

# OWNER'S MANUAL

SELF-GENERATING STEAM JACKETED COUNTER TILTING KETTLES



- MODELS:
- FT-4CE
  - FT-6CE
  - FT-10CE
  - FT-12CE



Form Number: S-2337 B 09/12

*"The Premier Steam Cooking Equipment Manufacturer"*

Printed in USA

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## IMPORTANT NOTES

This manual should be read thoroughly and all instructions followed carefully.

**Do not attempt to operate this unit in the event of a power failure.**

**Keep the appliance area free and clear from combustibles. Do not obstruct the flow of combustion and ventilation air. Adequate clearances must be maintained for servicing and proper operation.**

**This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.**

### **WARNING:**

**Improper installation, operation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing, operating or servicing this equipment.**

**This manual should be retained for future reference.**

## INTRODUCTION

**THIS OWNERS MANUAL CONTAINS DESCRIPTIVE INFORMATION, INSTALLATION, OPERATING INSTRUCTIONS, MAINTENANCE AND TROUBLE-SHOOTING INFORMATION FOR MODELS FT-4CE, FT-6CE, FT-10CE & FT-12CE STEAM-JACKETED KETTLES. PARTS LISTS ARE ALSO INCLUDED IN WHICH EACH REPLACEABLE PART IS IDENTIFIED AND SHOWN IN AN ACCOMPANYING ILLUSTRATION.**

### **Description:**

Market Forge Models FT-4CE (4-gallon capacity), FT-6CE (6 gallon capacity), FT-10CE (10 gallon capacity) and FT-12CE (12 gallon capacity) are electrically powered, self-contained, counter-top, tilting Kettles. Each model has a jacket of double-wall construction forming a sealed reservoir around the lower 2/3 of the kettle.

The reservoir is charged with water and anti-freeze solution. Kettles are equipped with a removable electric heating element and controls, including a low water cutoff device for protection of the heating element. Both models are of identical construction, except for kettle size and element heating capacity.

### **Basic Functioning:**

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

1. Operator flips the power switch to the ON position and sets the temperature control dial at the desired setting from 1 to 10 (90°F to 300°F, 32°C to 149°C, jacket temperature).
2. Control circuit is normally completed to the temperature controller if the following conditions exist:
  - a. Water level in kettle reservoir is adequate to prevent circuit interruption by the low water cutoff device. An activated cutoff is indicated by the amber low water light turning on, and the heating element shutting off.
  - b. Kettle is in vertical position with circuit completed through the tilt interlock switch (Micro switch).
3. Thermostatic control contacts close to energize contactor coils.
4. Power is supplied to the elements through closed power contactors.
5. As the temperature of water rises in the kettle reservoir increase in steam pressure is indicated on the pressure gauge.
6. When the temperature of steam in the reservoir reaches the setting shown on the temperature control dial the temperature controller opens to break the contacts and shut off the heating element. ON/OFF cycles will occur as required to maintain temperature control. See operation section.

### **Service:**

Required service both preventive and corrective is explained in operation section. 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 Co.**

35 Garvey Street, Everett, Massachusetts 02149-4403

Telephone: (617) 387-4100, (866) 698-3188

Technical Service & Parts: (888) 259-7076

[custserv@mfi.com](mailto:custserv@mfi.com)

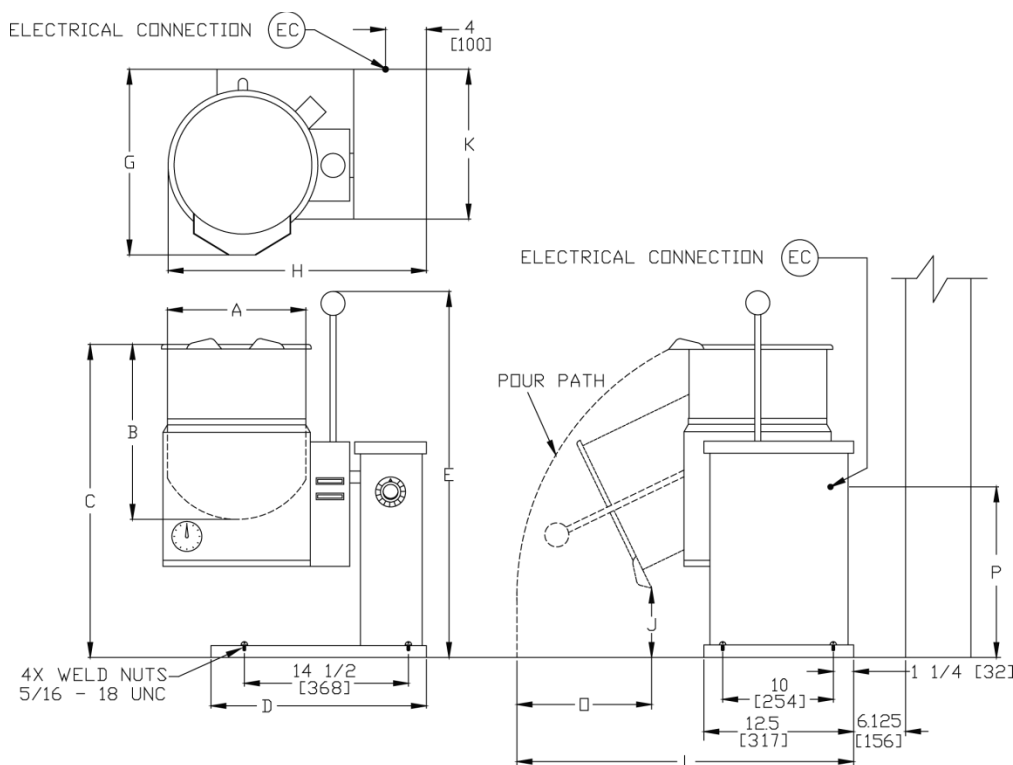
[www.mfi.com](http://www.mfi.com)

The model and serial numbers must be referenced when corresponding with Market Forge. These numbers can be found on the data plate located on the right side of the control box.

# INSTALLATION

## Service Connections

MODEL	CAPACITY		A	B	C	D	E	G	H	J	L	P	O
FT-4CE	4-Gal. <i>15 liters</i>	In <i>mm</i>	12 305	10.5 267	21.125 537	15.25 387	33.5 851	14.75 374	22 559	6.375 162	27.75 705	12.5 317	10 254
FT-6CE	6-Gal. <i>23 liters</i>	In <i>mm</i>	12 305	14.5 368	24.5 692	15.25 387	33.5 851	14.75 374	22 559	6.375 162	27.75 705	12.5 317	10 254
FT-10CE	10-Gal. <i>38 liters</i>	In <i>mm</i>	15.75 400	15 381	25.75 654	17.25 483	33 838	14.88 377	26 660	6.125 156	28 711	15 381	12.75 324
FT-12CE	12-Gal. <i>45 liters</i>	In <i>mm</i>	16 406	17 432	28 711	18 458	36.875 937	14.375 365	26 660	5.57 146	28 711	15 381	12.75 324



## Electrical Characteristics

MODEL	pH	208 VAC		240 VAC		408 VAC		220/380 VAC		240/415 VAC	
		kW	AMP	kW	AMP	kW	AMP	kW	AMP	kW	AMP
FT-4CE	1	7.5	36	7.5	31.2	--	--	--	--	--	--
FT-6CE	OR										
	3	7.5	20.8	7.5	18	7.5	9	7.5	11.4	7.5	10.4
FT-10CE	1	12	57.7	12	50	12	14.4	12	18.2	12	16.7
FT-12CE	OR										
	3	12	33.3	12	28.8	12	14.5	12	31.5	12	28.9

## **Installation Instructions:**

1. Immediately after unpacking, check for possible shipping damage. If the kettle is found to be damaged, save the packaging materials and contact the carrier within 15 days of delivery.
2. The kettle must be installed in accordance with:
  - a. State and/or local codes.
  - b. In the USA, the National Electrical Code, ANSI/NFPA-70 (latest edition). In Canada, the Canadian Electrical Code, Part 1, CSA Standard C22.1 (latest edition).

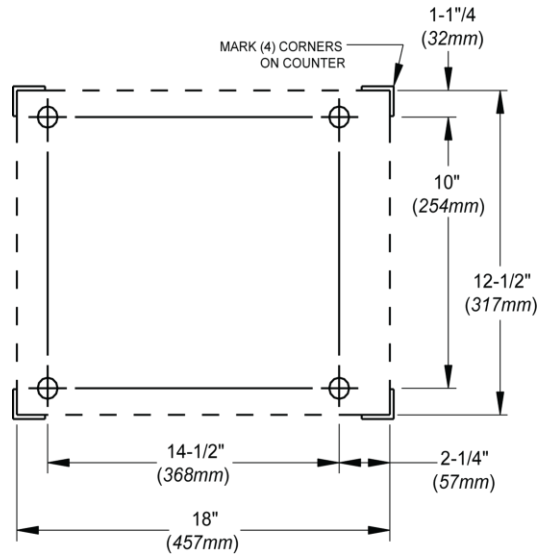


Figure 1

3. Position appliance on counter allowing sufficient rear clearance from wall to tilt freely and completely without obstruction.
4. Mark four corner locations of appliance base.
5. Remove appliance from counter and locate position of 4 holes as per Figure 1. Drill four 7/16" diameter holes.
6. Apply a continuous bead of Silastic or other equivalent sealant along the complete perimeter edge of the appliance base.
7. Use 5/16-18 Hex Cap Screws with suitable flat washers to bolt down. Screw length must be 1-1/4" long plus counter top thickness.
8. Wipe off excess sealant.
9. A Control Box with power supply equivalent to Electrical Rating of appliance should be located conveniently nearby.

### **WARNING:**

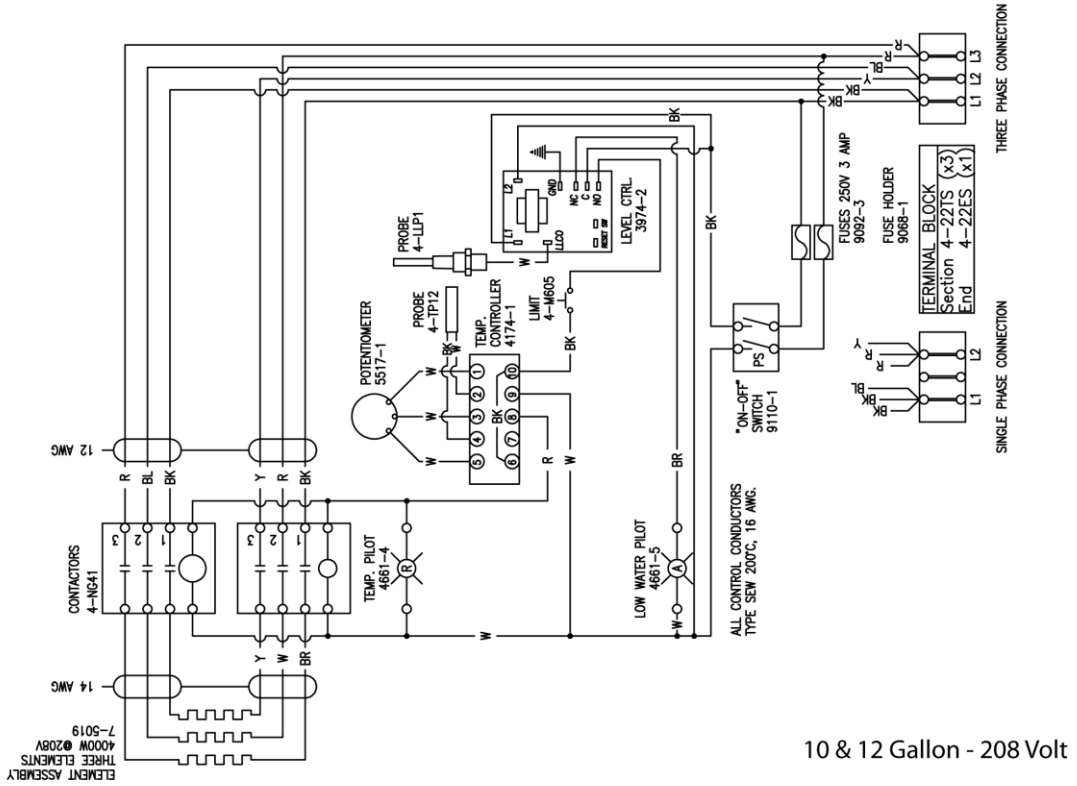
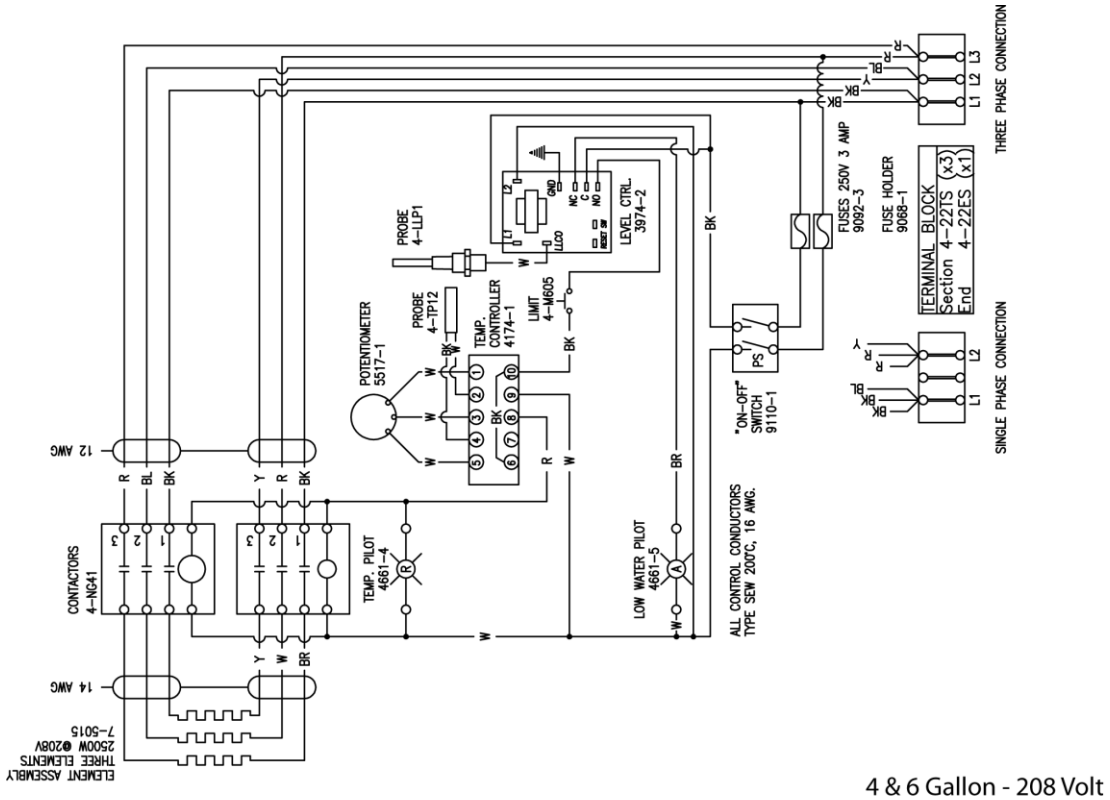
**Electrical and grounding connections must comply with the applicable portions of the National Electrical Code and/or other local electrical codes**

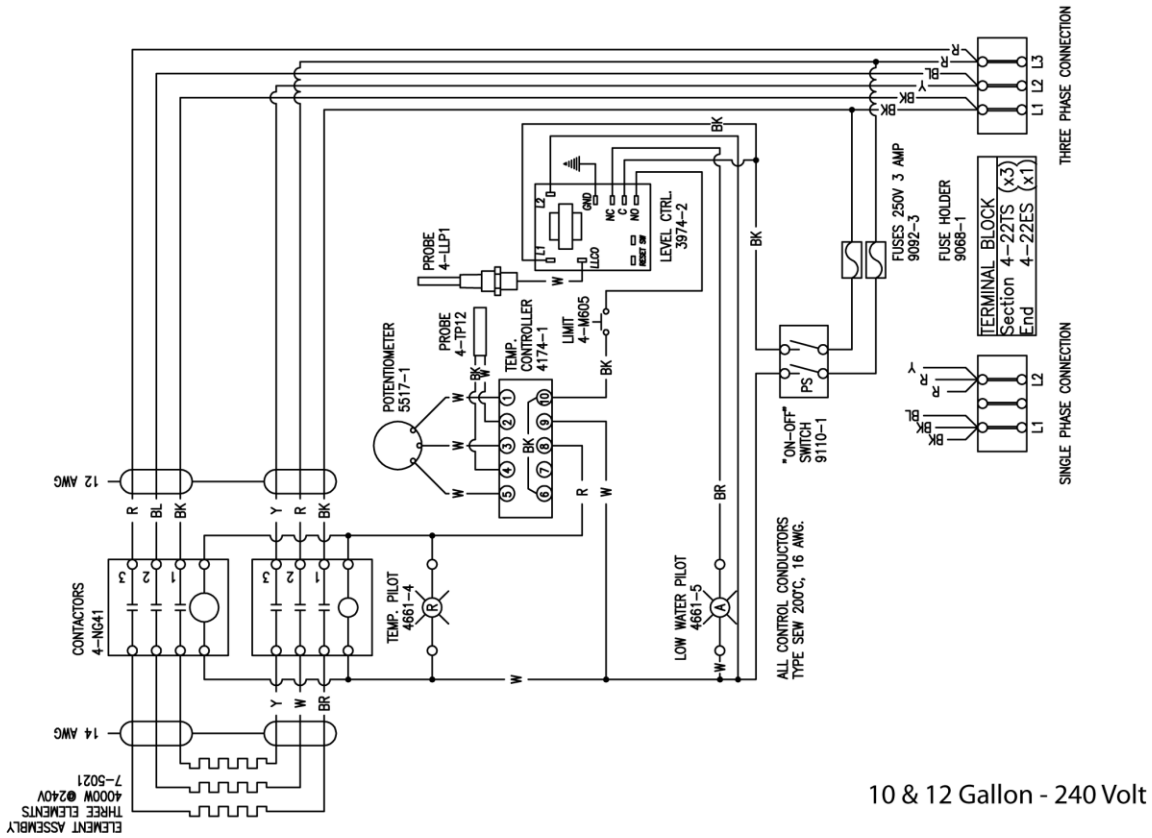
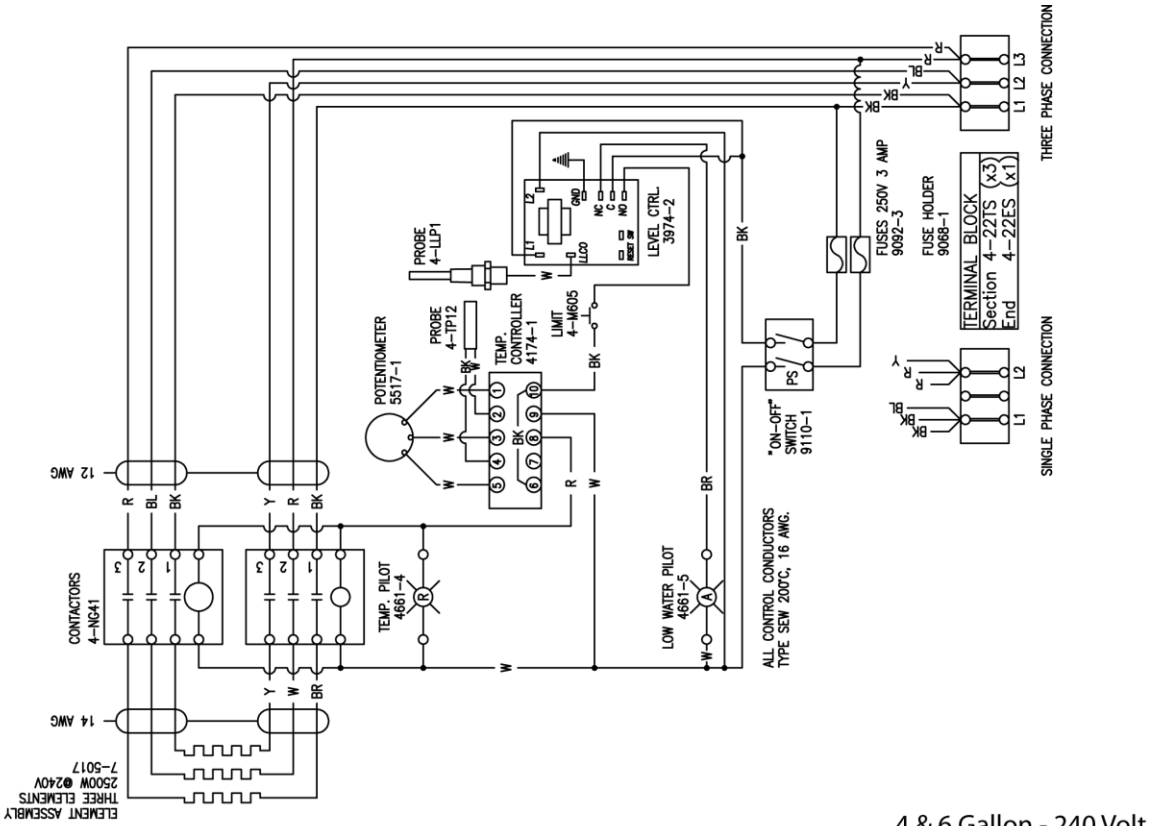
### **WARNING:**

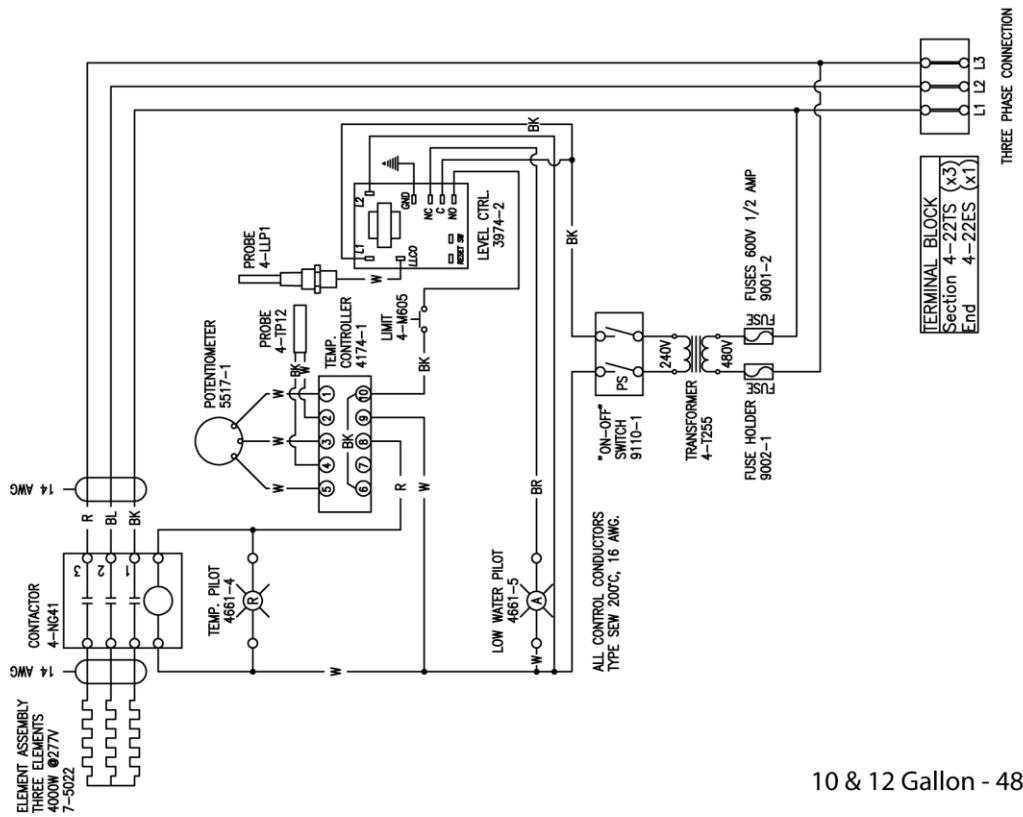
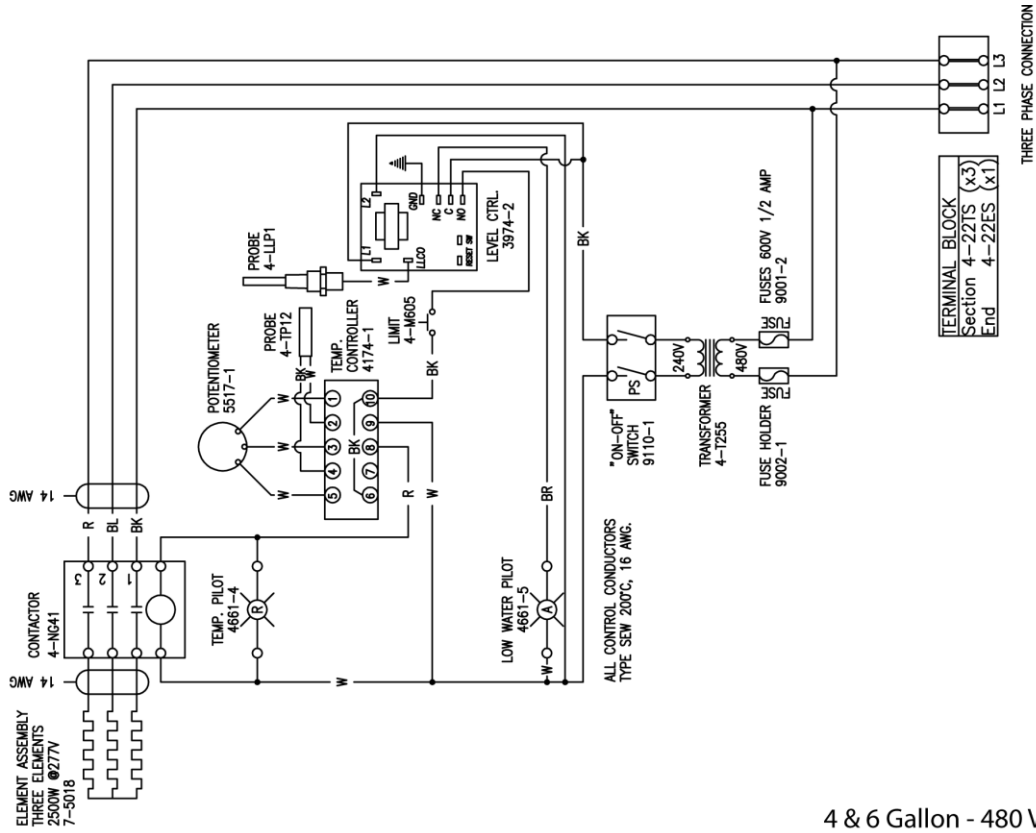
**Disconnect electrical power supply and place a tag at the disconnect switch to indicate you are on the circuit.**

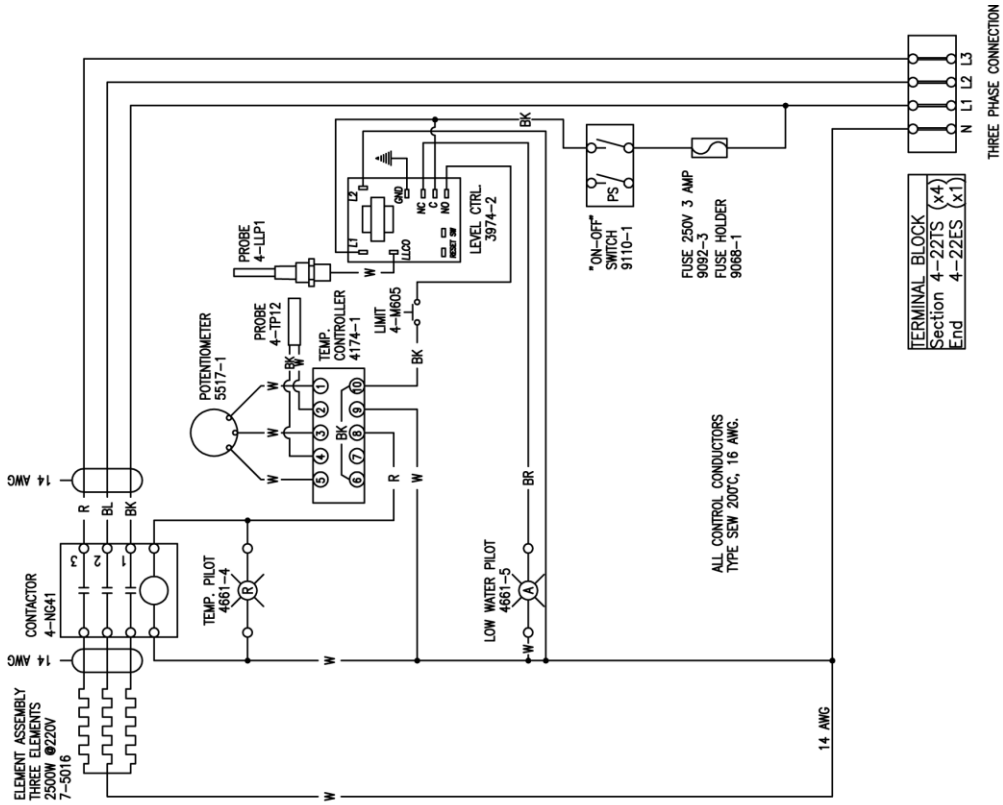
10. A waterproof electrical connection from power supply to console housing must be provided.
11. Ground appliance to terminal provided inside console housing.
12. Turn power ON and check for proper operation.

# Wiring Diagrams

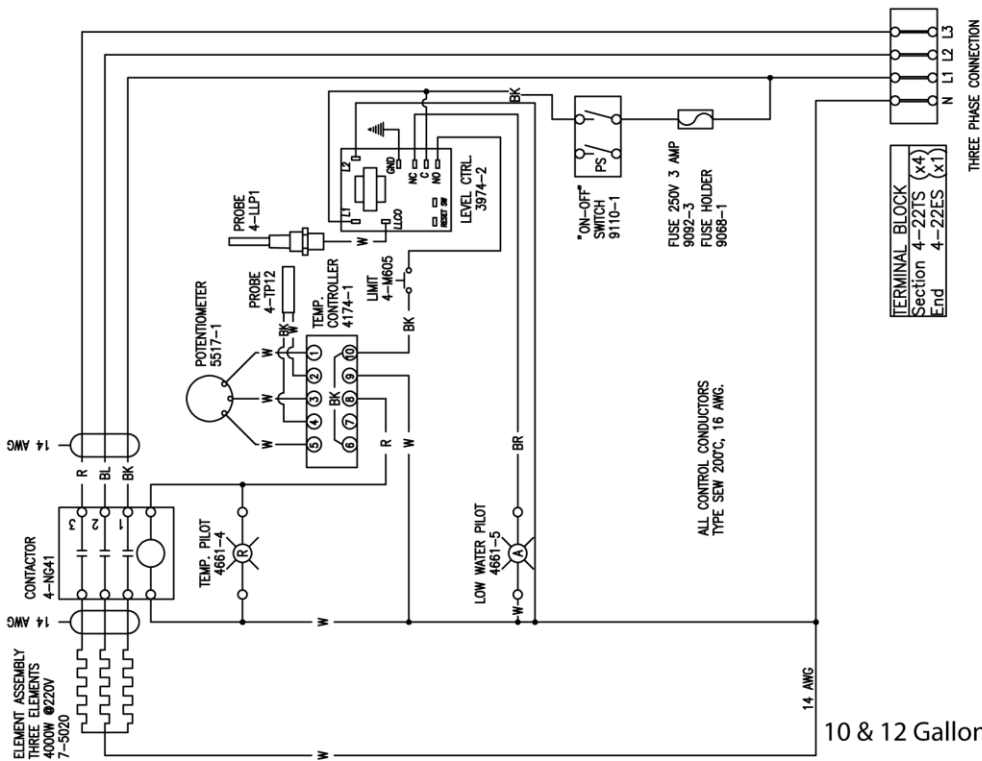




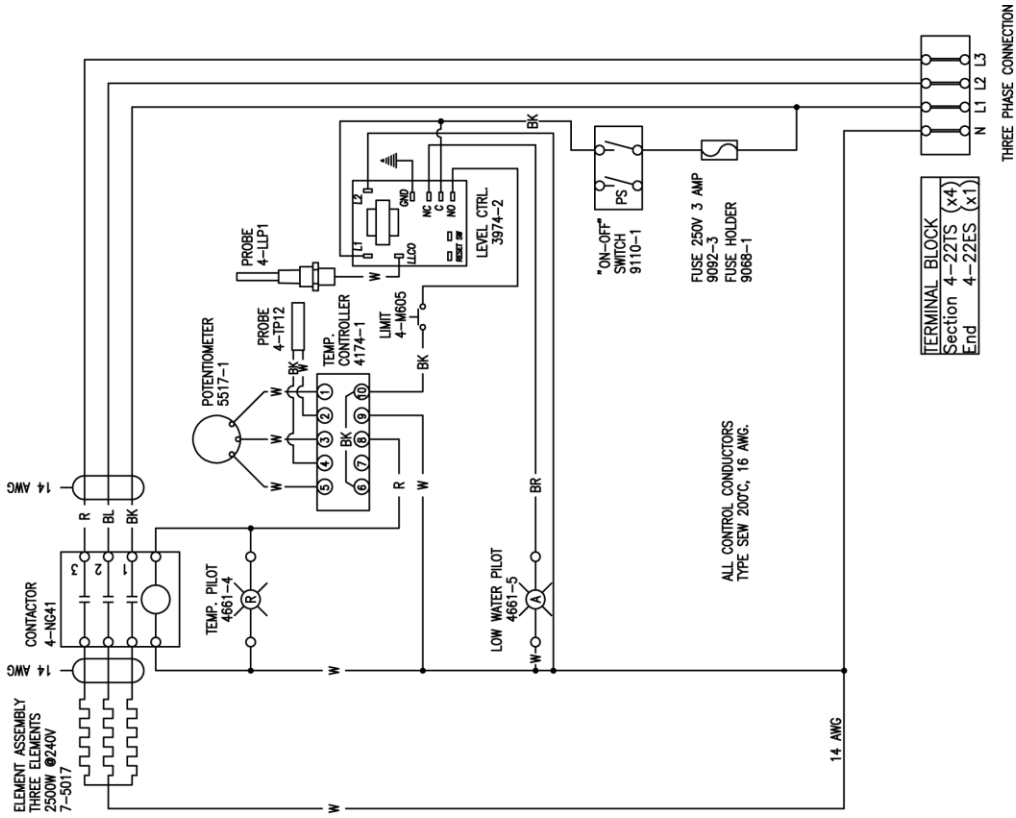




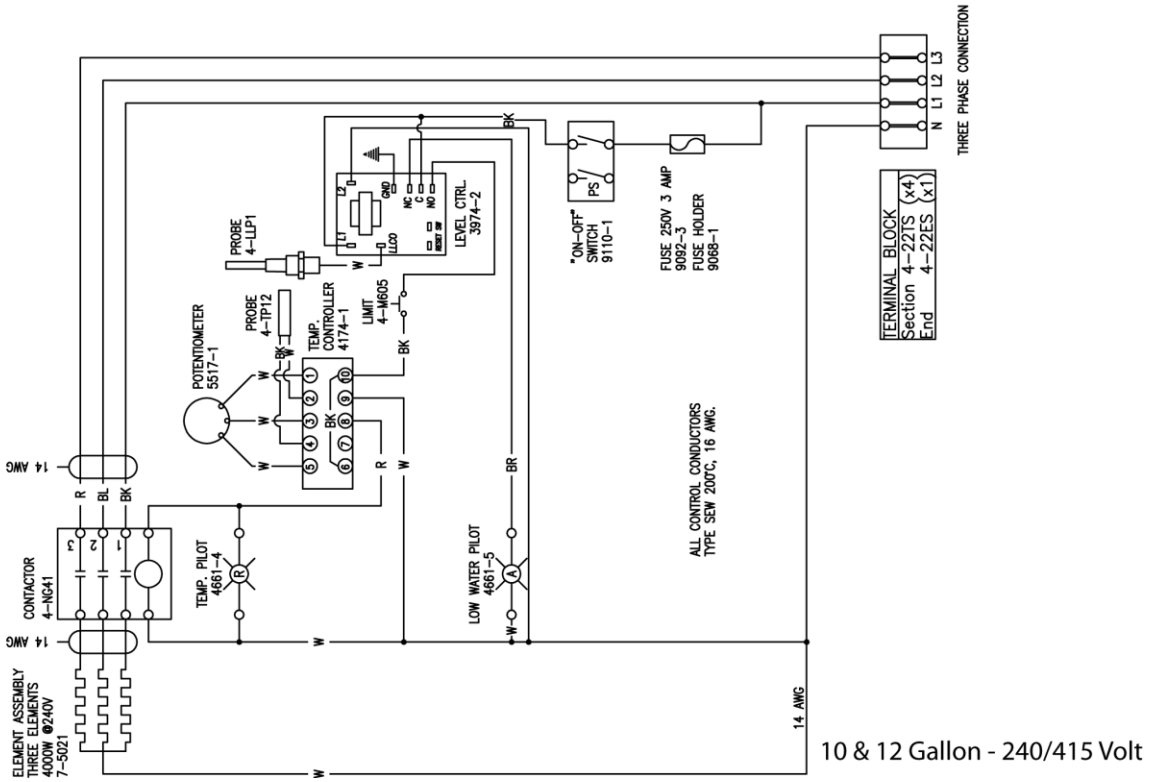
4 & 6 Gallon - 220/380 Volt



10 & 12 Gallon - 220/380 Volt



4 & 6 Gallon - 240/415 Volt



10 & 12 Gallon - 240/415 Volt

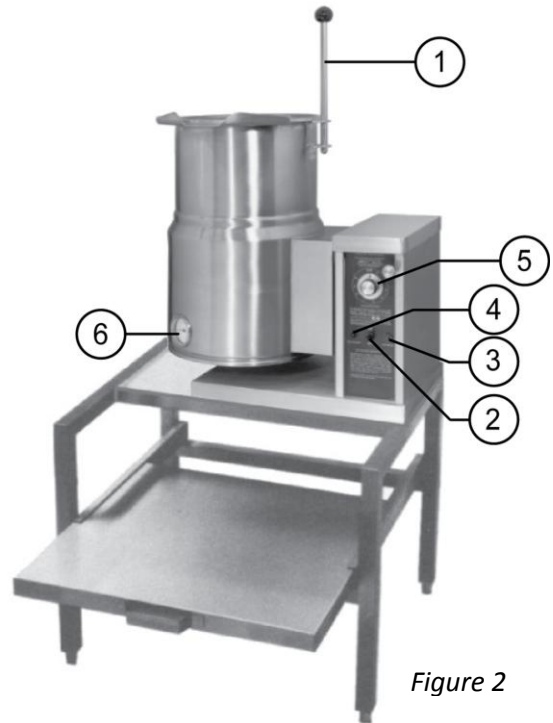
## OPERATION INSTRUCTIONS

1. Ensure that the external electrical shut-off to the kettle is on.
2. Check pressure gauge for correct cold kettle reading. Reading should be in the green vacuum zone. If reading is not in the vacuum zone, follow VENTING INSTRUCTION prior to using the kettle.
3. Place power switch in ON position.
4. Preheat the kettle by placing thermostat knob at maximum and wait until TEMPERATURE light goes off.

**NOTE:**

***Preheating should not be used when cooking milk and egg food products which adhere to hot cooking surfaces. These foods should be placed into kettle before heating is begun.***

5. Add food to be cooked into the kettle.
6. Place thermostat knob at required temperature setting with a temperature range from roughly 165°F to 289°F (74° C to 143° C, jacket temperature.) Refer to chart on page 7.
7. When cooking is finished set thermostat knob and power switch to the OFF position.
8. Pour finished product from kettle using tilt handle. Be careful to avoid splashing.
9. Add water to kettle for cleaning purposes.
10. Wash kettle thoroughly. See CLEANING procedure.



*Figure 2*

**Kettle Controls** (Figure 2)

ITEM NO.	DESCRIPTION
1	Tilt Handle
2	Power Switch
3	Low Water Indicator Light
4	Temperature (Heat Indicator) Light
5	Temperature Control Thermostat
6	Vacuum / Pressure Gauge

### **Thermostat Settings**

<b>Thermostat Settings</b>	<b>Approximate °F</b>	<b>Temperature (Water) °C</b>
4	90	32
5	125	52
6	160	71
7	195	91
8	231	110
9	273	134
10	300	149

### **Tilting Instructions**

Your kettle has the standard “Clean Lock” feature and may not be tilted without disengaging the tilt knob located on the console at the top right. This feature locks the kettle in the upright position and also allows the operator to lock the kettle at 105 degrees for ease of cleaning. To tilt the kettle the full distance, the tilt lock knob must be disengaged from the cleaning position by pulling out the tilt lock knob and tilting the kettle forward the full distance. Follow these steps to tilt kettle:

1. Pull out the tilt knob near top right of console.
2. Using kettle tilt handle pull kettle forward to desired angle of pour or until kettle locks at 105 degrees. The tilt knob can be released after the kettle has been tilted approximately 10°.
3. Kettle will lock in position at 105 degrees and may be tilted further by pulling the tilt lock knob a second time allowing the kettle to tilt the full distance.
4. To return the kettle to the upright position, pull out the tilt lock knob and tilt the kettle upward until it locks in the upright position. The kettle should not move in either direction once in the upright position.

## MAINTENANCE

### Cleaning Instructions

The kettle interior and exterior should be thoroughly washed after each use in preparation of a different food.

1. Add water and mild detergent to the kettle immediately after use.
2. Scrub kettle interior with nylon brush.

**NOTE:**

***Never scrape the inside of the kettle with metal tools, steel scouring pads, or abrasive cleaners. Scratches will result which will spoil the kettle's general appearance and make it harder to clean and maintain a sanitary condition.***

3. Loosen food which is stuck to kettle by allowing it to soak at a low temperature setting.
4. Rinse with clear water and dry.

**WARNING: Do not hose down appliance under any condition. Failure to comply will void warranty.**

5. Wipe down exterior, rinse and dry.

**WARNING: It is NOT RECOMMENDED to use cleaning agents that are corrosive.**

Use of cleaning agents that contain chloride, acids or salts are corrosive and may cause pitting and corrosion when used over a period of time; this will reduce the life of the appliance.

Should pitting or corrosion occur this is not covered by warranty.

Follow the recommended cleaning instructions. Use a mild detergent, warm water and rinse thoroughly.

## TROUBLESHOOTING

### General

No general maintenance is required other than adhering to the Cleaning Procedure Instructions.

### Low Water Level (Filling Jacketed Reservoir)

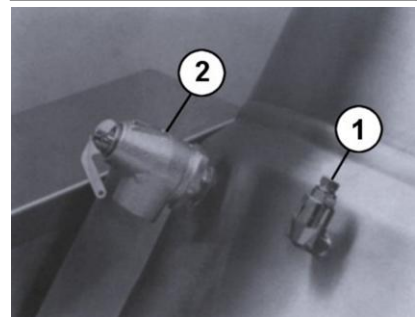
Proper water level must be maintained within the jacket for the kettle to operate. Depletion of water may occur from excessive opening of, or leakage through the safety relief valve.

If water is below required operating level, either initially at start-up or during use, the kettle will automatically shut off, and the LOW WATER signal light will come on.

In order for the kettle to operate, the following procedure must be followed:

1. Trip the safety relief valve lever to relieve all pressure from the kettle jacket.
2. At exterior rear of kettle jacket remove nut from Air Vent.
3. Insert funnel into Air Vent opening and slowly add the indicated amount of distilled water for:  
FT-4CE & FT-6CE Add 50 oz. (1.5 liters)  
FT-10CE & FT-12CE Add 100 oz. (3 liters)
4. Replace Air Vent nut.
5. Follow Air Venting Instructions below.
6. Continue normal Operating Procedure of kettle.

1	Bleed Vent
2	Pressure Relief Valve



### Venting Instructions

Check pressure gauge when kettle is cold. Gauge should be in the green vacuum zone. If not, air is present which must be vented (removed) for proper heating. Use the following procedures to vent air.

1. With an empty kettle, place power switch to the ON position.
2. Set temperature control thermostat to maximum. Heat kettle until heat indicator light goes off.
3. Using a 7/16" wrench, open bleed vent one full turn for 10 seconds and then close.

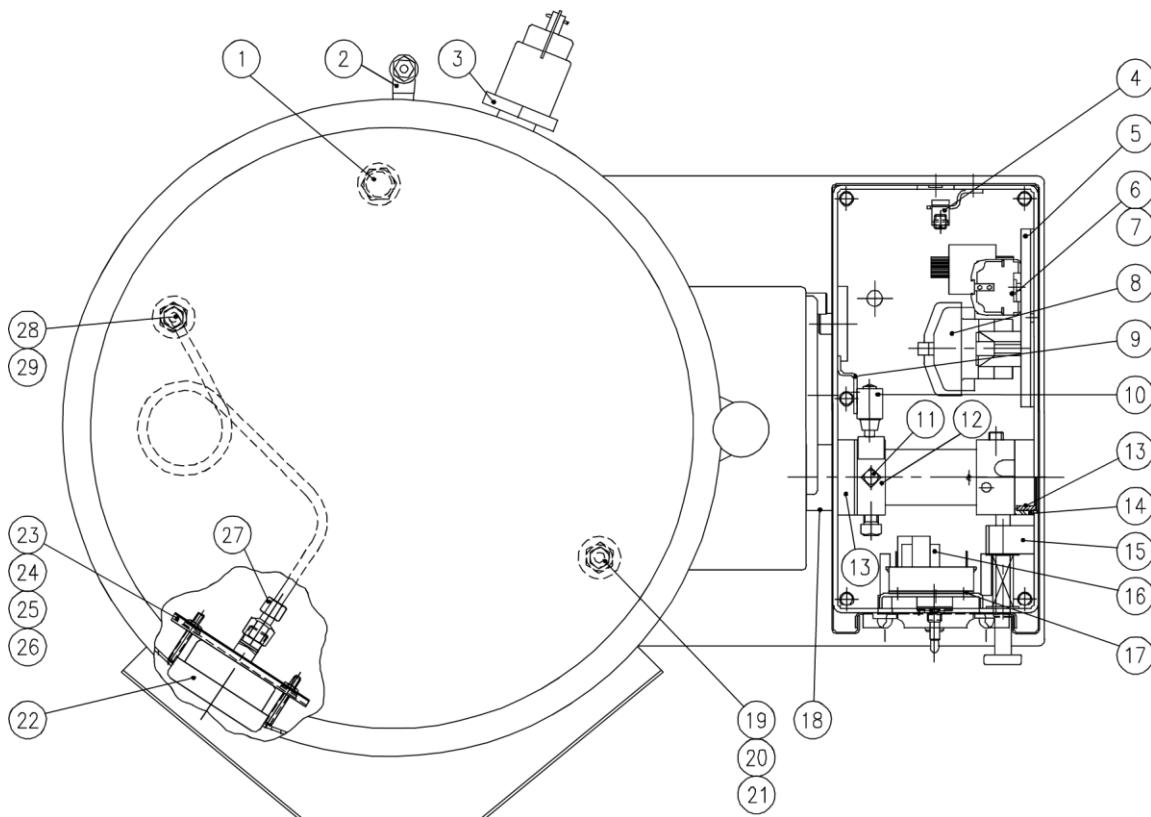
4. Cool kettle. Check for proper vacuum in the green vacuum zone. If reading is not low enough, repeat entire procedure, steps 1 to 3.

**CAUTION:**

**Before adding water to the reservoir, water supply should be analyzed to ensure that hardness is no greater than 2.0- grains per gallon and pH level is within the range of 7.0-8.5. Water which fails to meet these standards should be treated, or ionized distilled water with sodium used. EQUIPMENT FAILURE CAUSED BY INADEQUATE WATER QUALITY IS NOT COVERED UNDER WARRANTY.**

# ILLUSTRATED PARTS LIST

## Top View



**Top View Parts List**

ITEM	PART NO	DESCRIPTION	FT-4CE FT-6CE QTY.	FT-10CE FT-12CE QTY.
1	97-5425	Liquid Level Probe	1	1
2	97-5415	Air Vent Assembly	1	1
3	97-5009	Safety Relief Valve	1	1
4	97-5052	Ground Lug	1	1
5	98-6131	Component Mounting Bracket	1	1

ITEM	PART NO	DESCRIPTION	FT-4CE FT-6CE QTY.	FT-10CE FT-12CE QTY.
6	<a href="#">10-6963</a>	Terminal Block	3	3
	<a href="#">10-6963</a>	Terminal Block, (220/380, 240/415)	4	4
7	10-6962	Terminal Block, End Section	1	1
**8	<a href="#">97-5609</a>	Contactora (208, 240V)	2	2
	<a href="#">97-5609</a>	Contactora (380, 416, 480, 600V)	1	1
9	97-7111	Micro Switch Bracket	1	1
10	<a href="#">97-5414</a>	Micro Switch	1	1
11	97-7112	Square Head Set Screw, 3/8-16 NC x 1/2	2	2
12	<a href="#">97-6518</a>	Actuating Collar	1	1
13	<a href="#">97-5340</a>	Trunnion Bronze Bearing	1	1
14	97-5650	Trunnion Bearing Housing	2	2
15	<a href="#">97-7113</a>	Marine Lock Assembly	1	1
16	<a href="#">97-5797</a>	Temperature Controller	1	1
17	97-6515	Mounting Plate	1	1
18	<a href="#">97-6973</a>	Boston Bronze Bearing	1	1
19	<a href="#">97-6500</a>	Reducer, 3/8 NPT - 1/4 NPT	1	1
20	<a href="#">97-6398</a>	Compression Fitting	1	1
21	<a href="#">97-7114</a>	Temperature Probe	1	1
22	<a href="#">97-6563</a>	Pressure Gauge	1	1
*	<a href="#">97-5620</a>	"O" Ring	1	1
23	97-6499	Pressure Gauge Plate	1	1
24	97-7115	Hex Nut #10 - 32 NC Zinc	2	2
25	97-7116	Flat Washer #10 Zinc	2	2
26	97-7117	Split Lock Washer #10 Zinc	2	2
27	<a href="#">97-5046</a>	Compression Fitting	1	1
28	<a href="#">97-5000</a>	Compression Fitting	1	1
29	<a href="#">97-5146</a>	Copper Tubing		1
	<a href="#">97-5145</a>	Copper Tubing	1	
*30	<a href="#">97-5648</a>	Wire Harness - Thermostat	1	1
*31	97-5649	Wire Harness - Elements	1	1
*32	97-7118	Hex Bolt, 5/16-18 x 1-1/4	4	4
*33	97-7119	Flat Washer, 5/16 x 1-1/2 OD	4	4
*34	<a href="#">97-6368</a>	Relief Valve Extension	1	1

\* NOT SHOWN.

\*\* SELECT AS REQUIRED.



**Front View Parts List**

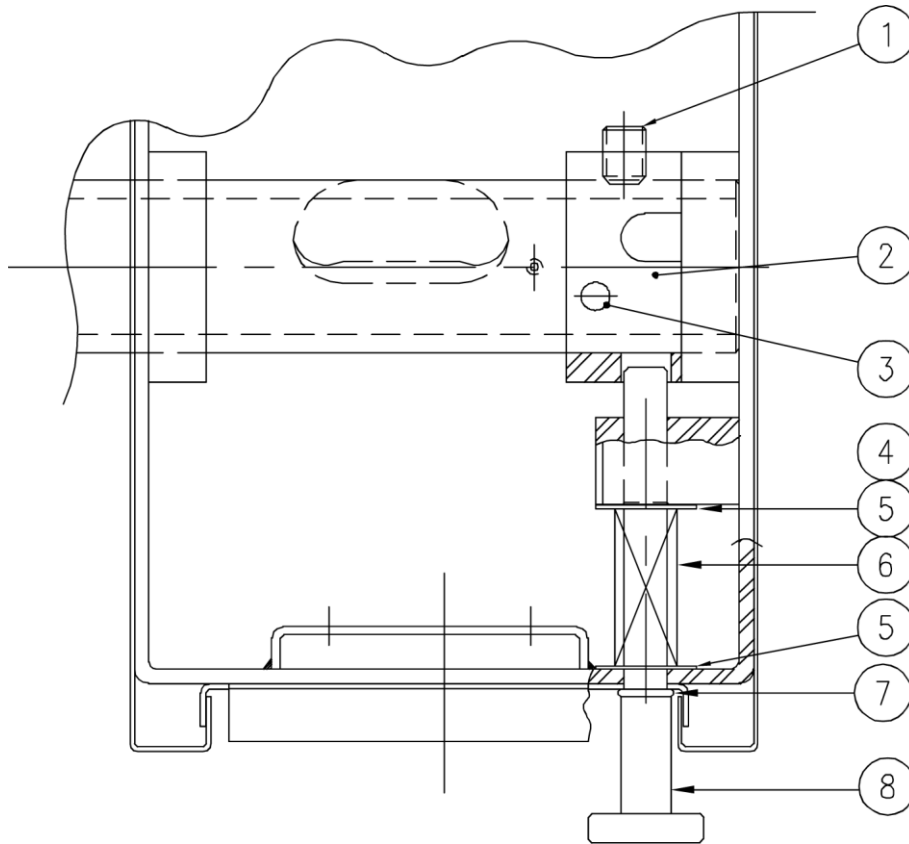
ITEM	PART NO	DESCRIPTION	FT-4CE FT-6CE QTY.	FT-10CE FT-12CE QTY.
1	97-5008	Handle Knob	1	1
2	97-5115	Tilt Handle	1	1
3	97-5116	Acorn Nut, 3/8" - 16 UNC	1	1
4	97-7120	Element Access Cover Assembly	1	1
5	97-6529	Gasket	1	1
6	97-7121	Internal Tooth Lock Washer, 1/4"	1	1
7	97-7122	Hex. Nut, 1/4" - 20 NC Zinc	1	1
*	97-6530	Yoke, Access Cover	1	1
8	97-6965	Console Cover Gasket	1	1
9	97-7123	Top Cover, Console	1	1
10	97-6981	Decal		1
	97-7124	Decal	1	
11	97-5617	Potentiometer Complete w/ Wires & Push On Terminals	1	1
12	97-5013	Knob	1	1
13	98-6162	Temperature Pilot, Red	1	1
14	97-6513	Power Switch	1	1
15	97-6512	Low Water Pilot, Amber	1	1
16	97-7125	Liquid Level Control	1	1
17	97-7126	Hex Nut, 3/8 - 16 NC Zinc	5	5
18	97-7127	Flat Washer, 3/8" Zinc	5	5
19	97-6506	Trunnion Box Bottom		1
	97-6507	Trunnion Box Bottom	1	
	97-7128	Gasket		1
	97-6922	Gasket	2	2
	97-6739	Screw, 10-32 x 1/2	1	
**20	97-5015	Element Assembly, 7.5 kW, 208V	1	
	97-5016	Element Assembly, 7.5 kW, 220/380V	1	
	97-5017	Element Assembly, 7.5 kW, 240/416V	1	
	97-5018	Element Assembly, 7.5 kW, 480V	1	
	97-7129	Element Assembly, 7.5 kW, 600V		1
	97-5019	Element Assembly, 12 kW, 208V		1
	97-5020	Element Assembly, 12 kW, 220/380V		1
	97-5021	Element Assembly, 12 kW, 240/416V		1
	97-5022	Element Assembly, 12 kW, 480V		1
	97-7130	Element Assembly, 12 kW, 600V	1	
21	97-7131	Element Gasket		1
	97-5025	Element Gasket	4	4
22	97-7132	Hex. Screw 5/16-18 NC x 3/4, ST/ST	1	1
23	97-7133	Base Assembly	1	

ITEM	PART NO	DESCRIPTION	FT-4CE FT-6CE QTY.	FT-10CE FT-12CE QTY.
24	<a href="#">97-6504</a>	Bottom Cover		1
	<a href="#">97-6505</a>	Bottom Cover	1	
25	<a href="#">97-6502</a>	Bottom Cover Gasket		1
	<a href="#">97-6503</a>	Bottom Cover Gasket		1
26	97-7134	Hex. Screw, 5/16 - 18 NC x 1/2 Zinc	1	1
*27	97-7135	Element Terminal Screw, 10 - 32 x 3/8	4	4
*28	<a href="#">97-7136</a>	Faucet Bracket, (Optional)	1	1
*29	97-7137	Kettle Cover, (Optional)	1	
	97-7138	Kettle Cover, (Optional)		1
* **30	<a href="#">97-5616</a>	Transformer, 380/416V-120V, 50/60 Hz, 100VA	1	1
	<a href="#">97-5613</a>	Transformer, 480V-120V, 60 Hz, 100VA	1	1
	<a href="#">98-6191</a>	Transformer, 600V-120V, 60 Hz, 100VA	1	1
* **31	<a href="#">97-5476</a>	Fuse, 250V, 3A, (208 - 240V Units)	2	2
	<a href="#">97-5476</a>	Fuse, 250V, 3A, (200/380V and 240/415V Units)	1	1
	<a href="#">98-6188</a>	Fuse, 1/2 A, 600V, (380 - 600V Units)	2	2
* **32	<a href="#">97-5864</a>	Fuse Holder, (208 - 240V Units)	2	2
	<a href="#">97-5864</a>	Fuse Holder, (220/380V and 240/415V Units)	1	1
	98-6187	Fuse Holder, (380 - 600V Units)	1	1

\* NOT SHOWN.

\*\* SELECT AS REQUIRED.

## Tilting Mechanism



***Tilting Mechanism Parts List***

ITEM	MF PART NO	DESCRIPTION	QTY.
1	97-7139	Hex. Socket Set Screw, 3/8 -16 NC x 1/2	1
2	97-7140	Cam Collar	1
3	97-7141	Spring Pin, 1/4 Diameter x 2 1/4" Long	1
4	<a href="#">97-6677</a>	External Ring Spae-Naur #R1000-37	1
5	<a href="#">97-7142</a>	Plain Washer, 3/8 ID x 7/8 OD x T = 0.048	2
6	<a href="#">97-5917</a>	Spring	1
7	<a href="#">97-6679</a>	"O" Ring Seal, E-515-80-11, 5/16 I.D.	1
8	<a href="#">97-6680</a>	Locking Pin	1

# MATERIAL SAFETY DATA SHEET

## PREPARATION INFORMATION:

Prepared for use in Canada by: E H & S Product Regulatory Management Department DOW  
CHEMICAL CANADA INC.

P.O. Box 1012

Sarnia, Ontario, N7T 7K7

(800) 331-6451

## CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**IN CASE OF EMERGENCY:** Fort Saskatchewan, Alberta: (780) 998-8282

Sarnia, Ontario: (519) 339-3711

Varenes, Quebec: (450) 652-1000

**Product:** **DOWFROST™ HD HEAT TRANSFER FLUID, DYED**

Product Code: 04632

Effective Date: 2/20/01 Date Printed: 07/10/02 MSD: 002239

DOW CHEMICAL CANADA INC. P.O.  
Box 1012

Sarnia, Ontario

Canada, N7T 7K7

24-Hour Emergency Phone Number (USA): (989) 636-4400

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The DOW CHEMICAL COMPANY, Midland, MI, USA, 48674 Customer

Information Center: 800-258-2436

## COMPOSITION/INFORMATION ON INGREDIENTS

Propylene Glycol CAS # 000057-55-6 94%

Dipotassium Phosphate CAS # 007758-11-4 <5%

Deionized Water CAS # 007732-18-5 <5%

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## **HAZARDS IDENTIFICATION**

### **EMERGENCY OVERVIEW**

Clear yellow liquid. Odourless. Avoid temperatures above 450°F, 232°C.
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**POTENTIAL HEALTH EFFECTS** (See Section 11 for toxicological data.)

**EYE:** May cause slight transient (temporary) eye irritation. Corneal injury is unlikely. Mists may cause eye irritation.

**SKIN CONTACT:** Prolonged contact is essentially nonirritating to skin. A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. Repeated exposures may cause flaking and softening of skin.

**INGESTION:** Single dose oral toxicity is considered to be extremely low. No hazards anticipated from swallowing small amounts incidental to normal handling operations.

**INHALATION:** At room temperature, vapours are minimal due to physical properties. Mists may cause irritation of upper respiratory tract (nose and throat).

**SYSTEMIC (OTHER TARGET ORGAN) EFFECTS:** Repeated excessive exposure to propylene glycol may cause central nervous system effects.

**CANCER INFORMATION:** Did not cause cancer in laboratory animals.

**TERATOLOGY (BIRTH DEFECTS):** Birth defects are unlikely. Exposures having no adverse effects on the mother should have no effect on the fetus.

**REPRODUCTIVE EFFECTS:** In animal studies, has been shown not to interfere with reproduction.

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### **FIRST AID**

EYES: Flush eyes with plenty of water.

SKIN: Wash off in flowing water or shower.

INGESTION: No adverse effects anticipated by this route of exposure incidental to proper industrial handling.

INHALATION: Remove to fresh air if effects occur. Consult a physician.

NOTE TO PHYSICIAN: No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

### **FIRE FIGHTING MEASURES**

#### **FLAMMABLE PROPERTIES**

FLASH POINT: 214°F, 107°C (based on a similar material)

METHOD USED: PMCC

AUTOIGNITION TEMPERATURE: Not determined.

#### **FLAMMABILITY LIMITS**

LFL: Not determined.

UFL: Not determined

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**HAZARDOUS COMBUSTION PRODUCTS:** During a fire, smoke may contain the original material in addition to unidentified toxic and/or irritating compounds. Hazardous combustion products may include and are not limited to carbon monoxide and carbon dioxide.

**OTHER FLAMMABILITY INFORMATION:** Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Flammable concentrations of vapour can accumulate at temperatures above 214°F. Liquid mist of this product can burn. Spills of these organic liquids on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. Container may rupture from gas generation in a fire situation.

**EXTINGUISHING MEDIA:** Water fog or fine spray, carbon dioxide, dry chemical, foam. Alcohol resistant foams (ATC type) are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively. Do not use direct water stream. May spread fire.

**MEDIA TO BE AVOIDED:** Do not use direct water stream.

**FIRE FIGHTING INSTRUCTIONS:** Keep people away. Isolate fire area and deny unnecessary entry. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Fight fire from protected location or safe distance. Consider use of unmanned hose holder or monitor nozzles. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of re-ignition has passed. Immediately withdraw all personnel from area in case of rising sound from venting safety device or discolouration of the container. Move container from fire area if this is possible without hazard.

**PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS:** Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

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**ACCIDENTAL RELEASE MEASURES** (See Section 15 for Regulatory Information)

PROTECT PEOPLE: Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls/ Personal Protection.

PROTECT THE ENVIRONMENT: Avoid contamination of all waterways. CLEAN-UP:

See Section 13, Disposal Consideration.

**HANDLING AND STORAGE**

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: No special handling requirements data available.

HANDLING: See Section 8, Exposure Controls/Personal Protection. STORAGE:

See Section 10, Stability and Reactivity.

**EXPOSURE CONTROLS/PERSONAL PROTECTION**

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION: Use safety glasses. Safety glasses should be sufficient for most operations; however, for misty operations wear chemical goggles.

SKIN PROTECTION: Use gloves impervious to this material.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator. In misty atmospheres, use an approved mist respirator.

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EXPOSURE GUIDELINES: Propylene glycol: AIHA WEEL is 10 mg/m<sup>3</sup> for total vapour and aerosol.

**PHYSICAL AND CHEMICAL PROPERTIES**

APPEARANCE/PHYSICAL STATE:	Clear yellow liquid.
ODOUR:	Odourless
VAPOUR PRESSURE:	0.22 mmHg @ 20°C
VAPOUR DENSITY:	2.6
BOILING POINT:	320°F, 160°C
SOLUBILITY IN WATER/MISCIBILITY:	Complete
SPECIFIC GRAVITY OR DENSITY:	1.058 @ 25/25°C

**STABILITY AND REACTIVITY** CHEMICAL STABILITY: Thermally stable at

typical use temperatures.

CONDITIONS TO AVOID: Avoid use temperatures above 450°F, 232°C. Product can degrade at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

INCOMPATIBILITY WITH OTHER MATERIALS: Avoid contact with oxidizing materials. Avoid contact with strong acids

HAZARDOUS DECOMPOSITION PRODUCTS: Hazardous decomposition products depend upon temperature, air supply and the presence of other materials.

HAZARDOUS POLYMERIZATION: Will not occur.

**TOXICOLOGICAL INFORMATION** (See Section 3 for Potential Health Effects. For detailed toxicological data, write or call the address or non-emergency number shown in Section 1).

SKIN: The LD50 for skin absorption in rabbits is >10,000 mg/kg.

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INGESTION: The oral LD50 for rats is 20,000 - 34,000 mg/kg.

MUTAGENICITY: In vitro mutagenicity studies were negative. Animal mutagenicity studies were negative.

**ECOLOGICAL INFORMATION** (For detailed Ecological data, write or call the address or non-emergency number shown in Section 1.)

#### ENVIRONMENTAL FATE

MOVEMENT & PARTITIONING: Based largely or completely on data for major component(s). Bioconcentration potential is low (BCF less than 100 or Log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).

DEGRADATION AND PERSISTENCE: Based largely or completely on data for major component(s). Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Degradation is expected in the atmospheric environment within minutes to hours.

ECOTOXICITY: Based largely or completely on data for major component(s). Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50 >100 mg/L in most sensitive species).

**DISPOSAL CONSIDERATIONS** (See Section 15 for Regulatory Information)

DISPOSAL: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND OR INTO ANY BODY OF WATER. All disposal methods must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste

characterizations and compliance with applicable laws are the responsibility solely of the waste generator. THE DOW CHEMICAL COMPANY HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION 2 (Composition/Information On Ingredients).

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FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: recycler, reclaimer, incinerator or other thermal destruction device.

As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Center at 800-258-2436 or 989-832-1556 for further details.

### **TRANSPORT INFORMATION**

**DEPARTMENT OF TRANSPORTATION (D.O.T.):** For D.O.T. regulatory information, if required, consult transportation regulations, product shipping papers, or contact your Dow representative.

**CANADIAN TDG INFORMATION:** For TDG regulatory information, if required, consult transportation regulations, product shipping papers, or your Dow representative.

### **REGULATORY INFORMATION** (Not meant to be all-inclusive – selected regulations represented).

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

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**U.S. REGULATIONS**

SARA 313 INFORMATION: To the best of our knowledge, this product contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Not to have met any hazard category.

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

<u>CHEMICAL NAME</u>	<u>CAS NUMBER</u>	<u>LIST</u>
1, 2-Propanediol	000057-55-6	PA1

PA1= Pennsylvania Hazardous Substance (present at greater than or equal to 1.0%). OSHA

HAZARD COMMUNICATION STANDARD:

This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

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**CANADIAN REGULATIONS**

WHMIS INFORMATION: The Canadian Workplace Hazardous Materials Information System (WHMIS) Classification for this product is:

This product is not a "Controlled Product" under WHMIS.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)

This product contains one or more substances which are not listed on the Canadian Domestic Substances List (DSL). Contact your Dow representative for more information.

**OTHER INFORMATION**

MSDS STATUS: Revised Section 8 (Exposure Guidelines).

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*The information herein is given in good faith, but no warranty, express or implied, is made. Consult The Dow Chemical Company for further information.*