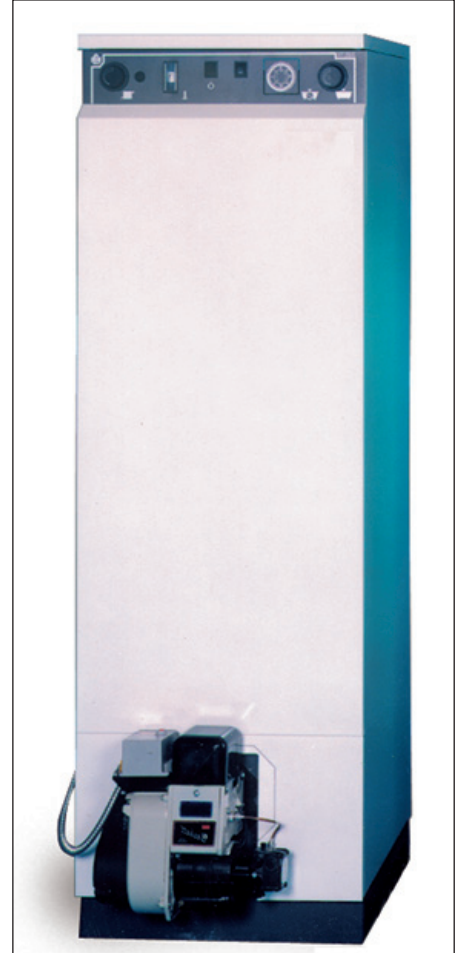




The
delta
elite

F-25/30/35/40 & 45



**SERVICE TECHNICIAN'S
TROUBLE SHOOTING GUIDE**

WARNING

Indicates a potentially hazardous situation, if ignored, can result in death, serious injury or substantial property damage.

NOTICE

Indicates special instructions on installation, operation or maintenance, which are important to the equipment/product, but not related to personal injury hazards.

WARNING

This guide is to be used in conjunction with the ELITE Installation and Maintenance manual. Procedures and servicing listed in this manual must be performed by a qualified service technician, installer, service agency or gas supplier. Any procedures or service performed by an unqualified individual or service agency can result in severe personal injury, death or substantial property damage.

Introduction

This guide is to be used in conjunction with the Triangle Tube ELITE Combination Water Heater Installation and Maintenance Guide.

Good Troubleshooting Practices

Before leaving for the job site:

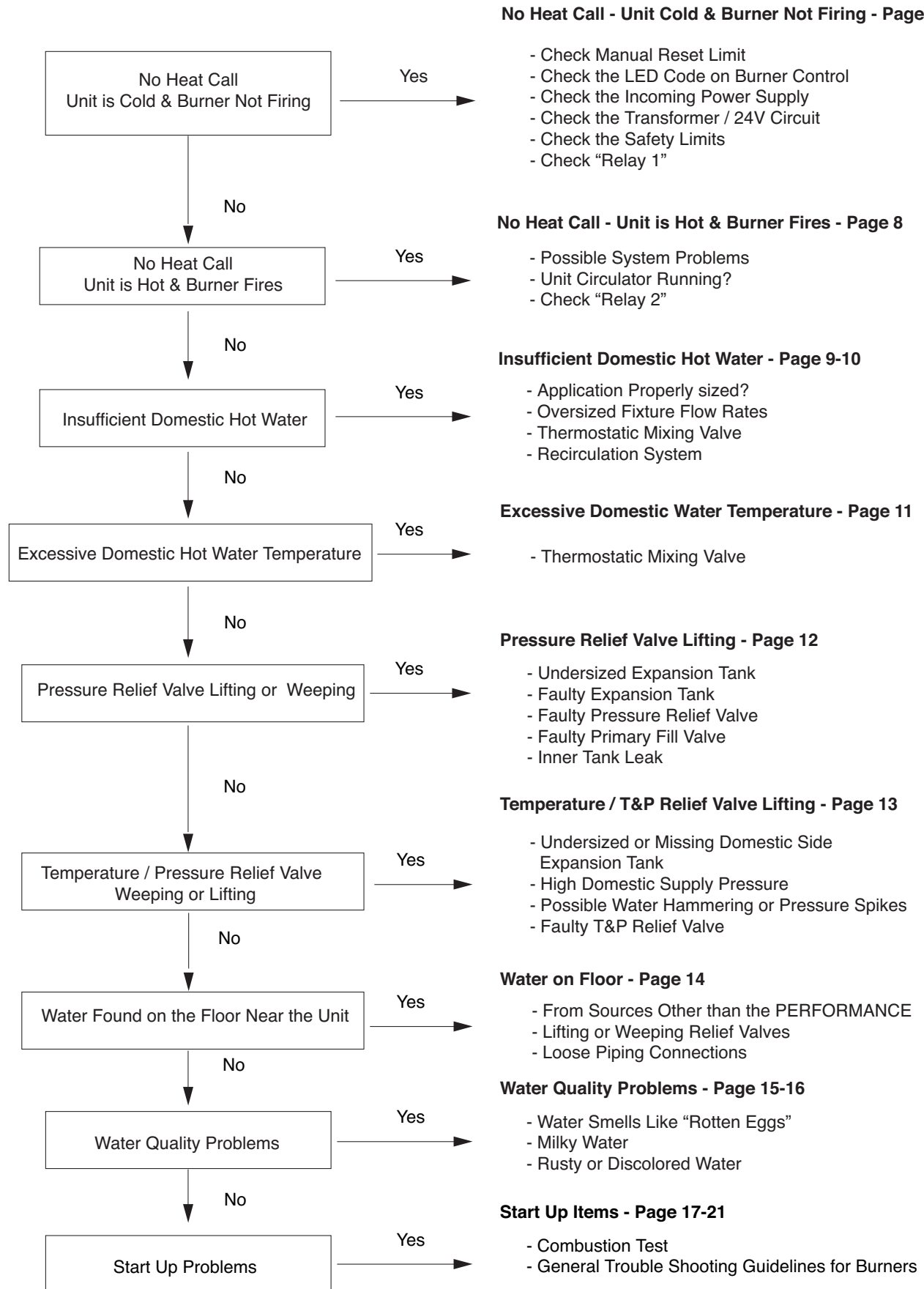
- Check your parts and tools.
 - Test equipment and tools that you will need:
 - Electrical meter that can measure voltage and continuity.
 - Pressure gauge, Watts #276H300 Test Gauge or similar.
 - Temperature Gauge or metering device.
 - Manometer.
 - Combustion analyzer.
 - Bucket, 1 gallon or larger with volume markings.
 - Stopwatch.
 - Standards tools of the trade (wrenches, screwdrivers...).
 - Parts to solve most problems:
 - 120V to 24V, 40 VA Transformer.
 - DPDT Relay, 24V coil with 120V rated contacts.
 - Thermostat Kit PGRKIT21.
- Know the ELITE model number.
- Review all appropriate manuals before leaving for the job site.

At the job site:

- Clarify the problem
- Have the ELITE manual and any other wiring, zone control or piping diagrams or installation guides readily available.
- Turn to page 2 - read carefully and follow instructions step by step.

REMEMBER

Follow the Troubleshooting Guide step by step, always double checking your results. Skipping steps or not completing steps can lead to wrong conclusions, repeated visits to the job site, unhappy customers and unnecessary warranty claims.



Service Instruction 1 - Accessing the Electrical Control Panel

1. Disconnect power supply to the ELITE prior to proceeding with the instructions.

WARNING

Failure to disconnect the power supply prior to proceeding with the instructions could lead to possible electrical shock hazard and cause severe personal injury or death.

2. Remove the top jacket panel by disengaging the lock pins by applying an upward force along the front edge of the panel.
3. Remove the front jacket panel by disengaging the lock pins using a flat head screwdriver.
 - a. Insert the screwdriver between the front jacket panel and the side jacket panel along the upper corner.
 - b. Use a twist motion to disengage the front panel from the side panel.
 - c. Repeat this process along the other side of the front jacket panel.
 - d. Once the upper corners are disengaged, lean the front panel forward and lift the panel up to disengage the lower tabs.

NOTICE

Use extreme care not to damage the jacket panels when using a screwdriver to disengage the front jacket panel.

4. Remove the (4) locking pins located on the top and lower corners of the black control panel. Once the locking pins are removed, the front control panel will lay forward exposing the control / electrical panel components
5. If needed the power supply may be reconnected to allow further troubleshooting procedures.

WARNING

Exercise extreme care when working with the electrical panel components exposed and the unit's electrical power reconnected. A potential electrical hazard exists when working in this condition. Failure to exercise extreme caution could lead to severe personal injury or death.

6. Disconnect the electrical supply prior to any replacement of electrical components or prior to reassembling the control panel to the unit.
7. To reassemble the front control panel, align the panel corners to the proper position on the side panel and tighten the lock down pins.

8. To reassemble the front jacket panel, insert the lower tabs into the side panels. Lift the panel up to align the locking pins with the retaining clips and snap the panel into place.
9. Align the top jacket panel with the locking pins and snap downward into place.

Service Instruction 2 - Removing Front or Top Jacket Panel and Burner Panel

1. Insert the screwdriver between the jacket panel or burner panel and the side jacket panel near the panel corner.
2. Use a twist motion to disengage the panel from the side panel.
3. Repeat this process along the corners of the jacket panel.
4. To remove the Front jacket once the upper corners are disengaged, lean the panel forward and lift the panel up to disengage the lower tabs.

NOTICE

Use extreme care not to damage the jacket panels when using a screwdriver to disengage the jacket panel.

Service Tip 1

All 120V wiring on the ELITE control panel is separate from the 24V wiring. The 120V wiring is located on the terminal strip in front of the transformer. The 24V wiring is located on the terminal strip to the left of the transformer. Both terminal strips are numbered from right to left; the 120V strip begins with #1 and the 24V begins with #5. For control panel, see pages 22 through 23.

Service Tip 2

The control panel consists of (2) DPDT relays. The relays are designated as Relay 1, which controls the burner function and is located near the transformer. The second relay, Relay 2, controls the circulator function and is located on the left side of the control panel.

Service Tip 3

During initial startup the ELITE may emit an odor. This odor is due to the initial burning of ceramic fibers in the combustion insulation and the oils on the interior tank surfaces. These odors will dissipate as the unit continues to operate.

No Heat Call - Unit is Cold & Burner Not Firing

Check the Manual Reset Safety Limit.

- The Manual Reset Safety Limit reset button is located on the center of the front control panel.
- If the Manual Reset Limit had tripped then check the following items:
 - The function of the Manual Reset Limit.
 - The setting of the Manual Reset Limit should be 205°F.
 - The function of the Primary Thermostat.
 - Check the Primary return system temperature. The recommended supply/return temperature differential is 20°F to 30°F.

Check the Burner Control.

Some oil burner controls are equipped with a LED indicator to aid the service technician in diagnosing potential problems. If a LED is part of the burner control, consult with the control manufacturer and/or the burner manufacturer for a detail list of flash codes and troubleshooting guidelines.

If the burner control contains a reset button, depress the button for approximately 60 seconds and release. If the burner resets and attempts to ignite, consult the burner manufacturer's troubleshooting guidelines or the general troubleshooting guidelines listed on page 17.

Note: If the burner control has no reset button, turn the power supplied to the unit OFF for approximately 60 seconds and then ON.

Check the Incoming Power Supply.

- Access the control panel components per Service Instruction 1.
- Check for voltage across terminals 1 and 2 for 120V. See Service Tip 1.
 - If voltage is not present check incoming electrical supply.
- Check for 120V, polarity, across terminals 1 and G. See Service Tip 1.
 - If voltage is present across terminals 1 and G, then polarity is correct.
 - If voltage is not present check incoming electrical supply wire connections and electrical supply source.
- Proceed to **Check the Transformer and 24V Circuit.**

Check the Transformer and 24V Circuit.

- Complete the procedure for checking Incoming Power Supply.
- Check for voltage across terminals 5 and 6 for 24 volts. See Service Tip 1.

- If voltage is not present, and 120V is supplied to the unit replace the Transformer.
- Proceed to **Check the Safety Limits.**

Check the Safety Limits.

- Complete the procedures for checking **Incoming Power Supply** and for checking the **Transformer and 24V Circuit.**
- Check for voltage across terminals 6 and 7 for 24 volts. See Service Tip 1.
 - If voltage is not present, check the following items related to the LWCO device:
 - Is the system pressure above 10 psig? The system pressure must be above 10 psig for the LWCO device to activate.
 - If the system pressure is above 10 psig, check for continuity across the LWCO device terminals. Replace the LWCO device if switch is proven open.
- Check for voltage across terminals 6 and 8 for 24 volts. See Service Tip 1
 - If voltage is not present, check the following items related to the Manual Reset Limit:
 - Push the reset button located on the Control Panel. Does it reset?
 - If the manual reset limit does reset check to ensure limit is set to 205°F and ensure primary supply/return differential is 20° to 30°F.
 - Is the Manual Reset Limit functioning properly? Is the manual reset limit tripping at a temperature setting of 205°F? Replace the Manual Reset Limit as needed.
- Check the function of the Automatic Reset Limit by:
 1. Turn the Secondary thermostat to the highest possible setting. The installer may need to run domestic hot water with the unit shut down in order to cool the inner tank and to initiate a “call for heat” on the Secondary thermostat.
 2. Check for voltage across terminals 6 and 11 for 24 volts. See Service Tip 1. If voltage is not present check the following:
 - Check for voltage across terminals 12 and 6 for 24 volts. If voltage is present continue to run domestic hot water to cool the unit down.
 - Turn the Secondary thermostat to the lowest possible setting and check for voltage across terminals 12 and 6 for 24 volts. If voltage is not present, replace the Secondary thermostat.
 3. If 24 volts is present at terminals 11 and 6, check for 24 volt across terminals 14 and 6. If voltage is not present check the following:
 - Is the system temperature below 160°F?
 - If the temperature is below 160°F, then replace the Automatic Reset Limit.

No Heat Call - Unit is Cold & Burner Not Firing

- If the system temperature is above 160°F, initiate a “call for heat” within the system and attempt to cool the unit down. If the unit cools down and the Automatic Reset limit does not reset, replace the limit.

NOTICE

The reason for either the Manual Reset or the Automatic Reset Limit to activate in a lockout mode may be due to a low return temperature from the system. It is recommended to maintain a 20°F to 30°F differential between the primary supply temperature and the primary return temperature. In radiant systems using a mixing valve or other means of providing tempered water to the system it is recommend to use a bypass loop between the primary supply and return piping. This by-pass loop should contain a valve that can be used to divert primary water from the supply to the return. The valve should be adjusted to increase the return temperature and a supply /return differential of 20° to 30°F. Once the differential is achieved, no further adjustments are required on the valve.

Check the Function of “Relay 1”. See Service Tip 2.

- If 24 volts is present at terminals 14 and 6, then check for 120 volts at terminals 4 and 2. See Service Tip 1.
 - If 120 volts is not present at terminals 4 and 2, replace the “Relay 1”.

Check for System Component Problems.

- Check the room thermostats for proper function.
- Check zone valves or circulators for proper function.
- Check zone panels or relays for proper function.

Check for System Electrical Problems.

- Ensure the thermostat wire connection at the Room T-stat Snap-set is connected to C and 1 terminals and is secured.
- Ensure the system electrical is not feeding 24 volts through the thermostat wires connected to the Room Snap-set.
 - Having a secondary 24 volts incoming through the room snap-set could cause failure of the internal control components.

Check for the Function of the ELITE System Circulator and Relay 2.

- Access the control panel per Service Instruction 1.
- Turn the Secondary thermostat to the lowest setting.
- Initiate a “call for heat” within the primary heating system.
- Check voltage across terminals 12 and 6 for 24 volts. See Service Tip 1.
 - If voltage is not present, check for 24 voltages across terminals 5 and 6, terminals 7 and 6, and terminals 8 and 6 to ensure no Safety Limits are locked out.
- With voltage at terminals 12 and 6, check for 24 volts at terminals 13 and 6. If no voltage is present at terminals 13 and 6 check the thermostat wires at the Room T-stat Snap-set and check to ensure the primary system is communicating a “call for heat” to the ELITE.
- With voltage at terminals 13 and 6, check for 120 volts at terminals 3 and 2.
 - If no voltage is present at terminals 3 and 2, replace Relay 2. See Service Tip 2.
 - Voltage is present at terminals 3 and 2, ensure the circulator is functioning properly.

Is the ELITE properly sized for the domestic water application?

- There are many methods of sizing various domestic hot water applications, i.e ASHRAE sizing tables, or ASPE domestic water heating design manual. Re-confirm the domestic hot water demand required for the application.
- Re-confirm the flow rates of the fixtures. Was the domestic demand based on showers heads at 2.0 gpm when they are actually 5.0 gpm? Use a bucket and a stopwatch to determine fixture flow rates.
 - Evaluate the hot water usage patterns for a day. Is the peak demand unusually high for the application?
 - Has the demand for domestic hot water changed since the system was installed? A bathroom remodeling project with a newly installed whirlpool tub will drastically change the domestic water demand.

The ELITE will provide domestic hot water at the following rates for a 10 minute dump period with a mixing valve setting for 120°F:

F-25	5.6 gpm
F-30	6.1 gpm
F-35	6.5 gpm
F-40	7.4 gpm
F-45	8.1 gpm

NOTICE

The outlet temperature after 10 minutes will be considerably lower than the initial draw of hot water. The overall temperature of the water collected during the draw will be approximately 110°F.

Is the thermostatic mixing valve properly set?

- The operating range of the mixing valve is 90°F to 120°F.
- The mixing valve is equipped with a cap that may be locked into position. Adjust the mixing valve setting to the desired temperature prior to locking the cap.
- The manual valve located on the U-tube should be in the open position.

WARNING

Closing the manual valve on the U-tube will affect the amount of cold water supplied to the mixing valve and the overall function of the mixing valve. A potential scalding hazard may exist resulting in severe personal injury or death.

Does the mixing valve require cleaning due to scaling deposits?

1. Isolate the domestic water supply to the ELITE and relieve any existing pressure.
2. Remove the main valve body from the ELITE using the union connections.
3. Remove the blue cap and locking ring from the valve using a 2.5 mm L key wrench (supplied with the mixing valve).
4. The interior of the valve body can be removed by unscrewing the large hexagonal nut and sliding the interior components out. Ensure the orientation of the components is noted so that they can be reassembled in the correct manner.
5. A mild cleaner that is safe to use on plastic parts can be applied to any scale buildup and then brushed away with a small bristle brush like a toothbrush.
6. After cleaning and reassembling, the valve should be reset and tested for outlet mixed temperatures based on mixing valve settings. A record of the temperatures and valve settings should be retained for future checks.

Does the domestic water system contain a recirculation line?

- The recirculation line circulator must be controlled by an aquastat placed on the recirculation line.
- Not having an aquastat controlled recirculation will cause the mixing valve not to function properly and will affect the domestic performance of the unit.

NOTICE

It is recommended to set the operating limit of the recirculation aquastat a minimum of 10°F below the setting of the mixing valve.

- Ensure the recirculation system contains a check valve to prevent back flow of cold water.

Is the thermostatic mixing valve properly set?

- The operating range of the mixing valve is 90°F to 120°F.
- The mixing valve is equipped with a cap that may be locked into position. Adjust the mixing valve setting to the desired temperature prior to locking the cap.
- The manual valve located on the U-tube should be in the open position.

WARNING

Closing the manual valve on the U-tube will affect the amount of cold supplied to the mixing valve and the function of the valve. A potential scalding hazard may exist resulting severe personal injury or death.

Does the valve require cleaning due to scaling deposits?

1. Isolate the domestic water supply to the ELITE and relieve any existing pressure.
2. Remove the main valve body from the ELITE using the union connections.
3. Remove the blue cap and locking ring from the valve using a 2.5 mm L Key wrench (supplied with the mixing valve).
4. The interior of the valve body can be removed by unscrewing the large hexagonal nut and sliding the interior components out. Ensure the orientation of the components is noted so that they can be reassembled in the correct manner.
5. A mild cleaner that is safe to use on plastic parts can be applied to any scale buildup and then brushed away with a small bristle brush like a toothbrush.
6. After cleaning and reassembling, the valve should be reset and tested for outlet mixed temperature based on mixing valve setting. A record of the temperatures and valve settings should be retained for future checks.

Is the expansion tank on the primary system properly sized?

- Each ELITE unit contains approximately 20 gallons of primary water that needs to be accounted for in the sizing of an expansion tank.

Conventional Expansion Tank

$$\text{Capacity Gallons} = \frac{\text{Heat Loss Btu/hr}}{5,000}$$

Diaphragm Expansion Tank Capacity

$$\text{Gallons} = \frac{\text{Heat Loss Btu/hr}}{7,000}$$

- Insufficient allowance for expansion on the boiler side can cause the pressure relief valve to lift or weep.

Is the expansion tank defective, water logged or improperly charged?

- Check for failed gaskets or bladders or a faulty Schrader valve.
- Use a tire gauge to check the charge pressure of the tank with the system pressure at 0 psig. The diaphragm expansion tank should be pre-charged to 12 psig.
- Check the location of the system circulator in relationship to the expansion tank and pressure relief valve. The relief valve may be sensing the head pressure of the circulator directly and not the actual system pressure.

Is the pressure relief valve functioning properly?

- Dirt and water deposits can accumulate under the valve seat.

Check the primary fill valve for defects.

- Is the valve filling the system to the correct pressure of 12 psig to 15 psig?
- Is the valve maintaining the correct system pressure?

Check for possible inner tank leak.

- If possible, isolate the outer tank of the ELITE by shutting the primary supply and return isolation valves off. Relieve the outer tank (primary) pressure. Observe the primary system pressure during that time.

Is there a thermal expansion tank installed on the domestic supply piping and is it properly sized?

- A thermal expansion tank is required if the domestic supply piping includes a backflow preventer or pressure reducing valve.
- Ensure the potable water thermal expansion tank is properly sized for a minimum 20 gallons volume and pre-charged at the incoming supply pressure.
- During long periods, when there is no draws of domestic hot water (i.e. overnight), the T&P relief valve may lift or weep due to thermal expansion, but may function properly during normal periods of domestic draws.

Is the thermal expansion tank defective, water logged or improperly charged?

- Check for failed gaskets or bladders or a faulty Schrader valve.
- Use a tire gauge to check the charge pressure of the tank. The charge pressure of the tank should be equivalent to the incoming supply pressure or the pressure measured downstream of a pressure reducing valve.

Check the incoming domestic supply pressure entering the ELITE.

- If the pressure is over 70 psig it is recommended to install a pressure-reducing valve. This will prevent any pressure spikes or increases in pressure due to thermal expansion, which may cause the T&P valve to lift or weep.

Check the domestic water system for possible sources of water hammering or pressure spikes.

- Some appliances such as clothes washers and dishwashers utilize fast acting valves, which may cause water hammering or pressure spikes through the domestic water system.
- Install water hammer arrestors as required per the manufacturer’s instructions or install flexible connectors to isolate the tank from vibrations within the domestic water system.

Is the pressure relief valve functioning properly?

- Dirt and water deposits can accumulate under the valve seat.

If the relief valve continues to weeps. The valve may require replacement.

- Replace the T&P relief will the following relief valve or equivalent:

F-25	Watts 100 XL-8
F-30/35/40/45	Watts 40 XL-8

Is the source of the water from the ELITE?

- Check for possible water seepage through foundation cracks. Did the water appear after a heavy rain?
- Check overhead pipes for leaking connections or excessive condensation.

Is the source of the water from the T&P Relief Valve?

- Place a bucket under the discharge piping of the T&P relief valve and monitor it for the next several days. This is a procedure that can be completed by the homeowner.
- If the T&P relief valve is the source of water found, refer to the T&P Relief Valve section of this manual (page 13).

NOTICE

The discharge piping of the T&P relief valve is required to be directed towards a suitable place of drainage. Refer to the Installation manual for additional information regarding the discharge piping of the T&P relief valve.

Check all piping connections - primary connections and domestic connections

- Check all primary connections at or near the ELITE. A buildup of corrosion is a sure sign of a leak.
- Check the domestic connections. Check around the areas where the domestic connections enter the outer tank of the ELITE. Excessive water hammering in the domestic system may crack the welds around the domestic connections and the outer tank shell.

Is the source of the water from the pressure relief valve?

- Place a bucket under the discharge piping of the pressure relief valve and monitor it for the next several days. This is a procedure that can be completed by the homeowner.
- If the pressure relief valve is the source of water found, refer to the pressure relief valve section of this manual (page 12).

NOTICE

The discharge piping of the pressure relief valve is required to be directed towards a suitable place of drainage. Refer to the installation manual for additional information regarding the discharge piping of the pressure relief valve.

The water smells like “rotten eggs”.

The most common cause of water to smell like “rotten eggs” is a non-toxic sulfate reducing bacteria. The bacteria usually enters into the water system through a break in the supply piping or during construction/maintenance of the supply piping. The bacteria survives in the water system by converting sulfate (SO₄) in the water to hydrogen sulfide (H₂S) gas. It is this gas that creates the “rotten egg” smell. The presence of hydrogen sulfide can also affect the taste of the water. Along with the stench caused by these bacteria, black deposits, which typically indicate pipe or fitting corrosion may also appear in the water.

WARNING

In extremely high concentrations, hydrogen sulfide gas can be toxic. However, the gas is detectable prior to any harmful levels can be reached.

The bacteria will thrive in any water system under the following conditions:

- High levels of sulfur in the water.
- Activated hydrogen in the water from cathodic reactions within the tank.
- Water with little or no dissolved oxygen.
- Storing the domestic water below 140°F.

Other causes of smelly or bad tasting water:

- Chlorides of magnesium and calcium gives water a bitter taste.
- Chloride of sodium will produce a salty tasting water.
- Sulfates above 50 ppm in the water gives the water a medicinal taste.
- Carbon dioxide in the water with a low pH results in water that is fizzy.
- Iron and tannic waters will produce water with a bad taste and odor.

The treatment of this situation requires the inner tank and water system to be shock chlorinated. Depending on the severity of the bacteria within the water system, several treatments may be required.

- To shock chlorinate the ELITE inner tank and water system, introduce (1) gallon of household bleach into the system.
- Flush the entire system by drawing hot water from every faucet or fixture until the smell of bleach has diminished.
- Repeat the procedure as needed.

Hot Water from the faucet appears milky.

When water is initially drawn from the faucet it appears to be milky or cloudy, but it becomes clear after the water is allowed to stand for several minutes. This is usually an indication that the water contains high levels of soluble gases such as oxygen, chlorine, carbon dioxide, hydrogen sulfide or others.

As the water system pressure increases, the amount of gas that the water can hold in a solution decreases. When air and gases are forced out of the heated water, the problem may be evident in one or both of the following conditions

- Gases, in the form of small bubbles, may make the water appear milky from the tap, but clear after several minutes when those bubbles will separate. Similar to the reaction that occurs as air bubbles form on the walls of a pan shortly before the water begins to boil.
- The release of dissolved gas can also create air pockets and air locks in the water system piping. This can cause spurts of air or gases when operating the hot water faucet.

There is generally no cure for milky water caused by dissolved gases, although it can be reduced with aerated faucets. In some applications the amount of air and gases precipitating out of the water will reduce in time. It should be noted that these gases are not harmful to the end user.

Discolored Water from the Hot Water Faucet

The water from the hot water faucet appears discolored: rusty, brown, black or yellow. Because the inner tank and sensing well is made of stainless steel, which by nature is resistant to corrosion, the problem is not tank related. The problem is usually a non-toxic iron reducing bacteria that are commonly found in soil, well water, and water treatment plants and piping systems. The bacteria usually thrives in those systems in which the soluble iron content exceeds 0.2 ppm. The bacteria will feed on the soluble iron in the water producing “rusty” color water as a by-product of the feeding process.

Variables in which the bacteria can thrive in:

- Elevated levels of iron and manganese in the water.
- Water with little or no dissolved oxygen.
- Water storage temperatures below 140°F.

Items that can potentially increase the presence of the bacteria:

- Water softeners.
- Well water.
- Long periods of no water movement.

The treatment of this situation requires the inner tank and water system to be shock chlorinated. Depending on the severity of the bacteria within the water system, several treatments may be required.

- To shock chlorinate the ELITE inner tank and water system introduce (1) gallon of household bleach into the system.
- Flush the entire system by drawing hot water from every faucet or fixture until the smell of bleach has diminished.
- Repeat the procedure as needed.

WARNING

The start up of the ELITE should be performed by a qualified installer, service agency or the gas or oil supplier. The start up procedure should include a complete combustion test. A complete combustion test must also be performed after any adjustments to the burner factory setting. Failure to comply with these requirements can result in severe personal injury, death or substantial property damage.

Combustion Test Guidelines

- The combustion test should be conducted using an electronic combustion analyzer or at minimum a “Fyrite” type CO2 analyzer.
- The combustion test sample can be taken a point between the flue hood and the barometric damper on the venting system of the ELITE.
- Ensure the vent system and air inlet duct system are install completely prior to start up and conducting a combustion test.

Combustion Test Parameters

O2 : 4.0 to 4.5%
CO2 : 9.5 to 10.0% Natural Gas
11.0% to 11.5% Propane
12.0% to 13.0% Oil
CO : 0 to 50 ppm
O to trace of smoke on oil applications

General Troubleshooting Guidelines for Oil Burners

NOTICE

The following is a list of general guidelines for troubleshooting oil burner applications. Some of these guidelines may not apply to the particular oil burner used in your application. It is recommended to reference the burner installation manual and to contact the oil burner manufacturer or local burner representative.

If the burner does not start:

The relay in the primary control may not be pulling in. **Check for:**

- Broken wires
- Dirty thermostat contacts
- Defective thermostat
- Defective primary control

The motor is lockout on thermal overload

Check for:

- Seized motor bearing
- Seized fuel pump
- Fan locked against housing
- Start winding burned out
- Defective starter switch
- Defective wiring

If the burner motor starts, but there is no flame:

There may be insufficient oil flow. **Check for:**

- Defective fuel pump
- Pump strainer clogged
- Defective solenoid valve
- Loose motor coupling
- Air leaks in suction line
- Clogged or dirty nozzle
- Clogged fuel filter

There is no ignition spark.

Check for:

- Defective / loose wiring connections at the primary control or electrode assembly.
- Incorrect electrode settings.
- Defective porcelain insulator on electrode assembly
- Defective transformer

There is oil and spark, but no flame.

Check for:

- Loose, dirty or defective nozzle.
- Low pump pressure
- Excess air / high draft
- Incorrect electrode settings
- Improper oil condition
- Improper spinner position.

If the burner starts and establish flame, but the flame goes out.

Primary control will shut off flame. **Check for:**

- Dirty cad cell
- View of flame obstructed, so that cad cell cannot see flame.
- Defective cad cell
- Defective primary control
- Loss of oil prime

If the burner starts and has a smoky flame:

Check for:

- Insufficient combustion air
- Improper mixing of oil and air
- Insufficient draft
- Flame impingement on the combustion walls
- Nozzle afterdrip due to faulty solenoid or cutoff valve

If you hear mechanical noise from the burner:

Check for:

- Loose fan
- Air in oil line
- Defective pump gears
- Obstructed suction line
- Defective motor bearings
- Pump and motor shaft misalignment
- Defective transformer
- Defective primary control

If you hear combustion noises:

Check for:

- Insufficient draft in the flue outlet or overfire
- Improper mixing of oil and air
- Incorrect air setting
- Incorrect head setting
- Loose or dirty fan

If there is puffback from the burner:

Check for:

- Delay ignition
- Nozzle afterdrip due to poor cutoff
- Excessive draft
- Incorrect air setting

If there is nozzle afterdrip:

Check for:

- Air in supply line from oil tank to the burner
- High vacuum at the oil pump
- Hot nozzle or gun assembly due to improper draft, misadjusted burner or blocked flueways.

General Troubleshooting Guidelines for the Carlin G3B Gas Burner

NOTICE

The following is a list of general guidelines for troubleshooting the Carlin G3B Gas Burner. It is recommended to reference the Carlin burner installation manual or contact Carlin or local burner representative for additional assistance.

If the burner does not run:

Check for:

- 120 volts at the burner terminal strip L1 - L2
- Check the burner transformer output. Each “T” on the burner terminal strip should read 24 volts to “G” ground.
- Check all wiring for proper connections
- Defective motor relay at the burner.
- Defective motor
- Defective burner control module

The burner completes the 40 second prepurge cycle and does not light:

Check for:

- Improper air setting
- Incorrect orifice size
- The gas valve or manual gas shutoff valve is closed
- Incorrect manifold pressure
- Insufficient gas supply line pressure
- Defective main gas valve
- Defective motor end switch not making contact
- Damage HSI (hot surface ignitor) element
- Defective burner control module

The burner establish main flame, but locks out after TFI (trail for ignition) period:

Check for:

- Incorrect air setting
- Incorrect orifice size
- Incorrect manifold pressure
- Inadequate or loss of gas supply
- Insufficient flame signal
- Improper draft

General Troubleshooting Guidelines for the Riello 200 / 400 Gas Burner

NOTICE

The following is a list of general guidelines for troubleshooting the Riello Gas Burner. It is recommended to reference the Riello burner installation manual or contact Riello or local burner representative for additional assistance.

If the burner goes through the standard prepurge period normally, establish main flame and goes into lockout within 5 seconds:

Check for:

- Proper connection of the phase / neutral wiring.
- Wiring to ground, is it absent or improper?
- The ionization probe is grounded, or not in contact with the flame, or the circuit to the control module is broken.
- The spark interferes with the flame signal due to incorrect setting of the electrode.

If the burner goes to lockout after the prepurge period is completed and main flame is not established:

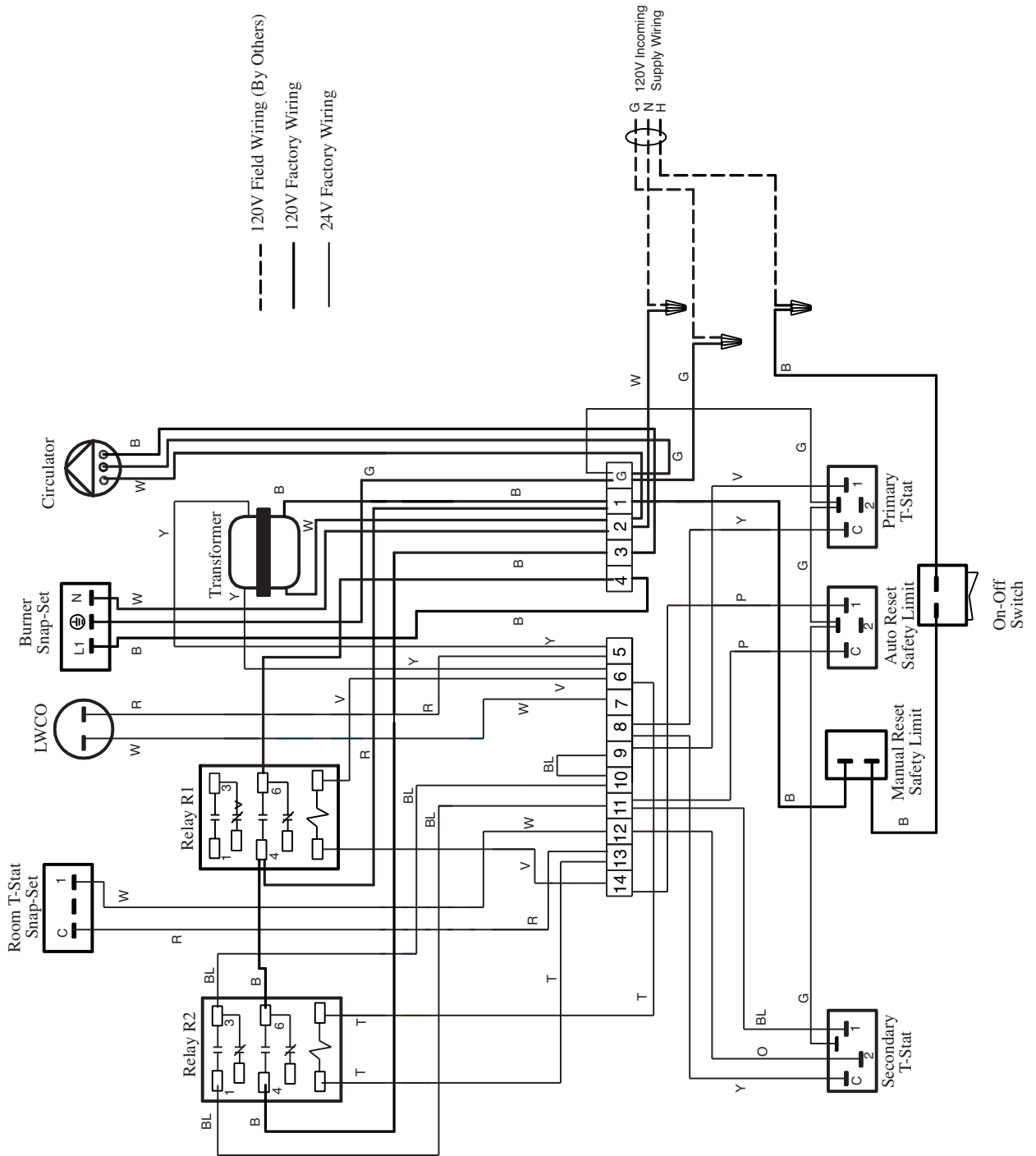
Check for:

- Air has not been fully bled from the gas lines
- There is insufficient gas being supplied through the gas valve
- Insufficient or no presents of an ignition spark

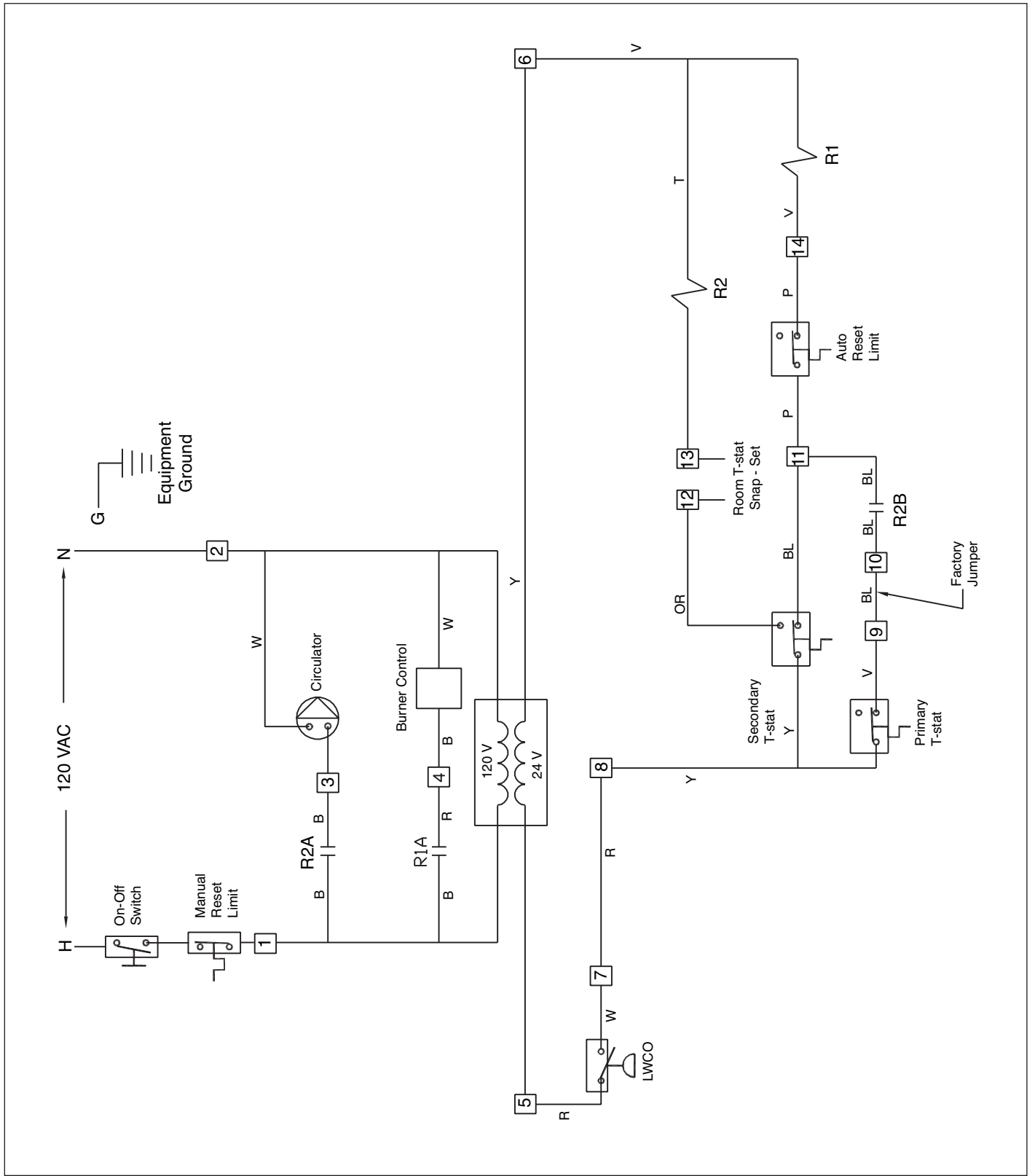
The burner does not start:

Check for:

- Defective 24 volt relay on the burner
- Bent or loose terminals on the burner control module
- Defective burner motor
- Defective capacitor



ELITE Factory Wire Connection Diagram



ELITE Factory Ladder Wiring Diagram

For additional Technical Assistance Contact:

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