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HYDRO-HEATER

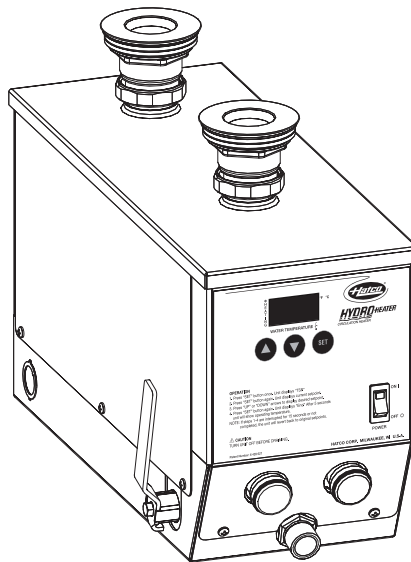
Sanitizing Sink Heaters

Bain-Marie Heaters/Food Rethernalizers

3CS2 and FR2 Series

Installation and Operating Manual

P/N 07.04.364.00



⚠ WARNING

Do not operate this equipment unless you have read and understood the contents of this manual! Failure to follow the instructions contained in this manual may result in serious injury or death. This manual contains important safety information concerning the maintenance, use, and operation of this product. If you're unable to understand the contents of this manual, please bring it to the attention of your supervisor. Keep this manual in a safe location for future reference.

⚠ ADVERTENCIA

No opere este equipo al menos que haya leído y comprendido el contenido de este manual! Cualquier falla en el seguimiento de las instrucciones contenidas en este manual puede resultar en un serio lesión o muerte. Este manual contiene importante información sobre seguridad concerniente al mantenimiento, uso y operación de este producto. Si usted no puede entender el contenido de este manual por favor pregunte a su supervisor. Almacenar este manual en una localización segura para la referencia futura.

⚠ AVERTISSEMENT

Ne pas utiliser cet équipement sans avoir lu et compris le contenu de ce manuel ! Le non-respect des instructions contenues dans ce manuel peut entraîner de graves blessures ou la mort. Ce manuel contient des informations importantes concernant l'entretien, l'utilisation et le fonctionnement de ce produit. Si vous ne comprenez pas le contenu de ce manuel, veuillez le signaler à votre supérieur. Conservez ce manuel dans un endroit sûr pour pouvoir vous y référer plus tard.

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IMPORTANT OWNER INFORMATION

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

Model No. _____

Serial No. _____

Voltage _____

Date of Purchase _____

Register your unit!

Completing online warranty registration will prevent delay in obtaining warranty coverage. Access the Hatco website at www.hatcocorp.com, select the *Parts & Service* pull-down menu, and click on "Warranty Registration".

Business Hours: 8:00 AM to 5:00 PM
Central Standard Time (C.S.T.)

(Summer Hours: June to September –
8:00 AM to 5:00 PM C.S.T.
Monday through Thursday
8:00 AM to 2:30 PM C.S.T. Friday)

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

E-mail: partsandservice@hatcocorp.com

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



24 Hour 7 Day Parts and 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 sink or holding vessel located above the heater. Water flows by natural convection from the holding vessel directly into a tubular water chamber with heating elements uniquely wrapped around 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 and resulting in longer life. The heated water flows upward and returns to the holding vessel.

A special electronic controller maintains the setpoint temperature ensuring a responsive and efficient operation. The unit's electrical and plumbing connections are factory-assembled and ready for installation.

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

This manual provides the installation, safety, and operating instructions for the Hydro-Heater Sanitizing Sink Heaters and Food Rethermalizers/Bain-Marie Heaters. Hatco recommends that all installation, operating, and safety instructions appearing in this manual be read prior to installation or operation of a unit.

Safety information that appears in this manual is identified by the following signal word panels:

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

IMPORTANT SAFETY INFORMATION



Read the following important safety information before using this equipment to avoid serious injury or death and to avoid damage to equipment or property.



WARNING

ELECTRIC SHOCK HAZARD:

- Units supplied without an electrical cord and plug require a hardwired connection to on-site electrical system. Connection must be properly grounded and of correct voltage, size, and configuration for electrical specifications of unit. Contact a qualified electrician to determine and install proper electrical connection.
- For units with an electrical cord and plug, plug unit into a properly grounded electrical receptacle of the correct voltage, size, and plug configuration. If plug and receptacle do not match, contact a qualified electrician to determine and install proper voltage and size electrical receptacle.
- Unit must be installed by qualified, trained installers. Installation must conform to all local electrical and plumbing codes. Installation by unqualified personnel will void the unit warranty and may lead to electric shock or burn, as well as damage to unit and/or its surroundings. Check with local plumbing and electrical inspectors for proper procedures and codes.
- Unit is not weatherproof. Locate the unit indoors where the ambient air temperature is a minimum of 70°F (21°C).
- Turn OFF power switch, unplug power cord/turn off power at circuit breaker, and allow unit to cool before performing any cleaning, adjustments, or maintenance.
- DO NOT submerge or saturate with water. Unit is not waterproof. Do not operate if unit has been submerged or saturated with water.
- Do not clean unit when it is energized or hot.
- This unit is not “jet-proof” construction. Do not use jet-clean spray to clean this unit.
- Discontinue use if power cord is frayed or worn.
- Do not attempt to repair or replace a damaged power cord. Cord must be replaced by Hatco, an Authorized Hatco Service Agent, or a person with similar qualifications.
- This unit must be serviced by qualified personnel only. Service by unqualified personnel may lead to electric shock or burn.
- Use only Genuine Hatco Replacement Parts when service is required. Failure to use Genuine Hatco Replacement Parts will void all warranties and may subject operators of the equipment to hazardous electrical voltage, resulting in electrical shock or burn. 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.



WARNING

FIRE HAZARD:

- Install unit with a minimum of 3-1/2" (89 mm) of space from bottom of unit to all combustible surfaces to prevent combustion.
- Do not use harsh chemicals such as bleach (or cleaners containing bleach), oven cleaners, or flammable cleaning solutions to clean this unit.

Make sure all operators have been instructed on the safe and proper use of the unit.

This unit is not intended for use by children or persons with reduced physical, sensory, or mental capabilities. Ensure proper supervision of children and keep them away from the unit.

Hatco Corporation is not responsible for actual food product serving temperature. It is the responsibility of the user to ensure that food product is held and served at a safe temperature.

This unit has no “user-serviceable” parts. If service is required on this unit, contact an 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.



CAUTION

BURN HAZARD:

- Some exterior surfaces on unit will get hot. Avoid unnecessary contact with unit.
- Drain water may reach temperatures in excess of 200°F (93°C). Use appropriate plumbing materials when installing drain.
- Water in holding vessel may reach temperatures in excess of 190°F (88°C). Use appropriate protection when operating unit.
- Hot water in unit may cause scalding injury. Allow unit to cool before draining or cleaning.
- DO NOT set temperature control higher than 190°F (88°C). Units are designed to heat water up to 190°F (88°C). Water over 190°F (88°C) is very active and could splash onto operator causing serious burns or injury.

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

Auto-Fill units must be installed with adequate backflow protection and must conform with all federal, state, and local codes.

IMPORTANT SAFETY INFORMATION

NOTICE

Units are voltage-specific. Refer to specification label for electrical requirements before beginning installation. Connecting unit to incorrect power supply will void product warranty and may damage unit.

For units with Auto-Fill, do not exceed an incoming water temperature of 140°F (60°C) or incoming water pressure of 80 psi (550 kPa).

This unit is intended for commercial use only — NOT for household use.

Do not turn on power to unit until holding vessel has been filled with water. Dry operation may cause element burnout.

ALWAYS drain holding vessel with power to unit off or element burnout could occur.

Standard and approved manufacturing oils may smoke up to 30 minutes during initial startup. This is a temporary condition. Operate unit correctly until smoke dissipates.

NOTICE

Do not use excessive force when tightening unions or nuts. Over-tightening and excessive force may cause leaks.

Incoming water in excess of 3 grains of hardness per gallon (GPG) (0.75 grains of hardness per liter [GPL]) must be treated and softened before being supplied to water heater(s). Water containing over 3 GPG (0.75 GPL) will decrease efficiency, increase energy use, and reduce operating life of unit through increased lime build-up. Product failure caused by liming or sediment buildup is not covered under warranty.

Use only delimers that are non-corrosive to aluminum, brass, and stainless steel. Damage to unit caused by corrosive materials is not covered under warranty.

Inspect unit regularly for lime and sediment buildup. Excessive buildup may affect performance and reduce operating life of unit.

MODEL DESCRIPTION

All Models

3CS2 and FR2 series Hydro-Heaters mount under a sink or holding vessel, leaving the interior of the holding vessel free of obstructions. Hydro-Heaters feature a tubular water chamber with a spiral heating element wrapped around the outside. They include a stainless steel front, powdercoated body, a low-water cut-off system, and a convenient drain.

Each unit comes with a one year parts and labor warranty. Units are shipped completely assembled and ready to install with all gaskets and fittings.

Optional features include a stainless steel body and base, an Auto-Fill system, a remote mounted control, and a security package. A flush hose kit is available as an accessory. Refer to the OPTIONS AND ACCESSORIES section for details.

3CS2 Models

The Hatco 3CS Hydro-Heater is designed for use with any manual dishwashing operation. It maintains a continuous supply of sanitizing rinse water at 180°F (82°C). The heater utilizes advanced electronic controls and “free flow” technology to ensure responsive and efficient operation.

FR2 Models

The Hatco FR2 Hydro-Heater is designed to be used with a Bain-Marie or Food Rethermalizer to heat or hold foods at safe temperatures between 140°F and 190°F (60° and 88°C). An electronic controller with digital display maintains an accurate setpoint temperature, and “free flow” technology ensures responsive and efficient operation.

FR2-3 and FR2-4 models are available with an optional 48" (1219 mm) cord and plug.

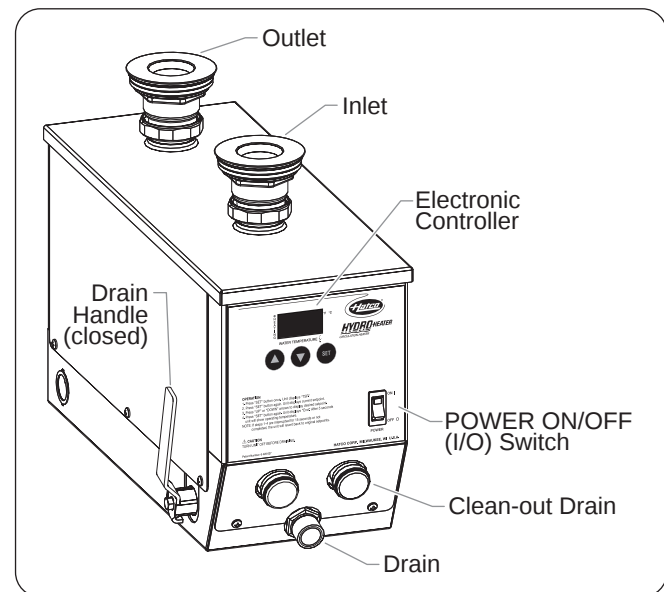


Figure 1. 3CS2/FR2 Series Hydro-Heater

MODEL DESIGNATION

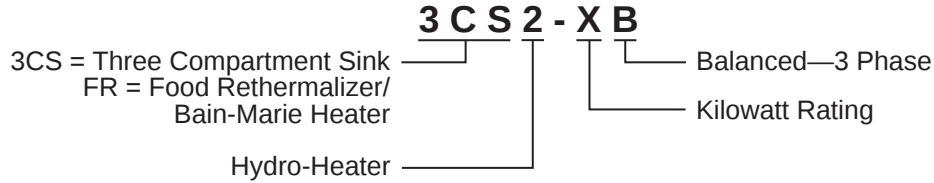


Figure 2. Model Designation

SPECIFICATIONS

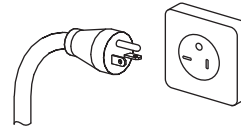
Plug Configurations

Some units are supplied from the factory with an electrical cord and plug installed. Plugs are supplied according to the applications.

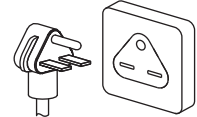


WARNING

ELECTRIC SHOCK HAZARD: For units with an electrical cord and plug, plug unit into a properly grounded electrical receptacle of the correct voltage, size, and plug configuration. If plug and receptacle do not match, contact a qualified electrician to determine and install proper voltage and size electrical receptacle.



NEMA 6-20P
(Available for FR2-3 only)



NEMA 6-30P
(Available for FR2-4 only)

Figure 3. Plug Configurations

NOTE: The specification label is located on the lower right side toward the front of the unit. See label for serial number and verification of unit electrical information.

Electrical Rating Chart—3CS2 Models

Model	Voltage	Kilowatts (kW)	Phase	Amps	Wiring Sizing AWG*†	Fuse or Circuit Breaker*	Shipping Weight
3CS2-3	208	3.0	1	14.4	12	20	24 lbs. (11 kg)
	240	3.0	1	12.5	12	20	24 lbs. (11 kg)
3CS2-4	208	4.5	1	19.2	10	30	24 lbs. (11 kg)
	240	4.5	1	16.7	10	30	24 lbs. (11 kg)
3CS2-6	208	6.0	1	28.8	8	40	27 lbs. (12 kg)
	240	6.0	1	25	8	40	27 lbs. (12 kg)
3CS2-3B	208	3.0	3 (Bal.)	8.4	14	15	24 lbs. (11 kg)
	240	3.0	3 (Bal.)	7.3	14	15	24 lbs. (11 kg)
3CS2-4B	208	4.5	3 (Bal.)	11.2	14	20	24 lbs. (11 kg)
	240	4.5	3 (Bal.)	9.6	14	15	24 lbs. (11 kg)
3CS2-6B	208	6.0	3 (Bal.)	16.7	12	30	27 lbs. (12 kg)
	240	6.0	3 (Bal.)	14.5	12	20	27 lbs. (12 kg)
3CS2-9B	208	9.0	3 (Bal.)	25	10	40	27 lbs. (12 kg)
	240	9.0	3 (Bal.)	21.7	10	30	27 lbs. (12 kg)

* Wire size is based on THHN copper wire for branch circuit protection at 0.91 derate factor. Circuit breakers and fused disconnects are to be mounted remotely and wired by contractor. Sizes are based on the 2002 NEC table 310-16. Conduit size based on conductors plus ground wire sizing per Table C1 from Appendix C.

† Based upon THHN wire rated 90°C.

NOTE: Shipping Weight includes packaging.

SPECIFICATIONS

Electrical Rating Chart—FR2 Models

Model	Voltage	Kilowatts (kW)	Phase	Amps	Wiring Sizing AWG*†	Fuse or Circuit Breaker*	Shipping Weight
FR2-3	208	3.0	1	14.4	12	20	24 lbs. (11 kg)
	240	3.0	1	12.5	12	20	24 lbs. (11 kg)
FR2-4	208	4.5	1	19.2	12	30	24 lbs. (11 kg)
	240	4.5	1	16.7	12	30	24 lbs. (11 kg)
FR2-6	208	6.0	1	28.8	10	40	27 lbs. (12 kg)
	240	6.0	1	25	10	40	27 lbs. (12 kg)
FR2-3B	208	3.0	3 (Bal.)	8.4	14	15	24 lbs. (11 kg)
	240	3.0	3 (Bal.)	7.3	14	15	24 lbs. (11 kg)
FR2-4B	208	4.5	3 (Bal.)	11.2	14	15	24 lbs. (11 kg)
	240	4.5	3 (Bal.)	9.6	14	15	24 lbs. (11 kg)
FR2-6B	208	6.0	3 (Bal.)	16.7	12	30	27 lbs. (12 kg)
	240	6.0	3 (Bal.)	14.5	12	20	27 lbs. (12 kg)
FR2-9B	208	9.0	3 (Bal.)	25	10	40	27 lbs. (12 kg)
	240	9.0	3 (Bal.)	21.7	10	30	27 lbs. (12 kg)

* Wire size is based on THHN wire for branch circuit protection at 0.91 derate factor. Circuit breakers and fused disconnects are to be mounted remotely and wired by electrical contractor. Sizes are based on the 2002 NEC table 310-16. Conduit size based on conductors plus ground wire sizing per Table C1 from Appendix C.

† Based upon THHN wire rated 90°C.

NOTE: Shipping Weight includes packaging.

Dimensions

Model	Width (A)	Depth (B)	Height (C)	Width (D)‡
3CS2 and FR2	6-3/4" (172 mm)	17-1/8" (433 mm)	12-3/8" (314 mm)	7-3/4" (197 mm)

‡ Units equipped with the Auto-Fill option have a Width (D) of 9-1/2" (241 mm).

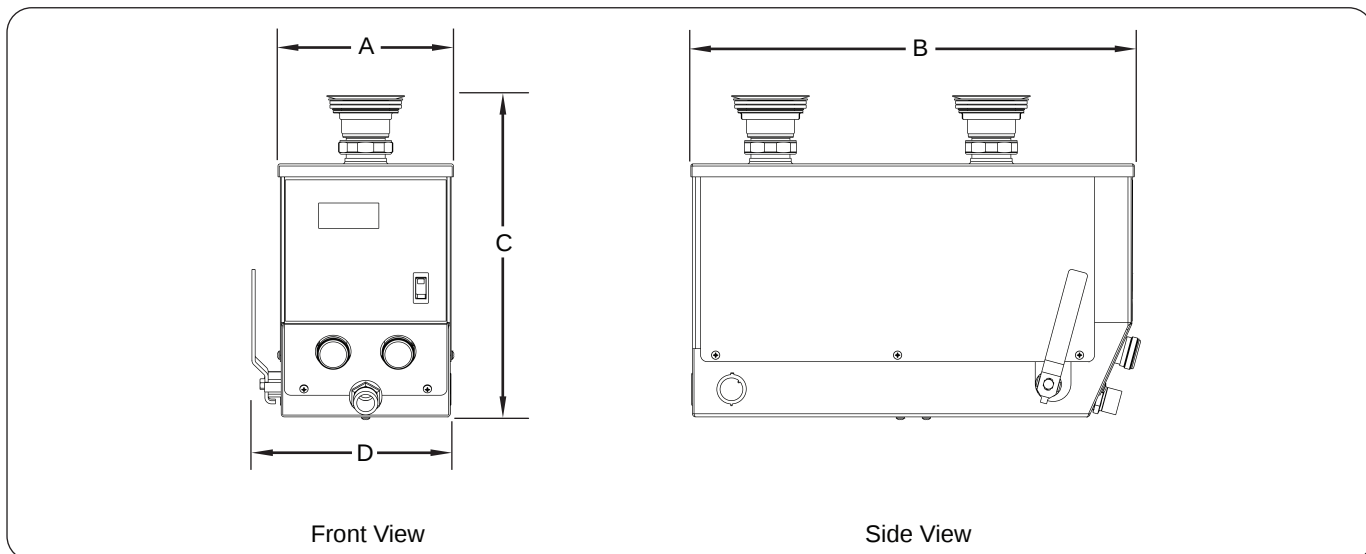


Figure 4. Dimensions—3CS2 and FR2 Models

NSF Criteria

NSF Standard 4 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 Hydro-Heater 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 that 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.

INSTALLATION

General

Hatco 3CS2 and FR2 Series Hydro-Heaters are shipped fully assembled. Care should be taken when unpacking the shipping carton to avoid damage to unit and components enclosed.

⚠ WARNING

ELECTRIC SHOCK HAZARD:

- Units supplied without an electrical cord and plug require a hardwired connection to on-site electrical system. Connection must be properly grounded and of correct voltage, size, and configuration for electrical specifications of unit. Contact a qualified electrician to determine and install proper electrical connection.
- For units with an electrical cord and plug, plug unit into a properly grounded electrical receptacle of the correct voltage, size, and plug configuration. If plug and receptacle do not match, contact a qualified electrician to determine and install proper voltage and size electrical receptacle.
- Unit must be installed by qualified, trained installers. Installation must conform to all local electrical and plumbing codes. Installation by unqualified personnel will void the unit warranty and may lead to electric shock or burn, as well as damage to unit and/or its surroundings. Check with local plumbing and electrical inspectors for proper procedures and codes.
- Unit is not weatherproof. Locate the unit indoors where the ambient air temperature is a minimum of 70°F (21°C).

FIRE HAZARD: Install unit with a minimum of 3-1/2" (89 mm) of space from bottom of unit to all combustible surfaces to prevent combustion.

1. Remove the unit from the box.

NOTE: To prevent delay in obtaining warranty coverage, complete online warranty registration. See the IMPORTANT OWNER INFORMATION section for details.

2. Remove tape and protective packaging from all surfaces of unit.

Sizing Information

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

For 3CS2 Series in a Sink Heater Application

- Minimum of 2000 watts per square foot (2.2 watts per sq. cm) of vessel top.
- 3CS2 units are sized based on 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 per square foot (0.8 watts per sq. cm) of vessel top.

For FR2 Series in a Food Rethermalizer Application

- Minimum 2000 watts per square foot (2.2 watts per sq. cm) of vessel top.

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

Installing the Unit

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

⚠ CAUTION

BURN HAZARD: Drain water may reach temperatures in excess of 200°F (93°C). Use appropriate plumbing materials when installing drain.

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

Auto-Fill units must be installed with adequate backflow protection and must conform with all federal, state, and local codes.

NOTE: FR2 Hydro-Heaters should be installed with a perforated water baffle (not supplied with unit) to distribute the heated water properly. The baffle should be 3/4" (19 mm) high with a divider wall between the inlet and outlet. The baffle should also have 3/4" (19 mm) holes around the periphery every 6" (152 mm).

NOTE: 3CS2 Hydro-Heaters should be mounted in the center of a sink or holding vessel.

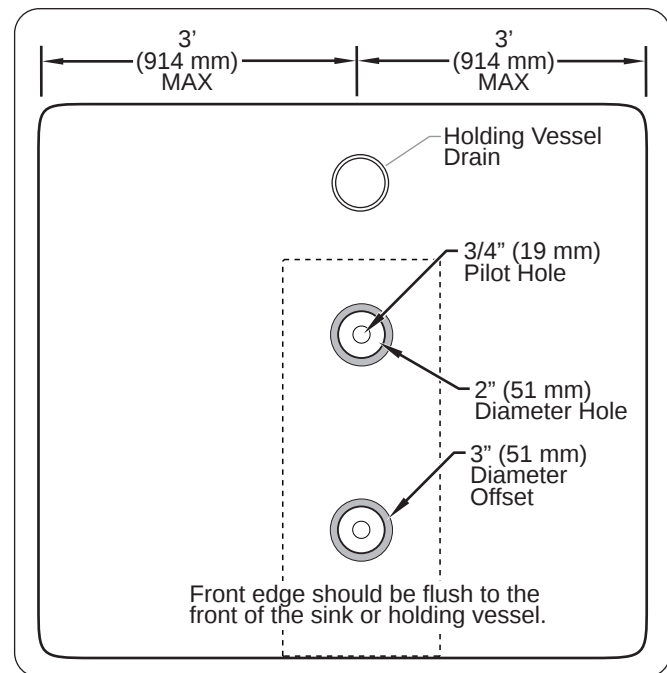


Figure 5. Top View of Holding Vessel

NOTE: The dotted lines in the image above indicate the position of the unit under the sink or holding vessel.

1. Expose the adhesive back of the paper template and position it on the bottom of the sink or holding vessel.

- The decal should be positioned exactly above where the Hydro-Heater will be positioned below the sink or holding vessel.
- Make sure the front edge of the decal is flush with the front edge of the sink or holding vessel.
- FR2 Series Hydro-Heaters should be positioned with no more than 3' (914 mm) on either side when mounted under the sink or holding vessel.

- Center punch and drill a 3/4" (19 mm) pilot hole at each of the two center marks on the template.

NOTE: The pilot holes are for cutting larger holes with a knockout hole punch.

- Remove the template and cut a 2" (51 mm) diameter hole at each pilot hole location using a knockout hole punch.
- Make a 1/8" (3 mm) offset around each 2" (51 mm) diameter hole. The offset should be a diameter of 3" (76 mm) centered around the hole.

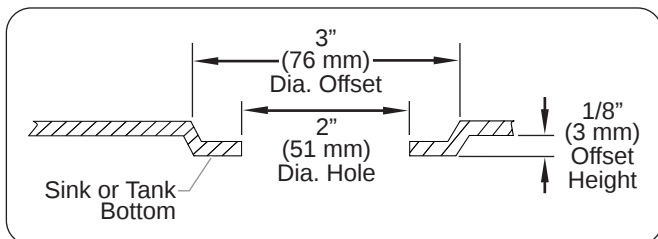


Figure 6. Side View of Hole and Offset

- Unscrew the drain spud assembly from the welded pipe on the heater.
- Unscrew the locknut from the drain spud assembly and slide off all of the washers except the thin rubber washer.
- With only the thin rubber washer attached to the drain spud, slide the drain spud through the sink hole from above.
- Secure the drain spud assembly to the sink or holding vessel.
 - From under the sink, slide the two thick rubber washers followed by the fiber washer onto the drain spud.
 - Screw the locknut (flat side up) onto the drain spud.
- Repeat steps 5–8 for the other spud assembly.
- Secure the unit to the sink or holding vessel.
 - Position the unit under the two spud assemblies.

NOTE: Make sure the union washers are positioned properly inside the union nuts and are not crimped.

- Screw the union nut to the threaded drain spud assembly.

NOTICE

Do not use excessive force when tightening unions or nuts. Over-tightening and excessive force may cause leaks.

- Tighten all of the nuts securely.

NOTE: Refer to the OPTIONS AND ACCESSORIES section for Auto-Fill installation information.

- Fill the sink or holding vessel with water and check for leaks.

NOTE: A 3/4" (19 mm) hose or pipe may be connected to the heater drain and run to an open sight drain. The heater drain should not be permanently connected to the sanitary drain system. The clean-out brush must have access to the heater drain(s). Check local plumbing code for proper drain installation. See the MAINTENANCE section for more information.

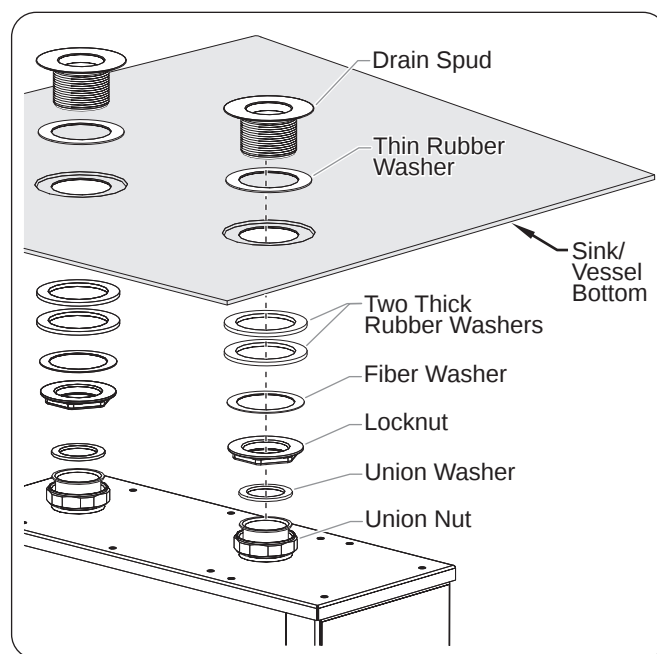


Figure 7. Installing a Hydro-Heater

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 1/4" screws supplied.

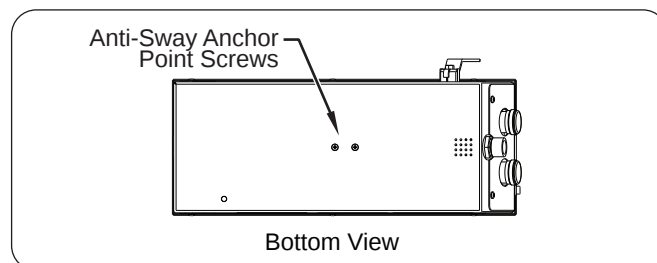


Figure 8. Anti-Sway Anchor Points

Electrical Information

Hatco 3CS2 and FR2 Series Hydro-Heaters are available for operation with standard power systems. Check the specification label for the proper power supply.

NOTICE

Units are voltage-specific. Refer to specification label for electrical requirements before beginning installation. Connecting unit to incorrect power supply will void product warranty and may damage unit.

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

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

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

OPERATION

General

Use the following procedures to operate a Hydro-Heater.

⚠ WARNING

Read all safety messages in the IMPORTANT SAFETY INFORMATION section before operating this equipment.

⚠ CAUTION

BURN HAZARD:

- Some exterior surfaces on unit will get hot. Avoid unnecessary contact with unit.
- Water in holding vessel may reach temperatures in excess of 190°F (88°C). Use appropriate protection when operating unit.
- DO NOT set temperature control higher than 190°F (88°C). Units are designed to heat water up to 190°F (88°C). Water over 190°F (88°C) is very active and could splash onto operator causing serious burns or injury.

NOTICE

Do not turn on power to unit until holding vessel has been filled with water. Dry operation may cause element burnout.

ALWAYS drain holding vessel with power to unit off or element burnout could occur.

1. For hardwired units, check that the fused disconnect switch or circuit breaker is in the "on" position. For cord and plug units, make sure the unit is plugged into a properly grounded receptacle of the correct voltage, size, and plug configuration. See the SPECIFICATIONS section for details.
2. Make sure that the small pipe caps (if provided) are tightened securely to the clean-out drains.
3. Close the drain by moving the drain handle toward the front of the unit until it stops.
4. Fill the sink or holding vessel with hot water to the normal operating level.
 - For units with Auto-Fill, open the water supply valve and verify the sink or holding vessel is being filled with water.
5. Move the POWER ON/OFF (I/O) switch to the ON (I) position.
 - The WATER TEMPERATURE display will glow to indicate power is supplied.

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 water reaches the upper water probe. The heating elements will remain on until the tank water reaches the programmed setpoint temperature.

6. Set the electronic controller to the desired setpoint temperature.
 - a. Press the **SET** key. The WATER TEMPERATURE display will show "TSP".
 - b. Press the **SET** key again. The WATER TEMPERATURE display will show the current setpoint temperature.
 - c. Press the **▲** key or **▼** key to change the setpoint temperature. The WATER TEMPERATURE display will show the new setpoint temperature.
 - d. Press the **SET** key. The WATER TEMPERATURE display will show "End". Wait 5 seconds and the unit will show the current operating temperature.

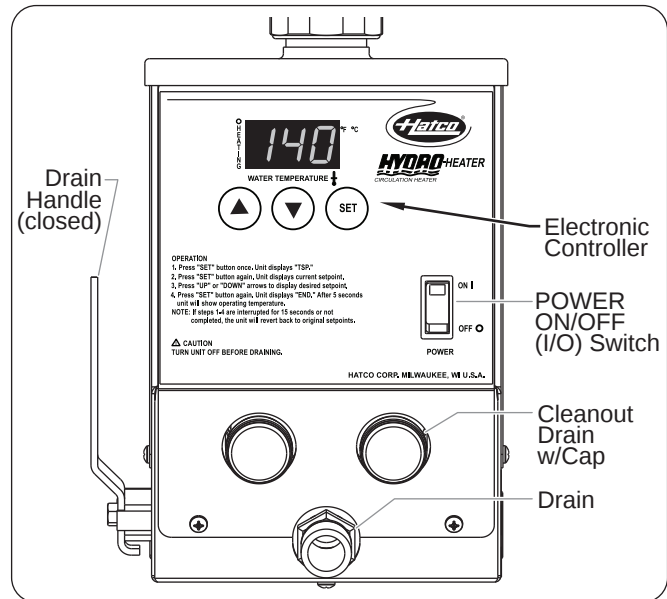


Figure 9. Hydro-Heater Control Panel

NOTE: If step 6 is interrupted or no changes are made for 15 seconds, the controller will go back to its original setting without accepting the change.

NOTE: If the WATER TEMPERATURE display shows "E2", the internal water sensing probe is out of temperature range. If this occurs, contact the Hatco Parts and Service Team or an Authorized Service Agent in your area for assistance.

NOTE: If the WATER TEMPERATURE display shows "E3", the low water sensing probe is not sensing water. The heating elements will not activate until the probe is submersed in water. If this occurs, add water or check the water supply connection.

General

Hydro-Heaters are designed for maximum durability and performance with minimum maintenance.

WARNING

ELECTRIC SHOCK HAZARD:

- Turn OFF power switch, unplug power cord/turn off power at circuit breaker, and allow unit to cool before performing any cleaning, adjustments, or maintenance.
- DO NOT submerge or saturate with water. Unit is not waterproof. Do not operate if unit has been submerged or saturated with water.
- Do not steam clean or use excessive water on unit.
- Do not clean unit when it is energized or hot.

This unit has no “user-serviceable” parts. If service is required on this unit, contact an 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.

Use only Genuine Hatco Replacement Parts when service is required. Failure to use Genuine Hatco Replacement Parts will void all warranties and may subject operators of the equipment to hazardous electrical voltage, resulting in electrical shock or burn. 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.

Recommended Cleaning Schedule

Complete cleaning and power flushing should be done:

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

Helpful Hints for Maximum Performance

- Keep inlet and outlet free of debris.
- Keep perforated water baffle (not supplied) in place and free of debris (FR2 units only).
- Delime unit using a non-corrosive deliming solution.

Cleaning

1. Move the POWER ON/OFF (I/O) switch to the OFF (O) position and allow the unit and water to cool.
2. Drain water from the sink or holding vessel.
3. Connect one end of a drain hose onto the unit drain with the other end in a bucket or open site drain in a manner according to local plumbing codes.
4. Drain water from the unit.
 - Open the unit drain by moving the drain handle backward until it is in the horizontal position and allow all water to drain.
 - Unscrew and remove the pipe cap(s) from the clean-out drain(s) and allow all water to drain, if applicable.
5. Wipe visible deposits from the sink or holding vessel. For units with Auto-Fill, clean water sensor on sidewall of tank.

6. Close the drain by moving the drain handle toward the front of the unit until it stops.
7. Screw the pipe cap(s) onto the clean-out drain(s), if applicable.
8. Add appropriate cleaning solution to the unit.

For daily cleaning: Dissolve a safe, non-toxic, non-corrosive sanitizer into 1 gallon (3.7 L) of hot water and pour into sink or holding vessel. Allow to soak for a minimum of 15 minutes.

For removing lime and mineral deposits: Add a mixture of 75% water and 25% white vinegar into the heat tank through the sink strainer assemblies. Do not use flavored vinegar. Allow the unit to stand with the mixture in the reservoir for an appropriate period of time.

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

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

9. After cleaning, drain all expended solution from the unit through the drain and the clean-out drain(s).
10. If applicable, scrub the clean-out drain(s) with the cleaning brush.
11. Thoroughly rinse unit with fresh water until discharge is clear and all sanitizers have been removed and rinsed.
12. Upon visual inspection, if tank is not thoroughly clean, repeat steps 8–11.
13. Close the drain by moving the drain handle toward the front of the unit until it stops.
14. Screw the pipe cap(s) onto the clean-out drain(s), if applicable.

Draining Heater For Service Protection

Use the following procedure when shutting down the unit for long periods of time.

1. Move the POWER ON/OFF (I/O) switch to the OFF (O) position.
2. Perform the entire “Cleaning” procedure in this section.
3. Turn off the electrical power supply to the heater.
4. Make sure the water has been drained from the unit as well as the sink or holding vessel.

TROUBLESHOOTING GUIDE

WARNING

This unit must be serviced by trained and qualified personnel only. Service by unqualified personnel may lead to electric shock or burn.

WARNING

ELECTRIC SHOCK HAZARD: Turn OFF power switch, unplug power cord/turn off power at circuit breaker, and allow unit to cool before performing any cleaning, adjustments, or maintenance.

Symptom	Probable Cause	Corrective Action
Water temperature too high.	The electronic controller is set too high.	Adjust the electronic controller to the desired temperature.
The electronic controller shows temperature in C° instead of F° (or F° instead of C°).	The electronic controller was not programmed to the correct unit of measure.	Contact Authorized Service Agent or Hatco for assistance.
Water temperature too low.	Sink heaters need 30 minutes to reach a safe sanitizing temperature.	Turn ON the unit and wait 30 minutes for the unit to reach proper temperature.
	The electronic controller is set too low.	Adjust the electronic controller to the desired temperature.
Heating elements burn out.	The sink or holding vessel is dry or has a low level of water. (Sink or holding vessel should be filled with water to normal operating level.)	Contact Authorized Service Agent or Hatco for assistance.
	Deposits built up in the heater pipes are restricting water flow. (Perform the entire "Cleaning" procedure in MAINTENANCE.)	Contact Authorized Service Agent or Hatco for assistance.
The sink or holding vessel leaks.	Fittings are too loose or too tight.	Properly tighten any fittings that may be causing the unit to leak. Replace gasket, if necessary.
The POWER ON/OFF (I/O) switch is in the ON (I) position but the unit is not heating the water.	The Energy Cut-Off switch was activated.	The unit overheated—likely due to a low water level. Fill the heater to the proper water level and turn the POWER ON/OFF (I/O) switch to the OFF (O) position and then to the ON (I) position.
	Fuses may be blown, the circuit breaker may be tripped, or the power cord may be unplugged.	Check for proper fuse sizing and replace fuses, check/reset circuit breaker, and/or check/replace power cord.
	Drain handle not fully closed.	Move the drain handle to the vertical position.

Error Codes

There are three error codes that may show in the display:

- E1: Indicates that the display temperature is out of range or display temperature probe is malfunctioning. Contact Authorized Service Agent or Hatco for assistance.
- E2: Indicates that the control temperature is out of range or control temperature probe is malfunctioning. Contact Authorized Service Agent or Hatco for assistance.
- E3: Indicates that the low water probe has not been satisfied. The heating elements are not yet submersed. Check water supply and water shut-off valve.

Auto-Fill System

A factory-installed Auto-Fill feature is available for 3CS2 and FR2 models. Units equipped with Auto-Fill require the following steps before startup.

⚠ WARNING

ELECTRIC SHOCK HAZARD: Unit must be installed by qualified, trained installers. Installation must conform to all local electrical and plumbing codes. Installation by unqualified personnel will void the unit warranty and may lead to electric shock or burn, as well as damage to unit and/or its surroundings. Check with local plumbing and electrical inspectors for proper procedures and codes.

⚠ CAUTION

Auto-Fill units must be installed with adequate backflow protection and must conform with all federal, state, and local codes.

NOTICE

For units with Auto-Fill, do not exceed an incoming water temperature of 140°F (60°C) or incoming water pressure of 80 psi (550 kPa).

1. Connect 1/4" NPT copper water supply line to the inlet of the solenoid valve on the unit.

NOTE: Ball 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 for the sensor to be installed.
 - Sensor should be installed in an area in the sink or holding vessel at least 1/2" (13 mm) below any food pans or other object it could come into contact with.
3. Mark and drill a 1/2" (13 mm) hole into the side wall of the sink or holding vessel.
4. Deburr the hole to prevent burrs from cracking or damaging the probe when tightened.
5. Position upper water sensor probe into tank with o-ring against inside wall.
6. Place washer onto threads of probe on outside wall of tank.
7. Secure 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.

Remote Mounted Control

A remote mounted control is available for 3CS2 and FR2 models. The remote mounted control is shipped with a 45" (1143 mm) cord and plug.

Installing the Remote Mounted Control

To install the remote mounted control:

1. Cut a hole 3" (77 mm) wide and 1-1/4" (32 mm) high in the mounting surface.
2. Feed the cable through the cutout and plug it into the unit.
3. Push the remote mounted control into the cutout until it snaps in place.

NOTE: If the cutout hole is too small, cut the hole to the appropriate size until the remote mounted control slides into the cutout hole and snaps into place.

Changing the Setpoint Temperature

To set the remote mounted control to the desired setpoint temperature:

1. Touch the set key. The display will show "SP1".
2. Touch the set key again. The display will show the current setpoint temperature.
3. Touch the up arrow or down arrow to adjust the setpoint temperature. The display will show the new setpoint temperature.
4. Touch the set key when the desired setpoint temperature is shown. The display will go blank.
 - Wait 5 seconds and the unit will show the current operating temperature.

NOTE: If step 3 is interrupted or no changes are made for 15 seconds, the controller will go back to its original setting without accepting the change.

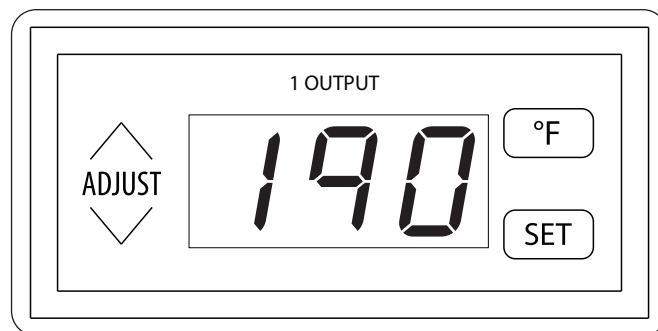


Figure 10. Remote Mounted Control

OPTIONS AND ACCESSORIES

Flush Hose Kit

The Flush Hose Kit is available for 3CS2 and FR2 models and is used to power flush the unit to keep it working at peak efficiency. The kit consists of a drain stopper, cleaning brush, and adapter. Use the following procedure to power flush the unit.

1. Move the POWER ON/OFF (I/O) switch to the OFF (O) position and allow the unit and water to cool.
2. Connect one end of a drain hose onto the 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 sink or holding vessel by moving the drain handle backwards until it is completely horizontal. Water will now flow from the drain hose.
4. Place the rubber stopper into the inlet strainer.

NOTE: *The inlet strainer is the strainer closest to the front of the unit.*

5. Attach the flush hose with adapter to a fresh water supply, and place hose into outlet strainer. Flush fresh water through the unit until the discharge from the drain is clear.
6. Turn off the fresh water supply, and reverse the positions of the rubber stopper and the power flush hose. Flush fresh water through the unit again until discharge from the drain is clear.
7. Turn off the water supply, remove the rubber stopper and power flush hose, and allow the unit to finish draining.
8. Remove clean-out caps and insert cleaning brush into clean-out and drain outlets. Use a scrubbing motion to clean the chambers
9. Reinstall the clean-out caps.
10. Rinse fresh water through the unit until discharge is clear.
11. Close drain by moving the drain handle all of the way forward until it is completely vertical.

NOTE: *Perform the entire "Cleaning" procedure in the MAINTENANCE section of this manual if buildup is significant.*

Security Package

A security package is a factory-installed option for 3CS2 and FR2 models. A security package contains Torx® screws and a control cover.

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 registering the Product with Hatco 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:

Conveyor Toaster Elements (metal sheathed)
Drawer Warmer Elements (metal sheathed)
Drawer Warmer Drawer Rollers and Slides
Strip Heater Elements (metal sheathed)
Display Warmer Elements (metal sheathed air heating)
Holding Cabinet Elements (metal sheathed air heating)
Heated Well Elements — HWB Series (metal sheathed)

b) One (1) Year Parts and Labor PLUS Four (4) Years Parts-Only Warranty on pro-rated terms that Hatco will explain at Buyer's request:

3CS and FR Tanks

c) One (1) Year Parts and Labor PLUS Nine (9) Years Parts-Only Warranty on:

Electric Booster Heater Tanks
Gas Booster Heater Tanks

d) Ninety (90) Day Parts-Only Warranty:

Replacement Parts

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, heat lamp bulbs, coated halogen light bulbs, halogen heat lamp bulbs, xenon light bulbs, LED light tubes, glass components, and fuses; Product failure in booster tank, fin tube heat exchanger, or other water heating equipment caused by liming, sediment buildup, chemical attack, or freezing; or Product misuse, tampering or misapplication, improper installation, or application of improper voltage.

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 using new or refurbished parts or Product by Hatco or a Hatco-authorized service agency (other than where Buyer is located outside of the United States, Canada, United Kingdom, or Australia, 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. Hatco reserves the right to accept or reject any such claim in whole or in part. In the context of this Limited Warranty, "refurbished" means a part or Product that has been returned to its original specifications by Hatco or a Hatco-authorized service agency. 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.

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Byassee Equipment Co.
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P & D Appliance
Commercial Parts & Service, Inc.
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Orlando 407-425-2681

B.G.S.I.
Pompano Beach 954-971-0456

Comm. Appliance Service
Tampa 813-663-0313

GEORGIA

TWC Services
Mableton 770-438-9797

Heritage Service Group
Norcross 866-388-9837

Southeastern Rest. Svc.
Norcross 770-446-6177

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Burney's Comm. Service, Inc.
Honolulu 808-848-1466

Food Equip Parts & Service
Honolulu 808-847-4871

ILLINOIS

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Decatur 217-429-4229

Midwest Elec. Appl. Service
Elmhurst 630-279-8000

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Service Solutions Group
Louisville 502-451-5411

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Midwest Food Equip. Service
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Kaemmerlen Parts & Service
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Omaha 402-341-1414

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Brooklyn 718-386-2515

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Memphis 901-527-7543

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Armstrong Repair Service
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Choquette - CKS, Inc.
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