



3CS, FR and Therma-Corn Installation and Operating Manual

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GENERAL

Hatco FR and 3CS heaters are designed to supply temperature controlled water to a holding vessel (sink or tank) above the heater. Water flows from the holding vessel into the heater directly into the first reservoir. This first reservoir acts as a soil collection sump. Debris that could affect the heating element operation settles out in the sump to be drained away later. The debris free water flows into the second reservoir in which the heating elements are mounted. The water is heated and returned to the holding vessel above.

This manual provides the installation and operation instructions for Hatco FR and 3CS heaters and Thermo-Corn models FRC-I and FRC-II.

We recommend all installation and operating instructions and safety precautions appearing in this manual be read prior to installation and operation.



Figure 1. 3CS Heater

Safety precautions preceded in this manual by the words **WARNING** or **CAUTION** printed in bold face are important. Warning means there is the possibility of personal

injury to yourself or others. Caution means there is the possibility of damage to the unit.

MODEL DESCRIPTION



Figure 2. FR Heater

3CS

The Hatco 3CS model heaters are specifically designed for use with any manual dishwashing operation. The 3CS heater maintains sanitizing rinse water of 180°F.

FR

The Hatco FR model heaters are designed to be used with a Bain-Marie or food reconstitutor, such as the Hatco Thermo-Corn, to heat or hold foods at temperatures between 140°F and 190°F. Holding temperature is controlled by an adjustable thermostat.

THERMA-CORN, FRC-I, and FRC-II

The Hatco Thermo-Corn, models FRC-I and FRC-II use a Hatco FR-3 heater, which is supplied with an electrical cord and plug.

SPECIFICATIONS DIMENSIONS 3CS AND FR

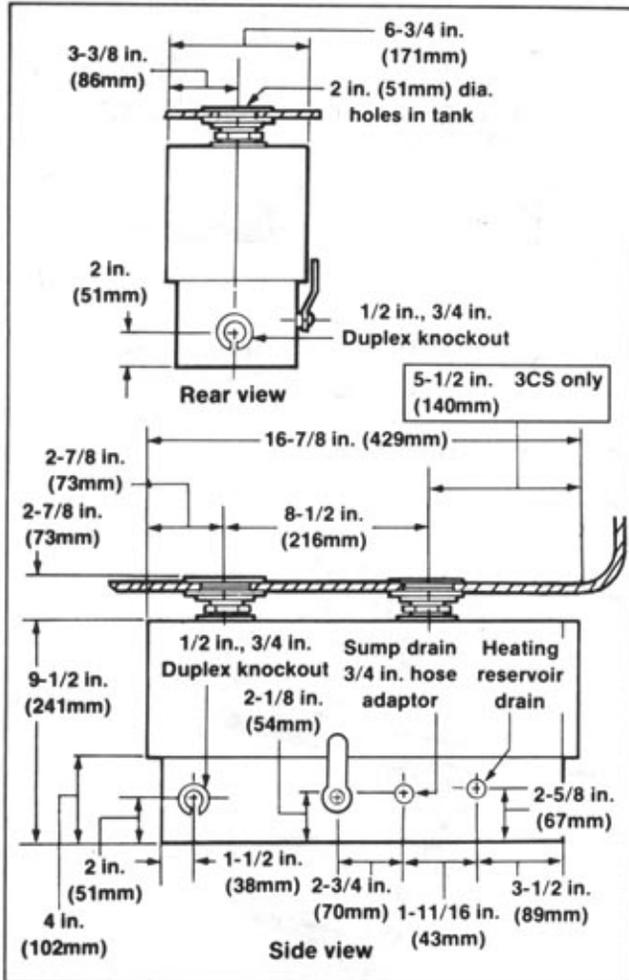


Figure 3. One and Two Element Style

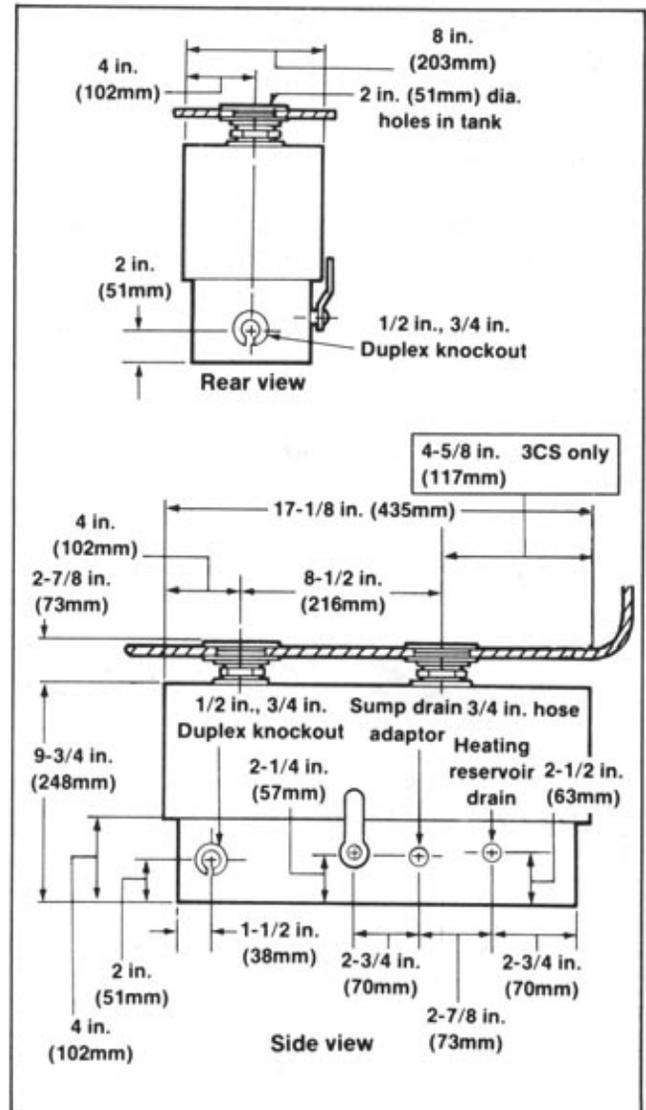


Figure 4. Three Element Style (Balanced 3 phase)

FR SIZING INFORMATION

For a Bain-Marie or steam table:
750 watts per square foot of vessel top.

For a food reconstitutor:
2000 watts per square foot of vessel top.

NOTE

Use one FR for a Bain-Marie up to 6 feet long. Over 6 feet, a minimum of two FR heaters are required.

See Figure 5. The FR should be positioned with no more than 3 feet on either side when mounted in holding vessel. A perforated water baffle must be used. (Not supplied by factory.)

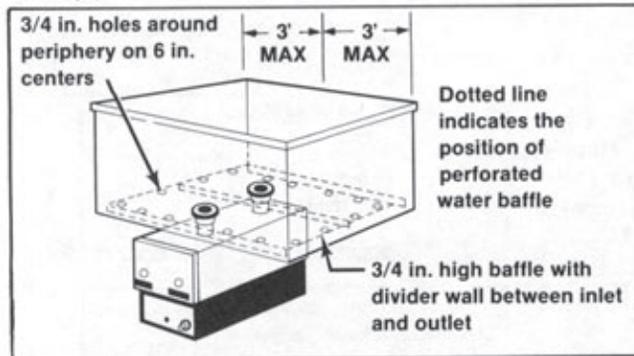


Figure 5. FR With Water Baffle

THERMA-CORN

The Therma-Corn is completely assembled and prewired at the factory. The Therma-Corn may be mounted to an accessory stand or inserted into a counter top.

See Figure 6. Adjustments may be made to the accessory stand by using the thumb screws for leveling and adjusting height.

See Figure 7. When installing the Therma-Corn into a counter top the opening must be 11-3/4 in. wide by 19-3/4 in. deep.

There must be at least a 30 in. clearance below the counter top to accommodate the tank, cooker and drain assembly.

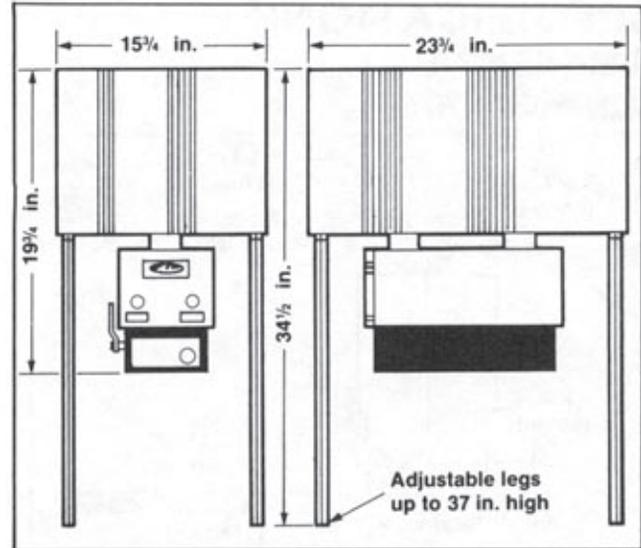


Figure 6. Therma-Corn Model FRC-II

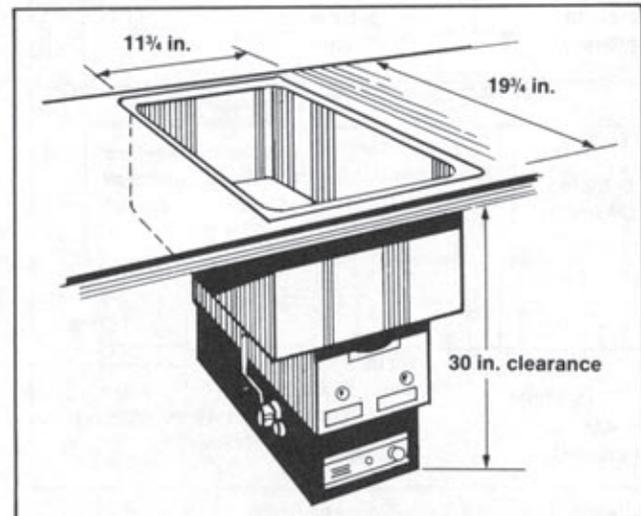


Figure 7. Therma-Corn Model FRC-I

CIRCUIT BREAKER AND FUSE SIZING CHART

3CS HEATERS

208 Volts				Wire Size	Fuse or Circuit Breaker
KW Rating	Phase	Size Amps			
3	1	14.5		12	20
4.5	1	22		10	30
6	1	29		8	40
6	3*	25		10	40
6.8	3(Bal.)	18.8		10	30
9.0	1	43		4	60
9.0	3*	37		6	50
9.0	3(Bal.)	25		10	40
240 Volts				Wire Size	Fuse or Circuit Breaker
KW Rating	Phase	Amps			
3	1	12.5		12	20
4.5	1	19		10	30
6	1	25		10	40
6	3*	22		10	30
6.0	3(Bal.)	14.4		12	20
9.0	1	38		6	50
9.0	3*	33		8	40
9.0	3(Bal.)	22		10	30
480 Volts				Wire Size	Fuse or Circuit Breaker
KW Rating	Phase	Amps			
3	1	6.3		14	15
4.5	1	9.4		14	15
6	1	12.5		12	20
6	3*	10.8		14	15
6.0	3(Bal.)	7.2		14	15
9.0	1	18.8		10	30
9.0	3*	16.2		12	20
9.0	3(Bal.)	10.8		14	15

*Open Delta—standard construction (Amperage higher than Balanced 3 phase)

Install a fused disconnect switch or circuit breaker sized according to the table. The wiring from the switch to the Hatco 3CS sink heater should be in accordance with local electrical requirements.

FR HEATERS

208 Volts			Wire Size AWG	Fuse or Circuit Breaker
KW Rating	Phase	Amps		
3.3	1	16	12	20
4.8	1	23	10	30
6.3	1	30	8	40
6.3	3*	25	8	40
7.1	3(Bal.)	19.7	10	30
9.3	1	45	4	60
9.3	3*	38	6	50
9.3	3(Bal.)	26.4	10	40
240 Volts			Wire Size AWG	Fuse or Circuit Breaker
KW Rating	Phase	Amps		
3.3	1	14	12	20
4.8	1	20	10	30
6.3	1	26	8	40
6.3	3*	22	10	30
6.3	3(Bal.)	15.6		
9.3	1	39	6	50
9.3	3*	33	8	40
9.3	3(Bal.)	23	10	30

*Open Delta—standard construction (Amperage higher than Balanced 3 phase)

Install a fused disconnect switch or circuit breaker sized according to the above table. The wiring from the switch to the Hatco FR should be in accordance with local electrical requirements.

PLUMBING

A paper template with adhesive backing is shipped with the heater. The template is used for locating the position

of the holes needed for the sink strainers. The heater mounts to the sink strainers.

1. Expose the adhesive portion of the template. Stick the template to the bottom of the holding vessel with the notation "Front Cover" against the front inside wall of the holding vessel.
2. Center punch and drill a 3/4 in. pilot hole at each of the 2 center marks on the template.

NOTE

The pilot holes are for cutting larger holes with Greenlee cutters.

3. Remove template and cut a 2 in. diameter hole at each pilot hole using a standard #AV1756 Greenlee cutter.

NOTE

If #AV1756 Greenlee cutter is not available, use a standard Greenlee 1-1/2 in. conduit cutter #500-6978, which is slightly under 2 in. diameter. File or ream holes as necessary to 2 in. diameter required for mounting sink strainers.

4. See Figure 8. In both of the 2 in. holes, install a male threaded sink strainer with a thin gasket between the strainer flange and the bottom of the holding vessel.
5. On the under side of the holding vessel at each strainer, install a thick gasket, then a thin metal or fiber washer and nut. Tighten nuts finger tight only at this time.
6. Attach the heater to the strainers using unions with 1-3/4 in. diameter rubber gaskets inside the connecting union nuts.

NOTE

Be sure gaskets do not crimp.

7. Tighten unions securely.
8. Tighten nuts on strainers securely.
9. Fill the holding vessel with water and check for installation leaks.

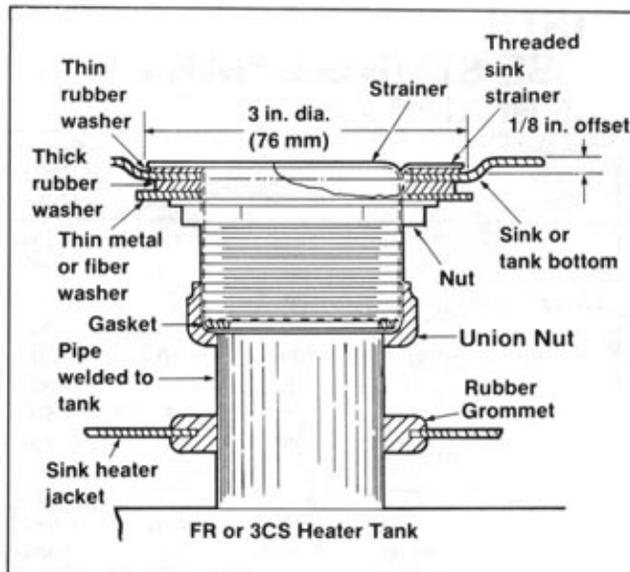


Figure 8. Installation Sink Strainer

CAUTION

Do not overtighten unions or nuts. Overtightening may cause leaks.

NOTE

A 3/4 in. hose or pipe may be connected to the heater sump drain and run to an open sight drain. The sump drain should not be permanently connected to the sanitary drain system. Check local plumbing code for proper drain installation.

ELECTRICAL

CAUTION

Do not turn on electrical current to the heater until the tank has been filled with water. Heating elements will burn out quickly if energized dry.

Conductors from a properly sized fused disconnect switch or circuit breaker must be wired to the Hatco 3CS or FR heater in accordance with local electrical codes.

Model FR-3 and FR-4 heaters may be supplied with an electrical cord and plug. These heaters must be plugged into an approved receptacle. For FR-3, NEMA 6-20R, for FR-4 NEMA 6-30R.

WARNING

For proper electrical installation, conforming to local electrical codes, consult a licensed electrical contractor.

NOTE

See *Circuit Breaker and Fuse Sizing Chart* for wiring recommendations. Refer to the specification plate on the front of the heater for voltage requirements.

OPERATING PROCEDURE START-UP

CAUTION

Do not turn on electrical current to the heater until the tank has been filled with water.

3CS Models

See Figure 9

1. Check that small pipe cap to the heating chamber drain is in place.
2. Close sump valve by operating the drain handle on the side of the heater.

NOTE

See Figure 9. Sump valve is closed when handle is vertical.

3. Fill the holding vessel with hot tap water to normal operating level.
4. Check that the fused disconnect switch or circuit breaker is on.

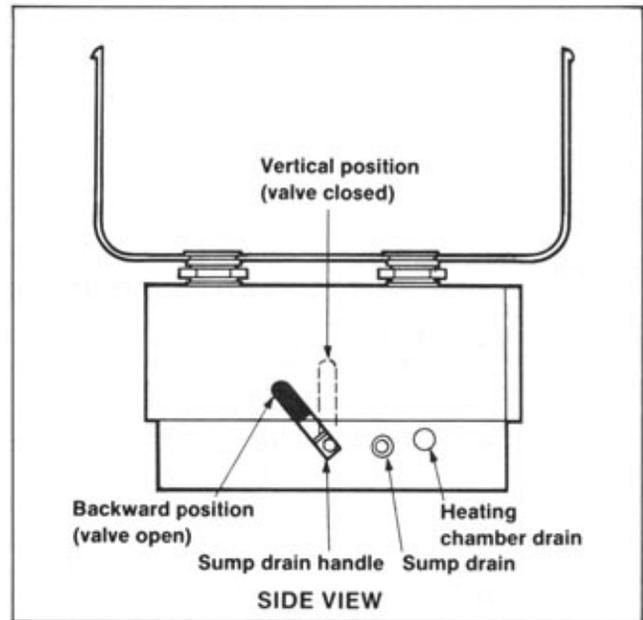


Figure 9. Heater Drain Controls

5. Turn power switch to "ON" position.
6. An optional amber light or indicating dial thermometer indicates when sanitizing temperature is reached.

NOTE

All Hatco heaters have an Energy Cut-Off switch (ECO) that will shut "OFF" the power if the unit should overheat.

If the Energy Cut-Off switch has activated a low water level may be the cause.

To reset 3CS heaters, fill to the proper water level. Turn the "OFF-ON" switch to "OFF" then "ON".

CAUTION

The ECO does not protect the heater when both reservoirs are drained.

**FR Models
Bain-Marie Application**

WATER TEMPERATURE CHART 750 WATTS PER SQUARE FOOT

6 INCH DEEP WATER

Temperature Water Heated To

Temperature Water at Start	Minutes to Heat											
	70	80	90	100	110	120	130	140	150	160	170	180
60	8	15	23	31	40	48	57	67	77	90	108	140
70		8	16	24	33	40	49	59	70	83	100	133
80			8	16	25	33	41	51	62	75	92	125
90				8	17	23	33	43	54	67	84	117
100					9	17	25	35	45	59	76	109
110						8	17	27	37	44	68	100
120							9	19	29	42	60	92
130								10	21	34	51	84
140									11	24	41	74
150										13	31	63
160											17	50
170												33

**FR Models
Bain-Marie Application**

WATER TEMPERATURE CHART 750 WATTS PER SQUARE FOOT

9 INCH DEEP WATER

Temperature Water Heated To

Temperature Water at Start	Temperature Water Heated To											
	70	80	90	100	110	120	130	140	150	160	170	180
60	12	23	35	47	60	72	85	100	116	136	162	211
70		12	24	36	49	61	74	89	105	125	151	200
80			12	24	37	49	62	77	93	113	139	188
						Minutes to Heat						
90				12	25	34	50	65	81	101	127	176
100					13	25	38	53	69	89	115	164
110						12	25	40	56	66	102	151
120							13	28	44	64	90	139
130								15	31	51	77	126
140									16	36	62	111
150										20	46	95
160											26	75
170												49

FR Models

See Figure 9

1. Check that small pipe cap to the heating chamber drain is in place.
2. Close sump valve by operating the drain handle on the side of the heater.

NOTE

See Figure 9. Sump valve is closed when the handle is vertical.

3. Fill the holding vessel with hot tap water to normal operating level.

NOTE

For FR heaters rated 750 watts per square foot of tank area see WATER TEMPERATURE CHART for minutes to heat.

4. Check that the power supply cord is plugged into a proper receptacle (20 AMP for FR-3, 30 AMP for FR-4). Turn the toggle switch to the "On" position. The power "On" light will glow indicating power is supplied.
5. Set the water temperature control dial to the desired temperature. The "Water at Temperature" light will glow when water is at the control temperature.

NOTE

All Hatco heaters have an Energy Cut-Off switch (ECO) that will shut "OFF" the power if the unit should overheat.

If the Energy Cut-Off switch has activated, a low water level may be the cause.

To reset, fill to the proper water level. Push the reset button on the front of the heater.

NOTE

The ECO does not protect the heater when both reservoirs are drained. The optional LWCO Relay disconnects power if water is drained.

Therma-Corn Models

See Figure 9

1. Check that small pipe cap to the heating chamber drain is in place.
2. Close sump valve by operating the drain handle on the side of the heater.

NOTE

See Figure 9. Sump valve is closed when the handle is vertical.

3. Fill the holding vessel with hot tap water to normal operating level.
4. Check that the power supply cord is plugged into a proper 20 AMP receptacle. Turn the toggle switch to the "On" position. The power "On" light will glow indicating power is supplied.
5. Set the water temperature control dial to the desired temperature. The "Water at Temperature" light will glow when water is at the control temperature.

NOTE

All Hatco heaters have an Energy Cut-Off switch (ECO) that will shut "OFF" the power if the unit should overheat.

If the Energy Cut-Off switch has activated, a low water level may be the cause.

To reset, fill to the proper water level. Push the reset button on top of the heater above the front cover.

NOTE

The ECO does not protect the heater when both reservoirs are drained. The optional Low-Water Cut-Off (LWCO) Relay disconnects power to the heating elements if the heater is energized without water in the reservoirs.

Filling the vessel with water will reset the LWCO.

6. Fill the baskets with frozen corn and place in the preheated Therma-Corn.

Baskets have a capacity of up to 40 (3-1/2 in. cut) ears of corn each.

NOTE

Heat up time for 80 ears of corn is approximately 25 minutes. The thermostat should be set to hold the water at 150°F.

If cobs are removed too soon, corn will not have fully reconstituted and the kernels will be soft or mushy.

After emptying a basket, refill with frozen corn and place the basket in the rear of the Therma-Corn. This is important because the water flow in the Therma-Corn is from front to back.

DRAINING 3CS and FR

NOTE

The holding vessel should be drained through its own drain valve to discharge debris and water that remains in the heater. The sump must be drained after each use by placing the sump drain handle in the backward position.

CAUTION

Do not drain holding vessel with power on.

1. Turn toggle switch to "OFF" position.
2. Drain holding vessel. The sump drain handle on the side of the heater opens the sump valve and contents of the sump and the vessel above will be drained. The waste should lead to an open sight drain in a manner according to local plumbing code.

CAUTION

Periodic inspection should be made for lime buildup in tanks. Excessive amounts can affect unit performance.

If the heater is to be stored or shipped in freezing temperature, completely drain the reservoirs to prevent damage to the unit. See DRAINING HEATER FOR SERVICE OR PROTECTION FROM FREEZING TEMPERATURES.

Therma-Corn

The Hatco Therma-Corn must be drained and cleaned daily.

CAUTION

Do not drain heater with the power on. Unless the heater is equipped with a Low-Water Cut-Off Relay, element burn out will occur.

1. See Figure 9. Turn power switch to "OFF" and drain heater by placing the sump drain handle in the backward position.
2. Wipe visible deposits from the tank and false bottom. Close the drain valve by operating the drain handle.
3. Dissolve 3 tablespoons of Stera-Sheen (green label) in 1 gallon of hot water and pour into the holding vessel.
4. Refill the tank with hot water to one half inch above the false bottom and soak for at least 15 minutes.
5. Open the valve and drain the tank.
6. Remove the false bottom and rinse in clear water.
7. Place the rubber stopper in the rear opening and the special hose adaptor in the front opening of the tank. Flush with clear water for approximately 1 minute, then close the valve and replace the false bottom in the tank.

NOTE

The false bottom is stamped "BACK" for correct installation in the tank.

CAUTION

To protect the heater from damage, if the Therma-Corn is to be shipped or stored in freezing temperatures, or if it is necessary to drain the heater for servicing, follow the draining procedure under DRAINING HEATER FOR SERVICE OR PROTECTION FROM FREEZING.

SAFETY PRECAUTIONS

Do not turn on electrical current to the heater until the holding vessel has been filled with water. Unless the heater is equipped with a Low-Water Cut-Off, element burn out will occur.

For proper electrical installation, conforming to local electrical codes, consult a licensed electrical contractor.

Heaters supplied with an electrical cord and plug must be plugged into a 20 amp receptacle.

Drain holding vessel with power "Off" or element burn out could occur.

To prevent electrical shock never service the heater without first turning off the power at the fused disconnect switch, the circuit breaker, or by unplugging the power cord.

DRAINING HEATER FOR SERVICE OR PROTECTION FROM FREEZING TEMPERATURES SEE FIGURE 9

WARNING

To prevent electrical shock never service the heater without turning off the power at the fused disconnect switch or circuit breaker or by unplugging the power cord.

1. Turn toggle switch to "OFF" position.
2. Turn off the electrical power supply to the heater at the fused disconnect switch, the circuit breaker or by unplugging the power cord.
3. Drain the holding vessel and the sump by placing the sump drain handle on the side of the heater in a backward position.
4. With a catch pan ready, unscrew the pipe cap on the side of the heater to drain the heating element chamber.

NOTE

Heating element chamber holds from 2-1/2 up to 4-1/2 quarts of water, depending upon model.

OPTIONAL ACCESSORIES

3CS TEMPERATURE MONITOR

This indicating dial thermometer indicates when sanitizing temperature is reached.

3CS TEMPERATURE LIGHT

When water temperature is raised to the desired temperature an amber light glows to indicate water is at temperature.

FR/CC LOW-WATER CUT-OFF

The Low-Water Cut-Off relay is available to prevent element burn out in the event the unit is turned on without adequate water in the heater.



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