



Welcome to the Campo “**Field Assist Troubleshooting Guides**”.

These guides were developed to assist the working technicians in the field. We’ve supplied issues and solutions to the most common problems encountered in the field. If you need assistance while troubleshooting on the job, they are easy to store in your smart phone, tablet or computer.

Getting Started is easy! Just click on ‘[Page #](#)’ for the problem you are encountering

Burner control is locked-out on reset  Burner control is NOT locked-out on reset

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➤ [Contact Us...Page 39](#)

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Burner control is locked-out on reset...

“Field Assist Troubleshooting Guide”



Choose the issue you are encountering and click on the Page #

- Resetting the Burner Control From Lock-out... [Page 3](#)
- You Reset The Control, The Burner Starts , But Does Not Fire... [Page 4](#)
- The Burner motor Did Not Start and Locks-out on Reset... [Page 18](#)
- The Flame Present' Light On The Control Is Illuminated Before The Call For Heat... [Page 21](#)
- If A Flame Is Present During The Pre-Purge... [Page 23](#)

Resetting the burner control from Lock-out...

"Field Assist Troubleshooting Guide"



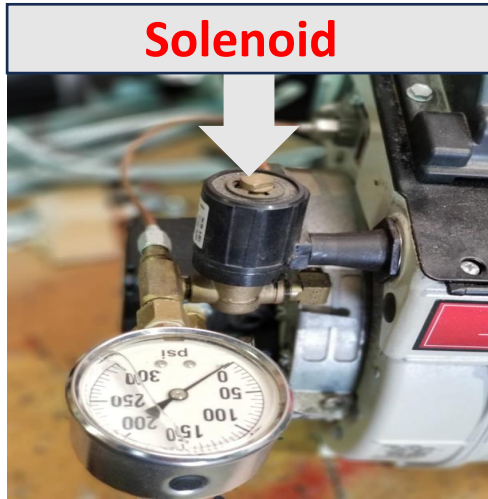
If the reset button light is flashing **red** every half second, this indicates the control is **locked out on safety**. To reset, press and release button. If the reset button light is solid **red**, this indicates the control is in **hard lock-out**. Reset the control by pressing the button for 15 seconds or until the pump prime light is illuminated.

➤ **Warning!** Continuous resetting of the burner control may cause an accumulation of fuel oil in the heatexchanger, and this could lead to an Implosion of the heatexchanger or personal harm.

Continue...[Page 4](#)

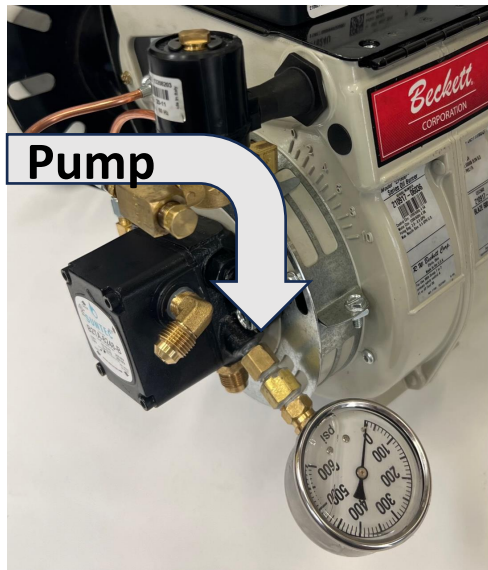
You reset the control, The burner starts , but no flame...

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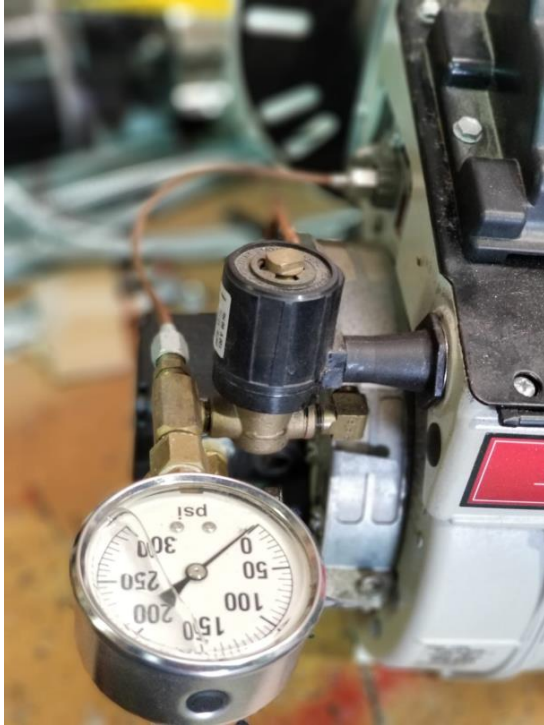
Note: the location of the gauge on the burner and choose page #

- If your gauge is located on the outlet side of the **solenoid** valve... [Page 5](#)
- If your gauge is located on the fuel **pump**... [Page 15](#)



You reset the control, The burner starts , but no flame...

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Note: the gauge is located on the outlet side of the solenoid valve

- Reset the control and check the pressure gauge after the **15** second pre-purge.
- ✓ If there is **160 PSI. pressure** after the purge...[Page 6](#)
- ✓ If there is **no pressure** after the purge...[Page 9](#)

You reset the control, The burner starts , but no flame...



✓ Defective igniter



✓ Defective electrodes



✓ Water in fuel oil



✓ Defective nozzle



➤ Check the components...[Pages 7](#)

You reset the control, The burner starts , but no flame...

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✓ If there is no spark OR the spark is weak, the igniter is defective.

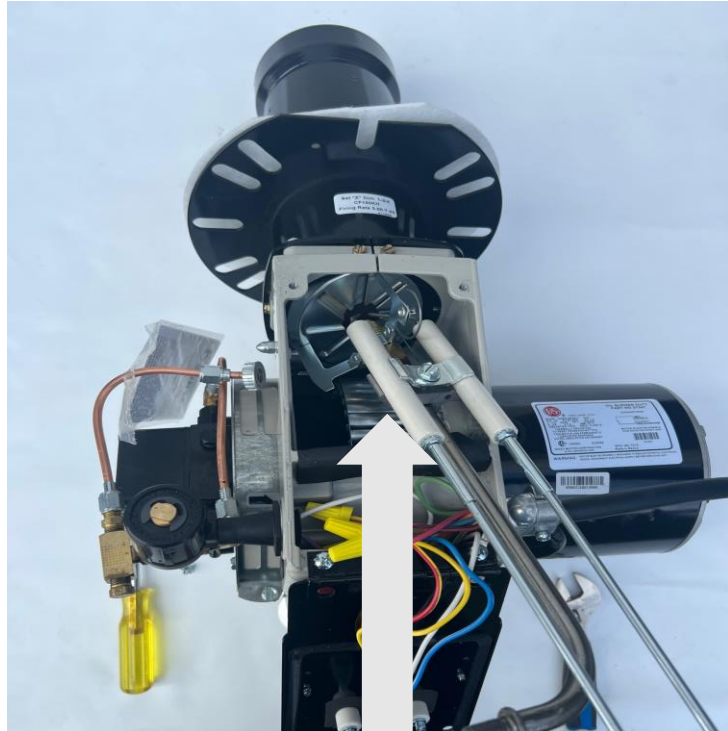
➤ Check the igniter for spark

- Shut off the power supply to the heater.
- Open the igniter from the burner housing
- Remove the cad cell from the igniter base plate
- Restore power and start the burner.
- Check for spark across igniter terminals

➤ **NOTE ensure to use a well insulated screwdriver to test for spark.**

➤ If the igniter tests good... [Page 8](#)

You reset the control, The burner starts , but no flame...



Nozzle line assembly

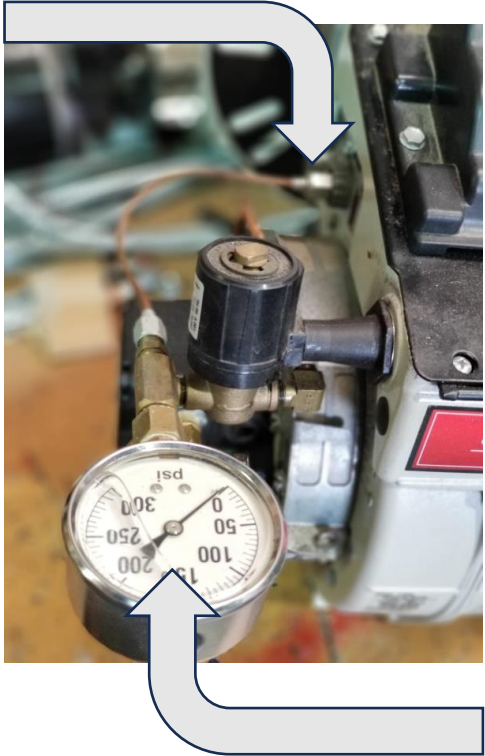
- Remove the Nozzle Line Assembly...
 - Inspect electrode porcelains for cracks
 - Check for water in nozzle assembly tube.
- ✓ If electrodes are good and there is no water in the oil tube, the nozzle needs to be replaced.



Problem Solved

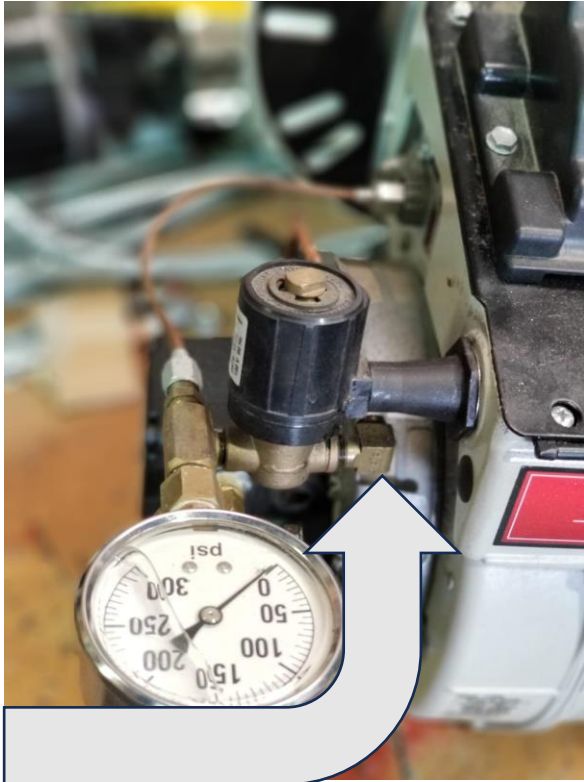
You reset the control, The burner starts , but no flame...

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- If there is **no** pressure after the purge...
 - Check the solenoid valve to see if it is opening by removing the oil pressure line from the nozzle line assembly.
 - Place the line pointing into a container and reset the burner.
- ✓ If oil comes out under pressure... [Page 6](#)
- ✓ If no oil comes out... [Page 11](#)
- ✓ Defective pump
- ✓ Broken pump coupling
- ✓ Clogged filters
- ✓ Clogged oil lines
- ✓ No fuel in tank

You reset the control the burner starts , but no flame...



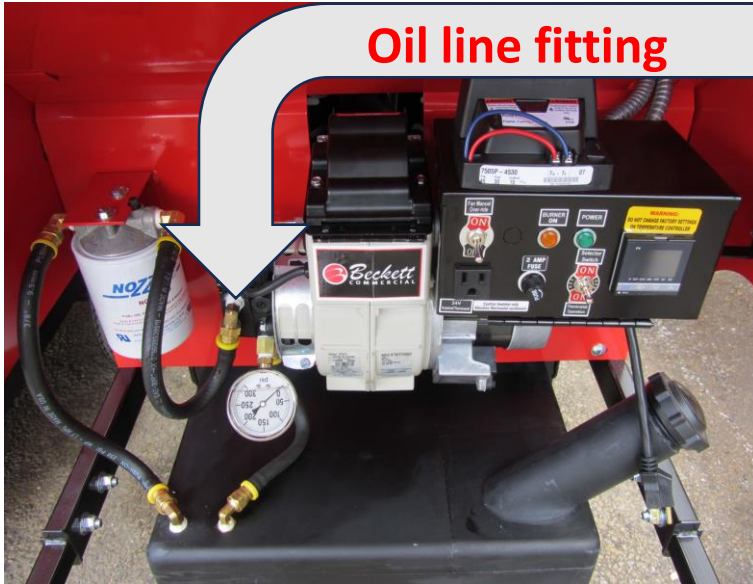
- Remove the oil pressure line that runs from the pump to the solenoid valve *at the valve end only*.
- Direct the line end into a container.
- Start burner to see if oil comes out with pressure.
- ✓ If oil comes out with pressure, the valve is defective.
- Before replacing the valve ensure it has **120 volts** after the purge from control.
- ✓ If **120 volts** is **not** present after the purge, defective control
- If no oil comes out...with the line still off, reset the control 2 or 3 times to ensure the pump has not lost prime.
- If still no oil comes out of the line...[Page 11](#)

You reset the control the burner starts ,
but no flame...

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Oil line fitting



- Remove oil line fitting to the pump and check if there **is fuel** in the pump and oil lines and filter.
- If there is fuel in the filter and lines,
- Defective coupling or defective fuel pump.



➤ Checking the coupling and fuel pump...[Page 12](#)

➤ If there is **NO** fuel oil in the pump and oil line ...[Page 14](#)

Checking the fuel pump and coupling...



Remove the pump and coupling. Inspect the coupling to ensure the coupling is fixed secure to both the motor shaft and the pump shaft.



- **NOTE:** If the coupling is good, then the pump is defective. Before replacing the fuel pump... [Page 13](#)

Problem Solved

When Replacing Fuel Oil Pump...!!!!

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Special Note!!

You MUST ensure there is a bypass plug installed in the pump when replacing.



Plug Location

Bypass plug port indicated on pump label

When replacing the fuel pump, install the bypass plug into the new pump.

If there is no fuel oil in the pump and oil lines, check for oil in the tank...

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- Check for fuel oil in tank



- Check for blocked filter or lines

Problem Solved

You reset the control the burner starts , but no flame...

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Note: the location of the gauge on the burner.

- ✓ Reset the burner control and check the pressure gauge.

If there **is** 160 PSI... [Page 16](#)

- ✓ If there is **no** pressure... [Page 11](#)

You reset the control the burner starts , but no flame...



If the pressure gauge reads **160 PSI**...

✓ Defective solenoid valve



✓ Defective igniter



✓ Defective electrodes



✓ Water in fuel oil



✓ Defective nozzle



➤ Test the components... [Pages 17](#)

You reset the control the burner starts , but no flame...

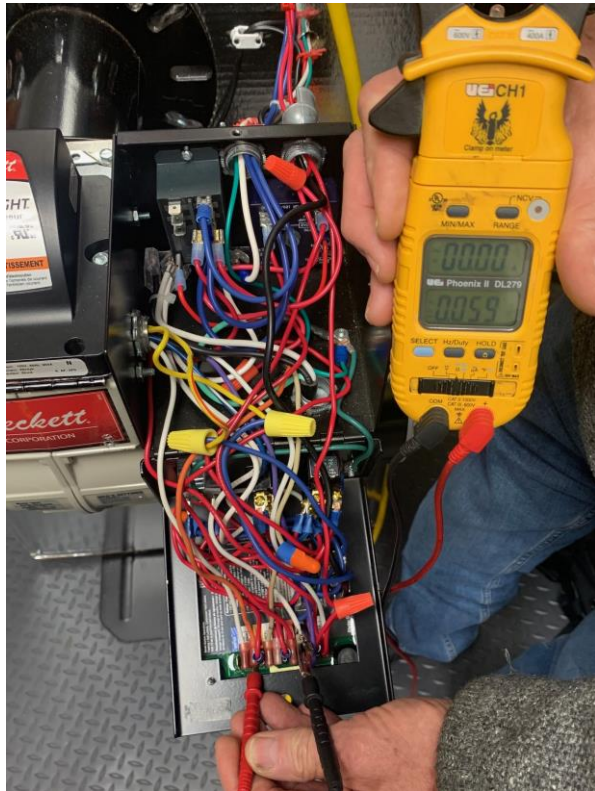
"Field Assist Troubleshooting Guide"



- Check the solenoid valve to see if it is opening by removing the oil pressure line from the nozzle line assembly.
- Place the line pointing into a container and reset the burner.
- ✓ If oil does **NOT** flow with pressure, the solenoid is defective.
- Before replacing the valve ensure there is **120 volts** to the valve after the purge from control.
- ✓ If **120 volts** is **not** present after the purge to the valve, defective control.
- If oil is flowing out under pressure... [Page 6](#)

The burner motor did not start and locks-out on reset...

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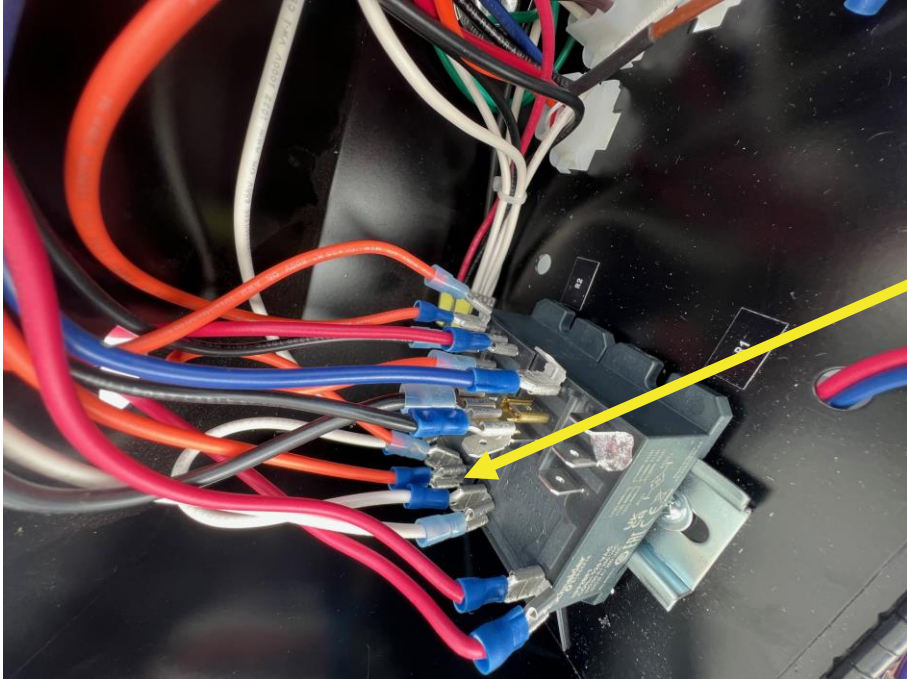
- ✓ Defective burner motor
- ✓ Defective Burner Control
- ✓ Defective Motor Relay



➤ Test the components... [Page 19](#)

Checking burner motor, motor relay and burner control...

"Field Assist Troubleshooting Guide"



Reset burner control, then check for **120 volts** on burner motor relay R2 coil.

- ✓ If **120 volts** is **NOT** present, defective burner control
- ✓ If **120 volts** **is** present, defective burner motor relay OR burner motor



➤ Checking burner motor and motor relay... [Page 20](#)

Checking burner motor and motor relay...



Reset the burner control and check for **120 volts** on burner motor relay (R2) on the motor terminal. (orange wire)

- ✓ If **120 volts** is present, defective burner motor
- ✓ If **120 volts** is **NOT** present, defective burner motor relay

Problem Solved

If the 'Flame Present' light on the control is illuminated *BEFORE* the call for heat...

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Flame Present Light



- ✓ There is a short in the cad cell
- OR
- ✓ There is a short in the cad cell harness



➤ Testing the cad cell or harness... [Page 22](#)



Remove the cad cell from the harness.

- ✓ If the green light remains **ON**, the harness is defective.
- ✓ IF the light goes **out**, the cad cell is defective.



Problem Solved

If there is a flame during the pre-purge...

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If there **is** a flame during the pre-purge...

- ✓ Defective solenoid valve



Problem Solved

If the Burner Control is NOT locked out on Reset and will not start...



- ✓ Ensure there is **120 volts** to the electrical panel.
- ✓ Ensure the 2- amp fuse is not burnt.
- If the Burner Control is NOT locked out on Reset and will not start...[page 25](#)
- If the Circulating Fan Fails To start...[page 32](#)
- If the fan is starting intermittently, erratically or inconsistently... [page 33](#)
- Circulating Fan Does Not Shut Off...[page 34](#)

If the burner control is NOT locked out on reset and will not start...



- Check for **120 volts** between Limit Terminal and Common (L2) on the burner control.



Limit Terminal

Common (L2)

- If **120 volts** is present... [page 26](#)
- If **120 volts** is **NOT** present... [pages 28](#)

If 120 volts is PRESENT on burner control...

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✓ Defective Bypass Switch



✓ Defective Burner Control



➤ Test the components... [PAGE 27](#)

Testing the bypass switch and burner control...

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To check the bypass switch, place a jumper wire on terminals T-T

- ✓ If the burner starts, the bypass switch is defective
- ✓ If the burner does not start, the burner control is defective



Problem Solved

If 120 volts is NOT present on burner control between L1 and (L2)...

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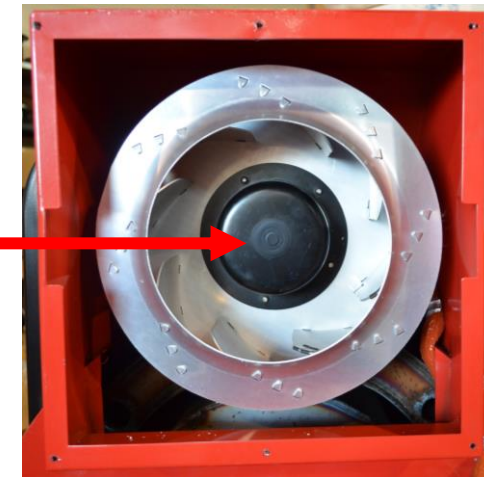
Thermocouple

Thermal Limit Disc

Temperature Controller

- ✓ Defective Thermal Limit Disc **150°F**
- ✓ Defective Thermocouple
- ✓ Defective Temperature Controller
- ✓ Defective Fan Motor Thermostat Switch

Thermostat Switch Sealed Inside Fan Motor
Not field serviceable



➤ Test the temperature controller... [Page 29](#)

Testing the temperature controller...

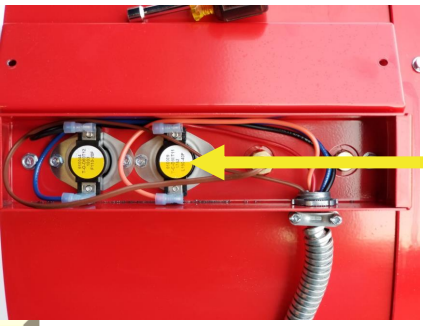


➤ **NOTE:** If the display on the temperature controller is reading 000 (or other false reading), it is defective.



Check for **120 volts** on the orange wire terminal #6 on the temperature controller.

✓ If **120 volts** is **NOT** present, the temperature controller is defective.



✓ If **120 volts** is present, the 150F thermal limit disc is defective or the heat thermostat in the fan motor is defective... [Page 30](#)

Test the high limit 150°F disc and motor thermostat



- Test for **120 volts** on each terminal of the disc to ground.
- ✓ If **120 volts** is **NOT** present on both terminals, the fan motor thermostat switch is defective.
- ✓ If **120 volts** is present on only 1 terminal of the disc, the disc is defective.
- **Note:** newer models have a manual reset limit disc ensure the reset is not tripper off.
- **Note:** the fan motor thermostat is located inside the motor and is **not** field serviceable.
- Test the motor thermostat... [Page 31](#)



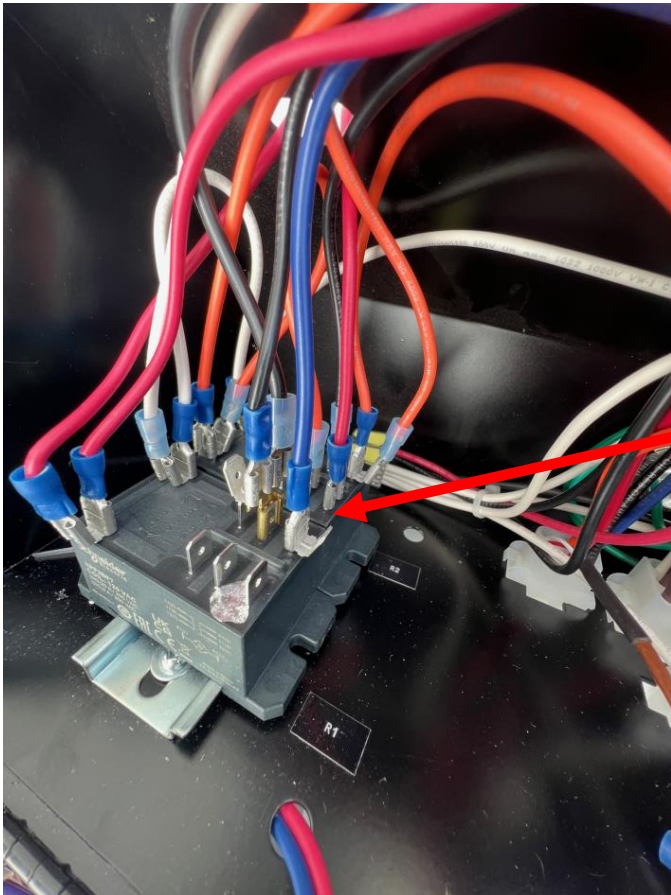
- **NOTE:** On late model, Blaze construction heaters, the circulating fan motors are equipped with a thermal heat thermostat that is not serviceable.
- The motor thermostat is wired in series with the **120 - volt** limit and temperature controller circuit.

Check to ensure the thermal heat thermostat contact is closed by testing for continuity, using the 2 white or 2 grey wires leading to the circulating fan motor.

- If the contact is closed, the thermal heat switch is good.
- ✓ If the contact is open, the 'Circulating Fan Motor' is defective and needs to be replaced.

Problem Solved

If the circulating fan fails to start...



With the Fan Override switch in the ON position, check for **120 volts** on the fan relay (R1) on the fan motor terminal. (Blue wire)

- ✓ If there is **120 volts** is present, the Motor is defective.
- ✓ If **120 volts** is **NOT** present, the relay is defective



Problem Solved

If the fan is starting intermittently, erratically or inconsistently...



The EB600D is equipped with redundant controls to ensure positive starts for the circulating blower fan.

- ✓ If the temperature controller display reaches 90°F and the fan does not start, the controller is defective.
- ✓ If the fan does not start within 90 seconds of the burner starting, the fan timer is defective.
- ✓ If the temperature at the fan 110°F Disc is over 110°F and the fan does not start, the 110°F fan disc is defective.



Problem Solved

- **Note:** It is very unlikely that all 3 components would be defective at the same time. If the circulating fan fails to start, likely it would be the circulating fan motor or the (R1) relay

Circulating fan does not shut off...



Fan Override Switch

➤ First, ensure that the ambient temperature at the 110°F fan disc is less than 80°F.

✓ The Fan Override switch is in the ON position. (Turn it to the OFF position)

✓ Defective 110°F fan disc



✓ Defective fan relay



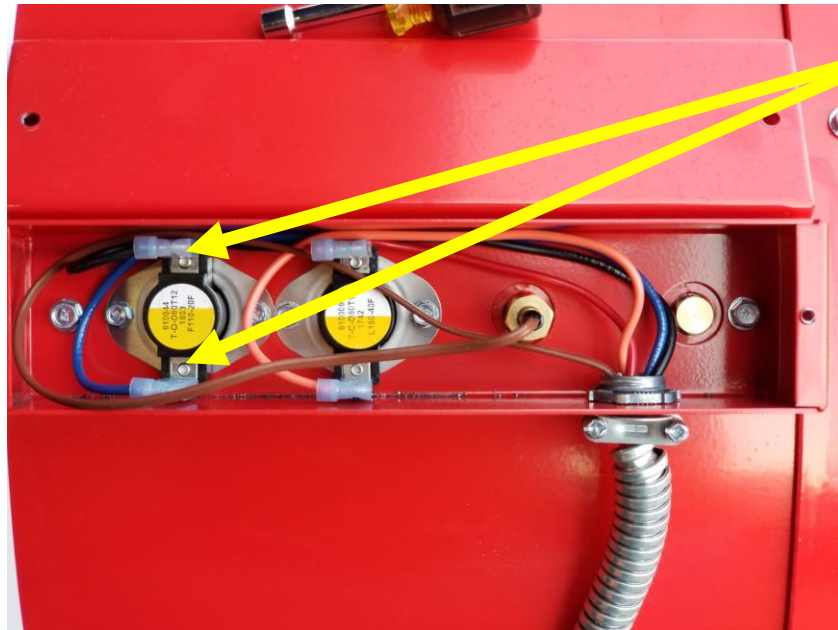
✓ Defective temperature controller



➤ Testing the components... [Page 35](#)

Circulating fan does not shut off

Checking – 110°F fan disc...



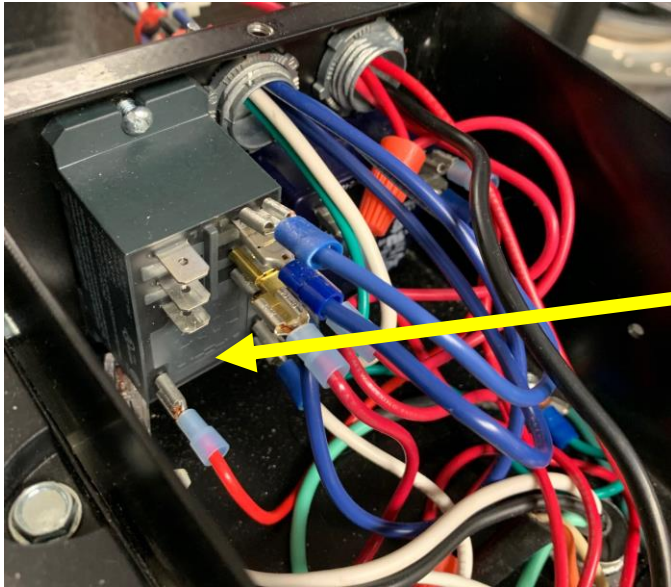
Check for **120 volts** between ground and each terminal.

Note: If **120 volts** is present on BOTH terminals, the disc is defective.

If **120 volts** is present on ONE terminal only, the disc is GOOD Continue...[Page 36](#)

Circulating fan does not shut off

Checking - circulating fan relay...



- Check for **120 volts** on the relay coil terminals.

✓ If **120 volts** is **not** present, defective relay

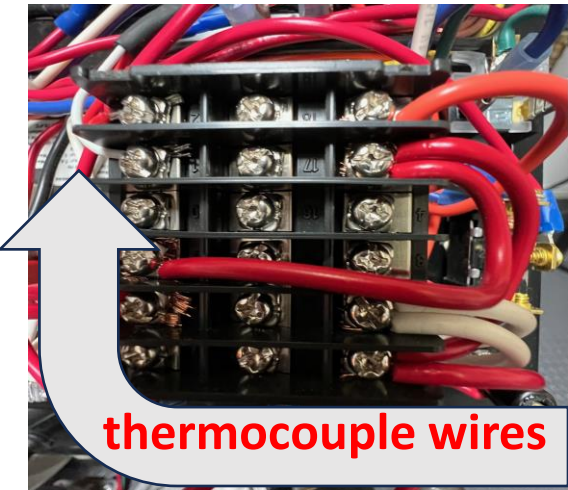
✓ If **120 volts** is present on the relay coil... [Page 37](#)





If the circulating fan 110°F disc is good AND there is **120 volts** on the circulating fan relay (R1) coil.

- ✓ Defective temperature controller
- ✓ Defective Thermocouple
- Testing the components... [Page 38](#)



Testing the thermocouple...

- Remove the (small) red and white thermocouple wires from the back of the temperature controller
 - Install a jumper wire between the two terminals
- ✓ If the fan **stops** running, the thermocouple is defective
- ✓ If the fan **continues** to run, the temperature controller is defective
- **Caution...** do not remove the wrong red and white wires

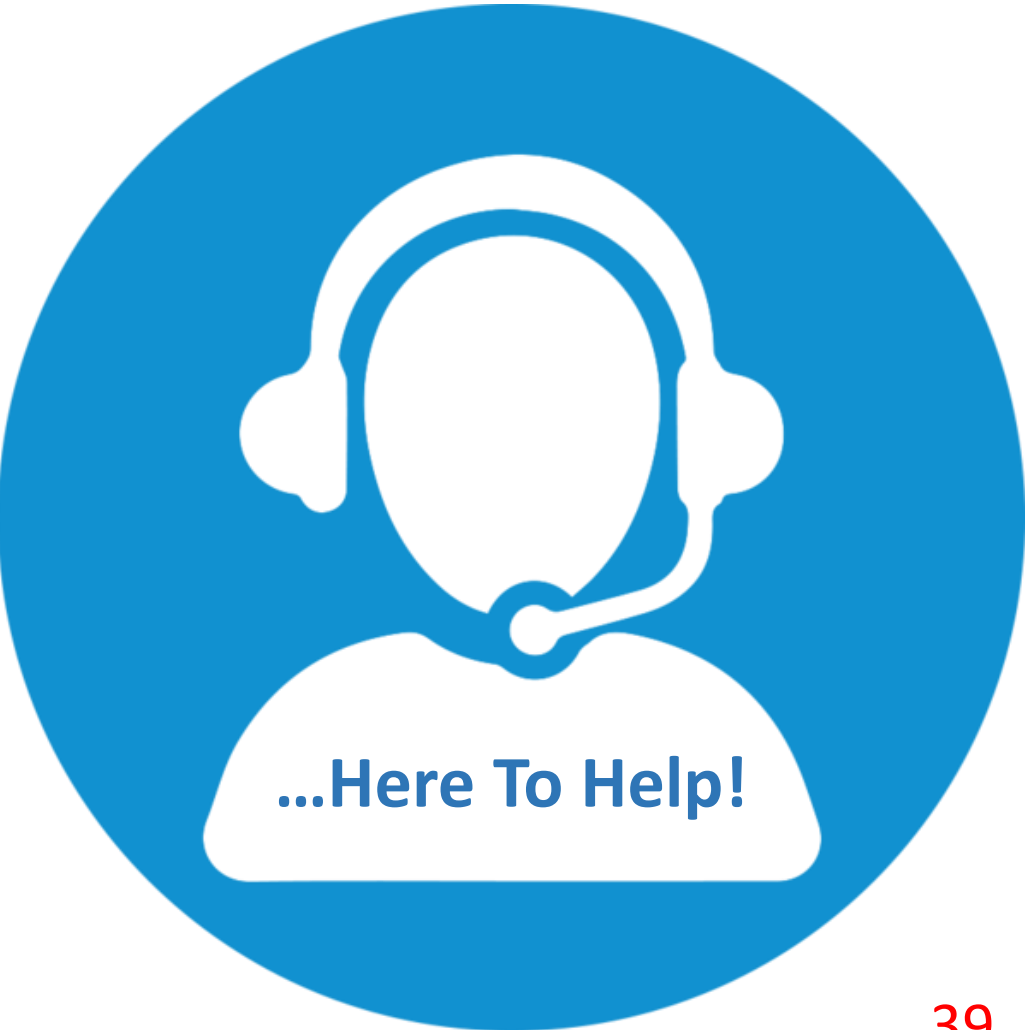
Problem Solved

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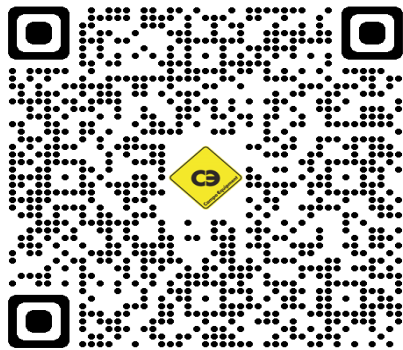
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Technical information... [Page 41](#)



Choose the information you require and click on the Page

- Start-up procedure...[Page 42](#)
- Adjusting air settings and oil pressure...[Page 49](#)
- Electrical hook up...[Page 51](#)
- Adjusting the burner combustion...[Page 45](#)
- Venting the heater...[Page 47](#)
- Electrode Adjustments...[Page 52](#)
- Annual Maintenance...[Page 53](#)



What you need to commission the heater!



Combustion Analyzer



Voltmeter



Smoke Tester

➤ Continue to start-up...[Page 44](#)



- **Make sure** all piping and fittings are tight and free from oil leaks. .
- **WARNING:** If the heater is going to be fed with power from a generator, always have the heater unplugged until the generator is running stable. Ensure the generator is sized to accommodate the heater voltage and amperage demand.
- Start-up continued...[Page 44](#)

Start-up procedure Fuel Oil continued...

"Field Assist Troubleshooting Guide"



- Make sure the venting is properly installed.
 - Make sure the proper voltage is supplied to the heater.
 - Make sure the proper size wiring is used to the heater.
 - With the switch for the burner in the off position, plug in the heater, turn the fan manual override switch to ON position and ensure voltage remains steady. Return fan manual override switch to OFF position.
- Place the toggle switch in bypass position to start the burner. Once the burner is running make sure that the oil pressure is adjusted to the manufacture's recommendations

➤ Start-up continued...[Page 45](#)



Clean & Reliable Combustion

Getting the most reliable performance out of an oil burner comes down to ensuring that it is properly set up. This can require some fine tuning, but the following steps should help you achieve the reliable combustion you are looking for.

- **No installation** is complete until the combustion of the heater has been performed.

Using a combustion analyzer... [Page 46](#)





- While the flue-stack is still cold pre-drill $\frac{1}{4}$ " hole in the flue-stack 18" above the flue collar.

Set the air settings to manufacture's recommendations. Once you've done that, start the burner and let it operate for 10 minutes. Draw a smoke sample from the flue pipe. Adjust the air settings to achieve between trace and number 1 smoke.. Next, draw a carbon dioxide (CO₂) sample from the flue pipe. Adjust the air settings to achieve between 11.5% & 12%. Check the CO (Carbon Monoxide) level, it should not be higher than 50 PPM.



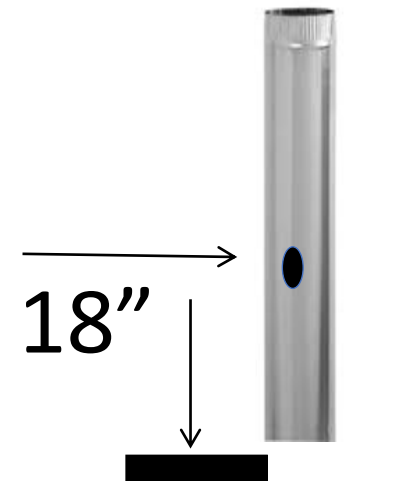
Air Adjustments



Smoke Tester



Combustion Analyzer



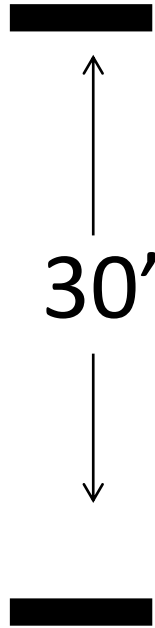
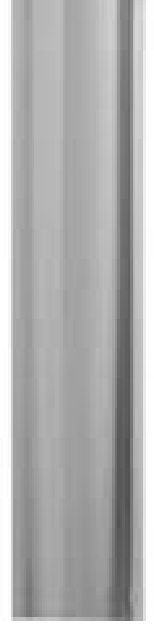
Test Hole

[Back to technical information...Page 41](#)

Venting outside a building...



WARNING: The appropriate measures must be taken to ensure there will be no positive pressures on the exhaust flue of the heater.



Make sure to install a stack minimum 30" on the flue.
Make sure to install a rain cap on the flue pipe.

30" Make sure that flue gases are not being circulated into by the cooling fan and pushed into the space you are heating.

➤ Venting from inside a building... [Page 48](#)

Best practices for venting when heater is located inside a building

- Avoid using as many 90-degree elbows as possible
- Venting runs should be as short as possible
- Vertical rise minimum 3 feet, 5 feet is better outside the building.
- Always install a rain cap.

- Never decrease diameter of flue piping.
- Horizontal runs $\frac{1}{4}$ " per foot rise.
- Make sure all piping is properly secured.
- Make sure there is no negative pressure inside the building where the heater is placed.

➤ **Note:** where the vent pipe passes through a combustible wall a fire proof thimble must be used.

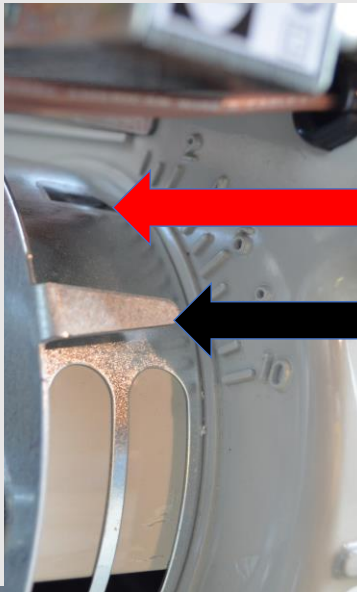
[Back to technical information...Page 41](#)



Combustion and adjusting the air settings...



➤ **EB600D** Air setting **3/0**, Oil pressure



Band

Shutter

- Recommended air settings are indicated in manufactures instructions and ...[Page 53](#)
- Example: **3/0** the first number being the shutter and the **second** number being the air band.
- **Note:** recommend air settings are approximate and will change with altitude and fuel oil temperature.
- **The Use of a combustion analyzer** will ensure clean and reliable burning and maximum efficiency.

➤ Back to technical information...[Page 41](#)

➤ **EB600D** oil pressure **175 PSI.**

➤ Head setting **# 1**

For Future use...





- **Only** extension cords that are CSA / UL approved should be used. Extension cords should be no less than **# 12** gauge up to **50** feet. Over and up to **100** feet, no less than **#10** gauge should be used. Do not plug multiple extensions together.



Make sure extension cords are placed so as not to obstruct walkways and protected against traffic.

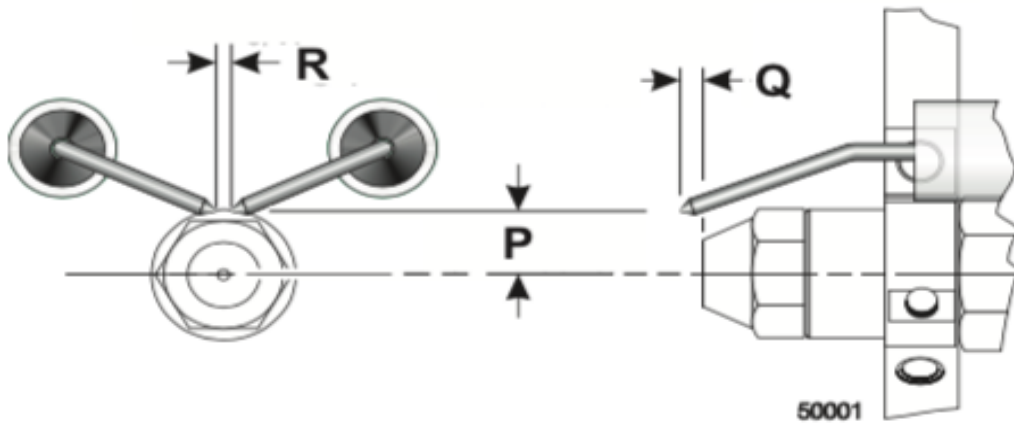
- **WARNING:** If the heater is going to be fed with power from a generator, always have the heater unplugged until the generator is running stable. Ensure the generator is sized to accommodate the heater voltage demand.

[Back to technical information...Page 41](#)





➤ EB 600D... (P = 3/16") (Q = 1/4") (R = 3/16" gap)



Legend (Figure 5)

- P Nozzle centerline to electrode tip = 3/16"
- Q Nozzle face to electrode tip = 1/4"
- R Electrode spacing = 3/16" gap

- EB600D Air setting 3/0,
- Oil pressure is 175 PSI. Head setting # 1

➤ Back to technical information... [Page 41](#)



SERIAL NUMBER:	Test DATE:
Model	/ /
Tested By:	
Oil Burner	
Preform and Record combustion results:	
CO2 PERCENTAGE (carbon dioxide)	
CO parts per million (ppm carbon monoxide)	
Remove nozzle line assembly adjust electrodes and clean	
Replace nozzle (if necessary)	
Remove cad cell and clean glass eye	
Test igniter	
Start burner and check control lock-out	
Check and adjust oil pressure	
Clean blower wheel (remove dust)	
➤ Continue maintenance... Page 54	



Heater controls	
<p>Test temperature controller Fan on at 90F / Fan off at 80F Burner off 10F above set high limit / Burner back on at high set temp</p>	
Check circulating fan,(Fan timer, Fan 110F disk)	
Check wiring terminals inside control panel	
Clean heater casing	
Check for water in fuel oil tank. Remove if needed (important)	
<p>➤ Return to information menu... Page 41</p>	