

# OPERATOR & SERVICE MANUAL

Part Number 121064

**OM/SM-TDH/C**

**NORTH AMERICA**

**Model: TDH/C**  
**Steam Jacketed Kettle**

*Self-contained*  
*Gas heated*  
*Table Top Mounted*  
*Crank-Tilting*



**THIS MANUAL MUST BE RETAINED FOR FUTURE REFERENCE. READ, UNDERSTAND AND FOLLOW THE INSTRUCTIONS AND WARNINGS CONTAINED IN THIS MANUAL.**

**FOR YOUR SAFETY**  
**DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.**

**POST IN A PROMINENT LOCATION**  
**INSTRUCTIONS TO BE FOLLOWED IN THE EVENT USER SMELLS GAS. THIS INFORMATION SHALL BE OBTAINED BY CONSULTING YOUR LOCAL GAS SUPPLIER. AS A MINIMUM, TURN OFF THE GAS AND CALL YOUR GAS COMPANY AND YOUR AUTHORIZED SERVICE AGENT. EVACUATE ALL PERSONNEL FROM THE AREA.**

**WARNING**  
**IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH. READ THE INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS THOROUGHLY BEFORE INSTALLING OR SERVICING THIS EQUIPMENT.**



**IMPORTANT — READ FIRST — IMPORTANT**

- WARNING:** FAILURE TO DISCONNECT POWER BEFORE SERVICING COULD RESULT IN ELECTROCUTION AND DEATH.
- WARNING:** IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH. READ THE INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS THOROUGHLY BEFORE INSTALLING OR SERVICING THIS EQUIPMENT.
- WARNING:** THE UNIT MUST BE INSTALLED BY PERSONNEL QUALIFIED TO WORK WITH ELECTRICITY AND PLUMBING. UNIT MUST BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE CODES.
- WARNING:** DO NOT ATTACH THE UNIT TO A TYPE “B” VENT. IT COULD CAUSE FIRE OR PROPERTY DAMAGE.
- WARNING:** DO NOT CONNECT ANY PIPING TO THE SAFETY VALVE. IT MUST BE FREE TO VENT STEAM AS NEEDED. TO AVOID BURNS FROM THE VENTED STEAM THE VALVE DISCHARGE SHOULD POINT DOWNWARD.
- DANGER:** ELECTRICALLY GROUND THE UNIT AT THE TERMINAL PROVIDED. FAILURE TO GROUND THE UNIT COULD RESULT IN ELECTROCUTION AND DEATH.
- CAUTION:** BE SURE ALL OPERATORS READ, UNDERSTAND AND FOLLOW THE OPERATING INSTRUCTIONS, CAUTIONS AND SAFETY INSTRUCTIONS CONTAINED IN THIS MANUAL.
- CAUTION:** DO NOT OVERFILL THE KETTLE WHEN COOKING, HOLDING OR CLEANING. KEEP LIQUIDS A MINIMUM OF 2-3" (5-8 CM) BELOW THE KETTLE BODY RIM TO ALLOW CLEARANCE FOR STIRRING, BOILING AND SAFE TRANSFER OF PRODUCT.
- CAUTION:** KEEP FLOORS IN FRONT OF KETTLE WORK AREA CLEAN AND DRY. IF SPILLS OCCUR, CLEAN IMMEDIATELY TO AVOID SLIPS OR FALLS.
- WARNING:** KEEP WATER AND SOLUTIONS OUT OF CONTROLS AND BURNERS. NEVER SPRAY OR HOSE DOWN THE CONTROL CONSOLE, ELECTRICAL CONNECTIONS, ETC.
- CAUTION:** MOST CLEANERS ARE HARMFUL TO THE SKIN, EYES, MUCOUS MEMBRANES AND CLOTHING. TAKE PRECAUTIONS: WEAR RUBBER GLOVES, GOGGLES OR FACE SHIELD AND PROTECTIVE CLOTHING. CAREFULLY READ WARNINGS AND FOLLOW DIRECTIONS ON CLEANER LABELS .
- WARNING:** DO NOT STAND ON OR APPLY UNNECESSARY WEIGHT OR PRESSURE ON THE KETTLE FRONT OR POURING LIP. THIS COULD RESULT IN THE OVERLOAD AND FAILURE OF THE TILT MECHANISM, AND POSSIBLE SERIOUS INJURY AND BURNS TO THE OPERATOR AND OTHERS.
- NOTICE:** NEVER LEAVE A SANITIZER IN CONTACT WITH STAINLESS STEEL SURFACES LONGER THAN 10 MINUTES. LONGER CONTACT CAN CAUSE CORROSION.
- WARNING:** FAILURE TO PERIODICALLY CHECK SAFETY VALVE OPERATION COULD RESULT IN PERSONAL INJURY AND/OR DAMAGE TO EQUIPMENT.
- WARNING:** WHEN TESTING, AVOID EXPOSURE TO THE STEAM BLOWING OUT OF THE SAFETY VALVE. DIRECT CONTACT COULD RESULT IN SEVERE BURNS.
- WARNING:** TO AVOID INJURY, READ AND FOLLOW ALL PRECAUTIONS STATED ON THE LABEL OF THE WATER TREATMENT COMPOUND.
- WARNING:** BEFORE REPLACING ANY PARTS, DISCONNECT THE UNIT FROM THE ELECTRIC POWER SUPPLY AND CLOSE THE MAIN GAS VALVE. ALLOW FIVE MINUTES FOR GAS TO VENT.
- CAUTION:** USE OF ANY REPLACEMENT PARTS OTHER THAN THOSE SUPPLIED BY GROEN OR AUTHORIZED DISTRIBUTORS CAN CAUSE INJURY TO THE OPERATOR AND DAMAGE TO THE EQUIPMENT AND WILL VOID ALL WARRANTIES.
- WARNING:** KEEP AREA AROUND KETTLE FREE AND CLEAR OF ALL COMBUSTIBLE MATERIALS. FAILURE TO DO SO COULD RESULT IN FIRE OR PROPERTY DAMAGE.
- CAUTION:** HEATING AN EMPTY KETTLE MAY CAUSE THE RELEASE OF STEAM FROM THE SAFETY VALVE.
- Important:** Service Performed by Other than Factory Authorized Personnel Will Void All Warranties.

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## Equipment Description

Green Model TDH/C is a stainless steel, steam-jacketed, table top mounted, crank-tilting kettle with a self-contained, gas heated steam source. The kettle body is welded into one solid piece and furnished with a reinforced rim and welded-in "butterfly" shaped pouring lip. The interior of the kettle is polished to a 180 emery grit finish, and the exterior is given a bright high buff finish. The unit is A.S.M.E. shop inspected and registered with the National Board for working pressures up to 50 PSI.

The self-contained steam source is heated by propane, butane, or natural gas and is equipped with electronic ignition. Charged at the factory with chemically pure water containing rust inhibitors, the steam source provides kettle temperatures of 150°F to approximately 295°F.

Controls for the unit include a crank tilt handwheel, thermostat, pressure gauge, safety valve, low water cut-off, On/Off switch, gas regulator valve, and water level sight glass.

The gas supply shuts off automatically when the kettle is tilted.

The unit must be specified for use with natural gas, propane, butane, or a stated propane/butane mixture. Service connections are required for gas and 115V electricity.

Firing Rate, BTU / Hour	
TDH/C-20	TDH/C-40
31,000 BTU/hr	52,000 BTU/hr

## KETTLE CHARACTERISTICS

Dimensions						
Model	Kettle Capacity	Jacket Capacity	Kettle Body Diameter	Kettle Body Depth	Base Width	Base Depth
TDH/C-20	20 Qt 18.9 R	6 Qt 5.7 R	14" 356 mm	11" 279 mm	28" 711 mm	24" 610 mm
TDH/C-40	40 Qt. 37.8 R	8 Qt 7.6 R	16½ 419 mm	14½ 362 mm	28" 711 mm	26¾ 679 mm

Options available include:

1. One-piece, lift-off cover.
2. Basket insert.
3. Stand that supports the unit and holds a pan in position for filling.
4. Water fill swing faucet.
5. Mirror Image (Crank on the Left)
6. 316 stainless steel interior

## Inspection & Unpacking

### WARNING

**THIS 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.**

The unit arrives completely assembled. The unit is strapped on a skid and in a heavy carton. Inspect the carton carefully for damage. Open the container and check the unit for hidden damage. Report shipping damage or shipment errors to the delivery agent.

### CAUTION

**SHIPPING STRAPS ARE UNDER TENSION AND CAN SNAP BACK WHEN CUT. TAKE CARE TO AVOID PERSONAL INJURY OR DAMAGE TO THE UNIT BY STAPLES LEFT IN THE WALLS OF THE CARTON.**

Write down the model number, serial number, and installation date for your unit at the top of the Maintenance and Service Log on Page 21. Keep this manual with the unit.

To remove the kettle from the box, cut any straps from around the box. Detach the box sides from the skid. Pull the box up off the unit, taking care to avoid damage or injury from any staples left in the box walls. When installation is to begin, cut the straps holding the kettle on the skid, and lift the kettle straight up off the skid. Examine the packing materials to make sure no loose parts are discarded with the materials.

### CAUTION

**UNIT WEIGHS FROM 215 LBS. (98 KG) TO 240 LBS. (109 KG). INSTALLER SHOULD OBTAIN HELP AS NEEDED TO LIFT THIS WEIGHT SAFELY.**

When installation is to begin, carefully cut the straps which hold the unit on the skid. Lift the unit straight up off the skid. Examine packing materials to be sure loose parts are not discarded with the materials.



**The TDH/C is shipped from the factory strapped on a pallet.**

**WARNING**

**THE KETTLE MUST BE INSTALLED BY PERSONNEL QUALIFIED TO WORK WITH ELECTRICITY AND PLUMBING. IMPROPER INSTALLATION CAN CAUSE INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT.**

## Installation and Initial Start-Up

### A. Installation

The TDH/C kettle should be installed in a ventilated room for efficient performance. Items which might obstruct or restrict the flow of air for combustion and ventilation must be removed. The area directly around the appliance must be cleared of any combustible material.

1. Installation on combustible floors is allowed. The unit requires a minimum clearance to combustible and noncombustible construction of six inches at the rear and six inches at the sides.
2. Groen recommends installation of the unit under a vent hood. The base must be fastened to the working surface.
3. Complete the piping to the gas service main using ½ inch IPS pipe or an approved equivalent.

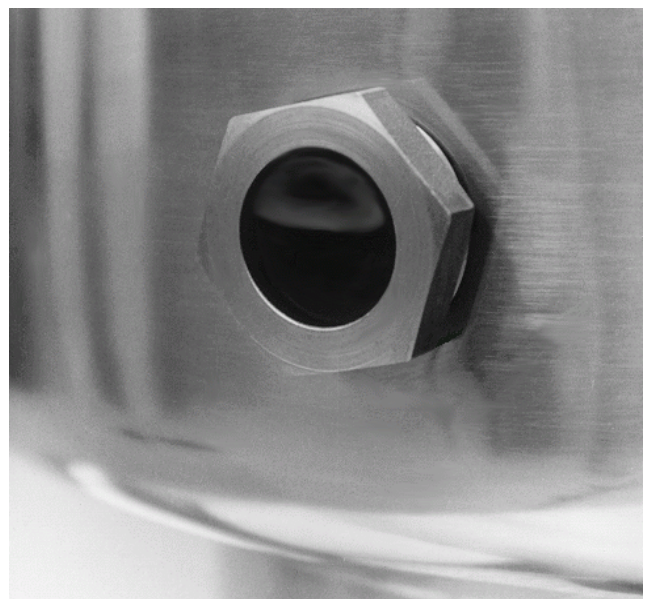
**WARNING**

**THIS UNIT IS FOR COMMERCIAL USE. DO NOT USE HOME OR RESIDENTIAL GRADE GAS CONNECTIONS. THEY DO NOT MEET GAS CODES AND COULD BE HAZARDOUS.**

4. Provide 115 VAC, 60 cycle, 1 phase, 1 AMP electric service. Local codes and/or The National Electrical Code should be observed in accordance with ANSI/NFPA-70 latest edition. AN ELECTRICAL GROUND IS REQUIRED. The electrical schematic is located on the inside of the service panel, and at the rear of this manual. In Canada provide electric service in accordance with the *Canadian Electrical Code*, C.S.A.-C22.1 Part 1 and/or local codes.
5. The installation must conform with local codes or the American National Standards Z223.1 - latest edition National Fuel Gas Code. The kettle should be installed in an adequately ventilated room with provision for adequate air supply. the best ventilation will employ a vent hood and exhaust fan with no direct connection between the vent duct and the kettle flue. DO NOT obstruct the flue or vent duct after installation. In Canada, the installation must conform to CAN/CGA B149 *Installation Codes for Gas Burning Appliances and Equipment* and/or local codes.
6. The appliance and its individual shutoff valve must be **disconnected** from the gas supply piping system during any pressure testing of the gas supply system

at test pressures that **exceed** ½ PSIG (3.45 kPa). The kettle must be **isolated** from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of that system at test pressures **which equal or are less than** ½ PSIG (3.45 kPa).

7. Adequate space for proper servicing and operation is required. DO NOT block any air intake spacings to the combustion chamber or obstruct air flow.
8. After the kettle has been connected to the gas supply, check all gas joints for leaks. A thick soap solution or other suitable leak detector should be used. **Do not use flame when checking the leaks.**
9. Once the unit is anchored to a mounting surface, Apply a small bead of silicone caulk around the perimeter of the kettle base.
10. Make sure the water level is correct in the jacket, by confirming that the level is near the middle of the sight glass. If the water level is low, follow the instructions in *Jacket Filling and Water Treatment* in the Maintenance section of this manual.
11. Check to be sure that the open end of the elbow



**Correct water level**

on the outlet of the safety valve is directed downward. Be sure to read and follow the instructions on the attached safety valve tag.

## B. Initial Start-Up

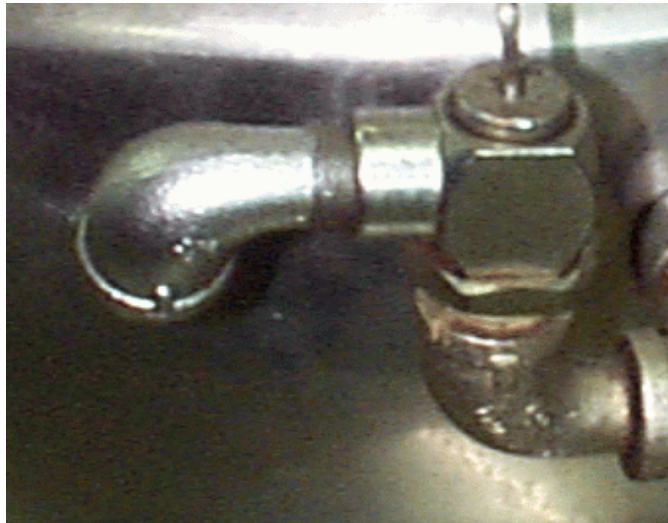
**IMPORTANT:**  
**BE SURE ALL OPERATORS READ, UNDERSTAND  
AND FOLLOW THE OPERATING INSTRUCTIONS,  
CAUTIONS, AND SAFETY INSTRUCTIONS  
CONTAINED IN THIS MANUAL.**

After the kettle has been installed, the installer should test to ensure that it is operating correctly.

1. Remove literature and packing materials from inside and outside of the unit.
2. Put on or two inches of water into the kettle.

3. Make sure the supplies of gas and electric power are on.
4. Follow the *"To Start Kettle Heating"* instructions in the Operation section of this manual. Begin heating the water at the highest thermostat setting. The indicator light should come on and heating should continue until the water boils.
5. To turn off the unit, follow *"To Stop Kettle Heating"* in the *Operation* Section of this manual..

If the kettle functions as described, it is ready for use. If the unit does not operate as designed, contact authorized Groen Service Agent.



**Make sure that the open end of the elbow on the pressure safety valve is directed downward.**

**WARNING**  
**DO NOT STAND ON OR APPLY UNNECESSARY WEIGHT OR PRESSURE ON THE KETTLE FRONT OR POURING LIP. THIS COULD RESULT IN THE OVERLOAD AND FAILURE OF THE TILT MECHANISM, AND POSSIBLE SERIOUS INJURY AND BURNS TO THE OPERATOR AND OTHERS.**



## Operation

### WARNING

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

#### A. Controls

Operator controls for the TDH/C kettle are:

1. Manual gas valve which controls the supply of gas from the main to the unit.
2. On-Off (toggle) switch. This switch turns the control circuit power supply on or off.
3. Thermostat dial, which turns the thermostat on or off, and sets the kettle operating temperature.
4. Crank tilt handwheel which controls kettle movement.

#### B. Operating Instructions

##### WARNING

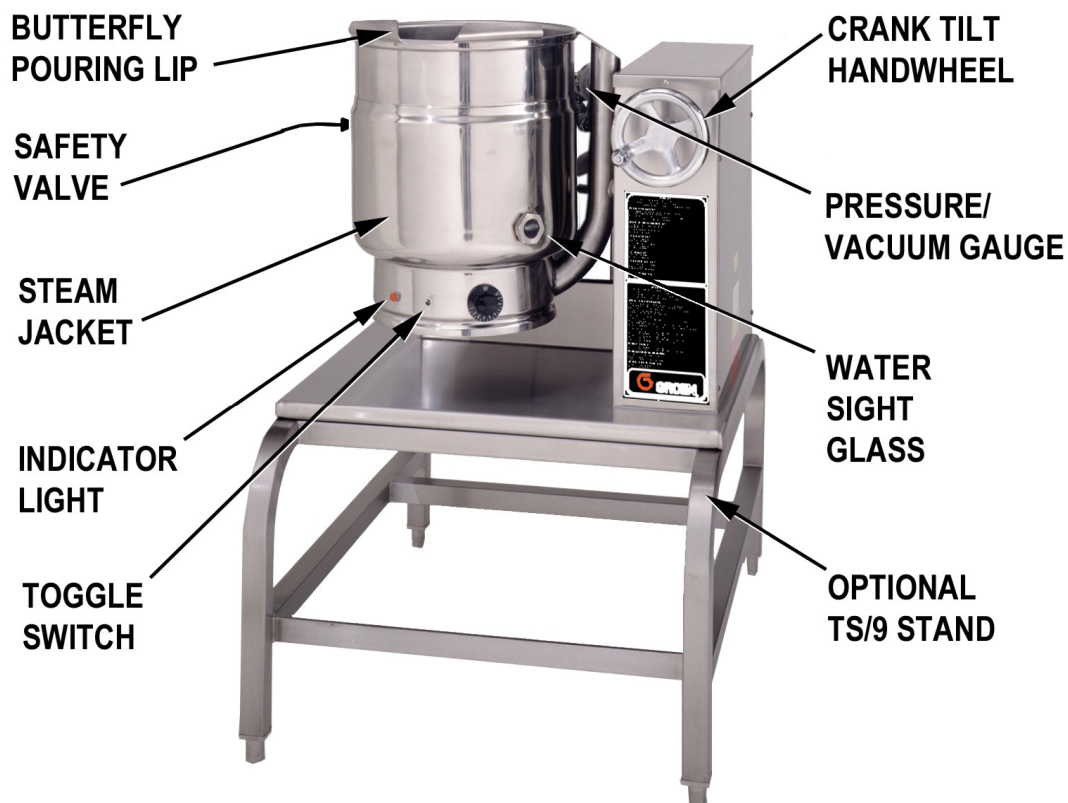
**KEEP AREA AROUND KETTLE FREE AND CLEAR OF ALL COMBUSTIBLE MATERIALS. DO NOT ATTEMPT TO LIGHT ANY BURNER WITH A FLAME.**

##### CAUTION

**HEATING AN EMPTY KETTLE MAY CAUSE THE RELEASE OF STEAM FROM THE SAFETY VALVE.**

#### 1. To Start Kettle

- a. CHECK THE WATER LEVEL IN THE JACKET EVERY DAY. The level should be at the middle of the sight glass. If the water level is low, see *Jacket Filling* in the Maintenance section of this manual.
- b. Check the pressure/vacuum gauge. If the gauge does not show 20 to 30 inches of vacuum (i.e. a reading of 20 to 30 below zero), see *Jacket Vacuum* in the Maintenance section of this manual.
- c. DO NOT attempt to light any burner with a flame.
- d. Open the main supply gas valve (handle in line with the pipe).
- e. Turn the toggle switch to ON.
- f. Turn the thermostat to the desired setting.



The TDH/C is shown on the optional TS/9 stand.



**2. To Stop Kettle Heating**

- a. Turn the thermostat dial to OFF.
- b. Turn the toggle switch OFF.
- c. For a prolonged shut-down:
  1. Follow the procedure above.
  2. Turn the manual gas valve OFF (handle at right angle to gas line).
  3. Disconnect the unit's electrical power.

**3. To Relight Kettle**

- a. Close main gas supply valve.
- b. Set on-off switch to OFF.
- c. Set thermostat to OFF.
- d. Wait five minutes, then proceed as directed under *To Start Kettle*.

**4. If Electric Power Fails, do not attempt to operate the unit. When power is restored, proceed as directed in *To Start Kettle*.****5. To Transfer Product or Empty Kettle:**

The kettle body is tilted using the crank tilt handwheel. Turning the crank clockwise tilts the kettle body; counter-clockwise returns it to an upright position. The kettle body will remain in any tilted position.



**WARNING**  
**AVOID ALL DIRECT CONTACT WITH HOT FOOD OR WATER IN THE KETTLE. DIRECT CONTACT COULD RESULT IN SEVERE BURNS.**

**TAKE CARE TO AVOID CONTACT WITH HOT KETTLE BODY OR HOT PRODUCT, WHEN ADDING INGREDIENTS, STIRRING OR TRANSFERRING PRODUCT TO ANOTHER CONTAINER.**

**CAUTION**

**DO NOT OVERFILL THE KETTLE WHEN COOKING, HOLDING OR CLEANING. KEEP LIQUIDS 2-3" (5-8 cm) BELOW THE KETTLE RIM TO ALLOW CLEARANCE FOR STIRRING, BOILING PRODUCT AND SAFE TRANSFER.**

**WARNING****WHEN TILTING KETTLE:**

- 1) **WEAR PROTECTIVE OVEN MITT AND PROTECTIVE APRON.**
- 2) **USE DEEP CONTAINER TO CONTAIN AND MINIMIZE PRODUCT SPLASHING.**
- 3) **PLACE CONTAINER ON STABLE, FLAT SURFACE, CLOSE TO THE KETTLE.**
- 4) **STAND TO AWAY FROM POUR PATH OF HOT CONTENTS.**
- 5) **POUR SLOWLY, KEEP CONTROL OF KETTLE, AND RETURN KETTLE BODY SLOWLY TO UPRIGHT POSITION AFTER CONTAINER IS FILLED OR TRANSFER IS COMPLETE.**
- 6) **DO NOT OVERFILL CONTAINER. AVOID DIRECT SKIN CONTACT WITH HOT CONTAINER AND ITS CONTENTS.**

**6. Use of Common Accessories**

1. Lift-Off Cover
  - a. As with stock pot cooking, an optional lift off cover will speed up the heating of water and food products. A cover helps retain heat in the cooking vessel and reduces the amount of heat and humidity released into the kitchen. Use of a cover can reduce some product cook times and help maintain the temperature, color and texture of products being held or simmered for extended periods.
  - b. Make sure the plastic ball handle is secure on the lift off cover before using. ALWAYS use the plastic handle to place or remove cover from the kettle. Wear protective oven mitts and a protective apron.
  - c. When putting the cover on the kettle, position it on top of kettle rim, with its flat edge facing the pouring lip.
  - d. When removing cover:
    - 1) Firmly grasp plastic handle



**WARNING**

**AVOID ALL DIRECT CONTACT WITH HOT SURFACES. DIRECT SKIN CONTACT COULD RESULT IN SEVERE BURNS.**

**AVOID ALL DIRECT CONTACT WITH HOT FOOD OR WATER IN THE KETTLE. DIRECT CONTACT COULD RESULT IN SEVERE BURNS.**

**CAUTION**

**DO NOT TILT KETTLE BODY WITH COVER OR BASKET INSERT IN PLACE. COVER MAY SLIDE OFF, CAUSING INJURY TO OPERATOR.**

- 2) Lift rear edge (farthest from operator) 1-2" (3-5 cm) to allow any steam and water vapor to escape the cooking vessel. Wait 2-3 seconds.



**Lift the rear edge of the lid first.**

- 3) Tilt cover to 45-60° angle and allow any hot condensate or product to roll off cover back into kettle.
- 4) Remove cover, ensuring that any remaining hot condensate or product does not drip on operator, floor or work surfaces.
- 5) Place cover on safe, flat, sanitary, out-of-the-way surface, or return to kettle rim.

## 2. Basket Insert

- a. An optional kettle basket insert can assist in cooking water-boiled products including eggs, potatoes, vegetables, shell fish, pasta and rice. The nylon mesh liner must be used when cooking product smaller than the mesh size of the basket, which is approximately 1/4" (6 mm). This includes rice and small pasta shapes.

### b. Tips For Use.

- 1) Allow for the water displacement of the basket and product to be cooked. This may mean only filling the kettle half full of water. Test the basket and product displacement with the kettle OFF, and with cold water in the kettle.

**CAUTION**

**DO NOT OVERFILL THE KETTLE WHEN COOKING, HOLDING OR CLEANING. KEEP LIQUIDS A MINIMUM OF 2-3" (5-8 cm) BELOW THE RIM TO ALLOW FOR STIRRING, BOILING AND SAFE PRODUCT TRANSFER.**

- 2) Load basket on a level, stable work surface.
- 3) Lift the loaded basket with both hands. Get help from another person if the basket is too heavy for safe handling. Then slowly lower product into kettle.
- 4) When removing basket with cooked product, lift basket straight up, ensuring bottom of basket clears the rim and pouring lip of the kettle. Wear protective oven mitts and protective apron.
- 5) Allow hot water to fully drain from product, before moving basket away from the kettle. Do not rest kettle basket on kettle rim or pouring lip. If basket is too heavy for individual to lift and safely move, get help from another person. Remove product immediately from basket into another container, being sure to avoid contact with hot product and hot basket **or** place basket with food on stable, flat surface, setting it inside a solid steamer or bake pan, to catch any remaining hot water draining from product.

## Cleaning

### 1. Suggested Cleaning Supplies:

- Cleaner, such as Klenzade HC-10 or HC-32 from ECOLAB, Inc.
- Kettle brushes in good condition.
- Sanitizer such as Klenzade XY-12.
- Film remover such as Klenzade LC

### 2. Precautions

Before any cleaning operation, shut off the kettle by turning the thermostat dial to "OFF".



**WARNING**  
KEEP WATER AND SOLUTIONS OUT OF CONTROLS AND BURNERS. NEVER SPRAY OR HOSE THE CONTROL CONSOLE, ELECTRICAL CONNECTIONS, ETC.

### 3. Procedure

- Clean food contact surfaces as soon as possible after use, preferably while the kettle is still warm. If the unit is in continuous use, clean and sanitize inside and outside at least once every 24 hours.
- Scrape and flush out large amounts of food residues. Be careful not to scratch the kettle with metal implements.

**CAUTION**  
NEVER LEAVE A CHLORINE SANITIZER IN CONTACT WITH STAINLESS STEEL SURFACES LONGER THAN 30 MINUTES. LONGER CONTACT CAN CAUSE CORROSION.

- Prepare a solution of the detergent/cleaning compound as instructed by the supplier. Clean the unit thoroughly. A cloth moistened with cleaning solution can be used to clean controls, housing, electrical conduit, etc.
- Rinse the kettle thoroughly with hot water. Then drain completely.



**CAUTION**  
MOST CLEANERS ARE HARMFUL TO THE SKIN, EYES, MUCOUS MEMBRANES AND CLOTHING. PRECAUTIONS SHOULD BE TAKEN TO WEAR RUBBER GLOVES, GOGGLES OR FACE SHIELD AND PROTECTIVE CLOTHING. CAREFULLY READ THE WARNINGS AND FOLLOW LABEL DIRECTIONS.

- As part of the daily cleaning program, clean all inside and outside surfaces that may have been soiled. Remember to check such parts as the underside of the cover, control housing, etc.
- To remove materials stuck to the equipment, use a brush, sponge, cloth, plastic or rubber scraper, or plastic wool along with the detergent solution. To make washing easier, let the detergent solution sit in the kettle and soak into the residue, or warm the detergent solution briefly. Do not use any metal material (like metal sponges) or metal (like a spoon, scraper, or wire brush) that might scratch the 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 and cause eventual corrosion and pitting.



Use a sponge, cloth or plastic brush to clean the kettle.



**Scrapers, steel wool or metal implements can harm the kettle surface.**

- g. The outside of the unit may be polished with a recognized stainless steel cleaner like “Zepper” from Zep Manufacturing Company.
- h. When the equipment needs to be sanitized, use a sanitizing solution equivalent to one that supplies 200 parts per million chlorine. Obtain advice on the best sanitizing agent from your supplier of sanitizing products.
- i. Following the supplier’s instructions, apply the sanitizing agent, after the unit has been cleaned and drained. Rinse off the sanitizer thoroughly.
- j. It is recommended that the unit be sanitized just before use.
- k. If there is difficulty removing mineral deposits or a film left by hard water or food residues, clean the kettle thoroughly. Then use a de-liming agent, such as Groen De-limer De-Scaler (Part Number 114800), Lime-Away from ECOLAB or an equivalent, following manufacturer directions.
- l. Rinse and drain the unit thoroughly before further use.
- m. If especially difficult cleaning problems persist, contact your cleaning product supplier for assistance. The supplier has a trained technical staff with laboratory facilities to serve you.

## Maintenance

*NOTICE: Contact Groen or an authorized Groen Service Agent when repairs are required.*

Service Log is provided at the rear of this manual. Each time service is performed on this Groen equipment, enter the date on which the work was done, and who did it. Keep this manual with the equipment.

### 1. Jacket Vacuum/Removing Air From Jacket

Every day, while the kettle is cold, read the pressure/vacuum gauge. A positive reading or a negative reading between zero and 20 on the pressure/vacuum gauge indicates excess air in the jacket. Air in the jacket slows kettle heating and can prevent the kettle from reaching operating temperature. To remove air:

- a. Start the kettle. (See the “Operation” section).
- b. Make sure the elbow on the outlet of the safety valve is turned so that escaping steam is directed down toward the floor.
- c. When the pressure/vacuum gauge reaches a positive pressure reading of five PSI, release trapped air by lifting the safety valve

lever for about one second. Repeat this step, then let the valve lever snap closed, so the valve will seat properly and not leak.

### 2. Test Safety Valve

At least twice a month, test the safety valve. Test the valve with the kettle operating at 15 PSI (105 kPa), by holding the test lever for at least five seconds. Then release the lever and permit the valve to snap shut. If the lever does not activate, if there is no discharge, or if the valve leaks, stop using the kettle immediately and contact a qualified factory service representative.

**WARNING**

**AVOID ANY EXPOSURE TO THE STEAM BLOWING OUT OF THE SAFETY VALVE. SEVERE BURNS CAN RESULT ON EXPOSED SKIN.**

**FAILURE TO CHECK SAFETY VALVE OPERATION PERIODICALLY COULD RESULT IN PERSONAL INJURY AND/OR DAMAGE TO EQUIPMENT.**

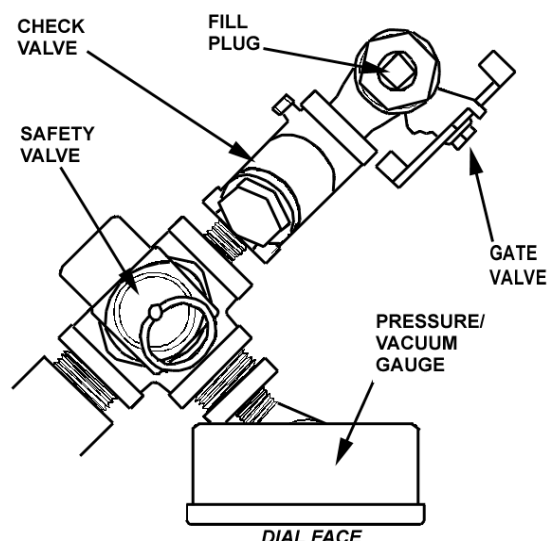
**WHEN TESTING, AVOID ANY EXPOSURE TO THE STEAM BLOWING OUT OF THE SAFETY VALVE. DIRECT CONTACT COULD RESULT IN SEVERE BURNS.**

### 3. Jacket Filling

Every day, **before you turn on the unit**, make sure the water level is approximately in the center of the water gauge glass. The jacket was filled at the factory with the proper amount of treated water, and is air-tight, but over time steam may be vented and water lost.

From time to time, you may need to restore the water to its proper level. The procedure for adding water follows.

- If you are replacing water lost as steam, use distilled water. **Do not use tap water.** If you are replacing treated water that was drained from the jacket, prepare more treated water as directed below.
- Allow the kettle to cool **completely**. Remove the pipe plug from the jacket fill



The safety valve and fill plug are located directly behind the pressure/vacuum gauge.

assembly. Then open the gate valve and pour in the distilled or treated water. Using a funnel will help you in this process. Hold the safety valve open while you pour, to let air escape from the jacket. Continue adding water until the water level rises to the center of the round sight glass.

- Close the gate valve.
- Air that gets into the jacket during the filling operation must be removed, because it will make heating less efficient. Follow the procedure in "Jacket Vacuum" above, to restore a negative pressure reading.

### 4. Water Treatment

**WARNING**

**TO AVOID INJURY, READ AND FOLLOW ALL PRECAUTIONS STATED ON THE LABEL OF THE WATER TREATMENT COMPOUND.**

- Fill a mixing container with the amount of water required. Use only distilled water.

Model	Kettle Capacity		Jacket Capacity	
TDH/C-20	20 Qts	18.9 R	6 Qts	5.7 R
TDH/C-40	40 Qts	37.8 R	8 Qts	7.6 R

- Hang a strip of pH test paper on the rim of the container, with about 1 inch of the strip below the surface of the water.
- Stir the water continuously, while you slowly add water treatment compound until a color between indicating a pH of 10.5 and 11.5 is reached. (Shown on the pH test kit chart.) Judge the pH by frequently comparing the test strip with the color chart provided in the pH test kit.
- Use a measuring cup to add the compound so that you may record the exact amount used.
- The amount may be used again, if the same water sources and compound are used in the future. However, it is best to check the pH each time treated water is prepared.

## Sequence of Operation

The following “action-reaction” outline is provided to help the user understand how the equipment works.

When the operator sets the desired temperature on the thermostat dial, the thermostat switch closes and sends a signal which (1) starts the spark and (2) opens the automatic valve for the pilot burner. The spark ignites the pilot flame, which heats a probe. The heated probe sends a signal that causes the spark to shut off and the automatic valve to admit gas to the main burner. The pilot flame ignites the main burner. If a pilot flame is not sensed within 30 seconds after the spark begins, a timer shuts down the whole operation. In addition to the lockout timer, safety features include:

1. Low water cutoff relay that will shut off the gas supply to all burners until the water level is corrected.

2. High limit pressure switch, set to open at about 47 PSI and shut down the burners until jacket pressure is decreased.
3. Pop safety valve, which will release steam if the jacket pressure exceeds 50 PSI.
4. Tilt switch that shuts off all burners when the kettle is tilted.

When the kettle reaches the set temperature, the thermostat switch opens, stopping the signal to the gas control valve and causing the valve to shut off all gas flow. When the kettle cools below the set temperature, the thermostat switch closes and starts another heating cycle. On-off cycling continues and maintains the kettle at the desired temperature.

## Troubleshooting

Your Groen kettle is designed to operate smoothly and efficiently if properly maintained. However, the following is a list of checks to make in the event of a problem. Wiring diagrams are furnished inside the service panel and in this manual. **If an item on the list is followed by X, the work should be done by a qualified service representative.**

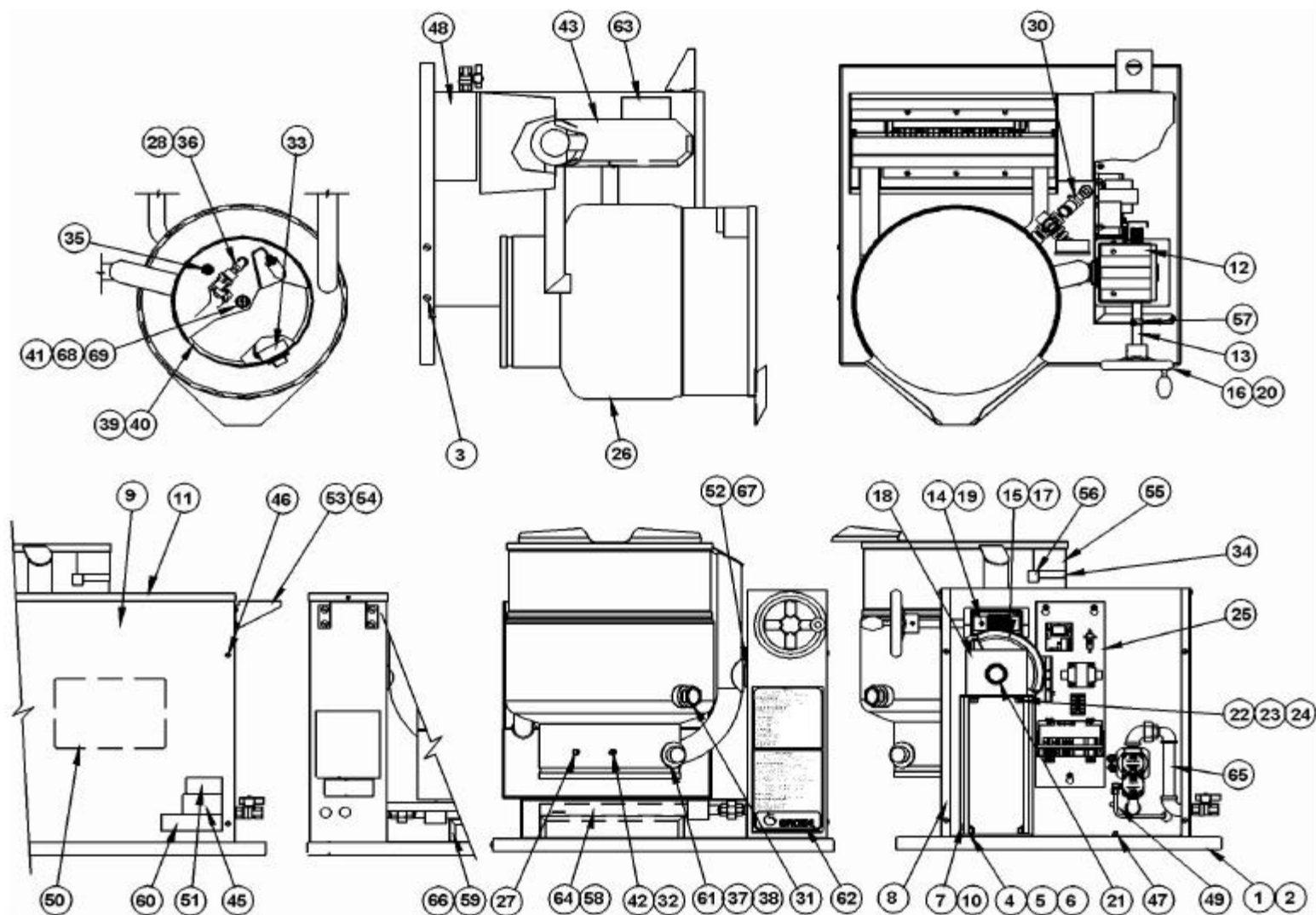
<b>WARNING</b>		
<b>BEFORE REPLACING ANY PARTS, DISCONNECT THE UNIT FROM THE ELECTRIC POWER SUPPLY AND CLOSE THE MAIN GAS VALVE. ALLOW FIVE MINUTES FOR UNBURNED GAS TO VENT.</b>		
<b>CAUTION</b>		
<b>USE OF ANY REPLACEMENT PARTS OTHER THAN THOSE SUPPLIED BY GROEN OR THEIR AUTHORIZED DISTRIBUTOR CAN CAUSE INJURY TO THE OPERATOR AND DAMAGE TO THE EQUIPMENT AND WILL VOID ALL WARRANTIES..</b>		
<b>SYMPTOM</b>	<b>WHO</b>	<b>WHAT TO CHECK</b>
		<b>X indicates items which must be performed by an authorized technician.</b>
Kettle is hard to tilt.	Auth Service Rep Only	a. Gears for foreign materials, lubrication and alignment. X
Kettle continues heating after it reaches desired temperature.	User	a. Thermostat dial setting.
	Auth Service Rep Only	b. Thermostat calibration. X c. Thermostat operation. The thermostat should click when the dial is rotated to settings above and below the temperature of the kettle. X
Kettle stops heating before it reaches the desired temperature.	User	a. Thermostat dial setting.
	Auth Service Rep Only	b. Thermostat calibration. X c. Thermostat operation. The thermostat should click when the dial is rotated to settings above and below the temperature of the kettle. X
Safety Valve pops open	User	a. For air in the jacket. See “Jacket Vacuum” in the Maintenance section. b. Thermostat dial setting.
Safety Valve pops open	Auth Service Rep Only	c. For defective thermostat. The thermostat should click when dial is rotated above and below kettle temperature. If defective, replace. X d. For defective safety valve. If valve pops below 49 PSI, replace. X



SYMPTOM	WHO	WHAT TO CHECK
		X indicates items which must be performed by an authorized technician.
Burners will not light.	User	a. That main gas supply valve is open. (handle in line with gas pipe). b. Gas supply to the building. c. That the kettle body is horizontal.
	Auth Service Rep Only	d. Thermostat operation. The thermostat should click when the dial is rotated to settings above and below the temperature of the kettle. X e. Momentary switch is being properly actuated. X
System does not produce a spark	Auth Service Rep Only	a. Thermostat, and close the contacts if they are open X b. AC voltage between terminals "2" and "GR." If it is not 24 Volt, replace the transformer X c. That the jumper is securely installed between terminal "5" and "GR." d. That the high tension cable is firmly attached and in good condition. If cracked or brittle, replace the pilot. X e. Pilot electric ceramic for crack or break. X f. Pilot spark gap. Regap, if it is not 7/64 inch. X g. Replace the electronic portion of the G770 system. X
Spark is present but the pilot will not light.	Auth Service Rep Only	a. That the pilot valve is securely connected to terminals "1" and "GR." (Some models have the pilot valve grounded internally).X b. For 24 VAC at terminals "1" and "GR." If 24V is not present, replace the G770 ignition control. X b. That gas pressure meets the control manufacturer specifications. X c. For gas at the pilot. If it is not flowing: (1) Check the pilot gas line for kinks and obstructions. X (2) Clean orifice, if necessary. X (3) Replace the pilot valve. X d. That the pilot spark gap is 7/64 inch and located in the pilot gas stream. If not, adjust or replace the pilot. X e. For drafts. Shield the pilot burner, if necessary. X
Pilot lights, but main burner will not come on and spark does not stay on.	Auth Service Rep Only	a. For 24 V between terminals "3" and "GR". If voltage is not correct, replace the G770 ignition control. X b. That the gas pressure meets control manufacturer specifications. X c. Electrical connections of main valve to terminals "3" and "GR" to assure they are securely attached. If so, replace the main valve." X
Pilot lights, but main burner will not come on, the spark stays on.	Auth Service Rep Only	a. That sensor cable and high voltage cable are separated from each other and not wrapped around any pipe or accessory. X b. Sensor cable, to ensure that there are secure attachments to terminal "4" and the sensor. X c. Sensor ceramic for cracks. X d. That cable is not grounded out. If it is, correct the ground. X e. That the sensor or sensor connector is not grounded out. X f. Sensor cable for continuity and condition of insulation. X g. Disconnect main valve lead from terminal "3," and sensor cable from terminal "4." Observing correct polarity, connect a DC micro ammeter between the sensor cable terminal and terminal "4." Check that the current is 0.15 microamp or greater with only the pilot operating. If it is, replace the G770 ignition control. X h. For proper gas pressure. X i. Clean pilot assembly, if necessary. X j. Tighten all mechanical and electrical connections. X k. Pilot application, and correct to increase sensor probe current, by: (1) Increasing or decreasing pilot orifice size. X (2) Shielding the pilot from drafts. X l. Replace sensor or orifice. X m. Replace G770 ignition control. X

## Parts List

To order parts, contact your Groen Certified Service Agency. Supply the model designation, part description, part number, quantity, and, where applicable, voltage and phase.



# OM/SM-TDH/C

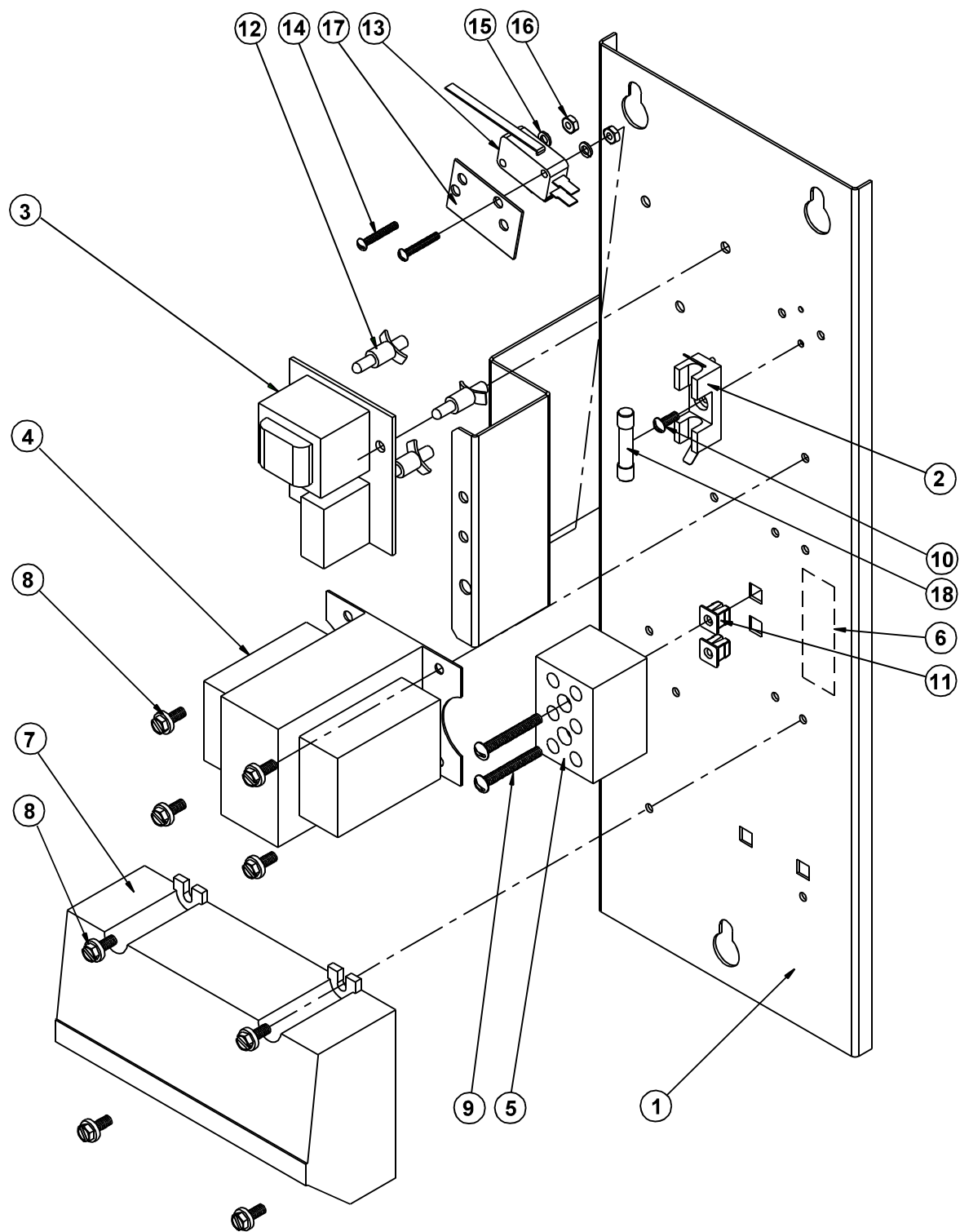
## Parts List

To order parts, contact your Groen Certified Service Agency. Supply the model designation, part description, part number, quantity, and, where applicable, voltage and phase.

Key	Description	Part No.	Key	Description	Part No.	Key	Description	Part No.
1	Weldment, TDH-40	122376	25	Assembly, Electrical Panel - TDH	128034	48	Shroud, Burner TDH/C-20	097020
	Weldment, TDH-20	124713	26	Weldment, Body 304 ss TDH-40	128024	49	Screw, 1/4-20 x 1/2 hex head ss	005608
2	Weldment, Base Support	124729		Weldment, Body 316 ss TDH-40	128045	50	Label, Wiring Diagram	132391
3	Screw, 1/4-20 x 1/2 truss head ss	012700		Weldment, Body 304 ss TDH-20	128030	51	Label, Warning	132398
4	Screw, 1/2-13 x 1-1/4 hex head ss	005623		Weldment, Body 316 ss TDH-20	128046	52	Grommet, 1-1/2 ID	003492
5	Nut hex 1/2-13 ss	005603	27	Lamp, Indicator, Red	003332	53	Bracket, Faucet	009054
6	Washer, lock 1/2 ss	005657	28	Elbow, 90 degrees street	003922	54	Screw, 1/4-20 x 1/2 Tr head ss	012700
7	Weldment, pedestal, TDH/C-40	124735	30	Assy, Safety Valve & Pressure Gauge	005801	55	Plate, Data	132316
	Weldment, pedestal, TDH/C-20	124737	31	Sight Glass	005831	56	Label, NSF	066735
8	Weldment, Cladding Side, TDH/C-40	124748	32	Switch, On-Off	006904	57	Bushing, Snap	000453
	Weldment, Cladding Side, TDH/C-20	124755	33	Thermostat	101524	58	Screw, 1/4-20 x 3/4 hex ss (TDH-40)	005609
9	Cladding, Panel TDH/C-40	124751	34	Nameplate, TDH	132390		Screw, 1/4-20 x 1-1/2 hex ss (TDH-20)	005469
	Cladding, Panel TDH/C-20	124758	35	Electrode, Water Level	074623	59	Bracket, Burner TDH-40	097069
10	Spacer, pedestal	128035	36	Switch, Pressure	096963		Bracket, Burner TDH-20	097049
11	Cladding, Top	124754	37	Grommet, 1/4 ID x 1/2	001518	60	Label, Warning	132330
12	Assembly, Gear Carrier	124741	38	Screw, 6-32 x3/8 round head	009697	61	Knob, Thermostat	002868
13	Shaft, Worm	122374	39	Cover, Element Housing	003141	62	Decal, Operating Instructions	132392
14	Gear, Worm	128001	40	Gasket, Bottom Plate	007937	63	Nameplate, CGA TDH Kettles	132389
15	Assembly, Gear Sector	128028	41	Weldment Plug and Standoff TDH-40	129707	64	Assembly, Burner & Piping, TDH-40	097055A
16	Assembly, Handwheel	124719		Weldment Plug and Standoff TDH-20	129709		Assembly, Burner & Piping, TDH-20	097033A
17	Key, 1/4 Sq. x 1.00 ss	122371	42	Plate, On/Off Switch	007403	65	Assembly, Natural Gas Piping	097031
18	Assembly, Bearing Block	128021	43	Assembly, Flue Stack - TDH-40	090686		Assembly, Propane Gas Piping	097032
19	Pin, Roll, 1/4 x 1-1/4 lg	012614		Assembly, Flue Stack - TDH-20	093605	66	Burner Bracket Support (TDH-20)	097050
20	Pin, Roll 1/4 x 1-5/8 lg	128036	45	Label, Warranty	128906	67	Spacer, Washer	129706
21	Ring, Retaining, 1-1/2	124764	46	Screw, 8-32 x 3/8 pan head ss	005764	68	Washer Lock 1/4"	005655
22	Washer, Lock 3/8 ss	005618	47	Nut, hex w/Keps 1/4-20	012940	69	Screw 1/4 x 1/2 hex head Cap	005608
23	Screw, 3/8-16 x 1.00 hex head ss	005612	48	Shroud, Burner TDH/C-40	097019			
24	Washer, Flat 3/8 ss	005830						

Parts List

To order parts, contact your Groen Certified Service Agency. Supply the model designation, part description, part number, quantity, and, where applicable, voltage and phase.

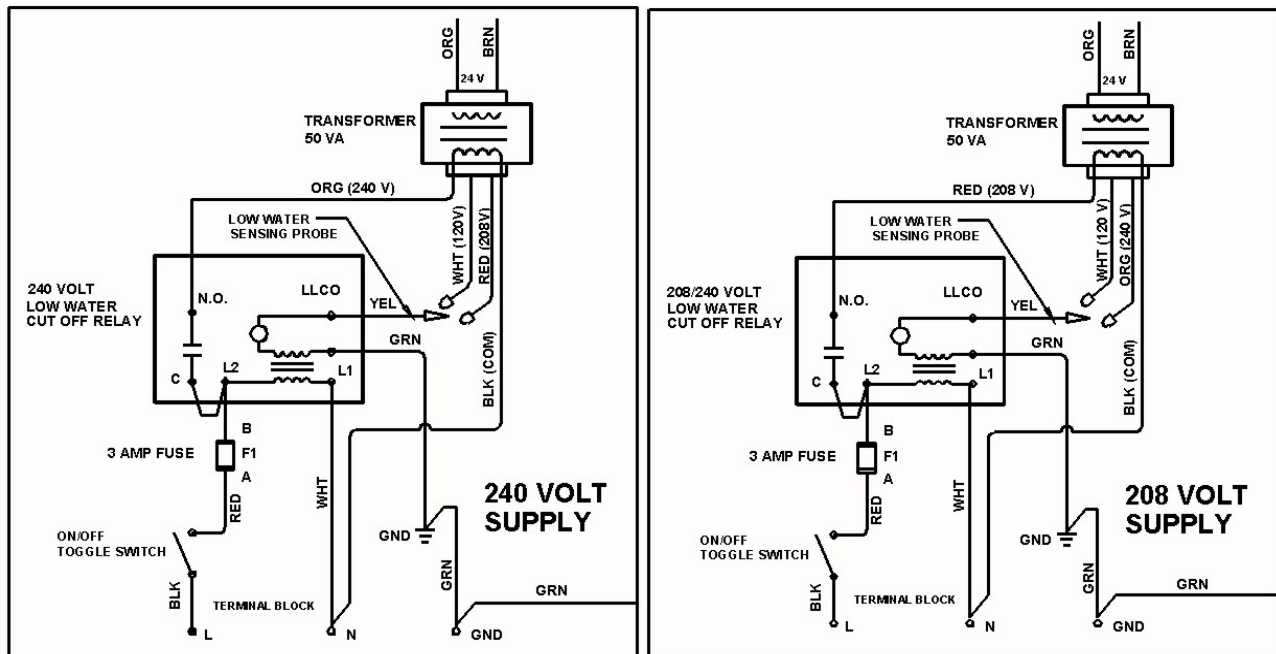


## Parts List

*To order parts, contact your Groen Certified Service Agency. Supply the model designation, part description, part number, quantity, and, where applicable, voltage and phase.*

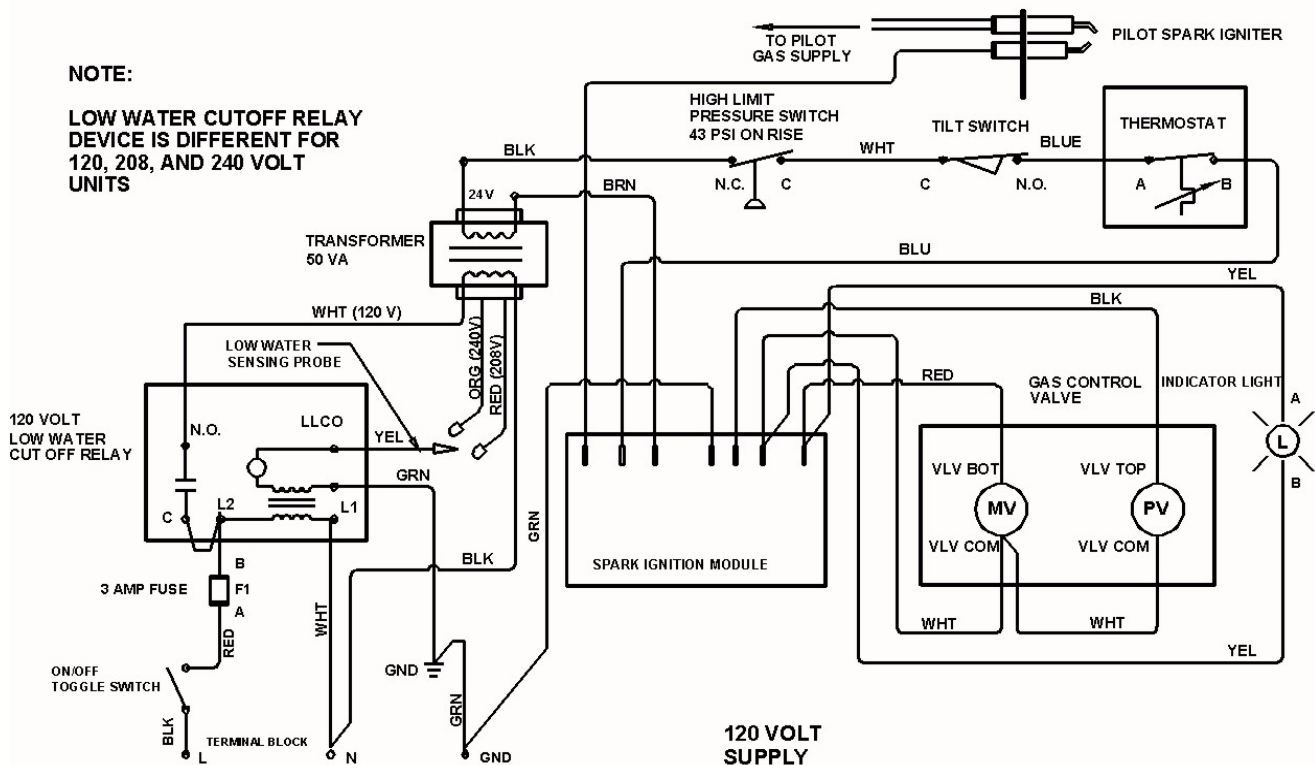
Key	Description	Part No.	Key	Description	Part No.
1	Assy, Elec. Mounting Bracket	124727	10	Screw, 6-32 x 3/8 lg self-tapping rnd head	012398
2	Fuse, Holder, Type 3 AG	077854	11	Insert, 8 screw - nylon	124759
3	Control, Water Level, 115 V	097023	12	P. C. Board Mounting Post	099901
4	Transformer, 50 VA 120/208/240	074839	13	Micro Switch	002982
5	Terminal Block, three pole	003888	14	Screw, Round Head 4-40 x 3/4 lg.	003122
6	Label, Supply Voltage	114316	15	Washer shakeproof lock 6	005715
7	Ignition Module	085153	16	Nut, Hex 4-40	003121
8	Screw, 8 x 3/8 lg. hex slot self-tapping	128000	17	Barrier Insulation	003490
9	Screw #8-32 x 1-1/4 Rnd Head	005056	18	Fuse, three Amp Type 3 AG	077853

# Schematic



## NOTE:

LOW WATER CUTOFF RELAY  
DEVICE IS DIFFERENT FOR  
120, 208, AND 240 VOLT  
UNITS



P/N 128029 REV. C



Service Log

Model No. \_\_\_\_\_

Purchased From \_\_\_\_\_

Serial No. \_\_\_\_\_

Location \_\_\_\_\_

Date Purchased \_\_\_\_\_

Date Installed \_\_\_\_\_

Purchase Order No. \_\_\_\_\_

For Service Call \_\_\_\_\_

Date	Service Performed	Performed By

## **References**

KLENZADE SALES CENTER  
ECOLAB. Inc.  
370 Wabasha  
St. Paul, Minnesota 55102  
800/352-5326 or 612/293-2233

NATIONAL FIRE PROTECTION ASSOCIATION  
60 Battery March Park  
Quincy, Massachusetts 02269

NFPA/54                      Installation of Gas Appliances & Gas Piping

NFPA/70                      The National Electrical Code

NATIONAL SANITATION FOUNDATION  
3475 Plymouth Rd.  
Ann Arbor, Michigan 48106

UNDERWRITERS LABORATORIES, INC.  
333 Pfingsten Road  
Northbrook, Illinois 60062

ZEP MANUFACTURING CO.  
1310-T Seaboard Industrial Blvd.  
Atlanta, Georgia 30318

## Limited Warranty To Commercial Purchasers \*

(Domestic U.S., Hawaii &  
Canadian Sales Only)

Groen Foodservice Equipment ("Groen Equipment") has been skillfully manufactured, carefully inspected and packaged to meet rigid standards of excellence. Groen warrants its Equipment to be free from defects in material and workmanship for (12) twelve months with the following conditions and subject to the following limitations.

- I. This parts and labor warranty is limited to Groen Equipment sold to the original commercial purchaser/users (but not original equipment manufacturers), at its original place of installation in the continental United States, Hawaii and Canada.
- II. Damage during shipment is to be reported to the carrier, is not covered under this warranty, and is the sole responsibility of purchaser/user.
- III. Groen, or an authorized service representative, will repair or replace, at Groen's sole election, any Groen Equipment, including but not limited to, draw-off valves, safety valves, gas and electric components, found to be defective during the warranty period. As to warranty service in the territory described above, Groen will absorb labor and portal to portal transportation costs (time & mileage) for the first twelve (12) months from date of installation or fifteen (15) months from date of shipment from Groen.
- IV. This warranty does not cover boiler maintenance, calibration, periodic adjustments as specified in operating instructions or manuals, and consumable parts such as scraper blades, gaskets, packing, etc., or labor costs incurred for removal of adjacent equipment or objects to gain access to Groen Equipment. This warranty does not cover defects caused by improper installation, abuse, careless operation, or improper maintenance of equipment. This warranty does not cover damage caused by poor water quality or improper boiler maintenance.
- V. **THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EACH OF WHICH IS HEREBY EXPRESSLY DISCLAIMED. THE REMEDIES DESCRIBED ABOVE ARE EXCLUSIVE AND IN NO EVENT SHALL GROEN BE LIABLE FOR SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES FOR THE BREACH OR DELAY IN PERFORMANCE OF THIS WARRANTY.**
- VI. Groen Equipment is for commercial use only. If sold as a component of another (O.E.M.) manufacturer's equipment, or if used as a consumer product, such Equipment is sold AS IS and without any warranty.

**\* (Covers All Foodservice Equipment Ordered After October 1, 1995)**



1055 Mendell Davis Drive  
Jackson, MS 39212  
Phone 601 372-3903  
Fax 601 373-9587

**OM/SM-TDH/C** (Revised 2/00)  
Part Number 121064