

SERVICE & PARTS MANUAL

ELECTRIC SELF-GENERATING FLOOR MODEL KETTLES



MODELS:

F-20PE

F-30PE

F-40PE

F-60PE

F-80PE

F-20LE

F-30LE

F-40LE

F-60LE

F-80LE

FT-20LE

FT-30LE

FT-40LE

FT-60LE

FT-80LE



MARKET FORGE
INDUSTRIES INC.

An Employee Owned Company

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SECTION 1 INTRODUCTION

This service and parts manual contains descriptive information, and maintenance and trouble-shooting information for model series F___PE, F___LE, and FT___LE steam jacketed kettles. A parts list is also included in which each replaceable part is identified and shown in an accompanying illustration.

1.1 DESCRIPTION

Floor model kettles are self-contained, self-generating steam jacketed vessels for cooking large volumes of liquid and semi-liquid food products. All models include a hemispheric shaped base of double-wall construction forming a steam jacket reservoir around the lower two-thirds of the kettle. The reservoir is charged with distilled water, rust inhibitor and anti-freeze solution, and is vacuum sealed. Kettles are equipped with electric heating elements and controls including a low water cut-off device for protection of heating elements.

Two model series differ in that FT___LE units are leg-mounted tilting kettles while F___PE units are pedestal mounted stationary kettles. Optional leg mounting of the pedestal models is designated by the model number series F___LE. The missing figures of the model numbers are the two digits representing the kettle capacity, i.e. FT-20LE for a 20 gallon tilting kettle. Tilting and stationary models are available in 20, 30, 40, 60, and 80 gallon sizes.

1.2 BASIC FUNCTIONING

Self-contained kettles operate by generating steam in the kettle reservoir. The sequence of functioning which occurs during operation is as follows:

1. Operator places the power switch in the ON position and sets the thermostat knob at the required setting from "1" to "10"—140° to 290° F (60° to 144° C)—jacket temperature.
2. Control circuit is normally completed to the thermostat control if two standard conditions exist:
 - a. Water level in kettle jacket is adequate to prevent circuit interruption by the low water cut-off device. An activated cut-off is evidenced by the Low Water light turning on and heating element cut off.
 - b. Kettle is in vertical position with circuit completed through the tilt interlock switch (FT___LE series only).
3. Thermostatic control contacts close to energize heater contactor coils and turn temperature indicator light on.

4. Power is applied to heaters through closed contactor power contacts.
5. As temperature of water rises in kettle reservoir, the steam pressure increase is indicated by the vacuum/pressure gauge.

NOTE:

Gauge normally reads 22-30 IN. Hg (74-100 k/Pa) (below 0 PSI, prior to heaters turning on. Air is eliminated from the system when jacket is filled (with the kettle reservoir at a pressure above 0 PSI) by opening the bleed vent one full turn for 10 seconds and closing.

6. When temperature of steam in the reservoir reaches the temperature coinciding with the thermostat setting, the thermostat switch opens to break the circuit to the contactor coils and shuts off the elements. Any number of on and off cycles of the control thermostat, contactors and elements will occur as required to maintain thermostat setting.

1.3 SERVICE

Required service, both preventive and corrective, is explained in Section 2. Should repairs be required, a network of authorized agencies is available to assist with prompt service. A current Directory of Authorized Service Agencies may be obtained by contacting:

Product Service Department
Market Forge Company®
35 Garvey Street
Everett, MA 02149
Telephone: (617) 387-4100

The model and serial numbers must be referenced when corresponding with Market Forge®. The data plate containing the serial number pertaining to the equipment is located on rear of kettle.

SECTION 2 MAINTENANCE

2.1 GENERAL

This section contains trouble-shooting and maintenance information intended for use by authorized service personnel, except for daily cleaning. It is recommended that the operator never attempt to make repairs without such assistance. A current Directory of Authorized Service Agencies may be obtained from Market Forge®. (See subsection 1.3).

For cleaning instructions, see Operating Instructions, S-2166.

2.2 TROUBLE-SHOOTING GUIDE

Table 2-1 gives information to assist service personnel in locating the general source of problems which occur with the self-contained kettles. Before attempting to locate the source of difficulty described, the technician should be familiar with basic functioning described in Subsection 1.2.

**TABLE 2-1
GENERAL TROUBLE-SHOOTING GUIDE**

PROBLEM Probable Cause	Remedy
1. INDICATOR LIGHT FAILS TO LIGHT WITH SWITCH IN ON POSITION AND THERMOSTAT DIAL SET. a. Power to kettle off. b. Kettle tilted (FT____LE only). c. Low water level in steam jacket—Low water light on. d. Indicator light burned out. e. Faulty power switch. f. Faulty thermostat. g. Faulty tilt interlock switch or time delay (FT____LE only). h. Faulty level control. i. Faulty wiring.	a. Locate external circuit breaker shut-off for incoming power and place in ON position. b. Return to full vertical position. c. Fill jacket. d. Replace light. e. Replace switch. f. Replace thermostat g. Replace as required. f. Replace control. i. Inspect condition of wire and tightness of all connectors. Correct as required.
2. KETTLE NOT HOT ENOUGH TO BOIL WATER WITH THERMOSTAT DIAL SET AT "10". a. Air in kettle jacket. b. Faulty relief valve. c. Burned out heating elements.	a. Open bleed vent one full turn for 10 sec. and close b. Replace valve. c. See subsection 2.3.4.
3. LOW WATER LIGHT ON. a. Low water level in jacket. b. Defective level control.	a. Fill jacket. (See Operating Instructions) b. Replace control.
4. KETTLE HARD TO TILT (FT____LE MODEL SERIES ONLY). a. Gears dry. b. Worn trunnion bearings.	a. Apply high quality bearing grease to worm and gears inside console. b. Disassemble left and right side bearings and replace as required.

2.3 REPAIR AND REPLACEMENT

2.3.1 General

Section 3 of this manual contains a listing of all replaceable parts and associated illustrations of the kettle. Disassembly procedures will be obvious from the illustrations.

When replacing probes or gauges in the steam jacket, it is essential to install replacements so as to obtain a pressure tight seal. Teflon tape sealant or equivalent should be used.

2.3.2 Model Series FT___LE Disassembly

All controls are accessed by lowering the kettle to the full tilt position and removing screw and bottom cover. The tilting gear mechanism is contained inside the console. Removal of screw and console cover (Figure 3-2, item 7) permits access to gears for service and periodic application of gear grease.

2.3.3 Model Series F___PE Disassembly

To access controls, screw is removed and bottom cover is slid down to the floor. Repair and testing of contactors and water level control is assisted by loosening the separate mounting plate for these components. For all other controls, it is necessary to reach up inside the kettle.

NOTE:

For more extensive repair, it is possible to disassemble the pedestal mounting and lift the kettle off the base plate. After repairs are completed, the base plate cover must be resealed to the floor and the pedestal using Silicone sealant.

2.3.4 Heating Element Replacement

Heating elements are replaceable. The kettle is equipped with three separate protective features—a low water level control, a tilt shut-off switch and a thermostat control.

Defective elements are isolated by testing each element with an ohmmeter. If a zero ohm reading cannot be obtained for any element, it is defective.

To replace defective element, proceed as follows:

F___PE

1. Lay kettle on cover hinge.
2. Remove screws from both halves of bottom cover.
3. Remove each cover half separately.
4. Remove nuts from element.
5. Remove element.
6. Install new element.
7. Reverse steps 1-4.

F___LE

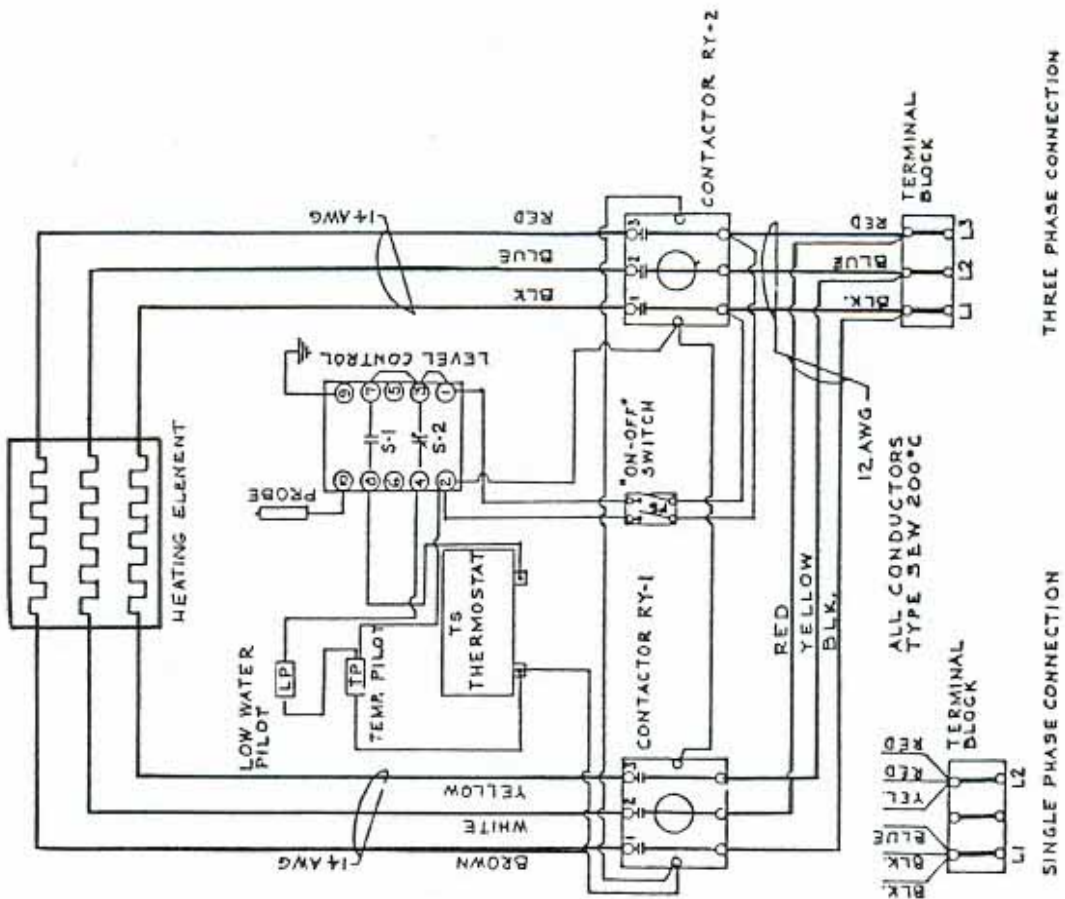
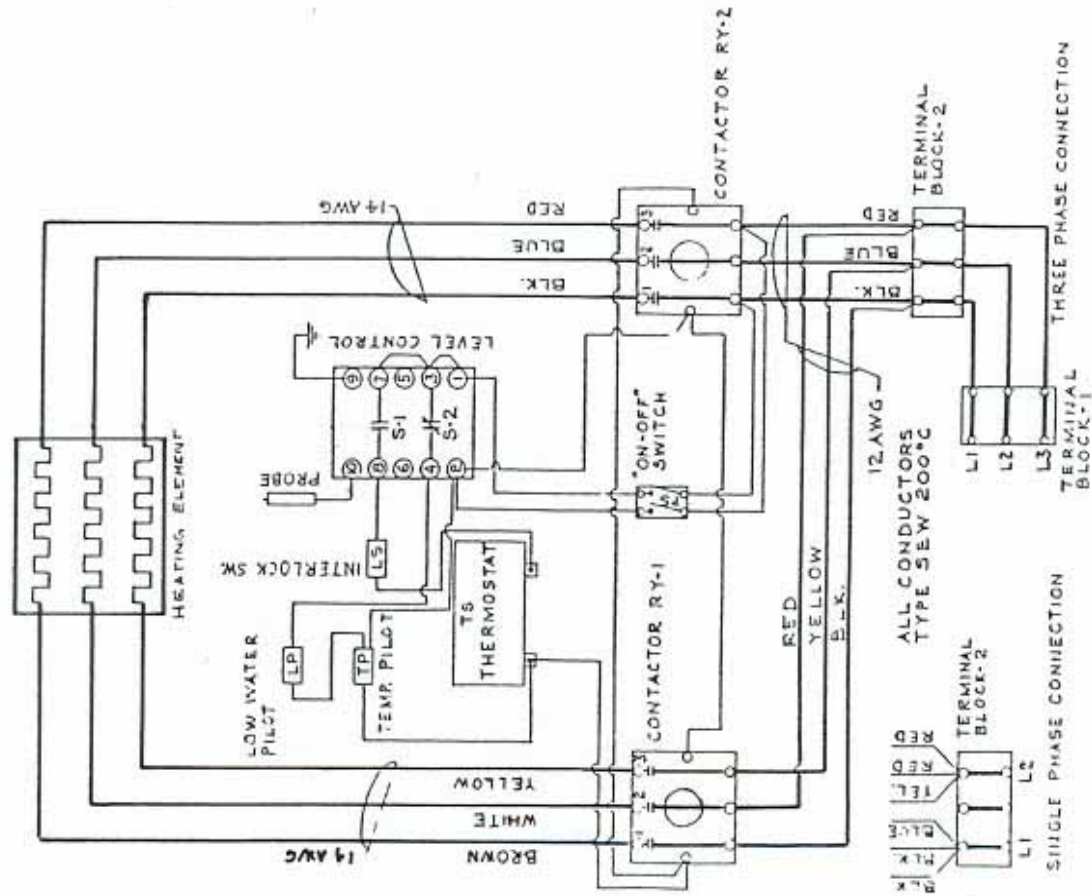
1. Lay kettle on cover hinge.
2. Remove flanged foot from each leg.
3. Remove screws from bottom cover.
4. Remove cover.
5. Remove nuts from element.
6. Remove element.
7. Install new element.
8. Reverse steps 1-5.

FT___LE

1. Lay kettle on cover hinge (if so equipped) or on rear of kettle.
2. Remove screws from bottom cover.
3. Remove cover.
4. Remove nuts from element.
5. Remove element.
6. Install new element.
7. Reverse steps 1-4.

TABLE 2-2
ELECTRICAL CHARACTERISTICS

MODELS	KW	PHASE	208VAC AMP	240VAC AMP	480VAC AMP	220/380VAC AMP	240/415VAC AMP
F-20PE, FT-20LE, F-20LE	12	1 3	57 34	50 29	25 15	— 32	— 29
F-30PE, FT-30LE, F-30LE	15	1 3	73 42	63 37	32 18	— 40	— 37
F-40PE, FT-40LE, F-40LE	24	3	67	58	29	63	58
F-60PE, FT-60LE, F-60LE	24	3	67	58	29	63	58
F-80PE, FT-80LE, F-80LE	24	3	67	58	29	63	58



Stationary Models (F—LE series) 208V, 230V, 240V

Tilting Models (FT—LE series) 208V, 230V, 240V

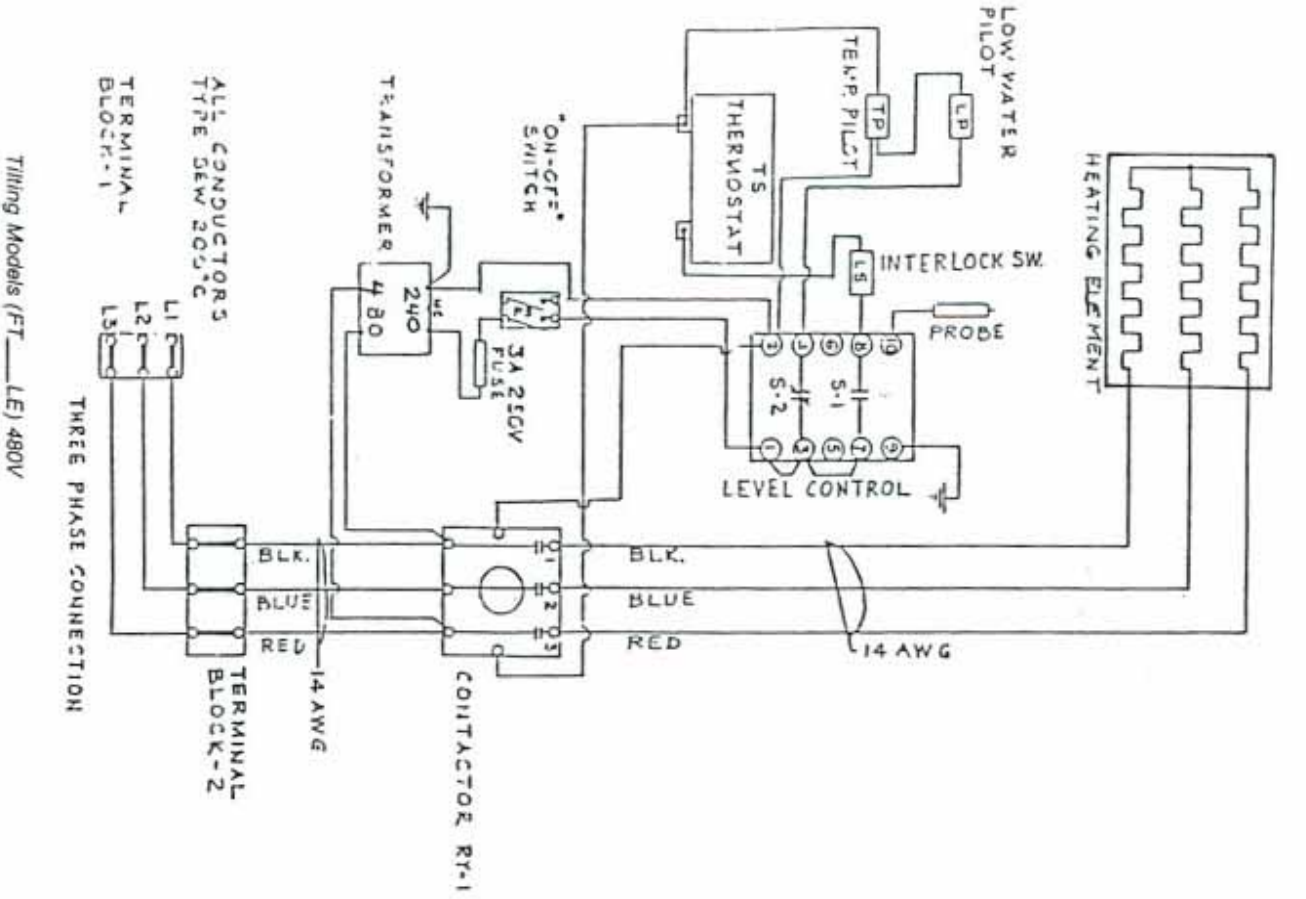
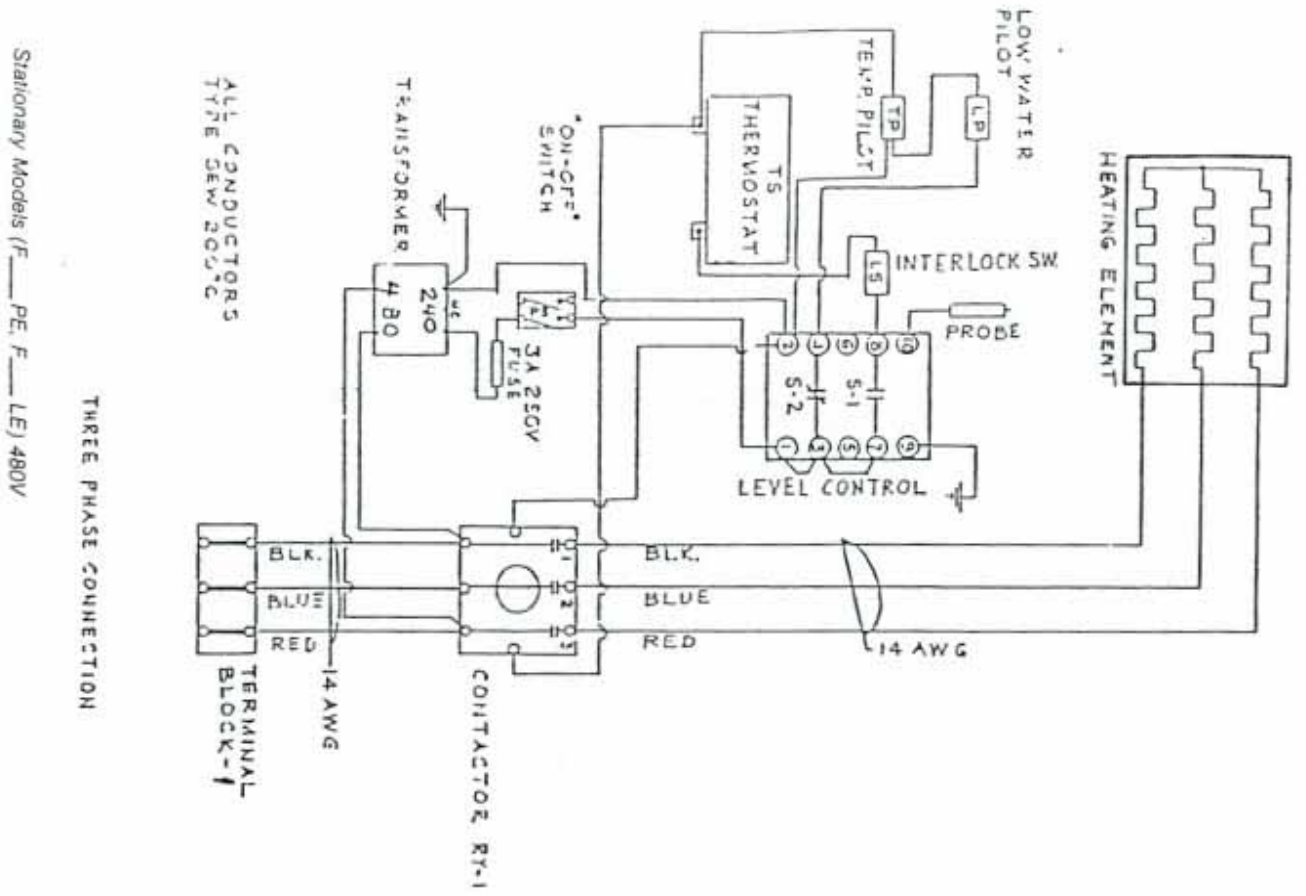
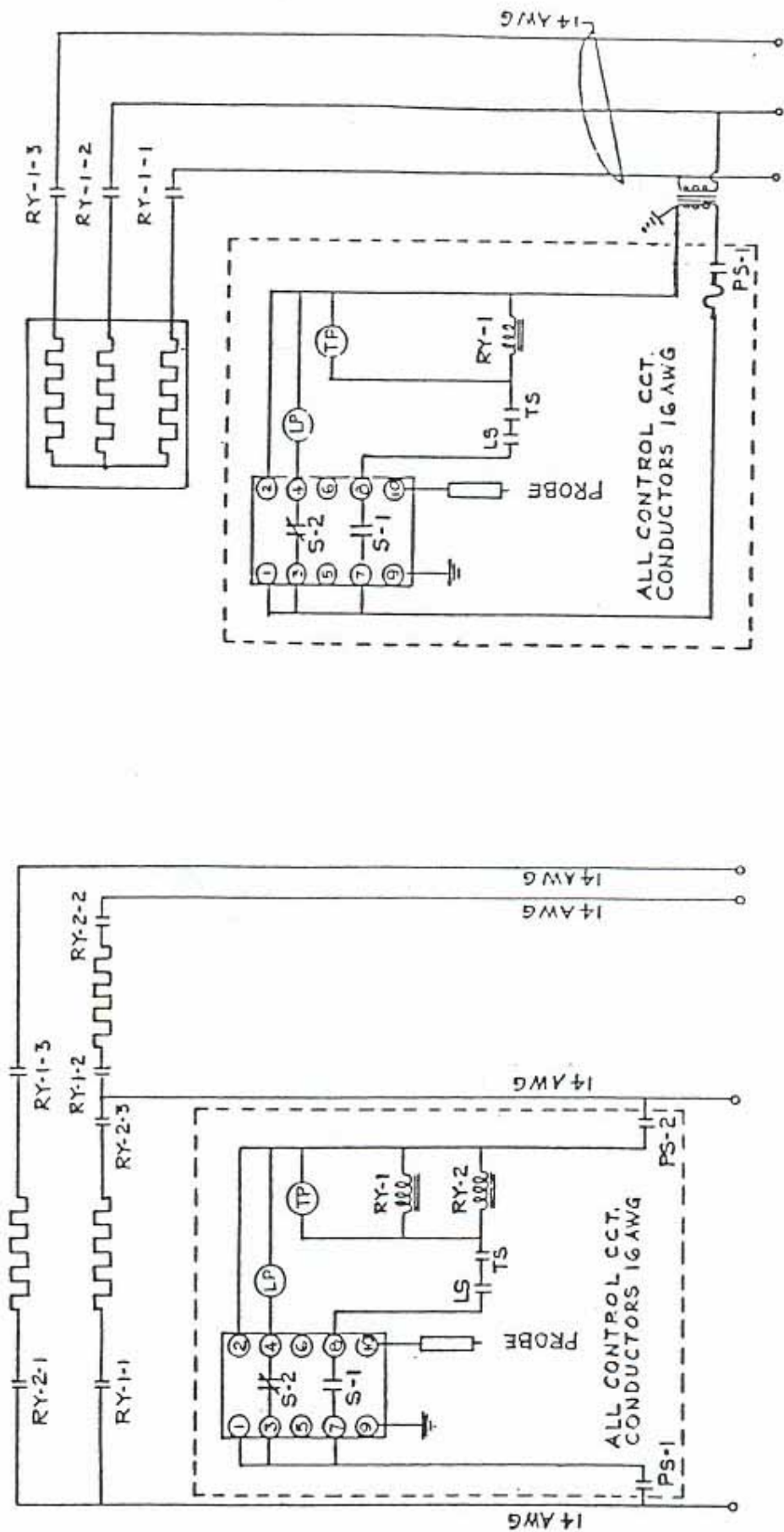


Figure 2-2



208V, 230V, 240V

480V (20 & 40 gallon only)

NOTE: See Table 2-2 for electrical connections

Figure 2-3 Schematic Diagram—Stationary & Tilting Model Series (F___PE, F___LE, FT___LE)

SECTION 3 ILLUSTRATED PARTS LIST

3.1 GENERAL

This section contains a complete listing of all replaceable parts of self-contained, steam jacketed kettles. For the purpose of parts identification, the units are broken down into several views with individual parts keyed to accompanying parts lists. Each parts list contains the figure index number, the Market Forge® part number and an abbreviated description.

3.2 ORDERING INFORMATION

Orders for repair parts should be directed to the nearest authorized parts distributor. For a current Market Forge® Authorized Parts Distributor List, contact:

Product Service Department
Market Forge® Company
35 Garvey Street
Everett, MA 02149
Telephone: (617) 387-4100

All orders should contain the Market Forge® part number(s), the part description(s), and the model and serial numbers of the kettle for which the part(s) is ordered.

3.3 INDEX OF ILLUSTRATED PARTS LISTS

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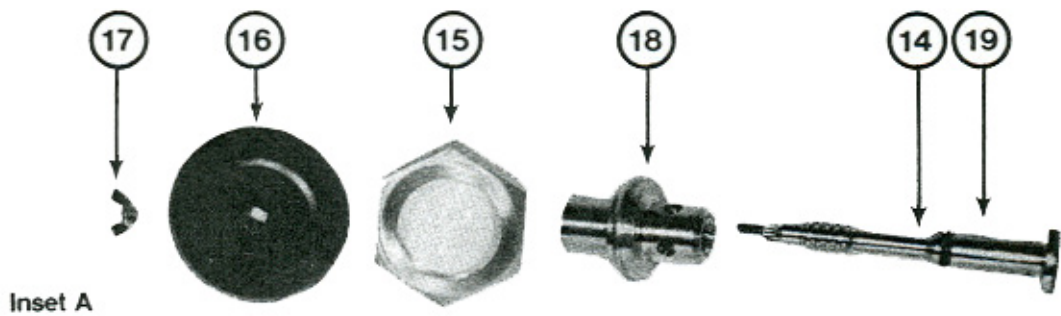
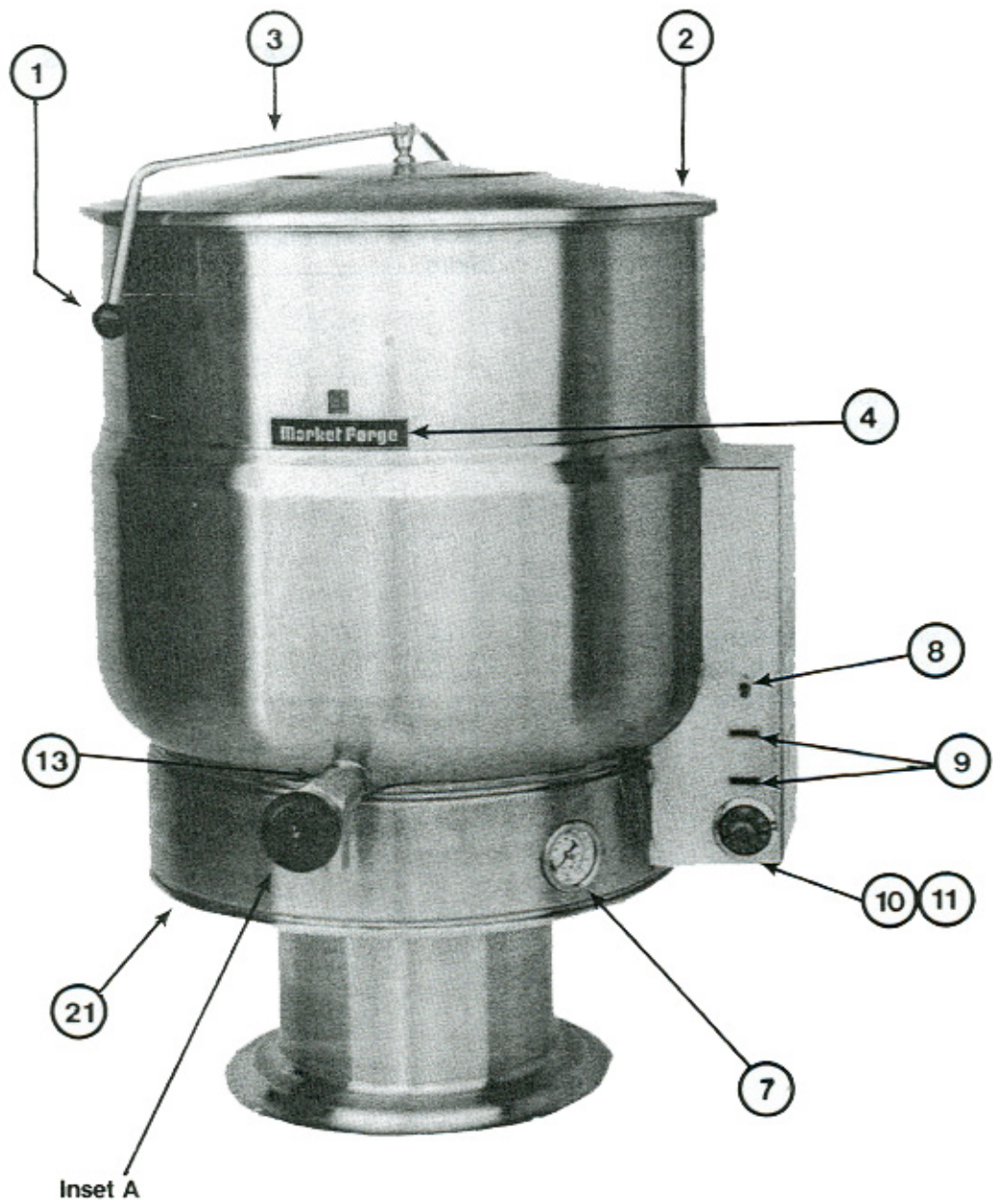


Figure 3-1 Kettle Exterior and Controls

Fig. 3-1 Index No.	Part Number	Description
1	97-5008	Knob, Lid (F____PE,F____LE)
2	97-5051	Cover, Models F-20PE, F-20LE
	97-5052	Cover, Models F-30PE, F-30LE
	97-5053	Cover, Models F-40PE, F-40LE
	97-5054	Cover, Models F-60PE, F-60LE
	97-5055	Cover, Models F-80PE, F-80LE
3	97-5056	Lever, Cover, Models F-20PE, F-20LE
	97-5057	Lever, Cover, Models F-30PE, F-30LE
	97-5058	Lever, Cover, Models F-40PE, F-40LE
	97-5059	Lever, Cover, Models F-60PE, F-60LE
	97-5060	Lever, Cover, Models F-80PE, F-80LE
4	10-5562	Logo Plate, "Market Forge"
5	_____	_____
6	_____	_____
7	97-5002	Pressure Gauge
8	97-5050	Tip, Lever (Red), Toggle Switch ON/OFF
9	20-0007	Pilot Light
10	97-5013	Knob, Thermostat
11	97-5012	Bezel, Thermostat
12	* 97-5061	Cover, Base Plate (F PE)
13	10-4928	Valve, Draw-off, 1 1/2"
	97-5063	Valve, Draw-off, 2"
	08-0008	Valve, Draw-off, 3"
14	10-4967	Stem, 1 1/2" Valve
	97-5075	Stem, 2" Valve
	20-0180	Stem, 3" Valve
15	10-4970	Hex Nut, 1 1/2" Valve
	97-5069	Hex Nut, 2" Valve
	97-5070	Hex Nut, 3" Valve
16	10-4971	Knob, 1 1/2" & 2" Valves
	20-0193	Knob, 3" Valve
17	10-4972	Wing Nut, Knob, 1 1/2" & 2" Valves
	97-5066	Acorn Nut, Knob, 3" Valve
18	97-5071	Bonnet, 1 1/2" Valve
	97-5072	Bonnet, 2" Valve
	10-4698	Bonnet, 3" Valve
19	10-4969	"O" Ring, 1 1/2" Valve
	97-5078	"O" Ring 2" Valve
	97-5079	"O" Ring, 3" Valve
20	* 97-5105	Strainer, Perforated, 1 1/2" Valve
	* 97-5106	Strainer, Perforated, 2" Valve
	* 97-5113	Strainer, Perforated, 3" Valve
21	* 97-5080	Cover, Bottom, Model F-20PE
	* 97-5081	Cover, Bottom, Model F-30PE
	* 97-5082	Cover, Bottom, Model F-40PE
	* 97-5083	Cover, Bottom, Model F-60PE
	* 97-5084	Cover, Bottom, Model F-80PE
	* 97-5085	Cover, Bottom, Model F-20LE
	* 97-5086	Cover, Bottom, Model F-30LE
	* 97-5087	Cover, Bottom, Model F-40LE
	* 97-5088	Cover, Bottom, Model F-60LE
	* 97-5089	Cover, Bottom, Model F-80LE
22	* 91-1232	Cover, Spring, Torsion
23	* 10-2448	Washer, Nylon
24	* 90-3042	Rod, Retaining
25	* 10-2359	Nut, Acorn, 1/4-20
26	* 10-2747	Spring, Torsion

*Not Shown

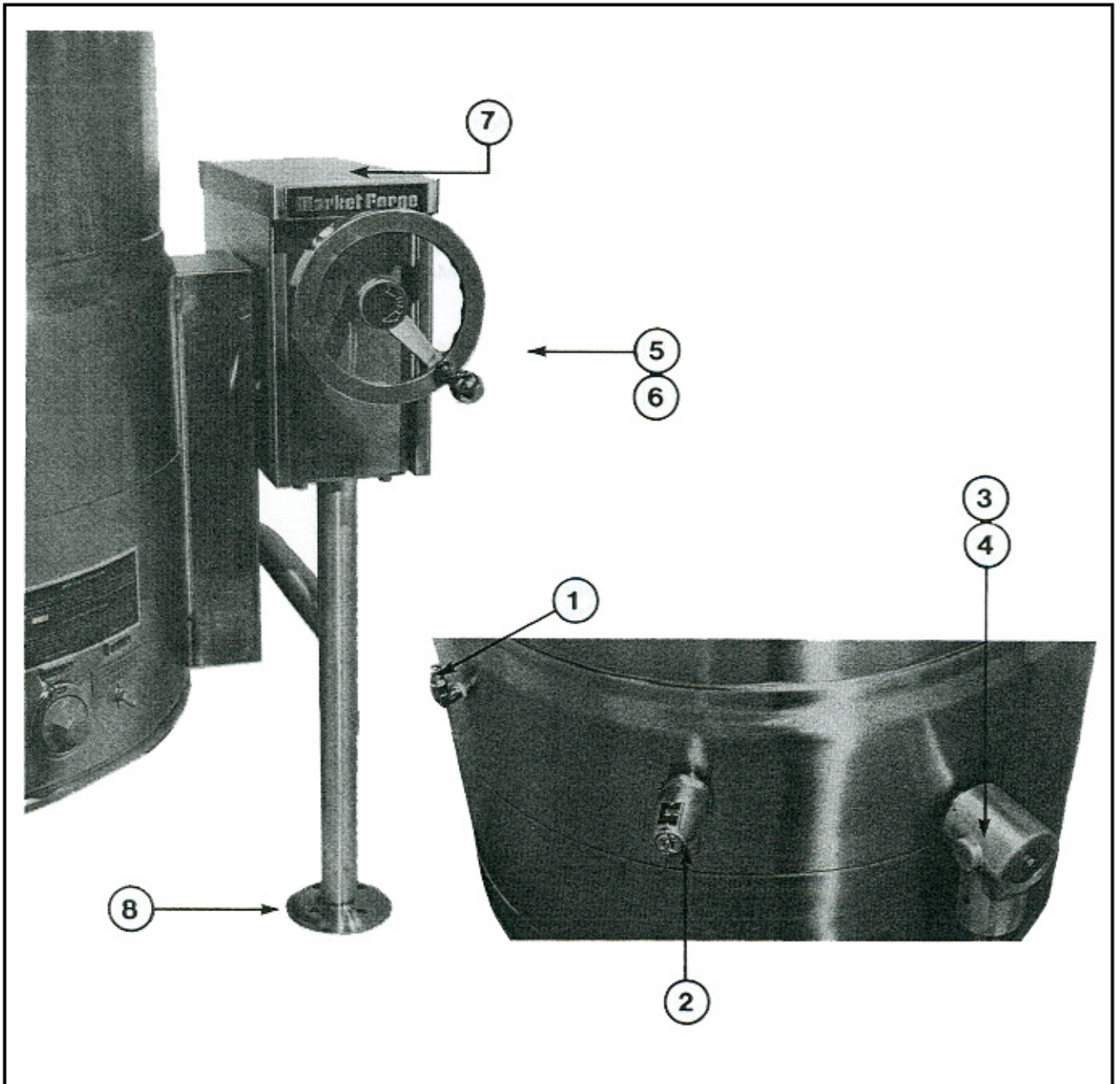


Figure 3-2 Safety Valve, Bleed Vent, and External Tilting Components

Fig. 3-2 Index No.	Part Number	Description
1	97-5010	Vent, Bleed
2	97-5009	Valve, Safety Relief
3	97-5049	Bearing, Outbore (FT____LE only)
4	97-5110	"O" Ring (FT____LE only)
5	97-5090	Handwheel (FT____LE only)
6	97-5091	Screw, Set, Handwheel (FT____LE only)
7	97-5114	Cover, Console (FT____LE only)
8	97-5032	Foot, Flanged (FT____LE, F____LE)

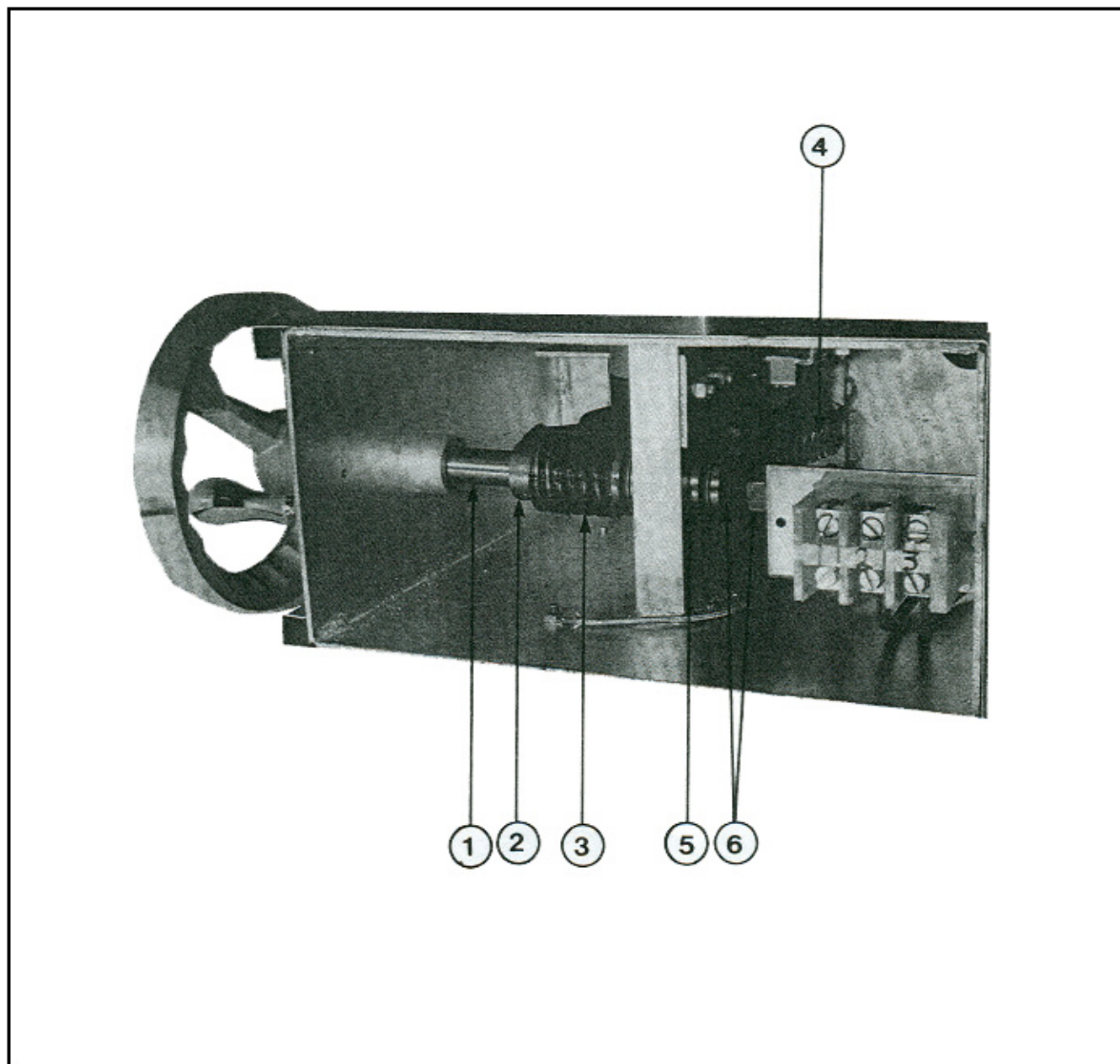


Figure 3-3 Console Interior FT____LE

Fig. 3-3 Index No.	Part Number	Description
1	97-5092	Shaft, Operating
2	97-5093	Pin, Tension
3	97-5094	Gear, Worm
4	97-5097	Segment, Gear, Small (FT-20LE, FT-30LE, FT-40LE)
	97-5098	Segment, Gear, Large (FT-60LE, FT-80LE)
5	97-5095	Bearing, Thrust
6	97-5096	Nut, Jam
7	* 20-0083	Switch, Limit
8	* 97-5099	Collar, Spacer
9	* 97-5100	Bolt, Fastening
10	* 97-5101	Washer, Lock
11	* 97-5109	Key, Worm

*Not Shown

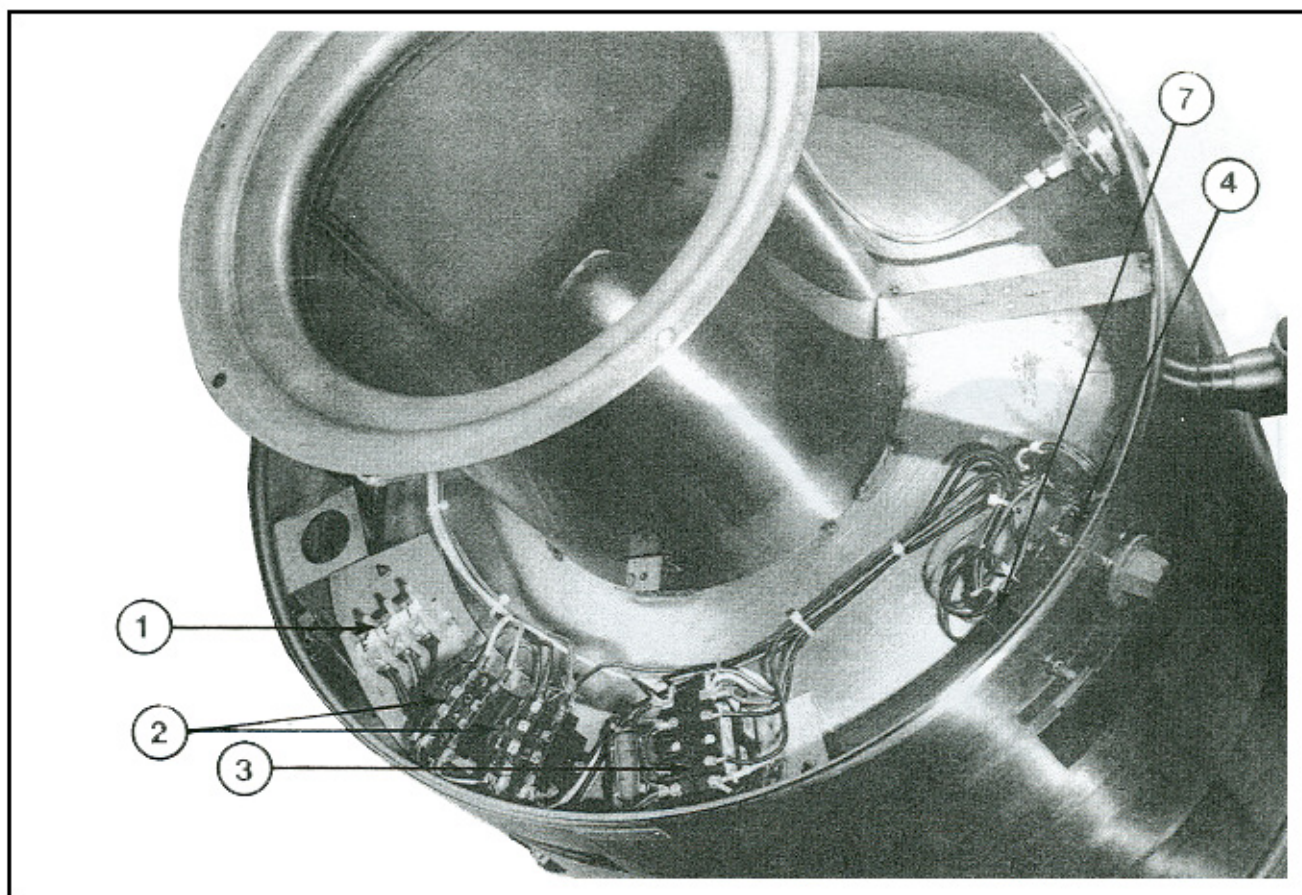


Figure 3-4(A) Electrical Components F —PE

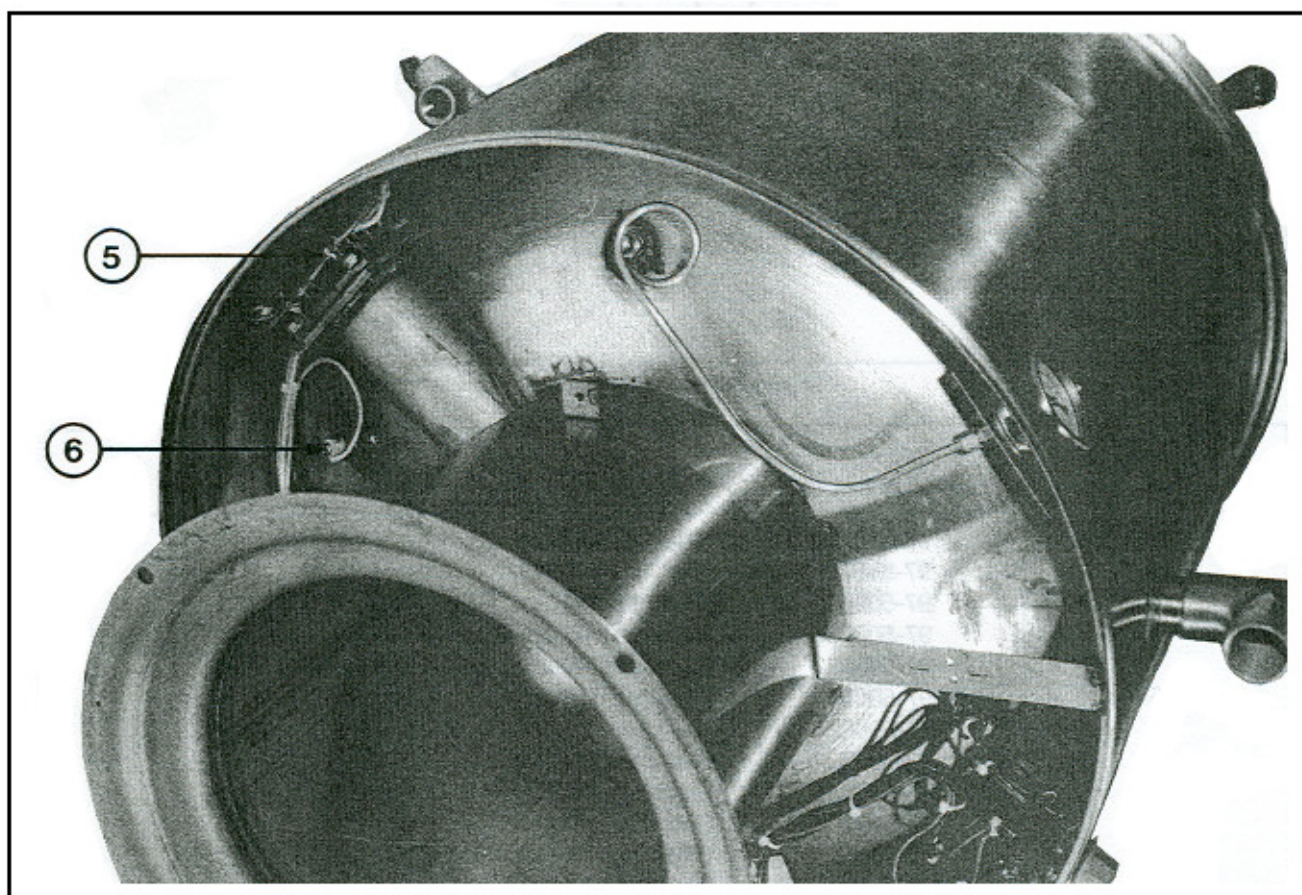


Figure 3-4(B) Electrical Components F —PE

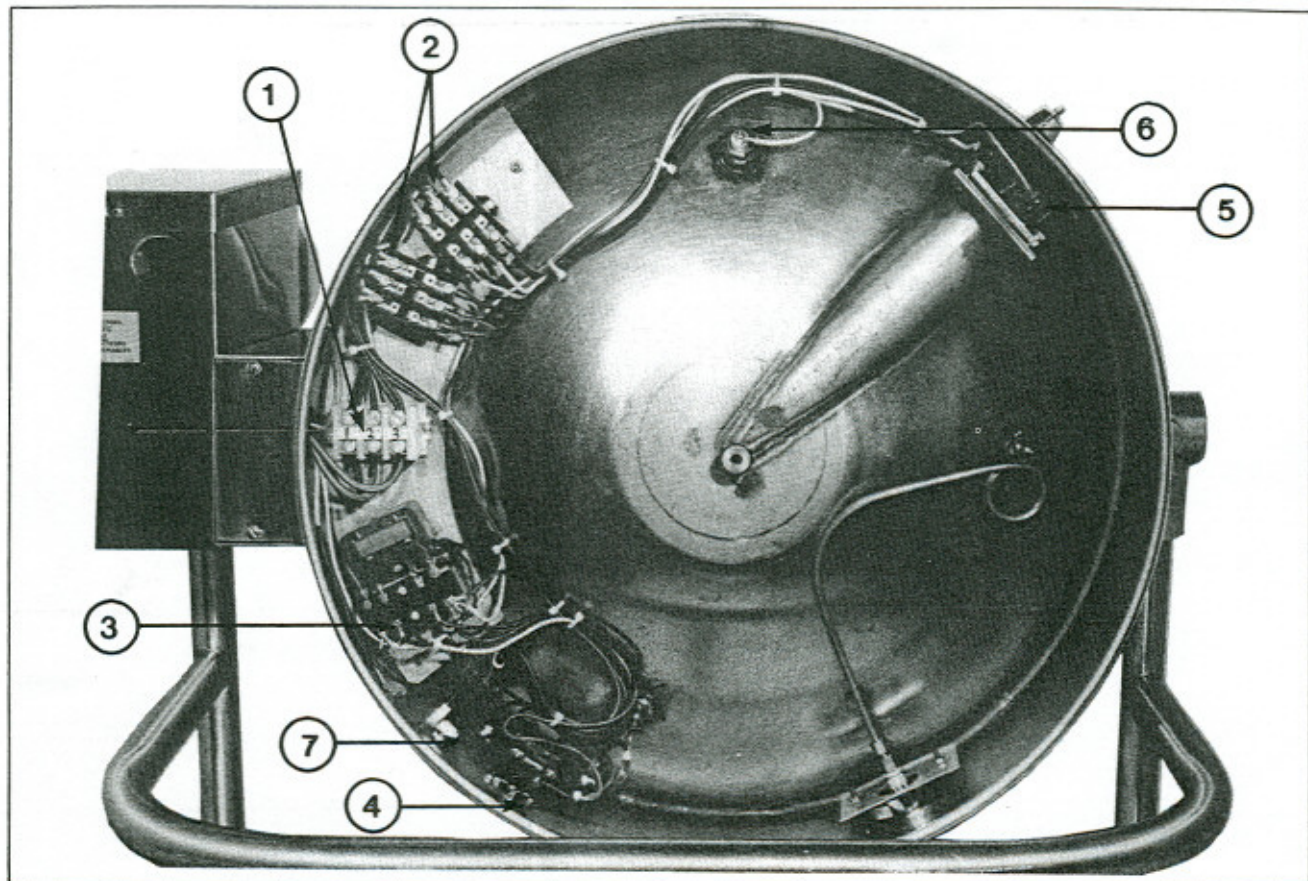


Figure 3-4(C) Electrical Components FT___ LE

Fig. 3-4 Index No.	Part Number	Description
1	97-5047	Block, Terminal, Section
	97-5048	Block, Terminal, End
2	20-0043	Contactors
3	10-7934	Control, Water Level
4	97-5048	Thermostat
5	97-5019 (208V)	Element, Heating, Assy., 12KW- All 20 gallon kettles
	97-5020 (220V)	
	97-5021 (240V)	
	97-5022 (480V)	
	97-5033 (208V)	Element, Heating, Assy. 15KW- All 30 gallon kettles
	97-5034 (220V)	
	97-5035 (240V)	
	97-5036 (480V)	
	97-5127 (208V)	Element, Heating, Assy., 24KW
	97-5129 (220V)	
	97-5128 (240V)	
	97-5130 (480V)	
6	10-7935	Probe, Water Level
7	97-5011	Switch, Power