OPERATOR MANUAL

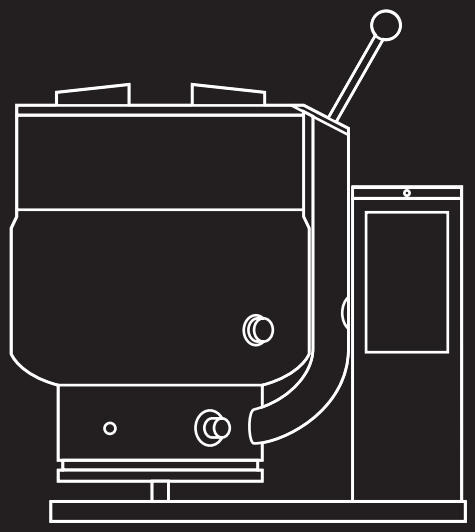
IMPORTANT INFORMATION, KEEP FOR OPERATOR

This manual provides information for:

TDB(C)CE STEAM JACKETED KETTLES

INTERNATIONAL

· Self Contained
· Electric Heated
· Table Top Mounted



NSF CE 0086

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

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.

NOTIFY CARRIER OF DAMAGE AT ONCE

It is the responsibility of the consignee to inspect the container upon receipt of same and to determine the possibility of any damage, including concealed damage. Groen suggests that if you are suspicious of damage to make a notation on the delivery receipt. It will be the responsibility of the consignee to file a claim with the carrier. We recommend that you do so at once.

Manufacture Service/Questions 888-994-7636.

Information contained in this document is known to be current and accurate at the time of printing/creation. Reference our product line website for the most updated product information and specifications.
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groen.com

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IMPORTANT - READ FIRST - IMPORTANT

THESE APPLIANCES MUST BE INSTALLED BY A COMPETENT PERSON IN CONFORMITY WITH THE INSTALLATION AND SERVICING INSTRUCTIONS AND NATIONAL REGULATIONS IN FORCE AT THE TIME. PARTICULAR ATTENTION MUST BE PAID TO THE FOLLOWING:

I. E. E. REGULATIONS FOR ELECTRICAL INSTALLATIONS
ELECTRICITY AT WORK REGULATIONS
HEALTH AND SAFETY AT WORK ACT
FIRE PRECAUTIONS ACT
LOCAL AND NATIONAL BUILDING REGULATIONS

USERS SHOULD BE CONVERSANT WITH APPROPRIATE PROVISIONS OF THE FIRE PRECAUTIONS ACT. IN PARTICULAR THEY SHOULD BE AWARE OF THE NEED FOR REGULAR SERVICING BY A COMPETENT PERSON TO ENSURE CONTINUED SAFE AND EFFICIENT APPLIANCE PERFORMANCE.

WARNING: TO PREVENT SHOCKS, APPLIANCES WHETHER GAS OR ELECTRIC, MUST BE EARTHED.

UPON COMPLETION OF INSTALLATION, THE OWNERS MANUAL SHOULD BE HANDED TO USERS AND THE INSTALLER SHOULD INSTRUCT RESPONSIBLE PERSON(S) IN THE CORRECT OPERATION AND MAINTENANCE OF THE APPLIANCE.

THIS EQUIPMENT IS ONLY FOR PROFESSIONAL USE, AND SHALL BE OPERATED BY QUALIFIED PERSONS. IT IS THE RESPONSIBILITY OF THE SUPERVISOR OR EQUIVALENT TO ENSURE THAT USERS WEAR PROTECTIVE CLOTHING, AND TO DRAW ATTENTION TO THE FACT THAT, SOME PARTS WILL, BY NECESSITY, BECOME VERY HOT AND WILL CAUSE BURNS IF TOUCHED ACCIDENTALLY.

UNLESS OTHERWISE STATED, PARTS WHICH HAVE BEEN PROTECTED BY THE MANUFACTURER ARE NOT TO BE ADJUSTED BY THE INSTALLER.

BEFORE ATTEMPTING ANY SERVICING, ENSURE THAT THE ELECTRICAL SUPPLY IS DISCONNECTED.

WARNING: THE UNIT MUST BE INSTALLED BY PERSONNEL QUALIFIED TO WORK WITH ELECTRICITY. IMPROPER INSTALLATION CAN RESULT IN INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT. THE UNIT MUST BE INSTALLED IN ACCORDANCE WITH APPLICABLE CODES.

CAUTION: SHIPPING STRAPS ARE UNDER TENSION AND CAN SNAP BACK WHEN CUT.

WARNING: TO AVOID DAMAGE OR INJURY, FOLLOW THE WIRING DIAGRAM EXACTLY WHEN CONNECTING A UNIT.

WARNING: BEFORE CLEANING THE OUTSIDE OF THE KETTLE, DISCONNECT ELECTRIC POWER . KEEP WATER AND SOLUTIONS OUT OF CONTROLS AND ELECTRICAL COMPONENTS.

NOTICE: DO NOT USE ANY DE-GREASER THAT CONTAINS POTASSIUM HYDROXIDE OR SODIUM HYDROXIDE OR THAT IS ALKALINE.

WARNING: USE OF ANY REPLACEMENT PARTS OTHER THAN THOSE SUPPLIED BY GROEN OR THEIR AUTHORIZED DISTRIBUTOR VOIDS ALL WARRANTIES AND CAN RESULT IN BODILY INJURY TO THE OPERATOR AND DAMAGE THE EQUIPMENT. SERVICE BY OTHER THAN FACTORY-AUTHORIZED PERSONNEL WILL VOID ALL WARRANTIES.

WARNING: HIGH VOLTAGE EXISTS INSIDE CONTROL COMPARTMENTS. DISCONNECT FROM BRANCH BEFORE SERVICING. FAILURE TO DO SO CAN RESULT IN SERIOUS INJURY OR DEATH.

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

WARNING: THIS UNIT IS INTENDED FOR USE IN THE COMMERCIAL HEATING, COOKING AND HOLDING OF WATER AND FOOD PRODUCTS, PER THE INSTRUCTIONS CONTAINED IN THIS MANUAL. ANY OTHER USE COULD RESULT IN SERIOUS PERSONAL INJURY OR DAMAGE TO THE EQUIPMENT AND WILL VOID WARRANTY.

WARNING: AVOID ALL DIRECT CONTACT WITH HOT EQUIPMENT SURFACES. DIRECT SKIN CONTACT COULD RESULT IN SEVERE BURNS.

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

CAUTION: DO NOT OVER FILL 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 PRODUCT TRANSFER.

IMPORTANT - READ FIRST - IMPORTANT

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

WARNING: WHEN TILTING KETTLE FOR PRODUCT TRANSFER:

1) WEAR PROTECTIVE OVEN MITT AND PROTECTIVE APRON.
2) USE CONTAINER DEEP ENOUGH TO CONTAIN AND MINIMIZE PRODUCT SPLASHING.
3) PLACE CONTAINER ON STABLE, FLAT SURFACE, AS CLOSE TO KETTLE AS POSSIBLE.
4) STAND TO LEFT OR RIGHT SIDE OF KETTLE WHILE POURING. DO NOT STAND DIRECTLY IN POUR PATH OF HOT CONTENTS.
5) POUR SLOWLY, MAINTAIN CONTROL OF KETTLE, AND RETURN KETTLE BODY TO UPRIGHT POSITION AFTER CONTAINER IS FILLED OR TRANSFER IS COMPLETE.
6) DO NOT OVER-FILL CONTAINER. AVOID DIRECT SKIN CONTACT WITH HOT CONTAINER AND ITS CONTENTS.

CAUTION: KEEP FLOORS IN FRONT OF KETTLEWORK AREA CLEAN AND DRY. IF SPILLS OCCUR, CLEAN IMMEDIATELY, TO AVOID SLIPS OR FALLS.

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

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

WARNING: BEFORE REPLACING ANY PARTS, DISCONNECT THE UNIT FROM THE ELECTRIC POWER SUPPLY.

WARNING: KEEP WATER AND SOLUTIONS OUT OF CONTROLS AND ELECTRICAL EQUIPMENT. NEVER SPRAY OR HOSE THE SUPPORT HOUSING OR ELECTRICAL CONNECTIONS.

ROHS STATEMENT: GROEN AS A MANUFACTURER OF ARTICLES UNDER THE GROEN AND CAPKOLD BRANDS, CONFORMS TO THE EUROPEAN PARLIAMENT & COUNCIL DIRECTIVES, 2011/65/EU RESTRICTION OF HAZARDOUS MATERIALS (ROHS). CONFORMANCE IS BASED ON DECLARATIONS RECEIVED FROM OUR SUPPLIERS THAT THE PRODUCTS AND RAW MATERIALS THEY SUPPLY COMPLY WITH THE EUROPEAN PARLIAMENT & COUNCIL DIRECTIVES, 2011/65/EU RESTRICTION OF HAZARDOUS MATERIALS (ROHS) (INCLUDING LEAD AND CADMIUM REQUIREMENTS). HOWEVER, WE DO NOT ROUTINELY ANALYZE THEIR PRODUCTS FOR THE ABOVE SUBSTANCES NOR DO WE REQUIRE OUR RAW MATERIALS SUPPLIERS TO DO SO.

WEEE DECOMMISSIONING STATEMENT: THE ARTICLES MANUFACTURED BY GROEN ARE NOT LISTED IN ANNEX 1 OF DIRECTIVE 2012/19/EU WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE). HOWEVER, WE STRONGLY SUPPORT THE SPIRIT OF THE DIRECTIVE AND RECOMMEND THAT, AT THE TIME OF DECOMMISSIONING OF THE ARTICLE, YOU RESPONSIBLY DISPOSE OF OR RECYCLE ALL COMPONENTS OF THE EQUIPMENT. BY SEPARATING AND RECYCLING YOUR WASTE EQUIPMENT AT THE TIME OF DISPOSAL YOU WILL HELP TO CONSERVE NATURAL RESOURCES AND ENSURE THAT THE EQUIPMENT IS RECYCLED IN A MANNER THAT PROTECTS HUMAN HEALTH AND THE ENVIRONMENT. ELECTRICAL CONTROL PANELS, ELECTRICAL COMPONENTS AND MOTORS HAVE MATERIALS THAT MUST NOT BE DISCARDED INTO COMMON MUNICIPAL WASTE DISPOSAL. THEY SHOULD BE SENT TO A PROPER ELECTRICAL WASTE FACILITY FOR DISPOSAL. OTHER MATERIALS, SUCH AS METALS, HAVE AN INTRINSIC VALUE IN THE RECYCLED METALS MARKET AND YOU SHOULD BE ABLE TO RECOVER THEIR VALUE BY CONTACTING A RECOGNIZED METAL RECYCLING FACILITY AND ARRANGING FOR APPROPRIATE RECYCLING.

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/70 - The National Electrical Code

NSF INTERNATIONAL
789 N. Dixboro Road
P.O. Box 130140
Ann Arbor, Michigan 48113-0140

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

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

Equipment Description

Pull Tilt TDB, CE Model

Crank Tilt TDBC, CE Model

Optional equipment available with TDB & TDBC kettles:

1. Stand that supports the unit and holds a pan in position for filling
2. Lift-off cover
3. Basket insert
4. Fill faucet
5. Manual stirrers (factory installed)
6. Motor driven agitator (factory installed)

The Groen TDB(C) is a table top, tilting, steam jacketed kettle with a thermostatically controlled, self-contained, electrically-heated steam supply and appropriate controls, mounted on a sturdy base. The Model TDB(C) is available in 20, 24, 40 and 48-quart capacities (18.8, 22.6, 37.6 and 45.3 liters).

The body of the kettle is constructed of stainless steel, welded into one solid piece. The kettle is furnished with a reinforced rim and a butterfly shaped pouring lip. It has a steam jacket rated for pressures up to 50 PSI 3.45 (3.45 Bar/345 kPa). Kettle finish is 180 emery grit on the inside and bright semi-deluxe on the outside. A tilt handle allows the operator to manually tilt the kettle body in a controlled manner. A crank tilt model is also available. Pouring height accepts pans up to 4 inches high on a table top.

A built-in steam generator, sized for the kettle capacity and heated by electricity, delivers steam into the jacket. “Airless” operation of the steam jacket permits uniform, efficient heating at temperatures as low as 150°F (66°C) and as high as 295°F (146°C). In addition to the adjustable thermostat for operating control, the unit has a tilt cut-off switch, low water cut-off, safety valve, and high-limit pressure switch as safety features. A heating indicator light, pressure gauge, and sight glass are provided for monitoring kettle operation.

A single electrical connection is required for installation. The unit may be ordered for use with 230 Volt single phase, or 400 Volt three phase power.

KETTLE CHARACTERISTICS								
Description	**TDB(C)-20**		**TDB(C)-40**		**TDB(C)-20**		**TDB(C)-20**	
Kettle Capacity	20 quarts	18.8 liters	40 quarts	37.6 liters	20 quarts	18.8 liters	20 quarts	18.8 liters
Jacket Capacity	4 quarts	3.7 liters	5 quarts	4.7 liters	4 quarts	3.7 liters	4 quarts	3.7 liters
Diameter	14 inches	360 mm	16-1/2 inches	420 mm	14 inches	360 mm	14 inches	360 mm
Depth	11 inches	280 mm	14-1/4 inches	360 mm	11 inches	280 mm	11 inches	280 mm
Base Width	24 inches	60 mm	28 inches	600 mm	24 inches	60 mm	24 inches	60 mm
Base Depth	16 inches	41 mm	16 inches	410 mm	16 inches	41 mm	16 inches	41 mm
KW at 230 Volt, Single Phase	7.8				13.3			
KW at 240 Volt, 3-Phase	8.4				14.4			
KW at 400 Volt, 3-Phase/N	7.8				13.3			
Rated Amp Load - 230V, Single Phase/N	33				57			
Rated Amp Load - 240V, 3-Phase	20 (L1, L2, L3)				35 (L1, L2, L3)			
Rated Amp Load - 400V, 3-Phase/N	11.2 (L1, L2, L3)				19 (L1, L2, L3)			

Inspection & Unpacking

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.

CAUTION
THIS UNIT WEIGHS 64 TO 74 KG (140 TO 163 LBS). INSTALLER SHOULD OBTAIN HELP AS NEEDED TO LIFT THIS WEIGHT SAFELY.

The TDB(C) is shipped from the factory strapped on a pallet. If the unit is a pull tilt model, the handle is packed inside the kettle for shipment.

The unit will arrive in a heavy shipping crate and will be attached to a skid. Immediately upon receipt, inspect the carton carefully for exterior damage.

Carefully remove the upper portion of the crate to free the unit on its skid. Cut the straps securing the kettle to the skid.

Thoroughly inspect the unit for concealed damage. Report any shipping damage or incorrect shipments to the delivery agent.

Write down the model number, serial number, and installation date, and retain this information for future reference. Space for these entries is provided at the top of the Service Log at the back of this manual. Keep this manual on file and available for operators to use.

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.

Attach the tilt handle (normally shipped inside the kettle) by carefully threading it into the socket on the trunnion support. Be careful to avoid cross-threading fine socket threads. This step is unnecessary if the kettle is a crank tilt model.

Installation

WARNING
INSTALLATION OF THE KETTLE MUST BE DONE BY PERSONNEL QUALIFIED TO WORK WITH ELECTRICITY. IMPROPER INSTALLATION CAN RESULT IN INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT.

DANGER
ELECTRICALLY GROUND THE UNIT AT THE TERMINAL PROVIDED. FAILURE TO GROUND UNIT COULD RESULT IN ELECTROCUTION AND DEATH.

The Groen Kettle is provided with complete internal wiring. It is ready for immediate connection. A wiring diagram is provided in this manual and on the inside of the control housing service panel. Any mechanical or electrical changes must be approved by Groen's Food Service Engineering Department.

The completed unit has been operated at the factory to test all controls and heater elements.

1. Set the kettle in place and level it. The base should be securely fastened to a table or work surface. Four 3/8"-16 N.C. threaded couplings are provided in the base of unit. Installation under a ventilation hood is recommended.

2. Provide electrical power as specified on the electrical information plate attached to the equipment. Observe all local and national codes, and all regulations in force at the time of installation.

3. The equipment is shipped ready for three phase operation. Refer to the wiring diagram for single phase operation.

4. Bring the electrical service through the entrance at the rear of the support housing, making a watertight connection with the incoming lines. (A BX connection is not recommended.) Observe all local and national codes, and all regulations in force at the time of installation.

5. Confirm that the jacket water level is above mid point of sight glass. If the level is low, follow the instructions under "Jacket Filling and Water Treatment," Page 13.

6. Electrically earth the unit at the terminal provided.

7. Equipotential terminal: In accordance with national regulations, the unit has been fitted with an equipotential terminal.

TDB(C) ELECTRICAL SPECIFICATIONS

KETTLE CHARACTERISTICS		
VOLTAGE-FREQ-PHASE	**TDB(C)-20, -24**	**TDB(C)-40, -48**
230 V, 50/60 Hz, 1-Phase	33 Amps	57 Amps
240 V, 50/60 Hz, 3-Phase	20 Amps	40 Amps
400 V, 50/60 Hz, 3-Phase W/ Neutral	33 Amps	57 Amps

ELECTRICAL SUPPLY CONNECTION REQUIREMENTS

KETTLE CHARACTERISTICS						
			20/24 QUARTS 19/23 LITERS		**40/48 QUARTS 38/45 LITERS**	
VOLTAGE	PHASE	NEUTRAL	KW	AMPS	KW	AMPS
230	**1**	**YES**	7.8	33	13.3	57
240	**3**	**NO**	8.4	20	14.4	35
400	**3 N**	**YES**	7.8	11.2	13.3	19

Initial Start-Up

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

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.

A simple turn of the thermostat controls the TDB and TDBC kettle.

Now that the kettle has been installed, you should test it to ensure that the unit is operating correctly.

1. Remove all literature and packing materials from inside and outside of the unit.
2. Confirm that the kettle tilts properly. Either turn the crank or use the handle to tilt the kettle and return it to the upright position.
3. Turn on the electrical service to the unit by setting the power switch to the ON position. The green POWER indicator lamp should light.
4. Pour two to four liters of water into the kettle.
5. Following “To Start Kettle” instructions in the “Operation” section of this manual, begin heating the water at the highest thermostat setting. The HEAT (amber) indicator light should come on immediately, and heating should continue until the water boils. The HEAT indicator will cycle on and off as the heater elements are cycled under control of the thermostat.
6. To shut down the unit, turn the thermostat dial to “O” and the power switch to OFF.

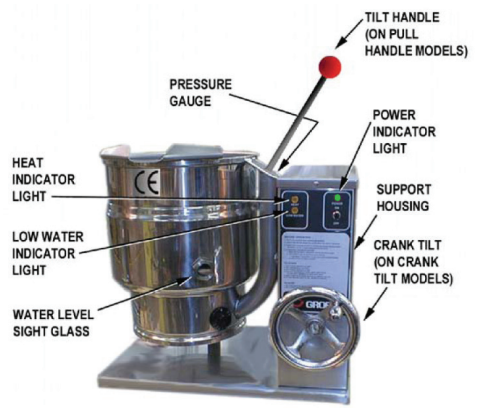
If the unit functions as described above, it is ready for use. If the unit does not function as intended, contact your local Groen Certified Service Agency.

Operation

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.

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



CE units have three lights on the Control Panel. The POWER (green) indicator light comes on when the the unit is turned on. It indicates that power is being supplied to the unit. The HEAT (amber) indicator light comes on when heating elements are heating the kettle. The LOW WATER (red) indicator light will come on when the water level in the jacket falls below acceptable operating levels. Refer to "Jacket Filling and Water Treatment" on Page 13.

TO START KETTLE

1. EVERY DAY make sure that the jacket water level is above the mid-point of the round sight glass. If the level is low, service is necessary.

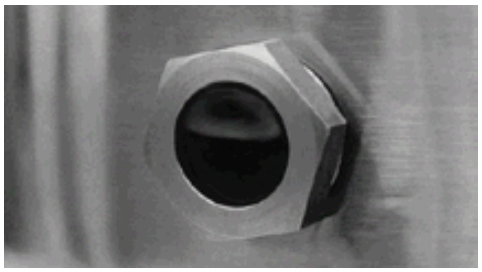
2. Check the pressure gauge. If the gauge does not show 20 to 30 inches of vacuum (i.e., a reading of 20 to 30 below 0) or a reading of -0.7 to -1.0 Bar, see "Jacket Vacuum" on page 12.

3. Turn on the electrical power to the unit by switching the power switch to the ON position.

4. Turn the thermostat dial to the desired setting. The HEAT indicator light indicates that the kettle is heating, and cycling of the light on and off indicates that the kettle is being held at the set temperature. Once in each cycle the contactors in the support housing will make a clicking sound. This is normal.

TO TRANSFER PRODUCT OR EMPTY KETTLE

The kettle is designed and manufactured to be tilted in a controlled manner. On those units equipped with a tilt handle, grasp the insulated plastic ball firmly. Maintain a firm grip on handle when tilting, while keeping kettle body in a tilted position and when SLOWLY returning the kettle body to an upright position. On those equipped with crank tilt, turn the handle. The kettle will remain in the position to which tilted until cranked again.



On TDB and TDBC units, the jacket water level is shown in a sight glass on the kettle body.

Lift the rear edge of the cover first.

COMMON ACCESSORIES

1. Lift Off Cover

As with stock pot cooking, an optional lift off cover can 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. Make sure the handle is secure on the lift off cover before using. ALWAYS use the handle to place or remove cover from the kettle. Wear protective oven mitts and a protective apron. When putting the cover on the kettle, position it on top of kettle rim, with its flat edge facing the pouring lip.

When removing cover:

a. Firmly grasp the handle.
b. 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.
c. Tilt cover to 45-60° angle and allow any hot condensate or product to roll off cover back into kettle.
d. Remove cover, ensuring that any remaining hot condensate or product does not drip on operator, floor or work surfaces.
e. Place cover on safe, flat, sanitary, out-of-the way surface, or return to kettle rim.

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, AS CLOSE TO KETTLE AS POSSIBLE.

4) STAND TO RIGHT OF KETTLE WHILE POURING—NOT DIRECTLY IN POUR PATH OF HOT CONTENTS.

5) POUR SLOWLY, MAINTAINING CONTROL OF KETTLE, AND RETURN KETTLE BODY TO UPRIGHT POSITION AFTER CONTAINER IS FILLED OR TRANSFER IS COMPLETE.

6) DO NOT OVERFILL CONTAINER. AVOID SKIN CONTACT WITH HOT CONTAINER AND ITS CONTENTS.

CAUTION
DO NOT TILT KETTLE BODY WITH COVER IN PLACE. COVER MAY SLIDE OFF, CAUSING INJURY TO OPERATOR.

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

CAUTION
KEEP FLOORS IN FRONT OF THE KETTLE WORK AREA CLEAN AND DRY. IF SPILLS OCCUR, CLEAN AT ONCE TO AVOID SLIPS OR FALLS.

2. Basket Insert

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.

TIPS FOR USE:

a. 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.
b. Load basket on a level, stable work surface.
c. Lift the loaded basket with both hands. Get help from another person if the basket is too heavy for safe handling.
d. Slowly lower product into kettle.
e. 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.
f. 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**
g. 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.

Sequence of Operation

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

When the operator starts up the kettle by turning on the power switch and the operating the thermostat dial from “0” to a desired setting, the thermostat switch closes. This lights up the HEAT indicator light and causes the contactors to close, allowing power to flow to the heating elements. When the temperature of the steam jacket reaches the value corresponding to the dial setting, the thermostat switch opens. This turns off the HEAT indicator light and causes the contactors to open, stopping the power to the heaters. As soon as the thermostat senses that the kettle is cooling below the set point, the thermostat switch closes, the HEAT indicator light comes on, the contactors close, and the heaters come on again. On-off cycling continues, keeping the kettle at the set temperature. This is why the heating indicator light cycles on and off during normal operation. Every time the kettle is tilted, a tilt cut-off switch interrupts the power supply to the heaters, so that the heating elements will not operate while not submerged in the jacket water.

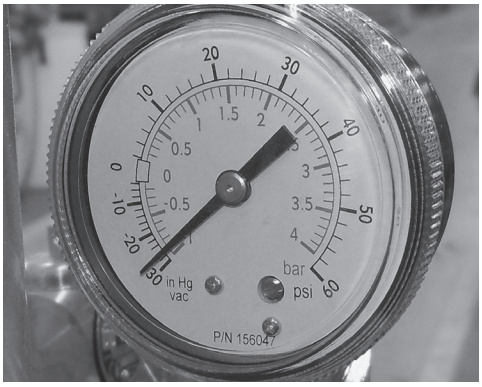
If steam pressure greater than 50 PSI (3.45 Bar/345 kPa) is generated in the jacket, the pressure relief valve will open and relieve the excess pressure.

If the jacket water level gets too low and the heating elements overheat, the high-limit control will open, shutting off power to the elements until the kettle cools.

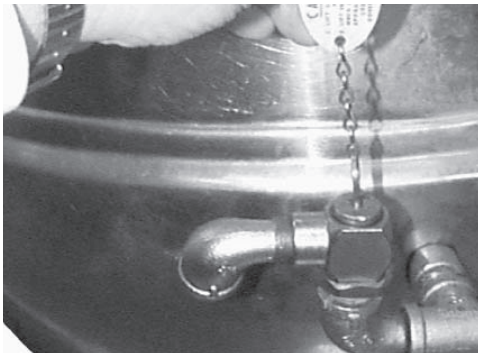
Setting the operating thermostat dial to “0” shuts down the heating circuits. Setting the power switch to the OFF position removes power from the control circuits.

Maintenance

WARNING
WHEN TESTING, AVOID ANY EXPOSURE TO THE STEAM BLOWING OUT OF THE SAFETY VALVE. DIRECT CONTACT COULD RESULT IN SEVERE BURNS. DISCONNECT ELECTRICAL POWER FROM THE KETTLE BEFORE ATTEMPTING TO GREASE THE TRUNNION BEARINGS.



The pressure gauge should show a vacuum of 20 to 30 inches when the kettle is cold.



Test the safety valve at least twice each month.

NOTICE: Contact an authorized representative when repairs are required.

A Maintenance & Service Log is provided at the back of this manual. Each time maintenance is performed on your kettle, enter the date on which the work was done, what was done, and who did it. Keep this manual on file and available for operators to use. Periodic inspection will minimize equipment down time and increase the efficiency of operation. The following points should be checked:

1. Periodic Maintenance

BY OPERATOR

a. Check the pressure/vacuum gauge every day. The gauge should show a vacuum of 20 to 30 inches of Mercury or a range of -0.7 to -1.0 Bar, when the kettle is cold. If it does not, see "Jacket Vacuum" on page 12.

b. Also check the jacket water level each day. It should be above mid point of the round sight glass. If the level is low, see "Jacket Filling and Water Treatment" on page 13.

BY SERVICE TECHNICIAN

c. Test the safety valve at least twice each month. Test the valve with the kettle operating at 15 PSI (1 Bar/105 kPa), by pulling up the test chain for at least five seconds. Then release the chain and let the valve snap shut. If the valve does not activate, (there is no evidence of discharge, or the valve leaks) stop using the kettle immediately and contact a qualified Groen service representative.

d. The inside of the support housing should be kept clean.

e. At least twice a year, grease the two trunnion bearings. The bearings are located within the kettle support housing. Remove the access panels from the support housing with a screwdriver to gain access to the grease fittings. Use a lithium-based, multi-purpose grease. When the access panels are removed, the mounting bolts for the trunnion bearings and tilt switch can also be checked for tightness.

f. On the crank-tilt models, the gear housing has fittings for proper lubrication of moving parts. Because the gears do not run in oil, periodic lubrication with grease is necessary. Frequency of lubrication will depend on operating conditions, but the service should be performed at least once every six months.

Add grease through the Zerk fittings on the gear housing until you see grease flow out of the bearings around the trunnion shaft. Also place a liberal amount of grease on the gear to cover the arc that is in contact with the worm gear. When finished, reassemble access panels to support housing.

Electrical wiring should be kept securely connected and in good condition.

2. Jacket Vacuum

When the kettle is cold, a positive pressure reading or a reading around zero on the pressure/vacuum gauge indicates the presence of air in the jacket. Air in the jacket slows down the heating of the kettle.

TO REMOVE AIR:

a. Start the unit. (See the "Operation" section of this manual.) (Be sure there is water or product in the kettle when heating).

IMPORTANT
PRESSURE GAUGE MUST READ 0 PSI (0 BAR/0 KPA) OR LESS BEFORE YOU FILL JACKET WITH WATER.

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.

b. When the pressure/vacuum gauge reaches a positive pressure reading of 5 PSI (0.35 Bar/34.5 kPa), release the trapped air and steam by pulling up on the safety valve for about 1 second. Repeat this step, then let the chain snap back into the closed position.

3. Jacket Filling and Water Treatment

The jacket was charged at the factory with the proper amount of treated distilled water. You may need to restore the water to its proper level, either because water was lost as steam during venting or because treated water was lost by draining.

TO FILL JACKET WITH WATER:

a. Allow kettle to cool before filling the jacket. If you are replacing water lost as steam, use distilled water. If you are replacing treated water that ran out of the jacket, prepare more treated water as directed in step 3, "Water Treatment Procedure".
b. Remove the elbow and pressure relief with an open-end wrench or cresent wrench.
c. Use a funnel and add water to jacket.
d. Check water level in jacket, by viewing water level indicator glass.
e. Continue to add water until the water level indicator glass is 3/4 full.
f. Apply teflon tape in a clockwise pattern and reinstall the pressure relief and elbow. Follow procedure in "Jacket Vacuum" to remove air from kettle jacket.

4. Water Treatment Procedure

a. Obtain water treatment compound and a PH test kit from your authorized Groen parts distributor.
b. Fill the mixing container with the measured amount of water required. (See the table at right). Use distilled water.
c. Hang a strip of pH test paper on the rim of the container, with about 25 mm of the strip below the surface of the water.
d. Measure the water treatment compound you will be using. (One way to do this is to add the compound from a measuring cup.)
e. Stir the water continuously, while you slowly add water treatment compound, until the water reaches a pH between 10.5 and 11.5. Judge the pH by frequently comparing the color of the test strip with the color chart provided in the pH test kit.
f. Record the exact amounts of water and treatment compound used. These amounts may be used again, if the same sources of water and compound are employed to refill the jacket in the future. However, it is advisable to check the pH every time treated water is prepared. For optimum performance, use correctly treated, distilled water.

5. Component Replacement

Wiring is marked as shown on the schematic drawings. Be sure new components are wired in the same manner as the old.

Model	Jacket Capacity
TDB(C)-20, -24	**3.8 Liters**
TDB(C)-40, -48	**4.7 Liters**

Troubleshooting

Your 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. X indicates items which must be performed by an authorized technician. **USE OF ANY REPLACEMENT PARTS OTHER THAN THOSE SUPPLIED BY Groen OR THEIR AUTHORIZED DISTRIBUTORS CAN CAUSE INJURY TO THE OPERATOR AND DAMAGE TO THE EQUIPMENT AND WILL VOID ALL WARRANTIES.**

SYMPTOM	WHO	WHAT TO CHECK
Kettle will not heat, and heating indicator will not come on.	User	a. Electric power supply to the unit. (Check the circuit breaker.) b. Water level in jacket.
	Authorized Service Rep Only	c. Control circuit fuses. Replace a blown fuse only with a fuse of the same AMP rating. X d. For loose or broken wires. X e. Tilt cut-off switch. X f. That pressure switch is open. X g. Operation of variable thermostat. X h. Low water cutoff. X
Kettle will not heat, but heating indicator comes on.	Authorized Service Rep Only	a. Thermostat calibration. X b. Heater elements with ohmmeter for ground short or open element. If element is defective, call service. X
Kettle continues heating after it reaches the desired temperature.	User	a. Thermostat dial setting.
	Authorized Service Rep Only	b. Thermostat circuit for short. X c. Thermostat operation. The thermostat should click when the dial is rotated above and below the setting for the temperature of the kettle. X d. Contactor, to determine whether it is energized or stuck. X
Kettle stops heating before it reaches the desired temperature.	User	a. Thermostat dial setting.
	Authorized Service Rep Only	b. Thermostat calibration. X c. Thermostat operation. The thermostat should click when the dial is rotated above and below the setting for the temperature of the kettle. X
Kettle heats slowly.	User	a. For air in the jacket. See “Jacket Vacuum” in the “Maintenance” section of this manual.
	Authorized Service Rep Only	b. Heater elements with ohmmeter for ground short or open element. If an element is defective, call service. X c. Voltage of main power source. X
Safety valve pops.	User	a. For air in the jacket. See “Jacket Vacuum” in the “Maintenance” section of this manual.
	Authorized Service Rep Only	b. Pressure switch setting. X c. Thermostat operation. Thermostat should click when the dial is rotated above and below the setting for the temperature of the kettle. X d. Pressure relief valve. If the valve pops at pressures below 49 PSI (3.38 Bar/338 kPa), replace it. e. Contactor, to determine whether it is energized. X

WARNING
TO PREVENT SHOCKS, ALL APPLIANCES WHETHER GAS OR ELECTRIC, MUST BE EARTHED.

REGULATIONS AND SAFETY PRECAUTIONS

These Appliances have been CE marked on the basis of compliance with the EMC and Low Voltage Directive. These appliances MUST BE installed by a competent person in conformity with the INSTALLATION AND SERVICING INSTRUCTIONS and National Regulations in force at the time.

Particular attention MUST be paid to the following:

- I.E.E. Regulations for Electrical Installations
- Electricity at Work Regulations
- Health and Safety at Work Act
- Fire Precautions Act
- Local and National Building Regulations

Those parts which have been protected by the manufacturer MUST NOT be adjusted by the User. Users should be conversant with the appropriate provisions of the Fire Precautions Act. In particular the need for regular servicing by a competent person to ensure the continued safe and efficient performance of the Appliance.

Upon completion of the installation, the Owners Manual should be handed to the users and the installer should instruct the responsible person(s) on the correct operation and maintenance of the Appliance. This equipment is ONLY FOR PROFESSIONAL USE, and shall be operated by QUALIFIED persons. It is the responsibility of the Supervisor or equivalent to ensure that users wear SUITABLE PROTECTIVE CLOTHING and to draw attention to the fact that, some parts will, by necessity, become VERY HOT and will cause burns if touched accidentally.

IMPORTANT: The Groen Steam Jacketed Kettle you have just purchased has been handcrafted from the finest materials, meticulously inspected, and carefully tested to ensure that you receive the best possible product. With reasonable care and periodic maintenance, it will provide years of faithful service. It is recommended that you establish a timetable for periodic maintenance as outlined in this manual. Space is provided in the Service Log at the back of this manual.

EQUIPMENT DESCRIPTION

Groen models TDB(C) are stainless steel, steam jacketed, table mounted, tilting kettles with a self-contained, electric-heated steam source. The kettle body is welded into one piece and furnished with a reinforced bar rim and welded “butterfly” pouring lip. The interior of the kettle is polished to a 180 emery grit finish, and the exterior is given a bright semi-deluxe finish. The unit is ASME shop inspected and registered with the National Board for working pressures up to 50 PSI (3.5 Bar/345 kPa). Kettle support, tilting mechanism, and controls are contained in an enclosed base. Tilting is provided by a self-locking, worm-and-gear device, or by a tilt handle.

Charged at the factory with treated, distilled water, the steam source provides kettle temperature of 150°F (66°C) to 295°F (146°C). Controls for the unit include a thermostat, pressure gauge, gauge glass, safety valve, pressure limit control, low water cut-off and an on/off switch.

Service connections are required for 230 Volt, single phase, 50/60 Hz, and 400 Volt, three phase, electricity. **IMPORTANT**: Prior to operation, clean out the kettle pan thoroughly using hot water and detergent. Rinse out and dry thoroughly.

WARNING
INSTALLATION OF THE UNIT MUST BE DONE BY PERSONNEL QUALIFIED TO WORK WITH ELECTRICITY AND PLUMBING IN ACCORDANCE WITH ALL APPLICABLE CODES. BEFORE REPLACING ANY PARTS, DISCONNECT THE UNIT FROM THE ELECTRIC POWER SUPPLY. TO PREVENT SHOCKS, ALL APPLIANCES WHETHER GAS OR ELECTRIC, MUST BE EARTHED.

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

WARNING
AVOID CONTACT WITH THE FLUE. SURFACES ARE VERY HOT AND WILL CAUSE BURNS. DO NOT OBSTRUCT FLUE OPENING.

OPERATION

1. Initial Operational Readiness Check

After the TDB(C) Kettle has been installed according to service and installation instructions, perform initial start-up as a test, to ensure that the unit is operating correctly.

a. Remove all literature and packing material from the interior and exterior of the unit.
b. Make sure electricity supply is switched on.
c. Ensure that the kettle is filled with water.
d. Check the water level in the jacket. The level should be between the lines on the gauge glass. If the level is low, the jacket water level will be required to be topped up. (This will require a service call).
e. Check the pressure gauge. If the gauge does not show sufficient vacuum (20 to 30 below zero) or -0.7 to -1.0 Bar, then the jacket will require venting. (This will require a service call).
f. Switch the power switch to the "On" position. The POWER lamp will illuminate.
g. Turn the thermostat dial to the required setting. The HEAT lamp will illuminate.

2. To Shut Down Kettle

a. Turn the thermostat dial to the "O" position.
b. Switch the power switch to the OFF position.
c. For a prolonged shut down, turn the electricity mains off. Follow steps a and b.

3. Filling the Kettle

Prior to operation, thoroughly clean the kettle using hot water and detergent.

Kettle capacities:

Model	Maximum Capacity	Recommended Capacity
TDB(C)-20	**18.9 liters**	**16 liters**
TDB(C)-24	**22.6 liters**	**19 liters**
TDB(C)-40	**37.6 liters**	**32 liters**
TDB(C)-48	**45.3 liters**	**38 liters**

To prevent surge boiling, no more than 80% of the maximum capacity should be used.

4. Users Thermostat

Provides automatic control of the Kettle Jacket temperature at settings up to 295°F (146°C) maximum.

5. Sequence of Operation

The following "action-reaction" outline is provided to help the user understand how the equipment works. When the operator starts up the kettle by turning the operating thermostat dial from "O" to a desired setting, the thermostat switch closes. This lights up the heating indicator light and causes the contactors to close, allowing power to flow to heating elements.

When the temperature of the steam jacket reaches the value corresponding to

WARNING
DO NOT STAND IN FRONT OF THE KETTLE BODY WHEN TILTING IT. BE CAREFUL TO KEEP HOT CONTENTS FROM SPILLING. ENSURE PEOPLE ARE KEPT AWAY FROM THE KETTLE WHEN EMPTYING THE KETTLE.

the dial setting, the thermostat switch opens. This turns off the heating indicator light and causes the contactors to open, stopping the power to the heaters.

As soon as the thermostat senses that the kettle is cooling below the set point, the thermostat switch closes, the heating indicator light comes on, the contactors close, and the heaters come on again. On-off cycling continues, keeping the kettle at the set temperature. This is why the heating indicator light cycles on and off during normal operation. Every time the kettle is tilted, the tilt cut-off switch interrupts the power supply to the heaters, so that the heating elements will not operate while not submerged in the jacket water.

If steam pressure greater than 50 PSIG (3.5 Bar/345 kPa) is generated in the jacket, the safety valve will open and relieve the excess pressure.

If the jacket water level gets too low before the heating elements overheat, the high-limit control will open and shut off power to the elements until the kettle cools.

Setting the operating thermostat dial to “0” shuts down the heating circuits. Setting the power switch to the OFF position removes power from the control circuits.

6. To Empty Kettle

TDB(C) KETTLES WITH CRANK TILT
To tilt the body of the kettle forward, turn the hand crank on the front of the cabinet anti-clockwise. The body will stay in the position it holds when you stop turning the handle. To return the body to the upright position, turn the crank clockwise.

TDB(C) KETTLE WITH TILT HANDLE
The kettle is designed to be tilted in a controlled manner. Grasp the insulated plastic ball firmly. Maintain a firm grip on the handle when tilting, while keeping the kettle body in a tilted position, and when slowly returning the kettle body to an upright position.

7. Power Failure

If the power to the unit fails do not attempt to operate the appliance until the electricity supply is reestablished. When the power comes back on follow the steps in “Initial Kettle Operational Readiness Check.”

Cleaning

WARNING
KEEP WATER AND SOLUTIONS OUT OF CONTROLS AND ELECTRICAL EQUIPMENT. DO NOT USE A HIGH PRESSURE HOSE TO CLEAN THE CONTROL CONSOLE, ELECTRICAL CONNECTIONS, ETC.

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

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

NOTICE
NEVER LEAVE A CHLORINE SANITIZER IN CONTACT WITH STAINLESS STEEL SURFACES LONGER THAN 30 MINUTES. LONGER CONTACT CAN CAUSE STAINING AND CORROSION.

Use a brush, sponge, cloth, plastic or rubber scraper, or plastic wool to clean.

Don't use metal implements or steel wool when cleaning.

1. **Suggested Cleaning Supplies:**
   a. Cleaner, such as Klenzade HC-10 or HC-32 from ECOLAB, Inc.
   b. Kettle brushes in good condition.
   c. Sanitizer such as Klenzade XY-12.
   d. Film remover such as Klenzade LC-30.

2. **Precautions**
   Before any cleaning operation, shut off the kettle by turning the thermostat dial to "0", and shut off all electric power to the unit at a remote switch, such as the circuit breaker.

3. **Procedure**
   a. 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 12 hours.

   b. Scrape and flush out large amounts of food residues. Be careful not to scratch the kettle with metal implements.

   c. 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.

   d. Rinse the kettle thoroughly with hot water. Then drain completely.

   e. 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.

   f. To remove burned-on foods, use a brush, sponge, cloth, plastic or rubber scraper, or plastic wool along with the cleaning solution. To reduce effort required in washing, let the detergent solution sit in the kettle for a few minutes and soak into the residue. Do NOT use abrasive materials or metal tools that might scratch the surface. Scratches make the surface harder to clean and provide places for bacteria to grow. Do not use steel wool, which will leave particles in the surface and cause eventual corrosion and pitting.

   g. The outside of the unit may be polished with a stainless steel cleaner such as "Zepper" from Zep Manufacturing Co.

   h. When equipment needs to be sanitized, use a solution equivalent to one that supplies 200 parts per million available chlorine. Obtain advice on sanitizing agents from your supplier of sanitizing products. Following the supplier's instructions, apply the agent after the unit has been cleaned and drained. Rinse off the sanitizer thoroughly.

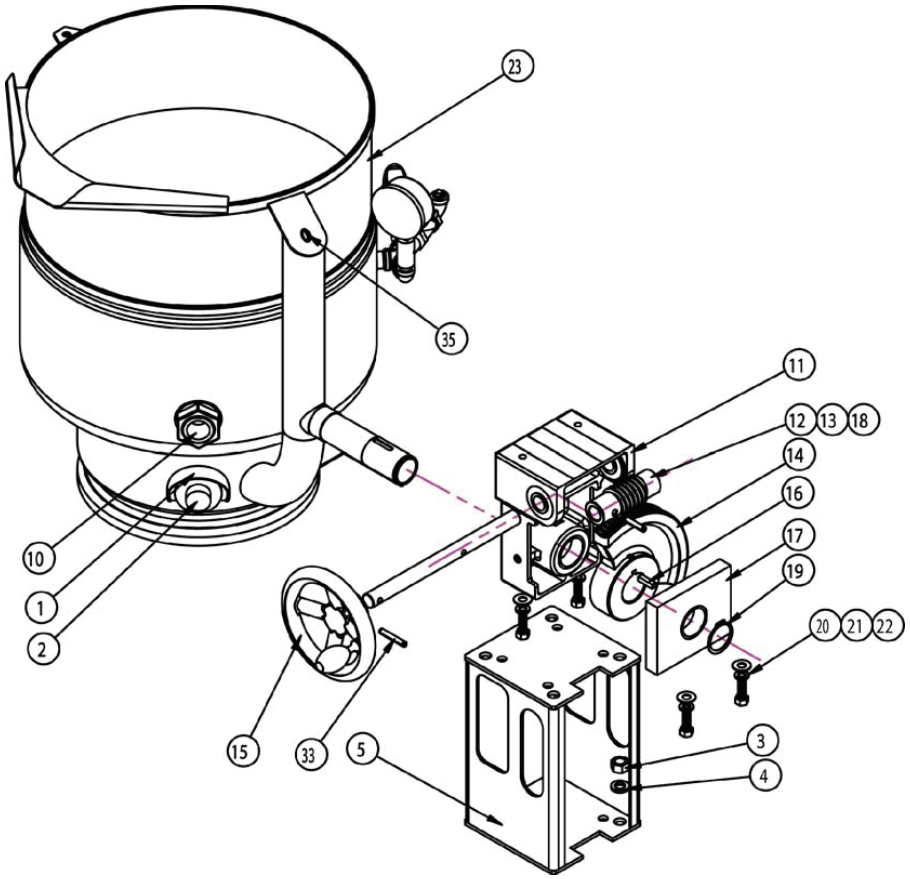
   i. It is recommended that each piece of equipment be sanitized just before use.

   j. If there is difficulty removing mineral deposits or a film left by hard water or food residues, clean the kettle thoroughly and then use a deliming agent, like Groen Delimer/Descaler (Part Number 114800), in accordance with the manufacturer's directions. Rinse and drain the unit before further use.

   k. If cleaning problems persist, contact your cleaning product representative for assistance. The supplier has a trained technical staff with laboratory facilities to serve you.

Parts List

Key	Description	Part #
1	COVER, THERMOSTAT	114830
2	KNOB, THERMOSTAT	122054
3	NUT, HEX 1/2-13 SS	005603
4	WASHER LOCK 1/2 SS	005657
5	WELDMENT, PEDESTAL - TDB	122388
10	LIQUID LEVEL INDICATOR	108554
11	ASSEMBLY, GEAR CARRIER	124741
12	SHAFT, WORM	122374
13	GEAR, WORM	128001
14	ASSEMBLY, GEAR SECTOR	128028
15	ASSEMBLY, HANDWHEEL	124719
16	KEY, 1/4 SQ. X 1" LG.	122371
17	ASSEMBLY, BEARING BLOCK	128021
18	PIN ROLL 1/4 X 1.25" LG.	012614
19	RETAINING RING 1.500	124764
20	WASHER LOCK 3/8"	005618
21	SCREW 3/8-16 X 1" HEX HEAD	005612
22	WASHER FLAT 3/8"	005830
23	WELDMENT KETTLE BODY 230/240V (20 QT)	141353
23	WELDMENT KETTLE BODY 230/240V (40 QT)	141355
33	PIN, ROLL 1/4 X 1.63 LG.	128036
35	SCREW, 3/8 - 24 X ½	137786
41	KIT, SWITCH AND GASKET*	137893
42	KIT, THERMOSTAT*	137894
43	PILLOW BLOCK, 1-1/2"*	002989
44	COLLAR SET 1-1/2" ID*	003118
45	SCREW HEX HEAD CAP 3/8"-16 X 1-1/2"*	005615
46	WASHER LOCK - SPLIT 3/8"*	005618
47	NUT HEX 3/8"-16*	005619
48	SPACER, MANUAL TILT SET COLLAR*	139042
49	NUT ACORN (DOME) 3/8-24*	003188
50	KNOB RED BALL HANDLE*	012691
51	SHAFT HANDLE 1/2" OD X*	018963

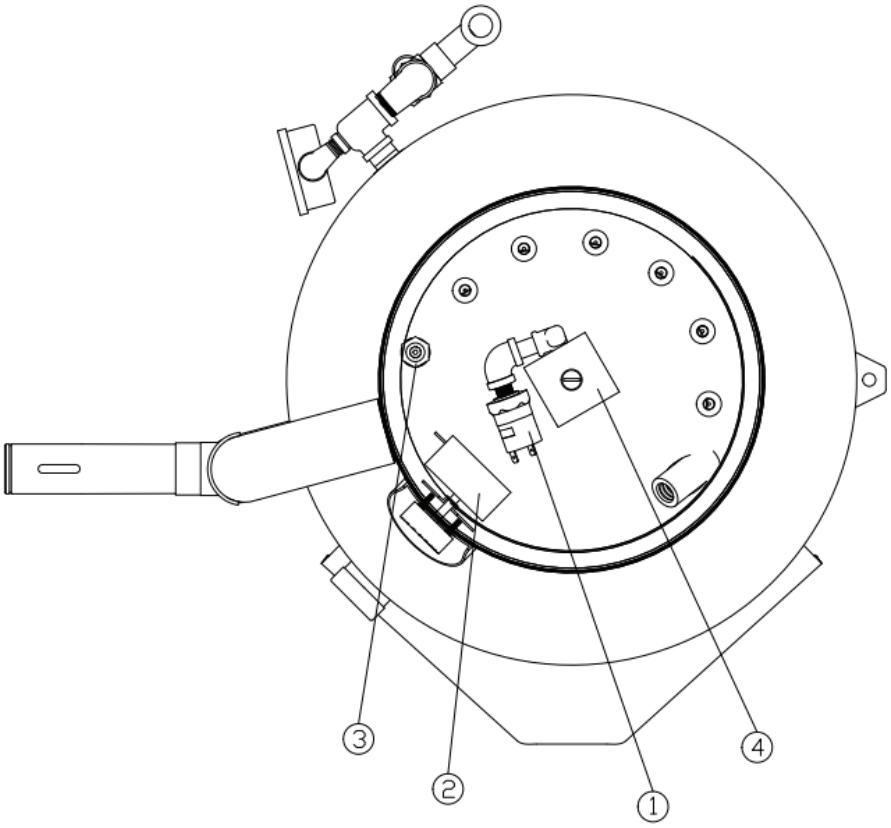


*Item not depicted/called out in drawing or photographs

Parts List

Key	Description	Part #
1	PRESSURE SWITCH ASSEMBLY, 47 PSI	182594
2	THERMOSTAT	012313
3	WATER LEVEL ELECTRODE	015589
4	BRACKET	137736
5	COVER*	003141
6	GASKET, BOTTOM COVER*	137969
7	SCREW, ¼-20 X 1 ½"*	012597
8	GASKET, BOTTOM COVER SCREW*	137968
9	HEATER JUMPER WIRE	171889

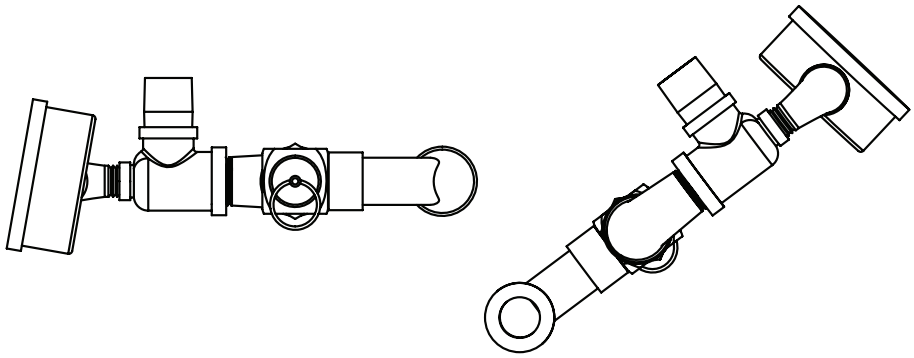
*Item not depicted/called out in drawing or photographs

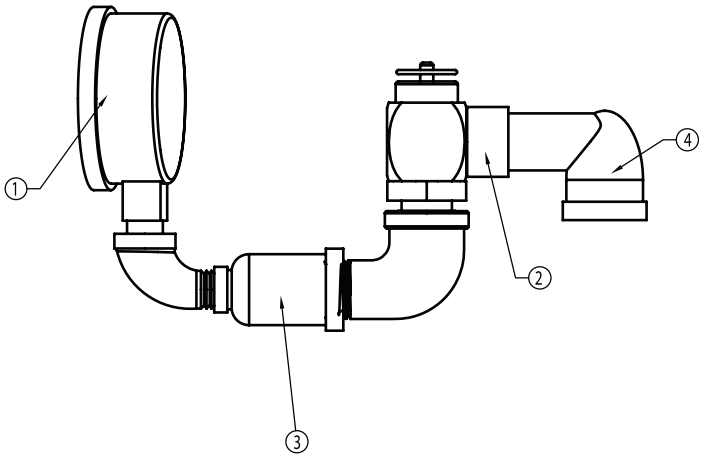


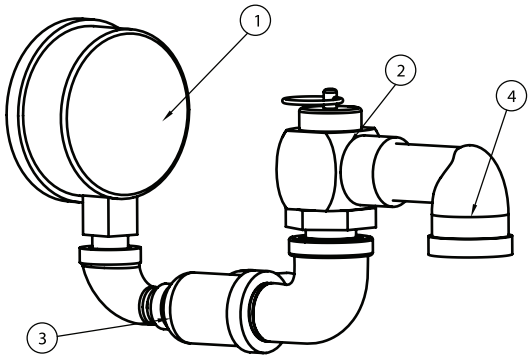
Parts List

Key	Description	Part #
1	GAUGE, COMPOUND PRESSURE W/DUAL	084208
2	VALVE, PRESSURE RELIEF 50 PSI, 1/2" NPT (PED)	141360
3	ASSY, WATER FILL SUB	137438
4	ELBOW 90 DEG STREET 1/2 NPT CHROME	010108

*Item not depicted/called out in drawing or photographs



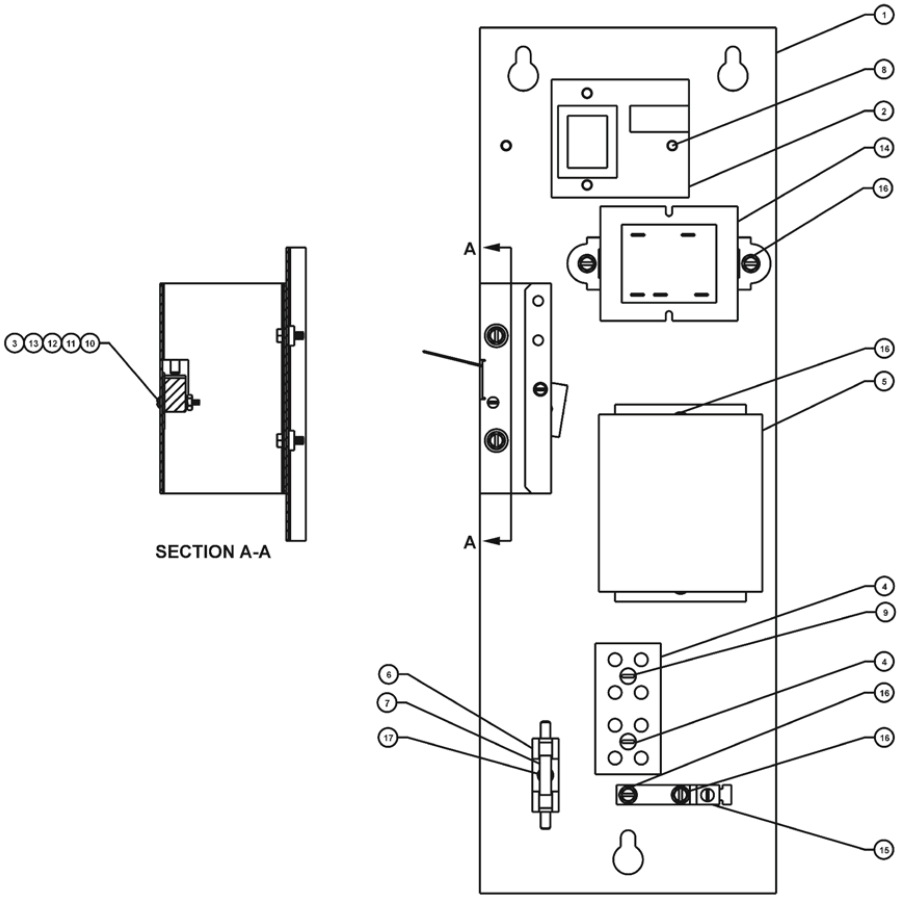




Electrical Parts List

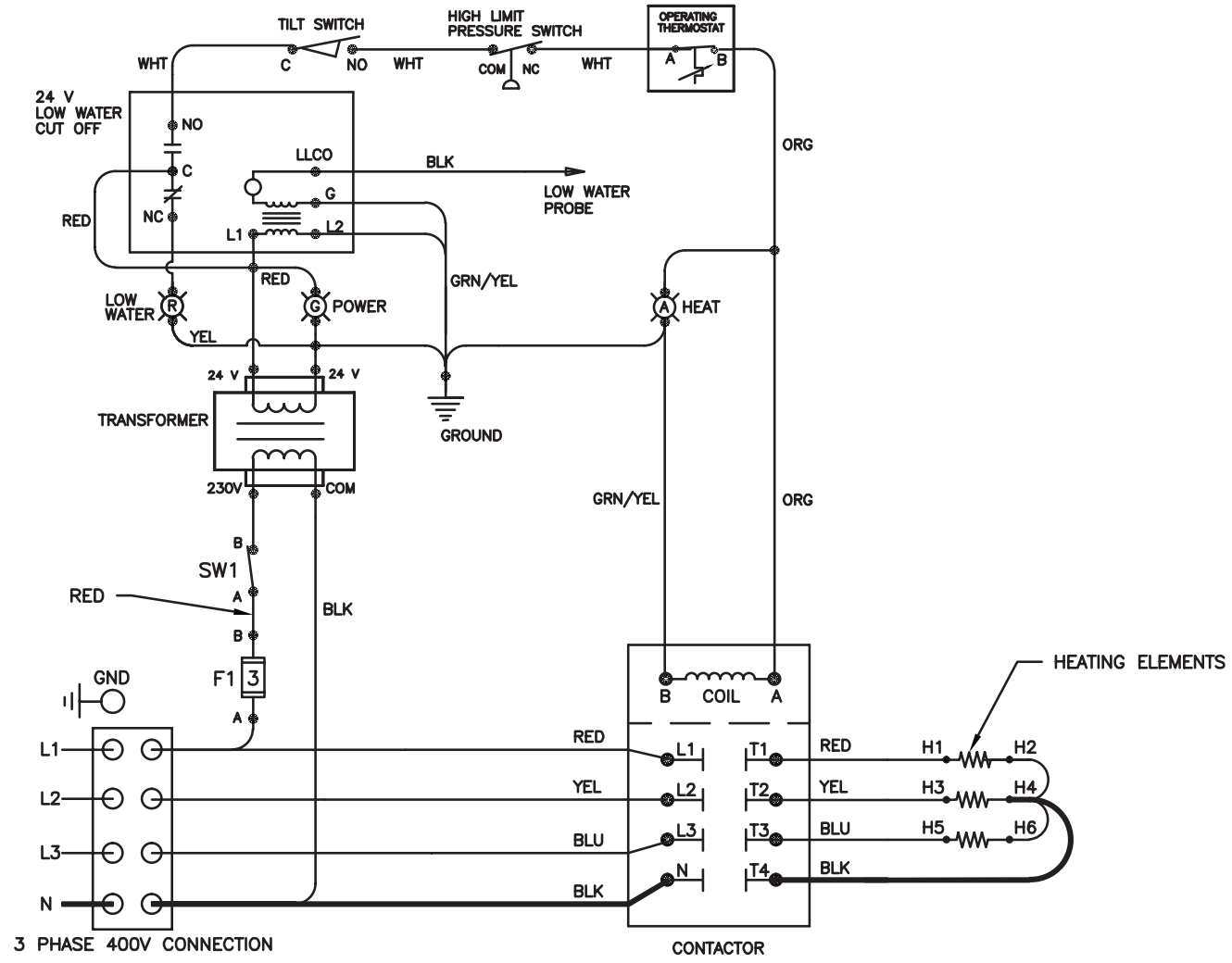
400/230V with Neutral & 240V without Neutral

Key	Description	Part #
1	ASM, ELECTRICAL MOUNTING BRACKET	148981
2	WATER LEVEL CONTROL BOARD	148323
3	MICRO SWITCH, 15 AMP 125/250 VAC	002982
4	TERMINAL BLOCK 4 POLE 85 AMP #14-4	088214
5	CONTACTOR 50 AMP RES 4 POLE	119811
6	FUSE HOLDER TYPE 3 AG	077854
7	FUSE 3.0 AMP TYPE 3 AG	077853
8	PC BOARD MOUNTING POST	099901
9	SCREW #8-32 X 1-1/4" ROUND HD	005056
10	SCREW #4-40 X 3/4" ROUND HD	003122
11	BARRIER INSULATION	003490
12	WASHER SHAKEPROOF LOCK #6	005715
13	NUT HEX #4-40	003121
14	TRANSFORMER, 50VA 208/230 V PRI, 24 V SEC	148899
15	LUG GROUND #14 - #6 AWG	129714
16	SCREW #8-32 X 3/8" HEX HD CAP	069789
17	SCREW #6-40 X 3/8" ROUND HD	009697
18	WIRING HARNESS ASM, TDB(C) 24 V CONTROL*	141364
19	WIRING HARNESS ASM, TDB(C) HIGH VOLTAGE WYE*	171819
20	WIRING HARNESS ASM, TDB(C) HIGH VOLTAGE DELTA*	162877
21	WIRING HARNESS ASM, TDB(C) HEATERS, 230/400 WYE*	141366
22	WIRING HARNESS ASM, TDB(C) HEATERS, 240 DELTA*	162876
23	SWITCH, TOGGLE*	122004
24	LIGHT, INDICATOR, GREEN, 24V*	162846
25	LIGHT, INDICATOR, AMBER, 24V*	116384
26	LIGHT, INDICATOR, RED, 24V*	116383



*Item not depicted/called out in drawing or photographs

Wiring Diagram
400/230 V with Neutral (Wye)

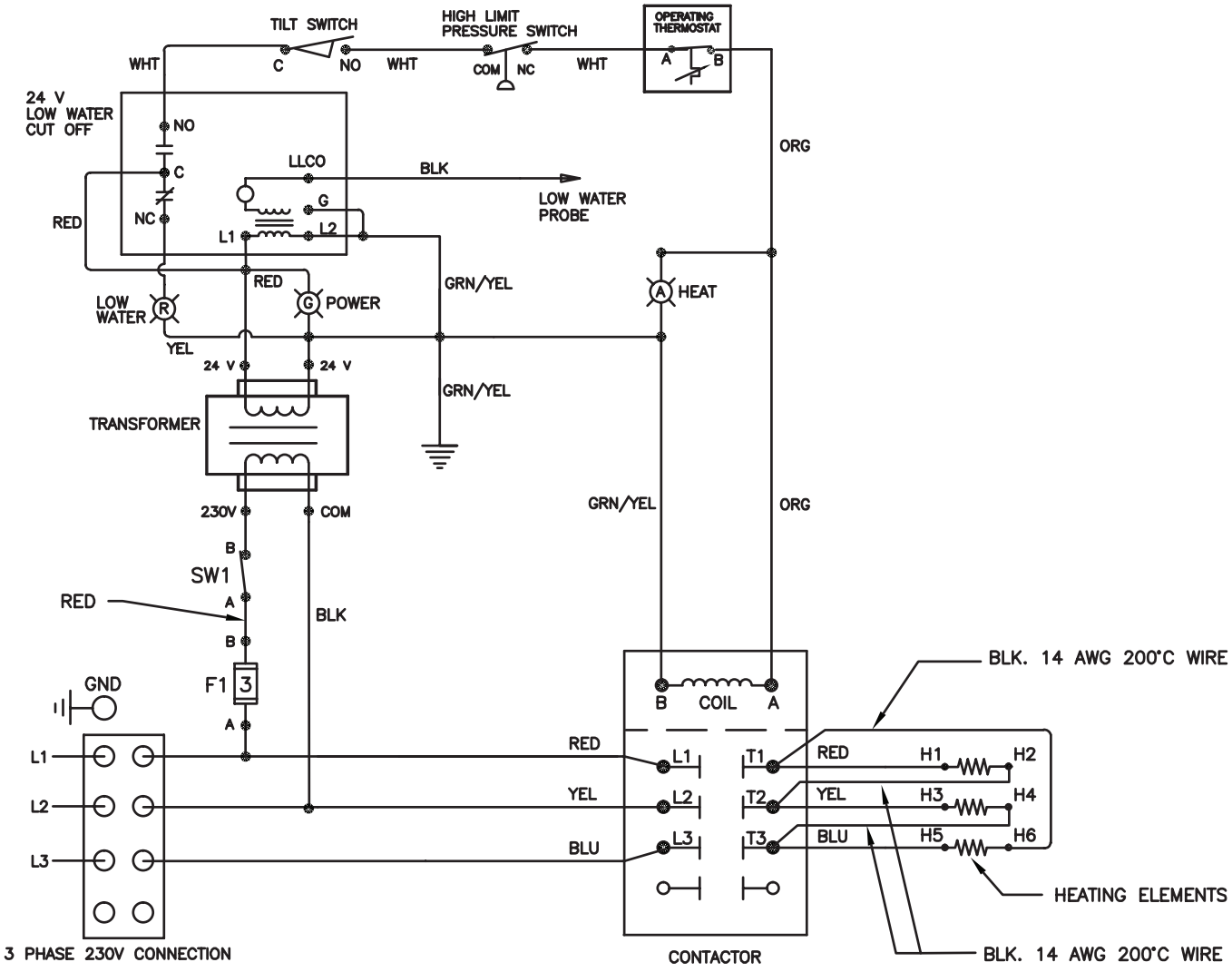


CAUTION:
CONTACT FACTORY FOR SINGLE PHASE CONVERSION INSTRUCTION

P/N 140825 REV. D
"CE" ONLY

Wiring Diagram

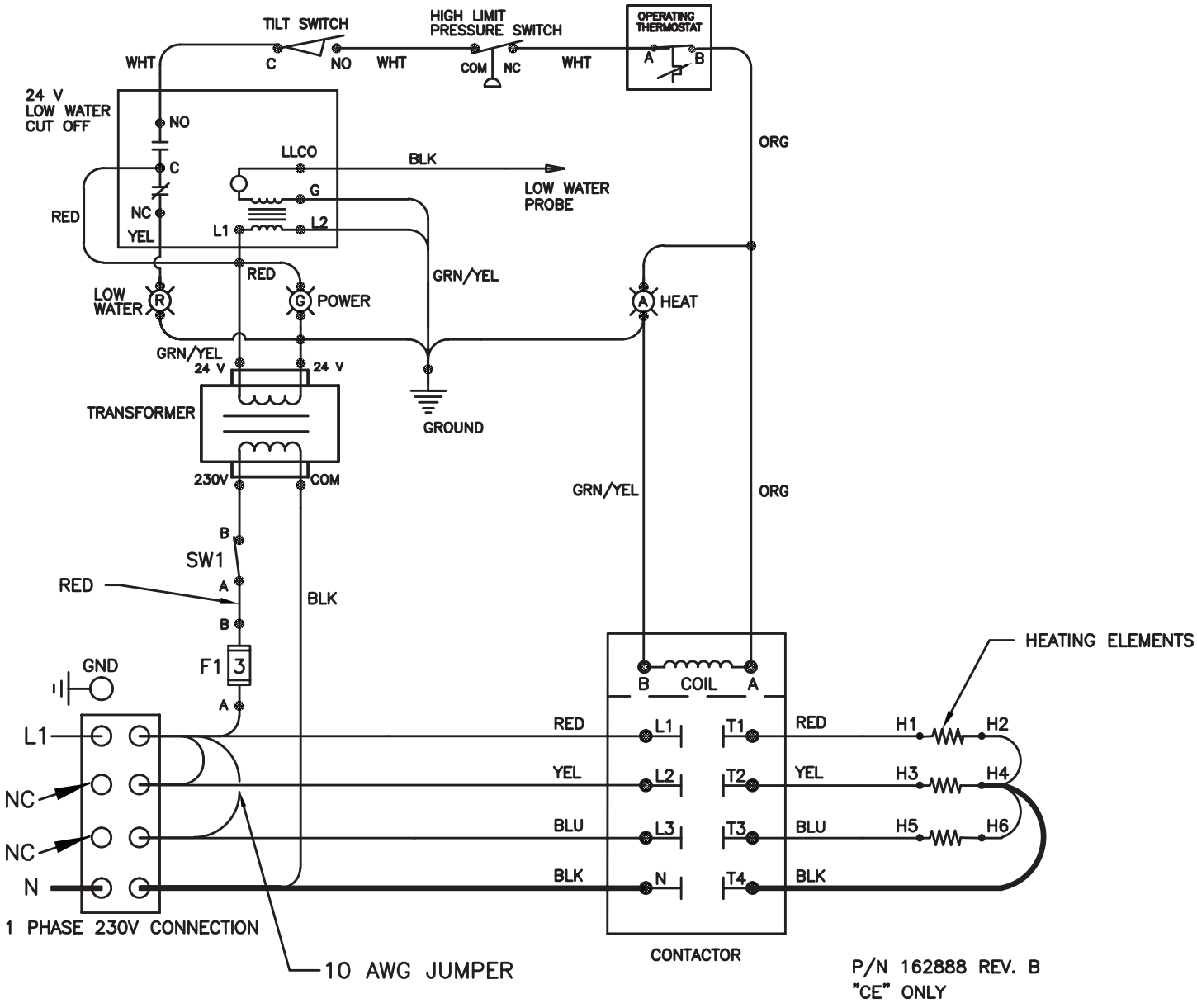
240V 3-Phase without Neutral (Delta)



P/N 162875 REV. B
"CE" ONLY

Wiring Diagram

240V 1-Phase without Neutral (Delta)



Service Log

Model No:	Purchased From:
Serial No:	Location:
Date Purchased:	Date Installed:
Purchase Order No:	For Service Call:

Date	Maintenance Performed	Performed By