# SERVICE MANUAL

**IMPORTANT INFORMATION, KEEP FOR OPERATOR**

This manual provides information for:

# smart steam™

BOILERLESS STEAMER

## *MODELS SSB-3E/5E/10EF, (2)SSB-3E/5E/10EF, SSB-3G/5G/10GF & (2)SSB-3G/5G/10GF*

- Self Contained
- Electric or Gas Heated
- Capacity: 3, 5 or 10 Steamer Pans Per Cavity
- Pans: 12" x 20" x 2 2/1"

GROEN

UNIFIED BRANDS
FOODSERVICE EQUIPMENT SOLUTIONS
A DOVER COMPANY

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## ASSEMBLY / DISASSEMBLY



## PARTS IDENTIFICATION

## 1.1 The Groen Service Concept

Since 1907 Groen has been in the business of designing and manufacturing the finest commercial appliances for the food service industry. Chefs, cooks and kitchen support personnel have come to depend upon the quality of construction and the reliability of operation.

Groen, in turn, depends upon our service centers and their field service personnel to keep the equipment in top operating condition. In order to do this, our designs are made with service and reliability in mind.

Once the Groen equipment is sold, manufactured, delivered and installed, our reputation is clearly in your hands. As part of our team, we value your efforts and input to our product design.

We will do all we can to make your job of keeping the equipment in perfect working order as easy as we can. Together, we will keep our customers satisfied.

## 1.2 Groen Certified Service

The SmartSteam Boilerless Steamer has been carefully designed to provide many years of efficient and reliable service. Part of the quality program is Groen Certified Service. This includes:

- Groen certifies that all equipment delivered to our customers has been inspected and tested for compliance with the specifications.
- Groen certifies that all parts required for service and maintenance will be readily available.
- Groen certifies that this manual will be updated by means of periodic service bulletins to provide the most up-to-date information for field maintenance and service personnel.

## 1.3 Warranty and Non-Warranty Repair

Groen Warranty provisions are clearly presented in the customer's Operator Manual.

Certain procedures for the cleaning and/or adjustment of the SmartSteam Boilerless Steamer are presented in this manual for reference, but not warranty related.

## 1.4 Safety

The Groen SmartSteam Boilerless Steamer has been designed with safety in mind. This includes safety to the operating and maintenance personnel, safety to the facility in which the equipment is installed and safety to the equipment itself.

The steamer has been designed to the highest industry standards and has been certified by the National Sanitation Foundation Testing Laboratory (NSF), Underwriters Laboratory (UL) and/or CSA (gas).

The steamer contains several devices which are specifically used to prevent unsafe conditions. If they are disconnected during service, make sure they are reinstalled properly and tested before the steamer is operated.

The safety precautions in this manual are in accordance with ANSI 535 Standard. Three different signal words alert you to a hazardous situation: **DANGER, WARNING, AND CAUTION**

**DANGER:** The signal word **DANGER** indicates that a hazardous situation exists and could result in serious injury or death.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- When you open the steamer door, be very careful to avoid escaping steam. Steam can cause burns.
- After removing the fan baffle partition, do not put your hands or other object into the cooking cavity until the fan comes to a complete stop. Rotating fan blades can cause severe injury!

**WARNING:** The signal word **WARNING** tells you that a possibly hazardous situation is present, and if not avoided, could cause serious injury or death.

- Always turn off the steamer power before removing partitions or panels.
- Disconnect the steamer from the power source before performing any service.

**CAUTION:** The signal word **CAUTION** warns you of a hazardous situation which, if not avoided, may result in minor or moderate injury.

- Steamer may be hot. Take precautions to prevent any contact with hot surfaces.
- Be sure all interior partitions have been installed before operating the steamer.
- All steamer operators and service personnel should be familiar with correct and safe operating procedures.
- Be sure steamer drain is not blocked as this could result in improper steamer operations.

Two other signal words, not directly related to personal safety, are also used in this manual: **NOTICE** and **IMPORTANT.**

**NOTICE** is used to alert you to hazards that may result in component and/or equipment damage.

**IMPORTANT** is used to highlight an operating or maintenance tip or suggestion.

## 1.5 Glossary of Terms

The following abbreviations and terms are used in this manual:

| | |
|---|---|
| **BTU** | British Thermal Unit |
| **GPM** | Gallons Per Minute |
| **LED** | Lighting Emitting Diode |
| **MM** | Millimeter |
| **NEC** | National Electric Code |
| **N.P.T.** | National Pipe Thread |
| **NSF** | National Sanitation Foundation |
| **PSI** | Pounds per Square Inch (Pressure) |
| **U.L.** | Underwriter's Laboratory, Inc. |

## 1.6 Tools and Supplies

This Section identifies the tools, instruments and supplies which will be required and useful in the inspection, repair and testing of the equipment described in this manual.

Most likely, many of these tools and supplies are already in your tool kits and are used in everyday maintenance. Make sure to use only the specified sealants, compounds and dressings recommended by Groen.

**CAUTION:** Care should be taken in using the correct tool as indicated. Using the wrong tool may inflict damage to the part being removed, installed and/or adjusted. Make sure that the calibrations on instruments are periodically checked for accuracy.

### 1.6.1 Required Tools

- Screw Drivers: Flat Blade No. 1 and No. 2
- Phillips No. 1 and No. 2
- Socket Wrenches: 1/4" through 7/8"
- Nutdrivers (metric and inches)
- Open Ended Wrenches: 1/4" through 7/8"
- Pipe Wrenches: 6" and 8" size
- Allen Wrenches: 1/16" through 1/4"
- Slip Joint Pliers: ChannelLock or Equivalent
- Wire Crimpers

### 1.6.2 Recommended Instruments

- Digital Multimeter: Fluke Model 77 or equivalent

### 1.6.3 Helpful Hardware

- Extension Mirror
- Screw Starter
- Level: 18" Model
- Fuse Puller

## 1.6.4 Recommended Supplies

- Pipe Thread Compound: Brand: LACO PipeTite Stik
  No. 11176 or equivalent
- Motor Sealant Grease: Bel-Ray
- 2" Aluminum Duct Tape
- Removable Thread Locker:
  Locktite Type 242 (Door)
  Locktite Type 222 (Exterior)
- Clear Silicone Sealant:
  Dow Corning Type 732
- Silicone Heat Sink Compound:
  *Non-Fluid Oil Corp., Chemplex 1381*
- High Temperature Anti-Seize and Lubricating Compound
  Bostix NEVER SEEZ NSBT-16

## 1.7 How To Use This Manual

Read this manual completely before attempting any disassembly or repairs.

Please note the similarities and differences between the various models described in the manual.

Before making repairs, you should have knowledge of the steamer operation as described in the Operations Section of this manual *and a good understanding of service techniques* as presented by the Groen Service School.

This service manual should be taken with you on all service calls. Use the correct tools in accordance with the procedures shown and use only Groen Certified Replacement Parts when performing steamer repairs.

**WARNING**
**ANY POTENTIAL USER OF THE EQUIPMENT MUST BE TRAINED IN SAFE AND CORRECT OPERATING PROCEDURES.**

## 2.1 Controls

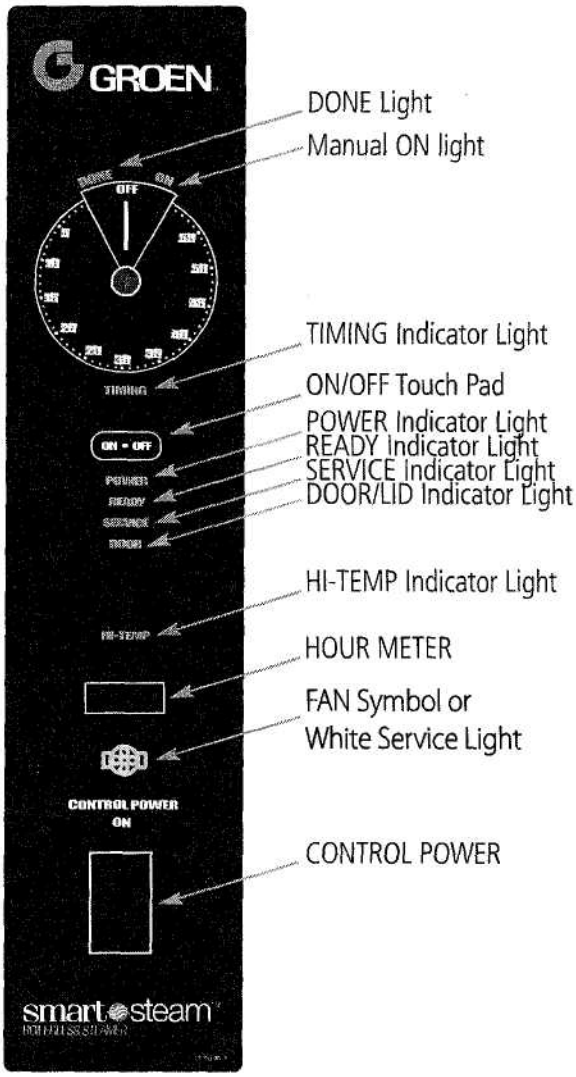
**Operator controls are on the front right of the unit.**

**The SmartSteam Boilerless Steamer control panel has the following touch pads and indicator lights:**

- **The ON/OFF touch pad gets the SmartSteam Boilerless Steamer ready for use and also shuts it OFF.**
- **The READY indicator light shows that the steam generating reservoir is at standby temperature and the cavity is hot enough to begin steaming.**
- **The Upper/Red SERVICE indicator light shows that an error has occured in the water fill or drain system.**
- **The Door/Lid Indicator light illuminates when there is a failure in the door circuit.**
- **The CONTROL POWER rocker switch should be toggled to the ON position to turn the unit ON prior to pressing the ON/OFF touchpad on the upper control panel. But should not be used for ON/OFF daily operations.**
- **The HI TEMP indicator light comes on when the steam generator is too hot.**
- **HOUR METER records cumulative hours of operation.**

**The unit will automatically shut off and cannot be turned on again until the reservoir cools and the HI TEMP indicator light goes out.**

- **The TIMING indicator light stays on when the timer is running.**
- **The White Service Light or Fan symbol indicator light shows when the control cooling fan is not functioning properly or the Snap-Disc T-Stat on the drain box has been tripped. The steamer will still function, but if the service light stays on for more than 30 minutes service should be called because continued use for prolonged periods could result in component damage due to excessive temperatures.**




*This overlay not to scale. Enhanced for better image quality.

**The timer is used in three ways:**

1 In the OFF position, the steamer stays at a low boil or ready status.

2 When a cook time is set, the unit steams until the timer times down to DONE. At that time, steaming stops, a red DONE light comes on and a beeper sounds until the user turns the knob to another position.

3 With the timer turned to the ON position, the unit steams continuously. The green light stays lit. The steamer will NOT time down.

## 2.2 Operating Procedure

1 Press the ON/OFF rocker switch to the ON position. Then press the ON/OFF button located on the control touch pad. The steam generating reservoir will fill and heat until the READY light comes on (about 10 -15 minutes). The unit will continue to heat for 20 minutes in high power and then go to stand-by.

2 Load food into pans in uniform layers. Pans should be filled to about the same levels and should be even on top.

3 Open the door and slide the pans onto the supports. If you will only be steaming one pan, put it in the middle position.

4 Close the door. With the READY indicator lit, take one of the following steps:

**TIMED STEAMING**

- If you want to steam the food for a certain length of time, set the timer for that period. The timer will automatically run the steamer for the set time and then return it to stand-by. A red DONE light will come on and a beeper will sound. Steam production stops.

**CONTINUOUS STEAMING**

- If you want to steam continuously, turn the timer to the manual ON position. A green ON light will come on. The unit will continue steaming until you stop it by turning the timer to OFF. When steaming continuously, YOU MUST CONTROL STEAMING TIME.

**WARNING**
**When opening the door, stay away from the steam coming out of the unit. Steam can cause burns.**

5 Open the door. Remove the pans from the steamer, using hot pads or oven mitts to protect your hands from the hot pans.

6 To shut down the unit, press the touch pad switch to OFF. The steam generating reservoir will automatically drain. With a Rev. C E-Prom, the unit will re-fill and then drain a second time.

**NOTE:** If you use the ON/OFF touch pad to power down the unit, and then subsequently turn the unit back on within 4-33 minutes after initial shutdown, you may briefly see the Lower/White Service or Fan Light appear for about 30-35 seconds while the unit is resetting itself. **To avoid seeing this light during the unit reset, power down the unit by shutting it off at the CONTROL POWER rocker switch.** However, if the Lower/White Service Light appears and does not go away after about 30 minutes, you should refer to Troubleshooting Section of Service Manual to service the control cooling fan, which is not functioning properly.

**NOTE: The steamer was designed to drain slowly (about 4-1/2 minutes) to remove residual heat from the bottom of the cavity. If the unit is inadvertently turned off, it can be turned on again after approximately 2 minutes which allows the water to drain below the bottom probe.**

## 2.3 Typical Operations

The following is a sequence of events typical to SmartSteam Boilerless Steamer.

### 1. Cooking Food

To use the steamer, the cavity door is closed, the CONTROL POWER rocker switch and the ON/OFF touch pad is set to ON. The unit performs a quick diagnostics sequence lighting all LEDs (except the HI-TEMP LED) on the front panel and the POWER indicator light remains illuminated. The unit verifies the floats/probes and drain by the sequence below. The drain valve is closed and the water enters the steam reservoir to the "fill" point. When the water level reaches the LOW level float/probe, the muffin fan will run. When the water level reaches the HIGH level float/probe, the water fill valve closes and the drain valve opens until water drops off the high float/probe. At this point, the drain valve closes and the water valve opens to refill the HIGH float/probe. When the water reaches the HIGH float/probe, the water fill valve closes - stopping the entry of water into the steam reservoir.

A relay energizes and provides power to the heating circuit for the steam reservoir. This heats the steam reservoir to boil the water - creating the required steam. When the cavity is heated to about 180 degrees F, the READY indicator light comes on - indicating that the cooking can start. When it is desired to cook food in the cavity, the pans are inserted into the cavity and the door is closed.

Heat-up time is about 15 minutes after the ON/OFF touch pad is pressed, if all of the above conditions are met.

Using the timer control, the knob is rotated around the dial to the desired time from 1 to 60 minutes or placed in the timed position and the Green TIMING light below the knob will illuminate. In the timed position, a Red DONE light on the left side of the dial will go on when cooking time is completed and the "beeper" will sound. In the "on" position, a Green ON light on the right side of the dial will go on to indicate that the steamer is being set to constant ON.

When the unit is at ready temperature and the timer is set to the timed position (1 to 60 minutes) or placed in the manual position, the motor and fan in the cavity starts, the condensate spray comes on, and the steam enters the cavity and is distributed throughout the cavity.

When the timed cooking period is complete a buzzer will sound and the Red DONE light (on the timer dial) will go on until the time knob pointer is rotated to the OFF (12 o'clock) position (between the two lights).

When the timer is set to the OFF position, the unit will continue to operate for 20 minutes, then perform a duty cycle of 1 minute ON , 9 minutes OFF.

If the door is opened during the cooking process, the door interlock switch causes the door light to illuminate; causing power to be removed from the convection motor, and the spray valve closes. The relay opens the circuit to the source of heat, instantly reducing the heat from the steam reservoir.

### 2. Water Entry Into Steam Reservoir

On power up, the boiler goes through a fill/drain diagnostic to verify the condition of the water level probe and drain.

**a.** If the drain is blocked, a service error is generated.

**b.** If either probe is not responding, a service error is generated.

**CAUTION:** A scaled reservoir or debris will cause service errors. When a button or float/probe have excessive scale they will not function properly.

**NOTICE:** When powered off, the controls empty the steam reservoir.

The HIGH WATER float/probe determines if there is a full and proper level of water in the steam reservoir. If the water level goes down, the float/probe is opened by the water level getting low. This causes the water fill valve for that steam reservoir to turn on to permit water to enter the steam reservoir.

Water will continue to enter the steam reservoir until the level of water is high enough to close the HIGH WATER float/probe. This determines that the steam reservoir is full and then the water supply solenoid valve is turned off stopping the water flow to the steam reservoir.

When the HIGH WATER float/probe is open, there is a 3 to 5 second delay before the water fill valve opens. This is to take into account the rising and lowering of the water level due to the bubbling action of the boiling water in the steam reservoir. If the float/probe is open for more than approximately 5 seconds, then the water fill valve is activated.

### 13. Service Errors

Service errors are normally caused by float/probe or timing issues (fill time and drain time).

A service error is generated when the electronic controls are blind to the status of the steam reservoir (i.e., floats/probes are not working) or by a blocked drain. The service error may stop the machine from running and will flash the SERVICE indicator light while sounding the beeper. Opening and closing the door will stop the beeper from sounding, but the light continues to flash and the machine may still be inoperable. Service error protects the steam reservoir from irreparable damage. You may have either a Stage 1 or Stage 2 error.

### 4. Heater Control

After the reservoir is initially filled and the diagnostic is complete, the Power Relay energizes providing power to the heating circuit. Then the control monitors the Ready Thermostat determines when the cavity is in "ready" condition.

**NOTICE:** If the door is open, the heating circuit will not be energized and the heating circuit will not turn on until the door is closed.

If the Ready Thermostat is at the required temperature and the timer knob is in the OFF position or the DONE position, the heater control cycles the heating circuit power relay and maintains the ready condition by cycling the elements 1 minute ON, 9 minutes OFF.

If the timer is in the TIMING position or the constant ON (manual) position, the heater control turns on heat to produce steam.

A High-Limit thermostat is provided as a safety device on each steam reservoir to monitor the internal temperature of the steam reservoir. This thermostat is set for 250 degrees F and will shut down the steamer if there is very little or no water and the steamer cavity starts to overheat.

### 5. Draining Water From the Steam Reservoir

When water or steam is drained from the reservoir, it passes through a water spray in the drain box controlled by a water solenoid valve to condense the steam before it exits the steamer drain box into the drain line.

A solenoid drain valve is connected to each steam reservoir. This valve is normally open permitting water from the steam reservoir to drain out. When the ON/OFF touch pad for the cavity is pressed (POWER indicator light comes on), the steam generator drain valve closes and the steam reservoir starts to fill until the water level reaches the HIGH WATER float/probe.

When the cavity ON/OFF touch pad is pressed again (POWER) indicator light turns off), the solenoid valve opens and drains the water from the steam reservoir. When water is drained from the steam reservoir(s), it passes through the drain box and then into the drain line.

When the unit is turned off by the control board, the system will drain for 3 minutes then refill to the High float/probe and drain. this is to remove the heat from the reservoir for cleaning and reduce any possible cavity warpage.
*If hot water is exiting, the drain fan thermal switch could close and energize circuit giving a White/Service light.

### 6. Low Water Level Detection

Below the HIGH WATER FLOAT/PROBE is the LOW WATER FLOAT/PROBE. This float/probe detects a low level of water in the steam reservoir. Because prolonged operation with less than the required amount of water in the steam reservoir could present a dangerous situation, the action is immediate.

When the LOW water level float/probe is uncovered OR not energized, shutdown of the steam reservoir will occur.

The Water Level Control Board and Low Probe or K4 Relay & Low Float monitors and shuts the unit down if reservoir water level is below the low float/probe.

## 3.1 Electric Model Installation

**WARNING**
**The unit must be installed by personnel who are qualified to work with electricity and plumbing. Improper installation can cause injury to personnel and/or damage to the equipment. The unit must be installed in accordance with applicable codes.**

**CAUTION**
**Do not install the unit with the rear vents blocked or within 2 inches of a heat source such as a braising pan, deep fat fryer, charbroiler or kettle.**

**To avoid drainage problems, level the unit front to back, or pitch it slightly to the rear.**

### 1. Electrical Supply Connection

a. **Panel Removal - Right side**
Open the wiring and control panel by removing screws from the right side panel. Slide the panel forward and set it aside.

b. **Supply Voltage**
The unit must be operated at the rated name plate voltage. The name plate can be found on the right side panel.

c. **Phase Selection**
Refer to steamer wiring diagram and element wiring on pages 3.7, 4.11 and 4.12 for wiring information.

**CAUTION**
**Each unit must have a separate ground wire for safe operation.**

d. **Terminal Block**
The terminal block for incoming power is located at the back of the control compartment. The ground terminal is located in the wiring compartment near the terminal block.

e. **Supply Wire**
The equipment grounding wire must comply with the National Electrical Code (NEC) requirements.The wiring diagram on the inside of the unit's right side cover gives directions for proper connection of the terminal block to the supply power. The proper wire must be used or the unit will not meet Underwriters Laboratories and NEC requirements. The electric hole is sized for a 1"conduit fitting on the SSB-3E and SSB-5E. The electric hole is sized for a 1-1/4" conduit fitting on the SSB-10E.

f. **Branch Circuit Protection**
**Each SmartSteam Boilerless Steamer, including individual units of stacked models, should have its own branch circuit protection and ground wire.**
Current and power demands for each unit are as shown below.

**AMPERAGE/RESISTANCE CHART**

| Model | Voltage/Phase | Amperage | Resistance |
|---|---|---|---|
| SSB-5E | 208 3-PHASE | 34 | 6.1 |
| SSB-5E | 240 3-PHASE | 29 | 8.3 |
| SSB-5E | 480 3-PHASE | 15 | 32 |
| SSB-5E | 208 1-PHASE | 58 | 3.6 |
| SSB-5E | 240 1-PHASE | 50 | 4.8 |
| SSB-3E | 208 3-PHASE | 25 | 8.3 |
| SSB-3E | 240 3-PHASE | 22 | 10.9 |
| SSB-3E | 480 3-PHASE | 11 | 43.6 |
| SSB-3E | 208 1-PHASE | 44 | 4.7 |
| SSB-3E | 240 1-PHASE | 38 | 6.3 |
| SSB-10E | 208 3-PHASE | 59 | 3.5 |
| SSB-10E | 240 3-PHASE | 51 | 4.7 |
| SSB-10E | 480 3-PHASE | 26 | 18.5 |

**WARNING**
**To avoid damage or personal injury, follow the wiring diagram exactly when connecting the unit.**

See page 3.3 for further installation instructions.

## 3.2 Gas Model Installation

**WARNING**
**The unit must be installed by personnel who are qualified to work with gas, electricity and plumbing. Improper installation can cause injury to personnel and/or damage to the equipment. The unit must be installed in accordance with applicable codes.**

**CAUTION**
**Do not install the unit with the rear vents blocked or within 2 inches of a heat source such as a braising pan, deep fat fryer, charbroiler or kettle.**

**To avoid drainage problems, level the unit front to back, or pitch it slightly to the rear.**

Although Groen recommends the SmartSteam Boilerless Steamer is installed near non-combustible surfaces, the following **minimum** clearances are to any surface, combustible or non-combustible.

Right Side . . . . . 2 inches
Left Side . . . . . 2 inches
Rear . . . . . 6 inches

However, for easy service, at least a 6 inch clearance should exist for right side access to gas shut-off valve.

The unit must be installed in a well-ventilated room with an adequate air supply. The steamer must be installed beneath a ventilation hood since gas combustion products exit the appliance.

Any item which might obstruct or restrict the flow of air for combustion and ventilation must be removed. Do not obstruct the flue cover or rear vents after installation.

The area directly around the appliance must be cleared of all combustible material. The installation must conform with local codes or, in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CSA B149.1

The unit and its individual shutoff valve must be disconnected from the gas supply system during any pressure testing of that system which has test pressures in excess of 1/2 PSI (3.45 kPa). It must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system which has test pressures equal to or less than 1/2 PSI (3.45 kPa).

### 1. Electrical Supply Connection

Provide 115 VAC, 60 HZ, 1 PH, 15 AMP service. Bring wire in through hole on the back panel. Each cavity requires a separate cord for connection. Local codes and/or the National Electrical Code should be observed in accordance with ANSI/NFPA 70. **AN ELECTRICAL GROUND IS REQUIRED.** The wiring diagram located in the service compartment and in this manual. Maximum load is 2-1/2 AMPs. In Canada, provide electrical service in accordance with the Canadian Electrical Code, CSA C22.2 Part 1 and/or local codes.

### 2. Gas Supply Connection

Connection to the gas supply shall be in accordance with the chart below. Supply pressure must be at least 4.5" W.C. (maximum 14" W.C.) for natural gas or 12" W.C. (maximum 14" W.C.) for LP gas. In Canada, the installation must conform to the Canadian Gas Code, CAN 1-B149, Installation Codes for Gas Burning Appliances and Equipment and/or local codes. Check all gas connections for leaks prior to unit operation.

**RATINGS FOR GAS SMARTSTEAM**

| MODEL | BTU | OPERATING PRESSURE | INCOMING GAS FEED RATE | |
|---|---|---|---|---|
| | | | MINIMUM | MAXIMUM |
| 3G Natural | 54,000 | 4.30" WC | 5" WC | 14" WC |
| 3G Propane | 54,000 | 10.5" WC | 12" WC | 14" WC |
| 5G Natural | 62,000 | 4.30" WC | 5" WC | 14" WC |
| 5G Propane | 62,000 | 10.5" WC | 12" WC | 14" WC |
| 10G Natural | 100,000 | 4.30" WC | 5" WC | 14" WC |
| 10G Propane | 100,000 | 10.5" WC | 12" WC | 14" WC |

See page 3.3 for further installation instructions.

## 3.3 Installation

Many of the problems associated with the degraded performance or non-operation of the SmartSteam Boilerless Steamer can be traced directly to improper installation and/or lack of proper and periodic cleaning–all of which is the responsibility of the customer.

This section is provided to determine that the equipment was installed correctly, to indicate the proper cleaning techniques are to be used by Groen customers and steamer test procedures.

It is to be expressly noted that ALL work associated with the installation and cleaning of the SmartSteam Boilerless Steamer is NOT covered by the Groen warranty provisions.

### 3. Water Connection

Make sure that the incoming water connection is made with a 3/4" N.H. COLD water supply hose. Rigid pipe is not required. The water pressure should be between 30 and 60 PSIG. Higher pressures will require the use of a pressure regulator. Make sure that all connections are tight with no leaks–no matter how small.

**NOTICE:** The quality of the water is a factor in the proper performance of the steamer. The water supply should have a minimum value of 30-40 parts per million of total dissolved solid (TDS). If water is too pure, probes will not sense unless float probes are installed.

### 4. Level Installation

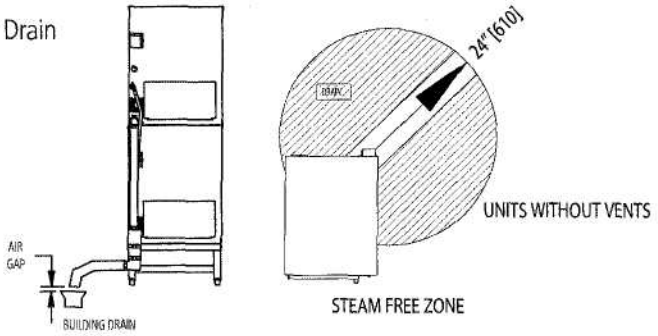
It is preferable that the steamer be installed level side to side (left to right) and slightly pitched (1 to 5 degrees) front to back, with the front always being lower than the rear. This allows the condensate water to go to the drain at the front of each cavity.

Make sure that all leg extensions are tight against the floor and that the steamer is supported on all four legs.

### 5. Drain Line Installation

The drain line should not be less than:
1-1/2" - for single units
2" (5E) - for double stacked units
There must be a 2 " air gap to the (non-pressurized) building drain. Make sure that the drain is sloped AWAY and DOWN from the steamer and that there are no obstructions in the line. Failure to observe these requirements may cause a water trap in the drain line and produce enough back pressure to prevent proper cavity draining–resulting in condensate water leaking from the door. Drain line must **NOT** be made of plastic pipe. It must be able to withstand boiling water.

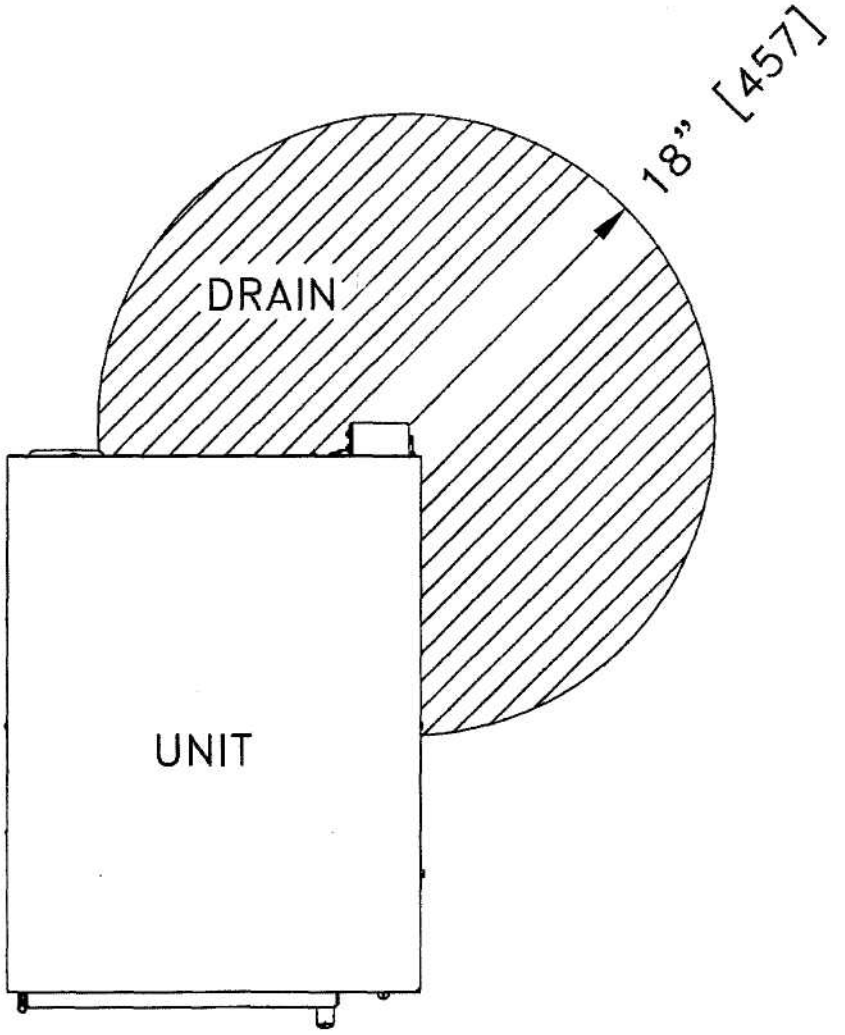
Proper Drain




Do not install rear of unit within a 24" radius from the drain outlet to any steam producing device. Do not install steamer directly above steam venting floor drains.

If the floor drain "only" services this steamer, then the drain may be located within the steam-free zone. The steam-free zone must be observed if other appliances cause steam at the floor drain.

# UNITS WITH VENTS CURRENT PRODUCTION STEAM FREE ZONE



## 3.4 Installation Checklist

### General

_____ Refer to page 3.3 for proper clearances.

_____ Do not install steamer directly above steam venting floor drain.

_____ Make sure the unit rear vents are not blocked and the unit is not within 2" of a heat source.

_____ Make sure steamer is level or pitched slightly forward.

_____ Check that fan is clean and clear of foreign materials.

### Gas Connection Checks

_____ Make sure installation conforms to local codes.

_____ Make sure steamer is installed under a ventilation hood. Check that the flue and all vents are free of obstruction.

_____ Check that gas supply is 5" W.C. (minute) to 14" W.C(max) for natural gas, and 12" W.C. (minute) to 14" W.C(max) for propane.

_____ Check that gas supply piping is 1/2" NPT.

_____ Verify operating gas pressure is per chart on page 3.2.

### Electrical Checks

_____ Make sure the steamer is properly grounded.

_____ Verify that the electrical connections conform to all local codes and the NEC requirements.

_____ Make sure the power supply branch circuit conforms to the specifications indicated on the steamer nameplate.

### Steamer Door Check

_____ Make sure the door gasket is making good contact with the cavity frame.

_____ Instruct operators to leave the door open when the steamer is shut down overnight or longer.

### Cold Water Supply Connections

_____ Make sure plumbing connections conform to local codes.

_____ If permitted by local codes, check that hose connection is flexible to allow steamer movement for servicing.

_____ Check inlet water pressure is 30-60 PSIG.

_____ Check that the water feed line is a minimum of 1/2" inside diameter

_____ Check water flow per chart on page 3.3.

### Drain Connections

_____ Make sure drain plumbing connections comply with local codes.

_____ Make sure drain line is 1-1/2"and 2-1/2" on stacked units.

_____ Check that drain line is suitable for boiling water. Make sure PVC is not being used for drain plumbing.

_____ Check that drain line is pitched downward.

_____ Make sure drain line is free of obstruction.

_____ Make sure drain is not connected to a building drain.

## 3.5 Steam Reservoir Cleaning

### Recommended Tools & Cleaners

- Nylon scrub pad, cloth or sponge. Scotch-Brite™ medium duty scrubbing sponges are preferred.
  **Do NOT use metal scrub pads.**
- Mild detergent soap.

### Cleaning Steps

1. If unit has a code, turn off at Touch Pad. Open the steamer door.
2. After the steamer has cooled completely, remove pans and pan racks.
3. Wipe down the steam lid after it has cooled completely, to remove any spilled food solids before you remove it for cleaning. Remove steam lid after cleaning.
4. Use a mild detergent to wipe down the entire steamer cavity, the pan racks, the steam lid and the probes.
   **NOTICE:** Use care when cleaning float probes. Floats can become disconnected from probe body if too much force is applied. Refer to label for orientation.
   Failure to clean the steamer as specified could negatively impact the performance of the steamer.
5. After cleaning the steamer, rinse the steamer to remove all traces of detergent and replace the pan racks and steam lid. Your SmartSteam Boilerless Steamer is now ready to use.

**WARNING**

**Disconnect the power supply before cleaning the outside of the steamer. Keep water and cleaning solutions out of controls and electrical components. Never hose or steam clean any part of the unit.**

**Avoid contact with any cleanser, deliming agent or degreaser as recommended by the supplier. Many are harmful. Read the warnings and follow the directions.**

**Even when the unit has been shut off, don't put hands or tools into the cooking chamber until the fan has stopped turning.**

**Don't operate the unit unless the removable partition has been put back in its proper location.**

**Do not use any cleaning agent that contains any sulfamic agent or any chloride, including hydrochloric acid (Hcl). To check for chloride content, see any material safety data sheets provided by the cleaning agent manufacturer.**

## 3.6 General Cleaning

To keep your SmartSteam Boilerless Steamer in proper working condition, use the following procedure to clean the unit. This regular cleaning will reduce the effort required to clean the steam reservoir and cavity.

### A. Suggested Tools

- Mild detergent or vinegar
- Stainless steel exterior cleaner such as Zepper®
- Cloth or sponge
- Spray bottle
- Nylon pad
- Towels
- Plastic disposable gloves

### B. Procedure

#### Exterior Cleaning

a. Prepare a warm solution of the mild detergent as instructed by the supplier. Wet a cloth with this solution and wring it out. Use the moist cloth to clean the outside of the unit. Do not allow freely running liquid to touch the controls, the control panel, any electrical part, or on the side or rear panels.
b. To remove material which may be stuck to the unit use plastic wool, a fiber brush, or a plastic or rubber scraper with a detergent solution.
c. Stainless steel surfaces may be polished with a recognized stainless steel cleaner such as "Zepper".

#### *Interior Cleaning*

Clean the unit daily or as residue builds upon the bottom of the oven cavity.

a. Press the Reference One or Touch Pad to turn the steamer off. Open the door.
b. Drain the water from the unit and allow the unit to cool before cleaning.
c. After the unit has cooled, remove pan and pan racks from the cavity.
d. Use a mild detergent to wipe down the steamer cavity, the probes on the Right panel, and the pan racks.

**WARNING**

**DO NOT DISASSEMBLE FLOAT PROBES DURING CLEANING, BREAKAGE WILL RESULT. USE HOT WATER TO WASH OUT PIVOT JOINTS OF FLOAT.**

e. Rinse the unit to remove detergent.
f. Attach pan racks. Unit is ready for use.

# HEAVY USER DELIMING MAINTENANCE PROGRAM

### Purpose

SmartSteam™ steamers are designed to require only a daily cleaning of the steamer cavity, pan racks, steam lid and probes to maintain full performance. Daily cleaning may not be sufficient to control scale build-up, when a SmartSteam™ steamer is operated in a heavy duty, continuous operation in an area with extreme hard water.

The following procedure outlines steps for optional periodic deliming for steamers in heavy duty applications and extreme water conditions. The frequency of the deliming depends upon the severity of the scale build-up and individual operators, but typically would not be more frequently than bi-monthly.

### Recommended Tools & Cleaners

a. Nylon scrub pad, cloth or sponge. Scotch-Brite™ medium duty scrubbing sponges are preferred. **DO NOT** use metal scrub pads.

b. Delimer/Descaler - Groen Delimer Descaler (P/N 114800), Commercial Lime Away or any equivalent. **DO NOT** use any cleaning or deliming agent that contains Citric Acid, any Sulfamic agent or any chloride, including Hydrochloric Acid.

**WARNING: Follow the handling instructions provided with the delimer/descaler, including the recommendations for protective rubber gloves, protective clothing/boots and protective eyewear.**

c. Vinegar - commercial vinegar (5 to 7% strength) has been used successfully by a number of SmartSteam™ users as a descaler. Follow the same instructions as when using delimer/descaler.

**IMPORTANT**

**Do not use any metal material (such as metal sponges) or metal implements (such as a spoon, scraper or wire brush) that might scratch any stainless steel surface. Scratches make the surface hard to clean and provide places for bacteria to grow. Do not use steel wool, which may leave particles imbedded in the surface which could eventually cause corrosion and pitting.**

### Cleaning Steps

**WARNING! ALLOW THE STEAMER TO COOL COMPLETELY BEFORE DELIMING. HOT SURFACES CAN CAUSE SEVERE BURNS.**

**STEP 1** Press the Touch Pad to turn the steamer off. Open the steamer door.

**STEP 2** Allow the steamer to cool completely before cleaning.

**STEP 3** After the steamer has cooled completely, remove the pans and racks.

**STEP 4** Remove any spilled foods from the steam lid. Remove the steam lid from the steam reservoir.

**STEP 5** Press ON/OFF to turn the steamer on. Wait for the steam reservoir to start to fill.

**NOTE: Use protective gear, including eyewear for the following steps involving delimer/descaler.**

**STEP 6** Add 1 cup of delimer/descaler (or vinegar) to the water in the steam reservoir and set the timer for 20 minutes. Close the steamer door.

**NOTE: ADDITIONAL AMOUNTS OF DELIMER AND LONGER TIME SETTINGS ARE NOT RECOMMENDED. THEY WILL NOT INCREASE THE EFFICIENCY OF THE PROCEDURE.**

**STEP 7** When the timer signals "DONE" and the beeper sounds, press the Touchpad to turn the steamer off. Open the steamer door and wait for the steam reservoir to drain.

**STEP 8** Press the Touch Pad to turn the steamer on and wait for the steam reservoir to again fill with water. Use a nylon scrub pad to remove the loosened scale.

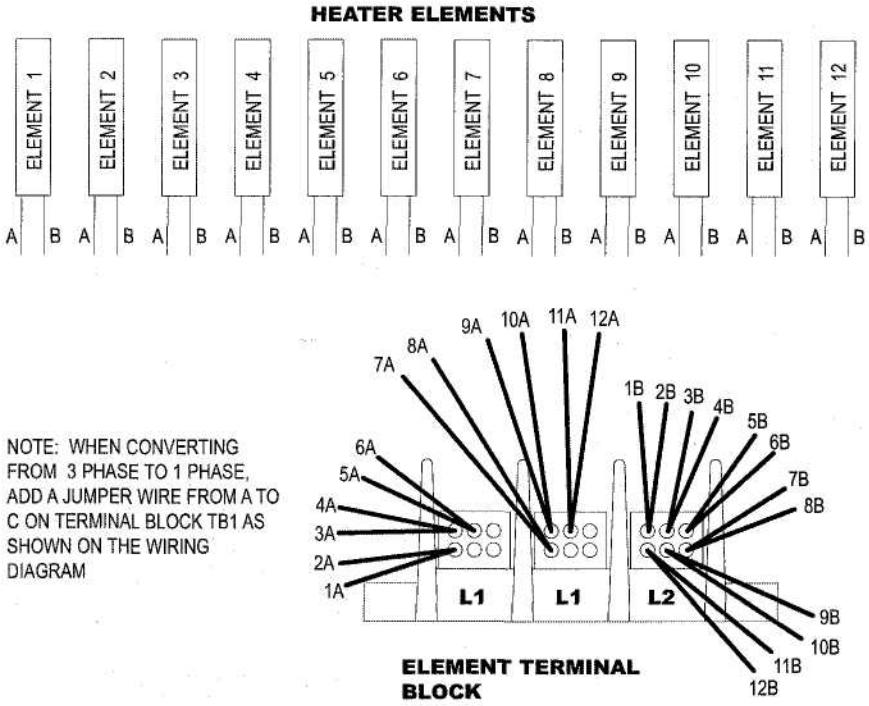
**STEP 9** Press the Touch Pad to turn the steamer off and drain the water from the steam reservoir.

**STEP 10** Wipe down steamer cavity and steam reservoir to remove all traces of scale and cleaning solution. Reinstall the pan racks and the steam lid.

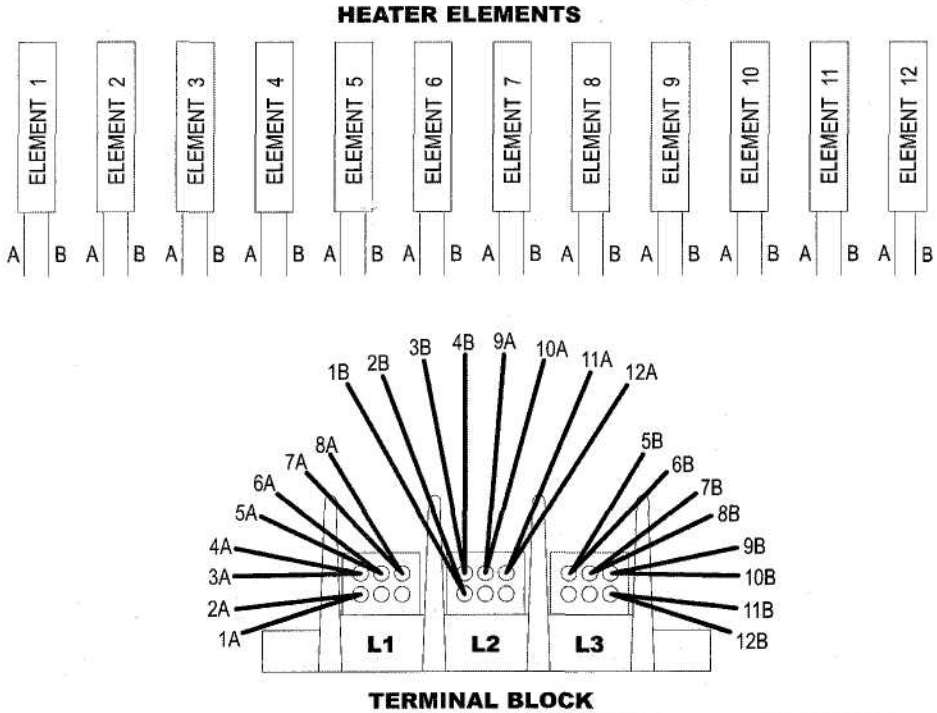
**NOTE: IF SCALE BUILD-UP STILL REMAINS, REPEAT THE PROCEDURE (STEPS 5 - 10) AS NECESSARY.**

## 3.7 Element Wiring SSB-5E

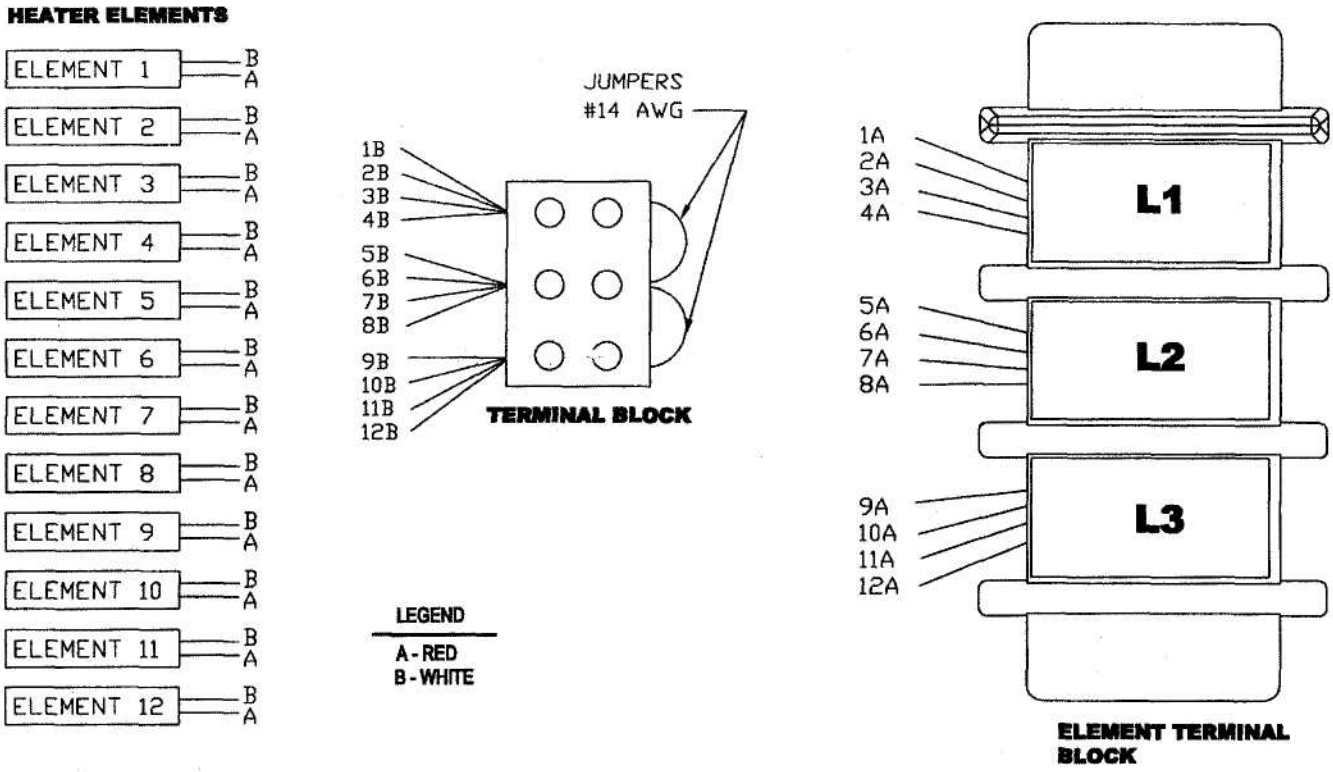
### GROEN SSB-5E ELEMENT WIRING - 1 PHASE



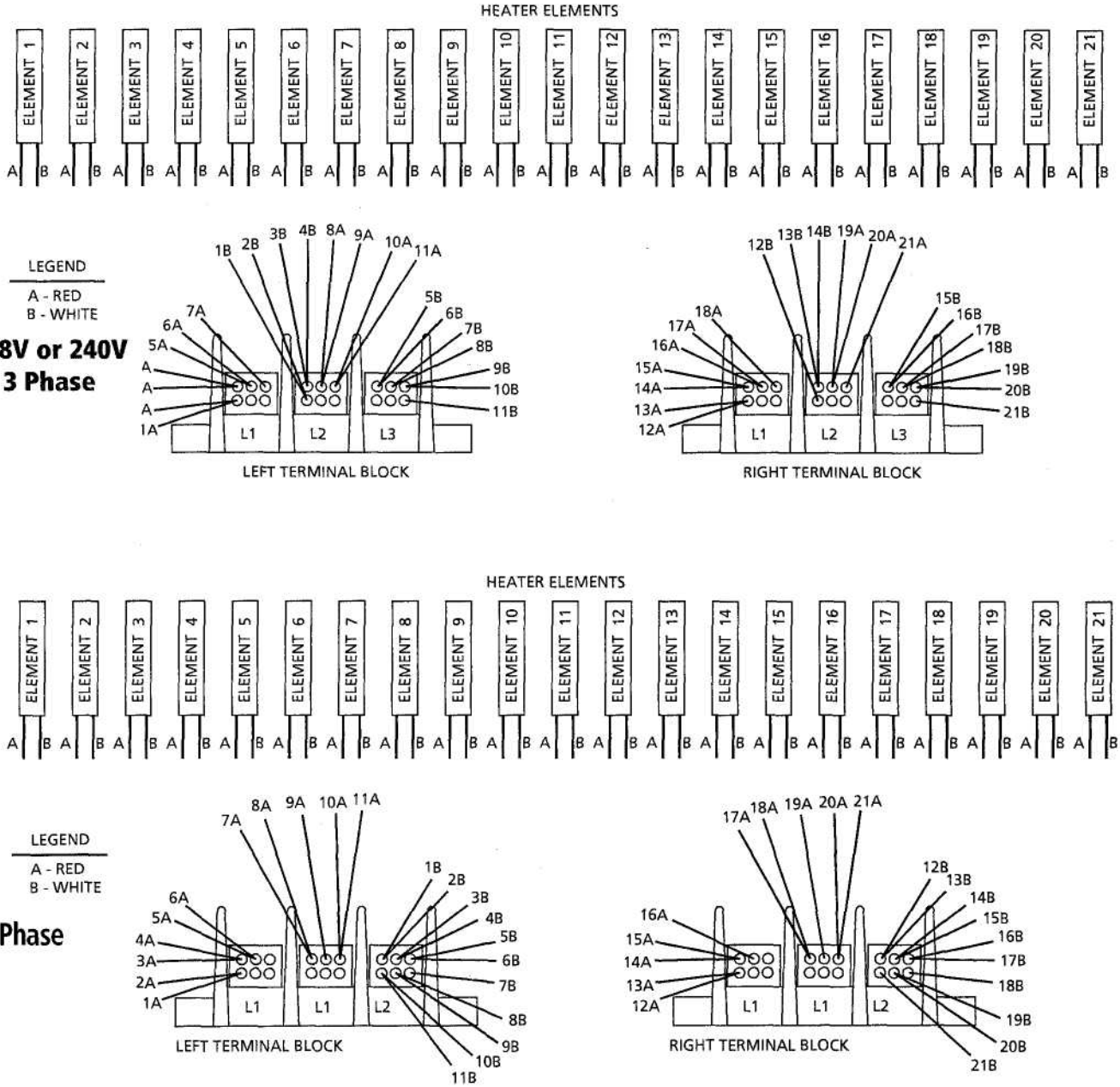

### GROEN SSB-5E ELEMENT WIRING - 208 or 240 3 PHASE



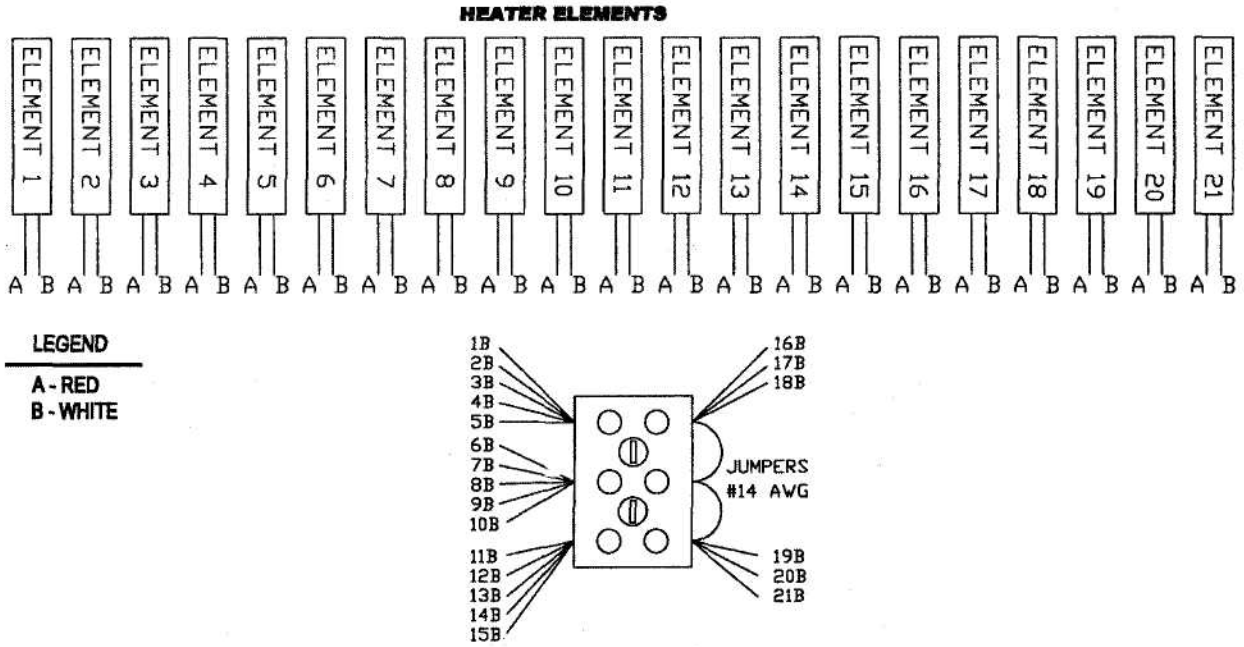
## GROEN SSB5E ELEMENT WIRING - 480V 3 PHASE
## USING 277V ELEMENTS IN WYE CONFIGURATION



## 3.7 Element Wiring SSB-10E



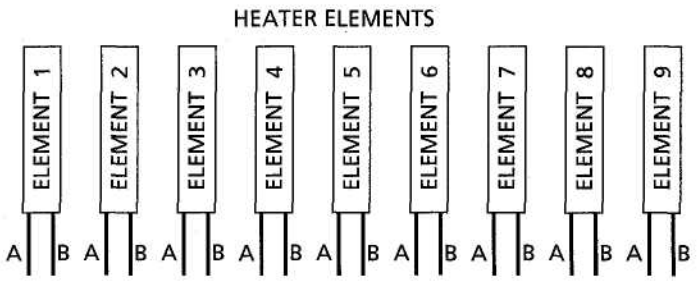
# GROEN SSB-10E ELEMENT WIRING - 480V 3 PHASE USING 277V ELEMENTS IN WYE CONFIGURATION




**LEFT ELEMENT TERMINAL BLOCK**

**RIGHT ELEMENT TERMINAL BLOCK**

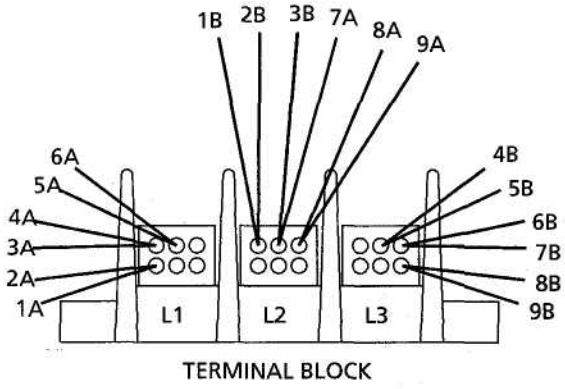
## 3.7 Element Wiring SSB-3E



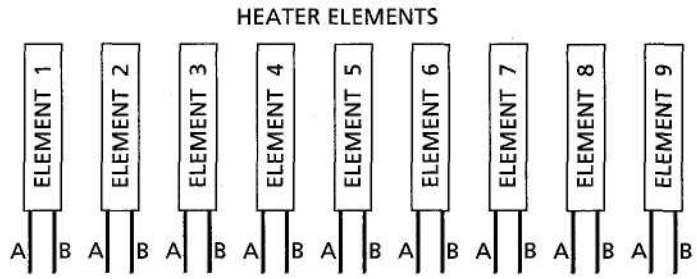

**208V or 240V 3 Phase**

LEGEND

A - RED
B - WHITE




TERMINAL BLOCK

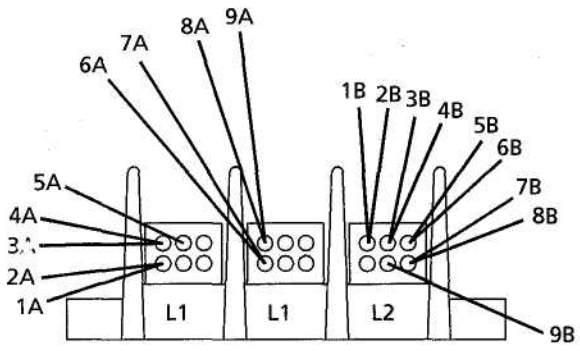



**1 Phase**

LEGEND

A - RED
B - WHITE

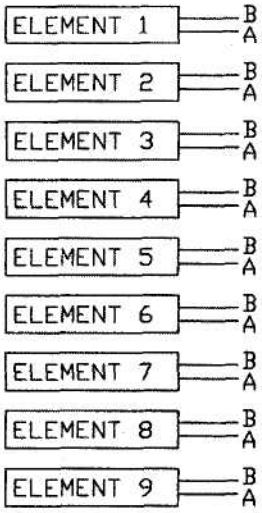
NOTE: WHEN CONVERTING FROM 3 PHASE TO 1 PHASE, ADD A JUMPER WIRE FROM A TO C ON TERMINAL BLOCK TB1 AS SHOWN ON THE WIRING DIAGRAM

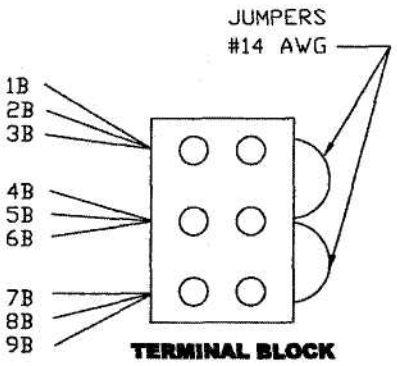



ELEMENT TERMINAL BLOCK

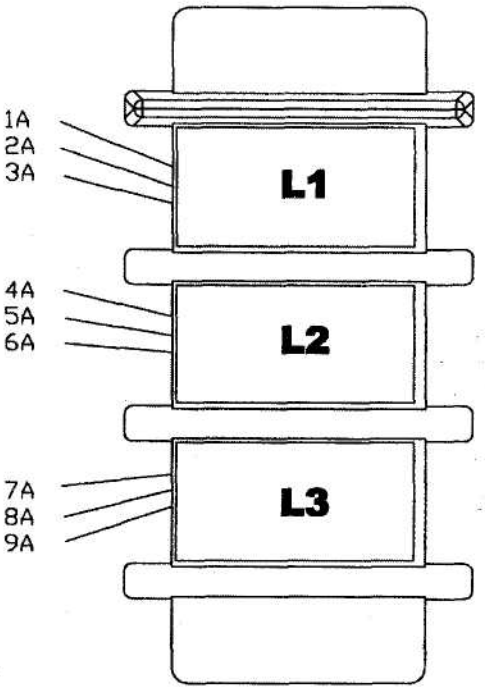
## GROEN SSB3E ELEMENT WIRING - 480V 3 PHASE USING 277V ELEMENTS IN WYE CONFIGURATION

**HEATER ELEMENTS**




**TERMINAL BLOCK**




**ELEMENT TERMINAL BLOCK**

**LEGEND**

A - RED
B - WHITE

**Procedure to Access Service Codes**

1. Turn unit off using the ON/OFF button on the touch pad control.
2. Press and hold the hidden button (located between Door/Lid and Hitemp lights) for 6 seconds.
3. Observe Ready light flash to start.
4. Count number of times Service light flashes.
5. Correlate with number in colum 1 of Error Code Table.

## 4.1 SmartSteam Error Codes

| ERROR | COMMENT | SHUTDOWN Fatal Error | BEEPER | LED | INDICATION |
|---|---|---|---|---|---|
| 1 | Fill to Low float/probe time exceeded / bad low probe | | Chirp | Flash Service Light once every 2 seconds | Clogged filter<br>Low water pressure<br>Bad float/probe<br>Bad fill drain<br>Open drain |
| 2 | Fill to High float/probe time exceeded / bad low float/probe | Drain then refill | Chirp | Flash Service Light once every 2 seconds | Clogged filter<br>Low water pressure<br>Bad probe<br>Bad fill drain<br>Open drain |
| 3 | Re-fill Make-up water time exceeded (recovery fill time or boil off rate | | Chirp | Flash Service Light once every 2 seconds | Clogged filter<br>Low water pressure<br>Bad float/probe<br>Bad fill drain<br>Open drain |
| 4 | Both water floats/probes failed | Fatal Error | On | Flash Service Light 3x / second | Lime<br>Bad fill valve |
| 5 | If error 3 occurred before error 4 Rev-B "use 5" (ML) | Fatal Error | On | Flash Service Light 3x / second | |
| 6 | Hi float/probe but no low float/probe | Fatal Error | On | Flash Door / Lid Light 3x / second<br>Flash Service Light 3x / second | Hi float/probe Satisfied with no Low float/probe |
| 7 | Between fill violation<br>Make-up water<br>Recovery time<br>Not used with float float/probe software | Fatal Error | On | Flash Service Light 3x / second<br>Flash Door / Li Light 3x / second | Make-up water fill time exceeded<br>Lime build-up |
| 8 | Drain time exceeded (fault) | Fatal Error | Chirp | Flash Service Light 3x / second | Failed blocked drain<br>2 float/probe false positive |
| 9 | Hot fill time exceeded | Fatal Error | On | Flash Service Light once every 2 seconds | Clogged filter<br>Bad float/probe<br>Failed fill drain<br>Fill Valve (Slow Fill)<br>Water Pressure |

## 4.2 SmartSteam Troubleshooting Procedure

Each test procedure builds on the prior ones. Always start at the beginning of this procedure, and continue until the results indicate a malfunction. Do not skip steps.

**WARNING: Disconnect electrical power before servicing.**

The indicator light table below will quickly point you to the problem area. If the codes or lights do not indicate the problem, use the troubleshooting procedures that follow.

**INDICATOR LIGHT TABLE**

| Light | Light Action | Indication |
|---|---|---|
| Power | On | Power is applied and On/Off switches are set to ON. |
| Door / Lid | On | Door open, bad door switch, or missing actuating magnet |
| Ready | On | Unit is at ready temperature |
| Hi-Temp | On | Heater or steam reservoir area overheated |
| Fan / White Service | On | Muffin fan may have failed, condensate not operating, hot water exiting. |
| Service and Door | Rapid flash and alarm | High float/probe grounded, Low float/probe both probes open, fill time exceeded |
| None (except Power) | Rapid flash and alarm | If unit will not fill, low float/probe grounded |

# TROUBLESHOOTING - Electric Models

GROEN

| SETUP | EXPECTED RESULTS | PROBABLE DEFECT | TEST or COMMENTS |
|---|---|---|---|
| Measure input voltage and compare to rating plate. | Input voltage is within 10% of rated voltage. | Wrong model (voltage) installed. | Notify customer |
| Check input power to determine if it is three phase or single phase. | Steamer wiring matches incoming power. | Wrong model ordered. Change wiring at terminal block to match incoming power. | When converting from three phase to single phase, do not exceed amperage of breaker or power cord / plug. |
| Disconnect or turn off water supply, open door, set bottom ON/OFF switch to ON, and touch pad ON/OFF switch to OFF. | 12vdc, 5vdc High float/probe and Low float/probe (lights) on circuit board are illuminated. | No line voltage | Standard test |
| | | Blown 6 amp fuse F1 or F2 | Standard test |
| | | Bottom ON/OFF switch | Standard test |
| | | *480v unit only-toroid circuit breaker* | *Reset breaker* |
| | | *480v unit only-toroid transformer* | *Measure 480vac in and 12vac +/- 20%vac out* |
| | | *12 volt transformer T2* | *Measure 208vac in and 12vac +/- 20%vac out* |
| | | Control board | Substitute to test |
| | | Incorrect wiring | Check wiring diagram |
| Press ON/OFF touchpad to ON | 24vac LED (light) on control board illuminates. | Breaker on 24 volt transformer | Reset breaker |
| | | 24 volt transformer T1 | Measure 208 or 240vac in and 24vac +/- 20% out |
| | | Overtemp shutdown control K1 | Measure across K1 coil terminals 0 to 1. If 12vdc and relay does not energize, K1 is bad. |
| | | Hi-Limit (auto-reset) | Hi-temp light will come on. Measure for continuity, normally closed. |
| | | Control board | Substitute to test |
| | | Incorrect wiring | Check per wiring diagram |
| Reconnect or turn on water supply | The low water float/probe light on the control board goes out after about 30 seconds. Muffin fan operates. | Low water float/probe | Float/probe measures open to ground without water. Short float/probe wire to ground to simulate water. |
| | | Water level board | Red light indicates power to board. Bypass to test. Disconnect wire to L1, move wire from NO-2 to NC-2, remove wire from H and NO-1 and jumper these two wires together. |

| SETUP | EXPECTED RESULTS | PROBABLE DEFECT | TEST or COMMENTS |
|---|---|---|---|
| | | Fill Valve | Fill valve is normally closed when water is below hi float/probe, 24VAC is applied to coil or valve and it opens. When water reaches hi-float/probe, the coil de-energizes. |
| | | Drain valve | Without power, the valve is open, when 24VDC is applied to the coil or the valve, it energizes to prevent draining. |
| | | Muffin fan | Verify 24vac across muffin fan coil. |
| | | Control board | Substitute to test |
| | | Incorrect wiring | Check per wiring diagram |
| | About 15 seconds after the low float/probe light goes out, the high float/probe light goes out. **Caution:** If control does not see high float/probe, the cavity will fill for 2 minutes, error will occur and unit will shut off. | The high float/probe light goes out but momentarily comes on again. | The controls are verifying float/probe operation. This is normal. |
| | | High water float/probe | Float/probe measures open to ground without water. Short probe wire to ground to simulate water. |
| | | Control board | Substitute to test |
| | | Incorrect wiring | Check per wiring diagram |
| Set timer to OFF and close door | Audible click as contactor pulls in | Door switch | Measure from J9 pin 1 to 2. 12vdc with door open, zero (low) voltage with door closed. If voltage is not zero, check door switch, door magnet, light and timer board, wiring. |
| | | Control Board | Measure for 12VDC out. |
| | | Incorrect wiring | Check per wiring diagram |
| | | Water level board | Red light indicates power to board. Bypass to test. Disconnect wire to L1, move wire from NO-2 to NC-2, remove wire from H and NO-1 and jumper these two wires together. |
| | | Contactor K3 | Verify 24VAC across K3 coil. |
| | | Light and timer board | Substitute to test |
| | About 15 minutes after closing the door, the ready light comes on. | Ready thermostat | Normally closed, opens at about 180° F. |
| | | Contactor K3 | Verify 24VAC across K3 coil. |

# TROUBLESHOOTING - Electric Models

GROEN

| SETUP | EXPECTED RESULTS | PROBABLE DEFECT | TEST or COMMENTS |
|---|---|---|---|
| | | Heater element | Measure amperage for each leg and compare to chart on page 3-1 If amperage is incorrect, disconnect power, disconnect leads then measure heater resistance (cold) and compare to chart on page 4-10. If resistance is not within 20% specified, replace heater element. |
| | | Incorrect wiring | Check per wiring diagram |
| | With ready light on, condensate water flows. | Condensate spray valve | Normally closed. Opens when 24vac is applied. |
| | | Control board | Check for 24VAC output |
| | | Incorrect wiring | Check per wiring diagram |
| Set timer to ON | ON light illuminates | Timer | Substitute to test |
| | | Control board | Substitute to test |
| | | Light and timer board | Substitute to test |
| | | Incorrect wiring | Check per wiring diagram |
| Set timer to 1 minute. | Timer times out, done light illuminates, motor stops, condensate stops and unit beeps until door is opened or timer is changed to another setting. | Control board | Substitute to test |
| | | Light and timer board | Substitute to test |
| | | Timer | Substitute to test |
| | | Incorrect wiring | Check per wiring diagram |
| Set time on timer and let run for about 10 seconds | Open door and verify fan is rotating (fan will gradually stop when door is opened). | Start capacitor | Standard test |
| | | Internal thermal protector on fan motor | Measure black to white motor leads. 35 +/- 20% ohms |
| | | Fan motor | Measure orange to brown motor leads. 35 +/- 20% ohms. Red to blue 42 +/- 20% ohms. |
| | | Control board | Substitute to test |
| | | Incorrect wiring | Check per wiring diagram |
| Turn ON/OFF touch pad to OFF | Cavity does not drain until power is turned off | Drain valve | Drain valve is normally open until 12vdc is applied, then it closes. |
| | | Control board | Measure for 12vdc out |
| | | Incorrect wiring | Check per wiring diagram |
| | No defect found but customer complaint is that unit is slow to heat. | Customer may be opening door frequently to add or remove food | Talk to customer |

**CONGRATULATIONS! The unit is operating correctly.**

# TROUBLESHOOTING - Gas Models

GROEN

| SETUP | EXPECTED RESULTS | PROBABLE DEFECT | TEST or COMMENTS |
|---|---|---|---|
| Check incoming gas supply and measure input voltage | 120 vac incoming power Recommended incoming gas pressure. | Insufficient gas pressure or wrong voltage | See chart on page 3.2 |
| | | Verify data plate for type gas supplied. (Natural or Propane) | Notify customer if incorrect |
| | | Gas inlet hose too small | |
| Disconnect or turn off water supply, open door, set bottom ON/OFF switch to ON, and touch pad ON/OFF switch to OFF. | 12VDC and 5VDC LED (light) and hi-probe and low probe lights on circuit board are illuminated | No line voltage | Standard test |
| | | Blown 6 amp fuse F1 or F2 | Standard test |
| | | Bottom ON/OFF switch | Standard test |
| | | 12 volt transformer T2 | *Measure 120vac in and 12vac +/- 20%vac out* |
| | | Control board | Substitute to test |
| | | Incorrect wiring | Check wiring diagram |
| | | Relay K2 | Substitute to test |
| Press ON/OFF touchpad to ON. | 24VAC LED on control board illuminates | 24 volt transformer T1 | Reset breaker on transformer or substitute to test |
| | | Hi-Limit (auto-reset) | Hi-Limit light comes on. Measure for continuity, normally closed |
| | | Overtemp shutdown control K1 | Measure across K1 coil terminals 0 to 1. If 12vdc and relay does not energize, K1 is bad. |
| | | Control board | Substitute to test |
| | | Incorrect wiring | Check per wiring diagram |
| Reconnect or turn on water supply | The low water float/probe light on the control board goes out after about 30 seconds and muffin fan operates | Low water float/probe | Float/probe measures open to ground without water. Short float/probe wire to ground to simulate water |
| | | Water level board | Red light indicates power to board. Bypass to test. Disconnect wire to L1, move wire from NO-2 to NC-2, remove wire from H and NO-1 and jumper these two wires together. |
| | | Fill valve | Fill valve is normally closed. When water is below high probe, 24vac is applies to coil of valve an it opens. When water reaches high probe the coil de-energizes. |

| SETUP | EXPECTED RESULTS | PROBABLE DEFECT | TEST or COMMENTS |
|---|---|---|---|
| | | Drain valve | Without power, the drain valve is open. When 24VDC is applied to the coil of the valve, it energizes to prevent draining. |
| | | Muffin fan | Verify 24VAC across muffin fan Check per wiring diagram |
| | | Control board | Substitute to test |
| | | Incorrect wiring | Check per wiring diagram |
| | About 15 seconds after the low float/probe light goes out, the high float/probe light goes out. **Caution:** If control does not see high float/probe, refer to time error chart on page 4.1. | The high float/probe light goes out but momentarily comes on again | The controls are verifying float/probe operation. This is normal. |
| | | High water float/probe | Float/probe measures open to ground without water. Short float/probe wire to ground to simulate water. |
| | | Control board | Substitute to test |
| | | Incorrect wiring | Check per wiring diagram |
| Set timer to OFF and close door | Audible click | Door switch | Measure from J9 pin 1 to 2. 12vdc with door open, zero (low) voltage with door closed. If voltage is not zero, check door switch, door magnet, light and timer board, wiring. |
| | | Water level board | Red light indicates power to board. Bypass to test. Disconnect wire to L1, move wire from NO-2 to NC-2, remove wire from H and NO-1 and jumper these two wires together. |
| | | K2 Relay | Verify 24vac across K2 coil |
| | | Light & timer board | Substitute to test |
| | | Control Board | Substitute to test |
| | | Incorrect wiring | Check per wiring diagram |
| | | Hot surface ignitor | If K2 drops out after 3 seconds, measure voltage to hot surface ignitor. It should glow red. If not, it is defective. |

# TROUBLESHOOTING - Gas Models

GROEN

| SETUP | EXPECTED RESULTS | PROBABLE DEFECT | TEST or COMMENTS |
|---|---|---|---|
| | | Flame sensor | Connect Microampmeter in series with flame sensor. With burner on, meter should read at least .2 microamps at start-up and increase slightly as unit heats up. If microamps are low, flame sensor is mislocated or defective. |
| | | Ignition module | Substitute to test |
| | | Gas valve | Measure gas pressure output of the gas valve. If incoming pressure is correct but outgoing pressure is not stable according to chart on page 3.2, replace the gas valve. |
| | | Gas valve energized | Verify 12VDC across gas valve |
| | About 15 minutes after closing the door, the ready light comes on. | Ready thermostat | Normally closed. Opens at about 180 degrees F. |
| | | Incorrect orifice size | Check orifice sizes in chart on page 4-11. |
| | | K2 relay | Substitute to test |
| | | Incorrect wiring | Check per wiring diagram |
| | With ready light on, condensate water flows. | Condensate spray valve | Normally closed. Opens when 24VAC is applied. |
| | | Control board | Check for 24VAC output |
| | | Incorrect wiring | Check per wiring diagram |
| Set timer to ON | ON light illuminates | Timer | Substitute to test |
| | | Control board | Substitute to test |
| | | Light and timer board | Substitute to test |
| | | Incorrect wiring | Check per wiring diagram |
| Set timer to 1 minute. | Timer goes out, done light light illuminates, and unit beeps until door is opened or timer is changed to another setting. | Timer | Substitute to test |
| | | Control board | Substitute to test |
| | | Light and timer board | Substitute to test |
| | | Incorrect wiring | Check per wiring diagram |
| Set time on timer and let run for about 10 seconds | Open door and verify fan is rotating (fan will gradually stop when door is opened. | Start capacitor | Standard test |
| | | Internal thermal protector on fan motor | Measure black to white motor leads. 35 +/- 20% ohms |

| SETUP | EXPECTED RESULTS | PROBABLE DEFECT | TEST or COMMENTS |
|---|---|---|---|
| | | Fan motor | Measure orange to brown motor leads. 35 +/- 20% ohms. Red to blue 42 +/- 20% ohms. |
| | | Control board | Substitute to test |
| Turn ON/OFF touch pad to OFF | Cavity does not drain until power is turned off | Incorrect wiring | Check per wiring diagram |
| | | Drain valve | Drain valve is normally open until 24vdc is applied, then it closes. |
| | | Control board | Measure for 12vdc out |
| | | Incorrect wiring | Check per wiring diagram |
| | No defect found but customer complaint is that unit is slow to heat. | Customer may be opening door frequently to add or remove food | Talk with customer |

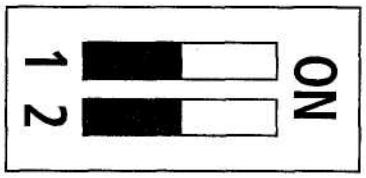
**CONGRATULATIONS! The unit is operating correctly.**

## 4.2 DIP Switch Settings

| Model | SWITCH 1 | SWITCH 2 |
|---|---|---|
| SSB-3E | OFF | OFF |
| SSB-3G | OFF | OFF |
| SSB-5E | OFF | ON |
| SSB-5G | OFF | OFF |
| SSB-10E | ON | ON |
| SSB-10G | ON | ON |
| ALL W/FLOATS | OFF | OFF |

Switch position has no function when Rev D chip is used

### Switch Orientation




### DRAIN TIMES BEFORE ERROR

| Model | Minutes |
|---|---|
| SSB-3E | 6 |
| SSB-3G | 11 |
| SSB-5E | 19 |
| SSB-5G | 6 |
| SSB-10E | 20 |
| SSB-10G | 20 |
| ALL W/FLOATS | 6 |

### FILL TIMES BEFORE ERROR

| Model | To Low Probes | | Low Probes to High Probe | | Total | |
|---|---|---|---|---|---|---|
| | REV B | REV C OR D | REV B | REV C OR D | REV B | REV C OR D |
| SSB-3E | 10 minutes | | 1.5 minutes | | 11.5 minutes | |
| SSB-3G | 10 minutes | | 1.5 minutes | | 11.5 minutes | |
| SSB-5E | 18 minutes | | 7 minutes | | 25 minutes | |
| SSB-5G | 10 minutes | | 1.5 minutes | | 11.5 minutes | |
| SSB-10E | 25 minutes | | 3 minutes | | 28 minutes | |
| SSB-10G | 25 minutes | | 3 minutes | | 28 minutes | |
| ALL W/FLOATS | | 3.5 minutes | | 1 minute | | 4.5 minutes |

## AMPERAGE / RESISTANCE CHART

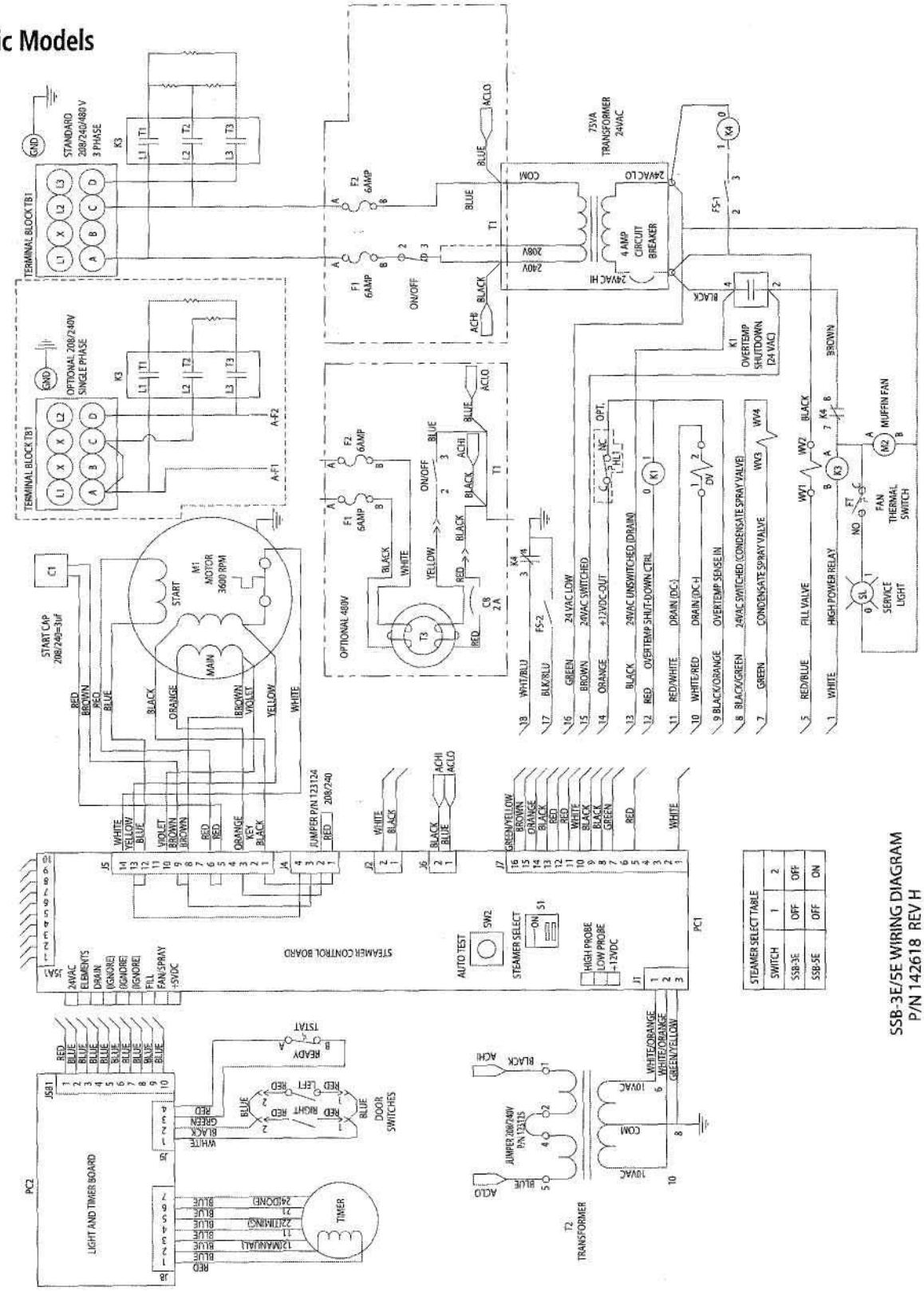
| Model / Voltage / Phase | | Amperage | Resistance |
|---|---|---|---|
| SSB-5E | 208 Three Phase | 34 | 6.1 |
| SSB-5E | 240 Three Phase | 29 | 8.3 |
| SSB-5E | 480 Three Phase | 15 | 32 |
| SSB-5E | 208 Single Phase | 58 | 3.6 |
| SSB-5E | 240 Single Phase | 50 | 4.8 |
| SSB-3E | 208 Three Phase | 25 | 8.3 |
| SSB-3E | 240 Three Phase | 22 | 10.9 |
| SSB-3E | 480 Three Phase | 11 | 43.6 |
| SSB-3E | 208 Single Phase | 44 | 4.7 |
| SSB-3E | 240 Single Phase | 38 | 6.3 |
| SSB-10E | 208 Three Phase | 59 | 3.5 |
| SSB-10E | 240 Three Phase | 51 | 4.7 |
| SSB-10E | 480 Three Phase | 26 | 18.5 |

## GAS ORIFICE SIZE CHART (ALTITUDE ABOVE SEA LEVEL IN FEET)

| Natural | 5G Size | 5G P/N | 10G Size | 10G P/N | 3G Size | 3G P/N |
|---|---|---|---|---|---|---|
| Blank | Blank | 145645 | Blank | 145645 | Blank | 145645 |
| 0 - 2000 | #39 (.0995) | 145646 | #41 (.0960) | 145993 | 2.40 mm (.0945) | 147132 |
| 2001-4000 | #40 (.0980) | 145647 | 3/32 (.0938) | 145648 | 2.35 mm (.0925) | 147133 |
| 4001-6000 | 3/32 (.0938) | 145648 | 2.25 mm (.0886) | 145994 | 2.25 mm (.0886) | 145994 |
| 6001-8000 | 2.30 mm (.0906) | 145649 | 2.15 mm (.0846) | 145995 | #44 (.0860) | 147134 |
| **Propane** | **5G Size** | **5G P/N** | **10G Size** | **10G P/N** | **3G Size** | **3G P/N** |
| 0 - 2000 | 1.65 MM (.0650) | 145716 | 1.45 mm (.0571) | 145996 | #53 (.0595) | 145986 |
| 2001-4000 | 1/16 (.0625) | 145717 | #54 (.0550) | 145997 | 1.50 mm (.0591) | 145719 |
| 4001-6000 | 1.55 mm (.0610) | 145718 | 1.35 mm (.0531) | 145998 | 1.45 mm (.0571) | 145996 |
| 6001-8000 | 1.50 mm (.0591) | 145719 | #55 (.0520) | 145999 | #54 (.0550) | 145997 |

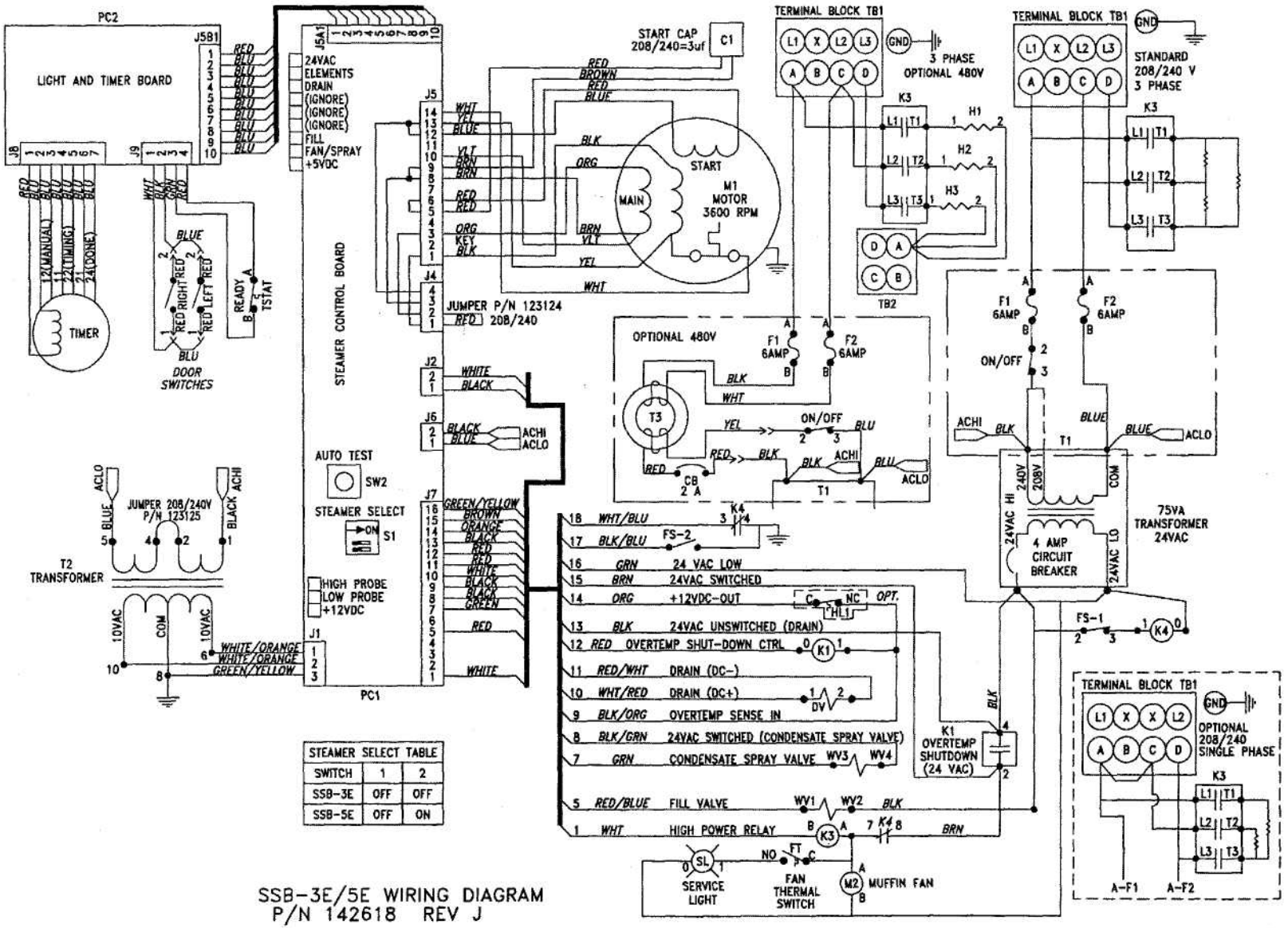
## 4.3 Electric Models

### 4.3.1 3/5 Pan Electric with Float Probes MSC Serial Production




SSB-3E/5E WIRING DIAGRAM
P/N 142618 REV H

# 4.3.1A 3/5 Pan Electric with Float Probes
# MSD Serial Production

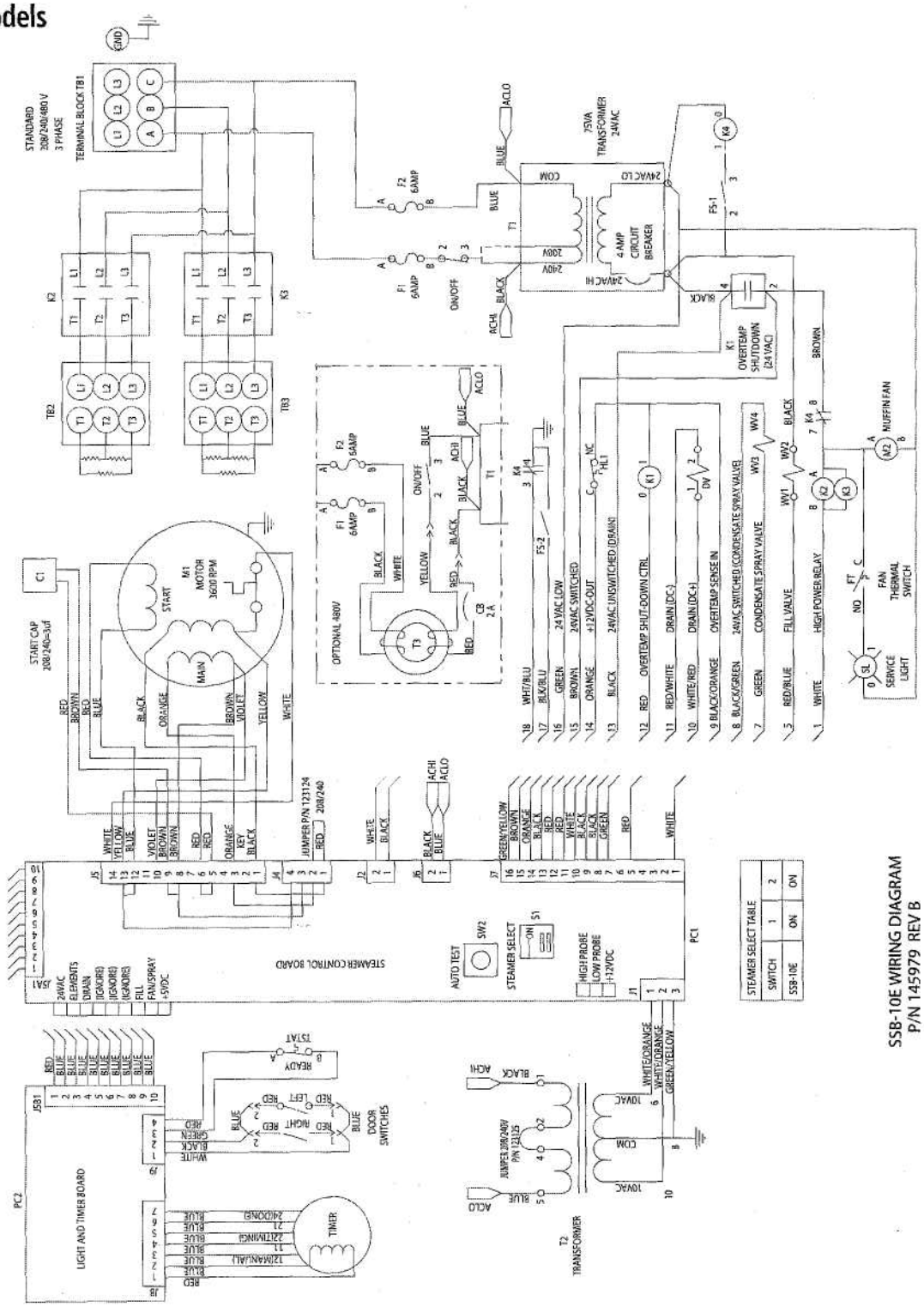



| STEAMER SELECT TABLE | | |
|---|---|---|
| SWITCH | 1 | 2 |
| SSB-3E | OFF | OFF |
| SSB-5E | OFF | ON |

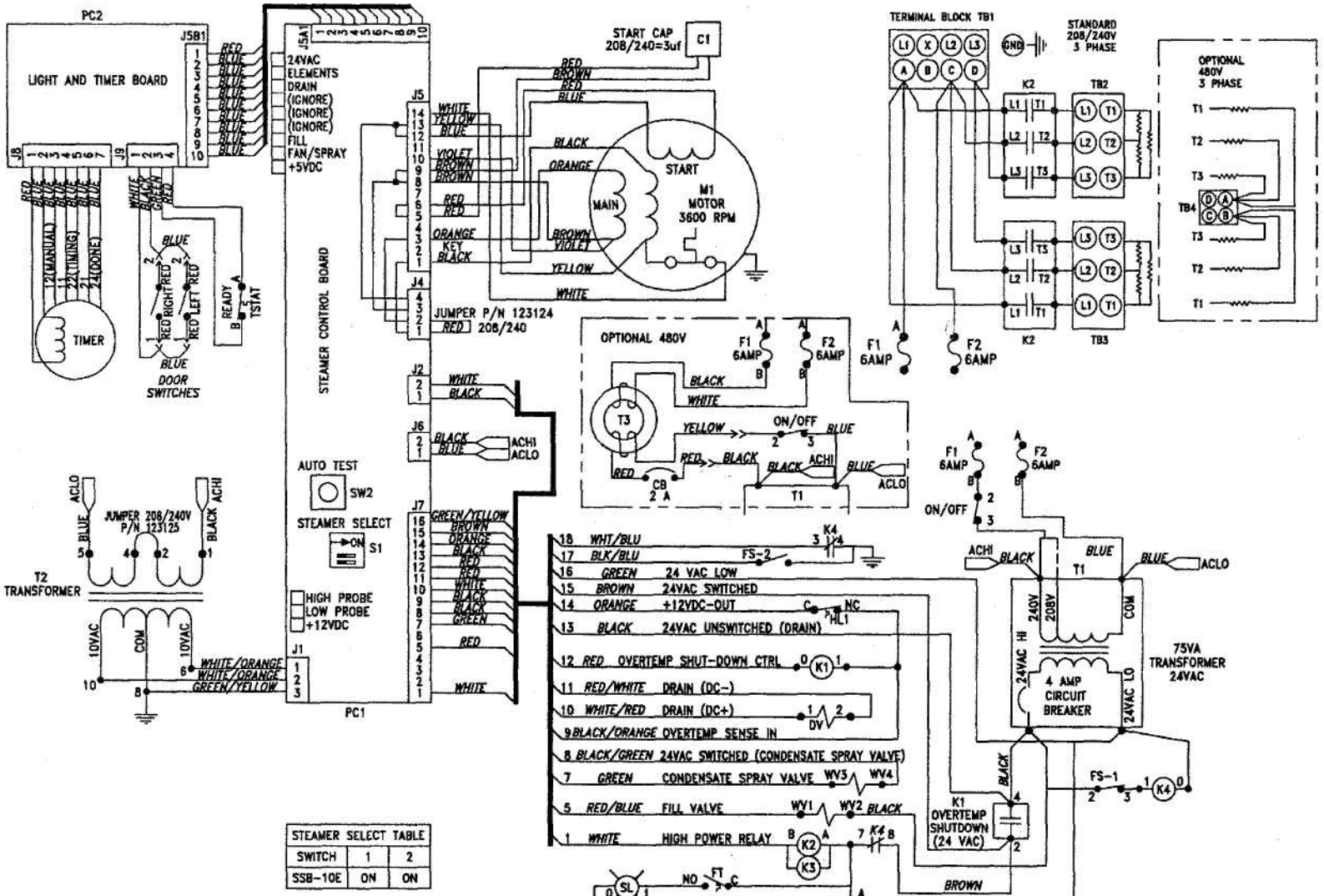
SSB-3E/5E WIRING DIAGRAM
P/N 142618 REV J

## 4.3 Electric Models

### 4.3.2 10 Pan Electric with Float Probes MSC Serial Production



# 4.3.2A 10 Pan Electric with Float Probes
# MSD Serial Production

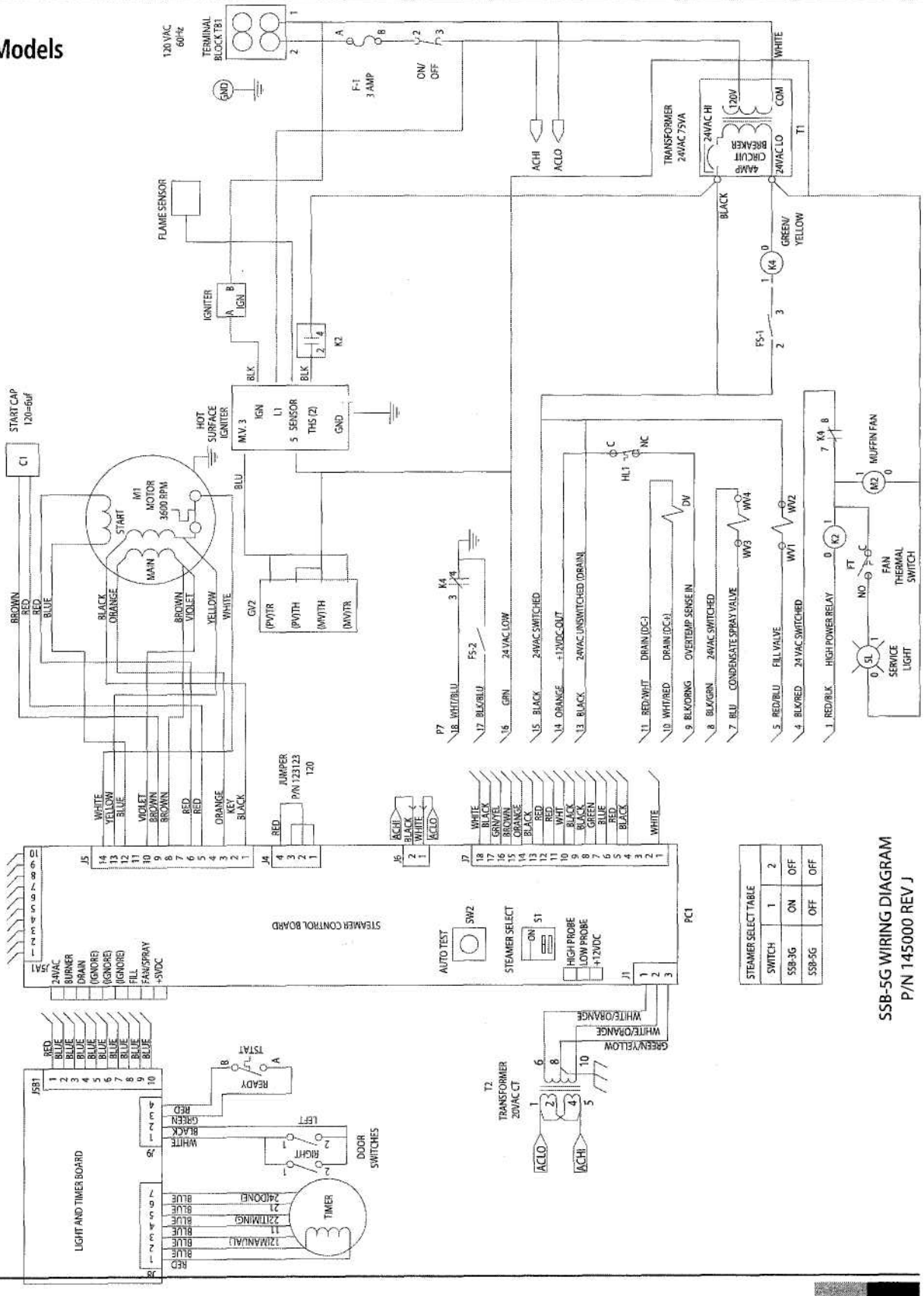



| STEAMER SELECT TABLE | | |
|---|---|---|
| SWITCH | 1 | 2 |
| SSB-10E | ON | ON |

SSB-10E WIRING DIAGRAM
P/N 145979 REV C

## 4.4 Gas Models

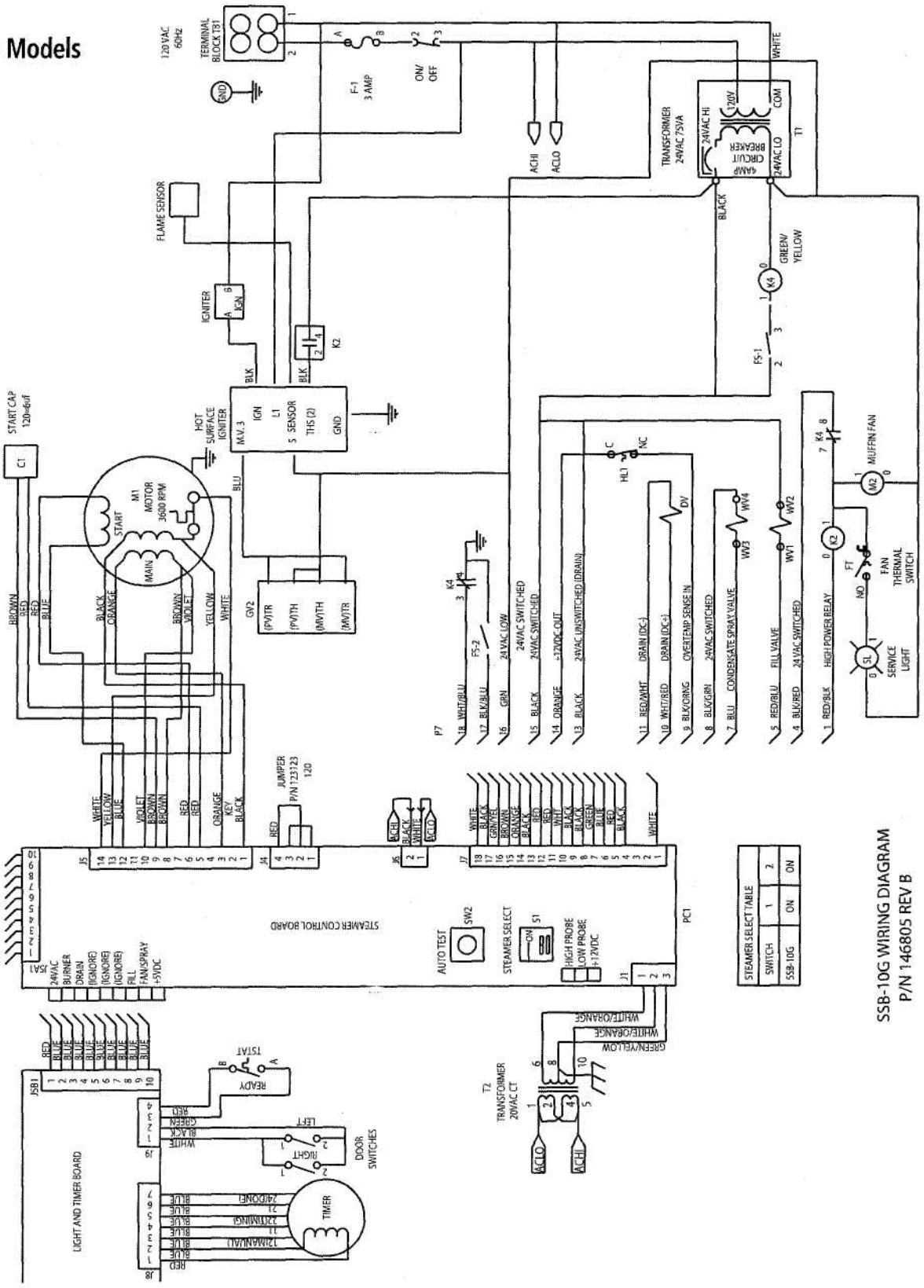
### 4.4.1 3/5 Pan Gas-Fired with Button Probes MSC Serial Production




SSB-5G WIRING DIAGRAM
P/N 145000 REV J

## 4.4 Gas Models

### 4.4.3 10 Pan Gas-Fired with Float Probes
### MSC Serial Production



## 5.1 General Information

This section provides common removal and installation procedures for parts used in more than one model of SmartSteam Boilerless Steamers. When Part Numbers differ by Steamer Model, the Part Numbers are not given in this section.

The following procedures are based upon having access to the steamer on all four sides. If the steamer is installed between other appliances and there is not enough room on the sides for access, the steamer must be pulled out from its position to gain proper access.

Care should be taken in moving the steamer so as not to stress or pull on the electrical, gas, and water connections.

**WARNING**
**After servicing gas piping on gas models, check for gas leaks before putting unit back in service.**

## 5.2 Cavity Compartment Side Panels

For Part Number, see section on the Steamer Model

**Removal**

1. With a flat blade screw driver remove the two 10-32 screws on the lower edge of the panel and one at the top edge (at the center of the top panel overhang). The panel is retained to the steamer by these three screws and three spring-like clips at the rear edge.
2. Once the screws are removed, the panel can be pulled forward about 1 inch, then lowered from behind the top panel overhang.

## 5.3 Top Cover

For Part Number, see section on the Steamer Model

**Note:** Under normal conditions the top cover should never have to be removed. The most likely reason for removing it is if the panel itself has been damaged by a falling object.

1. Remove right side and left side panels
2. At the front on each side, remove the screw holding a top cover retainer (see illustration) to the top cover. Then slide the cover forward until clear of the rear clips, and lift off.

**ASSEMBLY TIP** In replacing the top cover, make sure that both retainers are replaced and screwed down tight.

## 5.4 Steamer Control PC Board P/N 142778

**WARNING**
**Disconnect the steamer from electric power before beginning any service procedures.**

**Removal**

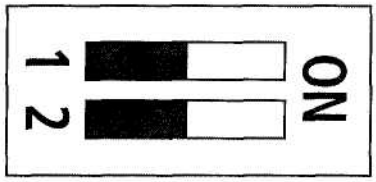
1. Unplug the following connectors: J1, J2, J5, J5A1, J6 and J7
2. Using a 5/16" socket, remove five 6/32" lock nuts and remove the board from five studs on the front panel. Be careful not to lose the plastic washers below each nut.
3. Remove voltage select jumper J4, and save for installation on new board.

**Installation**

4. On the new circuit board, set steamer select switch S1 and S2 for the model of steamer the board is being installed in:

| Model | SWITCH 1 | SWITCH 2 |
|---|---|---|
| SSB-3E | OFF | OFF |
| SSB-3G | ON | OFF |
| SSB-5E | OFF | ON |
| SSB-5G | OFF | OFF |
| SSB-10E | ON | ON |
| SSB-10G | ON | ON |
| ALL W/FLOATS | OFF | OFF |

**Switch Orientation**




5. Install voltage select jumper J4.
6. Position the board on five studs below the timer.
7. Install 6/32" lock nuts with washers. Use a 5/16" socket to tighten them in place.
8. Insert jacks J1, J2, J5, J5A1, J6 and J7 in the same connector locations as per removal. Press firmly to make sure the jack is fully seated on the board.

## 5.5 Light and Timer PC Board P/N 137233

**Removal**

1. Unplug the following connectors: J5B1, J8 and J9
2. Using a 5/16 " socket, remove two 6/32" lock nuts and remove the board from three studs on the front panel.

**Installation**

3. Position the board on three studs above the timer.
4. Install 6/32" lock nuts onto the and washers studs and tighten in place using a 5/16" socket.
5. Insert jacks J5B1, J8 and J9 in the same connector locations as per removal. Press firmly to make sure the jack is fully seated on the board.

## 5.6 Steam Reservoir Drain Valve P/N 071234

**Note:** When the steam reservoir drain valve is deenergized or OPEN), the silicone hose can freely slide through the valve housing. The steam reservoir drain valve is located to the right of the steamer cavity.

**Removal**

1. Turn off power and disconnect steamer from branch circuit. Remove right side panel. Let steamer drain completely.
2. Using spring clamp pliers, disconnect ONE END of the silicone drain hose by loosening the drain hose clamp from the drain fitting coming from the cavity drain. Remove clamp.
3. Unplug the valve electrical wires.
4. With a 5/16 inch nutdriver, remove the two 10-32 screws holding the drain valve to the bracket on the steamer base.
5. Remove the two 10-32 screws and remove the valve from the bracket.
6. Loosen the clamp and remove the other end of the silicone hose from the drain box. Inspect the hose for any damage or lime buildup. Clean or replace the hose if required, then reattach to the steam reservoir drain fitting.

**Installation**

7. Attach new drain valve to valve bracket. Slide the silicone hose through the drain valve housing and install hose clamp over the exposed end of the hose. Check that the hose is straight and not twisted.
8. Fit the exposed end of the silicone hose onto the elbow of the cavity drain. Using spring clamp pliers, position and tighten the hose clamp.
9. Plug the electrical leads of the valve into the wiring harness. Connect steamer to branch circuit, and turn on power.

**Testing**

Operate steamer and allow steam reservoir to fill. Check for leaks and observe if drain valve fully closes. Turn off steamer and observe that drain valve opens and the steam reservoir drains.

**10.** Reinstall right side panel.

## 5.7 Timer Assembly Timer Fastener Nut Timer Knob

**Removal**

1. Shut off power to steamer.
2. From the front of the steamer, remove the knob from the timer. Under the knob is a hexagonal nut which holds the time mechanism to the steamer. Note that there is a flat on the timer shaft which corresponds to a frictional mounting hole on the knob.
3. Unplug wires from the five timer mechanism terminals and the two black timer motor leads.
4. With a 9/16" open-ended wrench, remove the hex nut holding the timer in place. The timer may then be removed from inside the compartment.
5. **NOTE:** Right below the timer shaft, the timer has a small plastic disk molded onto the case. There is a corresponding hole punched into the front panel of the steamer. This hole may be seen from the inside of the compartment only when the timer is removed.

**Installation**

7. Fit the timer in place making sure that it is properly placed so that the disk on the timer fits into the punched hole in the front panel.
8. Once the timer is properly located, install and tighten the hex nut so that the timer does not slip or rotate. Do not overtighten the nut.
9. Align the flat of the knob hole with the flat on the timer shaft. Press the knob firmly onto the timer shaft.
10. Plug in the wires identified above and connect the two black wires from the motor leads.

## 5.8 Door Removal/Installation/Alignment

For Part Number, refer to section on Steamer Model

**Removal**

1. To remove the door, turn off the steamer power and allow the steamer to cool. Then open the door and, while supporting the weight of the door, remove hinge pin or remove door-to-hinge bolts.
2. Place the door on a flat, clean table or similar support, with gasket facing up. Be careful not to scratch door surface.
3. Inspect door gasket for signs of cuts, or other defects which may impair its function. Replace if necessary.

**NOTE:** Gasket not covered under terms of warranty.

**Installation**

4. To install the door, apply NEVER-SEEZ lubricant to hinge pin. Align door with hinge and insert hinge pin, or apply Locktite 242 to the door-to-hinge bolts, then install door and mounting bolts. Snug bolts only. Do NOT tighten mounting bolts at this time.

**Alignment**

5. Place a piece of masking tape over the door latch pin (bullet) hole in the door.
6. Close the door until the door latch pin just penetrates the masking tape. Make sure the door pin contacts only the door latch spring.
7. If door pin does not strike the center of the masking tape or spring hole in he U-channel, loosen the hinge-to-oven bolts and align the door to the door pin. Tighten hinge-to-oven mounting bolts.
8. You should be able to pull a dollar bill or comparable piece of paper with some effort, from between the gasket and steamer cavity with the door closed. To adjust the hinge side, loosen the door-to-hinge bolts and align the door gasket with the oven cavity. Tighten the door-to-hinge mounting bolts.
9. Operate steamer and check for leaks.

## 5.9 Door Reversal Procedures

1. Turn off steamer power and allow steamer to cool.
2. To remove door, support door while removing hinge-to-steamer bolts.
3. Place door with hinge on a flat, clean table (or similar support), with the gasket facing up. Be careful not to scratch door surface.

**NOTE:** Do not remove the hinge from the door.

4. Note and record distance between jam nut and end of door locking pin (bullet). This information will be needed during bullet installation in Step 6.
5. Loosen jam nut with a 1/2 inch wrench, remove door latch pin and jam nut.
6. Coat latch pin threads with NEVER-SEEZ high temperature (1800 degree F) anti-seize and lubricating compound. Install door latch pin and jam nut directly across steamer cavity from old bullet location. Install these two items so that jam nut-to-end of bullet distance is approximately the same as measured in Step 4.
7. Remove the two 1/4-20 truss head screws from above and below the old bullet location and install them above and below the new bullet location.
8. Remove screws and U-channel from the door. Take magnet and block assembly from present location and place it at the opposite end of the door channel, with magnet facing outward from the door.
9. Remove screws. Remove door handle from cam.
10. Apply NEVER-SEEZ high temperature (1800 degrees F) anti-seize and lubricating compound to the cam and Locktite 242 to screw threads.
11. Turn handle and cam 180 degrees from their original positions and install them on the door with screws. Be sure handle and cam move smoothly.
12. Be sure door handle is in the DOWN position. Turn U-channel 180 degrees from its original position, hold door spring in U-channel open with a screwdriver or similar tool, and install U-channel.
13. Check operation of the cam. Push up on the door handle and check if the spring opens. If the spring does not open, cam and spring are NOT correctly aligned and problem must be corrected.
14. Apply a light amount of Locktite 242 to screws, then install screws.
15. Apply Locktite 242 to the hinge-to-steamer bolts, then install door and hinge mounting bolts. Do NOT tighten mounting bolts at this time.
16. Align door to steamer. Refer to 4.9, Alignment procedure.

**NOTE:** There is a door switch inside the front panel of the steamer, on each side of the cavity. It is pre-wired in parallel, so no wiring change is necessary when the door is reversed.

17. Close steamer door and operate steamer. If steamer fan does not operate, check location of door magnet and try operation again. If fan operation problem still exists, refer to the Troubleshooting Section.
18. Allow steamer to operate for approximately 5 minutes, and then check for leaks. If there are no leaks, the steamer is ready for operation. If there are leaks around the door, recheck door alignment, and if necessary, door gasket installation.

## 5.10 Door Switch P/N 096857

**NOTE:** One normally open door switch is factory-installed on each side of the steamer cavity. Activated (that is, closed) by the proximity of the door magnet, they are wired in parallel so that only one switch at a time will affect steamer operation.

1. Remove the side panel for access to the door switch that is to be replaced.
2. Unplug the door switch leads from the steamer harness.
3. The switch is held in place with two small 4-40 screws. With a slotted screwdriver, remove these screws and the switch may be removed.
4. To install the switch use the two 4-40 screws and a screwdriver with a screwstarter features.
5. Connect switch leads to steamer harness.
6. Test steamer operation.
7. Replace side panel.

## 5.11 Door Gasket

For Part Number, refer to section on Steamer Model

**NOTE:** Door Gasket not covered under terms of warranty.

### Removal

1. Turn off steamer power and allow to cool.
2. Remove the door using one of the following two methods:
   a) Support door weight and remove hinge pin or
   b) Support weight of the door and remove the two door-to-hinge bolts.
3. Place the door on a flat, clean, smooth table or similar support with handle hanging over edge. Be careful not to scratch the door.
4. Remove four (or eight) 8-32 truss head screws and remove inner door panel.
5. Remove and discard door gasket.
6. Clean back of the inner door panel. Be sure old sealant is completely removed.

### Installation

1. Install new door gasket around inner panel as shown in the illustration. Be sure the inner door panel flange is fully inserted into the door gasket groove.
2. Apply a high temperature silicone sealant, such as GE RTV 159 or equivalent, to the four door spacers.
3. Apply Locktite 242 to inner door panel mounting screws.
4. Install inner door panel and door gasket on the door spacers, and tighten mounting screws.
5. Align door with hinge and insert hinge pin OR apply Locktite 242 to the door-to-hinge bolts, then install door and mounting bolts. Do NOT tighten mounting bolts at this time.
6. Align door to steamer and tighten bolts.

Please refer to 4.8 for alignment procedure.

## 5.12 Float Probes

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. Remove the right side cover from the steamer.
3. Disconnect the water level probe harness wire.
4. Loosen and remove the hex locking nut and washer.
5. Remove the float probe from inside the cavity.

**NOTE: Probe orientation prior to removal. Low probe rotates down and high probe rotates up.**

### Installation

6. Insert the new water level probe through the opening from inside the steamer cavity (be sure the o-ring seal is in place for a button probe or that the soft white washer is inside the cavity for a float probe.
7. From the outside, put on any washer and locking nut. Tighten nut finger tight and then another 1/4 turn to prevent any water leaks.
8. Attach the harness wire.
9. Turn on the branch circuit power supply.
10. Turn ON the steamer and test.

## 5.13 Element

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. Using a screwdriver, remove both left and right side panels.
3. Remove rear element access panel
4. Fold insulation out of the way.
5. Remove element insulation cover by removing the 6ea 7/16" x 32 nuts using a ratchet and 7/16" socket.
6. Remove element insulation.
7. Loosen but do not remove the element brackets using the 6 remaining 7/16" x 32 nuts using a ratchet and 7/16" socket.
8. Trace the wires of the element back to the element terminal block and remove the wires with a #2 flat blade screwdriver.
9. Slide the element out from the back of the unit through the element access area to replace.

### Installation

10. Slide the new through the element bracket from the rear access panel
11. Install the element wires into the element terminal block from which the original element was installed using a #2 flat blade screwdriver.
12. Tighten the 7/16" x 32 nuts supporting the element brackets using a ratchet and 7/16" socket.
13. Replace element insulation.
14. Replace element insulation cover and secure using a ratchet and the remaining 7/16" x 32 nuts.
15. Replace and secure rear element access panel using a #2 flat blade screwdriver and the 5-10/32" screws.
16. Recheck all wire connections and screws.
17. Using a screwdriver, replace both left and right side panels.
18. Reconnect power supply.

## 5.14 Burner

### Removal

1. Disconnect power and gas supplied to the unit.
2. Remove the left side panel by removing the three exterior screws.
3. Remove the side access plate by removing the two 10x32 nuts.
4. Unplug the HSI and flame sensor.
5. Remove the 5-1/4" screws on the holding plate near the ignition tube and the two on the bottom of the holding plate.
6. Loosen the 3/4" compression fitting on the ignition tube and move it toward the base.
7. Slide the burner out the left side of the unit.

### Installation

1. Slide the new burner into the left side of the unit.
2. Attach the ignition tube and tighten the 3/4" compression fitting.
3. Install the 5-1/4" screws into the holding plate.
4. Plug in the HSI and flame sensor.
5. Turn on gas supply and power to the unit.
6. **NOTE:** The ignition tube does not receive gas until the burners are active
7. Install the side access plate with the 2 10x32 nuts.
8. Re-install the left side panel with the three exterior screws.

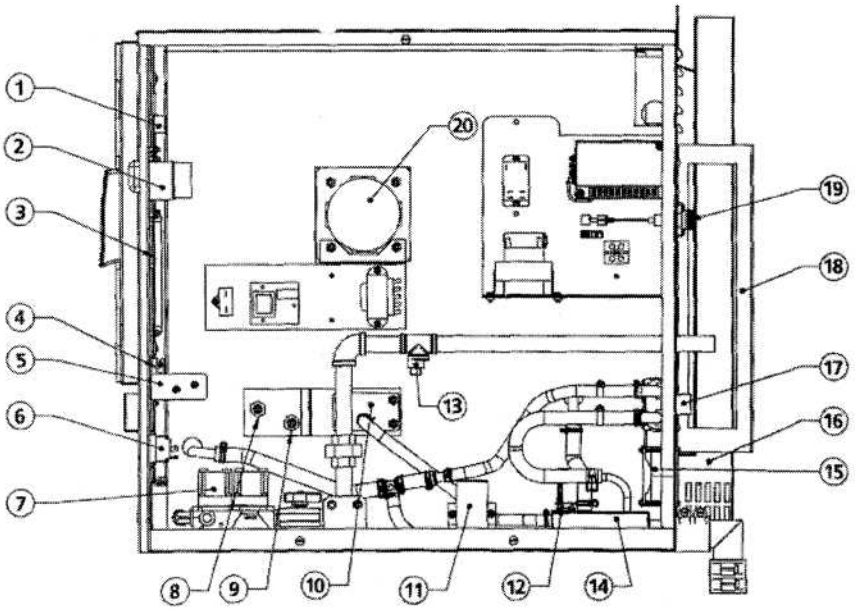
# PARTS IDENTIFICATION

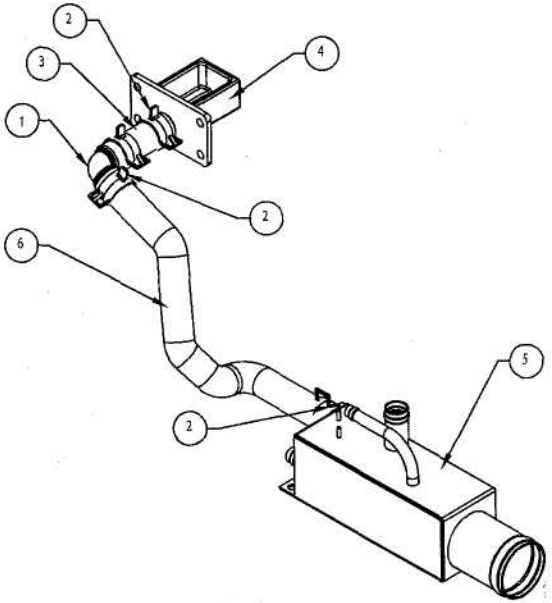
## 6.1 SSB Gas Cavity Assembly

| No. | Description | Part No. | Model |
|---|---|---|---|
| 1 | Light and Timer Board | 137233 | All |
| 2 | Timer | 141063 | All |
| 3 | Control Board | 148082 | All |
| 4 | Door Switch | 096857 | All |
| 5 | Service light, White (muffin fan) | 145141 | All |
| 6 | ON/OFF Toggle Switch | 088876 | All |
| 7 | Gas Valve - Natural | 098443 | All |
| * | Natural to Propane Conversion Kit | 147136 | 3G |
| * | Propane to Natural Conversion Kit | 147137 | 3G |
| * | Natural to Propane Conversion Kit | 345630 | 5G |
| * | Propane to Natural Conversion Kit | 147135 | 5G |
| * | Natural to Propane Conversion Kit | 147138 | 10G |
| * | Propane to Natural Conversion Kit | 147139 | 10G |
| 8 | Hi Float/Probe | 149880 | All |
| 9 | Lo float/Probe | 149880 | All |
| 10 | Drain CUP | 150628 | All |
| * | Drain Cup *Gasket* | 142613 | All |
| *11* | Drain Valve | 071234 | All |
| *12* | Drain T-stat | 145248 | All |
| * | Float Probe Kit | 149881 | All |

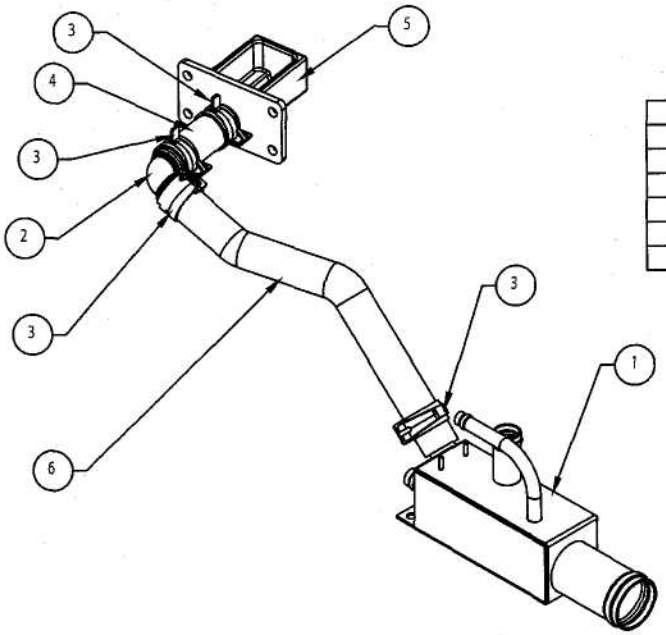
| No. | Description | Part No. | Model |
|---|---|---|---|
| 13 | Gas "T" for Doable Stack Units | 008772 | All |
| 14 | Condensate Assembly | 142774 | Old Style |
| 14 | Condensate Assembly | 150659 | 3G & 5G |
| 14 | Condensate Assembly | 150661 | 3G & 5G |
| 15 | Cooling fan | 140174 | All |
| 16 | Flue | 142812 | 5G |
| 16 | Flue | 143957 | 3G |
| 16 | Flue | 145254 | 10G |
| 17 | Water Valve | 071235 | All |
| 18 | Fine Protector | 144125 | 5G |
| 18 | Hue Protector | 144129 | 3G |
| 18 | Flue Protector | 145521 | 106 |
| 19 | Fuse Holder | 101549 | All |
| * | Fuse | 077853 | All |
| 20 | Blower Pan Motor | 096740 | All |
| * | Motor Shaft Sea) | 096868 | All |
| * | Oil Slinger Washer | 096831 | All |
| * | Timer Mounting Nut | 101145 | All |
| * | Timer Knob | 123100 | All |
| * | Clean Water Kit | 146956 | All |

*Not shown

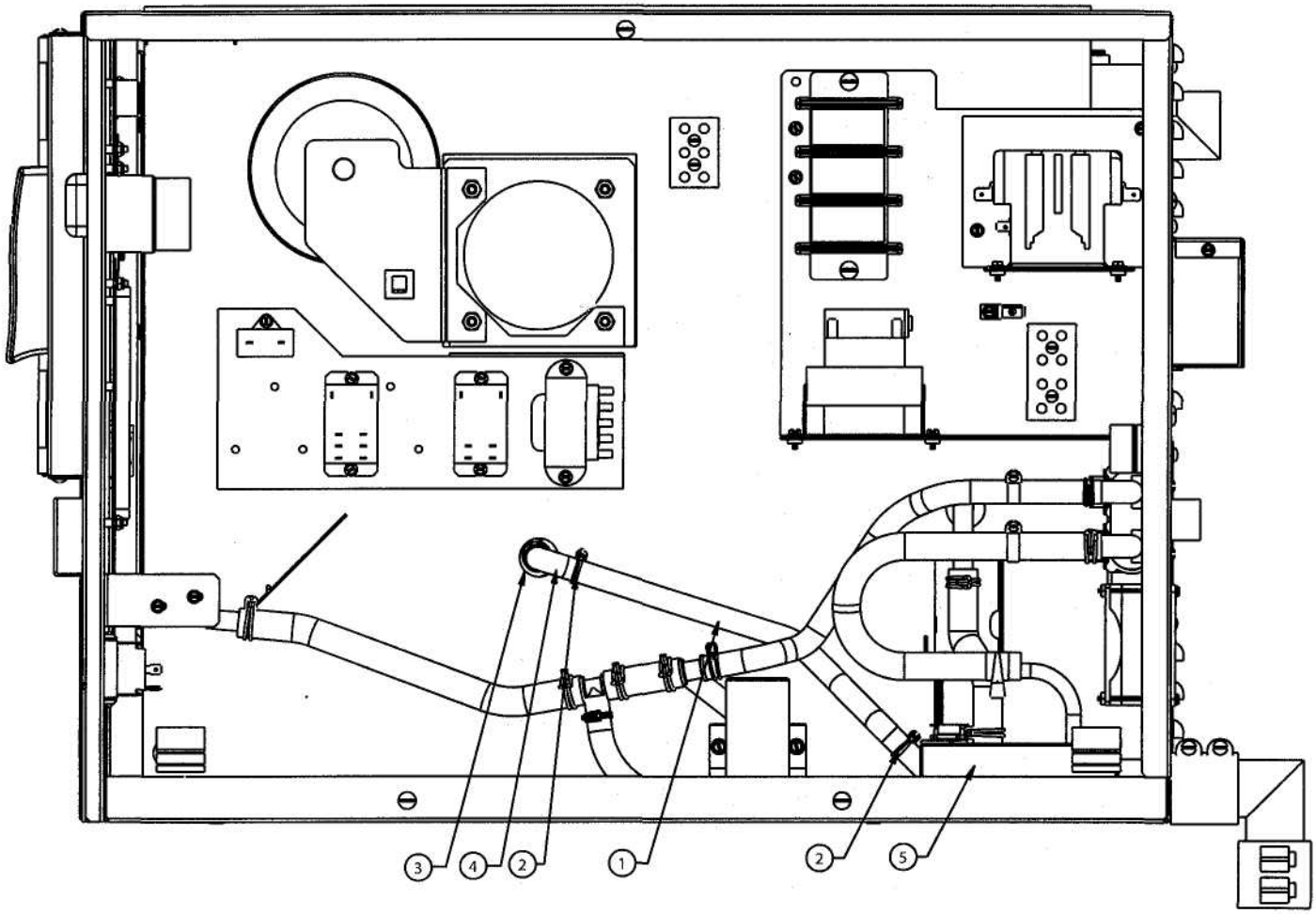





| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 142549 | ELBOW 3/4" HOSE BARB | 1 |
| 2 | 138457 | CLAMP, CONSTANT TENSION CTB-27 | 4 |
| 3 | 150662 | HOSE, CONDENSATE DRIP | 1 |
| 4 | 150628 | DRAIN, CONDENSATE | 1 |
| 5 | 150661 | WELDMENT, DRAIN MANIFOLD ASSY | 1 |
| 6 | 150672 | HOSE, CONDENSATE DRAIN SSB | 1 |



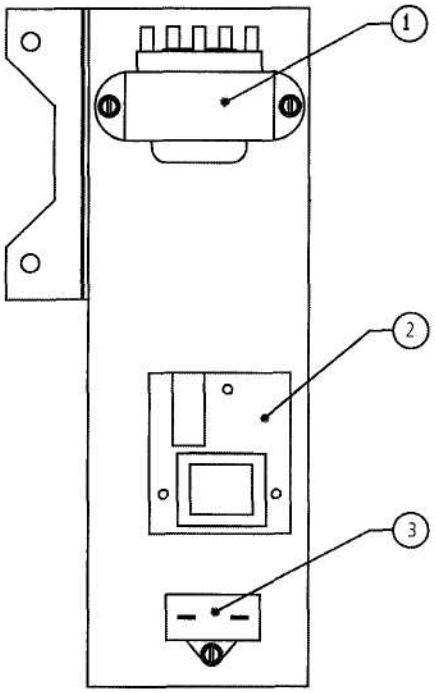

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 150659 | WELDMENT, DRAIN MANIFOLD ASSY, SSB-3/5E&G | 1 |
| 2 | 142549 | ELBOW 3/4" HOSE BARB | 4 |
| 3 | 138457 | CLAMP, CONSTANT TENSION CTB-27 | 1 |
| 4 | 150662 | HOSE, CONDENSATE DRIP | 1 |
| 5 | 150628 | DRAIN, CONDENSATE | 1 |
| 6 | 150672 | HOSE, CONDENSATE DRAIN SSB | 1 |




| SSB-3, 5 & 10E | | | |
|---|---|---|---|
| ITEM NO. | QTY. USED | PART OR IDENTIFYING NO. | NOMENCLATURE OR DESCRIPTION |
| 6 | | 150665 | FIELD REPLACE CONDENSATE DRIP CUP AND DRAIN SSB-10E & G |
| 6 | | 150663 | FIELD REPLACE CONDENSATE DRIP CUP AND DRAIN SSB-3/5E & G |
| 5 | | 150661 | WELDMENT, DRAIN BOX SSB-10E & G |
| 5 | | 150659 | WELDMENT, DRAIN BOX SSB-3/5E & G |
| 4 | | 142549 | 3/4" HOSE BARB, 90 DEG. ELBOW |
| 3 | | 150662 | HOSE, CONDENSATE DRIP |
| 2 | | 138457 | CLAMP, CONSTANT TENSION CTB-27 |
| 1 | | 150672 | HOSE, CONDENSATE DRAIN SSB |

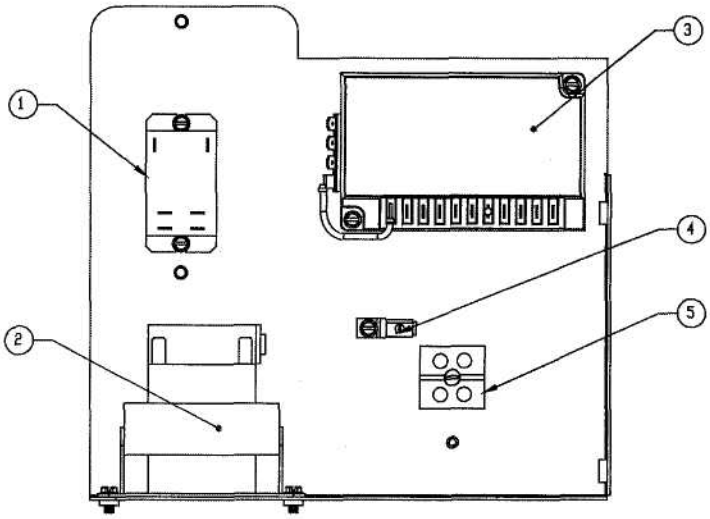
## 6.2 Water Level Board

| No. | Description | Part No. |
|---|---|---|
| 1 | Control Transformer | 119815 |
| 2 | Water Level Board | 142533 |
| 3 | Capacitor | 096812 |
| | | |




## 6.3 Ignition Module

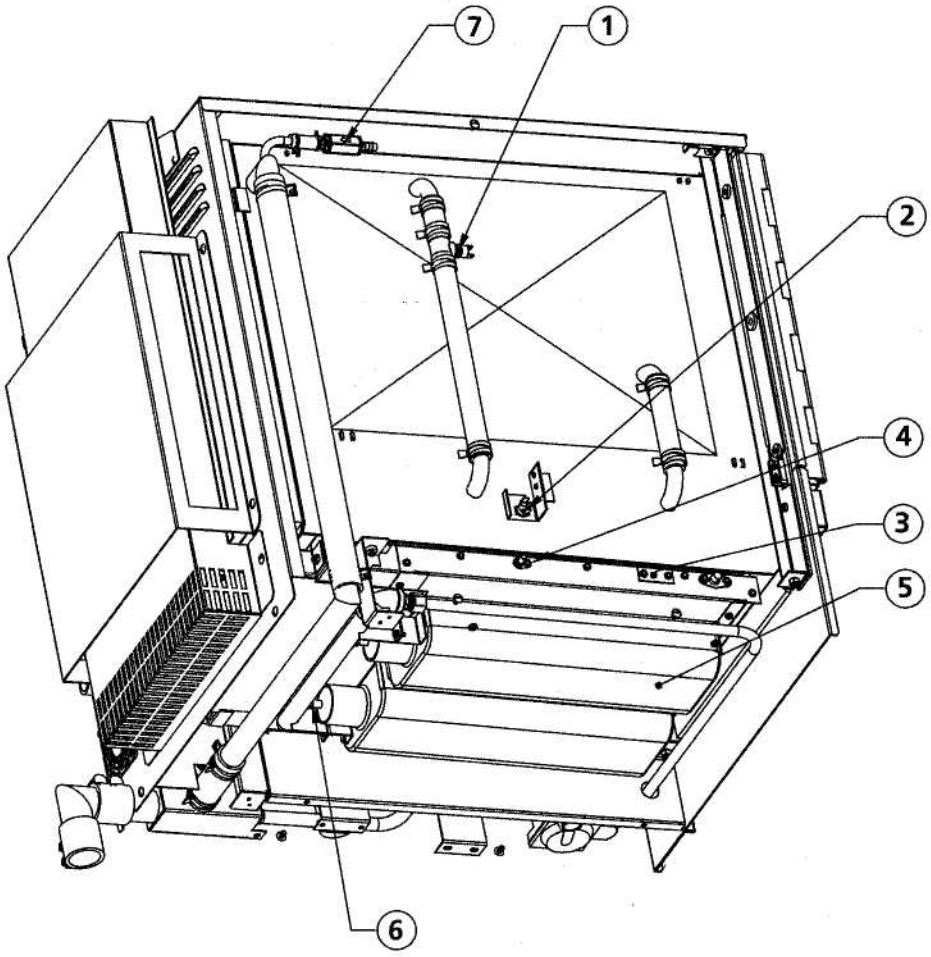
| No. | Description | Part No. |
|---|---|---|
| 1 | Power Relay | 119814 |
| 2 | 24VAC Transformer | 121715 |
| 3 | Ignition Module | 140184 |
| 4 | Ground Lug | 119829 |
| 5 | Terminal Block | 003887 |



## 6.4 Burner Assembly

| No. | Description | Part No. | Model |
|---|---|---|---|
| 1 | Ready T-stat | 088865 | All |
| 2 | Hi-limit | 144484 | All |
| 3 | Hot Surface Ignitor (H.S.I.) | 143559 | 5G & 3G |
| 4 | Flame Sensor | 143673 | All |
| 5 | Infrared (IR) Burner Assembly | 143976 | 5G & 3G |
| 5 | Infrared (IR) Burner Assembly | 145074 | 10G |
| 6 | Orifice, Natural Gas** | 143552 | All |
| 6 | Orifice, Propane Gas** | 144122 | All |
| 7 | Check Valve | 138428 | All |

**0-2000 ft, see chart on page 4.10 for other elevations



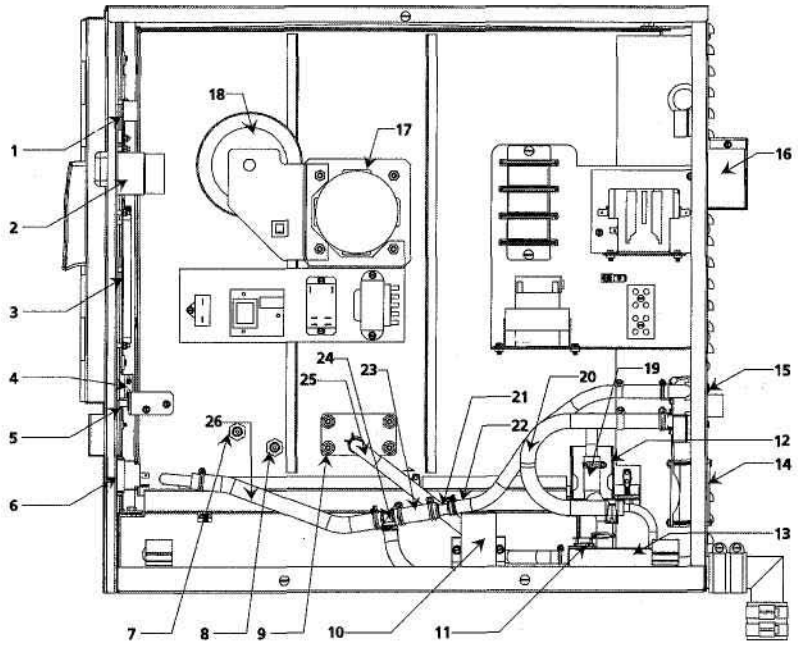
## 6.5 SSB Electric Cavity Assembly

| No. | Description | Part No. |
|---|---|---|
| 1 | Light and Timer Board | 137233 |
| 2 | Timer | 096826 |
| * | Timer Mounting Nut | 101145 |
| * | Timer Knob | 123100 |
| 3 | Control Board | 148082 |
| 4 | Door Switch | 096857 |
| 5 | Service light, White (muffin fan) | 145141 |
| 6 | ON/OFF Toggle Switch | 088876 |
| 7 | Hi Float/Probe | 149880 |
| 8 | Lo Float/Probe | 149880 |
| 9 | Drain Cup | 150628 |
| * | Drain Cup Gasket | 142613 |
| 10 | Drain Valve | 071234 |
| 11 | Drain T-stat | 145248 |
| 12 | Hi-limit T-stat | 145248 |
| 13 | Condensate Assembly (old style) | 142774 |
| 13 | Condensate Assembly | 150659 3E & 5E |
| 13 | Condensate Assembly | 150661 10 E |
| 14 | Cooling Fan | 140174 |
| * | Float Probe Kit | 147688 |

*Not shown

| No. | Description | Part No. |
|---|---|---|
| 15 | Water Valve | 071235 |
| 16 | Fuse Housing | 119848 |
| * | Fuse | 119823 |
| 17 | Blower Fan Motor Assembly | 096740 |
| * | Fan Shroud | 141528 |
| * | Blower Wheel | 096790 |
| * | Motor Shaft Seal | 096868 |
| * | Oil Slinger Washer | 096831 |
| 18 | Torrid Transformer (480V only) | 101549 |
| 19 | Overflow Hose | 146172 |
| 20 | Drain Cooling Hose | 140169 |
| 21 | 3/8" Reducer Hose | 143973 |
| 22 | Water Fill Hose | 140170 |
| 23 | Small Tee Hose | 143975 |
| 24 | Tee Drain | 125768 |
| 24 | Drain Cup Hose | 140171 |
| 25 | Front Fill Hose | 150672 |
| 26 | Hose Condensate Drip | 150662 |
| *27 | Field Replacement Kit | 150663 3E & 5E |
| 27 | Field Replacement Kit | 50665 10E |

*Not shown

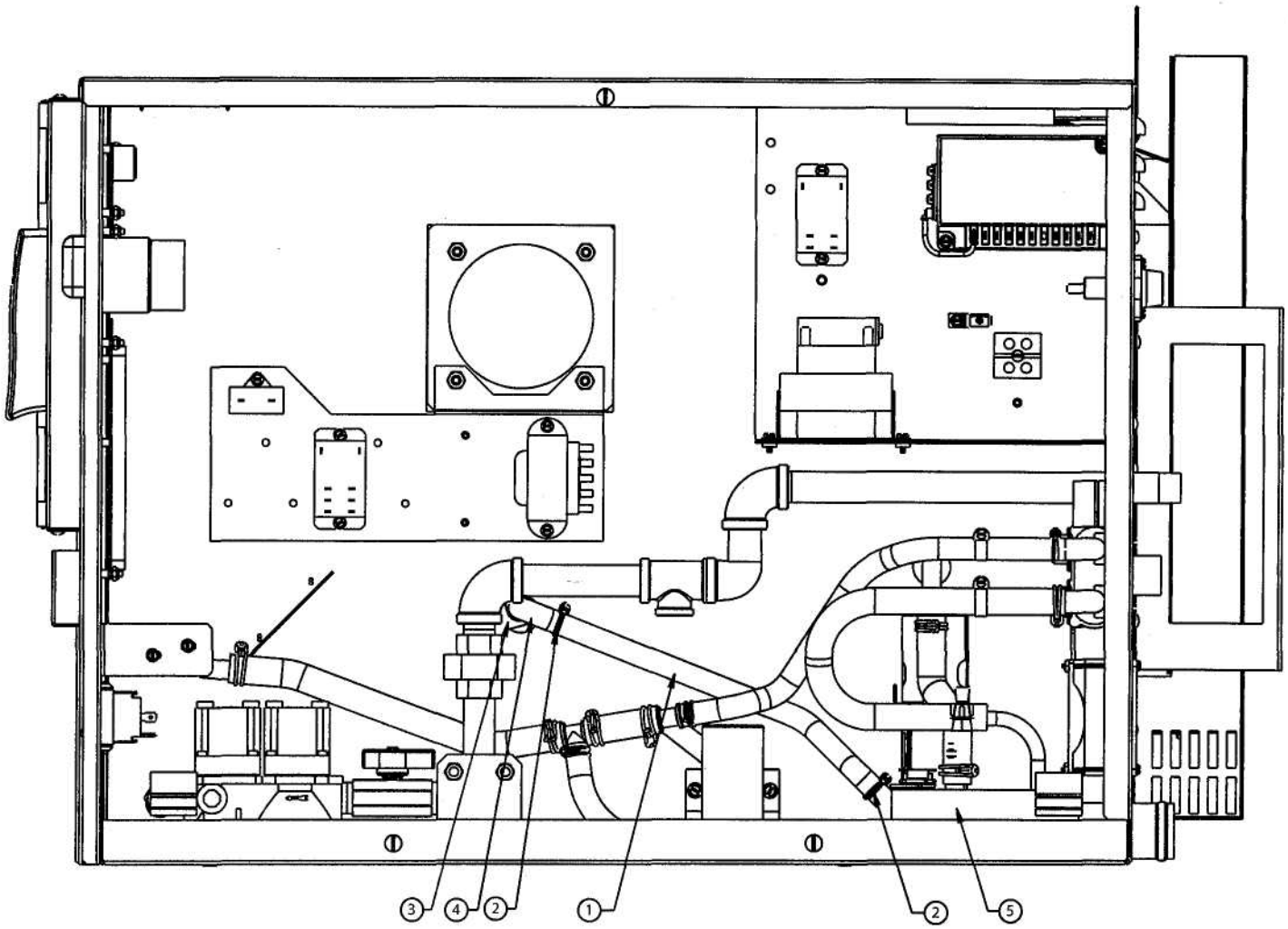



| | |
|---|---|
| SSB-5G | |
| 123125 | Jumper Harness |
| 143646 | Main Harness |
| 144109 | Door Switch Harness |
| 144106 | Power Harness |
| SSB-5E | |
| 123125 | Jumper Harness |
| 144109 | Door Switch Harness |
| 144107 | Power Harness |
| SSB-10G | |
| 123125 | Jumper Harness |
| 143646 | Main Harness |
| 146739 | Power Harness |
| 146740 | Door Switch Harness |
| SSB-10E | |
| 123125 | Jumper Harness |
| 146739 | Power Harness |
| 146738 | Control Harness |
| 146740 | Door Switch Harness |

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 142549 | ELBOW 3/4" HOSE BARB | 1 |
| 2 | 138457 | CLAMP, CONSTANT TENSION CTB-27 | 4 |
| 3 | 150662 | HOSE, CONDENSATE DRIP | 1 |
| 4 | 150628 | DRAIN, CONDENSATE | 1 |
| 5 | 150661 | WELDMENT, DRAIN MANIFOLD ASSY | 1 |
| 6 | 150672 | HOSE, CONDENSATE DRAIN SSB | 1 |



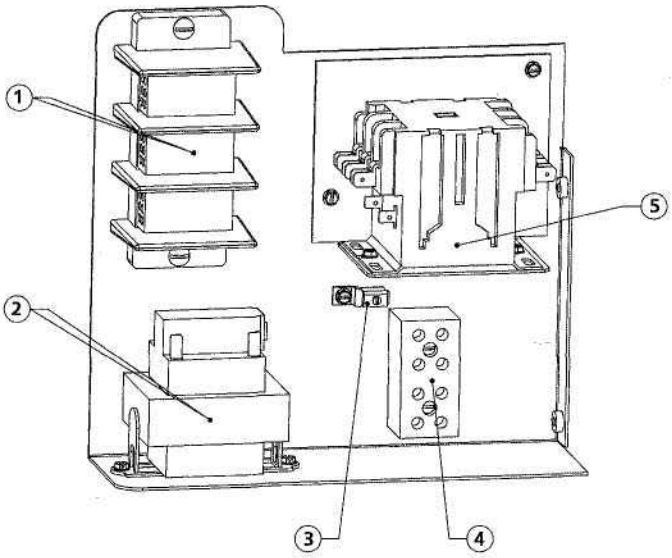

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 150659 | WELDMENT, DRAIN MANIFOLD ASSY, SSB-3/5E&G | 1 |
| 2 | 142549 | ELBOW 3/4" HOSE BARB | 4 |
| 3 | 138457 | CLAMP, CONSTANT TENSION CTB-27 | 1 |
| 4 | 150662 | HOSE, CONDENSATE DRIP | 1 |
| 5 | 150628 | DRAIN, CONDENSATE | 1 |
| 6 | 150672 | HOSE, CONDENSATE DRAIN SSB | 1 |

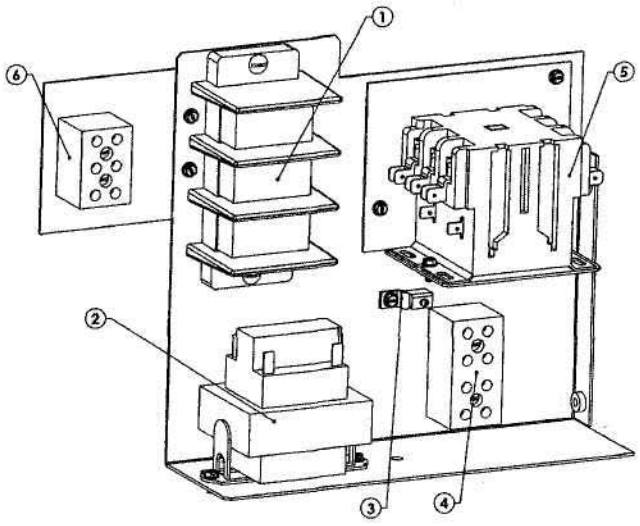



| SSB-3, 5, & 10G | | | |
|---|---|---|---|
| **ITEM NO.** | **QTY. USED** | **PART OR IDENTIFYING NO.** | **NOMENCLATURE OR DESCRIPTION** |
| 6 | | 150665 | FIELD REPLACE CONDENSATE DRIP CUP AND DRAIN SSB-10E & G |
| 6 | | 150663 | FIELD REPLACE CONDENSATE DRIP CUP AND DRAIN SSB-3/5E & G |
| 5 | | 150661 | WELDMENT, DRAIN BOX SSB-10E & G |
| 5 | | 150659 | WELDMENT, DRAIN BOX SSB-3/5E & G |
| 4 | | 142549 | 3/4" HOSE BARB, 90 DEG. ELBOW |
| 3 | | 150662 | HOSE, CONDENSATE DRIP |
| 2 | | 138457 | CLAMP, CONSTANT TENSION CTB-27 |
| 1 | | 150672 | HOSE, CONDENSATE DRAIN SSB |

## 6.6 Electrical High Voltage Assembly

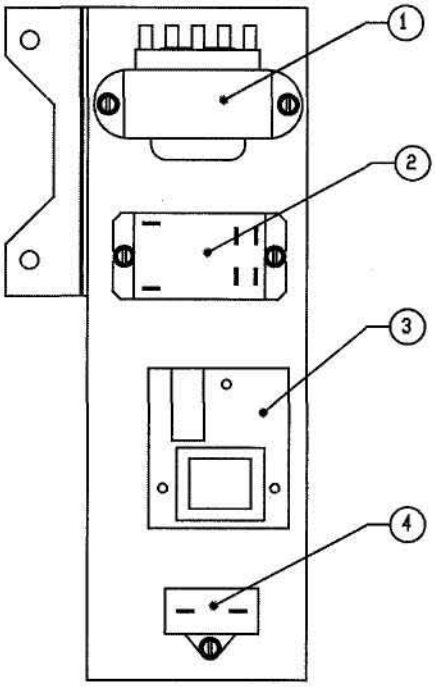
| No. | Description | Part No. |
|---|---|---|
| 1 | Terminal Block | 070185 |
| 2 | 24VAC Transformer | 121716 |
| 3 | Ground Lug | 119829 |
| 4 | Terminal Block Power (10E) | 002577 |
| 4 | Terminal Block Power (3/5E) | 088214 |
| 5 | Contactor | 145081 |
| 6 | Terminal Block 3-Pole (480V) | 003888 |

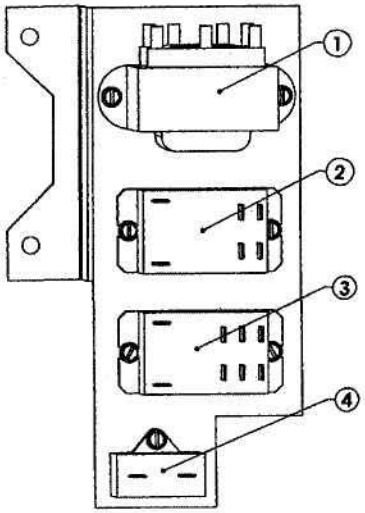



## 6.7 Electrical Low Voltage Assembly

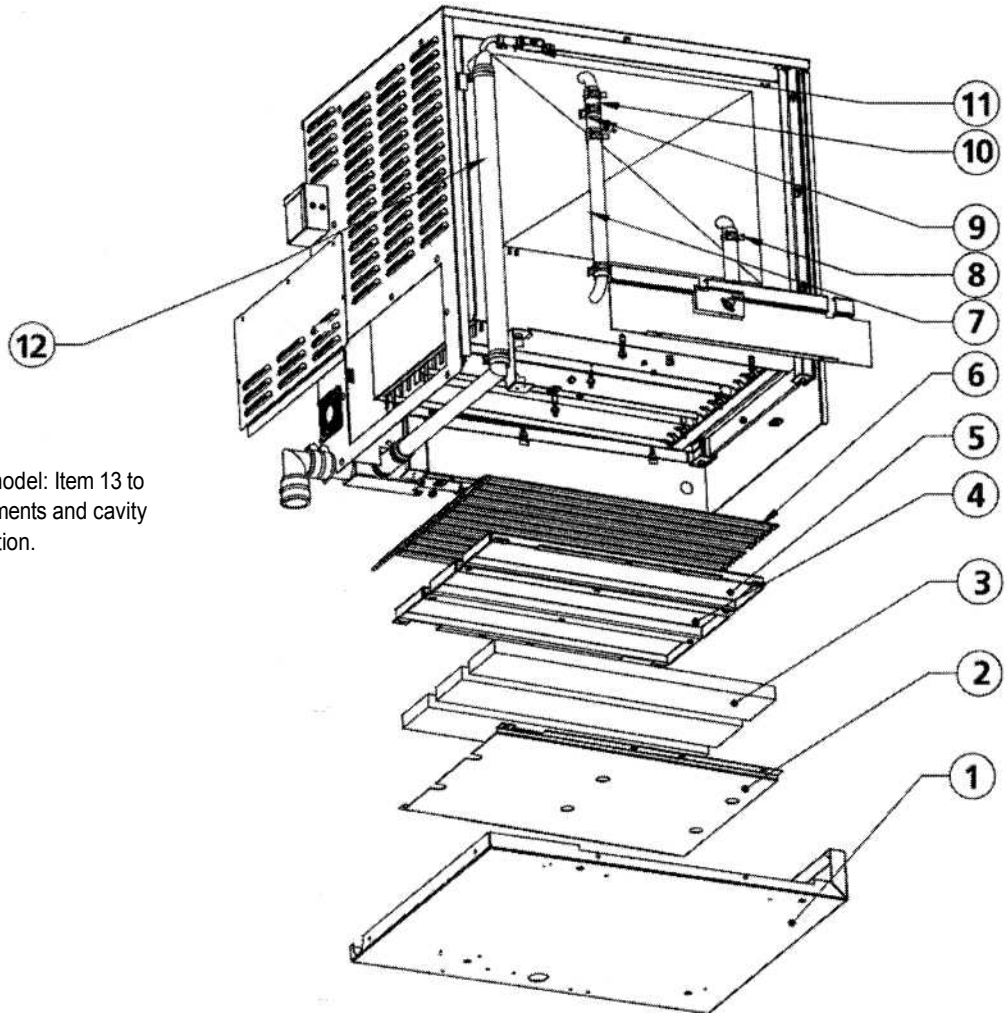
| No. | Description | Part No. |
|---|---|---|
| 1 | Control Transformer | 119815 |
| 2 | Relay, K1 | 119813 |
| 3 | Water Level Board | 142533 |
| 3 | Relay DPDT 24 VAC 30A | 121733 |
| 4 | Capacitor 3MFD | 096813 |



## 6,8 Element Breakdown (Exploded View)

| No. | Description | Part No |
|---|---|---|
| 1 | Base, SSB 5 *Pan* | 142802 |
| 2 | Element Plate | 141538 |
| 3 | Element insulation | 140178 |
| 4 | Center Element Support Bracket | 141538 |
| 5 | End Support Bracket | 141537 |
| 6 | Element(s) 20BV | 148553 |
| 6 | Elements) 240V | 148554 |
| 6 | Element(s) 480V (w/277V WYE Config) | 148552 |
| 6 | Elements) 480V 1100W | 143990 |




* Item 13 not shown in model: Item 13 to be placed between elements and cavity bottom prior to installation.

GROEN®

UNIFIED BRANDS

**Service Bulletin # 194**

## AVOID DISPUTED SERVICE CALLS:

Remind Customers that SmartSteam Requires Daily Probe Wipe Down

Models Affected: All SmartSteam™ Boilerless Steamer Models

SmartSteam never needs deliming and only requires minimal maintenance to deliver high performance. Our mutual customers are so delighted with not having to delime, they are overlooking the need for the daily cleaning regimen with wipe down of the water level probes.

If customers don't do this for a while, after a few days to a few weeks, one of the following may occur:

1. The "Door/Lid" Ajar Light and "Service" Light flash on the control panel.
2. Unit may overfill with water

When you receive a call to service a SmartSteam unit with the symptoms above, suggest to the customer that they perform the daily wipe down, with an emphasis on wiping the probes clean. In most cases, the malfunction will go away entirely.

Explain to them that if you come and find the problem is dirty probes, you must charge them for the service call, since a daily cleaning regimen with wipe down of the water level probes is a customer responsibility and is not covered under warranty.

1055 Mendell Davis Drive
Jackson, Mississippi 39272
www.groen.com

Toll free: 1-800/676-9040
Phone: 601/372-3903
Fax: 601/373-9587

September 22, 2003

PART NUMBER 147423, REV. D

GROEN

UNIFIED BRANDS

**Service Bulletin # 196**

# DUAL ON/OFF SWITCHES

Models Affected: All SmartSteam™ Boilerless Steamer Models

On SmartSteam Boilerless Steamers, some customers don't realize that there are two ON/OFF switches. They press the bottom rocker switch, but fail to press the top membrane switch. When this occurs, the unit will be inoperative. No lights on the front panel will light.

When you receive a call to service a SmartSteam unit with the above symptoms, ask the customer to verify that both ON/OFF switches are on.

1055 Mendell Davis Drive
Jackson, Mississippi 39272
www.groen.com

Toll free: 1-800/676-9040
Phone: 601/372-3903
Fax: 601/373-9587

December 9, 2003

PART NUMBER 147423, REV. D

GROEN
UNIFIED BRANDS

# Float Probe System

Models Affected: All SmartSteam units

Groen has introduced a Float Probe system to our SmartSteam product line making the unit less susceptible to issues created by the lack of a daily cleaning or variations in the local water supply. The float water probe will detect the physical presence of water inside the steam reservoir. The kit comes with instructions and all the components needed to install the Float Probe System. The part number of this kit is 147688.

The above kit will be available only through our Groen Service Department until September 30, 2004; thereafter, all service agents can order them direct for stocking purposes.

**When preparing the Smart Steam cavity for the installation, the technician will need a *step drill bit* to properly size the probes holes for the cavity.**

1055 Mendell Davis Drive
Jackson, Mississippi 39272

Toll free: 1-800/676-9040
Phone: 601/372-3903