CLEVELAND

INSTALLATION, OPERATION AND REPAIR MANUAL

TRI - LEG ELECTRIC
SELF - CONTAINED KETTLE

MODEL KEL
KEL - T
SSE - L
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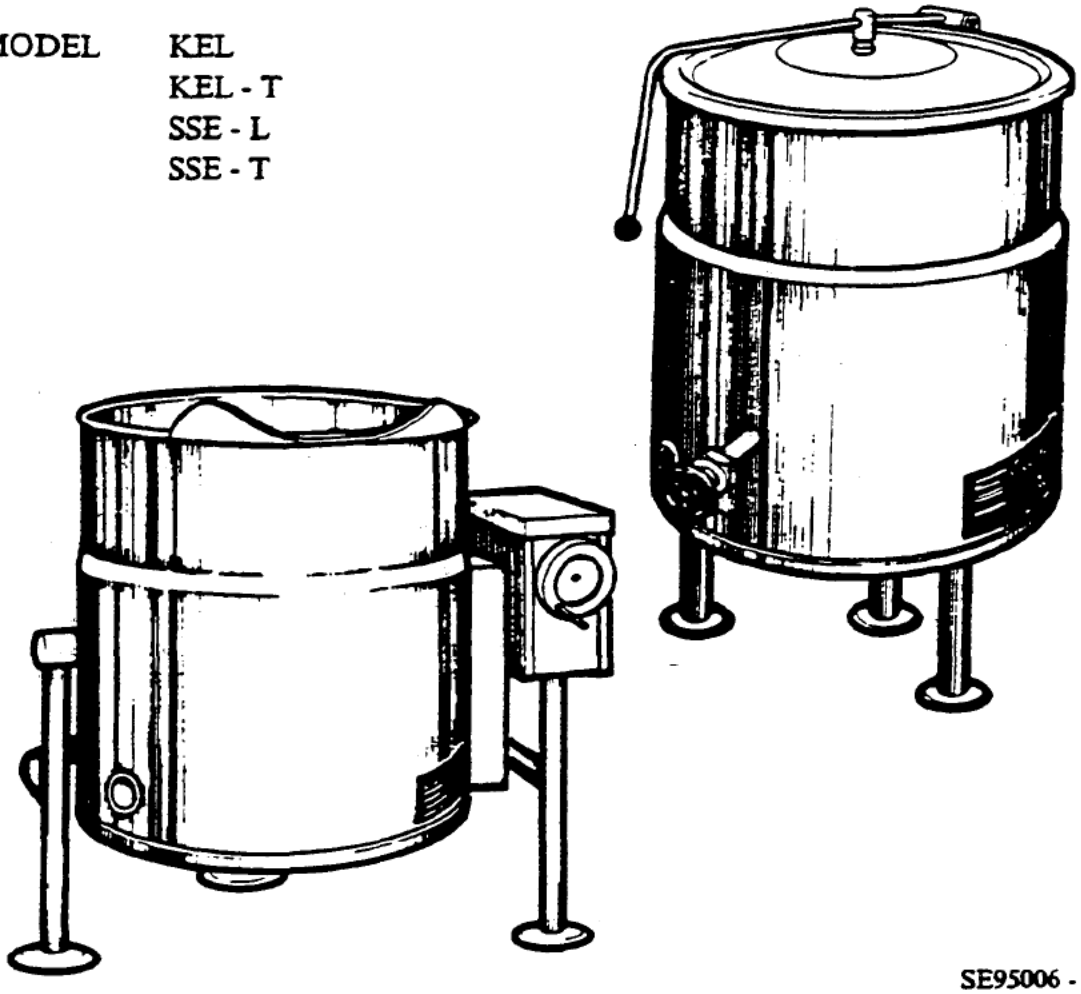

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CLEVELAND RANGE INC.
1333 East 179th St.
Cleveland. Ohio
U.S.A. 44110

(216)481-4900

CLEVELAND

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS FOR

ELECTRIC SELF-CONTAINED KETTLES

FLOOR MODELS

KEL-25	KEL-25-T	SSE-25-L	SSE-25-T
KEL-40	KEL-40-T	SSE-40-L	SSE-40-T
KEL-60	KEL-60-T	SSE-60-L	SSE-60-T
KEL-80	KEL-80-T	SSE-80-L	SSE-80-T
KEL-100	KEL-100-T	SSE-100-L	SSE-100-T

PRODUCT INFORMATION

MODEL STYLE _____

MODEL NO._____ SERIAL NO._____

INSTALLATION DATE _____ INSTALLER _____

RETAIN THIS MANUAL FOR YOUR REFERENCE

INSTALLATION INSTRUCTIONS

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

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

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.

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.

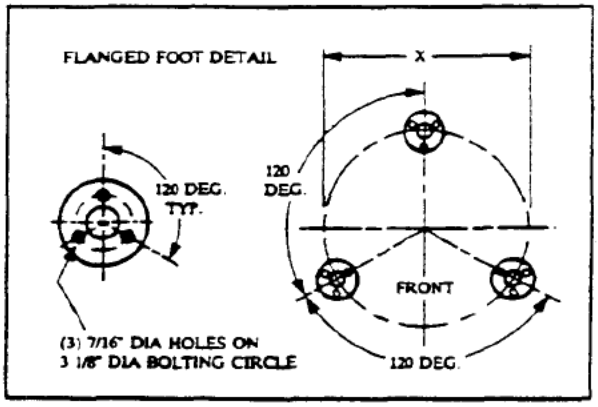
2. As soon as damage is discovered or suspected, notify the carrier that delivered the shipment.

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 sheet for the clearance requirements, in order to determine the location of the kettle. Next, carefully cut open the shipping carton for easy removal of the kettle.



TRI - LEG MOUNTING DETAIL

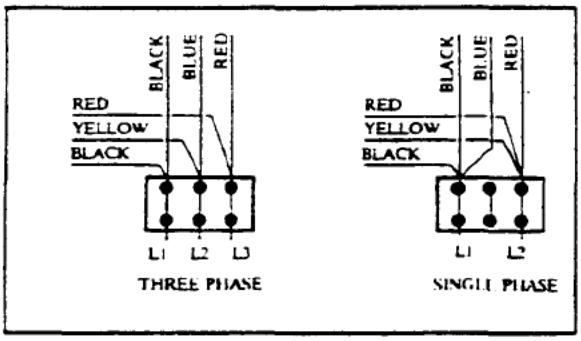
ASSEMBLY

Position the kettle in its' permanent location, and level the kettle by turning the adjustable flanged feet. Once positioned and leveled, permanently secure the kettle's flanged feet to the floor using 5/16 inch lag bolts and floor anchors (supplied by the installer). There are three bolts required to secure each of the flanged feet.

ELECTRIC SERVICE CONNECTION

Install in accordance with local codes and/or the National Electric Code ANSI/NFPA No. 70-1990 (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. Refer to specification sheet for all electrical specifications.



The kettle is wired for 3-phase operation at the factory. For single phase operation, rewire the terminal block to that shown in the accompanying diagram.

ELECTRICAL CONNECTION

STATIONARY MODELS

Remove the screws securing the dome-shaped service cover underneath the kettle and remove the cover. A wiring diagram is affixed to the inside of cover. Fasten permanent copper wiring to the three-connection terminal block. Be sure to connect ground wire to the separate ground terminal connector (ground lug). Slide the cover's slot over the wiring and secure the cover to kettle with the screws.

TILTING MODELS

Remove the screw at the rear of the console cover and remove the cover. A wiring diagram is affixed to the underside of the console cover. Feed permanent copper wiring through the cut-out in the bottom of the console, and fasten to the three-connection terminal block. Be sure to connect the ground wire to the separate ground terminal connector (ground lug). Replace the console cover and secure it with the screw.

INSTALLATION CHECK

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

1. Supply power to the kettle by placing the fused disconnect switch to the "on" position.

2. Read the vacuum/pressure gauge to ensure that the needle rests in the green zone(at room temperature). If the needle is in the "vent air" zone, refer to the "Kettle Venting Instructions".

3. Place the kettle's power on/off switch to the "on" position.

4. Turn the temperature control knob to "min". The green LED light should remain lit, indicating the heater elements are energized, until the set temperature (124°F/50°C) is reached. Then the green light will cycle on and off with the thermistor (solid state control).

5. If the kettle is a tilting model, tilt the kettle forward. The red "low water" light should be lit when the kettle is in a tilted position. This light indicates that the heater elements are not submerged in water, and they have automatically been shut off by the kettle's safety circuit. This is a normal conditon when kettle is in a tilted position.

6 Lower the kettle to the upright position. The red "low water" light should go out when the kettle is upright. If the red light remains lit in the upright position, it indicates a low water condition, and water must be added to reservoir before the kettle can be operated. Refer to the "Reservoir Fill Procedures", on the kettle's label, for details.

7. Turn the temperature control knob to "max." and allow the kettle to preheat. The green light should remain on until the set temperature is reached (260°F/127° C), then cycle on and off with the thermistor. Fill the kettle with cold water to the steam jacket's welded seam. Refer to the chart below for the time required to bring the water to a boil.

8. When all testing is complete, empty the kettle and place the power on/off switch in the "off" position.

The accompanying chart shows **approximate** times required for electric kettles of various capacities to boil water. Temperature control knob must be set at "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.

FULL KETTLE COOKING TIMES

Gals.	Ltrs.	Time in Minutes 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.

KETTLE VENTING INSTRUCTIONS

If the vacuum/pressure gauge reading is in the "vent air" zone, it means that the air has entered the steam/water jacket, resulting in little or no vacuum. Air inside the jacket will act as an insulator therefore reducing kettle efficiency. To remedy this situation, the following venting procedures should be followed:

1. With the temperature control knob set at number 6 or 7, heat the empty kettle until the vacuum/pressure gauge indicates 5-10 psi.

2. Release steam and air from the steam/water jacket by loosening, one-half turn, the 7/16 inch chrome-plated brass venting valve nut (located at the rear of the kettle) for 10-15 seconds.

3. Tighten the vent valve nut, being careful **not** to overtighten.

The kettle's steam/water ja cket should now be free of air. At room temperature, the pressure gauge needle should rest in the green zone, indicating a vacuum in the kettle's jacket.

To check the gauge for proper vacuum after venting, the temperature can be quickly reduced by filling the kettle with cold water.

If the kettle will not hold a vacuum, have a qualified service technician test for leaks at the vent valve, the safety valve, the probe, and the vacuum/pressure gauge fittings. We suggest mixing a 50/50 solution of liquid detergent and water while heating the kettle to at least 5 psi pressure. Then, shut off power to the kettle at the fused disconnect switch.

The soapy solution should be applied to the suspected area while the gauge shows at least 5 psi pressure. Any bubbles which appear will indicate a leak.

> **WARNING:** The fused disconnect switch must be off before removing the kettle's bottom cover, which exposes dangerous high voltage.

RESERVOIR FILL PROCEDURES

The reservoir'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 locate and repair the leakage problem before adding 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.

1. Ensure kettle is at room temperature.
2. Shut off power to the kettle at the fused disconnect switch.
3- Remove the bottom cover (tilting kettles can be tilted forward for easier access to the cover). Tilt the kettle back to the upright position once the cover has been removed.
4. Unscrew and remove the chrome-plated brass venting valve nut located on the back of the kettle.
5. Hold the safety valve open while adding distilled water through the vent hole, using a funnel. Refer to chart below for the proper amount required.
6. Place the chrome-plated brass venting valve nut into the water fill bole and carefully tighten. Do not overtighten. Replace bottom cover.
7. Restore power to the kettle at the fused disconnect switch.
8. The kettle must now be vented. Refer to the "Kettle Venting Instructions".

> **CAUTION:** Only distilled water should be used when adding water to a partially filled water reservoir. Local tap water conditions may cause kettle damage which is not covered under warranty.

DISTILLED WATER REQUIREMENTS

Kettle Capacity	When Red "Low Water Light" Comes on, Add Distilled Water	When the Reservoir is Completely Empty, Add Distilled Water
30gaL	1.80 gal	4.25 gal
40 gal	2.00 gal.	4.50 gal
60 gal	2.10 gal	5.50 gal
80 gal	2.60 gal	6.25 gal
100 gal	2.80 gal	7.00 gal

OPERATING INSTRUCTIONS

1. Before turning the kettle on, read the vacuum/pressure gauge. The gauges needle should be in the green zone. If the needle is in the "vent air" zone, refer to the "Kettle Venting Instructions". Any air that may be present will increase cooking times. 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 power on/off switch to the "on" position.

4. Preheat the kettle by turning the temperature control knob to the desired temperature setting (see temperature range chart). The green light will remain lit, indicating the heater elements are energized, 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 the food product into the kettle.

6. Turn the temperature control knob to the required temperature setting between "Min." (120° F/49° C) and "Max." (260° F/127° C). The green light will cycle on and off with the solid state control, indicating the heaters are cycling on and off to maintain the set temperature.

7. The red "low water" light should not be lit during kettle operation. This light indicates that the heater elements are not submerged in water, and they have been automatically shut off by the kettle's safely circuit. On tilting kettles, it is normal for the red light to come on when the kettle is in a tilted position. However, the kettle cannot be operated when the red light remains lit while the kettle is in the upright position. This indicates a low water condition, and water must be added to the reservoir. Refer to the "Reservoir Fill Procedures" for details.

8. When cooking is completed, place the power on/off switch to the “off” position.

9. Pour the contents of the kettle into an appropriate container by opening the draw-off valve or 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 pan of kettle cleaning is to prevent food 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.

TEMPERATURE RANGE CHART

Temperature Control Setting	* Approx. Product Temperature °F	°C
Minimum	120	49
1	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
Maximum	260	127

*** Certain combinations of ingredients will result in temperature variations.**

CARE AND CLEANING

Your kettle must be cleaned regularly to maintain its fast, efficient cooking performance, and to ensure its continued safe, reliable operation.

WARNING: Do not use chloride base detergents.

1. Prepare a warm water and mild detergent solution in the kettle.

2. Remove food soil inside the kettle using a nylon brush. Do not use a metal bristle brush, as this may permanently damage the kettle's stainless steel surface.

3. Loosen food which is stuck to the kettle by allowing it to soak at a low setting.

4. If the kettle is equipped with a draw-off valve, it should be cleaned as follows:

   a. Remove the drain screen from the bottom of the kettle. Thoroughly wash and rinse the screen either in a sink or a dishwasher, then replace it into the kettle.

   b. 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.

   c. In a sink, wash and rinse the valve stem, hex nut and knob. Wash and rinse the inside of the valve body using a nylon brush.

   d. Reassemble the draw-off valve by reversing the procedure for disassemble. The valve's hex nut should be hand tight only.

5. Rinse kettle interior thoroughly, then dram the rinse water.

6. Leave the cover off when the kettle is not in use.

7. Using mild soapy water and a damp sponge, wash the exterior of the kettle, rinse, and dry. Avoid soaking the electric control panel. Always turn off equipment power before using water to wash equipment.

NOTE: For more difficult cleaning applications one of the following can be used: alcohol, baking soda, vinegar, or a solution of ammonia in water. Avoid the use of chloride cleansers, which may damage the kettle's stainless steel surface.

WARNING: Steel wool should never be used for cleaning the cooking chamber of kettle. Particles of steel wool become embedded in the cooking surface and rust, which may corrode the stainless steel.

WARNING: Never hose down the kettle. Water seeps into the underside of the kettle, shorting and burning out the elements.

MAINTENANCE

This equipment requires very little preventive maintenance other than daily cleaning. Some kettles are equipped with handwheel tilting mechanisms which require periodic preventive maintenance to assure continued trouble-free operation. Inspect the worm screw, tilting gears and bearings occasionally (at least once a year). Lubricate as required using a high temperature grease. Remove bottom cover, heat kettle and test pressure relief valve twice a year.

ELECTRIC KETTLE CALIBRATING PROCEDURE

1. Insure the unit has a vacuum before you begin calibrating procedures. If unit requires venting refer to "KETTLE VENTING INSTRUCTIONS" in this manual.

2. Turn kettle on and set temperature dial to maximum (10).

3. Allow the unit to cycle twice.

4. Check temperature of the inner kettle surface with a digital thermometer.

5. Temperature should be 265°F.

6. Using a screw driver adjust temperature by turning the potentiometer on the black box. Turn very little. Turn clockwise to INCREASE, and counter-clockwise to DECREASE temperature.

7. Allow the unit to cycle twice.

8. Check temperature of the inner kettle surface with a digital thermometer.

9. Repeat steps 4 through 8 until unit is calibrated.

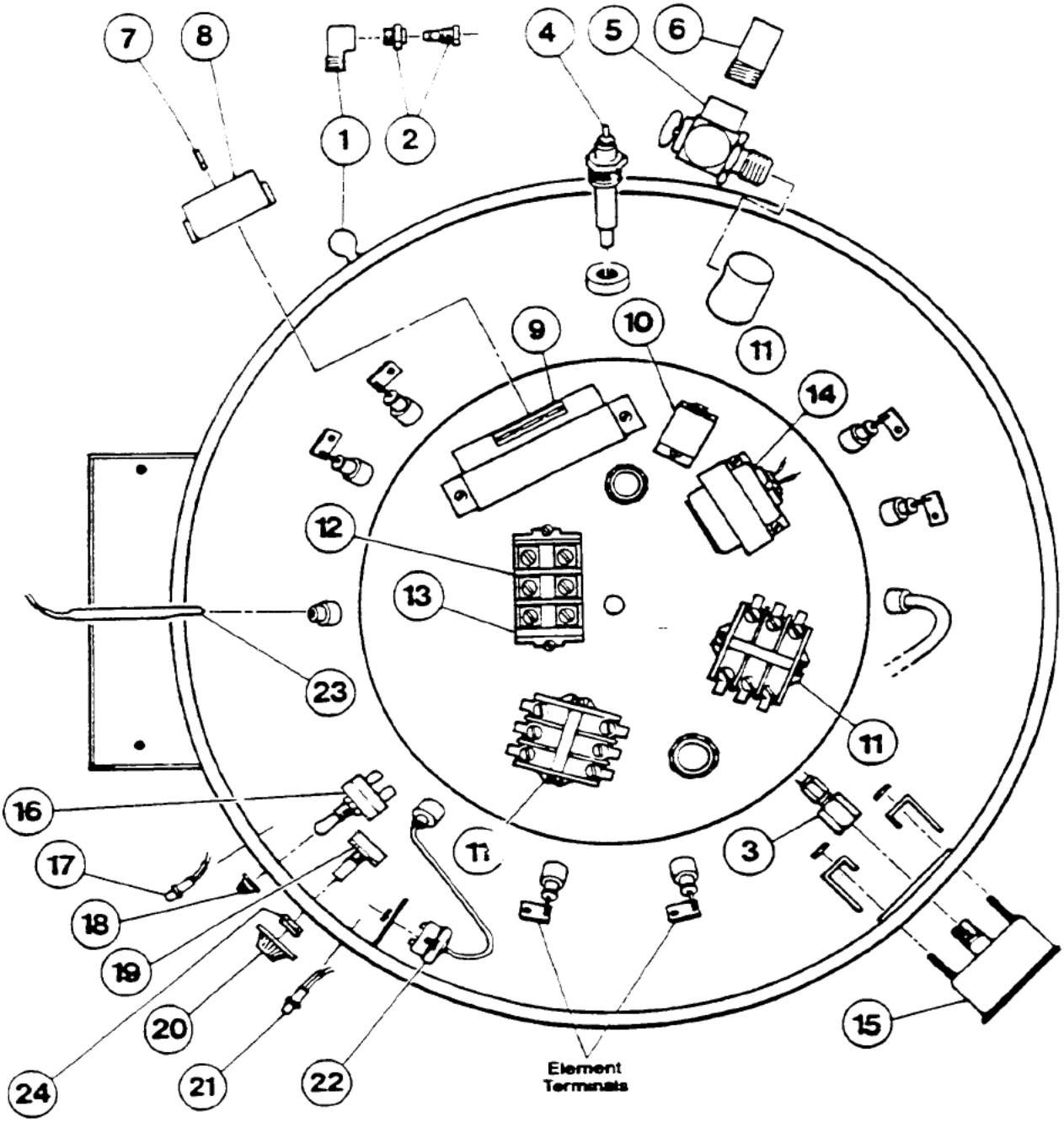
OPERATING CONTROLS AND INDICATORS

ITEM NO.	DESCRIPTION	FUNCTION
16	On-Off Toggle Switch (Pg. 213-09DR)	Controls electrical power to kettle.
20	Solid State Temperature Control Knob (Pg. 213-09DR)	This control knob allows the operator to select kettle heat increments from Min. to Max.(see temperature setting chart in the operating instructions section of this manual).
17	Heat Indicator Light (Green) (Pg. 213-09DR)	When lit, indicates that the kettle heating elements are on. Cycles On-Off with solid state contols.
21	Low Water Indicator Light (Red) (Pg. 213-09DR)	When lit, indicates that the kettle heating elements have cut out and the unit requires more water. (See Reservoir Fill Procedure).
15	Vacuum/Pressure Gauge (Pg. 213-09DR)	Indicates steam pressure in PSI inside the steam jacket as well as vacuum in inches of mercury.
5	Pressure Relief Valve (Pg. 213-09DR)	In the unlikely event that there is an excess steam build-up in the jacket, this valve opens automatically to relieve this pressure.
1	Chrome Plated Brass Vent (Pg. 213-09DR)	This valve is used to vent the kettle if there is insufficient vacuum as well as for refilling the kettle with water. (See Venting Instructions and Reservoir Fill Procedures).
NS	Service Cover (Not Shown)	Located underneath the kettle. Remove this cover for easy access to contactor, kettle control box, etc.
1-7	Daw-Off Valve (Pg. 600-04TD)	This valve is used to empty the kettle of either food products or wash water. It is supplied as standard equipment on stationary models and is optional on tilting kettles.
11	Hand Wheel (Pg. 213-10DR)	Turn to tilt kettle for pouring.
16	Power Tilt Control Switch (Pg. 213-12DR)	This switch allows the operator to tilt the kettle up or down.

PARTS LIST - KETTLE BOTTOM

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.	F105025	Bleed vent elbow	1
2.	KE50570	Bleed vent nut	1
3.	F105022	Connector	1
4.	KE50556	Probe, low water	1
5.	KE51723	Safety valve, 50 PSI, 1/2"	1
6.	KE50997	Blow down tube	1
7.	KE51226	Wire connector terminal	10
8.	KF51225	Edge connector	1
9.	KE00458	Solid state control box	1
10.	KE50753	Relay, 12 VDC	1
11.	KE51322	Contactor, 208/240V, 40 Amp. (Standard kettles)	2
	KE50750	Contactor, 208/240V, 50 Amp. (Special high wattage kettles-6 elements)	2
	KE50751	Contactor, 208/240V, 60 Amp. (Special high wattage kettles-6 elements)	2
12.	KE50377	Terminal block section (Large, white)	3
	SK50055	Terminal block section (Small, black)	3
13.	KE50376	Terminal block end section (Large, white)	1
	SK50054	Terminal block end section (Small, black)	1
14.	KE50752	Transformer	1
15.	KE50429	Pressure gauge	1
16.	KE50504	Switch, toggle, SPST	1
17.	KE50568	L. E. D green	1
18.	SK50062	Rubber boot	1
19.	KE50988	Potentiometer	1
20.	KE50569	Knob, potentiometer	1
21.	KE50567	L.E.D. red	1
22	KE50558	Safety Thermostat (140° C)	1
23.	KE00515	Thermistor	1
24.	KE51005	Rotary seal	1

KETTLE BOTTOM

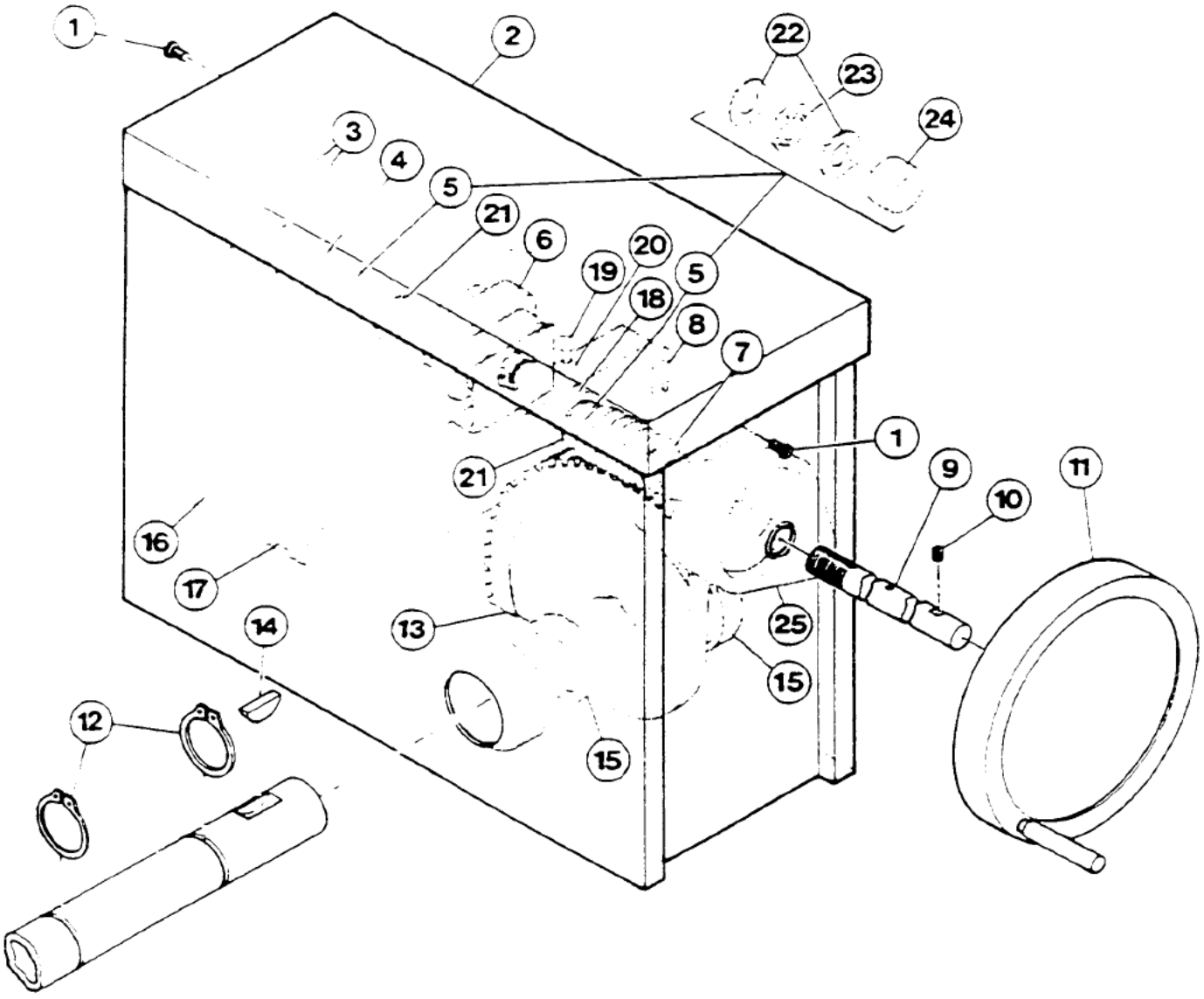


PARTS LIST - CONTROL HOUSING

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.	FA11134	Screw, 10-24 x 3/8"SS	2
2.	KE50325	Console cover	1
5.	FA95008	Locknut, 3/4-16	2
4.	FA30088	Washer, 1 1/2-OD x 13/16"ID x .125"W	1
5.		See note	2
6.	KE50752	Transformer, 240/16V	1
7.	KE50315	Worm	1
8.	FA95005	Tension pin	1
9.	KE50375	Tilt shaft	1
10.	FA19186	Set screw, hand wheel	1
11.	KE00508	Hand wheel	1
12.	FA95007	Retaining ring	2
13.	KE00151	Worm gear	1
14.	FA95006	Woodruff key	1
15.	KE51711	Bearing, roller, trunnion	2
16.	KE50377	Terminal block section (Large, white)	3
	SK50055	Terminal block section (Small, black)	3
17.	KE50376	Terminal block end section (Large, white)	1
	SK50054	Terminal block end section (Small, black)	1
18.	SE00034	Bearing assy.	1
19.	FA10623	Boll, 5/16-24 x 1 1/2"	1
20.	FA20029	Nut, hex, 5/16-24	1
21.	KE51891	Washer, 1 1/2"OD x 13/16"ID x .037"W	2
22.-24.	SE00036	Thrust bearing assy.	2
22	KE52192	Washer, thrust bearing	4
23.	KE52191	Bearing, thrust	2
24.	KE52193	Spacer, thrust bearing	2
25.	KE51730	Bearing, tilt shaft	1

Note: Please order Item no. 22.-24. - Part no. SE00036

CONTROL HOUSING

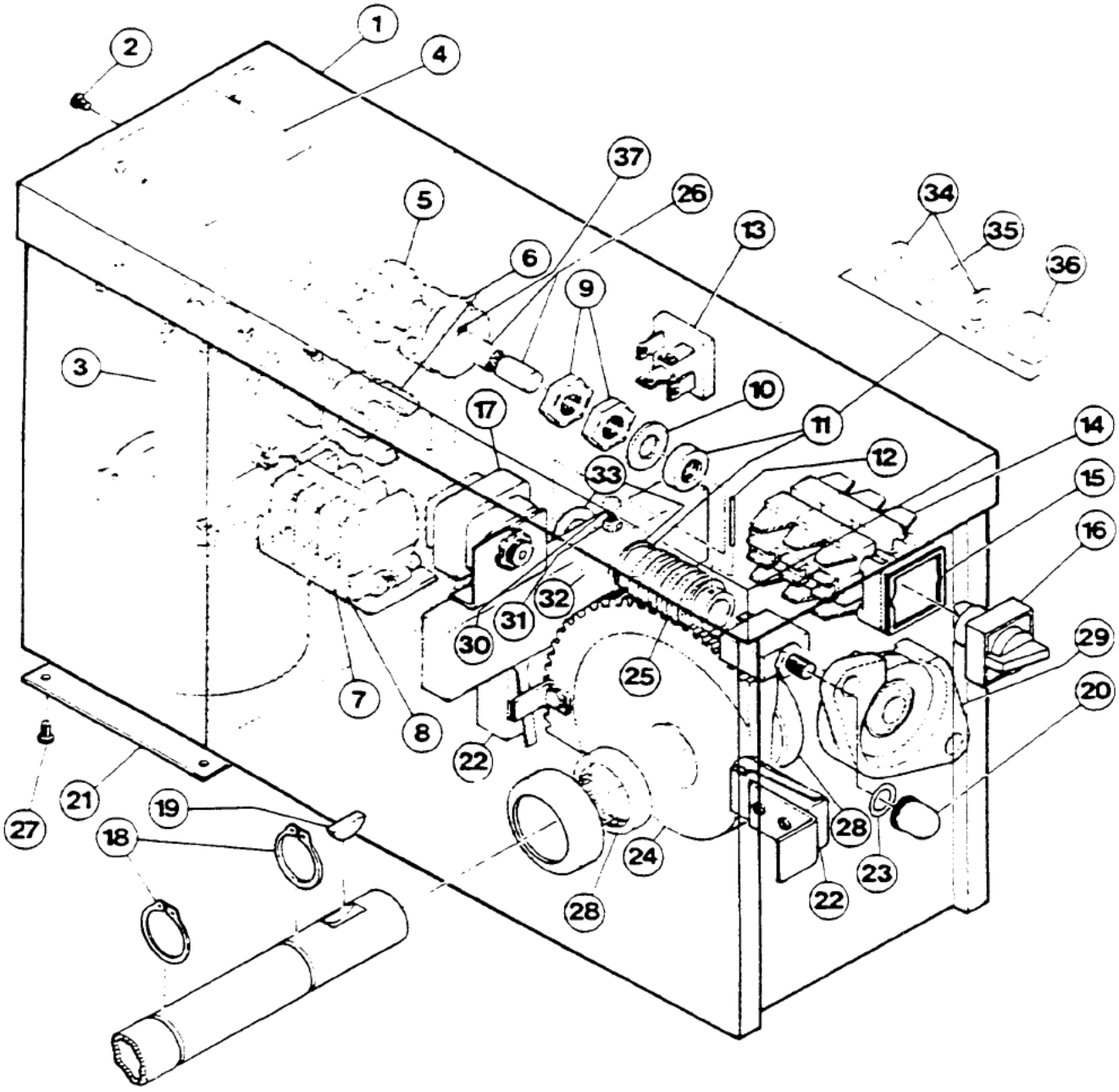


PARTS LIST- POWER TILT OPTION

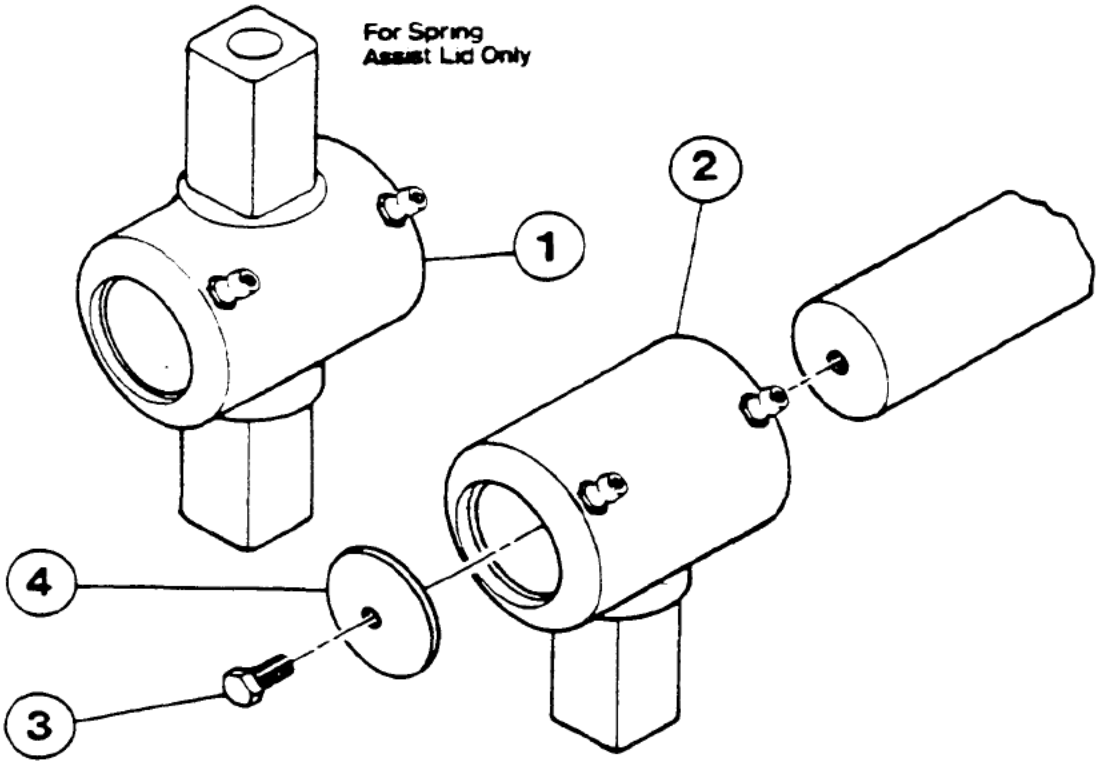
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.	KE51012	Gear box lid	1
2.	FA11134	Screw, 10-24 x 3/8" SS	1
3.	KE50577	Motor	1
4.	KE51224	Transformer, 208/120V(HG3J)	1
	KE52386	Transformer, 220, 240/120V(HG5J)	1
5,	KE50583	Buna-N insert	1
6.	KE50582	Coupling	2
7.	KE50377	Terminal block section (Large, white)	3
	SK50055	Terminal block section (Small, black)	3
8.	KE50376	Terminal block end section (Large, white)	1
	SK50054	Terminal block end section (Small, black)	1
9.	FA95008	Locknut, 3/4-16	2
10.	FA30088	Washer, 1 1/2"OD x 13/16"ID x .125"W	1
11.		See note	2
12.	FA95005	Tension pin	1
13.	KE50581	Bridge rectifier	1
14.	KE51011	Contact section	6
15.	KE51009	Square spacer plate	1
16.	KE51010	Square actuator	1
17.	KE50752	Transformer, 240/16V	1
18.	FA95007	Retaining ring	1
19.	FA95006	Woodruff key	1
20.	KE50580	Water resistant boot	1
21.	KE51223	Bottom cover	1
22.	KE51007	Micro switch	2
23.	FA00012	"0" Ring, circuit breaker	1
24.	KE00150	Worm gear	1
25.	KE50315	Worm	1
26.	KE50441	Tilt shaft	1
27.	FA11081	Screw, 8-32 x 1/2", SS	4
28.	KE51711	Bearing, roller, trunnion	2
29.	KE51731	Bearing, tilt shaft	1
30.	FA10623	Bolt, 5/16-24 x 1 1/2"	1
31-	FA20229	Nut, hex, 5/16-24	1
32.	SE00034	Bearing assembly	1
33.	KE51891	Washer, 1 1/2"OD x 13/16"ID x .037"W	2
34.-36.	SE00036	Thrust bearing assembly	2
34.	KE52192	Washer, thrust bearing	4
35.	KE52191	Bearing, thrust	2
36.	KE52193	Spacer, thrust bearing	2
37.	FA95037	Key, 3/16" x 3/16" x 3/4"	1
38.	FA95014	Key, 3/16" x 3/16" x 1"	1
39.	KE50579	Circuit breaker, 1 amp	1

Note: Please order item no. 34.-36. - Part no. SE00036

POWER TILT OPTION

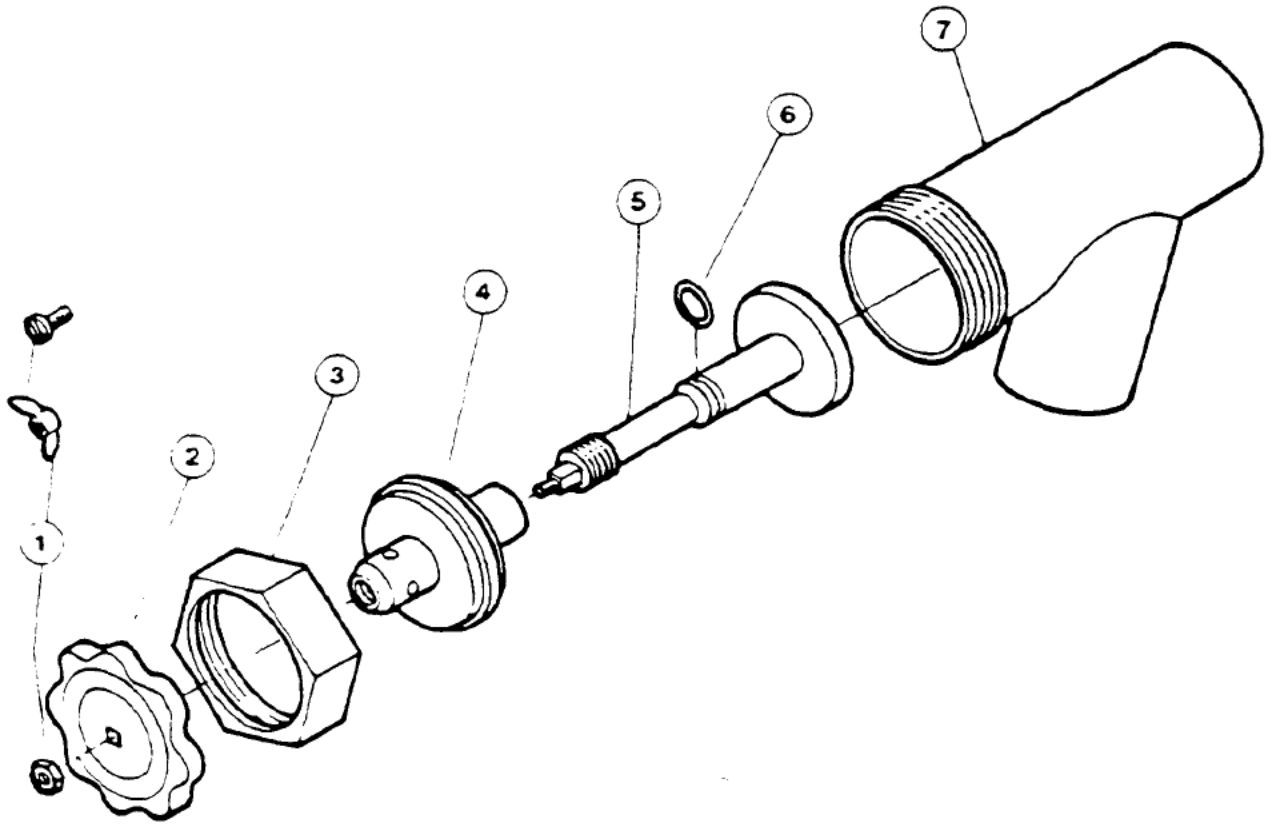


PARTS LIST - TRUNNION ASSEMBLY



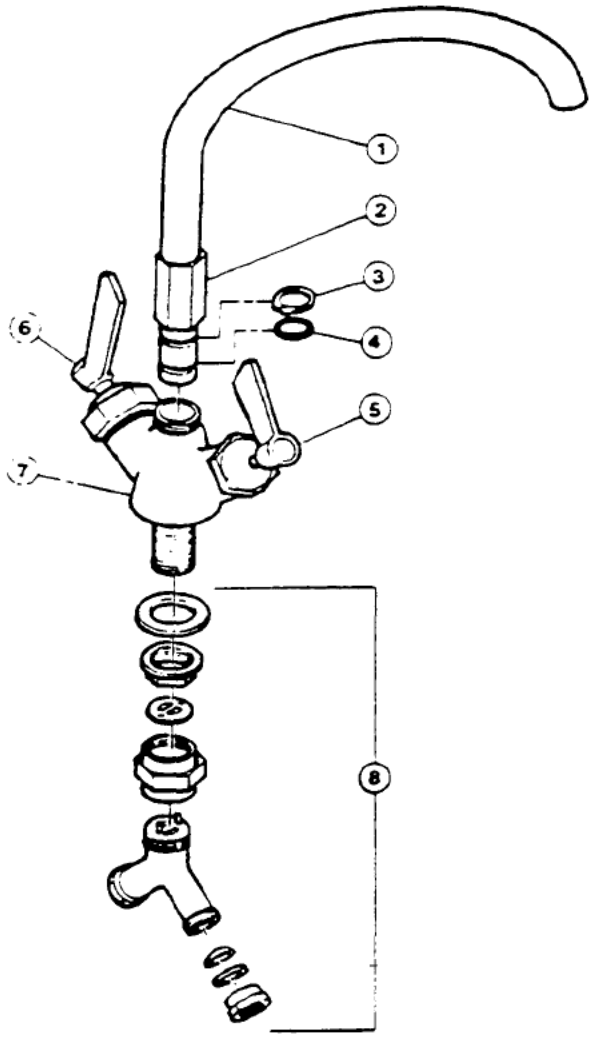
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	KE00354-D	Trunnion bearing casting	1
2	KE00351-D	Trunnion bearing casting	1
3	KE00349	Bolt, 5/16-18 x 1/2"	1
4	KE50666	Spherical washer	1

PARTS LIST - 2" TANGENT DRAW-OFF VALVE



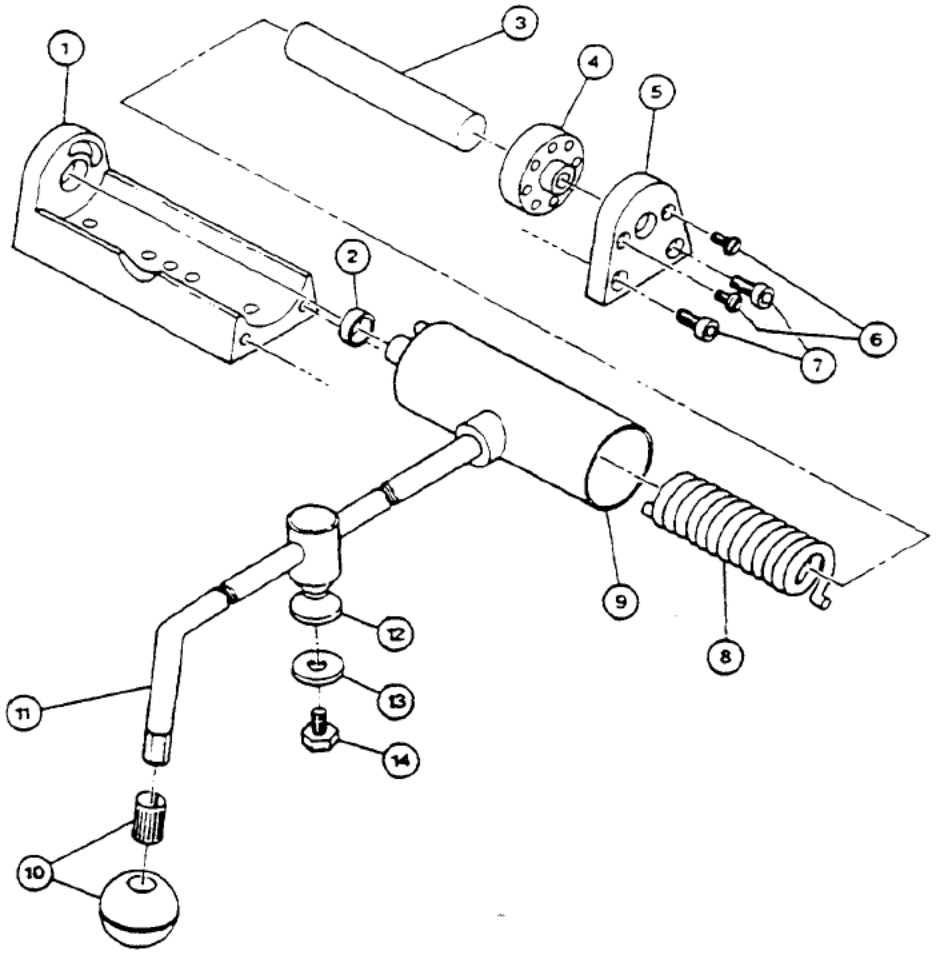
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1. to 7.	KE50972-B	Draw-off assembly	1
1.	FA21008	Hex nut	1
	FA95049	Wing nut	
2.	KE527551	Knob	1
3.	KE52754	Hex nut	1
4.	KE52753	Retainer	1
5.	KE52752	Piston	1
6.	FA00111	"O" Ring	1
7.	KE52751	Valve body	1

PARTS LIST - FAUCET



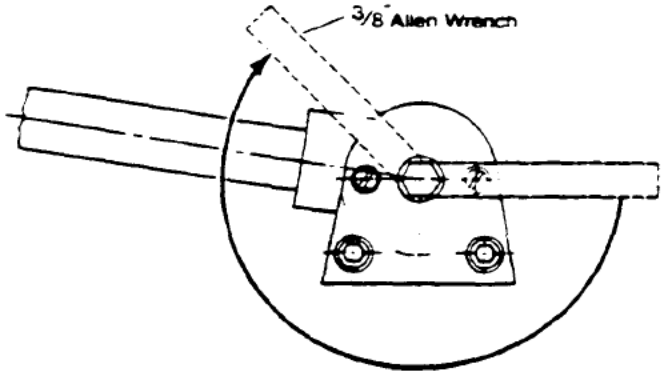
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1		3/4" Spout	1
	KE50833	for KS-E-LA	
	KE50828	for KT-20-EA	
	KE50829	for KT-30-EA, KT-4O-EA, KT-60-EA	
2	KE51404	Spout nut, short(used on spout KE50833)	1
	KE51736	Spout nut, tall (used on spouts KE50828, KE50829 and KE50830)	1
3	FA95022	Retaining ring	1
4	FA00016	"O"ring	1
5	SE50021	Cold water stem assemby	1
6	SE50020	Hot water stem assembly	1
7	KE51403	Double pantry control valve (c/w item no. 5,6,8)	1
8	SE50022	Yoke connection kit	1

PARTS LIST - HINGE ASSEMBLY



ITEM NO.	PART NO.	DESCRIPTION	QTY.
1.-9.	SE00057	Hinge assembly (40 gal. and under)	1
	SE00058	Hinge assembly (60 gal. and over)	1
1.	KE51218	Body, spring assist hinge	1
2.	KE50824	Hinge bearing	1
3.	KE50823	Pin (hinge)	1
4.	KE50820	Insert, brass adjustment	1
5.	KE50819	End piece	1
6.	FA11507	Screws, adjustment	2
7.	FA11284	Bolts, end block	2
8.	KE50122	Spring (40 gal. and under)	1
	KE50121	Spring (60 gal. and over)	1
9.	KE50821	Cylinder	1
10.	KE50151	Knob, ball type	1
11.		Cover handle (specify model)	1
12.	KE00095	Lid holder	1
13.	FA30500	Washer, lid holder	1
14.	FA11223	Bolt, lid holder	1

ALL KETTLES AND SKILLETS
HINGE ADJUSTMENT INSTRUCTIONS



1. Insert 3/8" Allen wrench.
2. Turn clockwise to relieve tension on spring.
3. While tension is released remove one of the two slotted screws.
4. To prevent Allen wrench from springing back abruptly while the second slotted screw is removed, insert a pin (approximately 1/8") in the hole where the first slotted screw was removed from.
5. Remove second slotted screw.
6. While holding Allen wrench remove pin.
7. Turn Allen wrench clockwise to tighten or counter-clockwise to loosen tension to produce desired effect.
8. Re-insert pin in one of the two holes.
9. Tighten one slotted screw in the other hole (it may be necessary to turn Allen wrench slightly to align holes.)
10. Remove pin and repeat step number 9 for other slotted screw.

ALL ELECTRIC KETTLES
SERVICING 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 top kettles the entire control mounting panel may be removed from kettle control housing for easier troubleshooting and pans replacement.

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

Possible Causes

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

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 Kettle Filling 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	Replace defective 12 VDC relay.
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 16 VAC 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	Go to step #10.
		No	Replace defective ON/OFF switch.
10.	Unplug control box and measure the resistance across potentiometer. Is it approx. 0 ohms at max. and 50,000 ohms at min. settings?	Yes	Go to step #11.
		No	Replace defective potentiometer.
11.	Remove edge connector from control box. While kettle is cold or thermistor is removed and allowed to cook, measure the resistance between edge connectors pins #2 and #7. Is it approx. 100,000 ohms?	Yes	Spray contact cleaner on control box terminals and edge connector. Try box again, if the problem still exists, replace defective control box.
		No	Replace defective thermistor.

B/ Problem: Kettle heats too slowly or not hot enough.
(Note: normal max. operating pressure with an empty kettle is 25-30 psi.)

Possible Causes

1. Air in kettle jacket-requires venting.
2. Defective safety thermostat.
3. Defective potentiometer.
4. Defective thermistor.
5. Defective contactors.
6. Defective control box.
7. Defective element/s.

Fault Isolation Procedure

Step	Test	Result	Remedy
1.	In a cold state, does the pressure gauge read in the green zone?	Yes	Go to step #2.
		No	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 max. operating pressure).	Yes	Go to step #3.
		No	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	Replace defective safety thermostat.
		No	Go to step #4.
4.	Unplug control box and measure the resistance across potentiometer. Is it approx. 0 ohms at max. and 50,000 ohms at min. setting?	Yes	Go to step #5.
		No	Replace defective potentiometer.
5.	Remove kettle thermistor and allow to cool. Remove edge connector from control box. Test resistance across edge connectors pins #2 and #1. Is it approx. 100,000 ohms?	Yes	Go to step #6.
		No	Replace defective thermistor.

6.	Turn the potentiometer on the control box clockwise to increase the max. operating temperature. Does the kettle now achieve max. operating pressure of 25-30 psi in an empty kettle?	Yes	Kettle is operating properly.
		No	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.
2. Defective potentiometer.
3. Defective 12 VDC relay.
4. Defective control box.

Fault Isolation Procedure

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

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

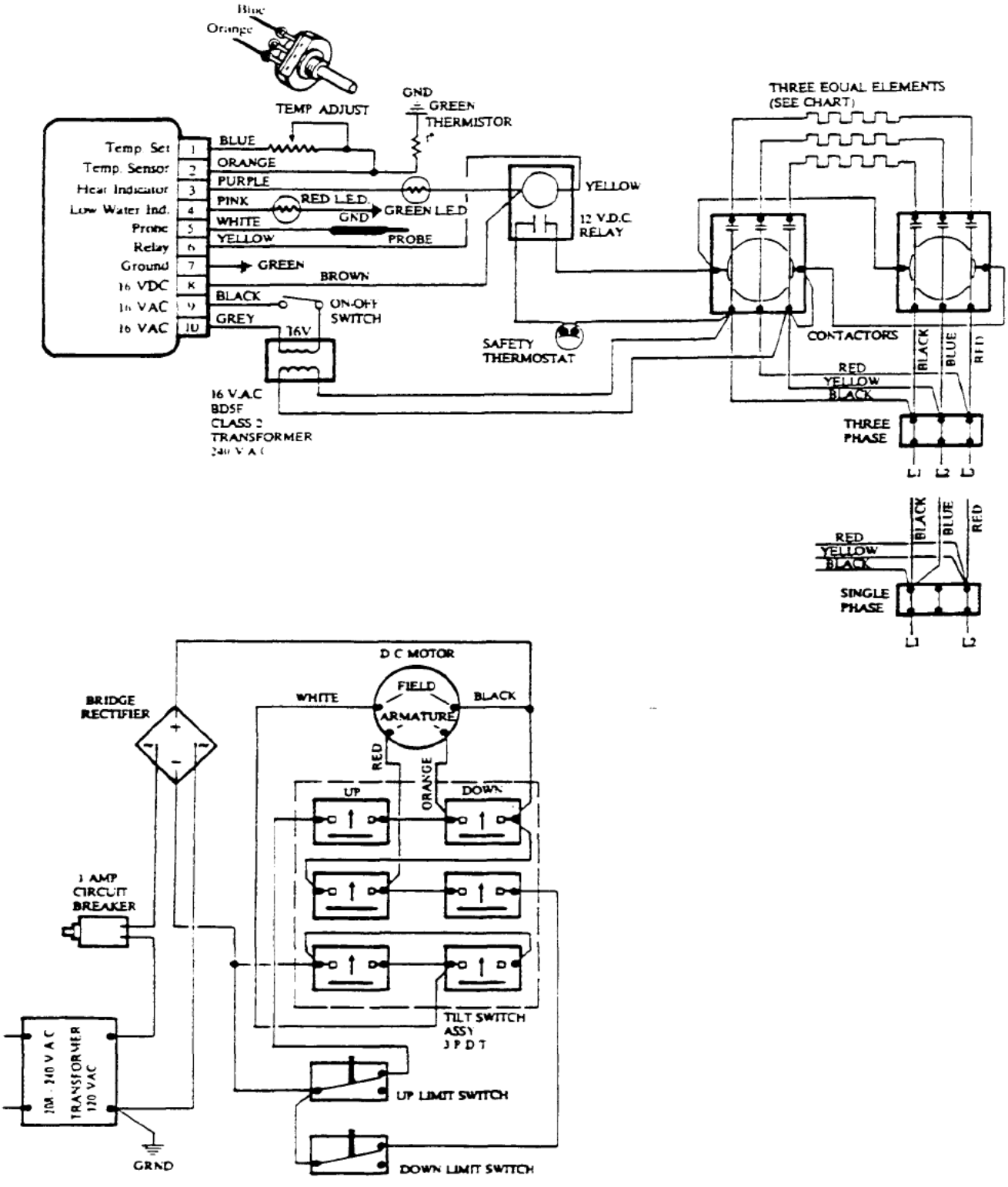
Step	Test	Result	Remedy
1.	Remove wire from low water level probe and ground the wire to the body of the kettle. Does the red LED turn off?	Yes	Replace or clean defective low water level probe.
		No	Spray contact cleaner on control box terminals and edge connector. Try box again. If problem still exist,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

MODEL	ELECTRICAL RATINGS											
	208 VOLTS				240 VOLTS				220/380 VOLTS			
	1 Phase		3 Phase		1 Phase		3 Phase		1 Phase		3 Phase	
	KW	AMP	KW	AMP	KW	AMP	KW	AMP	KW	AMP	KW	AMP
KS20/KT20	*9.8*	47	9.8	27	13	55	13	32	—	—	11	25
KS30/KT30	12.3	59	12.3	34	16.4	68	16.4	39	—	—	13.6	21
KS40/KT40	14.8	71	14.8	41	19.6	82	19.6	47	—	—	16.4	25
KS60/KT60	14.8	71	14.8	41	19.6	82	19.6	47	—	—	16.4	25

	240/416 VOLTS				480 VOLTS				575 VOLTS			
	1 Phase		3 Phase		1 Phase		3 Phase		1 Phase		3 Phase	
KS20/KT20	KW	AMP	KW	AMP	KW	AMP	KW	AMP	KW	AMP	KW	AMP
	—	—	13	18	9.8	21	9.8	12	18	31	18	18
KS30/KT30	—	—	16.4	23	9.8	21	9.8	12	18	31	18	18
KS40/KT40	—	—	19.6	27	B.I	27	13.1	16	18	31	18	18
KS60/KT60	—	—	19.6	27	19.6	41	19.6	24	24	42	24	24

For electrical supply other than shown above, refer to the wiring diagram affixed to the underside of the console cover.
NOTE: Amperage (amps/ph) column above is the actual current draw of the unit. Please reference electrical codes in your area for the correct wire and circuit breaker sizing.

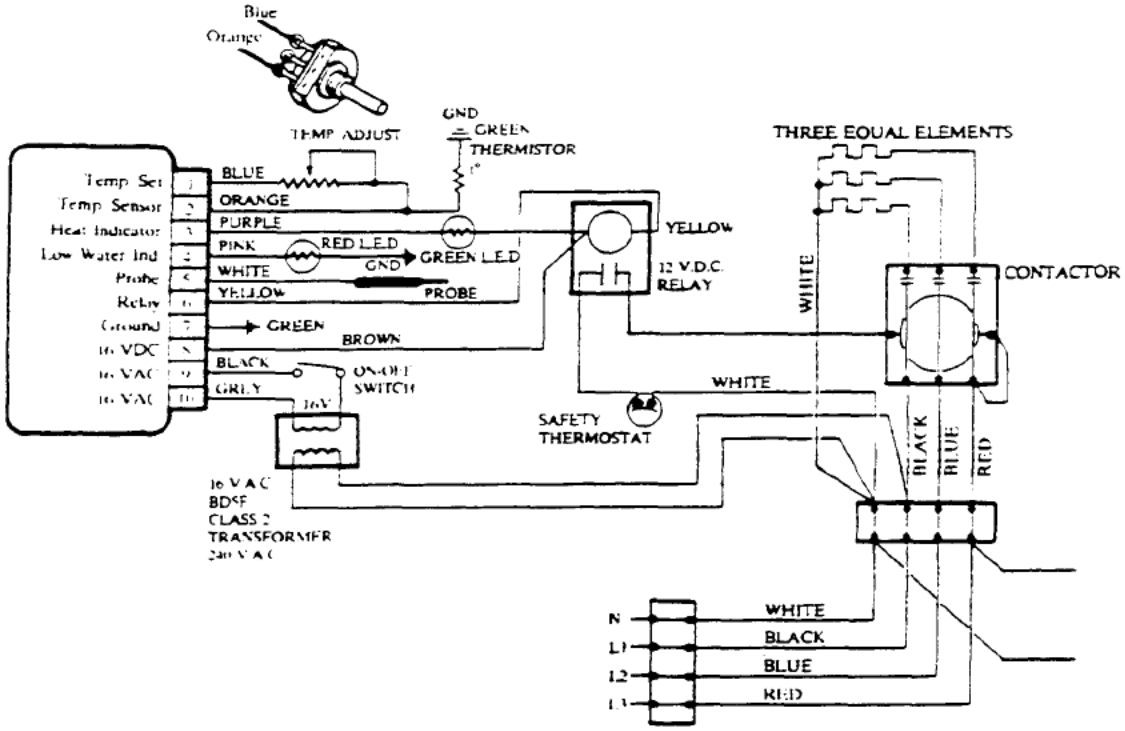
STANDARD NORTH AMERICAN WIRING DIAGRAM

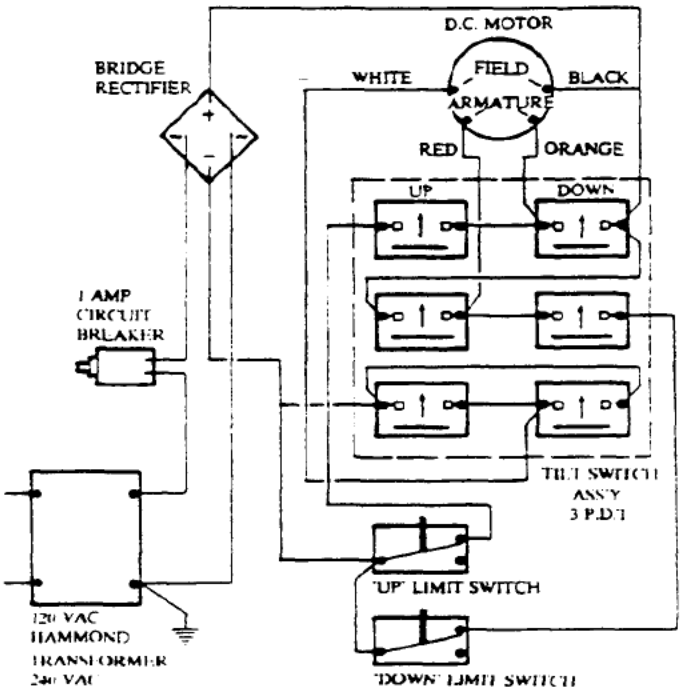


For electrical supply other than shown above, refer to the wiring diagram affixed to the underside of the console cover.

NOTE: Please reference electrical codes in your area for the correct wire and circuit breaker sizing.

STANDARD EUROPEAN WIRING DIAGRAM





For electrical supply other than shown above, refer to the wiring diagram affixed to the underside of the console cover.

NOTE: Please reference electrical codes in your area for the correct wire and circuit breaker sizing.

HARRISONS & CROSFIELD (CANADA) LTD.

MATERIAL SAFETY DATA SHEET

PRODUCT: ETHYLENE GLYCOL DATE: 24 October 1986

SUPPLIER: Harrisons & Crosfield (Canada) Ltd.
777 Supertest Road,
Downsview, Ontario, M3J 2M5
Phone (416) 736 9299, Telex 06-524509
Emergency Phone (416) 667 8074

I. IDENTIFICATION

SYNONYMS: Glycol; EG; MEG; 1, 2 ethanediol
CHEMICAL NAME: Ethylene glycol
CHEMICAL FAMILY: Glycols
CHEMICAL FORMULA: HOC2H4CH C.A.S. NUMBER: 107-21-1
SHIPPING NAME:
CLASSIFICATION: Not regulated P.I.N.: PACKING GROUP:

II. HAZARDOUS INGREDIENTS

Ingredient	Range %	TLV (ppm)
Ethylene glycol	100	Vapor-50 ppm

III. HEALTH HAZARDS

THRESHOLD LIMIT VALUE: Vapour - 50 ppm. Paniculate - 10 mg/m3

EFFECTS OF OVEREXPOSURE:

EYES: Liquid, vapours, and particularly mists, may cause discomfort in the eye with transient conjunctivitis. Serious corneal injury is not anticipated.

SKIN: slightly irritating.

INHALATION: May cause irritation of the throat and headache. High vapour concentrations caused, for example, by heating the material in an enclosed and poorly ventilated workspace may produce nausea, headache, and dizziness.

INGESTION: May cause abdominal discomfort and pain (dizziness, malaise, lumbar pain, oliguria, uraemia, and central nervous system depression. Severe kidney damage follows the swallowing of large volumes of ethylene glycol. May be fatal.

CHRONIC HEALTH HAZARDS: Inhalation of mists may produce signs of effects on the central nervous system, particularly dizziness and nystagmus.

OTHER HEALTH HAZARDS: Ethylene glycol has been shown to produce dose-related teratogenic effects in rats and mice when given by gavage or drinking water at high concentrations. There is no available information to suggest that it has caused birth defects in humans. Two chronic feeding studies, using rats and mice have not produced any evidence that ethylene glycols causes dose-related increases in tumour incidence, or a different pattern of tumours compared with untreated controls. The absence of a carcinogenic potential for ethylene glycol has been supported by numerous in vitro genotoxicity studies showing it does not produce mutagenic or clastogenic effects.

FIRST AID:

EYES: Flush with water for at least 15 minutes.

SKIN: Remove contaminated clothing and flush skin with water.

INHALATION: Remove to fresh air. Call a physician if discomfort persists.

INGESTION: If conscious, give two glasses of water and induce vomiting. Call a physician.

NOTES TO PHYSICIAN: The principle toxic effect of the material, when swallowed, will be due to the ethylene glycol content, which caused kidney damage. Early administration of ethanol may block the formation of nephrotic metabolites in the liver. Ethanol should be given intravenously, as a 5% solution in sodium bicarbonate, at a rate of about 10 ml. of ethanol per hour. A desired therapeutic level of ethanol in blood is 100 mg/dL. Hemodialysis may be required. See also Section IX.

IV. FIRE & EXPLOSION HAZARDS

FLASH POINT & method (C): 116 (TCC)

FLAMMABLE LIMITS (% in air): LOWER: 3.2 UPPER: 15.3 (est)

EXTINGUISHING MEDIA: Use water spray, carbon dioxide, dry chemical, alcohol-type or universal-type foams applied by the manufacturers' recommended technique.

SPECIAL FIRE FIGHTING PROCEDURES: Do not spray pool fires directly. A solid stream of water directed into hot, burning liquid can cause frothing. Use self-contained breathing apparatus and protective clothing.

UNUSUAL FIRE & EXPLOSION HAZARDS: None currently known

V. PHYSICAL DATA

The following physical data are approximate only and do not represent specification values. They should only be used in the context of this Material Safety Data Sheet.

BOILING POINT (C): 197 SPECIFIC GRAVITY (20C): 1.12

VAPOUR PRESSURE: 0.08 VAPOUR DENSITY (air=l) : 2.1

WATER SOLUBILITY: Complete VOLATILITY (%): Nil

EVAPORATION RATE:(Butyl acetate=1): < 0.01

APPEARANCE & ODOUR: Colourless liquid, mild odour.

VI. REACTIVITY

STABILITY: Stable.

CONDITIONS TO AVOID: None currently known.

INCOMPATIBILITY: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon dioxide and/or carbon monoxide produced on burning.

HAZARDOUS POLYMERIZATION: No.

CONDITIONS TO AVOID: None currently known.

VII. SPILLS & LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Wear suitable protective equipment. Small spills - flush with large quantities of water. Large spills - collect for disposal.

WASTE DISPOSAL METHODS: Incinerate in a furnace where permitted by Federal, Provincial, and local laws and regulations.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: NIOSH or MSHA approved air supplied mask in high concentrations.

VENTILATION: General mechanical room ventilation is expected to be adequate if handled in covered equipment. Local exhaust ventilation is needed at points where vapour is expected to be vented to the air.

PROTECTIVE GLOVES: Rubber or plastic.
EYE PROTECTION: Monogoggles or face shield.

ADDITIONAL PROTECTIVE EQUIPMENT: Eye bath and safety shower.

IX. ADDITIONAL INFORMATION

HANDLING & STORAGE: May be fatal if swallowed. Do not breathe mist. Avoid prolonged or repeated breathing of vapour. Avoid contact with eyes. Wash thoroughly after handling. Where heavy concentrations of fine mist are present, a respirator should be used to prevent inhaling mist particles.

OTHER INFORMATION: Pulmonary oedema with hypoxemia has been described in a number of patients following poisoning with ethylene glycol. The mechanism of production has not been elucidated, but it appears to be noncardiogenic in origin in several cases. Respiratory support with mechanical ventilation and positive end-expiratory pressure may be required.

******* END OF REPORT *******

PREPARED BY: Regulatory Services DATE ISSUED: 28 July 1986

Harrisons & Crosfield (Canada) Ltd. DATE REVISED:24 Oct. 1986

FINNAN

FINNAN ENGINEERED
PRODUCTS LIMITED

EMERGENCY Tel. No.
(416) 438-6070
(416) 294-5237
(416) 497-5512

POISON CONTROL CENTER
Toronto: I-800-268-9017
Quebec
City: 418-656-8090

MATERIAL SAFETY DATA SHEET

April 28/89

	SECTION I PRODUCT INFORMATION
NAME OF PRODUCT	FINNAN 1524L and 1529L
PURPOSE OF PRODUCT	Closed System Corrosion Inhibitor
CHEMICAL NAME	Mixture FORMULA

SECTION II HAZARDOUS INGREDIENTS

COMPONENTS	WT/ WT %	Oral-rat LD50	HAZARD	CAS NO.
Sodium Nitrite	20-24	120mg/Kg	Assists combustion	7632-00-0
Tolytriazole	0.2-0.3	675mg/Kg	Toxic	29385-43-1
Sodium Hydroxide	0.8	N/Av.	Corrosive	1310-73-2
Sodium Tetraborate	3.3	2660mg/Kg	LDL0, man, 709 mg/Kg	1330-43-4

SECTION III PHYSICAL STATE

APPEARANCE AND PHYSICAL STATE Straw color liquid			ODOUR Mild	
1. BOILING POINT ° C (°F)		>100°C	5. pH OF PRODUCT OR ACID/BASE CONTENT	11.5-12.0
2. VAPOUR	PRESSURE	N/Ave.	6. SPECIFIC GRAVITY (Water=1)	1.20-1. 22
	DENSITY (Air=1)			
3. SOLUBILITY IN WATER		Miscible	7. FREEZING POINT	N/Av.
4. PERCENT VOLATILE		71% as water	8. AUTODECOMPOSITION TEMP.	490°C

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/Ap.	FLAMMABLE LIMITS : Upper Lower
EXTINGUISHING MEDIA As appropriate for combustibles in area.	
SPECIAL FIRE FIGHTING PROCEDURES Self-contained breathing apparatus and protective clothing must be worn in fighting all fires involving chemicals.	

SECTION V HEALTH HAZARD DATA		
A - EFFECTS OF ACUTE OVEREXPOSURE		
(A)	SKIN	Corrosive to skin, may cause dermatitis.
(B)	INHALATION	For nitrite , 4 hr. LC50 in rats: 1.45 mg/litre of air.
(C)	INGESTION	Harmful or fatal if swallowed.
(D)	EYES	Corrosive to eyes.

B - EFFECTS OF CHRONIC OVEREXPOSURE
- Nitrite not listed as a carcinogen by ACGIH, IARC or OSH.
- Nitrite tests on animals demonstrate no embryotoxic or reproductive toxicity.
- See Appendix.

SECTION VI EMERGENCY AND FIRST AID		
(A)	SKIN	Wash with soap and water at once while removing contaminated clothing
(B)	INHALATION	No exposure is expected at room temperature.
(C)	INGESTION	If victim is conscious, induce vomiting by giving two glasses of water or salt water and inserting finger down throat. Call Poison Control or a physician immediately.
(D)	EYES	Immediately flush eyes with copious amounts of water for 20 mins. Consult a physician if redness or irritation persists.

SECTION VII TOXICOLOGICAL DATA	
EXPOSURE LIMITS:	Not established.
ROUTE OF ENTRY:	Skin or eye contact, ingestion.

SECTION VIII SPILL OR LEAK PROCEDURES
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Collect and reuse as much as possible, absorb the residues with sand or other mineral absorbent materials and dispose of.
DISPOSAL PROCEDURES Follow your local, provincial and federal chemical disposal regulations.

SECTION IX PROTECTION INFORMATION

RESPIRATORY PROTECTION:	LOCAL EXHAUST (X)	MECHANICAL EXHAUST ( )		
	GLOVES (X)	APRONS (X)		
	SAFETY GLASSES ( )	CHEMICAL GOGGLES (X)	FACE SHIELD ( )	
OTHER PROTECTIVE EQUIPMENT: Eyewash station.				

SECTION X REACTIVITY DATA

STABILITY	STABLE (X)	UNSTABLE ( )
HAZARDOUS DECOMPOSITION OR COMBUSTION PRODUCTS	Toxic brown nitrogen dioxide gas is formed.	
CONDITIONS TO AVOID	Mixing with acids or strong oxidizing chemicals must be avoided	

SECTION XI HANDLING AND STORAGE PRECAUTIONS

Handle as an alkaline liquid. Store away from acids and oxidizing chemicals. Keep the lid closed at all times.

SECTION XII FURTHER INFORMATION

Under certain circumstances, when dry nitrite comes in contact with combustible material, it may act as a source of oxygen, thus assisting combustion.

Do not add amines to water systems containing Finnan 1524L or Finnan 1529L to avoid formation of carcinogenic nitrosamines.

PREPARED BY: ALI KAMELI

APPROVED BY: J.C. Finnan