heater Fuses ○ Tripped Hi-limit controller ○ Open Hi-limit relay • If the heater is not cycling OFF when the process displayed temperature is 3°F or more above the setpoint temperature, check: <ul style="list-style-type: none"> ○ Defective Controller (Temperature runaway) ○ Shorted SSR ○ Tuning parameters are incorrect (ex. CZO value too large)
Temperature will not reach the Setpoint	The heater is not	<ul style="list-style-type: none"> • Defective Controller (will not gate SSR) • Open Heater Fuses

	<p>turning ON</p> <p>Defective SSR</p> <p>The Hi-limit relay does not click or pull in when pressing the heater on push-button</p>	<ul style="list-style-type: none"> • Tripped Hi-limit controller • Test SSR gate signal output. • • Check both the incoming and output wiring and voltage. • Check for loose wiring connector. Replace Protocol.
<p>Display reads "HL ERROR" (<i>blinking</i>)</p>	<p>The process temperature has exceeded the Hi-limit temperature setpoint.</p> <p>Controller Calibration</p>	<p>Set the hi-limit to a higher temperature and press the RESET push-button.</p> <p>Check diagnostics mode for actual temperature readout of the Hi-limit (HL-T/C). If the reading is off by greater than 2-3 degrees or displays 500°C (932°F), calibrate the controller.</p>
<p>Display reads "S-TC ERR" (<i>blinking</i>)</p>	<p>The Control thermocouple is open</p>	<ul style="list-style-type: none"> • Check for loose connections on the Control T/C terminals (SEN). • Defective T/C. Remove the T/C and short the terminals with a jumper. The control should display ambient temperature.
<p>Display reads "H-TC ERR" (<i>blinking</i>)</p>	<p>The Hi-limit thermocouple is open</p>	<ul style="list-style-type: none"> • Check for loose connections on the Hi-limit T/C terminals (HIL) • Defective T/C. Remove the T/C and short the terminals with a jumper. The control should display ambient temperature
<p>Temperature runaway - heater will not turn "OFF"</p>	<p>Shorted SSR Relay</p> <p>Defective controller</p>	<p>Disconnect the one of the SSR leads (SSR terminal #3 or #4). If the heater stays "ON", Replace SSR.</p> <p>If heater turns "OFF", controller maybe defective (check diagnostics mode).</p>
<p>The center of the chamber temperature is different from the control temperature displayed</p>	<p>The hot air entering the chamber will be the hotter than center of the chamber.</p>	<p>Change the CZO value in the Tune Mode to shift the controller's displayed readout to the temperature in the center of the chamber.</p>
<p>No digital display with the power LED ON</p>	<p>The control power supply is defective</p>	<p>Replace the Protocol controller.</p>
<p>Test SSR gate signal</p>		<p>Connect a VOM (set on 20vdc/higher scale) across</p>

output		<p>the SSR Relay input terminals (SSR terminal #3 and #4)</p> <ul style="list-style-type: none"> • Adjust the setpoint temperature a minimum of 20°C degrees above the process displayed temperature (output should measure approximately (+)15vdc). • Adjust the setpoint temperature a minimum of 20°C degrees below the process displayed temperature (output should measure 0vdc). • Adjust the setpoint temperature at the process displayed temperature (voltage output should pulse somewhere between 0vdc & 15vdc). • If the controller output voltage does not follow the levels listed above, replace controller.
Keypad does not work or only some of the keys beep	Defective Protocol	<ul style="list-style-type: none"> • Turn the power ON and OFF by cycling the Green Power Push-button. • Press the Reset key • Replace Protocol.
Hi-limit relay does not click or pull in when pressing the heater on push-button	<p>No power or voltage to the Protocol to energize the relay (ex. airflow switch is not closed).</p> <p>The Protocol hi-limit is not energizing relay even if the Heater Relay LED is on or faintly lite.</p>	<ul style="list-style-type: none"> • Check the incoming wiring and voltage. • Check for loose wiring connector • Check both the incoming and output wiring and voltage. • Check for loose wiring connector. • Replace Protocol.
No Events are displayed in Profile	Events not enabled	The CODE*E* is located under Tune Mode. Using the same code as required for the Tune Mode, change the number of relays to the number of events being used (ex. Display indicates zero (0) relays used change the number to one (1) for Event One).
Control or Hi-limit readout displays 500°C or 932°F	Loss of calibration	Perform calibration per Manual or Addendum.

We hope you will find this information useful. THANK YOU for contacting us and allowing us to be a service to you. Please contact us at 1-800-473-7373 if you have any questions.

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