

XIII Troubleshooting

A. Before Troubleshooting

The following pages contain trouble shooting tables for use in diagnosing control problems. When using these tables the following should be kept in mind:

- 1) This information is only meant to be used by a professional heating technician as an aid in diagnosing boiler problems.
- 2) Where applicable, follow all precautions outlined in the Section X (Start-up and Checkout) of the boiler installation manual.
- 3) In general, these tables assume that there are no loose or miswired electrical connections. Before using these tables inspect all electrical connections on the boiler to make sure that they are tight. Also, check the wiring on the boiler against the wiring diagram in Figures 9.2 and 9.3. Ensure that incoming 120 VAC power polarity is correct and that the boiler is properly grounded. Further, ensure that the control power supply is 24 VAC (minimum 18 VAC to maximum 30 VAC).
- 4) All controls on the boiler are tested at least once in the manufacturing process and a defective control or component is generally the least likely cause. Before replacing a component, try to rule out all other possible causes.
- 5) When checking voltage across at wiring connectors be careful not to insert the meter probes into the metal sockets. Doing so may damage the socket, resulting in a loose connection when the harness is reconnected.

B. If Display is Blank

- 1) Check for 24 VAC on transformer secondary connections (screws to which blue and yellow leads are connected). If voltage across these screws is between 18 and 30 VAC, possible causes include:
 - Loose connection at either plug or transformer end of transformer harness (blue/yellow harness).
 - Defective transformer harness
 - Defective boiler control
- 2) If voltage is less than 18VAC at transfer secondary, possible causes include:
 - Service switch off
 - Trip 120VAC breaker
 - Miswired or loose connection in 120VAC boiler circuit.
 - Loose connection inside J-box between transformer primary and 120VAC line.
 - Defective transformer (possibly caused by short circuit in 24VAC wiring or additional loads connected to the transformer in the field).

C. If Control Shows *Err* Code

Use Table 13.0 to help identify and correct the cause of the problem.

D. If Control Shows *5EA* Code, but Other Problem Present

If no *Err* Code is observed (even after repeatedly pressing **I** to cycle through Operation Mode), use Table 13.1 to help identify and correct the cause of the problem.

TABLE 13.0: ERROR CODES

Error Code	Meaning	Possible Cause
2	Pressure Switch failed to open	<ul style="list-style-type: none"> Jumped air pressure switch Condensate in air pressure switch or switch tubing Defective air pressure switch
4	Low Flame Signal	<ul style="list-style-type: none"> Low gas pressure at gas valve inlet Partially plugged pilot tubing or pilot orifice Loose connection in ignition cable or ground wiring Dirty pilot electrode/ground strap Pilot electrode porcelain cracked Damaged pilot hood/ assembly Defective control
6	Pilot Flame detected when no flame should be present	<ul style="list-style-type: none"> Defective gas valve High gas pressure Defective control
18	Internal electronics failure	<ul style="list-style-type: none"> Possible internal problem with boiler control. Cycle power to the boiler and replace control if problem persists.
23	Flame sensed during 30s pre-purge (before pilot valve opened)	<ul style="list-style-type: none"> Defective gas valve High gas pressure Defective control
29	Air pressure switch failed to close	<ul style="list-style-type: none"> Vent system blockage Vent system not constructed in accordance with installation manual (excessive length, undersized pipe, wrong terminal, etc) Condensate or leakage in air pressure switch tubing Winds in excess of 40mph
32	Boiler water temperature sensor failure	<ul style="list-style-type: none"> Loose sensor connection at control Defective Sensor Defective control
35	Duplicate Zone	Error code reserved for future use
57	Grounded pilot electrode	<ul style="list-style-type: none"> Condensate or foreign material is shorting pilot electrode to ground. Ignition cable insulation is damaged and touching ground. Pilot is damaged
58	AC Power Frequency Error	<ul style="list-style-type: none"> 120VAC power supply frequency is incorrect (Should be 60Hz) 120VAC power supply is dirty (consult electrician and/or Utility) Boiler water temperature sensor common (center wire) is damaged and shorted to ground
59	Line voltage error (Supply voltage too high or low)	<ul style="list-style-type: none"> Power supply voltage is incorrect (should be 120VAC nominal) Defective or incorrect 24VAC transformer Loose 120VAC connection or 24VAC connection between transformer and control
60	Thermostat input higher than threshold	<ul style="list-style-type: none"> External voltage is applied to thermostat connections (most common cause is external transformer in old thermostat wiring).
61	Line Voltage Unstable	<ul style="list-style-type: none"> 120VAC power supply is dirty (consult electrician and/or Utility) Loose 120VAC connection or 24VAC connection between transformer and control Large electrical loads elsewhere on the installation are switching on and off, causing incoming voltage to swing excessively at boiler.
63	Maximum recycles exceeded	<ul style="list-style-type: none"> See Error Code 4 above (boiler lost proof of pilot 6 times in a row)
64	Internal failure	<ul style="list-style-type: none"> Improper pilot operation If problem persists, replace control
89	EnviraCom communication lost	Should not be observed on BWF or CWD Series Boilers.

TABLE 13.1: FAULTS WITHOUT ERROR CODE PRESENT

Displayed Codes	Problem	Possible Cause
5tA 1 tt OFF dh OFF	Burners and Circulator Off	<ul style="list-style-type: none"> • Thermostat/s not calling for heat • Loose connection in thermostat, zone valve end switch, or zone panel wiring. • Thermostat, zone valve, or zone panel miswired • Defective thermostat, zone valve, or zone panel
5tA 1 tt On	Burners Off Circulator On Boiler Warm	<ul style="list-style-type: none"> • Boiler off on high limit (normal operation) • Boiler off on thermal purge (normal operation - See Table 10b.6)
tt On	Heating Circulator Off	<ul style="list-style-type: none"> • Heating Circulator is being forced off on DHW priority (normal operation if Pt=ON - see Table 10b.7). • See causes for “DHW Circulator off“ below
dh On	DHW Circulator Off	<ul style="list-style-type: none"> • Loose connection in circulator wiring • Defective circulator • Circulator is running, but system problem is preventing circulation
5tA 15	Burners Off and Fan is Off.	<ul style="list-style-type: none"> • Limit or LWCO connected to Option Plug is open. • No option is connected at the Option Plug and jumper plug (PN 9601830) is missing. • Flame roll-out switch (FRS) open due to blocked heat exchanger. Correct problem and replace FRS with exact replacement (see parts list)
5tA 6	No spark at pilot	<ul style="list-style-type: none"> • Loose connection in ignition cable or pilot ground • Damaged electrode porcelain or ignition wire insulation (replace pilot) • Pilot electrode or Ground strap damaged (replace pilot) • If you cannot hear spark at all, replace control
5tA 6	Spark, but no pilot flame	<ul style="list-style-type: none"> • Low inlet gas pressure • Plugged, kinked, or leaking pilot tubing • Plugged pilot orifice • Gas line not purged of air • Defective pilot assembly • Defective gas valve (before replacing, confirm that there is 24VAC between PV and MV/PV. If there is not, control harness is loose or the control itself is defective). • Loose connection in harness between control and gas valve.
5tA 6	Pilot flame present, but spark does not shut off	<ul style="list-style-type: none"> • Low inlet gas pressure • Partially plugged, kinked, or leaking pilot tubing • Partially plugged pilot orifice • Loose connection in ignition cable or pilot ground • Damaged electrode porcelain or ignition wire insulation (replace pilot) • Pilot electrode or Ground strap damaged (replace pilot) • Defective Control
5tA 8	Pilot flame present, spark off, but Main Burner does not light at all	<ul style="list-style-type: none"> • Loose connection in harness between control and gas valve • Defective gas valve (before replacing, confirm that there is 24VAC between MV and MV/PV. If there is not either there is a loose connection in the control harness or the control itself is defective).
5tA 10	Main burner lights, but shuts off immediately	<ul style="list-style-type: none"> • Low inlet gas pressure • Partially plugged, kinked, or leaking pilot tubing • Partially plugged pilot orifice
5tA 10 or 5tA 13	No spark or pilot	<ul style="list-style-type: none"> • Pilot was either never established or proof of pilot was lost after it was lit. Cycle power to the boiler and look for symptoms above.