



Operators Manual

Installation, Operation & Service

Electric Floor Model Mixers

MODELS:

MKEL-40-T, MKEL-60-T, MKEL-80-T, MKEL-100-T
TMKEL-40-T, TMKEL-60-T, TMKEL-80-T, TMKEL-100-T



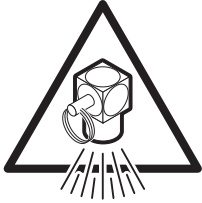
1333 East 179th St., Cleveland, Ohio, U.S.A. 44110

Enodis

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For your safety

DANGER

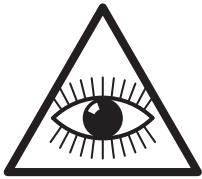


Keep clear of pressure relief discharge.

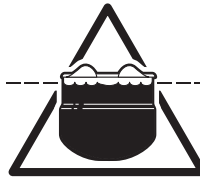


Keep hands away from moving parts and pinch points.

IMPORTANT



Inspect unit daily for proper operation.



Do not fill kettle above recommended level marked on outside of kettle.

CAUTION



Surfaces may be extremely hot! Use protective equipment.



Wear protective equipment when discharging hot product.

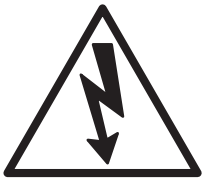


Do not lean on or place objects on kettle lip.



Stand clear of product discharge path when discharging hot product.

SERVICING

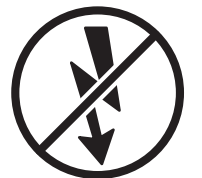


Shut off power at main fuse disconnect prior to servicing.



Ensure kettle is at room temperature and pressure gauge is showing zero or less prior to removing any fittings.

GAS APPLIANCES



Do not attempt to operate this appliance during a power failure.



Keep appliance and area free and clear of combustibles.

INSTALLATION

GENERAL

Installation of the kettle must be accomplished by qualified electrical installation personnel working to all applicable local and national codes. Improper installation of product could cause injury or damage.

This equipment is built to comply with applicable standards for manufacturers. Included among those approval agencies are: UL, NSF, ASME/Ntl. Bd., CSA, CGA, ETL, and others. Many local codes exist, and it is the responsibility of the owner/installer to comply with these codes.

Note: Maximum voltage for LVD (low volt directive for Europe) to be 440 volts for CE marked appliances.

INSPECTION

Before unpacking visually inspect the unit for evidence of damage during shipping.

If damage is noticed, do not unpack the unit, follow Shipping Damage Instructions shown below.

SHIPPING DAMAGE INSTRUCTIONS

If shipping damage to the unit is discovered or suspected, observe the following guidelines in preparing a shipping damage claim.

1. Write down a description of the damage or the reason for suspecting damage as soon as it is discovered. This will help in filling out the claim forms later.
2. As soon as damage is discovered or suspected, notify the carrier that delivered the shipment.
3. Arrange for the carrier's representative to examine the damage.
4. Fill out all carrier claims forms and have the examining carrier sign and date each form.

INSTALLATION

The first installation step is to refer to the Specification Sheets or Specification Drawings for detailed clearance and drain requirements in order to determine the location of the kettle. Next, carefully cut open the shipping carton for easy removal of the kettle.

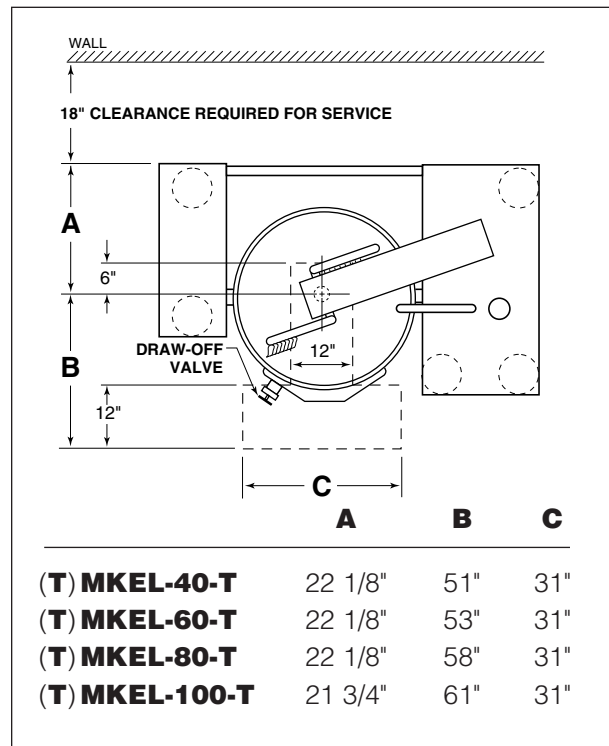
CLEARANCE REQUIREMENTS

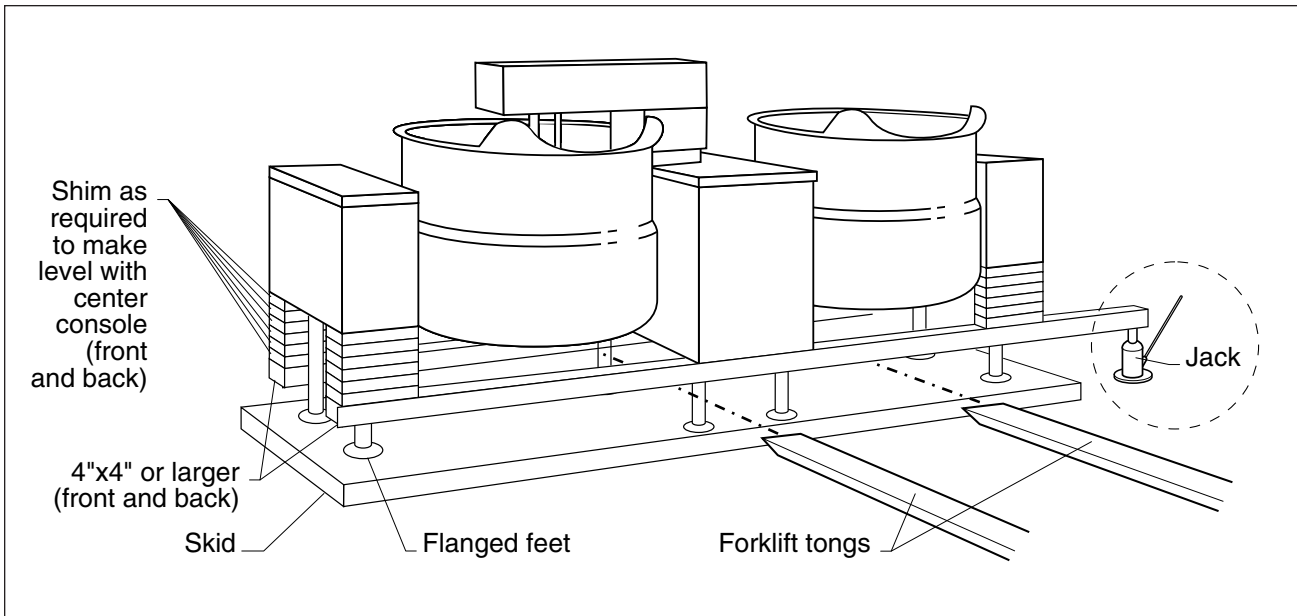
This unit must be installed in accordance with the clearances shown on the rating label which is adhered to the unit.

FOR YOUR SAFETY. Keep the appliance area free and clear of combustible materials.

RECOMMENDED FLOOR DRAIN LOCATION

Recommended Floor Drain Location





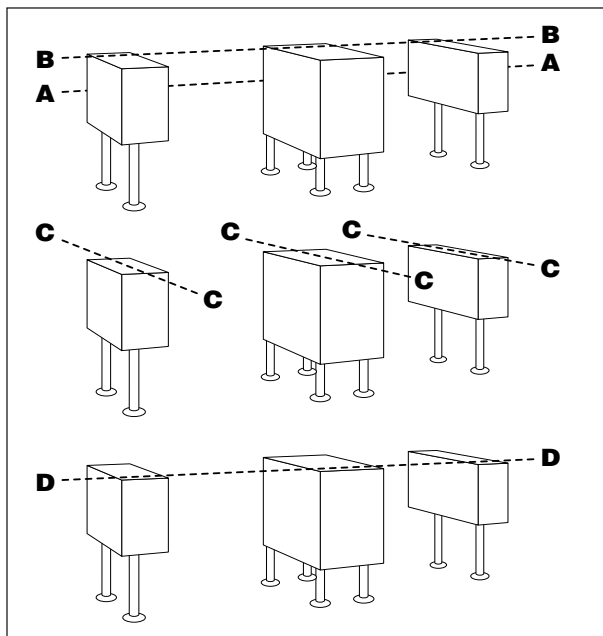
Recommended Installation Procedure

MOVING UNIT

1. While still on skid, move unit as close to final installation position as possible.
2. Prepare unit for lifting as shown in diagram.
3. Lift gently with a forklift or jacks and remove skid.
4. Lower gently to ground and remove forklift and blocking.
5. If unit has to be re-positioned, slide gently. Do not twist or push one side of unit excessively and cause binding on trunnions.

LEVELING

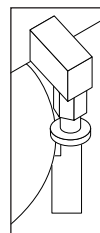
Note: Instructions reflect a more complicated twin mixer kettle - process for single mixer kettles is the same.



Recommended Leveling Procedure

1. With straight-edge, line the backs of the consoles up with each other (dotted line **A**).
2. Level and straight-edge backs of consoles (dotted line **B**). Adjustments are made by turning flanges on back feet only.

3. Level consoles individually from front to back (dotted lines **C**). Adjustments are made by turning flanges on front feet only.
4. Re-check that the back is level (dotted line **B**) and then the front (dotted line **D**). Adjust if necessary.



Guide Pins

5. Check that mixer bridge is level and guide pins lock smoothly without binding. If not repeat steps **1** through **4**.

NOTE: See Operating Instructions before operating unit.

6. Make electrical connections (see electrical service connections) and test mixer bridge as follows:

- ⇒ **A/** Raise mixer bridge.
- ⇒ **B/** Swing bridge out over centre console.
- ⇒ **C/** Swing bridge to the left as far as possible.

- ⇒ **D/** Lower bridge.
 - ⇒ **E/** Bridge pins should enter pin hole on kettle perfectly, If not return to step 1 and repeat leveling steps.
 - ⇒ **F/** Raise bridge and swing to far right (for twin mixers only).
 - ⇒ **G/** Repeat steps **D** and **E** (for twin mixers only).
- 7.** Once positioned and leveled, permanently secure the kettle's flanged feet to the floor using 5/16 inch stainless steel lag bolts and floor anchors (supplied by the installer). Secure each of the flanged feet with one bolt in each hole.
 - 8.** Connect piping as described in the "PIPING CONNECTION" section.

ELECTRICAL SERVICE CONNECTIONS

Install in accordance with local codes and/or the National Electric Code ANSI/NFPA No 70-1981 (USA) or the Canadian Electric Code CSA Standard C22.1 (Canada). A separate fused disconnect switch must be supplied and installed. The kettle must be electrically grounded by the installer.

The electric supply must match the power requirements specified on the kettle's rating plate. The copper wiring must be adequate to carry the required current at the rated voltage.

- 1.** Ensure main power is turned off before connecting wires.
- 2.** Remove the screws at the rear of the center console cover, and remove the cover. A wiring diagram is affixed to the underside of the console cover.
- 3.** Feed permanent copper wiring 18" through the cut-out in the bottom of the console. Connect wiring in junction box in the bottom of the console.
- 4.** Turn main power back on.
- 5.** Check for correct rotation of electric motor (access by removing top front cover on center console). If rotation is incorrect, disconnect main power and reverse any two of the three live lines.
- 6.** Replace the console cover and secure it with screws.

QUALITY ASSURANCE CHECKLIST

Follow this list only after all other installation steps are completed. Some steps require the use of equipment. Follow operating instructions.

The following will be performed before the unit is connected to utilities:

- 1.** Visual Examine unit for scratches, dents, or other defects.
- 2.** Visual Check flanged feet all have bolts holding them.
- 3.** General Check all accessible wiring, mechanical and plumbing connections by hand for secure, tight and satisfactory assembly. Remove all paper.
- 4.** Level Check unit has been leveled and squared correctly.

The following will be performed with the unit connected to utilities:

- 5.** Raise Bridge If bridge does not raise then check motor rotation. Bridge should not raise until speed control is turned to minimum and then adjusted back up.
- 6.** Swing Bridge Bridge when fully raised should swing without hitting any object, i.e. control housing, kettle lip. Check that hydraulic hoses are not being pinched by stops on swivel assembly.
- 7.** Tilt Kettle Kettle tilts smoothly both down and back up. If power tilt, check that micro switches are adjusted properly (kettle is level in upright position and drains fully when tilted) and are not being crushed by gear.
- 8.** Lower Bridge Raise bridge. Switch to mix. Turn speed control to zero to reset micro switch then set speed control to number four. Check that unit does not begin to mix until bridge has lowered part way into the kettle. Check that mixer bridge pin lowers into pin hole correctly
- 9.** Speed Control - Main Main agitator arm not rotating when set at minimum but will start to move slowly on one. Speed control makes positive contact with micro switch.
- 10.** Speed Control - Secondary Set main speed control to five. Adjust secondary control from minimum to maximum. Look for considerable speed variance.
- 11.** Water Faucets Turn on hot water faucet. Turn off and check for leaks in piping and drips from faucet spout. Repeat above with cold water faucet.
- 12.** Product Discharge Valve Add water to kettle. Check for leaks from valve. Open and close valve a few times and check for leaks again.

OPTIONAL CONTROLS

Some units may not have the following items to test

- 13. Meter** Complete this test using markings on mixer arm or a measuring strip if there are no markings on the unit. Test the meter at the following values up to capacity (Should be approx. $\pm 1/4$ "). During this test check that the (interrupt) switch stops the water flow and the (continue/reset) when switched to "continue" resumes the flow without resetting the meter.

GALLONS	LITERS
5	20
20	80
40	160
80	320
100	400

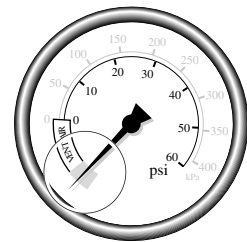
When the (continue/reset) switch is turned to "reset" the displayed quantity on the meter should be erased and the count begins at zero.

INSTALLATION CHECKS

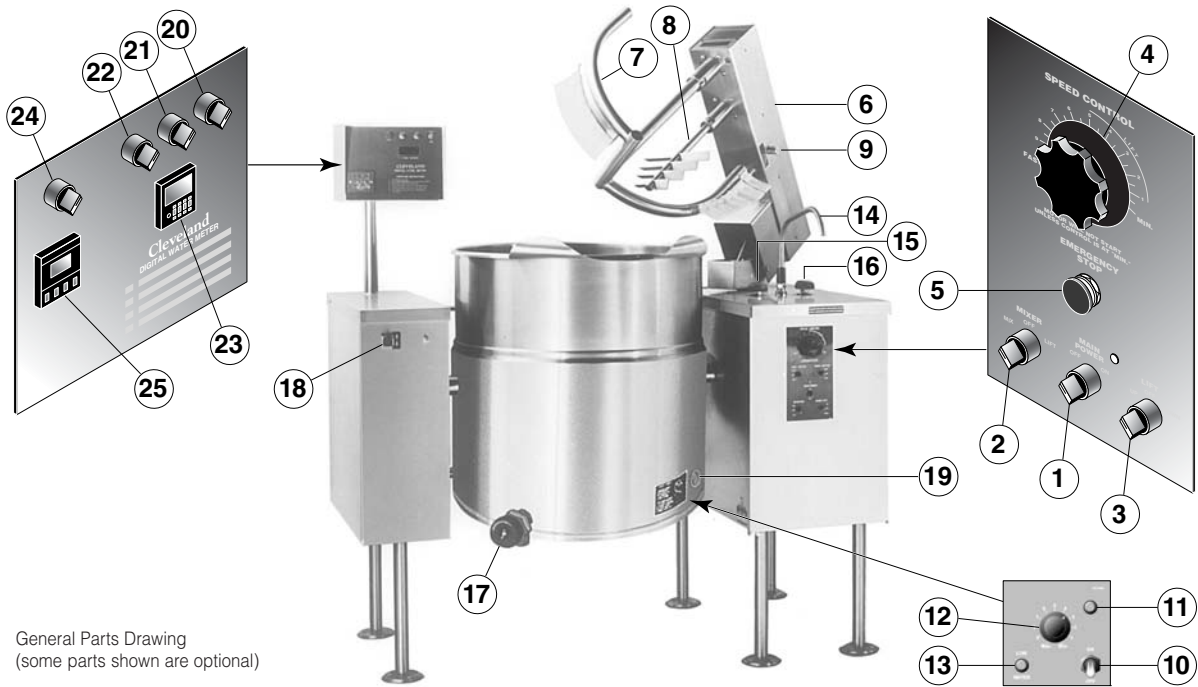
Although the kettle has been thoroughly tested before leaving the factory, the installer is responsible for ensuring the proper operation of kettle once installed.

Performance Checks

1. Supply power to the kettle by placing the fused disconnect switch to the "ON" position.
2. Before turning the kettle on, read the vacuum/pressure gauge. The gauge's needle should be in the green zone.
3. Place the kettle's power ON/OFF switch to the "ON" position.
4. Turn the temperature control knob to "1" (Min.). The green LED light should remain lit, indicating the burner is lit, until the set temperature is reached (124°F/50°C). Then the green light will cycle on and off, indicating the element is cycling on and off to maintain temperature.
5. Tilt the kettle forward (tilting models only). After a few seconds the red "LOW WATER" light should be lit when the kettle is in a tilted position. This light indicates that the element has automatically been shut off by the kettle's safety circuit. This is a normal condition when the kettle is in a tilted position.
6. Raise the kettle to the upright position (tilting models only). The red "low water" light should go out when the kettle is upright.
7. Turn the temperature control knob to "10" (Max.) and allow the kettle to preheat. The green light should remain on until the set temperature (260°F/127°C) is reached. Then the green light will cycle ON and OFF, indicating the element is cycling ON and OFF to maintain temperature. Fill the kettle with cold water to the steam jacket's welded seam.
8. When all testing is complete, empty the kettle and place the power ON/OFF switch in the "OFF" position.



OPERATING INSTRUCTIONS



General Parts Drawing
(some parts shown are optional)

ITEM #	DESCRIPTION	FUNCTION
1.	Main Power Switch	Power switch for unit.
2.	Mix/Lift Switch	Sets hydraulics to mix or lift mode.
3.	Up/Down Switch	When unit is in lift mode, mixer bridge can be raised or lowered with this switch.
4.	Mixer Speed Control Dial	Controls speed of agitators and mixer bridge lift.
5.	Emergency Stop Button	Stops hydraulic system (agitators and mixer bridge lift).
6.	Mixer Bridge	Encloses agitator motors.
7.	Main Agitator Arm	Provides most of the product movement.
8.	Secondary Agitator Arm	Provides reverse agitation and product lift in kettle.
9.	Secondary Speed Control Knob	Controls speed of secondary agitator arm.
10.	On/Off Heat Switch	Controls electrical power (heat) to kettle.
11.	Heat Indicator Light (Green)	When lit, indicates that the kettle burner is on. Cycles ON-OFF with burner.
12.	Solid State Temperature Control Knob	This control allows the operator to adjust the kettle temperature in increments from 1 (Min.) to 10 (Max.). (see Temperature Range Chart).
13.	Low Water Indicator Light (Red)	When lit, indicates that the kettle is low on water and will not operate in this condition. This will also light when the kettle is tilted.
14.	Faucet Spout	Delivers water to the kettle.
15.	Hot Water Valve	Turns on hot water.
16.	Cold Water Valve	Turns on cold water.
17.	Tangent Draw-Off Valve	Used for draining product or wash water from kettle.
18.	Power Tilt Control Switch	Used for tilting the kettle up or down. Replaced by hand tilt wheel on manual tilt units.
19.	Vacuum/Pressure Gauge	Indicate steam pressure in PSI inside steam jacket as well as vacuum in inches of mercury.
20.	Interrupt Switch	Interrupts flow without resetting water meter.
21.	Start Switch	Starts water flow to kettle.
22.	On/Off Switch	Power switch to water meter.
23.	Water Meter Control	Display and setting for water meter.
24.	Active/Bypass Switch	Switch to activate or bypass (manual operation) the controller.
25.	Temperature Controller	Digital temperature control and indicator.

Operating Suggestions

Cleveland Range Mixer Kettles are simple and safe to operate. The following tips will allow you to maximize the use of your new mixer.

1. Allow unit to preheat before addition of product to kettle. However when cooking egg and milk products, the kettle should NOT be preheated, as products of this nature adhere to hot cooking surfaces. These types of foods should be placed in the kettle before heating is begun.
2. An important part of kettle cleaning is to prevent foods from drying on. For this reason, cleaning should be completed immediately after cooked foods are removed. Refer to the "Care and Cleaning" instructions for detailed kettle washing procedures.
3. If a mixer bridge is equipped with a temperature probe for a controller or thermometer, the probe must be submerged a minimum of three inches in the product for accurate readings.

Safety

DO NOT LEAN ON OR PLACE OBJECTS ON KETTLE LIP. SERIOUS INJURY COULD RESULT IF KETTLE TIPPED OVER, SPILLING HOT CONTENTS.

1. Close TANGENT DRAW-OFF VALVE (17) before filling the kettle.
2. When raising or lowering MIXER BRIDGE (6), insure FAUCET SPOUT (14) is not in the way of MAIN AGITATOR ARM (7) or damage to spout will result.
3. As a safety precaution the MIXER SPEED CONTROL DIAL (4) must first be turned to zero before unit will start to mix.
4. Always remember, like a cooking pot the kettles become very hot when cooking. Avoid contact with bare skin.

Operating the Kettle

1. Before turning kettle on, read the Vacuum/Pressure Gauge (19). The gauges needle should be in the green zone. Once heated, the kettle's normal maximum operating pressure is approximately 10-12 psi, while cooking a water base product.
2. Ensure that the electrical service to the kettle is turned on at the fused disconnect switch.
3. Place the kettle's On-Off Heat Switch (10) to the "ON" position.

Temperature Control Setting	Approximate Product Temperature	
	°F	°C
1. (Min.)	130	54
2.	145	63
3.	160	71
4.	170	77
5.	185	85
6.	195	91
7.	210	99
8.	230	110
9.	245	118
10. (Max.)	260	127
NOTE: Certain combinations of ingredients will result in temperature variations		

Temperature Range Chart

4. Preheat the kettle by turning the Solid State Temperature Control Knob (12) to the desired temperature setting (see above "Temperature Range Chart"). The Heat Indicator Light (Green) (11) will remain lit, indicating the burner is lit, until the temperature setting is reached. When the green light goes off, the heaters are off, and preheating is complete.

NOTE: When cooking egg and milk products, the kettle should not be preheated, as products of this nature adhere to hot cooking surfaces. These types of food should be placed in the kettle before heating is begun.

5. Place food product into the kettle. The Heat Indicator Light (Green) (11) will cycle on and off indicating the elements are cycling on and off to maintain the set temperature.

NOTE: Do not fill kettle above recommended level marked on outside of kettle.

NOTE: The Low Water Indicator Light (Red) (13) should not be lit when kettle is in the upright position during kettle operation. This light indicates that the elements have been automatically shut off by the kettle's safety circuit. It is, however, normal for the red light to come on when the kettle is in a tilted position.

6. When cooking is completed place On-Off Heat Switch (10) to the "OFF" position.

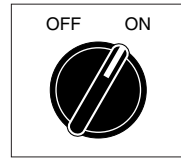
7. Pour the contents of the kettle into an appropriate container by tilting the kettle forward. Care should be taken to pour slowly enough to avoid splashing off the product.

NOTE: As with cleaning food soil from any cookware, an important part of kettle cleaning is to prevent food from drying on. For this reason, cleaning should be completed immediately after cooked foods are removed.

The accompanying chart shows approximate times required for electric kettles of various capacities to boil water. Temperature control knob must be set at "10" (Max.) throughout the heatup period. Water will boil about 1/3 faster if the kettle is filled only to the outer steam jacket's welded seam, resulting in a kettle filled to 2/3 capacity.

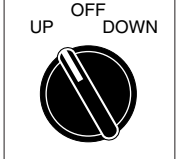
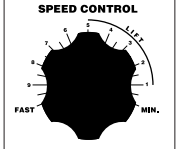
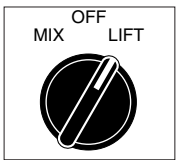
APPROXIMATE FULL KETTLE COOKING TIMES							
		Times in Minutes					
Gals.	Ltrs.	Standard Wattage			High Wattage*		
		208V	240V	480V	208V	240V	480V
25	95	60	45	60	40	30	30
40	150	60	50	75	40	30	30
60	225	100	75	75	50	40	40
80	300	130	100	100	65	50	50
100	375	160	120	120	80	60	60

* High Wattage is only available with 3 phase units



General Operation

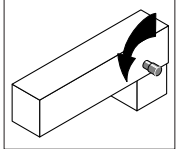
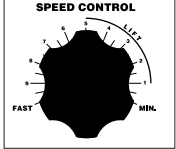
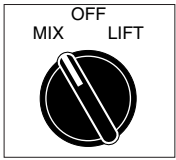
1. Turn MAIN POWER SWITCH (1) to "ON".



Lifting & Lowering Bridge

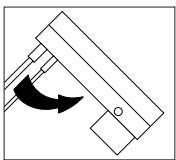
WARNING- Insure FAUCET SPOUT (14) is out of way before raising or lowering bridge.

1. Turn MIX/LIFT SWITCH (2) to "LIFT".
2. Turn MIXER SPEED CONTROL (4) to "MIN" and back up to #5.
3. Turn and hold UP/DOWN SWITCH (3) "UP" to raise or "DOWN" to lower.



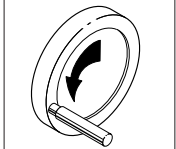
Mixing

1. Turn MIX/LIFT SWITCH (2) to "MIX".
2. Turn MIXER SPEED CONTROL (4) to "MIN" and slowly adjust to desired speed.
3. Adjust SECONDARY SPEED CONTROL (9) to desired speed.

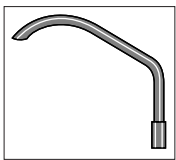
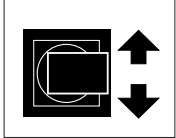


Tilting Kettle

1. Raise MIXER BRIDGE (6) and swing to side.
2. For **manual tilt:** turn HANDWHEEL (3).
3. For **power tilt:** turn switch " " to raise, or " " to tilt.



WARNING- Do not tilt kettle when mixer agitators are in kettle bowl.



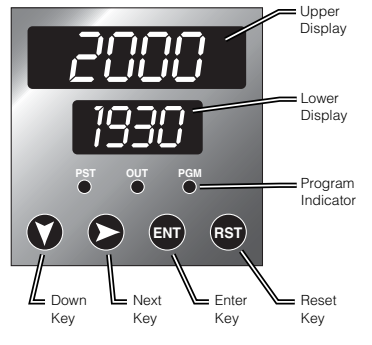
Adding Water Manually

1. Locate FAUCET SPOUT (14) over desired kettle.
2. Turn on HOT or COLD WATER VALVES (15 or 16).



DIGITAL WATER METER OPERATING INSTRUCTIONS

Note: The digital counter has been preset at the factory and should operate satisfactory. If installing a new counter (or the configuration settings to your existing digital counter become corrupted) you must configure the digital counter as shown below (**Configuring a Digital Counter**) prior to operation.



1 Turn POWER switch "ON".

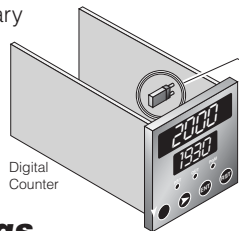
2 Set required volume by first pushing the **Next** key until the digit you want to change is flashing in the lower display. Then use the **Down** key to change the value of the selected digit.

When all digits are set, press the **ENT** key.

- 3** Locate delivery spout over desired kettle.
- 4** Turn **START** switch to "RESET". Delivery will start at "0" and stop at preset volume.
- 5** To stop delivery at any time, turn **INTERRUPT** switch to "••".
- 6** To complete delivery after interrupting, turn **START** switch to "CONTINUE".
- 7** Turn POWER switch to "OFF" when meter is not in use.

CONFIGURING A DIGITAL COUNTER

This procedure is only necessary when installing a replacement counter or settings to existing counter become corrupted

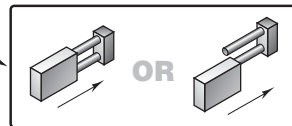


Changing to Configuration Mode

1 To enter Configuration Mode, turn POWER switch "OFF" and remove counter from its' housing.

2 Change the position of the jumper. **Note:** The actual position is irrelevant, as long as the position is changed.

3 Replace the counter in its' housing and turn POWER switch "ON".



Editing the Parameter Settings

After changing the jumper position (see above instructions - **Changing to Configuration Mode**), edit the parameters as follows:

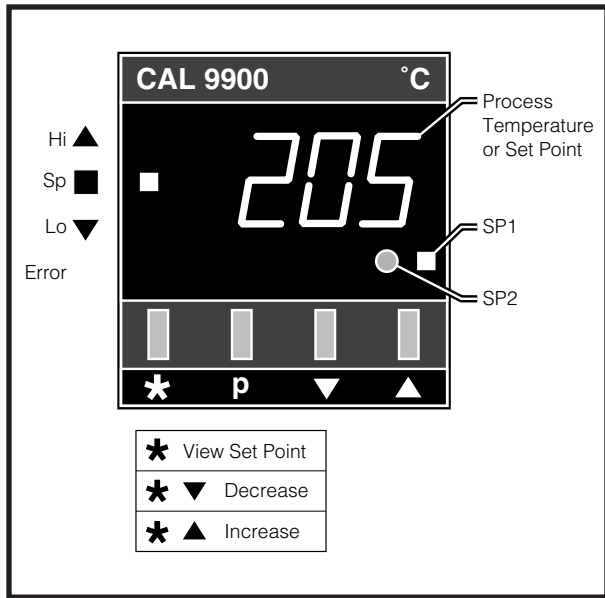
Note: The **PGM** (program) indicator will flash while the counter is in the configuration mode.

- Use the **Down** key to step through the parameters.
- When the desired parameter description is shown in the upper display (see **Parameters Chart**), press the **Next** key to enter the edit mode and to scroll through the available settings.
- When the desired setting is shown, press the **ENT** key.
- To exit the Configuration Mode, momentarily remove power from counter or press and hold down the **RST** key for at least two seconds.

Parameters Chart	Parameter Description (Upper Display - in order of appearance)	Required Settings (Lower Display)
Counter Speed	SPEE	20 20 Hz.
Input Operation	InPu	A-B A-B (Add/Subtract)
Panel Reset Key	PrES	EnAb Enable
Auto Reset	ArES	EnAb Enable
Input Pull-Ups	PULL	no No (Current-Sourcing)
Count Direction	Cdir	uP Up-Counting
Lock Strategy	Loc	nonE None

Use **Down** key to step through parameters.

Use **Next** key to step to setting shown below.



CAL 9900 Controls Drawing

MIXER KETTLE OPERATION USING CAL 9900

Note: Temperature probe on mixer bridge must be covered with a minimum of three inches of product to function correctly.



1. Open STEAM VALVE completely
2. Turn mixer MAIN POWER switch to "ON" (CAL 9900 lights up and displays present temperatures).



3. Turn HEAT/COOL switch to "OFF/AUTO".



4. Turn ACTIVE/BYPASS switch to "BYPASS". The unit should not be heating or cooling at this point.



5. Push (*) button on CAL 9900 to read set point temperature. (This is the desired product temperature).
6. To change set point temperature push and hold (*) button while pushing (▲) or (▽) button. New set point is determined when (*) button is released.
7. Add product to kettle.



8. Turn ACTIVE/BYPASS switch to "ACTIVE". If the set point temperature is higher than the product temperature, the kettle will start heating.

Note: For twin kettles, the CAL 9900 will control the kettle the mixer is in.

Changing Functions & Options

The controller has been preset at the factory and should operate satisfactory. If you wish to fine tune the unit for your specific application consult the CAL 9900 Installation and Operation Manual. Following is a simplified procedure for changing parameters.



1. Mixer MAIN POWER switch in the "ON" position.

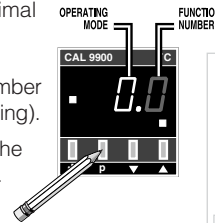


2. ACTIVE/BYPASS switch in "BYPASS" position.

3. Press button labeled (p). The display should show a number with a decimal place in it.

Left of the decimal place is the **OPERATING MODE** setting (this number should be flashing).

To the right is the **FUNCTION NUMBER**.



4. To change the **OPERATING MODE** setting push the (▲) or (▽) buttons.



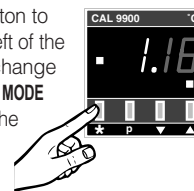
5. To move to the **FUNCTION NUMBER** (right of the decimal) push (*) button.



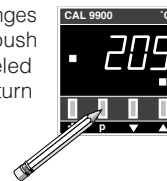
6. That number should now be flashing. To move to another **FUNCTION NUMBER** push the (▲) or (▽) buttons.



7. Push (*) button to move to the left of the decimal. To change the **OPERATING MODE** setting push the (▲) or (▽) buttons.



8. When your changes are complete push the button labeled (p) again to return to the Process Temperature.



Cleveland Range Factory Settings

OPERATING MODE	FUNCTION NUMBER
0	0
0	1
5	2
0	3
4 steam 5 electric	4
0	5
5	6
0	7
0	8
1	9
0	10
0	11
0	12
0	13
0	14
0	15
9	16
0	17
0	18
1	19
2 T.A.P 0	20
0	21
0 = °C 1 = °F	22
6	23
--	24
0	25
--	26






CLEANING INSTRUCTIONS



CARE AND CLEANING

Cooking equipment must be cleaned regularly to maintain its fast, efficient cooking performance and to ensure its continued safe, reliable operation. The best time to clean is shortly after each use (allow unit to cool to a safe temperature).

WARNINGS

- ⇒  Do not use detergents or cleansers that are chloride based or contain quaternary salt.
Chloride Cleaners
- ⇒  Do not use a metal bristle brush or scraper.
Wire Brush &
- ⇒  Steel wool should never be used for cleaning the stainless steel.
Steel Pads
- ⇒  Unit should never be cleaned with a high pressure spray hose.
High Pressure Spray Hose
- ⇒  Do not leave water sitting in unit when not in use.
Stagnant Water

CLEANING INSTRUCTIONS

1. Turn unit off.
2. Remove drain screen (if applicable). Thoroughly wash and rinse the screen either in a sink or a dishwasher.
3. Prepare a warm water and mild detergent solution in the unit.
4. Remove food soil using a nylon brush.
5. Loosen food which is stuck by allowing it to soak at a low temperature setting.
6. Drain unit.
7. Rinse interior thoroughly.
8. If the unit is equipped with a **Tangent Draw-Off Valve**, clean as follows:
 - a) Disassemble the draw-off valve first by turning the valve knob counter-clockwise, then turning the large hex nut counter-clockwise until the valve stem is free of the valve body.
 - b) In a sink, wash and rinse the inside of the valve body using a nylon brush.
 - c) Use a nylon brush to clean tangent draw-off tube.
 - d) Rinse with fresh water.
 - e) Reassemble the draw-off valve by reversing the procedure for disassembly. The valve's hex nut should be hand tight only.
9. If the unit is equipped with a **Butterfly Valve**, clean as follows:
 - a) Place valve in open position.
 - b) Wash using a warm water and mild detergent solution.
 - c) Remove food deposits using a nylon brush.
 - d) Rinse with fresh water.
 - e) Leave valve open when unit is not in use.
10. Using mild soapy water and a damp sponge, wash the exterior, rinse, and dry.

NOTES

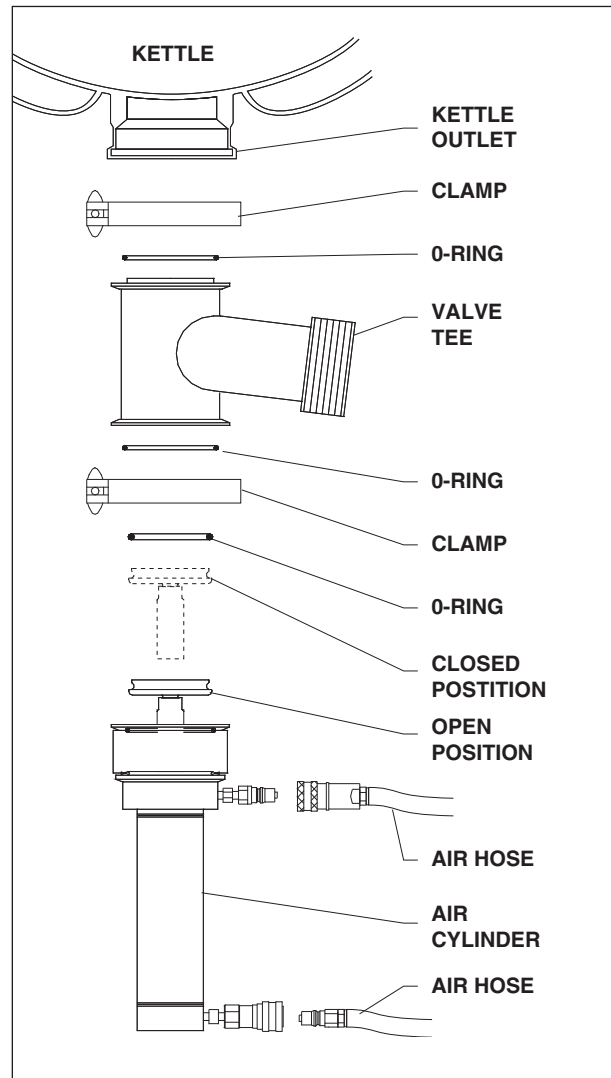
- ⇒ For more difficult cleaning applications one of the following can be used: alcohol, baking soda, vinegar, or a solution of ammonia in water.
- ⇒ Leave the cover off when the kettle is not in use.
- ⇒ For more detailed instructions refer to the Nafem Stainless Steel Equipment Care and Cleaning manual (supplied with unit).

SCRAPER BLADES

1. Remove retaining ring and slide scraper blades off agitator arm.
2. Place parts in a pan of warm water to soak.
3. Clean in a sink, using a warm water and mild detergent solution.
4. Rinse with fresh water.
5. Allow to dry thoroughly on a flat, clean surface.

PRODUCT VALVE

Daily - clean product valve as follows:



1. Open product valve.
2. Disconnect air hoses.
3. Remove air cylinder.
4. Remove valve tee.
5. Remove all O-rings.
6. Clean air cylinder, do not submerge in water. Wipe clean and sanitize.
7. Clean and sanitize tee and O-rings.
8. Grease and reinstall O-rings.
9. Reinstall tee to kettle outlet.
10. Reinstall air cylinder to bottom of tee.
11. Reconnect air hoses.
12. Close valve and check for alignment.

STAINLESS STEEL EQUIPMENT CARE AND CLEANING

(Supplied courtesy of Nafem. For more information visit their web site at www.nafem.org)

Contrary to popular belief, stainless steels ARE susceptible to rusting.

Corrosion on metals is everywhere. It is recognized quickly on iron and steel as unsightly yellow/orange rust. Such metals are called "active" because they actively corrode in a natural environment when their atoms combine with oxygen to form rust.

Stainless steels are passive metals because they contain other metals, like chromium, nickel and manganese that stabilize the atoms. 400 series stainless steels are called ferritic, contain chromium, and are magnetic; 300 series stainless steels are called austenitic, contain chromium and nickel; and 200 series stainless, also austenitic, contains manganese, nitrogen and carbon. Austenitic types of stainless are not magnetic, and generally provide greater resistance to corrosion than ferritic types.

With 12-30 percent chromium, an invisible passive film covers the steel's surface acting as a shield against corrosion. As long as the film is intact and not broken or contaminated, the metal is passive and stain-less. If the passive film of stainless steel has been broken, equipment starts to corrode. At its end, it rusts.

Enemies of Stainless Steel

There are three basic things which can break down stainless steel's passivity layer and allow corrosion to occur.

1. Mechanical abrasion
2. Deposits and water
3. Chlorides

Mechanical abrasion means those things that will scratch a steel surface. Steel pads, wire brushes and scrapers are prime examples.

Water comes out of the faucet in varying degrees of hardness. Depending on what part of the country you live in, you may have hard or soft water. Hard water may leave spots, and when heated leave deposits behind that if left to sit, will break down the passive layer and rust stainless steel. Other deposits from food preparation and service must be properly removed.

Chlorides are found nearly everywhere. They are in water, food and table salt. One of the worst chloride perpetrators can come from household and industrial cleaners.

So what does all this mean? Don't Despair!

Here are a few steps that can help prevent stainless steel rust.

1. Use the proper tools.

When cleaning stainless steel products, use non-abrasive tools. Soft cloths and plastic scouring pads will not harm steel's passive layer. Stainless steel pads also can be used but the scrubbing motion must be in the direction of the manufacturers' polishing marks.

2. Clean with the polish lines.

Some stainless steel comes with visible polishing lines or "grain." When visible lines are present, always scrub in a motion parallel to the lines. When the grain cannot be seen, play it safe and use a soft cloth or plastic scouring pad.

3. Use alkaline, alkaline chlorinated or non-chloride containing cleaners.

While many traditional cleaners are loaded with chlorides, the industry is providing an ever-increasing choice of non-chloride cleaners. If you are not sure of chloride content in the cleaner used, contact your cleaner supplier. If your present cleaner contains chlorides, ask your supplier if they have an alternative. Avoid cleaners containing quaternary salts; it also can attack stainless steel and cause pitting and rusting.

4. Treat your water.

Though this is not always practical, softening hard water can do much to reduce deposits. There are certain filters that can be installed to remove distasteful and corrosive elements. To insure proper water treatment, call a treatment specialist.

5. Keep your food equipment clean.

Use alkaline, alkaline chlorinated or non-chloride cleaners at recommended strength. Clean frequently to avoid build-up of hard, stubborn stains. If you boil water in stainless steel equipment, remember the single most likely cause of damage is chlorides in the water. Heating cleaners that contain chlorides have a similar effect.

6. Rinse, rinse, rinse.

If chlorinated cleaners are used, rinse and wipe equipment and supplies dry immediately. The sooner you wipe off standing water, especially when it contains cleaning agents, the better. After wiping equipment down, allow it to air dry; oxygen helps maintain the stainless steel's passivity film.

7. Never use hydrochloric acid (muriatic acid) on stainless steel.

8. Regularly restore/passivate stainless steel.

Recommended cleaners for specific situations

Job	Cleaning Agent	Comments
Routine cleaning	Soap, ammonia, detergent, Medallion	Apply with cloth or sponge
Fingerprints & smears	Arcal 20, Lac-O-Nu Ecoshine	Provides barrier film
Stubborn stains & discoloration	Cameo, Talc, Zud, First Impression	Rub in direction of polish lines
Grease & fatty acids, blood, burnt-on-foods	Easy-off, De-Grease It Oven Aid	Excellent removal on all finishes
Grease & oil	Any good commercial detergent	Apply with sponge or cloth
Restoration/Passivation	Benefit, Super Sheen	

Review

1. Stainless steels rust when passivity (film-shield) breaks down as a result of scrapes, scratches, deposits and chlorides.
2. Stainless steel rust starts with pits and cracks.
3. Use the proper tools. Do not use steel pads, wire brushes or scrapers to clean stainless steel.
4. Use non-chlorinated cleaners at recommended concentrations. Use only chloride-free cleaners.
5. Soften your water. Use filters and softeners whenever possible.
6. Wipe off cleaning agent(s) and standing water as soon as possible. Prolonged contact causes eventual problems.

To learn more about chloride-stress corrosion and how to prevent it, contact the equipment manufacturer or cleaning materials supplier.

Developed by Packer Engineering, Naperville, Ill., an independent testing laboratory.

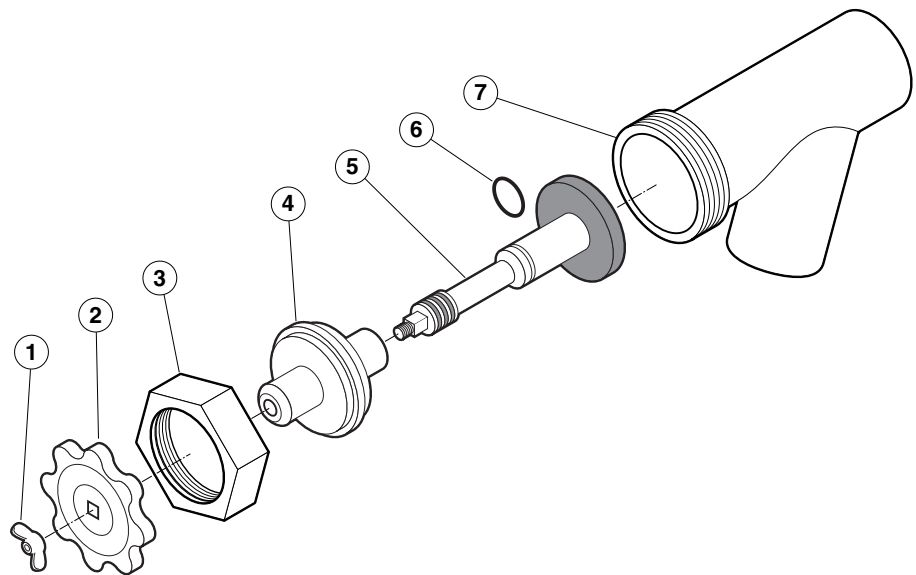
SERVICE PARTS

WARRANTY

Our Company supports a worldwide network of Maintenance and Repair Centers. Contact your nearest Maintenance and Repair Centre for replacement parts, service, or information regarding the proper maintenance and repair of your cooking equipment

In order to preserve the various agency safety certification (UL, NSF, ASME/Ntl. Bd., etc.), only factory-supplied replacement parts should be used. The use of other than factory supplied replacement parts will void warranty.

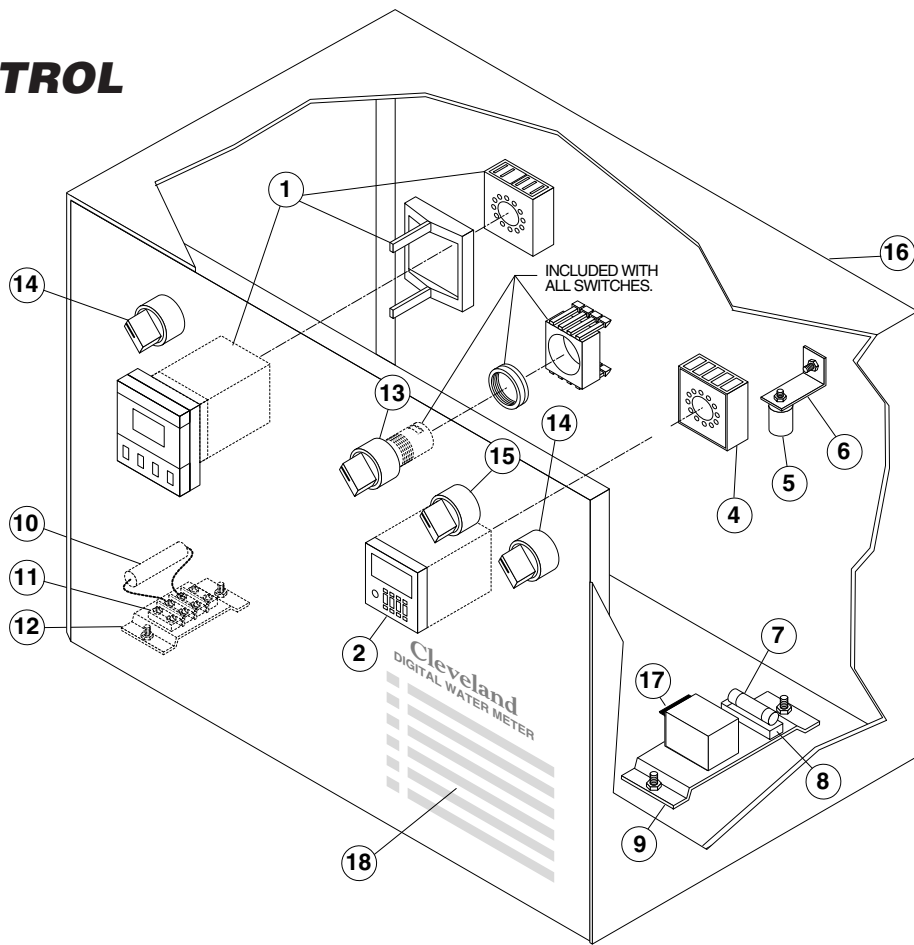
2" TANGENT DRAW-OFF VALVE



<i>ITEM NO.</i>	<i>PART NO.</i>	<i>DESCRIPTION</i>	<i>QTY.</i>
1. - 7.	KE50972-B	Draw-Off Assembly	1
1.	FA95049	Wing Nut	1
2.	KE527551	Knob	1
3.	KE52754	Hex Nut	1
4.	KE52753	Retainer	1
5.	KE52752	Piston	1
6.	FA00111	"O" Ring	1
7.	KE52751	Valve Body	2

REMOTE CONTROL ASSEMBLY

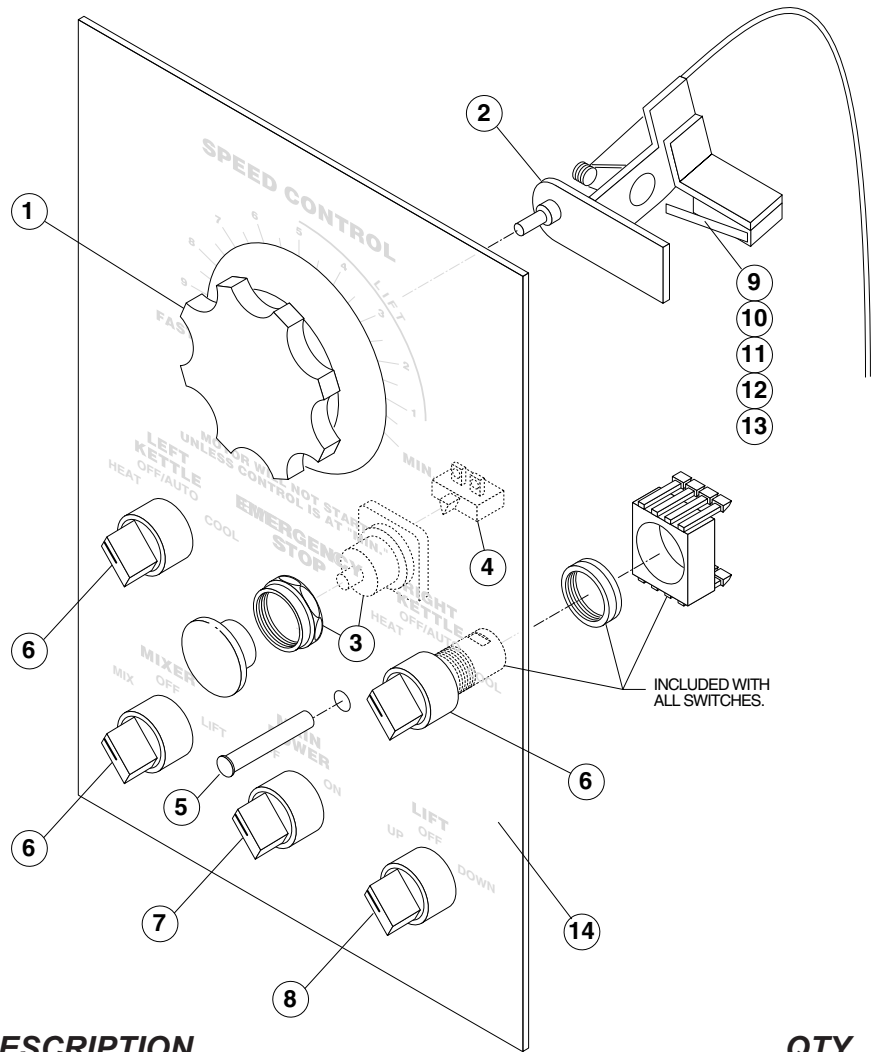
NOTE: See SWITCH CONFIGURATIONS for applicable contact cartridge/capacitor combinations and part numbers



ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.	KE53479	Digital Temperature Controller and Indicator	1
2.	KE53257	Digital Counter	1
3.	KE51857	Front Cover, Digital Counter	1
4.	KE53258	Panel Mount Socket	1
5.	KE52710	Thermostat	1
6.	KE52835	Bracket for Thermostat	1
7.	KE52936	Fuse	1
8.	KE51139	Holder, Fuse	1
9.	KE54402	Mounting Bracket, Fuse	1
10.	KE01820	Ambient Heater Assembly	1
11.	SK50370	Terminal Block	1
12.	KE54402	Mounting Bracket, Terminal Block	1
13.	KE003209-6	Momentary Spring Return Switch Assembly	1
14.	KE003209-1	Switch Assembly, On/Off - Maintained	2
15.	KE003209-7	Momentary Spring Return Switch Assembly	2
16.	KE52272	Cover	1
17.	KE50753-9	Relay	1
18.		Label:	1
	KE95229	English	
	KE95229-1	French	

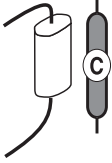
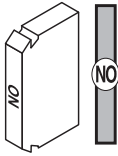
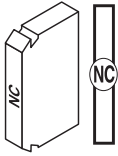
MAIN CONSOLE CONTROLS

NOTE: See SWITCH CONFIGURATIONS for applicable contact cartridge/capacitor combinations and part numbers



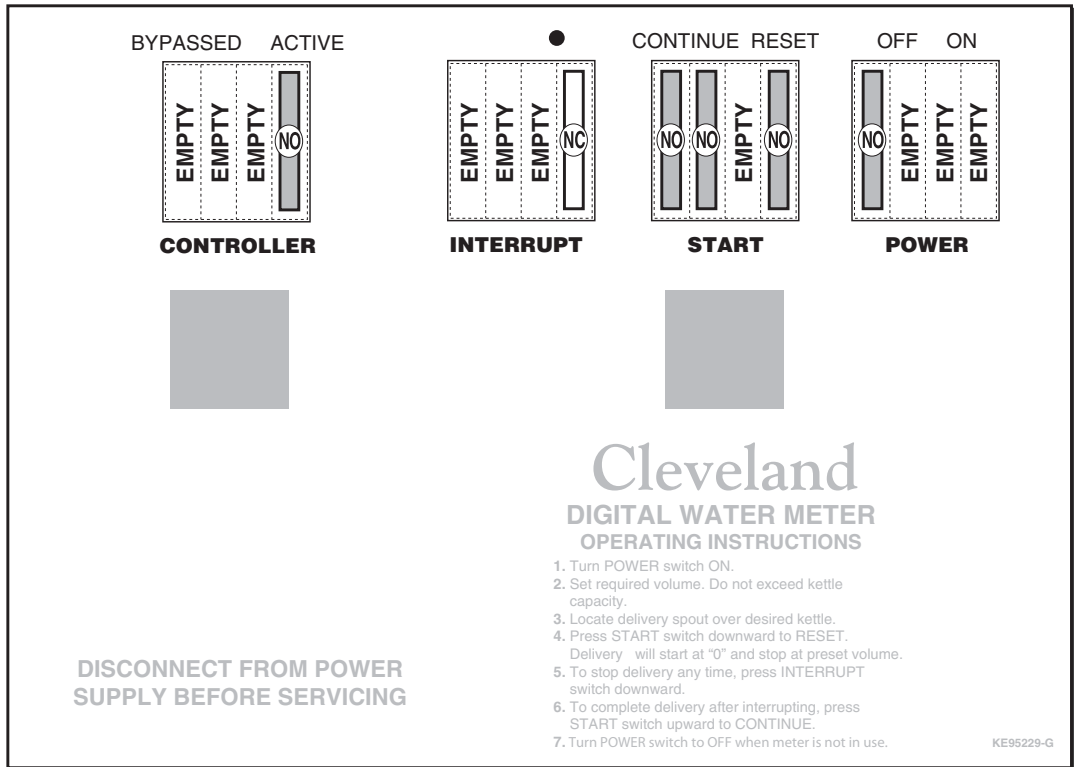
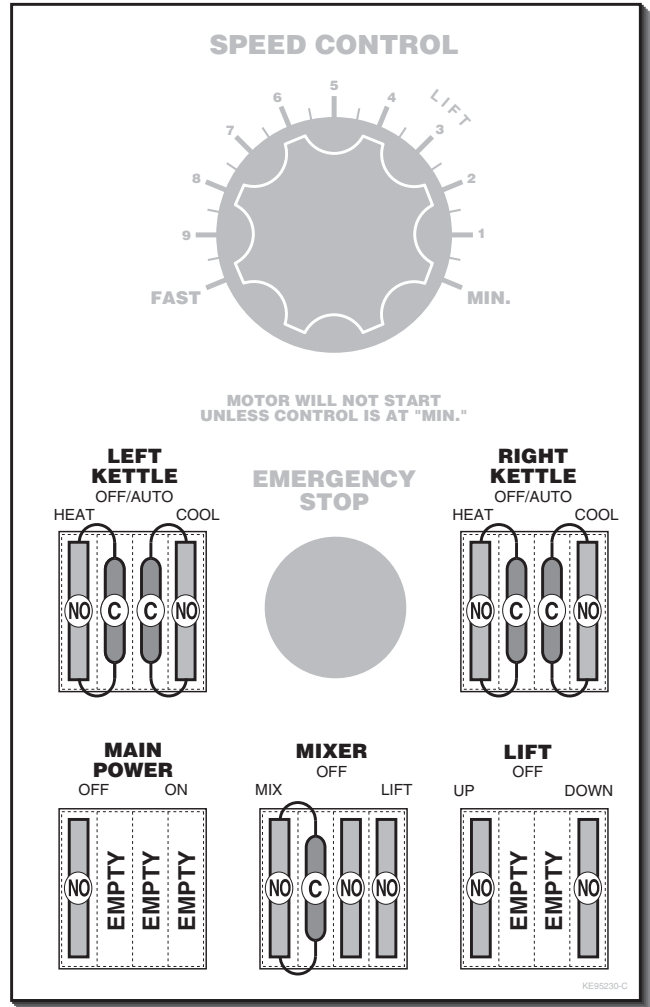
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.	KE52190	Knob, Speed Control	1
2.	KE00860	Cable and Bracket, Speed Control (includes items 9 - 13)	1
3.	KE53193	Emergency Switch	1
4.	KE53377	Push Button Contact Block	1
5.	SK50315-1	Pilot Light	1
6.	KE003209-5	Switch Assembly, On/Off/On - Maintained (single kettle)	2
		(twin kettle)	3
7.	KE003209-1	Switch Assembly, On/Off - Maintained	1
8.	KE003209-7	Switch Assembly, On/Off/On - Momentary	1
9.	KE52180	Micro Switch	1
10.	FA10032	Machine Screw, #4-40 x 5/8" LG	2
12.	FA32002	Tooth Lock Washer #4	2
13.	FA20000	Hex Nut, #4-40	2
14.	KE95230-E	Label:	1

SWITCH CONFIGURATION

INDEX		
Capacitor	Contactor Cartridges *	
 <p>C</p>	 <p>NO (normally open - green)</p>	 <p>NC (normally closed - red)</p>
PART NO.		
KE52074	KE603208-9	KE603208-8

NOTES: *For units built prior to December 2006, the complete switch assembly must be ordered (see applicable drawing).

Refer to Maintenance Section for Switch Disassembly Instructions.



HYDRAULIC COMPONENTS

Scraper Blades:



KETTLE SIZE

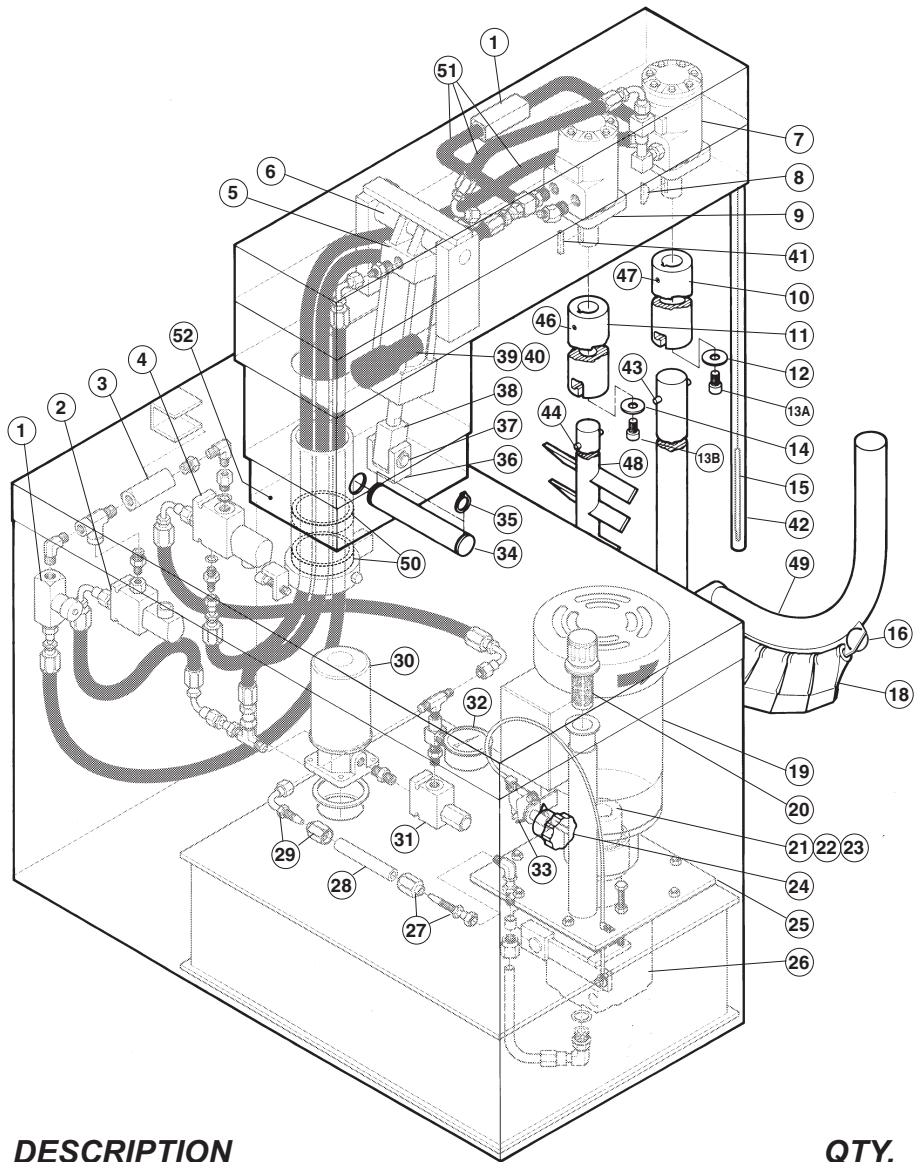
GALLONS	QUANTITY
40	22
60	26
80	30
100	34
125	38
150	38



Cooling Fan:

Fan KE54860
 Fan Cover KE601236
 Fan Guard KE54861

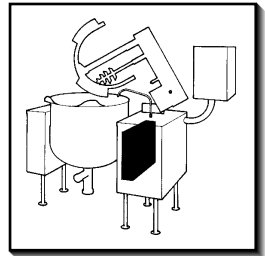
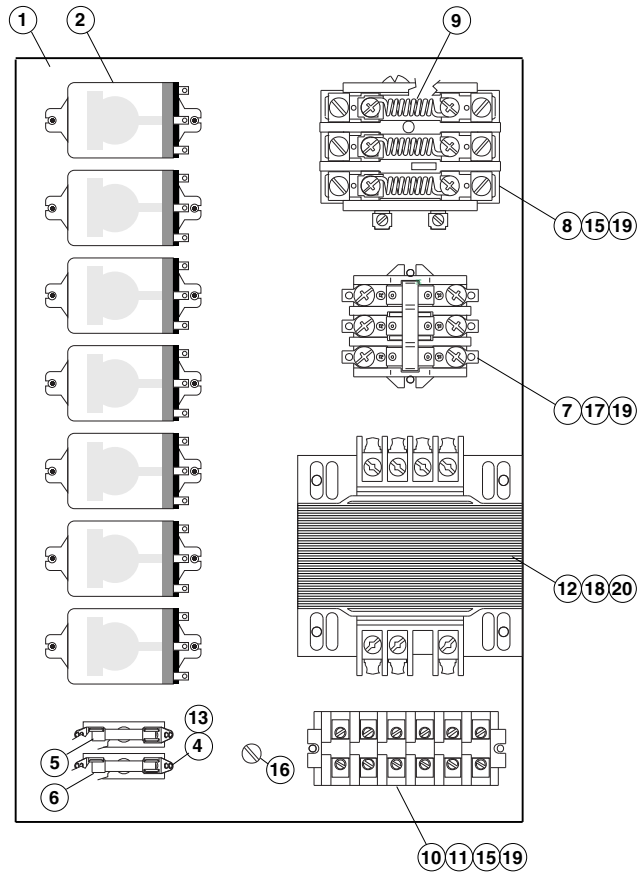
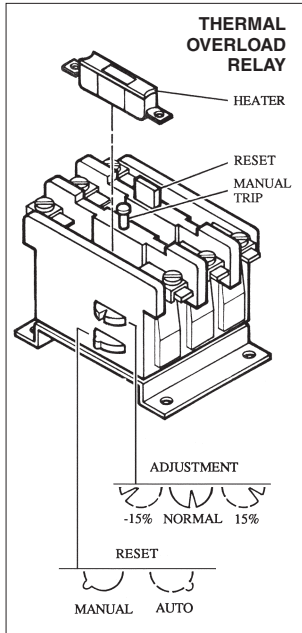
NOTE: For Hydraulic Hoses order Part No. RT00505 and specify length required



ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.	KE51607	Flow Control Valve	2
2.	KE54834-10	Solenoid Valve, 2 Way, 120 Volt	1
	SE50224	Coil Only 120 Volt	1
3.	KE51608	Check Valve	1
4.	KE54834-11	Solenoid Valve, 3 Way, 120 Volt	1
	SE50224	Coil Only 120 Volt	1
5.	KE51848	Jack	1
	SE50241	Rod Gland Seal Kit	1
	SE50242	Piston Seal Kit	1
6.	KE52124	Jack Upper Pin	1
7.	KE51846	Hydraulic Motor, Scraper Arm, 40 gal.	1
	KE51938	Hydraulic Motor, Scraper Arm, 60-150 gal.	1
	KE53004	Hydraulic Motor, Scraper Arm, 200-250 gal.	1
8.	FA95006	Woodruff Key	1
9.	KE51845	Hydraulic Motor, Secondary Agitator, 40-150 gal.	1
	KE53005	Hydraulic Motor, Secondary Agitator, 200-250 gal.	1
10.	KE51715	Main Coupling, Scraper Arm	1
11.	KE51716	Secondary Coupling, Agitator Arm	1
12.	KE52114	Coupling Washer, Primary S.S.	1
13A.	FA11286	Socket Head Screw, 1/4 X 20	2
13B.	FA11346	Socket Head Screw, 5/16 X 20	2
14.	KE52115	Coupling Washer, Secondary S. S.	1
15.	CT50097	R.T.D Probe Single	1
16.	KE53962	Blade Stop Ring	2

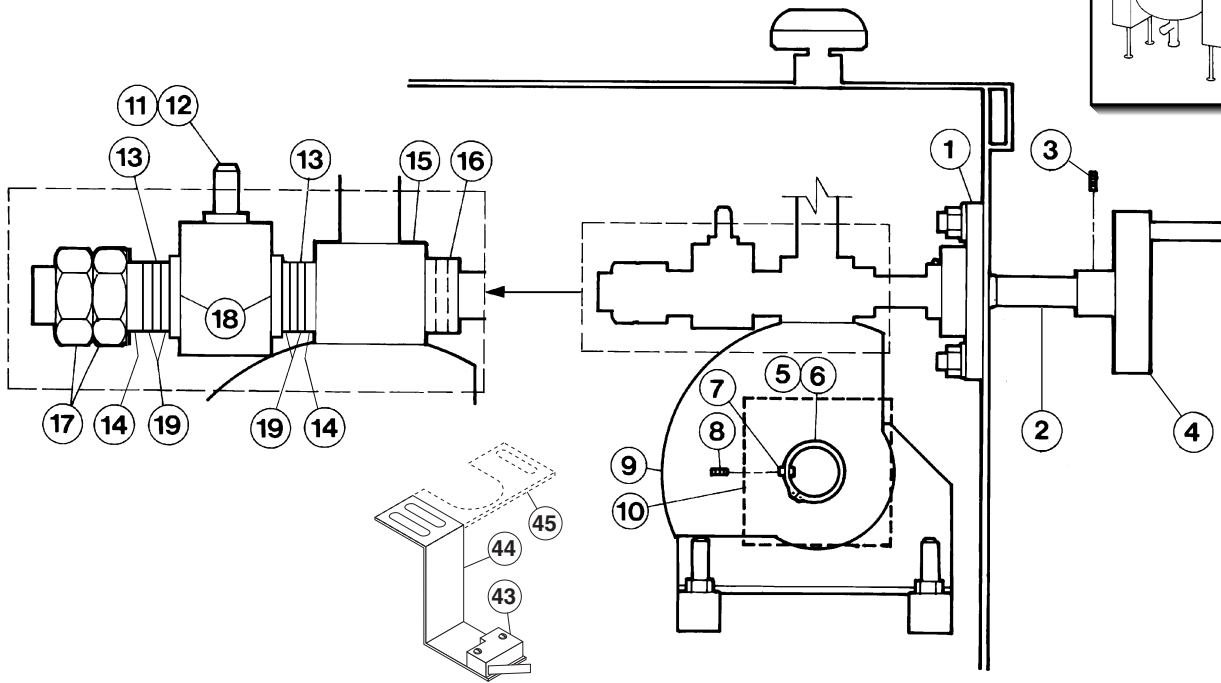
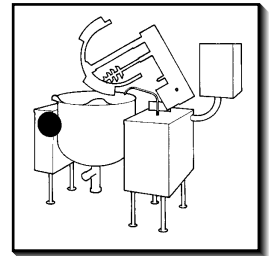
18.	KE51834	Scraper Blades	as required
19.	KE51875-3	Electric Motor, 3 hp., 208-230/460V	1
	KE51875-4	Electric Motor, 3 hp., 220/380/440V	1
	KE51875-5	Electric Motor, 3 hp., 575V	1
20.	KE51889	Filter, Tank Breather	1
21.	KE52222	Gear, 3/4" I.D. Pump, prior to 1995	1
21.	KE52222-1	Gear, 3/4" I.D. Pump, after 1995	1
22.	KE52223	Gear, 7/8" I.D. Motor	1
23.	KE52224	Nylon Coupling.	1
24.	KE52190	Speed Control Knob	1
25.	KE52171	Gasket, Oil Tank	1
26.	KE51844	Hydraulic Pump	1
27.	FI05060	Swivel adapter	5
28.	SE50280	Hydraulic Hose, Per Foot	40
29.	FI05061	Swivel Elbow. 90 Degrees	9
30.	SE50094	Oil Filler	1
31.	KE51874	Pressure Relief Valve, Hydraulic	1
32.	KE52382	Pressure Gauge	1
33.	KE00860	Speed Control Cable Assembly	1
34.	KE51622	Bridge Tilt Pin	1
35.	FA95022	Retaining Ring	1
36.	KE51623	Clevis Bracket	1
37.	SE50353	Clevis Pin c/w Clips	1
38.	KE51624	Knuckle Joint	1
39.	KE50295	Mounting Bracket, Mercury Switch	1
40.	KE50294	Mercury Switch	1-2
41.	FA95055-3	Woodruff Key	1
42.	T40527	Housing, probe, 40 gal.	1
	T40528	Housing, probe, 60 gal.	1
	T40529	Housing, probe, 80 gal.	1
	T40530	Housing, probe, 100 gal.	1
	T40531	Housing, probe, 125 gal.	1
	T40532	Housing, probe, 150 gal.	1
	T405321	Housing, probe, 200 gal.	1
	T405322	Housing, probe, 250 gal.	1
43.	KE51921	Pin, Scraper Arm	1
44.	KE51925	Pin, Secondary Agitator	1
46.	FA19506	Set Screw, Secondary Agitator	1
47.	FA19507	Set Screw, Scraper Arm	1
48.	KE00935	Secondary Agitator, 40 gal. (includes #44)	1
	KE00936	Secondary Agitator, 60 gal. (includes #44)	1
	KE00937	Secondary Agitator, 80 gal. (includes #44)	1
	KE00938	Secondary Agitator, 100 gal. (includes #44)	1
	KE00939	Secondary Agitator, 125 gal. (includes #44)	1
	KE00940	Secondary Agitator, 150 gal. (includes #44)	1
	KE009401	Secondary Agitator, 200 gal. (includes #44)	1
	KE009402	Secondary Agitator, 250 gal. (includes #44)	1
49.	KE00947	Primary Agitator, 40 gal., with Gallon Markings (includes #16, 18 & 43)	1
	KE00948	Primary Agitator, 60 gal., with Gallon Markings (includes #16, 18 & 43)	1
	KE00949	Primary Agitator, 80 gal., with Gallon Markings (includes #16, 18 & 43)	1
	KE00950	Primary Agitator, 100 gal., with Gallon Markings (includes #16, 18 & 43)	1
	KE00951	Primary Agitator, 125 gal., with Gallon Markings (includes #16, 18 & 43)	1
	KE00952	Primary Agitator, 150 gal., with Gallon Markings (includes #16, 18 & 43)	1
	KE009521	Primary Agitator, 200 gal., with Gallon Markings (includes #16, 18 & 43)	1
	KE009522	Primary Agitator, 250 gal., with Gallon Markings (includes #16, 18 & 43)	1
	KE00947-1	Primary Agitator, 40 gal., with Liter Markings (includes #16, 18 & 43)	1
	KE00948-1	Primary Agitator, 60 gal., with Liter Markings (includes #16, 18 & 43)	1
	KE00949-1	Primary Agitator, 80 gal., with Liter Markings (includes #16, 18 & 43)	1
	KE00950-1	Primary Agitator, 100 gal., with Liter Markings (includes #16, 18 & 43)	1
	KE00951-1	Primary Agitator, 125 gal., with Liter Markings (includes #16, 18 & 43)	1
	KE00952-1	Primary Agitator, 150 gal., with Liter Markings (includes #16, 18 & 43)	1
	KE009521-1	Primary Agitator, 200 gal., with Liter Markings (includes #16, 18 & 43)	1
	KE009522-1	Primary Agitator, 250 gal., with Liter Markings (includes #16, 18 & 43)	1
50.	KE52687	Roller Bearing	2
51.	RT00505	Hydraulic Hose	specify length
52.	KE00715	Bridge Swivel Housing Assembly	1

ELECTRICAL COMPONENT ASSEMBLY



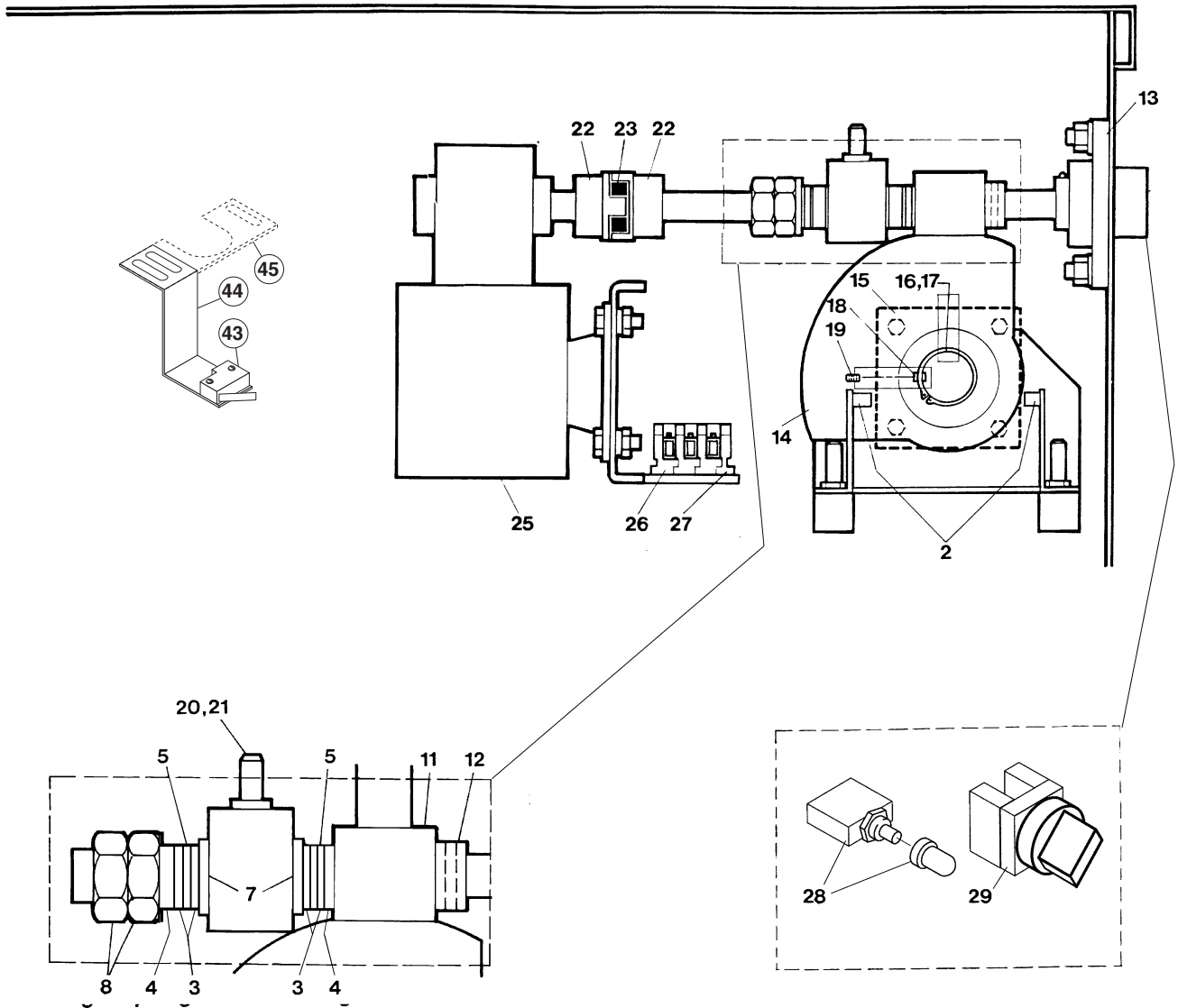
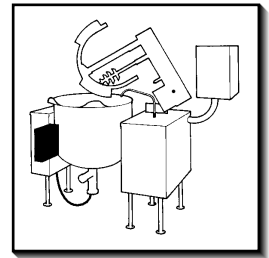
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.	KE50343-7	Component Mounting Plate	1
2.	KE50753-10	Relays	2-7
4.	KE51139	Fuse Holder	2
5.	SK50445	Fuse (3 amps)	1
6.	KE52936	Fuse (1 amps)	1
7.	KE50750-1	Contactor	1
8.	KE51982	Thermal Overload Relay	1
9.		Heater for Thermal Overload	3
	KE52055	200, 208, 220, 240, 380 & 415 volt	
	KE52051	440, 480 volt	
10.	SK50055-1	Terminal Block Sections	3-6
11.	SK50054-1	Terminal Block End Section	1
12.		Transformer	1
	KE53838-5	200, 208, 220, 240, 440 & 480 volt	
	KE53838-6	380 & 415 volt	
13.	FA10133	Screws #6-32x3/8" lg.	3
15.	FA10239	Screws #8-32x3/8" lg.	6
16.	FA12500	Screws #8-32x3/8" lg. (brass with undercut)	1
17.	FA10245	Screws #8-32x1" lg.	2
18.	FA10362	Screws #10-32x3/8" lg.	4
19.	FA32005	Lockwashers #8	8
20.	FA32006	Lockwashers #10	4

MANUAL TILT - 10" CONSOLE



ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.	KE51730	Tilt Shaft Bearing	1
2.	KE50375	Tilt Shaft, Small Gear, 40 to 80 gal.	1
	KE503751	Tilt Shaft, Small Gear, 100 gal. and up	1
3.	FA19505	Handwheel Allen Screw, Hex Socket	1
4.	KE00508	Handwheel Assembly	1
5.	FA95007-1	Retaining Ring	1
6.	FA05002-6	"O" Ring	2
7.	FA95048	Woodruff Key	1
8.	FA19201	Set Screw	1
9.	KE00151	Segment Gear, Small, up to 60 gal.	1
	KE52833	Segment Gear, Large, 80 gal. and up	1
10.	KE00699	Trunnion Housing	1
11.	FA19177	Hex-Socket Set Screw	1
12.	FA20047	Jam Nut	1
13.	KE52191	Roller Bearing	2
14.	KE52193	Thrust Bearing Spacer	2
15.	KE50315	Worm Gear	1
16.	FA95005	Tension Pin	1
17.	FA95008	Hex Nut 3/4-16	2
18.	FA30088	Washer	3
19.	KE52192	Thrust Washer	4
43.	SK24744500	Switch (CE option)	1
44.	KE602748	Bracket, 380 & 415V (60 gallon and up) (CE option)	1
45.	KE602754	Bracket, 380 & 415V (25-40 gallon and up) (CE option)	1

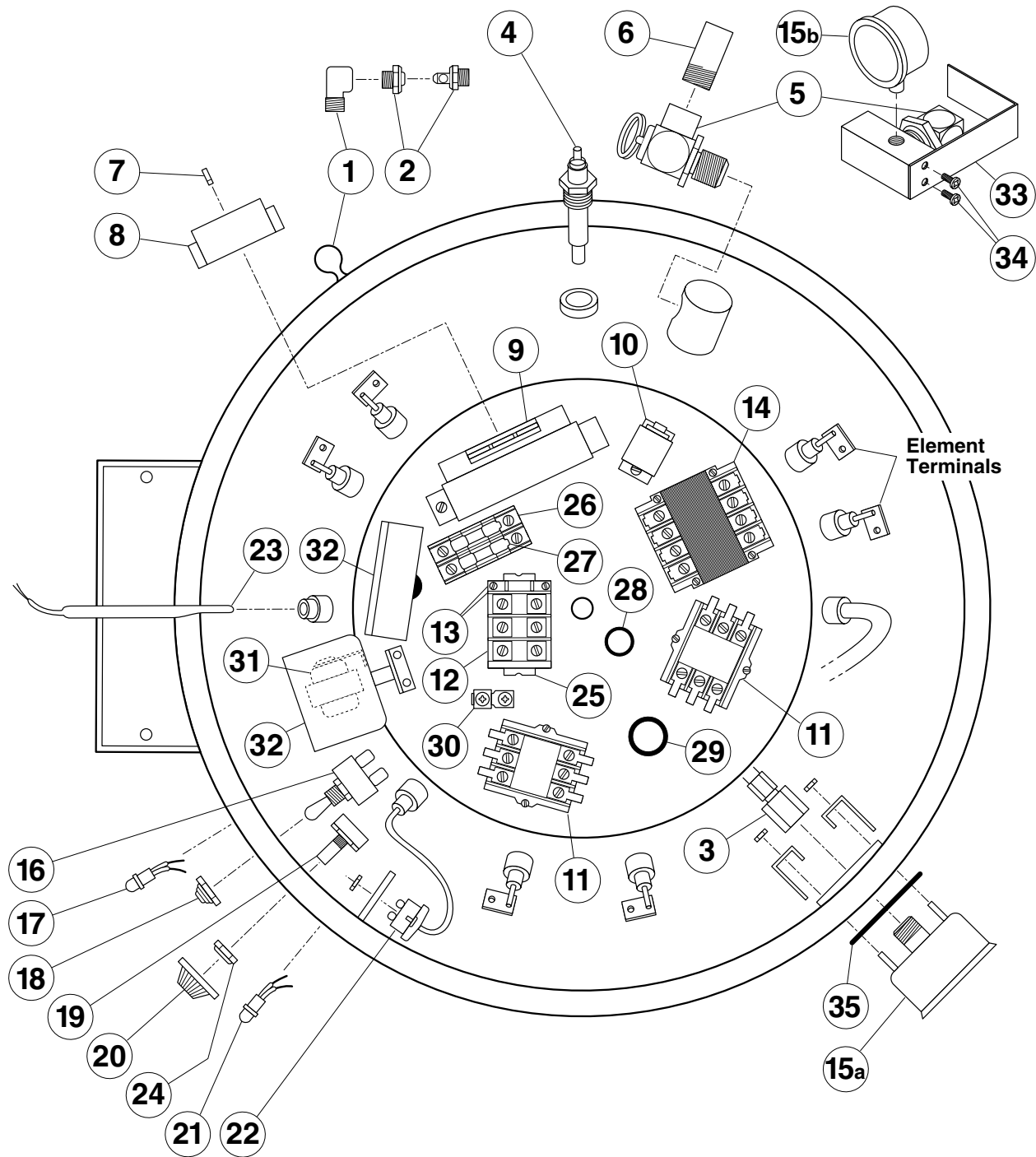
POWER TILT - 10" CONSOLE



POWER TILT - 10" CONSOLE

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.	KE51007	Micro Switch	2
2.	KE50581	Bridge Rectifier	1
3.	KE52192	Thrust Washer	4
4.	KE52193	Thrust Bearing Spacer	2
5.	KE52191	Roller Bearing	2
6.	FA30088	Washer	2
8.	FA95008	Hex Nut, 3/4-16	2
11.	KE50315	Worm Gear,	1
12.	FA95005	Tension Pin	1
13.	KE51730	Tilt Shaft Bearing	1
14.	KE00151	Segment Gear, Small, up to 60 gal.	1
	KE52833	Segment Gear, Large, 80 gal. and up	1
15.	KE00699	Trunnion Housing, 40 to 80 gal.	1
	KE001182	Trunnion Housing, 100 gal. and up	1
16.	FA95007-1	Retaining Ring	1
17.	FA05002-6	"O" Ring	2
18.	FA95048	Woodruff Key	1
19.	FA19201	Set Screw	1
20.	FA19177	Hex-Socket Set Screw	1
21.	FA20047	Jam Nut	1
22.	KE50582	Coupling	2
23.	KE50583	Coupling Insert	1
25.	KE52832-1	MOTOR	1
26.	SK50055-1	Terminal Block	1
27.	SK50054-1	Terminal Block End-Section	1
28.	KE50579-1	Circuit Breaker	1
	FA05002-34	"O" Ring, Circuit Breaker	1
	KE50580	Water Resistant Boot	1
29.	KE003209-11	Complete Switch	1
	KE603208-4	Momentary Switch Activator***	1
	KE603208-7	Contact Section Holder, Latch***	1
	KE603208-9	Contact Block***	4
***NOTE: for units built prior to Dec. 2006 order Complete Switch KE003209-11			
43.	SK24744500	Switch (CE option)	1
44.	KE602748	Bracket, 380 & 415V (60 gallon and up) (CE option)	1
45.	KE602754	Bracket, 380 & 415V (25-40 gallon and up) (CE option)	1

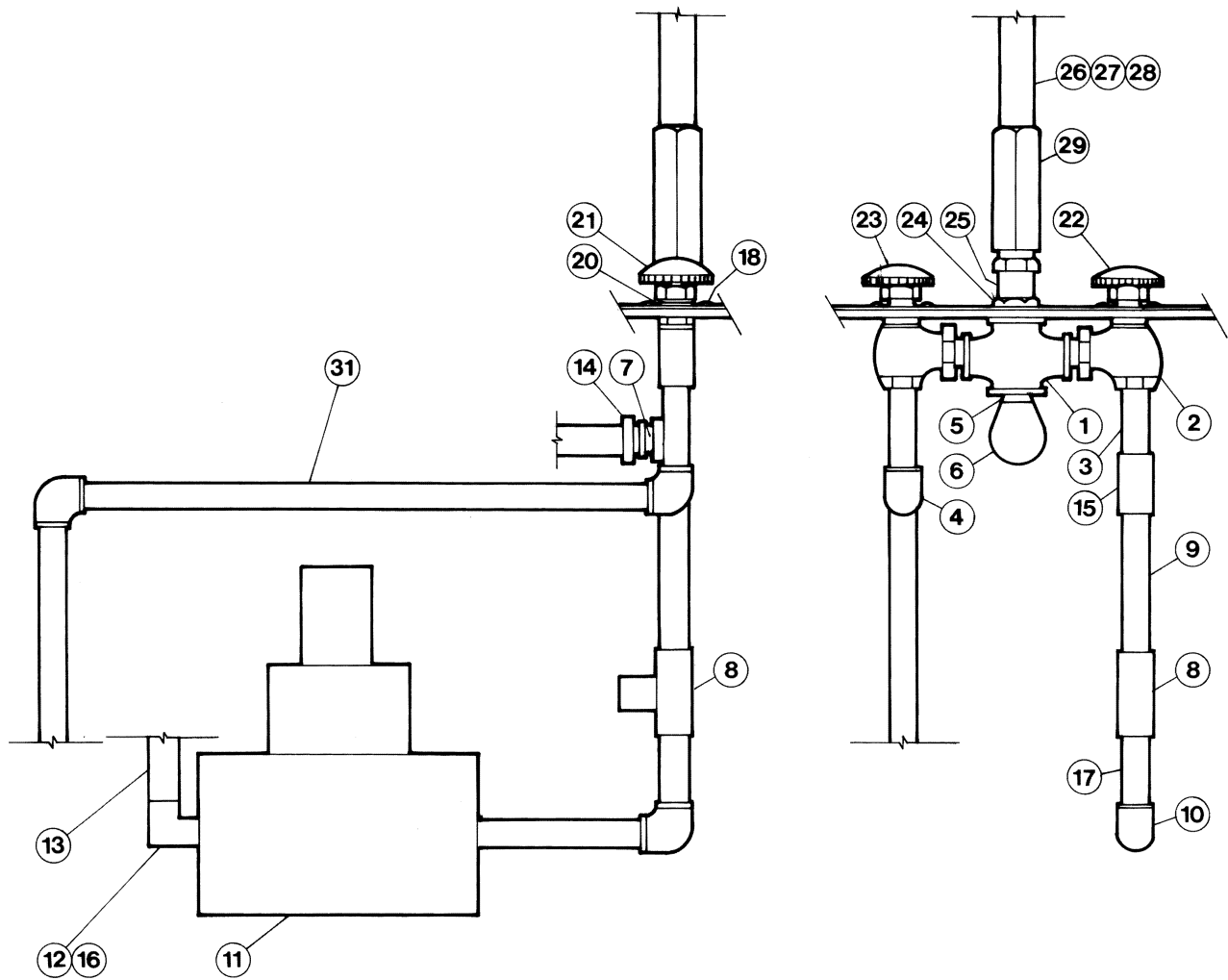
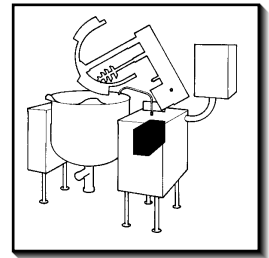
KETTLE BOTTOM



KETTLE BOTTOM

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.	FI05025	Bleed Vent Elbow	1
2.	KE50570	Bleed Vent Nut	1
3.	FI05022	Connector	1
4.	KE50556-1	Probe, Water Level	1
5.	KE54941-5	Safety Valve, 50 PSI, 1/2" (North America)	1
	KE54941-31	Safety Valve, 50 PSI, 1/2", (Europe)	1
6.	KE50997	Blow Down Tube	1
7.	KE51226	Wire Connector Terminal	10
8.	KE51225	Edge Connector	1
9.	KE00458	Solid State Control Box	1
10.	KE50753-7	Relay, 12 VDC	1
11.	KE50750-3	Contactors, 208/240V, 40 Amp. (standard kettles)	2
	KE50750-4	Contactors, 208/240V, 50 Amp. (special high wattage kettles - 6 elements)	2
	KE50750-5	Contactors, 208/240V, 60 Amp. (special high wattage kettles - 6 elements)	2
12.	KE50377	Terminal Block Section (Large, White)	3
	SK50055-1	Terminal Block Section (Small)	3
13.	KE50376	Terminal Block End Section (Large, White)	1
	SK50054-1	Terminal Block End Section (Small)	1
	SK50054-2	Terminal Block End Barrier	1
14.	KE53838-11	Transformer, 380-415 to 120-220V	1
	KE53838-12	Transformer, 440-480 to 240V	1
	KE53838-13	Transformer, 600 to 240V	1
15a.	SE00104	Pressure Gauge, Back Mount, c/w Item #35	1
15b.		Pressure Gauge	
	KE000714-4	For units built prior to February 2005	1
	KE50429-5	For units built after January 2005	1
16.	SE00105	Toggle Switch, SPST, c/w Item #18	1
17.	KE50568-1	L.E.D., Green	1
18.	SK50062	Rubber Boot	1
19.	SE00074	Potentiometer, c/w Item #24	1
	SE00103	Potentiometer with ON/OFF Switch, c/w Item #24	1
20.	KE50569-1	Knob, Potentiometer	1
21.	KE50567-1	L.E.D., Red	1
22.	KE55069-8	Safety Thermostat (140° C)	1
23.	KE50515	Thermistor	1
24.	KE51005	Rotary Seal	1
25.	KE54761	Bracket, Terminal Block	1
26.	KE51139-1	Fuse Holder	1
27.	KE52936-1	Fuse, 1/2 amp (used on 380 to 600V units)	1
28.	KE54833-3	Snap-In Bushing, .875"	1
29.	KE54833-4	Snap-In Bushing 1.093"	1
30.	KE50473	Ground	1
31.	KE53838-19	Transformer, 120 to 16V	1
	KE53838-21	Transformer, 240 to 16V	1
32.	KE50391	Bracket, Electrical Entry, 1 3/8" hole	1
	KE50392	Bracket, Electrical Entry, 1 3/4" hole	1
33.		Guard Bracket - No longer required	
34.		Guard Bracket - No longer required	
35.	FA05002-21	"O" Ring	1

WATER METER ASSEMBLY - 18" CONSOLE



WATER METER ASSEMBLY - 18" CONSOLE

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.	FI05058	3/4" Cross	1
2.	KE02055-2	Steam Valve Modification	2
3.	N0640B4.5	Nipple	2
4.	FI00063	Elbow 90 degree	4
5.	FI000356	Reducing Bushing	1
6.	KE600812-1	Street Elbow	1
7.	FI05029	Hose Barb	2
8.	KE54834-5	* Solenoid Valve, 3/4"	1
	SE50407	Rebuild Kit	
	SE50401	Replacement Coil	
9.	N0640B3	Nipple, Gallon Meter	1
	N0640B3.5	Nipple, Litre Meter	
10.	FI00363-3	Reducing Elbow 90 Degree	1
11.	KE51861	Gallon Meter	1
	KE51860	Litre Meter	
12.	FI00062	Elbow 90 Degree	1
13.	KE52173	1/2"1.D. Hot Water Wash-up Hose	1
14.	FI05220-3	Hose Clamp	2
15.	FI00179	Tee	1
16.	FI05074	Adapter, Gallon Meter	2
	KE600362	Adapter, Litre Meter	
17.	N0640B1.5	Nipple	1
18.	FA11091	Machine Screw	8
20.	KE51369	Steam Valve Flange	2
21.	SE00028	Knob Assembly	2
22.	KE95321	Label "Hot"	1
23.	KE95322	Label "Cold"	1
24.	SD50097	Flanged Nut	1
25.	KE51585	Faucet Spout Fitting	1
26.	KE50825-12	Faucet Spout	1
27.	FA05002-19	"O" Ring	1
28.	FA95022	Retaining Ring Carter	1
29.	KE51736	Long Faucet Nut	1

***NOTE:** See SOLENOID VALVE MAINTENANCE section for further information.

MAINTENANCE

INSPECTION AND MAINTENANCE CHECK LIST

Cleveland Range equipment requires little preventative maintenance. We do however provide the following chart as a guide line for inspection and maintenance to keep your unit functioning at 100%.

MONTHLY INSPECTIONS

Item	Inspection
Item Switches	Inspect switches for damage and correct operation. Replace as required.
<u>Product Drain Valves</u>	
Tangent Draw-Off Valve	Inspect parts for damage. Test valve for leakage. Replace as required.
Butterfly Valve.	Inspect parts for damage. Test valve for leakage. Replace as required.
Air Valve	Inspect parts for damage. Test valve for leakage. Check valve seals for air leakage. Inspect supply hose and fittings. Replace as required. Inspect air filter and replace if required.

SIX MONTH MAINTENANCE

Lubrication	Grease trunnion housings. Grease bridge swivel assembly. Use "Never Seize" on tilt worm and gear.
Strainers	Clean strainers in steam in and cooling water supply lines.

YEARLY MAINTENANCE

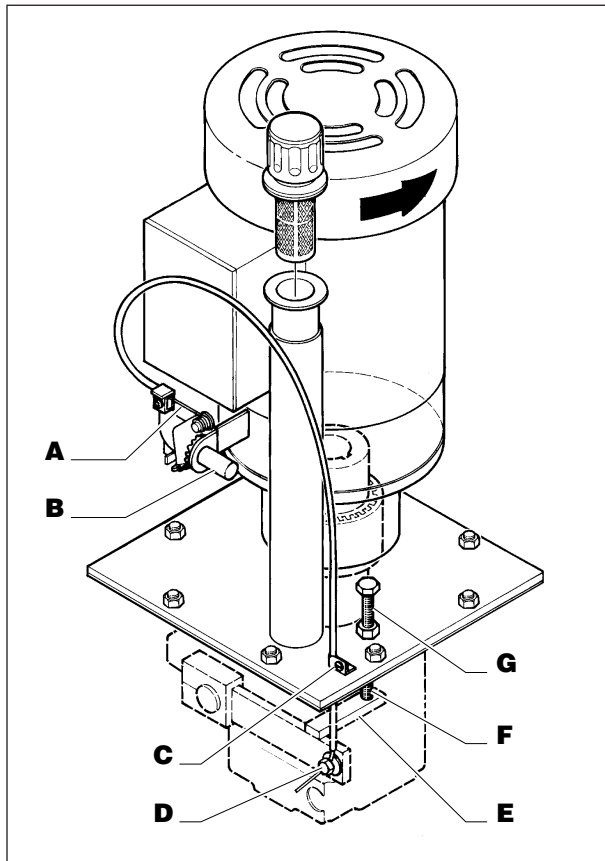
Lubrication	Drain hydraulic oil and remove filter. Replace oil and filter (see Hydraulic Oil Replacement Procedure.
Solenoid Valves	Inspect solenoid valves for proper operation. Clean or replace as required.

WARRANTY

Our Company supports a worldwide network of Maintenance and Repair Centers. Contact your nearest Maintenance and Repair Centre for replacement parts, service, or information regarding the proper maintenance and repair of your cooking equipment

In order to preserve the various agency safety certification (UL, NSF, ASME/Ntl. Bd., etc.), only factory-supplied replacement parts should be used. The use of other than factory supplied replacement parts will void warranty.

RE-INSTALLING SPEED CONTROL CABLE



Speed Control Assembly

1. Turn sprocket of speed control so that wire "A" is fully extended towards shaft "B".
2. Insert end of cable through bracket "C".
3. Insert wire so it protrudes approximately 1/2" to 5/8" through hole in bolt "D". Tighten bolt and bend end of wire.
4. Bring pump arm "E" up until it hits stop bolt "F" and tighten screw "C".
5. Reassemble unit. Speed control knob will go on pointing toward minimum setting.
6. Turn mixer on with speed control set at minimum setting.
7. If scraper arm is turning, loosen nut "G" and back stop bolt "F" off a few turns. Next loosen screw "C" and slowly pull up cable until scraper arm stops turning. Retighten screw "C". Gently turn stop bolt "F" down until it hits arm. Lock in place by tightening nut "G".
8. Scraper arm should now go from no rotation to fast rotation by turning speed control knob.

NOTE: Mixer may run rough and noisy for one or two hours if air has become trapped in the line.

HYDRAULIC OIL REPLACEMENT PROCEDURE

One of the most important maintenance tasks is to change the hydraulic oil yearly. Under heavy usage the oil should be changed every nine months. It is important to change the oil regularly to prevent its breakdown which leads to the damaging of components.

The oil filter should be changed at the same time as the hydraulic oil. A clean filter prevents particles from damaging the other components in the system.

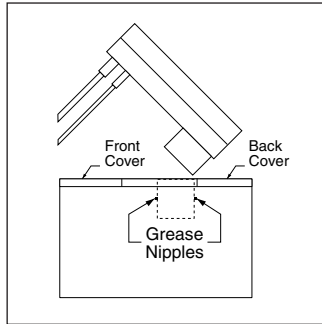
Replace the hydraulic fluid as follows:

- ⇒ Disconnect power to unit.
- ⇒ Remove the front top panel on the main console.
- ⇒ Remove chrome vent cap from breather pipe located beside electric motor.
- ⇒ Remove plug bolt from bottom left front corner of main console to drain oil into your catch pail.
- ⇒ Remove oil filter.
- ⇒ Replace plug bolt.
- ⇒ Refill unit through breather pipe using approximately 12 U.S. gallons of Tellus 32 hydraulic oil (oil should be 6 1/2" deep in tank).
- ⇒ Install new oil filter (Part# SE50094).
- ⇒ Replace chrome vent cap and front top panel.
- ⇒ Reconnect power to unit.
- ⇒ Run unit to remove any air in the lines.

NOTE: Mixer may run rough and noisy for one or two hours if air has become trapped in the line.

LUBRICATION

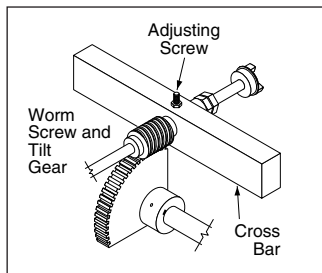
Lubricate the following parts every three months to insure smooth operation and reduce wear.



Side View of 18" Console

MIXER BRIDGE HOUSING

There are two grease nipples on the mixer bridge swivel housing which are accessed by removing the front and back covers on the 18" console.

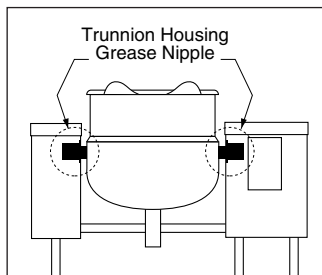


Trunnion and Tilt Mechanism Drawing

TRUNNION HOUSING, WORM SCREW AND TILT GEAR

These parts are accessed through the front cover on the 18" console.

Apply grease to gear teeth. Check for excessive play and adjust with adjusting screw located on top of cross bar.

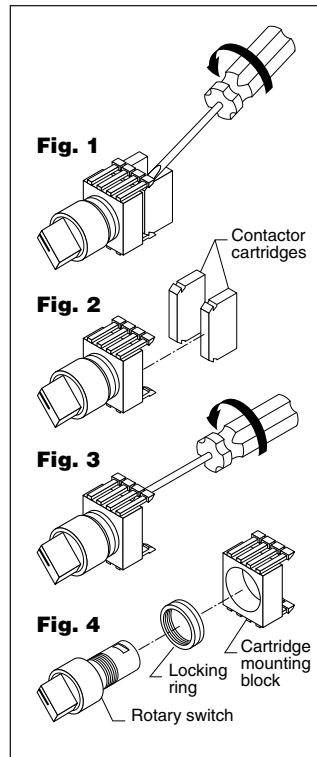


Kettle Trunnion Drawing

KETTLE TRUNNIONS

Accessed via the top covers on the 10" and 18" consoles. Each has two grease nipples.

DISASSEMBLY OF SWITCH ASSEMBLY



Switch Assembly

1. Place slotted screwdriver between contactor cartridge and cartridge mounting block as shown in **Fig.1**.

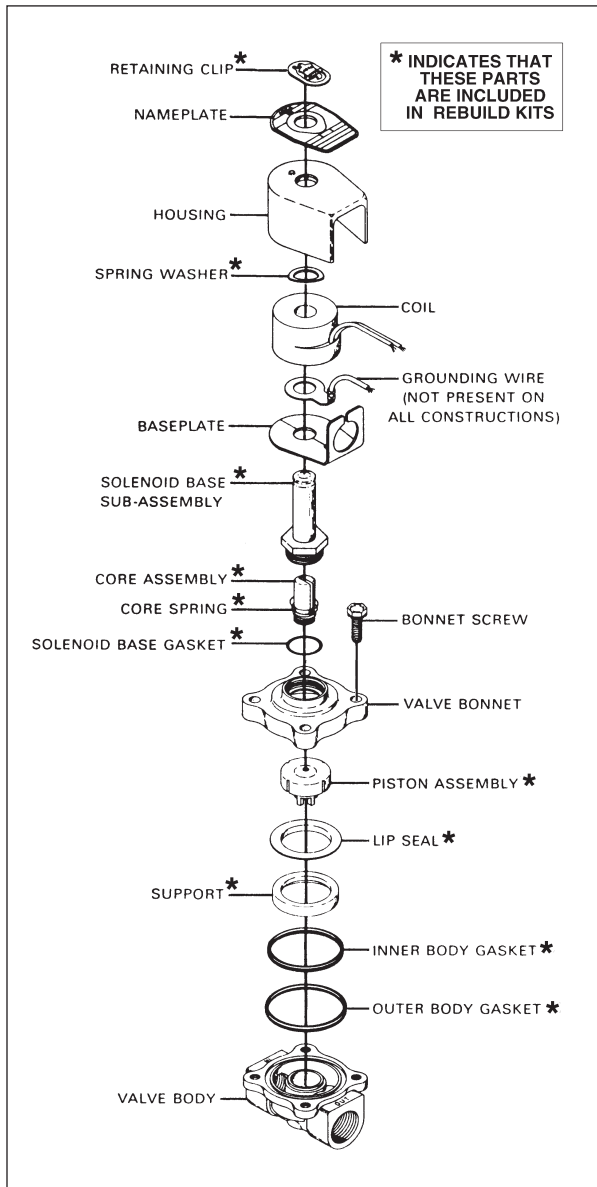
2. Twist screwdriver to free cartridge.

3. Place screwdriver under tab in the back of the cartridge mounting block as shown in **Fig. 3**.

4. Twist screwdriver to remove block from the rotary switch.

3. Unscrew locking ring to remove rotary switch.

SOLENOID VALVE MAINTENANCE



Solenoid Valve Exploded View Drawing

Ordering Information

Parts marked with an asterisk (*) in the Solenoid Valve Exploded View Drawing are supplied in the Rebuild Kits.

Valve# (Description)	Rebuild Kit#	Replacement Coil#
CT50182 (2", 120V/60 Hz.)	SE50400	SE50401
CT50244 (1", 120V/60 Hz.)	SE50402	SE50401
CT50245 (1", 120V/60 Hz.)	SE50403	SE50404
KE51652 (3/4", 120V/60 Hz.)	SE50405	SE50406
KE51656 (3/4", 120V/60 Hz., HW)	SE50407	SE50401
KE52668 (3/8", 120V/60 Hz.)	SE50408	SE50404
KE53007 (1 1/4", 120V/60 Hz.)	SE50409	SE50404
KE53159 (3/4", 120V/60 Hz.)	SE50410	SE50404

NOTE: It is not necessary to remove the valve from the pipeline for repairs.

WARNING: Turn off electrical power supply and depressurize valve before making repairs.

Cleaning

All solenoid valves should be cleaned periodically. The time between cleanings will vary depending on the medium and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required. Clean valve strainer or filter when cleaning the valve.

Preventive Maintenance

1. Keep the medium flowing through the valve as free from dirt and foreign material as possible.
2. While in service, the valve should be operated at least once a month to insure proper opening and closing.
3. Depending on the medium and service conditions, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace worn or damaged parts. However, for best results, replace all parts as supplied with a Rebuild Kit.

Causes of Improper Operation

1. *Faulty Control Circuits:* Check the electrical system by energizing the solenoid. A metallic "click" signifies that the solenoid is operating. Absence of the "click" indicates loss of power supply. Check for loose or blown fuses, open circuited or grounded coil, broken lead wires or splice connections.
2. *Burned-Out Coil:* Check for open-circuited coil. Replace coil as necessary. Check supply voltage; it must be the same as specified on nameplate.
3. *Low Voltage:* Check voltage across the coil lead. Voltage must be at least 85% of nameplate rating.
4. *Incorrect Pressure:* Check valve pressure. Pressure to valve must be within range specified on nameplate.
5. *Excessive Leakage:* Disassemble valve and clean all parts. If leakage continues, replace all parts as supplied with a Rebuild Kit.

Coil Replacement

WARNING: Turn off electrical power supply.

- 1.** Disconnect coil lead wires and green grounding wire if present.
- 2.** Remove retaining clip, nameplate and housing.

WARNING: When metal retaining clip disengages, it will spring upward.

- 3.** Slip spring washer and coil off the solenoid base subassembly.
- 4.** Coil is now accessible for replacement. Reassemble in reverse order of disassembly. Use Solenoid Valve Exploded View Drawing for identification and placement of parts.

CAUTION: Solenoid must be fully reassembled because the housing and internal parts complete the magnetic circuit.

Valve Disassembly

WARNING: Depressurize valve and turn off electrical power supply.

- 1.** Disassemble valve in an orderly fashion. Use exploded view for identification and placement of parts.
- 2.** If necessary, disconnect coil lead wires, grounding wire (if present), and rigid conduit from solenoid housing,
- 3.** Remove retaining clip and slip the entire solenoid enclosure off the solenoid base sub-assembly.

WARNING: When metal retaining clip disengages, it will spring upward,

- 4.** Unscrew solenoid base sub-assembly and remove core assembly, core spring, and solenoid base gasket.
- 5.** Remove bonnet screws, valve bonnet, piston assembly, lip seal, support, inner and outer body gaskets.
- 6.** All parts are now accessible to clean or replace; Replace worn or damaged parts. However, for best results, replace all parts as supplied with an Rebuild Kit.

Valve Reassembly

- 1.** Reassemble in reverse order of disassembly. Use exploded view for identification and placement of parts.
- 2.** Lubricate all gaskets with DOW CORNING 111® Compound lubricant or an equivalent high-grade silicone grease.
- 3.** Position support and inner and outer body gaskets in valve body.
- 4.** Position lip seal, flanged end up, onto piston assembly. Install piston assembly with lip seal into support in valve body cavity.
- 5.** Replace valve bonnet and bonnet screws. Torque bonnet screws in a crisscross manner to 95 ±10 inch-pounds (10,7 ±1,1 newton-meters).
- 6.** Replace solenoid base gasket, core assembly, and solenoid base sub-assembly. Torque solenoid base sub-assembly to 175 ±25 inch-pounds (19,8 ±2,8 newton-meters).
- 7.** Replace solenoid enclosure and retaining clip.
- 8.** Restore line pressure and electrical power supply to valve.
- 9.** After maintenance is completed, operate the valve a few times to be sure of proper opening and closing.

RESERVOIR FILL PROCEDURES

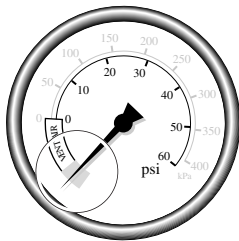
The kettle's water level must be maintained at the proper level to submerge the heater elements. Under normal operating conditions, the sealed water reservoir should never require the addition of water.

If the red "low water" light comes on during use (while the kettle is in an upright position), the water level has reached a critically low level. The low water protection control has automatically shut off the heater elements. The following procedure must be completed before further use:

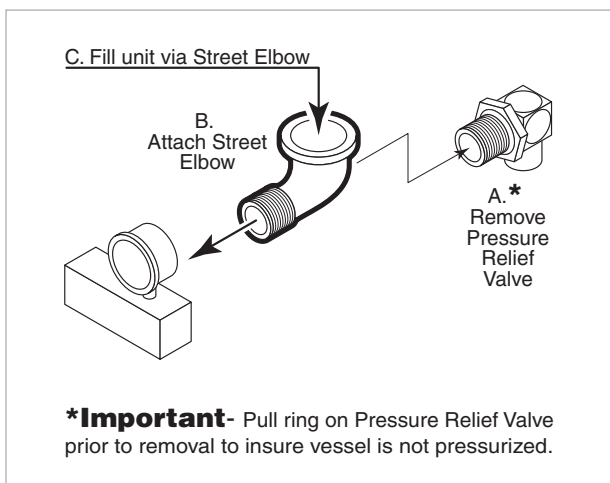
NOTE: Have a qualified service technician repair the leakage problem and add water to the unit. Ensure that the red "low water" light is on when the kettle is upright. On tilting kettles, it is normal for the red light to come on when the kettle is in a tilted position, as the elements are not submerged in water at this point.

DISTILLED WATER REQUIREMENTS

Kettle Capacity	When Red "Low Water Light" comes on, add Distilled Water
25 gallon	1.0 U.S Gallons
30 gallon	1.5 U.S Gallons
40 gallon	2.0 U.S Gallons
60 gallon	2.1 U.S Gallons
80 gallon	2.6 U.S Gallons
100 gallon	2.8 U.S Gallons



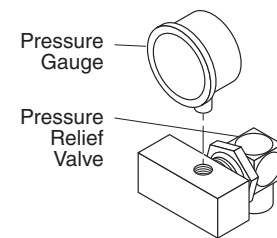
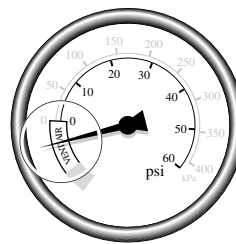
1. Ensure kettle is at room temperature and pressure gauge showing zero or less pressure.
2. Shut off power to the kettle at the fused disconnect switch.



Pressure Relief Valve/Gauge Assembly Drawing

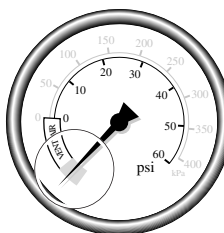
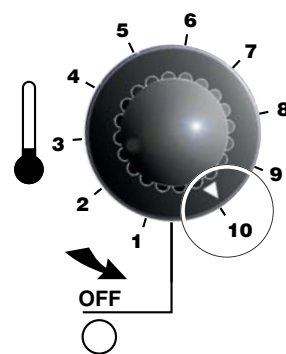
3. Pull Pressure Relief Valve (A) open to insure vessel is not pressurized.
4. Remove Pressure Relief Valve (A).
5. Replace Pressure Relief Valve (A) with Street Elbow (B).
6. Add distilled water (C) through the Street Elbow (B), using a funnel if necessary. Refer to **Distilled Water Requirements** chart for the proper amount required.
7. Apply a thread sealant (i.e. Teflon tape) to the Pressure Relief Valve's (A) thread and replace.
8. Restore power to unit at the fused disconnect switch.
9. The kettle must now be vented. (Refer to the KETTLE VENTING INSTRUCTIONS).

KETTLE VENTING INSTRUCTIONS



The following venting procedure should be followed when the Vacuum/Pressure Gauge needle is in the "VENT AIR" zone:

NOTE: Check for and eliminate leaks prior to venting (See Repairing Leaks in Steam Jacketed Kettle Fittings).



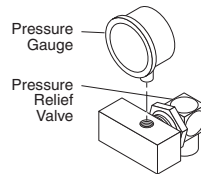
1. Turn kettle ON and set Temperature Control to 10 (Max.), heat the empty kettle until unit cycles off.
2. Vent kettle by pulling safety valve ring 8-10 times in short 2-3 second blasts with a 5 second interval between pulls.
3. Turn kettle OFF. Add cold water to kettle until its surface temperature is below 100°F. The pressure gauge needle should be in the green zone, indicating a vacuum in the kettle's jacket.

CALIBRATING PROCEDURE

1. Insure the unit has a vacuum before you begin calibrating procedures. If unit requires venting refer to Kettle Venting Instructions.
2. Set On-Off Switch/Temperature Control to "10" (Max.).
3. Allow the unit to cycle twice.
4. Check temperature of the inner kettle surface with a digital surface thermometer.
5. Temperature should be between 260° F and 265° F.
6. Using a screw driver adjust temperature by turning the potentiometer on the black box. Turn very little. Turn clockwise to INCREASES and counter-clockwise to DECREASE temperature.
7. Allow the unit to cycle twice.
8. Check temperature of the inner kettle surface with a digital surface thermometer.
9. Repeat steps 4. through 8. until unit is calibrated.

PRESSURE RELIEF VALVE PERIODIC TESTING PROCEDURE

Most insurance agencies require periodic testing of pressure relief valves used on pressure vessels. This procedure will allow you to safely and quickly test your kettle's pressure relief valve. We recommend this test be performed twice a year.



WARNING: IMPROPER REFILLING OF KETTLE JACKET WILL RESULT IN IRREVERSIBLE DAMAGE TO UNIT.

NOTE: The following instruction is intended for use by qualified service personnel.

WARNING: Kettle surface will be hot and steam will be released during testing. Take necessary precautions including the use of gloves and eye protection to prevent personal injury.

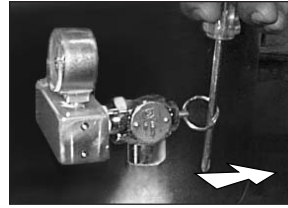


DANGER: PRESSURE RELIEF VALVE WILL EXHAUST HIGH TEMPERATURE STEAM. CONTACT WITH SKIN COULD RESULT IN SERIOUS BURNS. KEEP FACE, HANDS AND BODY CLEAR OF DISCHARGE.



DANGER: WORKING ON MACHINES WITH POWER COULD RESULT IN SEVERE ELECTRICAL SHOCK.

1. With the kettle empty, set On-Off Switch/Temperature Control to "10" (Max.). Allow the kettle to heat until the unit cycles off.
2. Switch On-Off Switch/Temperature Control to "0" (Off) and disconnect main power at fused disconnect switch.
3. Stand to the side of the pressure relief valve discharge tube and pull valve open for a maximum of one second. Repeat test three to four times.



Each time the mechanism should move freely and be accompanied by a rapid escape of steam.

If valve appears to be sticking replace pressure relief valve.

If foreign material is discharged then drain kettle and replace pressure relief valve.

See KETTLE JACKET CLEANOUT AND PASSIVATION PROCEDURES for full instructions on the correct method for refilling kettle jacket.

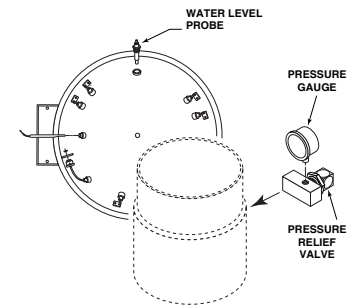
WARNING: Improper refilling of kettle jacket will result in irreversible damage to unit.

NOTE: Rust inhibitor is purchased locally. Read directions and do not exceed manufacturer's recommendation (excessive rust inhibitor can also cause solidification).

VACUUM LEAK TEST PROCEDURE

If the kettle will not hold vacuum, test for leaks at:

- A. Water Level Probe (Remove bottom cover).
- B. Pressure Relief Valve.
- C. Pressure Gauge.



LEAK TEST PROCEDURE:

1. Heat kettle until unit cycles off.
2. Shut off power to the kettle at the fused disconnect switch.
3. Spread Bubble Type Leak Detector over suspected area and watch closely for bubbles.
4. Repair areas as required.

REPAIRING LEAKS IN STEAM JACKETED KETTLE FITTINGS

If unit will not hold a vacuum the most likely cause is a leak at one of the fittings.

Often, the easiest way to eliminate a leak is reseal the suspect areas.

1. Water Level Probe Remove, clean threads, apply teflon thread sealant and reinstall.
2. Pressure Relief Valve **A/** Inspect for signs of leaks. Replace if required.
B/ Remove, clean threads, apply teflon thread sealant and reinstall.
3. Pressure Gauge **A/** Inspect face of gauge. If it contains moisture on the inside of face replace.
B/ Remove, clean threads, apply teflon thread sealant and reinstall.

KETTLE JACKET CLEANOUT AND PASSIVATION PROCEDURES

The following procedure should be performed at least once every three years to prevent possible corrosion and ensure the optimum life of the kettle.

WARNING:
IMPROPER REFILLING OF KETTLE JACKET WILL RESULT IN IRREVERSIBLE DAMAGE TO UNIT.

DANGER:
MOLYFILM 315 IS CORROSIVE, AVOID CONTACT WITH SKIN AND EYES.

DANGER:
AVOID INHALATION - VAPORS FROM MOLYFILM 315 MAY BE HARMFUL OR FATAL.

DESCRIPTION - Molyfilm 315 inhibits corrosion in stainless steel and copper. A pH buffer is present to assist in maintaining the appropriate pH to assist in corrosion inhibition.

DISPOSAL - Follow all Federal, State and local codes when disposing of product.

SHELF LIFE - Molyfilm 315's effectiveness will diminish after three years.

REFILL QUANTITIES (ORDERING INFO: 1 Liter Molyfilm 315 Rust Inhibitor - Part# KE600340-1)

IMPORTANT: To ensure satisfactory mixing follow the MIXING / FILLING PROCEDURE described below.

Kettle Size	Volume of Water		Volume of Molyfilm 315	
	U.S. Gal.	Liters	oz.	cc (ml.)
40 U.S. Gal.	4.8	18	6.5	190
60 U.S. Gal.	5.8	21.8	7.8	230
80 U.S. Gal.	6.5	24.6	8.9	260
100 U.S. Gal.	7.3	27.5	9.9	290

MIXING / FILLING PROCEDURE

1. Refer to chart to determine the required volumes of water and Molyfilm 315.
2. In a separate container mix 1/2 gallon of the required volume of water with the total required volume of Molyfilm 315.
3. Pour mixture into kettle.
4. Pour the remaining required volume of water into kettle.

DANGER:
PRESSURE RELIEF VALVE WILL EXHAUST HIGH TEMPERATURE STEAM. CONTACT WITH SKIN COULD RESULT IN SERIOUS BURNS. KEEP FACE, HANDS AND BODY CLEAR OF DISCHARGE.

DANGER:
WORKING ON MACHINES WITH POWER COULD RESULT IN SEVERE ELECTRICAL SHOCK.

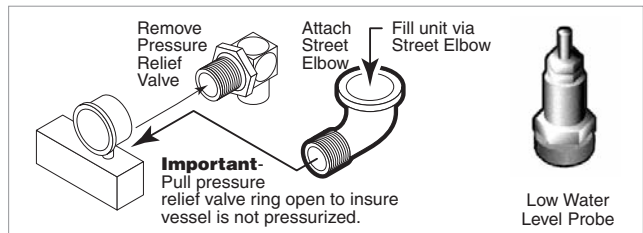
DANGER:
EXTREMELY HOT SURFACES. WORK ONLY ON COLD KETTLE.

FLUSHING PROCEDURE

WARNING: The fused disconnect switch must be off before removing the kettles bottom cover.



1. Ensure kettle is at room temperature and pressure gauge showing zero or less pressure.
2. Shut off power to the kettle at the fused disconnect switch.
3. Pull pressure relief valve ring open to insure vessel is not pressurized.
4. Pull pressure relief valve ring open to insure vessel is not pressurized.
5. Remove pressure relief valve.
6. Replace pressure relief valve with street elbow.
7. Remove bottom cover from kettle.
8. Remove low water level probe and allow water to drain.
9. Add water through the street elbow and flush out as much debris as possible with water.
10. Apply a thread sealant (i.e. Teflon tape) to the low water level probe threads and replace.
11. Fill kettle jacket with a mixture of water and Molyfilm 315 (see REFILL QUANTITIES chart).
12. Remove street elbow.
13. Apply a thread sealant (i.e. Teflon tape) to the pressure relief valve's thread and replace.
14. Turn kettle on, vent and heat on high for 1/2 hour.
15. Cool and drain kettle as per above procedure.



REFILLING UNIT

1. Apply a thread sealant (i.e. Teflon tape) to the low water level probe threads and replace.
2. Fill kettle jacket with a mixture of water and Molyfilm 315 (see REFILL QUANTITIES chart).
3. Remove street elbow.
4. Apply a thread sealant (i.e. Teflon tape) to the pressure relief valve's thread and replace.
5. Restore power to unit at the fused disconnect switch.
6. Vent kettle. See Kettle Venting Instructions for proper procedure.

PRESSURE GAUGE "O" RING REPLACEMENT

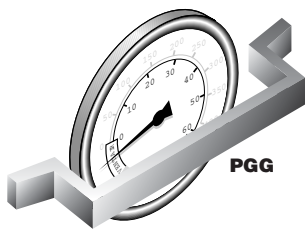
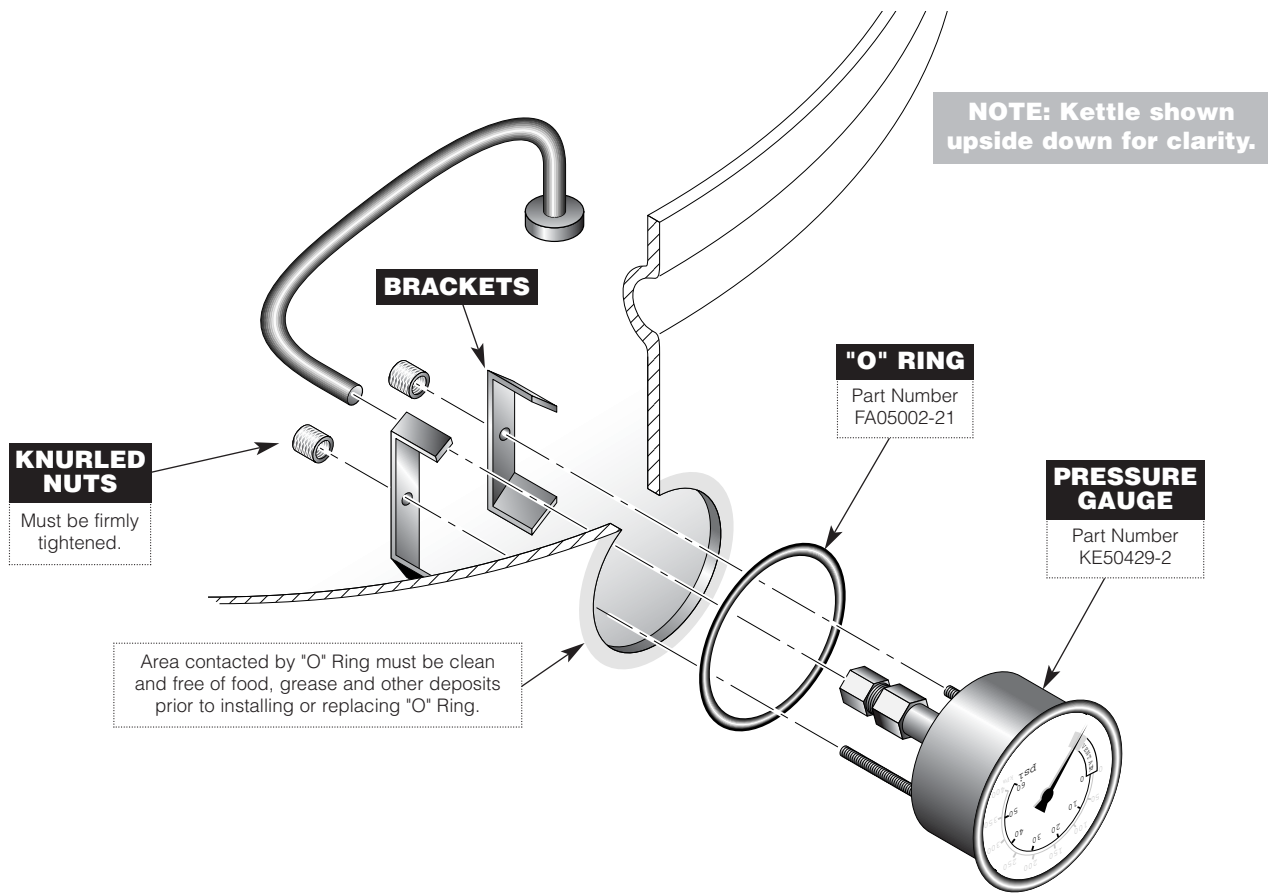


Cleveland Kettles are designed to withstand adverse operating conditions associated with high volume cooking facilities. To achieve this, internal components are completely sealed from the outside environment.

However, if the Pressure Gauge "O" Ring fails or is not replaced with the gauge, damage can result when water penetrates through this area. This occurs because the bottom cover seal that normally keeps water out now traps the water in.

Two major reasons for water penetration at the Pressure Gauge are:

- A/** Gauge is loose so the "O" Ring is not providing a proper seal.
- B/** Gauge is replaced without the "O" Ring being replaced.



If Pressure Gauge is prone to damage due to operating conditions, the following option is available:

Pressure Gauge Guard (Part Number PGG)

1/4" x 1/2" stainless steel bar bolted over gauge to prevent damage from impacts. (Can be field installed.)

DIAGNOSTIC GUIDE

This section contains servicing information intended for use by Authorized Service Personnel.

NOTE 1: If Fault Isolation Procedure is required, be sure to start at step #1.

NOTE 2: On table type kettles the entire control mounting panel may be removed from kettle control housing for easier troubleshooting and parts replacement.

A/ Problem: Kettle is not heating at all. (Kettle must be on and temperature control set.)

Possible Causes

- | | | |
|------------------------------------|--|--|
| 1. No incoming power. | 6. Defective safety thermostat. | 10. Defective thermistor. |
| 2. Kettle is tilted. | 7. Defective contactor/s. | 11. Defective 240/16 VAC transformer. |
| 3. Low water condition. | 8. Defective potentiometer. | 12. Defective control box. |
| 4. Defective ON/OFF switch. | 9. Defective low water level probe. | 13. Defective elements. |
| 5. Defective 12 VDC relay. | | |

Fault Isolation Procedure

Step	Test	Result	Remedy
1.	Is there proper incoming voltage at terminal block?	Yes	Go to step #2.
		No	Correct external power supply problem.
2.	Is the red LED illuminated?	Yes	Follow Reservoir Fill Procedure. If this does not correct the problem, go to Problem D .
		No	Go to step #3.
3.	Is the green LED illuminated?	Yes	Go to step #4.
		No	Go to step #7.
4.	Do both contactors energize?	Yes	Check contactor contacts for pitting. Voltage across contactor terminals while in a closed position indicates a poor contact. Replace contactor/s as necessary. Check elements for short at ground or an open circuit. If element/s are defective contact the factory. Elements are not field replaceable.
		No	Go to step #5.
5.	Measure continuity across safety thermostat. Is it an open circuit?	Yes	Replace defective safety thermostat.
		No	Go to step #6.
6.	Is there 120 VAC present across the coils of the contactors?	Yes	Replace defective contactor/s.
		No	Go to step #6.
7.	Remove wire from low water level probe and ground it to the body of the kettle. Do the contactors now energize?	Yes	Clean or replace defective low water level probe. Replace defective red LED.
		No	Go to step #8.
8.	Is there 16VAC present at output of 16 VAC transformer?	Yes	Go to step #9.
		No	Replace defective 240/16 VAC transformer.

9.	Measure continuity of ON/OFF switch. Is it operating properly?	Yes No	Go to step #10 . Replace defective ON/OFF switch.
10.	Unplug control box and measure the resistance across potentiometer. Is it approximately 0 ohms at maximum setting and 50,000 ohms at minimum?	Yes No	Go to step #11 . Replace defective potentiometer.
11.	Remove edge connector from control box. While kettle is cold or thermistor is removed and allowed to cool, measure the resistance between edge connector's pins #2 and #7. Is it approximately 100,00 ohms?	Yes No	Spray contact cleaner on control box terminals and edge connector. Try box again, if the problem still exists, replace defective control box. Replace defective thermistor.

B/ Problem: Kettle heats too slowly or not hot enough. (**Note:** normal max. operating pressure with an empty kettle is 30-35 psi.)

Possible Causes

- | | | |
|---|------------------------------------|----------------------------------|
| 1. Air in jacket requires venting. | 3. Defective potentiometer. | 6. Defective control box. |
| 2. Defective safety thermostat. | 4. Defective thermistor. | 7. Defective elements/s. |
| | 5. Defective contactor/s. | |

Fault Isolation Procedure

Step	Test	Result	Remedy
1.	In a cold state, does the pressure gauge read in the green zone?	Yes No	Go to step #2 . There is air present in the jacket of the kettle. Follow Kettle Venting Procedure. If constant venting is required, there is a leak that should be corrected.
2.	Do the contactors shut off too early? (before reaching normal maximum operating pressure.)	Yes No	Go to step #3 . Check contactor contacts for pitting. Voltage across terminal of contactor while energized signifies a poor contact. Replace contactor/s as necessary. Check elements for short to ground or open circuit. If elements are defective, contact the factory. Elements are not field replaceable.
3.	Does the green LED remain illuminated after the contactors shut off?	Yes No	Replace defective safety thermostat. Go to step #4 .
4.	Unplug control box and measure the resistance across potentiometer. Is it approximately 0 ohms at maximum and 50,000 ohms at minimum setting?	Yes No Yes	Go to step #5 . Replace defective thermistor.. Go to step #6 .

5.	Remove kettle thermistor and allow to cool. Remove edge connector from control box. Test resistance across edge connector's pins #2 and #7. Is it approximately 100,000 ohms?	No	Replace defective thermistor
6.	Turn the potentiometer on the control box clockwise to increase the maximum operating temperature. Does the kettle now achieve maximum operating pressure of 30-35 psi in an empty kettle?	Yes No	Kettle is operating correctly. Spray contact cleaner on control terminals and edge connector. Try box again. If problem still exists, replace defective control box.

C/ Problem: Kettle is overheating.

Possible Causes

- | | |
|------------------------------------|-----------------------------------|
| 1. Defective thermistor | 3. Defective 12 VDC relay. |
| 2. Defective potentiometer. | 4. Defective control box. |

Fault Isolation Procedure

Step	Test	Result	Remedy
1.	Does the green LED turn off even though the contactors remain energized?	Yes No	Replace defective 12 VDC relay. Go to step #2 .
2.	Unplug the control box and measure the resistance across the potentiometer, Is the resistance approximately 0 ohms at maximum and 50,000 ohms at minimum setting?	Yes No	Go to step #3 . Replace defective thermistor.
3.	Remove kettle thermistor and allow to cool. Remove edge connector from control box. Test resistance across edge connector's pins #2 and #7. Is it approximately 100,000 ohms?	Yes No	Go to step #4 . Replace defective thermistor.
4.	Turn the potentiometer on the control box counter-clockwise to decrease the maximum operating temperature. does the kettle continue to overheat?	Yes No	Spray contact cleaner on control box terminal and edge connector. Try box again. If problem still exists, replace defective control box. Kettle is operating correctly.

D/ Problem: Red LED remains illuminated even though water has been added.

Possible Causes

- | | |
|---|----------------------------------|
| 1. Defective low water level probe | 2. Defective control box. |
|---|----------------------------------|

Fault Isolation Procedure

Step	Test	Result	Remedy
1.	Remove wire from low water level probe and ground the wire to the body of the kettle. Does the red LED turn off?	Yes No	Replace or clean defective low water level probe. Spray contact cleaner on control box terminals and edge connector. Try box again. If problem still exist, replace defective control box.

SPARE PARTS LIST

<i>ITEM ON.</i>	<i>DESCRIPTION</i>	<i>QTY. DOMESTIC</i>	<i>QTY. OVERSEAS</i>
<u>Spare Parts</u>			
SE50426	Air Filter Element	1	1
SE50428	"O" Ring for Air Filter	1	1
KE52895	Air Regulator	---	1
KE52936	Fuse	1	1
KE003209-1	Switch Assembly - On/Off - Maintained	---	1
KE003209-3	Switch Assembly - On/Off/On - Maintained	---	1
KE003209-6	Switch Assembly - Momentary Spring Return	---	1
KE003209-7	Switch Assembly - Momentary Spring Return	---	1
KE02274	Capacitor Assembly	2	2
KE603208-8	Capacitor Cartridge - NC	2	2
KE603208-9	Capacitor Cartridge - NO	2	2
KE50753-10	Relay	2	2
KE00860	Cable and Bracket Assembly - Speed Control	---	1
SE50224	Solenoid Valve Coil	---	1
KE53962	Blade Stop Ring	2	2
KE51834	Scraper Blades	2	2
SE50094	Oil Filter	1	1
KE51652	Solenoid Valve, 3/4" - 50 psi.	---	1
KE52668	Solenoid Valve, 3/8"	---	1
KE52701	Steam Trap	---	1
UR50077	Thermostat	---	1
KE50579	Circuit Breaker	---	1
FA00012	"O" Ring for Circuit Breaker	1	1
KE50580	Water Resistant Boot for Circuit Breaker	1	1
KE603208-9	Contact Block	---	1
FA00016	"O" Ring for Faucet Spout	2	2
SK50445	Fuse - 3 amps	1	1
SK52936	Fuse - 1 amps	1	1
KE50750-1	Contactoer	---	1
SE00104	Pressure Gauge, Back Mount, c/w Item #35	1	1
SE00105	Toggle Switch, SPST, c/w Item #18	1	1
SE00074	Potentiometer, c/w Item #24	1	1

FLOW PATH FOR HYDRAULIC SYSTEM

