isotemp
by indel marine

WATER HEATERS

INSTALLATION AND OPERATING INSTRUCTIONS

PRODUCED BY

GREAT WATER, INC.
BRUNSWICK MAINE
WWW.GREAT-WATER.COM
207 729 8500 TEL 517 813 6509 FAX
INFO@GREAT-WATER.COM

Table of Contents

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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.

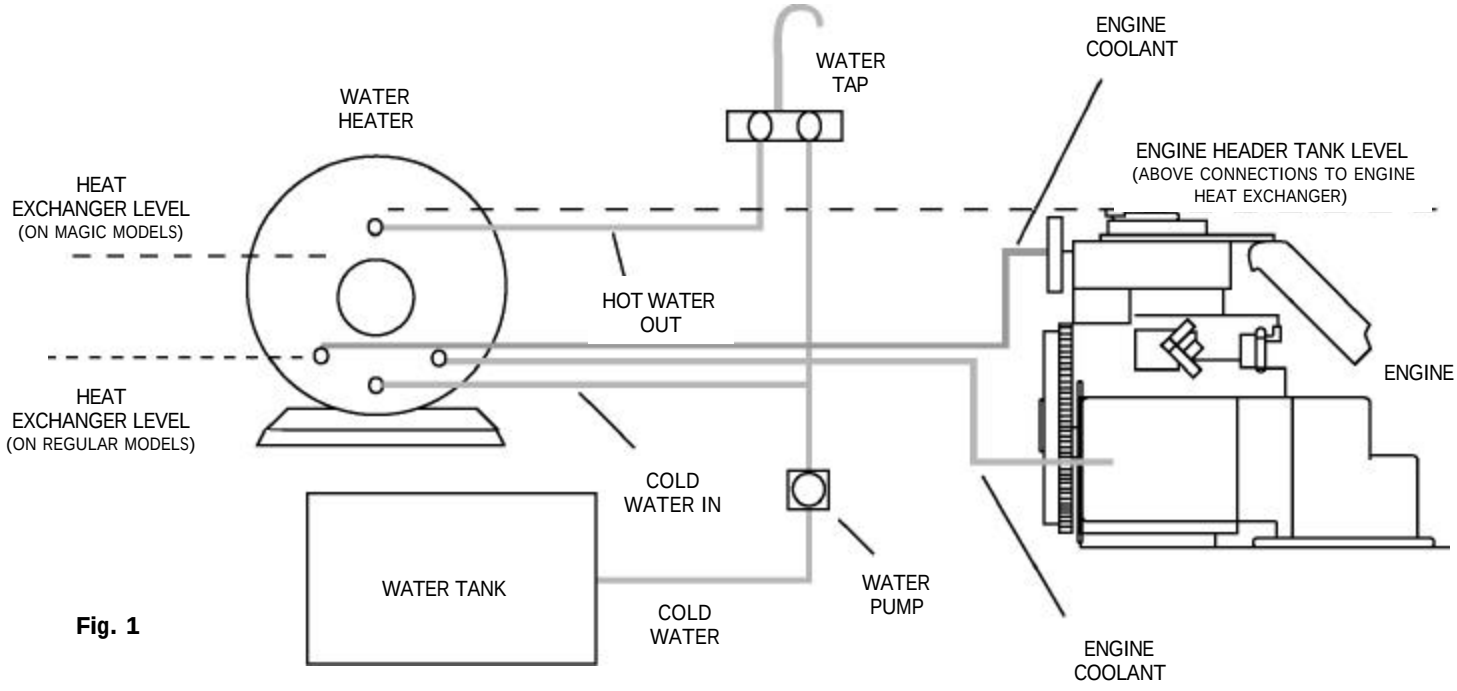
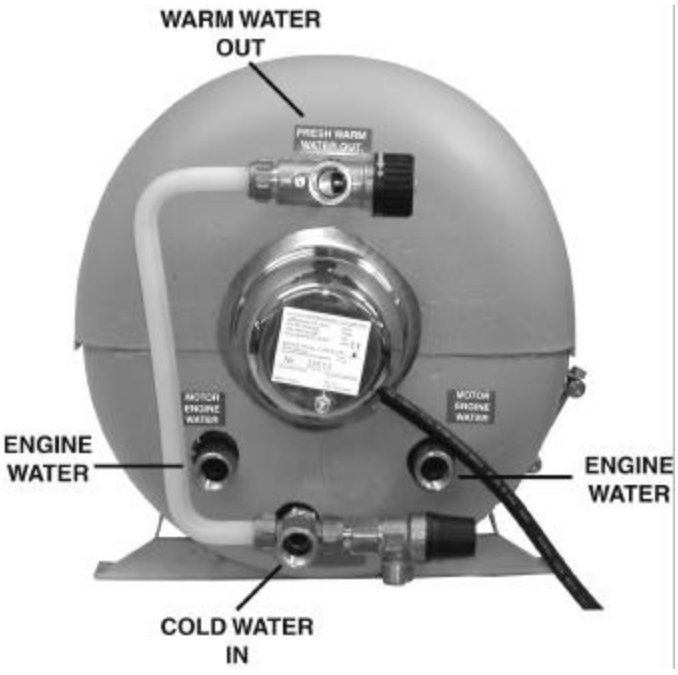


Fig. 1

2 Mounting

The Isotemp water heater is designed to give excellent performance when mounted horizontally. The drain must always be at the lowest point. The mounting brackets can be adjusted to the side 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.

It is possible to remove the insulation from the tank so that the tank can be passed through a small opening. In order to do this the fittings and the electrical connection cover must be removed. The mounting brackets also need to be taken off and the two halves of the molded polyurethane insulation can then be removed. This will reduce the diameter to 10.5 inches.



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 a ½" female BSP threaded coupling that will mate with ½" male NTP adapters. Use a curing pipe sealant on the threads such as Loctite PST 592 to insure a leak-free connection.

3.2 Hoses

Use hoses rated for use with engine coolants and high temperature of 210°F for the connections to the heat exchanger.
Hoses used for the water system should be rated at 125 psi and approved for use with potable water systems.

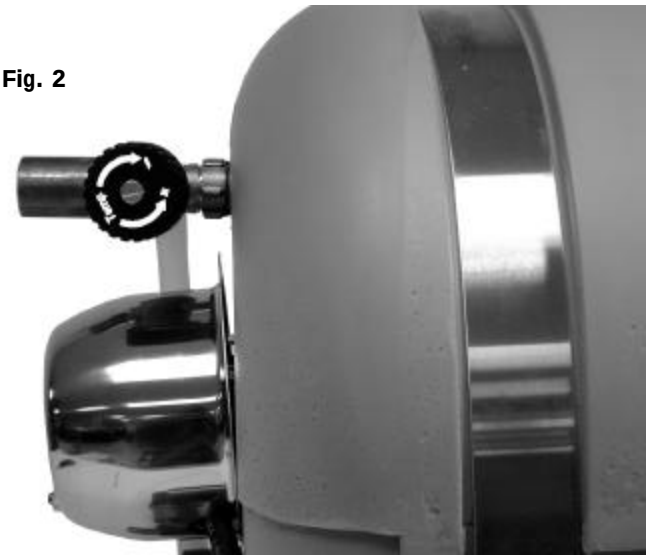
3.3 Connections to Engine

Isotemp water heaters may be used with either fresh water or raw water-cooled engines. For good results an operating temperature of 130°F to 165°F is recommended. (For magic tanks a temperature of 180°F is recommended for good results.) The heat exchanger requires a flow of one half gallon (2 liters) 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 Connections

The water tank inlet is normally fed from the water system electric pressure pump. The pressure switch on the pump should be adjusted to a maximum of 42 psi (3 bar). Please note that the pressure relief valve on the tank is set at 58 psi (4 bar). If the system pressure goes above this setting the relief valve will open and water will be released to the drain.

Fig. 2



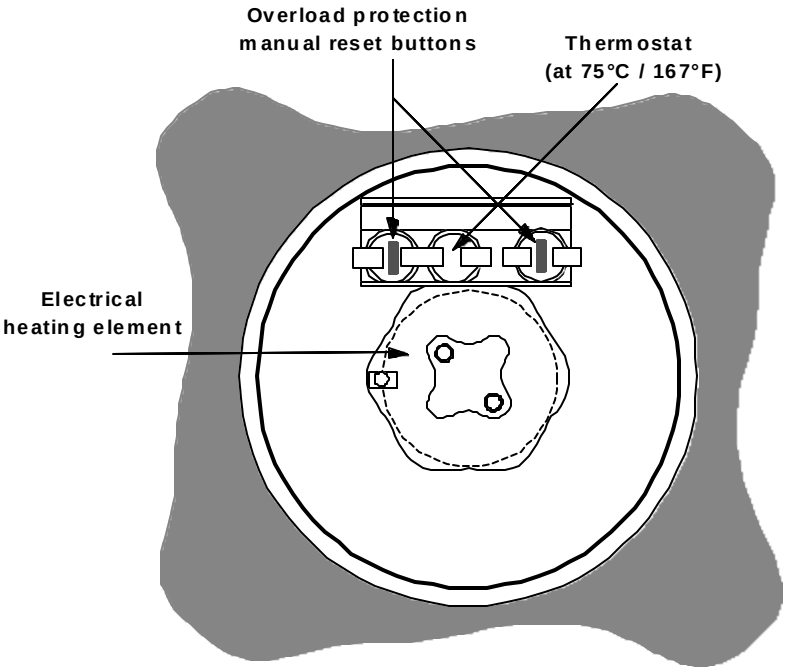
The tank outlet is fitted with a tempering valve (also called a thermostatic mixing valve) that will mix cold water with the hot water to reduce the temperature to a safe level. This temperature can be adjusted with the knob mounted on the side (Fig. 2). (Older Isotemp models have temperature knobs which read "V" and "K" instead of "+" and "-". "V" indicates hotter and "K" indicates colder.) Adjust this counterclockwise to increase the temperature of the water. 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 on the bottom of the tank. A hose can be fitted to the drain. A small quantity of water will normally drain from the relief valve as the tank is heated.

3.5 Electrical Connections

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 watt 110VAC 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. There is a three terminal strip under the connection cover where the power connections are made. 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 at 167°F (75°C) and by two overheat protectors that are set at 203°F (95°C). If the overheat protectors trip they must be manually reset. This is done by pressing the small rectangular button in the center of the protector. See Fig. 3.

Fig. 3



A diagram of the electrical circuit is also provided. See Fig. 4.

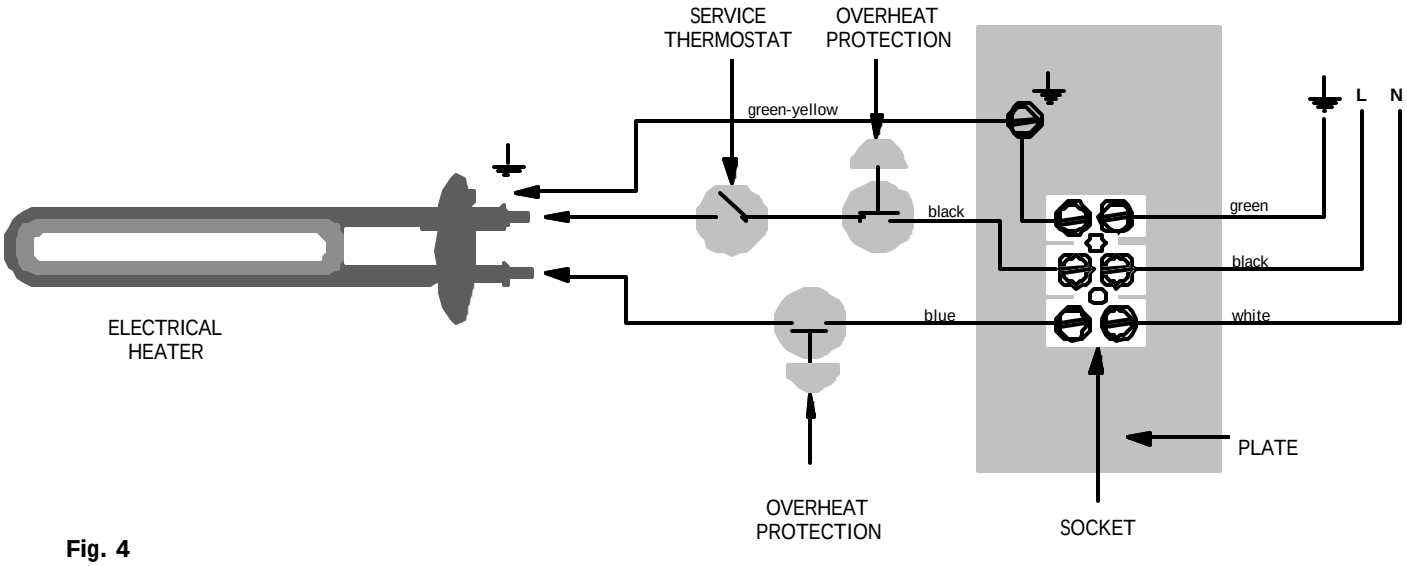


Fig. 4

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 turning the knob counterclockwise one notch. Water will flow into the drain hose. Make sure the drain hose is not blocked or closed. Turn the knob counterclockwise again and the valve will close.
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 (Fig. 5) and opening the drain valve by turning the relief valve knob counterclockwise one notch (Fig. 6).
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.

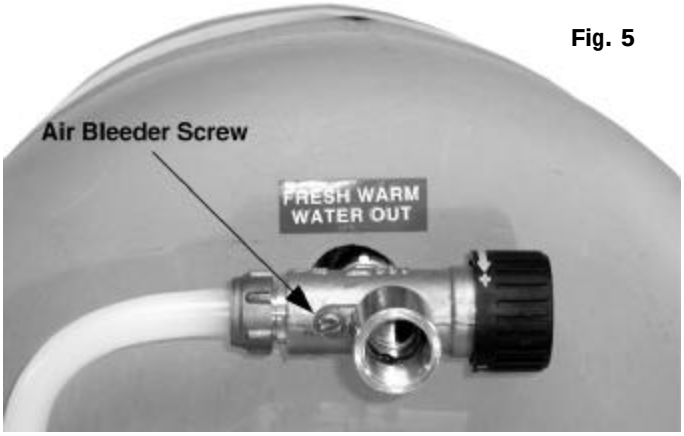


Fig. 5

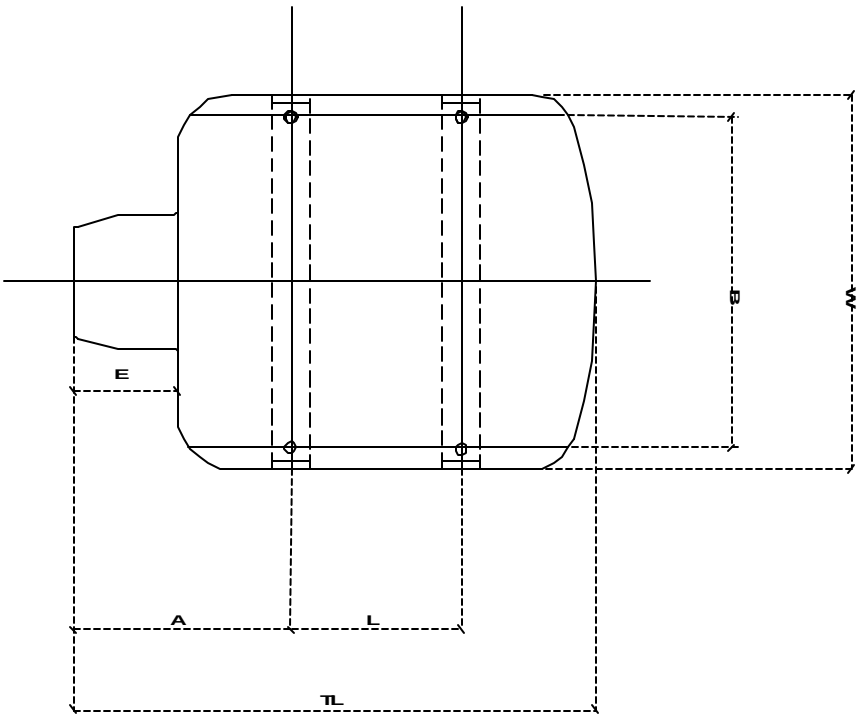
Fig. 6

6 Double Heat Exchanger

Double Heat Exchanger Water Heaters (Model 404R) have connections for second heat exchanger located on the back (Fig. 7).

Fig. 7

7 Technical Data and Dimensions



A distance between front cover and center of front mounting bracket
B distance between holes on mounting bracket
E length of electrical connection cover
L distance between center of front and back mounting brackets
L2 distance between mounting brackets on models with 3 brackets
TL overall length of the tank from the front of the cover to the center of the back
W width of tank (removing insulation reduces width by 2")

Model			A	E	L	L 2	B	TL	W
0151R			8.1	3.5	8.7	-	9.4	22.4	-
0221R	0221M		6.8	3.5	6.1	-	11.8	18.5	13.8
0301R			6.8	3.5	12.4	-	11.8	24.0	13.8
0401R	0401M	0404R	6.8	3.5	18.7	-	11.8	30.7	13.8
0551R			6.8	3.5	12.6	13.2	11.8	37.0	13.8

All dimensions in inches.

Technical Data							
Model	**0151R**	**0221R**	**0221M**	**0301R**	**0401R**	**0401M**	**0551R**
Volume Gallons	4	6	6	8	11	11	15
Weight lbs dry	15	18	33	24	26	46	35
Height	10.2"	14.6"	14.6"	14.6"	14.6"	14.6"	14.6"
Connections freshwater:			1/2" BSP female thread				
Connection engine water:			1/2" BSP female thread				
Connection heater coil:			1" BSP male thread				
Heater coil capacity:			750W				
Safety valve opens at:			58 psi (4 bar)				
Material tank and connections:			AISI 316				
Material insulation:			Polyurethane foam with hardened shell				
Thickness:			.8" - 1.8"				
Temperature loss:			1°F/hour				