



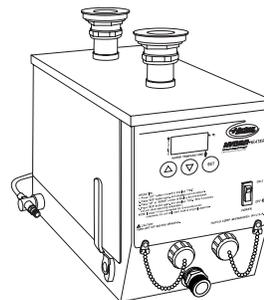
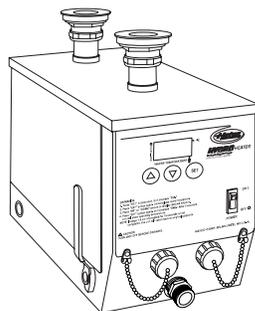
HYDRO-HEATER

Sanitizing Sink Heaters

Food Rethermalizers/Bain-Marie Heaters

Installation & Operating Manual

I&W #07.05.133.00



This manual contains important safety information concerning the maintenance, use, and operation of this product. Failure to follow the instructions contained in this manual may result in serious injury. If you are unable to understand the contents of this manual, please bring it to the attention of your supervisor. Do not operate this equipment unless you have read and understood the contents of this manual.

Este manual contiene importante información sobre seguridad concerniente al mantenimiento, uso, y operación de este producto. Cualquier falla en el seguimiento de las instrucciones contenidas en este manual puede resultar en un serio daño. Si usted no puede entender el contenido de este manual por favor pregunte a su supervisor. No opere este equipo al menos que haya leído y comprendido el contenido de este manual.

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IMPORTANT OWNER INFORMATION

Record the model number, serial number (identification plate located on the lower right hand side, front corner of the unit), voltage, and purchase date of your Hydro-Heater in the spaces below. Please have this information available when calling Hatco for service assistance.

Model No. _____

Serial No. _____

Voltage _____

Date of Purchase _____

Business Hours: 8:00 a.m. to 5:00 p.m.
Central Standard Time

(Summer Hours: June to September –
8:00 a.m. to 5:00 p.m. C.D.T.
Monday through Thursday
8:00 a.m. to 2:30 p.m. C.D.T. Friday)

Telephone: (800) 558-0607; (414) 671-6350

Fax: (800) 690-2966 (Parts & Service)
(414) 671-3976 (International)



24 Hour 7 Day Parts & Service
Assistance available in the United
States and Canada by calling
(800) 558-0607.

Additional information can be found by visiting our
web site at www.hatcocorp.com

INTRODUCTION

Hatco 3CS2 Hydro-Heater Sanitizing Sink Heaters and FR2 Hydro-Heater Food Rethermalizers/Bain-Marie Heaters are designed to supply temperature-controlled water to a holding vessel (sink or tank) located above the heater. Water flows by natural convection from the holding vessel directly into a tubular water chamber with heating elements uniquely wrapped on the outside of the flow tube. The heating elements do not come in direct contact with the water reducing sediment and lime buildup on the element, resulting in longer life. The heated water flows upward and returns to the holding vessel. A special electronic controller maintains the setpoint temperature assuring a responsive and efficient operation.

The unit electrical and plumbing connections are factory-assembled and ready for installation.

This manual provides the installation, safety and operating instructions for the Hydro-Heater

Sanitizing Sink Heaters and Food Rethermalizers/Bain-Marie Heaters. We recommend all installation, operating and safety instructions appearing in this manual be read prior to installation or operation of your Hatco Hydro-Heater. Safety instructions that appear in this manual after a warning symbol  and the words **WARNING** or **CAUTION** printed in bold face are very important.  **WARNING** means there is the possibility of serious injury or death to yourself or others.  **CAUTION** means there is the possibility of minor or moderate injury. **CAUTION** *without the symbol* signifies the possibility of equipment or property damage only.

Hatco Hydro-Heaters are a product of extensive research and field testing. The materials used were selected for maximum durability, attractive appearance and optimum performance. Every unit is thoroughly inspected and tested prior to shipment.

IMPORTANT SAFETY INSTRUCTIONS

IMPORTANT! Read the following important safety instructions to avoid personal injury or death, and to avoid damage to the equipment or property.

⚠ WARNINGS

- ⚠ Hatco 3CS2 and FR2 series units are designed for commercial use only by properly trained personnel! To avoid any injury or damage to the unit read and follow the instructions contained in this manual. Do not operate this equipment unless you have read and completely understood the contents of this manual.
- ⚠ To avoid any electrical shock hazard, or physical burns turn the power OFF at the fuse disconnect switch/circuit breaker or unplug the unit from the power source and allow to cool completely before performing any maintenance or cleaning.
- ⚠ For proper electrical installation conforming to local electrical codes consult a licensed electrical contractor. Improper electrical connections may cause a serious electrical shock injury or may damage the unit.
- ⚠ For proper plumbing installation conforming to local plumbing codes consult a licensed plumbing contractor.
- ⚠ Units equipped with a power cord and plug should be plugged into an electrical outlet of the correct voltage, size and plug configuration. If the plug and receptacle do not match, contact a qualified electrician to determine the proper voltage and size and install the proper electrical outlet.
- ⚠ To prevent any injury or damage to the unit do not pull unit by power cord.
- ⚠ To prevent any injury, discontinue use if power cord is frayed or worn.
- ⚠ Units are designed to heat water up to 190°F (88°C). DO NOT set temperature controls to a setting higher than 190°F (88°C). Water over 190°F (88°C) is very active and could splash onto operator causing serious burns or injury.
- ⚠ To avoid any injury or damage to the unit use only Authorized Hatco Service Agents to perform any temperature display changes.
- ⚠ If service is required on this unit, contact your Authorized Hatco Service Agent, or contact the Hatco Service Department at 800-558-0607 or 414-671-6350; fax 800-690-2966 or International fax 414-671-3976.

⚠ WARNINGS

- ⚠ This product has no “user” serviceable parts. To avoid damage to the unit or injury to personnel, use only Authorized Hatco Service Agents and Genuine Hatco Parts when service is required.
- ⚠ Genuine Hatco Replacement Parts are specified to operate safely in the environments in which they are used. Some aftermarket or generic replacement parts do not have the characteristics that will allow them to operate safely in Hatco equipment. It is essential to use Hatco Replacement Parts when repairing Hatco equipment. Failure to use Hatco Replacement Parts may subject operators of the equipment to hazardous electrical voltage, resulting in electrical shock or burn.

⚠ CAUTIONS

- ⚠ Water in the unit and holding vessel is very hot. Wear protective gloves and proper attire when operating to avoid injury.
- ⚠ Do not use extension pipes on the inlet and outlet connections on heater units. Poor performance or unsafe conditions may occur.
- ⚠ Unit is not weatherproof. For safe and proper operation locate the unit indoors where the ambient air temperature is constant and is a minimum of 70°F (21°C).

IMPORTANT SAFETY INSTRUCTIONS

IMPORTANT! Read the following important safety instructions to avoid personal injury or death, and to avoid damage to the equipment or property.

CAUTIONS

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

Do not turn the electrical current to the unit on until the holding vessel has been filled with water or element burnout may occur.

Inspect daily for lime and sediment buildup inside unit. Excessive amounts can affect unit performance and reduce the operating life of the unit.

To avoid any damage to the heater unit use only delimers that are non-corrosive to aluminum, brass and stainless steel. Damage caused by corrosive material or solutions is not covered under warranty.

CAUTIONS

Drain holding vessel with power to the unit off, or element burnout may occur.

Water Quality Requirements - Incoming water in excess of 3.0 grains of hardness per gallon (GPG) (.75 grains of hardness per liter) must be treated and softened before being supplied to a Hydro-Heater. To maintain efficiency and to extend the operating life “regular deliming and cleaning” must be performed when water supplied contains over 3.0 GPG (.75 GPL).

To avoid any damage to units with Auto-fill, do not exceed the following:

Incoming Water Temperature: 140°F (60°C)

Incoming Water Pressure: 80 PSI (550 kPa)

MODEL DESCRIPTIONS

ALL MODELS

The Hydro-Heater mounts to the underside of a holding vessel, leaving the entire vessel area free. Units are shipped ready to install with all gaskets and fittings. Hydro-Heaters include a stainless steel front, powder coated body, a low-water cut-off system and a convenient drain outlet.

3CS2 MODELS

The Hatco 3CS2 model heaters are designed for use with any manual dishwashing operation. The 3CS2 heater maintains sanitizing rinse water of 180°F (82°C) by using a special electronic temperature controller and “free flow” technology, assuring a responsive and efficient operation.

FR2 MODELS

The Hatco FR2 model heaters are designed to be used with a Bain-Marie or Food Rethermalizer to heat or hold foods at temperatures between 140°F and 190°F (60° - 88°C). The desired holding temperature is maintained by a special electronic controller and “free flow” technology, assuring a responsive and efficient operation.

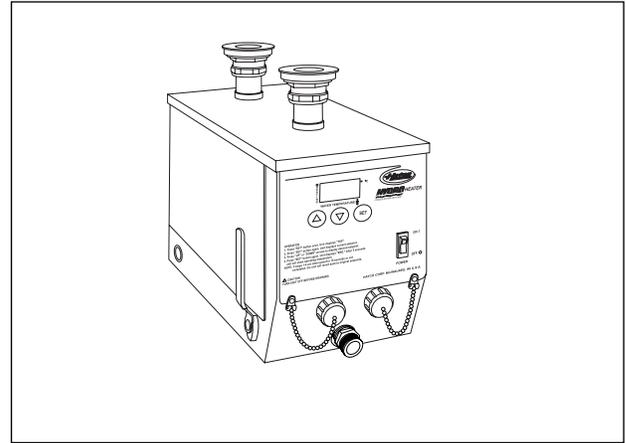


Figure 1. Hydro-Heater

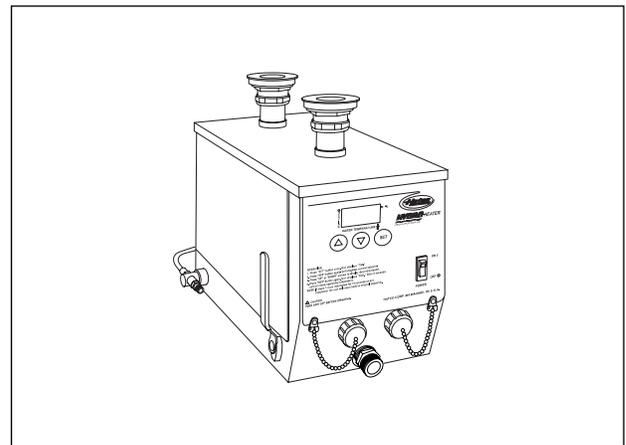


Figure 2. Hydro-Heater with Auto-Fill

SPECIFICATIONS

PLUG CONFIGURATIONS

⚠ WARNING

Units equipped with a power cord and plug should be plugged into an electrical outlet of the correct voltage, size and plug configuration. If the plug and receptacle do not match, contact a qualified electrician to determine the proper voltage and size and install the proper electrical outlet.

Model	208 Volt	240 Volt
FR2-3	NEMA 6-20P	NEMA 6-20P
FR2-4	NEMA 6-30P	NEMA 6-30P

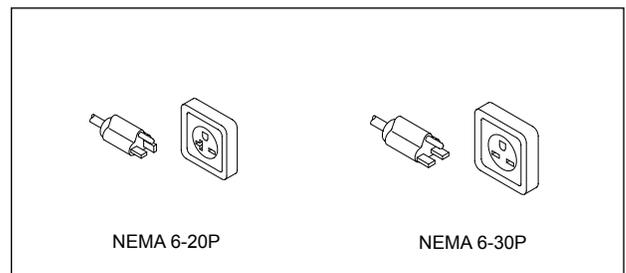


Figure 3. Plug Configurations

SPECIFICATIONS

ELECTRICAL RATING CHART – 3CS2 MODELS

Model	Voltage	Kilowatts (kW)	Phase	Amps	Wire Sizing AWG*†	Fuse or Circuit Breaker*	Shipping Weight
3CS2-3	208	3	1	14.5	12	20	24 lbs. (11 kg)
3CS2-4	208	4	1	19.2	12	30	24 lbs. (11 kg)
3CS2-6	208	6	1	28.8	10	40	27 lbs. (12 kg)
3CS2-3	240	3	1	12.5	12	20	24 lbs. (11 kg)
3CS2-4	240	4	1	16.7	12	30	24 lbs. (11 kg)
3CS2-6	240	6	1	25.0	10	40	27 lbs. (12 kg)
3CS2-3B	208	3	3	8.4	14	15	24 lbs. (11 kg)
3CS2-4B	208	4	3	11.2	14	15	24 lbs. (11 kg)
3CS2-6B	208	6	3	16.7	12	30	27 lbs. (12 kg)
3CS2-3B	240	3	3	7.3	14	15	24 lbs. (11 kg)
3CS2-4B	240	4	3	9.6	14	15	24 lbs. (11 kg)
3CS2-6B	240	6	3	14.5	12	20	27 lbs. (12 kg)
3CS2-8	208	8	1	38.4	8	50	27 lbs. (12 kg)
3CS2-8	240	8	1	33.3	8	50	27 lbs. (12 kg)
3CS2-9B	208	9	3	25.0	10	40	27 lbs. (12 kg)
3CS2-9B	240	9	3	21.7	10	30	27 lbs. (12 kg)
3CS2-12B	208	12	3	33.4	8	50	27 lbs. (12 kg)
3CS2-12B	240	12	3	29.0	10	40	27 lbs. (12 kg)

* Based upon NEC 2002 Code

† Based upon THHN wire rated 90°C.

SPECIFICATIONS

ELECTRICAL RATING CHART – FR2 MODELS

Model	Voltage	Kilowatts (kW)	Phase	Amps	Wire Sizing AWG*†	Fuse or Circuit Breaker*	Shipping Weight
FR2-3	208	3	1	14.5	12	20	24 lbs. (11 kg)
FR2-4	208	4	1	19.2	12	30	24 lbs. (11 kg)
FR2-6	208	6	1	28.8	10	40	27 lbs. (12 kg)
FR2-3	240	3	1	12.5	12	20	24 lbs. (11 kg)
FR2-4	240	4	1	16.7	12	30	24 lbs. (11 kg)
FR2-6	240	6	1	25.0	10	40	27 lbs. (12 kg)
FR2-3B	208	3	3	8.4	14	15	24 lbs. (11 kg)
FR2-4B	208	4	3	11.2	14	15	24 lbs. (11 kg)
FR2-6B	208	6	3	16.7	12	30	27 lbs. (12 kg)
FR2-3B	240	3	3	7.3	14	15	24 lbs. (11 kg)
FR2-4B	240	4	3	9.6	14	15	24 lbs. (11 kg)
FR2-6B	240	6	3	14.5	12	20	27 lbs. (12 kg)
FR2-8	208	8	1	38.4	8	50	27 lbs. (12 kg)
FR2-8	240	8	1	33.3	8	50	27 lbs. (12 kg)
FR2-9B	208	9	3	25.0	10	40	27 lbs. (12 kg)
FR2-9B	240	9	3	21.7	10	30	27 lbs. (12 kg)
FR2-12B	208	12	3	33.4	8	50	27 lbs. (12 kg)
FR2-12B	240	12	3	29.0	10	40	27 lbs. (12 kg)

* Based upon NEC 2002 Code

† Based upon THHN wire rated 90°C.

NOTE: NSF Standard 4 has recently added performance requirements for food rethermalizing. The requirements mirror the requirements for food rethermalizing in the FDA Food Code. The basic requirement is that food reach a temperature of 165°F (74°C) in a time period of two hours or less.

Appliances that are manufactured for the purpose of rethermalizing food will need to meet these performance requirements in order to be listed to NSF Standard 4.

The Hatco FR2 Series heating unit is specifically made for food rethermalizing, however, the heating unit is designed to be incorporated into a hot water bath rethermalizer. Hatco does not supply the vessel that contains the water, nor the system which determines how food is placed and held in the vessel. The Hatco FR2 unit attaches to the bottom of the vessel and supplies hot water to the vessel.

Hatco does supply sizing recommendations to enable the appliance manufacturer to correctly size the FR2 unit to the vessel. However, there are variables in the way that the vessel is manufactured that affect its ability to pass the NSF performance requirements. The Hatco FR2 unit is listed with NSF for construction only. Due to the fact that the FR2 is only a portion of a larger system, it is impossible to do performance testing until the FR2 unit is incorporated onto the water vessel.

The result is that it is the responsibility of the vessel manufacturer to have the entire rethermalizing appliance tested and listed in accordance with NSF Standard 4. Simply hanging an NSF listed FR2 unit on the appliance does not transfer NSF listing to the entire appliance.

SPECIFICATIONS

SIZING INFORMATION

Hatco recommends the following guidelines be used to ensure proper operation and sanitation.

For 3CS2 Series in a Manual Warewashing Application

- Minimum 2000 watts (2 kW) per square foot (.2 watts per sq. mm) of vessel top.
- 3CS2 units are sized based on a 140°F (60°C) supply water with a 30 minute preheat period to reach the sanitizing temperature.

For FR2 Series in a Bain-Marie or Steam Table Application

- Minimum 750 watts (.75 kW) per square foot (.08 watts per sq. mm) of vessel top.

For FR2 Series in a Food Rethernalizer Application

- Minimum 2000 watts per square foot (.2 watts per sq. mm) of vessel top.

NOTE: Use one 3CS2 or FR2 unit for a vessel up to 6' (1829 mm) long. Over 6' (1829 mm) minimum two units required.

See the *Minutes To Heat Table* to determine the amount of time required to heat water using a FR2 series in a Bain-Marie or Steam Table application.

DIMENSIONS

Width (A)	Width (B)	Depth (C)	Height (D)
6-3/4" (172 mm)	7-3/4" (197 mm)	17-1/8" (435 mm)	12-3/8" (314 mm)

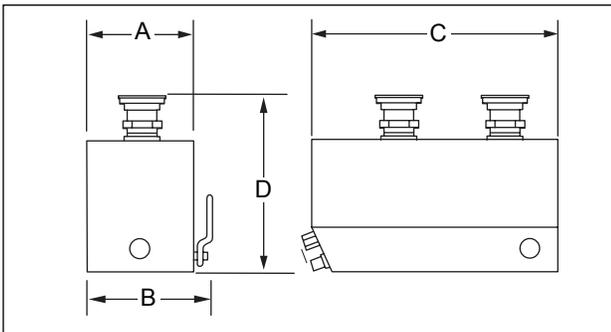


Figure 4. Dimensions without Auto-fill

ELECTRICAL

Install a fused disconnect switch or circuit breaker sized according to the applicable *Electrical Rating Chart*. The wiring from the switch or circuit breaker to the Hatco unit must be in accordance with local electrical requirements and codes

⚠ WARNING

For proper electrical installation conforming to local electrical codes consult a licensed electrical contractor. Improper electrical connections may cause a serious electrical shock injury or may damage the unit.

Models come complete with all electrical wiring and are equipped with three electrical knockouts, one at the rear and one on each side towards the rear. When performing installation, run electrical connections through one of these knockouts.

NOTE: Auto-fill models provided with two electrical knockouts, one at the rear and one on the right hand side towards the rear.

Only models FR2-3 and FR2-4 heaters can be ordered and supplied with an electrical cord and plug.

Width (A)	Width (B)	Depth (C)	Height (D)
6-3/4" (172 mm)	8-1/2" (216 mm)	17-1/8" (435 mm)	12-3/8" (314 mm)

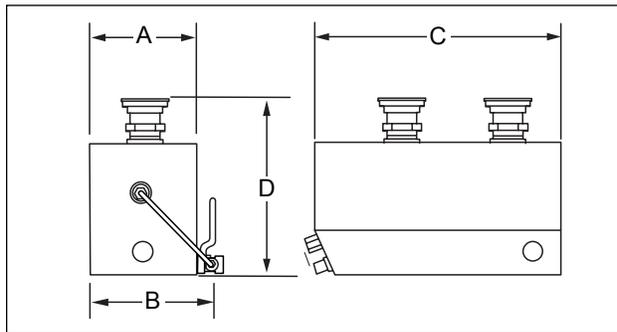


Figure 5. Dimensions with Auto-fill

INSTALLATION

PLUMBING

An adhesive backed paper template is shipped with the unit and is used to locate the sink strainer holes. Use the following procedure to install the heater unit to the holding vessel.

NOTE: The FR2 heater should be positioned with no more than 3' (914 mm) on either side when mounted under holding vessel. See Figure 6. A perforated water baffle (not supplied with unit) must be used to distribute the heated water properly.

NOTE: Use one FR2 for a Hot Food Table up to 6' (1829 mm) long. Over 6' (1829 mm) minimum 2 units required.

⚠ CAUTION

Unit is not weatherproof. For safe and proper operation locate the unit indoors where the ambient air temperature is constant and is a minimum of 70°F (21°C).

⚠ CAUTION

Do not use extension pipes on the inlet and outlet connections on heater units. Poor performance or unsafe conditions may occur.

1. Expose the adhesive back of the paper template and stick the template on the bottom of the holding vessel. Center the template with the words "Front Cover" positioned against the front inside wall of the vessel.
2. Center punch and drill a 3/4" (19 mm) pilot hole at each of the two center marks on the template.
3. Remove the template and cut a 2" (51 mm) diameter hole at each pilot hole location using a standard #ATV1756 Greenlee cutter.

NOTE: If a #ATV1756 Greenlee cutter is not available, use a standard Greenlee 1-1/2" conduit cutter #500-6978, which is slightly under 2" (51 mm) diameter. File or ream holes as necessary to 2" (51 mm) diameter required for mounting sink strainers.

4. See Figure 7. In each of the holes, install a male threaded sink strainer with a thin gasket between the strainer flange and the bottom of the holding vessel.
5. Install **two** thick gaskets at the underside of the holding vessel along with a thin fiber gasket, and secure **finger tight** with the nut.

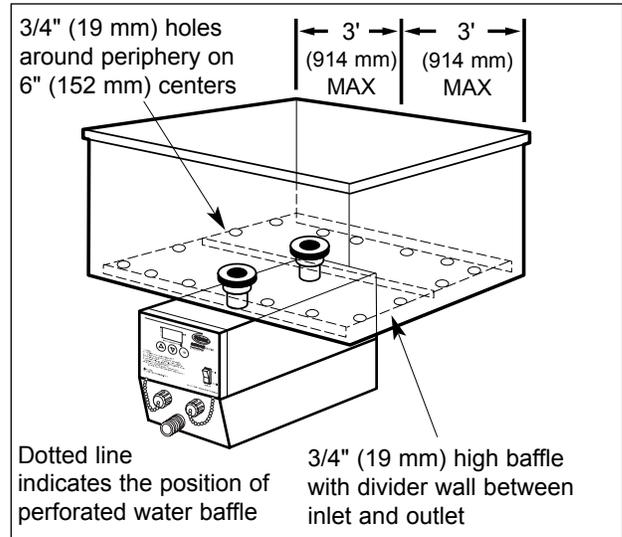


Figure 6. Hydro-Heater Water Baffle

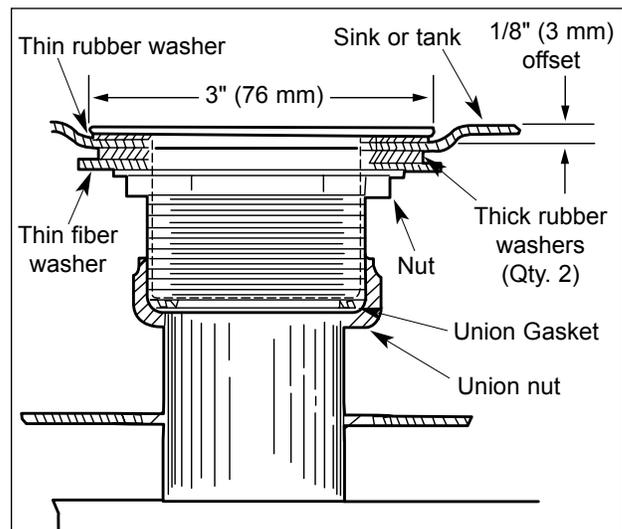


Figure 7. Installing Sink Strainer

6. Attach the heater to the strainers loosely with the union nuts and 1-3/4" (45 mm) rubber gaskets.

NOTE: Make sure rubber gaskets are positioned inside the union nuts and are not crimped.

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

INSTALLATION

CAUTION

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

NOTE: A 3/4" (19 mm) 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. See MAINTENANCE for more information.

NOTE: Units exposed to movement, such as shipboard installations, must be stabilized before operating. Two anti-sway anchor points are located on the bottom-center of the unit. Attach stabilization hardware to these points using the 8/32" screws supplied.

CAUTION

Water Quality Requirements - Incoming water in excess of 3.0 grains of hardness per gallon (GPG) (.75 grains of hardness per liter) must be treated and softened before being supplied to a Hydro-Heater. To maintain efficiency and to extend the operating life "regular deliming and cleaning" must be performed when water supplied contains over 3.0 GPG (.75 GPL).

CAUTION

**To avoid any damage to units with Auto-fill, do not exceed the following:
Incoming Water Temperature: 140°F (60°C)
Incoming Water Pressure: 80 PSI (550 kPa)**

AUTO-FILL

Units equipped with Auto-fill require the following steps be completed before start-up.

WARNING

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

1. Supply 1/4" NPT copper water supply line to inlet of solenoid valve on heater.

NOTE: Ball valve or gate valve, line strainer, union(s) and vacuum breaker or other anti-siphon device must be supplied by table manufacturer or installer if required.

2. Locate a point on the sidewall of the water vessel which is 1/2" (13 mm) up from the bottom of the food pan(s).
3. Mark and drill a 1/2" (13 mm) hole into the side wall of the tank.
4. Deburr the hole. Burrs may crack or damage the probe when tightened.
5. Position upper water sensor into tank with o-ring against inside wall.
6. Place washer onto threads of probe on outside wall of tank.
7. Secure all with nylon nut, making sure flat side of nut is towards washer.
8. Tighten until snug. Be careful not to overtighten nut. Overtightening may cause leaks and/or crack the probe.
9. Turn on water and check for leaks.
10. Connect wire lead to probe.

START-UP PROCEDURES

⚠ WARNINGS

Hatco 3CS2 and FR2 series units are designed for **commercial use only** by properly trained personnel! To avoid any injury or damage to the unit read and follow the instructions contained in this manual. Do not operate this equipment unless you have read and completely understood the contents of this manual.

⚠ WARNINGS

Units are designed to heat water up to 190°F (88°C). **DO NOT** set temperature controls to a setting higher than 190°F (88°C). Water over 190°F (88°C) is very active and could splash onto operator causing serious burns or injury.

⚠ CAUTION

Water in the unit and holding vessel is very hot. Wear protective gloves and proper attire when operating to avoid injury.

CAUTION

Do not turn the electrical current to the unit on until the holding vessel has been filled with water or element burnout may occur.

1. Make sure clean-out cap(s) (2-3 element units only) are securely tightened. See Figure 8.
2. Close sump drain by moving handle all of the way forward **until it stops**. See Figure 8.
- 3A. Fill the holding vessel with hot tap water to normal operating level.
- 3B. Auto-Fill Units - Open water supply valve if present.
4. Check that the fused disconnect switch or circuit breaker is on, or if equipped with power cord and plug make sure unit is plugged into a properly grounded receptacle.
- 5A. Turn power switch to ON position. The electronic display will glow to indicate power is supplied.
- 5B. Auto-Fill Units - Verify tank is being filled with water. The electronic display will light up at this time to indicate power is supplied to the unit. See Figure 9.

The display will show "E3" indicating that the water level is low.

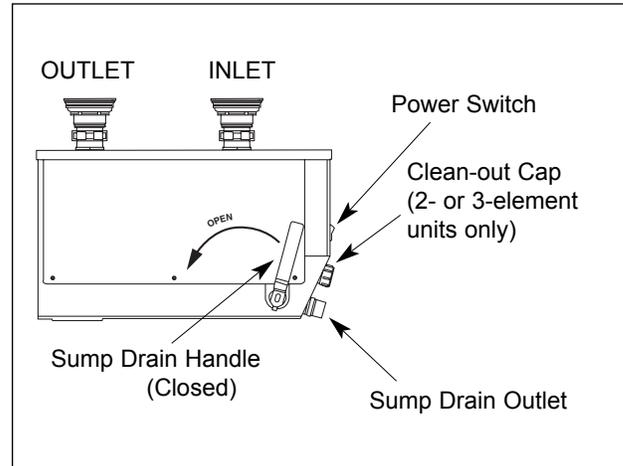


Figure 8. Hydro-Heater Side View

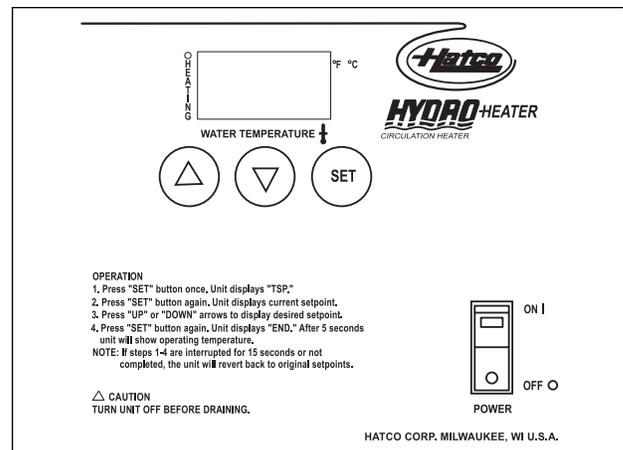


Figure 9. Controller

NOTE—AUTO-FILL UNITS ONLY: When the tank water level reaches the low water probe the display will show the current water temperature and a small red light will glow in the upper left-hand corner of the display indicating the heating elements are energized. Water will continue to fill the tank until the upper water probe has been satisfied. The heating elements will remain on until the tank water reaches the programmed temperature setpoint.

6. To set the controller to the desired water temperature press "Set" button once; unit will display "t5P." See Figure 9.
7. Press "Set" button again; unit displays current setpoint.
8. Press "Up" or "Down" arrow to change and display desired setpoint.
9. Press "Set" button again unit will display "END". After 5 seconds unit will display current operating temperature.

OPERATION

***NOTE:** If steps 6-9 are interrupted or no changes are made for 15 seconds the controller will go back to its original setting without accepting the change.*

***NOTE:** If unit displays “E1” or “E2” the internal water sensing probe is out of temperature range. If this occurs contact Hatco Parts and Service Team or an Authorized Service Agent in your area for assistance.*

CHANGING TEMPERATURE DISPLAY FROM FAHRENHEIT (F°) TO CELSIUS (C°)

WARNING

To avoid any injury or damage to the unit use only Authorized Hatco Service Agents to perform any temperature display changes.

A dipswitch panel consisting of four switches is located behind the front graphic overlay.

Switch 2 is used to change the temperature display from F° to C°.

1. Turn the power switch to the OFF position at the fuse disconnect switch/circuit breaker and unplug power cord (if equipped) from the power source and allow unit to cool.
2. Remove front control compartment cover.
3. Move dipswitch “2” to the right to change the display from Fahrenheit (F°) to Celsius (C°).
4. Re-install control compartment cover.
5. Restore power supply and turn power switch to ON.

OPERATION

MINUTES TO HEAT TABLE*

Water Temp. At Start-Up	9" (229 mm) DEEP WATER - 750 WATTS PER SQUARE FOOT OF VESSEL TOP											
	Temperature °F (°C) Water Heated To:											
	70 (21)	80 (27)	90 (32)	100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)
60°F (16°C)	12	23	35	47	60	72	85	100	116	136	162	211
70°F (21°C)		12	24	36	49	61	74	89	105	125	151	200
80°F (27°C)			12	24	37	49	62	77	93	113	139	188
90°F (32°C)				12	25	34	50	65	85	101	127	176
100°F (38°C)					13	28	38	53	69	89	115	164
110°F (43°C)						12	25	40	56	66	102	151
120°F (49°C)							13	28	44	64	90	139
130°F (54°C)								15	31	51	77	126
140°F (60°C)									16	36	62	111
150°F (66°C)										20	46	95
160°F (71°C)											26	75
170°F (77°C)												49

Water Temp. At Start-Up	6" (152 mm) DEEP WATER - 750 WATTS PER SQUARE FOOT OF VESSEL TOP											
	Temperature °F (°C) Water Heated To:											
	70 (21)	80 (27)	90 (32)	100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)
60°F (16°C)	8	15	23	61	40	48	57	67	77	90	108	140
70°F (21°C)		8	16	24	33	40	49	59	70	83	100	133
80°F (27°C)			8	16	25	33	41	51	62	75	92	125
90°F (32°C)				8	17	23	33	43	54	67	84	117
100°F (38°C)					9	17	15	35	45	59	76	109
110°F (43°C)						8	17	27	37	44	68	100
120°F (49°C)							9	19	29	42	60	92
130°F (54°C)								10	21	34	51	84
140°F (60°C)									11	24	41	74
150°F (66°C)										13	31	63
160°F (71°C)											17	50
170°F (77°C)												33

* Results may vary depending upon wattage/square foot. As wattage per foot increase, the speed of heating will increase.

MAINTENANCE

GENERAL

⚠ WARNING

To avoid any electrical shock hazard, or physical burns turn the power OFF at the fuse disconnect switch/circuit breaker or unplug the unit from the power source and allow to cool completely before performing any maintenance or cleaning.

⚠ WARNING

To prevent any injury or damage to the unit do not pull unit by power cord.

⚠ WARNING

To prevent any injury, discontinue use if power cord is frayed or worn.

Recommended Cleaning Schedule

Complete cleaning and power flushing should be done

- On a daily basis.
- Whenever food particles accumulate in the tank.
- Whenever a spill occurs.
- Whenever the unit is to be stored or shipped, especially in freezing temperatures.

Helpful Hints

- Keep inlet and outlet free of debris.
- Keep false bottoms in place and free of debris (FR2 units only).

DRAINING & CLEANING ALL MODELS

NOTE: The holding vessel or sink should be drained through its own drain valve first to discharge debris and water that remains in it.

CAUTION

Drain holding vessel with power to the unit off, or element burnout may occur.

DAILY (See Figure 10)

1. Turn power switch to the OFF position.
2. Connect one end of a drain hose onto the sump drain outlet and place the open end in a bucket or open site drain in a manner according to local plumbing codes.
3. Drain the heating unit to discharge visible water and debris by moving the sump drain handle backwards until it stops.
4. Wipe visible deposits from the sink or tank and on units with **Auto-Fill clean water sensor on sidewall of tank**.

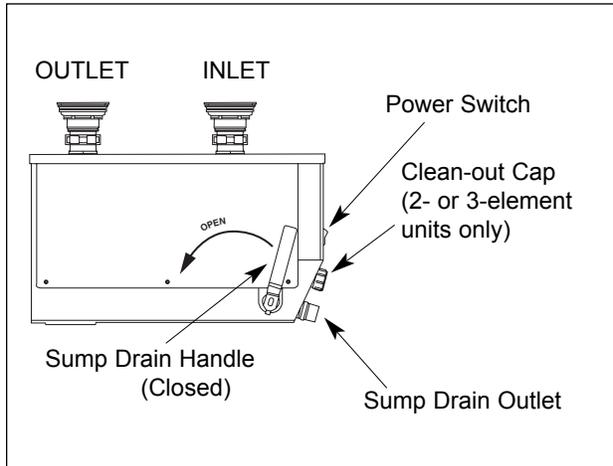


Figure 10. Hydro-Heater Side View

5. Close sump drain by moving handle all of the way forward **until it stops**. See Figure 10.
6. Dissolve a safe, non-toxic, non-corrosive sanitizer into 1 gallon (3.7 L) of hot water and pour into tank or sink and refill to 2" (51 mm) deep and allow to soak for a minimum of 15 minutes.

NOTE: Follow the sanitizers instructions for proper mixture of water and sanitizer.

7. Repeat step 3.
8. Thoroughly rinse unit with fresh water until discharge is clear and all sanitizers have been removed and rinsed.
9. Repeat step 5.
10. Follow normal operation instructions.

NOTE: If unit has heavy build-up and deposits that do not remove during normal cleaning and flushing refer to OPTIONAL POWER FLUSH CLEANING.

OPTIONAL POWER FLUSH CLEANING

NOTE: Power Flush Kit sold separately.

1. Turn power switch to OFF position.
2. Connect one end of a drain hose onto the sump drain outlet and place the open end in a bucket or open site drain in a manner according to local plumbing codes.
3. Drain the holding vessel by moving the sump drain handle backwards until it completely stops. Water will now flow from the drain hose.
4. Place the rubber stopper, Hatco part #05.06.026.00, into the inlet strainer.

NOTE: Inlet strainer is the strainer closest to the front of the unit.

5. Attach power flush hose with adapter, Hatco part #05.06.010.00, to a fresh water supply and place into outlet (rear) strainer. Flush fresh water through heater unit until discharge from sump is clear.
6. Turn fresh water supply off and reverse the positions of the rubber stopper and power flush hose and again flush fresh water through heater unit until discharge from sump is clear.

7. Turn off water supply, remove rubber stopper and power flush hose and allow unit to finish draining.
8. Remove clean-out caps and (2 or 3 element units only) (See Figure 10) insert cleaning brush, Hatco part #03.40.060.00, into all clean out and sump drain outlets. Use a scrubbing motion to clean the chambers.
9. Reinstall clean-out caps removed in step 8.
10. Rinse fresh water through the heater unit until discharge is clear.
11. Close sump drain by moving handle all of the way forward **until it stops**.

NOTE: FOLLOW DELIMITING INSTRUCTIONS IF BUILDUP IS SIGNIFICANT.

MAINTENANCE

DELIMING INSTRUCTIONS

CAUTION

Inspect daily for lime and sediment buildup inside unit. Excessive amounts can affect unit performance and reduce the operating life of the unit.

NOTE: Product failure caused by liming or sediment buildup is not covered under warranty.

CAUTION

To avoid any damage to the heater unit use only delimers that are non-corrosive to aluminum, brass and stainless steel. Damage caused by corrosive material or solutions is not covered under warranty.

The amount of lime and mineral content in the water and how often the unit is operated will dictate how often the unit needs to be delimed.

Units used with water that contains high lime and mineral content may require deliming on a daily basis.

NOTE: The delimer used should be a safe, non-toxic, non-corrosive solution. Follow the delimer's instructions.

In order to dissolve water scale, lime and rust deposits from the electric heating elements, thermostat probes and interior surfaces of the unit, use the following procedure:

1. Turn power switch to OFF position.
2. Connect one end of a drain hose onto the sump drain outlet with the other end in a bucket or open site drain in a manner according to local plumbing codes.

3. Drain the water from the holding vessel by moving the sump drain handle backwards until it stops.
4. Close sump drain valve by moving handle forward.
5. Slowly add delimer and water mixture into heat tank through sink strainer assemblies. Allow the unit to stand with the mixture in the reservoir for the recommended period of time.

NOTE: The time required will vary depending on the solution used and amount of deposits in the reservoir.

6. After cleaning, drain all expended solution from the unit through the sump drain.
7. Thoroughly flush heater through the front and rear openings with fresh water for several minutes until discharge is clear.
8. Close sump drain by moving handle all of the way forward **until it stops**.
9. Follow normal operation instructions.

CAUTION

Do not turn the electrical current to the unit on until the holding vessel has been filled with water or element burnout may occur.

⚠ WARNING

If service is required on this unit, contact your Authorized Hatco Service Agent, or contact the Hatco Service Department at 800-558-0607 or 414-671-6350; fax 800-690-2966 or international fax 414-671-3976.

⚠ WARNING

This product has no “user” serviceable parts. To avoid damage to the unit or injury to personnel, use only Authorized Hatco Service Agents and Genuine Hatco Parts when service is required.

⚠ WARNING

Genuine Hatco Replacement Parts are specified to operate safely in the environments in which they are used. Some aftermarket or generic replacement parts do not have the characteristics that will allow them to operate safely in Hatco equipment. It is essential to use Hatco Replacement Parts when repairing Hatco equipment. Failure to use Hatco Replacement Parts may subject operators of the equipment to hazardous electrical voltage, resulting in electrical shock or burn.

HATCO LIMITED WARRANTY

1. PRODUCT WARRANTY

Hatco warrants the products that it manufactures (the "Products") to be free from defects in materials and workmanship, under normal use and service, for a period of one (1) year from the date of purchase when installed and maintained in accordance with Hatco's written instructions or 18 months from the date of shipment from Hatco. Buyer must establish the product's purchase date by returning Hatco's Warranty Registration Card or by other means satisfactory to Hatco in its sole discretion.

Hatco warrants the following Product components to be free from defects in materials and workmanship from the date of purchase (subject to the foregoing conditions) for the period(s) of time and on the conditions listed below:

- a) **One (1) Year Parts and Labor PLUS One (1) Additional Year Parts-Only Warranty:**
 - Toaster Elements (metal sheathed)
 - Drawer Warmer Elements (metal sheathed)
 - Drawer Warmer Drawer Rollers and Slides
 - Food Warmer Elements (metal sheathed)
 - Infra-Black® Elements (metal sheathed)
 - Display Warmer Elements (metal sheathed air heating)
 - Holding Cabinet Elements (metal sheathed air heating)

- b) **One (1) Year Parts and Labor PLUS Four (4) Additional Years Parts-Only Warranty on pro-rated terms that Hatco will explain at Buyer's Request:**
 - Powermite® Gas Booster Heater Tanks
 - Mini Compact Tanks (stainless steel)
 - 3CS and FR Tanks

- c) **One (1) Year Parts and Labor PLUS Four (4) Additional Years Parts-Only Warranty PLUS Five (5) Year Parts-Only Warranty on pro-rated terms that Hatco will explain at Buyer's Request:**
 - Booster Heater Tanks (Castone®)

- d) **One (1) Year Parts-Only Warranty for components not installed by Hatco:**
 - Accessory Components (including but not limited to valves, gauges and remote switches)

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR PATENT OR OTHER INTELLECTUAL PROPERTY RIGHT INFRINGEMENT. Without limiting the generality of the foregoing, SUCH WARRANTIES DO NOT COVER: Coated incandescent light bulbs, fluorescent lights, lamp warmer heat bulbs, glass components, Product failure in booster tank, fin tube heat exchanger, or other water heating equipment, caused by liming, sediment buildup, chemical attack or freezing, Product misuse, tampering or misapplication, improper installation, application of improper voltage, or recalibration of thermostats or high limit switches, or transportation damage.

2. LIMITATION OF REMEDIES AND DAMAGES

Hatco's liability and Buyer's exclusive remedy hereunder will be limited solely, at Hatco's option, to repair or replacement by a Hatco-authorized service agency (other than where Buyer is located outside of the United States or Canada, in which case Hatco's liability and Buyer's exclusive remedy hereunder will be limited solely to replacement of part under warranty) with respect to any claim made within the applicable warranty period referred to above. Without limiting the generality of the foregoing, all portable Products (as defined in N.S.F. 4-4.28.4) shall be delivered by Buyer, at its sole expense, to the nearest Hatco-authorized service agency for replacement or repair. Hatco reserves the right to accept or reject any such claim in whole or in part. Hatco will not accept the return of any Product without prior written approval from Hatco, and all such approved returns shall be made at Buyer's sole expense. HATCO WILL NOT BE LIABLE, UNDER ANY CIRCUMSTANCES, FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, INCLUDING BUT NOT LIMITED TO LABOR COSTS OR LOST PROFITS RESULTING FROM THE USE OF OR INABILITY TO USE THE PRODUCTS OR FROM THE PRODUCTS BEING INCORPORATED IN OR BECOMING A COMPONENT OF ANY OTHER PRODUCT OR GOODS.

HATCO AUTHORIZED PARTS DISTRIBUTORS

ALABAMA

Jones McLeod Appl. Svc.
Birmingham 205-251-0159

ARIZONA

Auth. Comm. Food Equip.
Phoenix 602-234-2443
Byassee Equipment Co.
Phoenix 602-252-0402

CALIFORNIA

Industrial Electric
Huntington Beach 714-379-7100
Chapman Appl. Service
San Diego 619-298-7106
P & D Appliance
S. San Francisco 650-635-1900

COLORADO

Hawkins Commercial Appliance
Englewood 303-781-5548

DELAWARE

Food Equipment Service
Wilmington 302-996-9363

FLORIDA

Whaley Foodservice Repair
Jacksonville 904-725-7800
Nass Service Co., Inc.
Orlando 407-425-2681
B.G.S.I.
Pompano Beach 954-971-0456
Comm. Appliance Service
Tampa 813-663-0313

GEORGIA

Adcox Service Co.
Atlanta 404-361-8010
Southeastern Rest. Svc.
Norcross 770-446-6177

HAWAII

Burney's Comm. Service, Inc.
Honolulu 808-848-1466
Food Equip Parts & Service
Honolulu 808-847-4871

ILLINOIS

Parts Town
Lombard 708-865-7278
Eichenauer Elec. Service
Decatur 217-429-4229
Midwest Elec. Appl. Service
Elmhurst 630-279-8000
Cone's Repair Service
Moline 309-797-5323

INDIANA

GCS Service
Indianapolis 317-545-9655

IOWA

Electric Motor Service Co.
Davenport 319-323-1823

KENTUCKY

GCS Service
Louisville 502-367-1788

LOUISIANA

Chandlers Parts & Service
Baton Rouge 225-272-6620
Bana Comm. Parts, Inc.
Shreveport 318-631-6550

MARYLAND

Electric Motor Service
Baltimore 410-467-8080
GCS Service
Silver Spring 301-585-7550

MASSACHUSETTS

Ace Service Co., Inc.
Needham 781-449-4220

MICHIGAN

Commercial Kitchen Service
Bay City 517-893-4561
Bildons Appliance Service
Detroit 248-478-3320
Midwest Food Equip. Service
Grandville 616-261-2000

MINNESOTA

GCS Service
Minneapolis 612-546-4221

MISSOURI

GCS Service
Kansas City 816-920-5999
Commercial Kitchen Services
St. Louis 314-890-0700
Kaemmerlen Parts & Service
St. Louis 314-535-2222

NEBRASKA

Anderson Electric
Omaha 402-341-1414

NEVADA

Burney's Commercial
Las Vegas 702-736-0006
Hi. Tech Commercial Service
N. Las Vegas 702-649-4616

NEW JERSEY

Jay Hill Repair
Fairfield 973-575-9145
Service Plus
Flanders 973-691-6300

NEW YORK

Acme American Repairs, Inc.
Brooklyn 718-456-6544

NEW YORK (continued)

Alpro Service Co.
Brooklyn 718-386-2515
Appliance Installation
Buffalo 716-884-7425
Northern Parts Dist.
Plattsburgh 518-563-3200
J.B. Brady, Inc.
Syracuse 315-422-9271

NORTH CAROLINA

Authorized Appliance
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OHIO

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Certified Service Center
Cincinnati 513-772-6600
Commercial Parts and Service
Columbus 614-221-0057
GCS Service
Columbus 614-476-3225
Electrical Appl. Repair Service
Independence 216-459-8700
E. A. Wichman Co.
Toledo 419-385-9121

OKLAHOMA

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Oklahoma City 405-235-2184
Krueger, Inc.
Oklahoma City 405-528-8883

OREGON

Bressie Electric Co.
Portland 503-231-7171
Ron's Service, Inc.
Portland 503-624-0890

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Harrisburg 717-236-9039
Elmer Schultz Services
Philadelphia 215-627-5401
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RHODE ISLAND

Marshall Electric Co.
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SOUTH CAROLINA

Whaley Foodservice Repair
W. Columbia 803-791-4420

TENNESSEE

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Memphis 901-527-7543

TEXAS

Stove Parts Supply
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Commercial Kitchen Repair Co.
San Antonio 210-735-2811
San Antonio Rest. Equip.
San Antonio 210-532-1660

UTAH

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VIRGINIA

Daubers
Norfolk 757-855-4097
Daubers
Springfield 703-866-3600

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Restaurant Appl. Service
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Madison 608-246-3160
A.S.C., Inc.
Milwaukee 414-543-6460

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Toronto 416-422-5580
Choquette CKS
Ottawa 613-739-8458

QUÉBEC

Choquette CKS
Montreal 514-722-2000
Choquette CKS
Québec City 418-681-3944

HATCO CORPORATION

P.O. Box 340500, Milwaukee, WI 53234-0500 U.S.A.

(800) 558-0607 (414) 671-6350

Parts & Service Fax (800) 690-2966 Int'l. Fax (414) 671-3976

www.hatcocorp.com