



Basic, Slim & Slim Square Water heater



Installation and Operating Instructions



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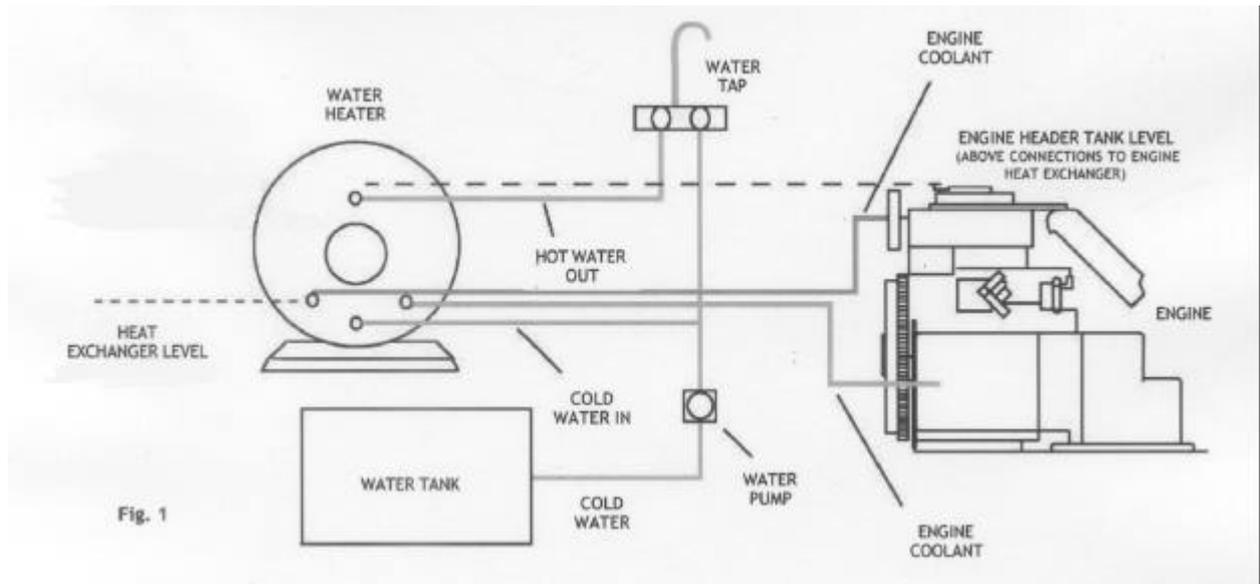
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1. Locating the tank

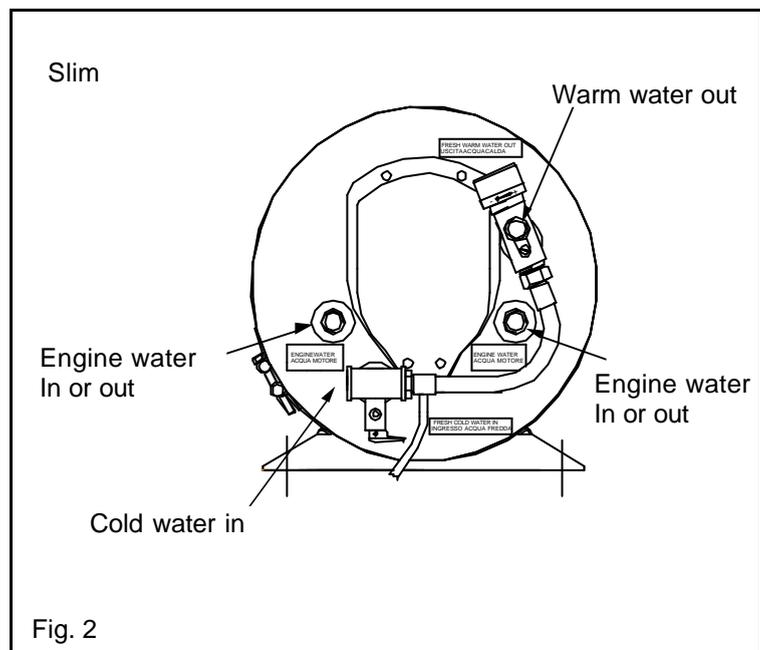
The water heater can be mounted anywhere on the vessel as long as the connections to the engine heat exchanger are below the engine header tank (Fig. 1). It is best to keep the length of the heat exchanger hoses short to keep flow resistance and heat loss to a minimum. In many installations the tank heat exchanger is simply connected in series with the engine coolant circuit. In some installations it is connected in parallel with a flow restrictor/diverter. The choice depends on the specific recommendations of the engine manufacturer and or installer. Please consult the manufacturer or dealer of your engine for any recommendations they may have for connecting to the engine cooling system.



2. Mounting

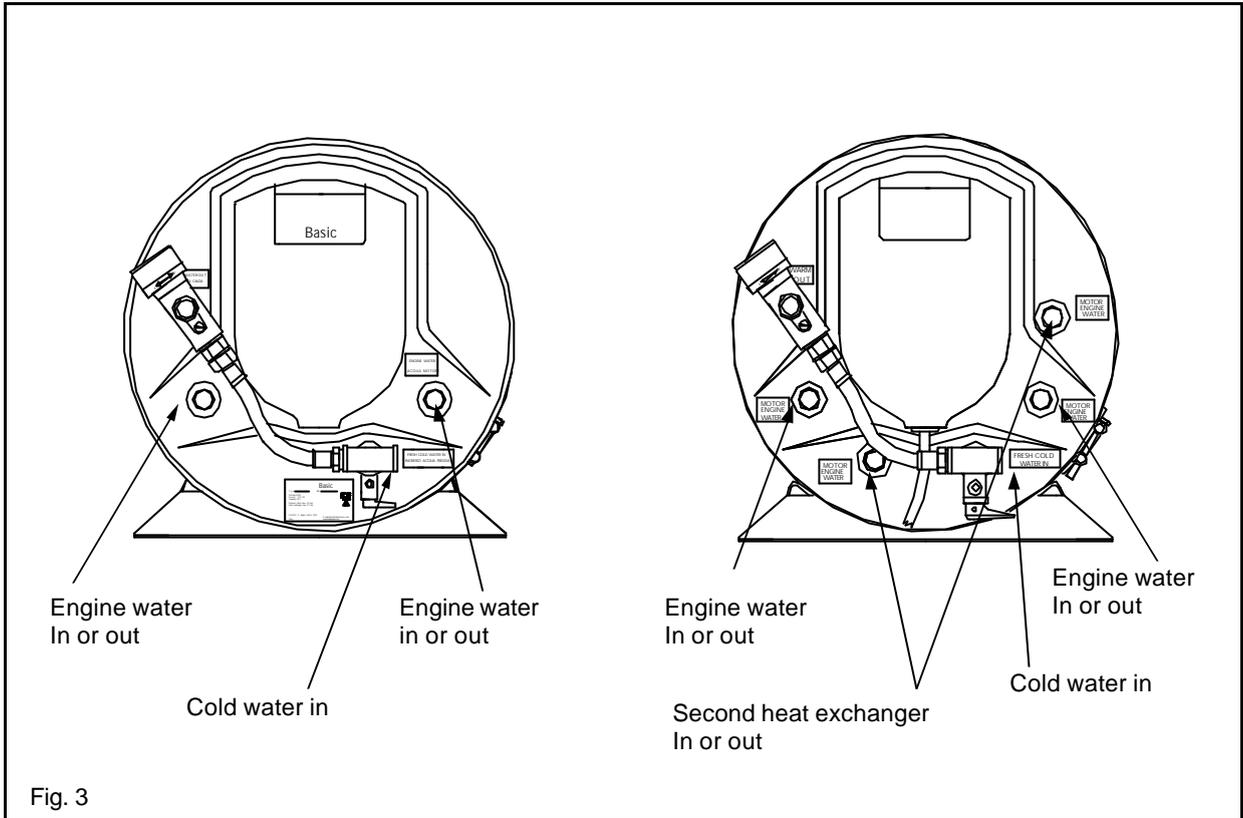
The Isotemp Basic, Slim & Slim Square water heaters are designed to give excellent performance when mounted horizontally and vertically. The drain / safety valve must always be at the lowest point. The mounting brackets can be adjusted to the side on Basic and Slim for mounting the tank on a bulkhead. Always mount the tank to a suitable shelf or bulkhead and keep in mind the extra weight of the tank when it is full of water.

Fig. 2 Slim, Fig. 3 Basic and Fig. 4 Slim Square

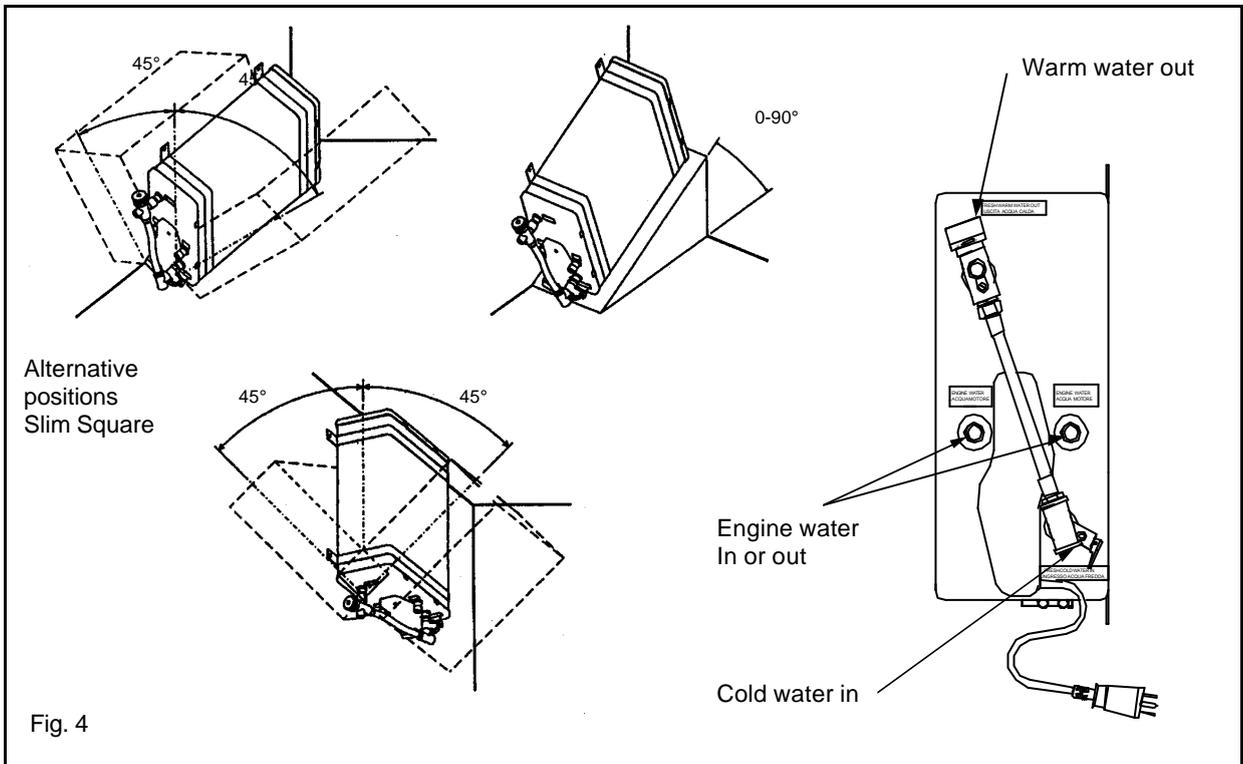


Isotemp Basic

**Isotemp Basic
Double heat exchanger**



Slim Square



3. Connections

3.1 Fittings

Use good quality fittings to make all connections. Bronze, stainless steel and corrosion resistant brass alloys are recommended. Most plastic fittings will not withstand high temperatures and are not recommended. All US tanks use 1/2" female BSP or NPT threaded coupling that will mate with 1/2" male NPT adaptors. Use a curing pipe sealant on the threads such as Loctite PST 592 or equivalent to insure a leak-free connection.

3.2 Hoses

Use hoses rated for use with engine coolants and high temperature of 210°F for connections to the heat exchanger.

Hoses used for water system should be rated at 125 psi and approved for use with portable water systems, and food industry quality is preferred.

3.3 Connections to engine

Isotemp water heaters may be used with either fresh or raw water-cooled engines. For good results an operating temperature of 140°F to 185°C is recommended. The heat exchanger requires a flow of 1/2 a gallon per minute for efficient heating of the water in the tank. Please follow recommendations of the engine supplier for how to make the connections to the engine cooling system. Keep the diameter of the fittings and hoses large enough to maintain low flow resistance. 5/8" (16 mm) is a very common size for these hoses.

3.4 Freshwater system connection

The water tank inlet is normally fed from the water system electrical pressure pump. The pressure switch on the pump should be adjusted to maximum 60 psi (4 bar). Please note that the pressure relief valve on the tank is set to 80 psi (5.5 bar). If the system setting goes above this setting the relief valve will open and water will be released to the drain.

The tank is fitted with a tempering valve, also called a thermostatic mixing valve, that will mix cold water with hot water to reduce the temperature to a safe level. This temperature can be adjusted with the knob mounted on the side (Fig. 5)

Adjust this counterclockwise to increase the temperature of the water. Temperature range: 100°F to 150°F. All hot water taps on the boat should be a mixer type that will allow for mixing of cold and hot water at the tap.

The drain valve is integrated into the pressure relief valve and is mounted at the bottom of the tank. A 3/8" hose can be fitted to the drain outlet. A small quantity of water can drain from the relief valve as the tank is heated.

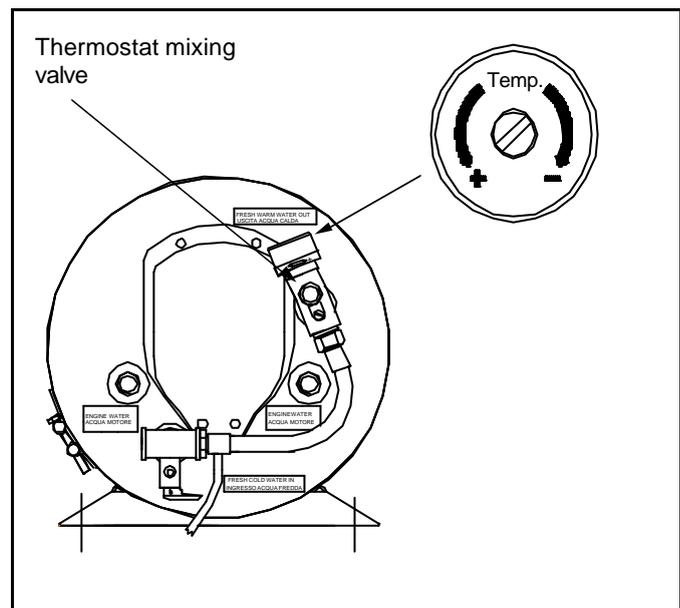


Fig. 5

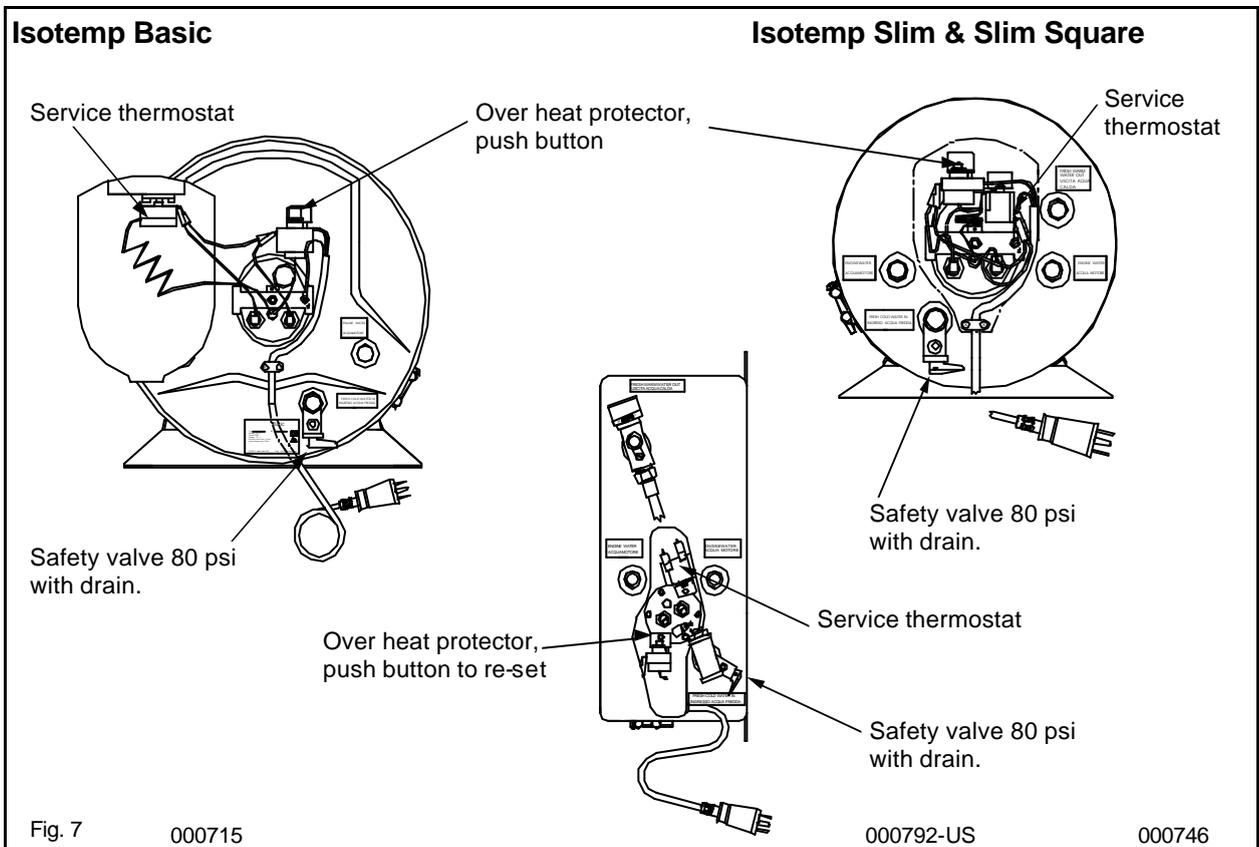
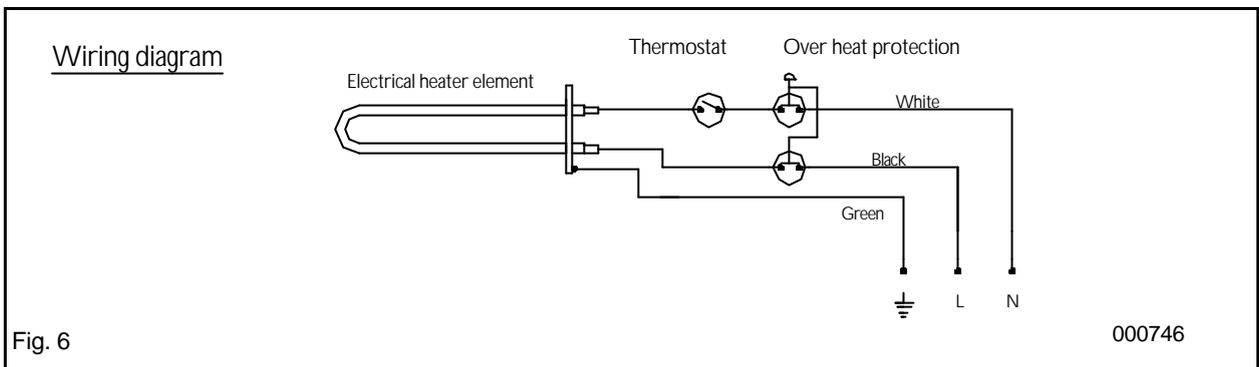
3.5 Electrical connections

See wiring diagram Fig. 6

The tank is supplied with a pre-wired power cord that can be fitted with a connector or wired into an electrical connection box.

All US tanks are supplied with a 750 W 120 VAC heating element. Current draw on this circuit will be 7 to 8 amps. Please protect this circuit with an appropriate sized circuit breaker. Recommended wiring: good quality 12/2 tinned duplex boat wire, AWG 12. Always unplug the heater and/or turn off all circuit breakers and disconnect shore power connections before removing the connection cover. The electrical circuit is controlled by a service thermostat set to 167°F (75°C) and a double overload protector that is set to 205°F (96°C). If the overload protector trip, it has to be manually reset. This is done by pressing the small knob on top of the overload protector. Unscrew the white cap first. See Fig. 7

Wiring diagram



Important! The water heater shall be connected to the mains power supply only when it is in service.

When leaving the boat for any length of a period, it is recommended to pull out the cable connector from the socket to also disconnect the earth protection. This should be done even if the shore power system is shut off, as there can be a potential difference, between the earth from shore and the sea water earth of the boat. This can seriously damage, by stray current corrosion, the immersion heater, water heater tank or the engine with its drive unit.

Installation of a insulation transformer in the shore power equipment eliminates the risk of galvanic corrosion via the shore power connection.

4 Start up/Test

Fill the hot water tank by turning on the water pressure pump and opening a hot water tap to allow air to bleed out of the hoses and / or plumbing.

Check the drain and pressure relief valve by pushing the lever. Water will flow into the drain hose. Make sure the drain hose is not blocked or closed. Pull the lever back to closed position. Start the engine to check the circulation of the coolant. It will be necessary to add coolant to the system to compensate for the additional volume of the exchanger and hoses.

Check for air locks in the connecting hoses and raise and lower these as necessary to clear the air from the hoses before securing the hoses in place.

Lastly plug in the tank and turn on the circuit breaker. Check for proper operation.

5. Maintenance

5.1 Winterization

When there is a risk of freezing the tank must be drained.

This is done by opening the air bleeder screw mounted on the mixing valve, take it away completely, (Fig. 8) and opening the drain valve by pushing the lever on the safety valve. (Fig 9).

If the engine is raw-water cooled the heat exchanger must also be drained by removing the hoses and blowing air into the coils to drain any water.

The tank can now be safely left in the vessel over the winter.

When leaving the vessel for longer periods, it is recommended to take out the power cord to eliminate the risk of stray current from the shore power earth connections.

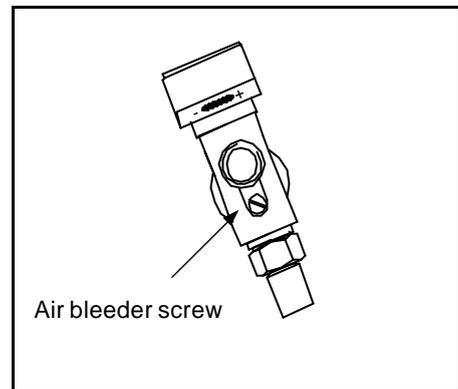


Fig. 8

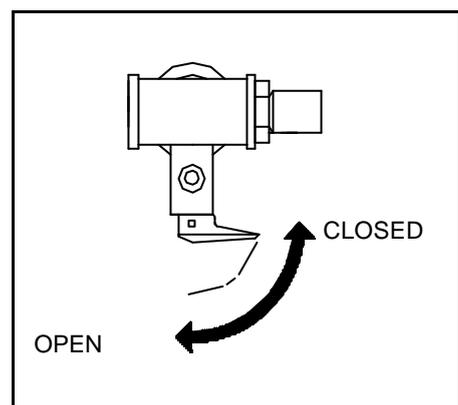


Fig. 9

5.2 Replacing Thermostats

Warning: Be sure to turn power off first!

Take off the front plastic cover.
The service thermostat and the overheat protector have the temperature sensor ends put into a tube on the electrical heater element bracket. See figure 7. Pull off cable shoes after having noticed the positions and unscrew the thermostat unit. Pull out the sensor end.
Mount new thermostat in the opposite order. Be sure sensor end is properly put in to the tube.

5.3 Replacing heating element

**Warning! Be sure to turn power off first!
Drain the tank.**

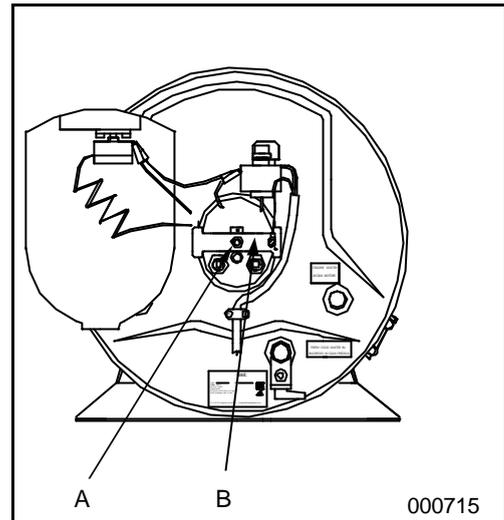


Fig. 10

Basic And Slim

Take off the plastic cover, unscrew the two screws at the sides and push the cover downwards. Dismantle the thermostat and the overheat protector from their brackets for better access on the Slim model.

On Basic they can be left in position during the operation.

Pull off the wires from the heating element tabs.

Loosen the center nut, fig. 10-A, and take off the support, fig. 10-B. Put on the nut again on the center bolt for easier handling, better to grip by hand.

Push off the rubber gasket inwards, it will come out together with the heater element unit. Turn the heater element unit 90° to the left, the wire tabs shall point to the right.

Twist the unit until the inner end hits the tank to the left. Pull out the heater element unit through the hole with the left side first.

Unscrew the heater element from the mounting flange.

Mount the new heating element with new seal rings and a new big rubber gasket in the opposite order to the description above. The inner end of the heating element shall point downwards after assembly.

Slim Square

The heating element unit is on the Square model fastened by 6 screws on a flange which is fastened into the tank. It has a rubber gasket. Fig. 11

First, pull off the wires from the heating element tabs.

Loosen all 6 screws, the heating element unit including the flange can be pulled out.

The heating element is fastened on the flange with nuts. Unscrew the heating element from the mounting flange. Mount the new heating element with new seal rings and a new big rubber gasket.

The inner end of the heating element shall point downwards after assembly.

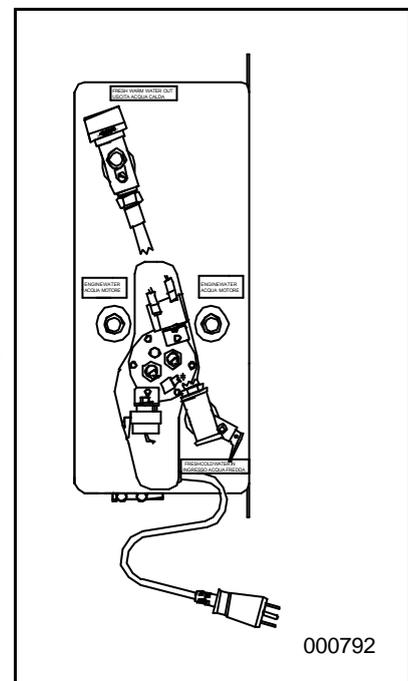


Fig. 11

6. Double heat exchanger, Basic 11 & 20 gal.

Double heat exchanger water heaters have connections for second heat exchanger located also on the front, side by side with ordinary heat exchanger connections.

See fig. 3

7. Technical data and dimensions

7.1 Basic

Type	Volume gal.	L x D x H inch	Weight lbs.	Heater element
602421B000003	6.4	19-15/16 x 15-3/8 x 15-1/2	30.8	120V - 750W
603023B000003	8	21-13/16 x 15-3/8 x 15-1/2	37.5	120V - 750W
604021B000003	11	26 x 15-3/8 x 15-1/2	44	120V - 750W
604023BD00003 Double heat exch.	11	26 x 15-3/8 x 15-1/2	48.5	120V - 750W
605021B000003	13	30-11/16 x 15-3/8 x 15-1/2	50.7	120V - 750W
607521B000003	20	42-1/8 x 15-3/8 x 15-1/2	64	120V - 750W
607523BD00003 Double heat exch.	20	42-1/8 x 15-3/8 x 15-1/2	68.4	120V- 750W

Material: Heat exchanger coil, storage tank and all connections: Stainless steel AISI 316

Outside cover and mounting brackets: Stainless steel AISI 304

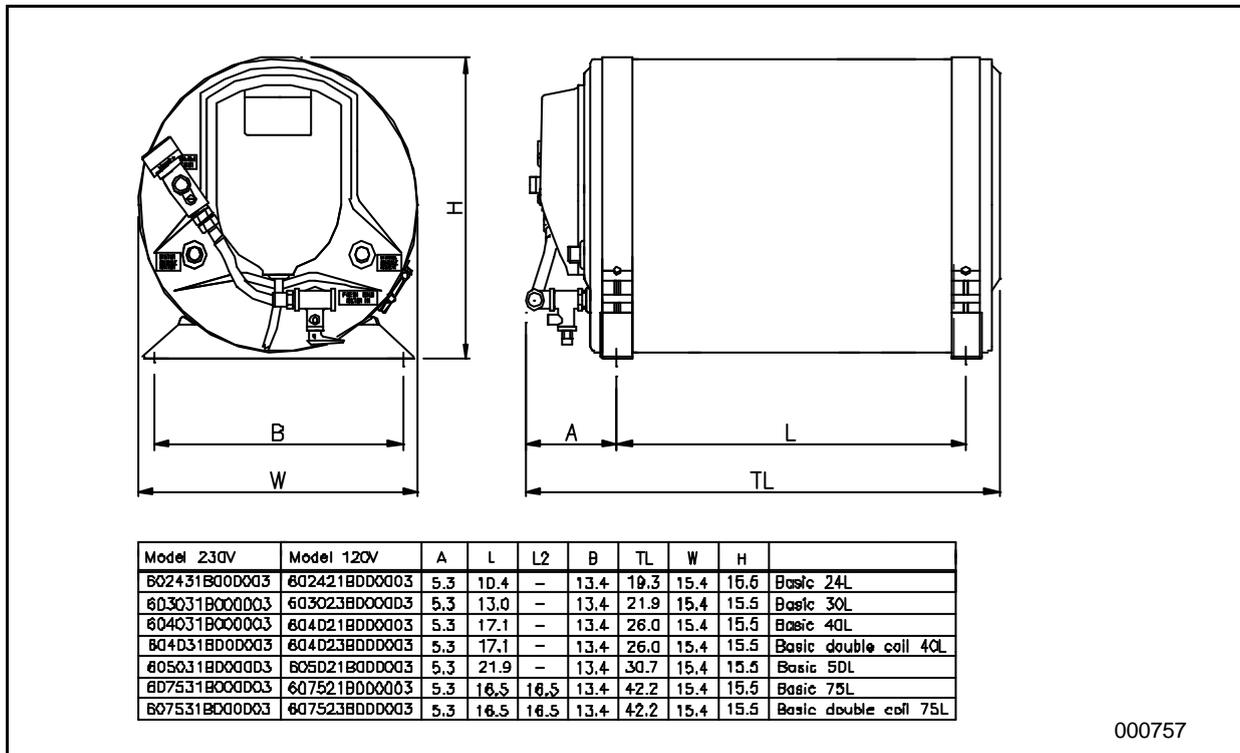
Heater element: Nickel plated copper.

Insulation: Polyurethane foam

Safety valve: 80 psi / 5.5 bar

The manufacturer reserves the right to change specifications without prior notice.

Dimensions Basic



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7.2 Slim & Slim Square

Type	Volume gal.	L x D x H inch	Weight lbs.	Heater element
601521S000003	4.0	21-1/4 x 11-1/4 x 11-5/8	23	120V-750W
602021S000003	5.3	26-1/4 x 11-1/4 x 11-5/8	25.3	120V-750W
602521S000003	6.6	30-7/8 x 11-1/4 x 11-5/8	30	120V-750W
601623Q000003 Square	4.2	22-1/4 x 7-3/16 x 15-3/4	33	120V-750W

Material: Heat exchanger coil, storage tank and all connections: Stainless steel AISI 316

Outside cover and mounting brackets: Stainless steel AISI 304

Heater element: Nickel plated copper.

Insulation: Polyurethane foam

Safety valve: 80 psi / 5.5 bar

The manufacturer reserves the right to change specifications without prior notice.

Dimensions

