

The Digitronic Controller

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-34) available for the DIGITRONIC 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 DIGITRONIC Controller has been included as follows.

PROBLEM or SYMPTOM	PROBABLE CAUSE	SUGGESTED CORRECTIVE ACTION
Erratic temperature control		<p>The controller has a fixed 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/TRIAC) ○ Open 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 or Triac
Setpoint drifts up & down 61-06-AL & AR-1601 only!	Defective Potentiometer	Disconnect the potentiometer wires from the terminals #P1 & P2, the setpoint should ramp to the maximum and should stabilize.

	Defective Controller	<p>If the setpoint drifts more than one (1) degree, the controller is defective.</p> <p>If the controller is stable, replace potentiometer.</p>
<p>Setpoint drifts up & down</p> <p>61-06-AR-1602</p>	<p>Defective Potentiometer</p> <p>Defective Controller</p>	<p>Disconnect the potentiometer wires from the terminals #P1, P2 & P3.</p> <ul style="list-style-type: none"> • Jumper across terminals P2 & P3, the setpoint should stabilize at 000 (+/- 1°). • Jumper across terminals P2 & P1, the setpoint should ramp to a maximum value and should stabilize. <p>If the setpoint drifts more than one (1) degree in either jumper position, the controller is defective.</p> <p>If the controller is stable, replace potentiometer.</p>
<p>Modify setpoint potentiometer from 2-wire to 3-wire</p>		<p>Remove jumper from potentiometer terminal #3 to #2. Connect a new wire on terminal #3. Connect as follows:</p> <ul style="list-style-type: none"> • Pot terminal #1 = Controller terminal #P3 • Pot terminal #2 = Controller terminal #P2 • Pot terminal #3 = Controller terminal #P1 <p>If the setpoint goes down-scale when adjusted CW, reverse the P1 and P3 leads.</p>
<p>Display reads "EEE", "000" or three dots</p> <p>61-06-AR-1602</p>	<p>Incorrect Potentiometer Connections</p> <p>Broken Thermocouple</p>	<ul style="list-style-type: none"> • Pot terminal #3 (lead P3) is open, display will read "EEE". • Pot terminal #2 (lead P2) is open, display will count from ambient to the maximum temperature and then read "EEE". • Pot terminal #1 (lead P1) is open, display will read "000" • Pot terminals #1 (lead P1) & #3 (lead P3) are interchanged, display will read "000". • Pot terminals #1 (lead P1) & #2 (lead P2) are interchanged, display will read a setpoint (this may not read the correct value). • Thermocouple is open, display will read "EEE" or three dots.
<p>Temperature runaway - heater will not turn "OFF"</p>	<p>Shorted TRIAC</p> <p>Defective controller</p>	<p>Disconnect the "G" lead from the terminal strip. If heater stays "ON", replace TRIAC.</p> <p>If heater turns "OFF", controller maybe defective (test SCR gate, or optical isolator, or chip switch operation).</p>
<p>Controller will not gate TRIAC</p>	<p>Defective optical isolator chip.</p>	<p>Short T2 & G terminals. If Triac fires:</p> <ul style="list-style-type: none"> • Check for missing jumper across terminals (+)

<p>61-06-AL</p>	<p>Defective controller</p> <p>Jumper across (+) (-) terminals missing</p>	<p>and (-).</p> <ul style="list-style-type: none"> • Test SCR gate signal output. • Test optical isolator chip. <p>If Triac doesn't fire, Triac is defective.</p>
<p>Controller will not gate TRIAC</p> <p>61-06-AR-1601 & 1602</p>	<p>Defective chip switch</p> <p>Defective controller</p> <p>Jumper across (+) (-) terminals missing</p>	<p>Short T2 & G terminals. If Triac fires:</p> <ul style="list-style-type: none"> • Check for missing jumper across terminals (+) and (-). • Test SCR gate signal output. • Test Triac chip switch (component K44). <p>If Triac doesn't fire, Triac is defective.</p>
<p>Test SCR gate signal output</p>		<p>Disconnect either the (+) or (-) wire at the terminal strip and connect a VOM (set on 10vdc/higher scale) across the (+) & (-) terminals.</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 +10vdc). • 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 & 10vdc). • If the controller output voltage does not follow the levels listed above, replace controller.
<p>Test optical isolator module.</p> <p>61-06-AL</p>		<p>The optical isolator chip is an obsolete part. If the SCR gate signal output is functioning OK, we recommend converting to SSR drive system. Use SSR kit P/N 203580.</p>
<p>Test chip switch</p> <p>61-06-AR 1601 & 1602</p>		<p>The controller has two chip switches, normally only one is used. If the oven is not equipped w/ a process timer you can swap K37 (alarm) w/ K44 (Triac). BEFORE REPLACING CHIP SWITCH, MAKE SURE THE TRIAC IS NOT SHORTED ACROSS THE GATE LEADS (white and red leads)!</p> <p>To load test chip switch w/o a Triac, connect a 30k-1watt or 15k-2 watt resistor and a VOM across terminals T2 & G.</p> <ul style="list-style-type: none"> • Adjust setpoint 20°C above process displayed temperature (should measure a switch closure/0vac). • Adjust setpoint 20°C below process displayed temperature (should measure open switch/line voltage).

		<ul style="list-style-type: none"> • If chip switch does not function properly, check the SCR gate signal output.
<p>Test proportional control signal for optional control motor M744D, M744J, M7984N</p>		<p>The controller output range is from -10vdc to 10vdc (typically operating within -5vdc to 5vdc). The normal operating range of the control motor is 0vdc (full closed) to 2.5vdc (full open).</p> <ul style="list-style-type: none"> • Connect a high impedance VOM across terminals EP and (-) with VOM set to 10vdc or higher range. • Adjust setpoint equal to process displayed temperature. The output voltage should measure 0vdc with the damper being fully closed. • Gradually increase setpoint above the process displayed temperature. The output voltage should increase. When the voltage signal equals 2.5vdc the damper should be fully open. <p>Some control motors are equipped with a trim potentiometer which allows you to shift the point at which the damper motor starts to drive open. For example if you want the damper to start to open prior to the process displayed temperature reaching the setpoint. You would adjust the trim potentiometer to operate in the negative end of the proportional range (-0.5vdc to 2.0vdc).</p>

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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