



Installation and Owners manual

***For the following HEATER model numbers:
100H, 200H, 300H, 400H, 500H, 700H and 900H
Series Hydronic Heaters***

Approximate Installation Time: 3-5 Hours

Tools Required:

***#2 Phillips Screw Driver; Power Drill; 7/64" Drill Bit; 1"-4" Hole Saw; Jig Saw;
Hose Cutter; Wire Crimper; Teflon Plumbers Tape; Marine Sealant; Pencil.***



HEATER CRAFT®

Guidelines And Definitions

These instructions contain information that is important for you to know and understand. The information provided relates to safety issues for the installation and use of our products. To help you identify important information, we use the following system.

Warning –

Important Safety information – A hazard that may cause an injury, serious injury, or loss of life.

Caution –

Information for preventing improper operation of, or damage to equipment.

Note –

Information pertaining to the installation, operation, and/or maintenance of this product that you should pay special attention to.

Heater Craft will not be held liable for any accidental damage to persons and/or property resulting from any installation not completed within the specified guidelines started herein.

Operation Warning

Carbon Monoxide (CO) is emitted from the engines' exhaust. Do not run the engine without proper ventilation. Do not run the engine in a confined space or where back drafting may occur. For more information about carbon monoxide refer to ABYC standards: A-7, T-22(1), and TH-23; or contact one of the following agencies.

American Boat and Yacht Council, Inc ***410-956-1050***

United States Coast Guard ***754-441-3287***
www.uscgboating.org

National Marine Manufacturers Association ***313-946-6200***
www.nmma-medialink.com

Boat U.S. ***703-823-9550***
www.boatus.com.

Heater Craft
6672 Boekel Road
Rathdrum, ID 83858
Attn: Technical Support
(208) 687-4400
Fax (208) 687-9700
www.heatercraft.com

Heater System

1. Layout the heater system in the boat before installation and make sure the mounting location of the heater unit and routing of all the hoses will work.

Warning – Do not mount the heater unit into the bilge area or any compartment that may draw air from the bilge.

Types of Heater Installation:

Ducted units typically mount under the helm or in a storage area that will allow routing of the vent hoses to desired vent locations.

Grill Mounted units typically mount into a stairwell or into a storage area.

Note – Our heater units are equipped with with 5/8" or 3/4" heater core outlets. Please make sure that you have the proper size of heater hose and fittings for your installation. If the hoses and heater core outlets are not the same size, it is necessary to install a hose coupling with the proper hose sizes to prevent coolant leakage.

2. Determine your source for the hot water supply.

Main engine – This installation is like your automobile, engine coolant will circulate from the engine to the heater unit and return to the engine.

Caution – If your engine application has a freshwater closed cooling system the heater unit should be mounted below the level of the radiator cap. If heater is mounted above this level it is possible for air to be come trapped in-line. If there is air trapped in-line it will not allow the water to circulate efficiently and may cause the engine to overheat. If the heater unit is mounted above the radiator cap it may be necessary to install an in-line air bleed valve at the highest point or an in-line circulation pump.

Main engine with separate coolant loop for the heater – This installation will require additional components. You will utilize a water exchanger to transfer heat from the engines' cooling system to the heater loop. A pump is needed to circulate the water in the heater loop. Basic instructions are outlined on page 8.

Boiler-type system – Refer to the manufacture's instructions for hook-up information.

Note – Be sure the hoses are not kinked or pinched in any way, and do not contact any moving parts, sharp objects or edges. They can be secured with a plastic tie.

3. Route and secure the heater water/coolant hoses between the heater unit location and the hot water source.

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Engine

Warning – Hot engine coolant can cause severe burns! Never open the cap on a hot radiator. Some vehicles are equipped with electric fans that may start without warning even with the engine shut off. Wait until the engine has cooled completely before installation.

Note – Due to the wide variety of engine applications, the following are general instructions for a gasoline-powered engine hook-up. please call Technical Support (208) 687-4400 with your questions regarding your specific engine application.

Always use silicone sealant or teflon tape on the threads of all fittings before installing to prevent water/coolant leakage.

1. Refer to the engine manufacturer's recommendations regarding the thermostat. The standard thermostat in most factory applications is 142 degrees. The heater system will operate more effectively with a 160 degree thermostat. If you are changing the thermostat, locate the thermostat housing on the engine. Remove the existing thermostat and install a 160 degree thermostat. When installing a new thermostat, you may have to replace the thermostat gasket or use RTV sealant.

2. Locate and remove the cooling system plug on the intake manifold. This would be located at the front of the engine near the thermostat housing or on the thermostat housing itself. (On some applications it may be necessary to remove the temperature sending unit and install a brass tee.) Install the proper size hose barb.

Caution – The intake manifold also has vacuum ports. If you connect to a vacuum port, water/coolant will be drawn into your engine and may cause internal damage.

Note – If you remove a sending unit, it is necessary to test the gauge operation after reinstalling to be sure it is properly grounded.

The Hot water pressure will increase with engine RPM. This means on some applications the heater will cool down during periods of extended idling. If your engine is normally operated at low engine RPM's it may be necessary to install an in-line circulation pump. Please contact Technical Support (208) 687-4400 for options.

3. Locate and remove the plug on the water pump housing and install the proper size hose barb.

Note – If your particular engine does not have a plug to remove, it is necessary to install a hose tee into the large hose connecting the thermostat housing to the water pump. Please contact Technical Support (208) 687-4400 for options.

4. Cut the water/coolant hoses to length, attach with hose clamps, and secure in place.

Note – Fasten the hose clamps near the end of the hose to prevent the hose end from "mushrooming" and to prevent coolant leakage.

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Heater Installation

1. Locate the area(s) for mounting the hot air vents.

Note – Vents should be located so the heat will blow out in a desirable direction and allow easy access for adjustments. Install them in areas that are protected from damage from gear or persons.

2. Drill or cut the proper size hole to match the vents that you are using.

Heater Craft Vents:

- H-504, Directional Euro Vent – use 3" hole saw.
- H-506, Directional Louvered Vent – use 4 1/4" hole saw.
- H-509, Hot Tube Extendible Vent – use 4" hole saw.

Grilled /surface mount units:

- 4H series, cut out a 6 3/4" x 16" rectangle.
- 5H series, cut out a 6 3/4" x 9 3/4" rectangle.
- 8H series, cut out a 6 1/2" x 8 3/4" rectangle.
- 9H series, cut out a 4" x 8 5/8" rectangle.

3. mark the location of the mounting holes and pre-drill.
4. Mount the heater unit in the area chosen with the heater core in a horizontal position when possible.

Note – It may be easier to make the hose and wiring connections before mounting the heater unit.

5. Cut the water/coolant hoses to length, attach them with hose clamps, and secure in place.

Note – Fasten the hose clamps near the end of the hose to prevent the hose end from "mushrooming" and to prevent coolant leakage.

Connect the hoses to either barb on the heater core.

6. Install the vents in place and attach the vent hose. Secure the vent hose with a plastic wire tie or hose clamp.

7. Route the vent hoses to the heater unit.

Note – Route the vent hose in a way that prevents damage from gear or persons.

8. Cut the vent hose to length, attach with plastic wire tie or hose clamp and secure in place.

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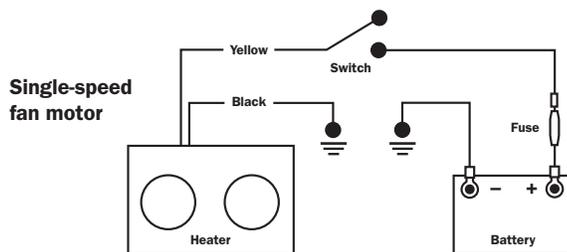
Wiring The Fan Motor

1. The wires from the heater unit are color-coded and correspond as follows.

Single-speed fan motor:

The fan motor and switch should be protected with an in-line fuse. The fuse rating should be greater than the amperage draw of the fan motor.

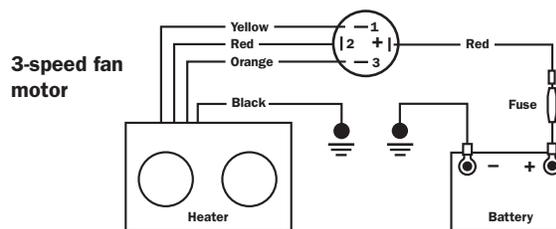
- Red or Yellow lead – on/off switch (power source)
- Black lead – ground



3-speed fan motor:

A four-position switch is needed for full operation. The fan motor and switch should be protected with a 15-amp in-line fuse.

- Yellow lead – Low speed
- Red lead – Medium speed
- Orange lead – High speed
- Black lead – ground



2. Route the Black wire to a ground source and attach.

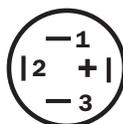
3. Route the fan wire to the fan switch and attach.

Heater Craft Switches

E-112 Switch and E-113 Mounting plate.

1. Locate a place to install the heater fan switch.
2. Drill the proper size hole for your installation:
 - Without the switch mounting plate, drill a 7/16" hole.
 - With the switch mounting plate, drill a 1 1/8" hole.
 - To mount the switch plate, pre-drill a 5/64" hole for the mounting screws provided and mount the switch plate.

E-112 Switch Wiring Diagram



Terminal 1 – Yellow wire, low-speed. Terminal 3 – Orange wire, high speed.
Terminal 2 – Red wire, medium speed. Terminal + – Red wire, fused power source.

H707 Switch and Mounting plate.

1. Locate a place to install the heater switch and switch plate.
2. Drill a 1 3/8" hole for the switch plate.
3. Pre-drill 7/64" holes to mount the switch plate.
4. Route the wires to the switch and mount the switch/switch plate assembly.

Note – Low speed wire has in-line resistor. High speed wire has no resistor. Center terminal – to power source

Testing The Installation

Warning: Carbon Monoxide (CO) is emitted from the engines' exhaust. Do not run the engine without proper ventilation. Do Not run the engine in a confined space or where back drafting may occur.

1. Test the fan motor on all settings.

Note – If the airflow does not correspond to the switch setting, the wires are not on the proper terminal. Refer to the wiring diagram and recheck the switch wiring.

2. Check all hot-air outlets to make sure there are no air restrictions.

3. Prepare to run the engine.

Warning – Keep hands, hair, loose clothing and tools away from all moving parts.

Caution – Make sure the water source is properly connected to the engine.

Raw-Water Cooled Engine

1. Run the engine and check for leaks at the hose barbs, hose connections, heater hose, and heater core.

Closed Cooled Engine

1. Refill engine-cooling system to the required level. Operate engine until normal operating temperature is reached.

2. Shut off the engine and check the heater core, hose connections, and all hoses for coolant leaks.

3. After engine has cooled, recheck the coolant level.

Note – On an engine application it is necessary to increase the engine RPM to create effective hot water flow. Shop testing will not always provide adequate water temperature or flow to test the maximum air temperature output. Certain engine applications may require a water test to achieve actual heater output.

Winterizing

Raw-Water Open Cooled Engine

The heater unit and hoses should be drained of water to prevent freeze damage. This can be done by removing the hoses at the engine and blowing the water out of the heater unit and hoses. An RV anti-freeze or water/anti-freeze solution can be added for extra protection and to prevent rust or corrosion.

Caution – Do not exceed 35 psi when blowing out the heater core.

Freshwater closed cooling

It is not necessary to winterize as long as you are using a sufficient water/anti-freeze solution as needed for the climate conditions in your area.

Questions regarding winterization please call Technical support (208) 687-4400 or log on www.heatercraft.com and fill out a technical support request form and a qualified Heater Craft representative will be in contact within 24 hours.

Optional Equipment

H415 In-line Circulation Pump

1. Locate and mount the pump.

Note – Do not mount the pump into bilge, or any location where it may become submerged. The warranty for the pump will be void if, upon disassembly, we determine that the pump has been submerged in water for any length of time.

2. Cut the return water hose from the heater unit.

Note – The output hose is connected to the intake manifold or thermostat area (most V-8 gasoline engines). The return is connected to the water pump or the large hose between the thermostat housing and the water pump (most V-8 gasoline engines)

3. Attach the hoses to the corresponding ports on the pump.

Note – Fasten the hose clamps near the end of the hose to prevent the hose end from "mushrooming" and to prevent coolant leakage.

4. Wire the pump to the switch or use 2-7061 Auxiliary Pump to heater relay switch harness to power the pump and heater unit using standard four position switch. (The pump and switch should be protected with a 10-amp in-line fuse.) The pump wires should be routed with the factory wiring harness whenever possible.

Note – The wires should be routed away from moving parts, high heat sources such as engine exhaust manifolds and sharp edges or objects.

H703 Fresh Air Duct Installation (700H/800H only)

Warning: Carbon Monoxide (CO) is emitted from the engines' exhaust. Do not run the engine without proper ventilation. Do Not run the engine in a confined space or where back drafting may occur. Do not install the air intake where it can draw in engine exhaust.

1. Apply silicone type sealant around the inside edge (lip) of the fresh air intake.
2. Attach the fresh air intake to the heater unit.
3. Locate and install an intake vent for the fresh air source. Securing the vent and hose with with a plastic wire tie or hose clamp.
4. Route the vent hose to the heater unit.

Note – Route the vent hoses in a manner that will prevent damage from gear or people.

5. Cut the vent hose to length, attach with plastic wire tie or hose clamp, and secure in place.

Note – Vent hoses should be as short as possible for efficiency.

Optional Equipment

S30077 Coolant To Water Engine Heat Exchanger

Note – *The following are general guidelines for this type of system.*

1. Locate and mount the exchanger.
2. Locate and mount the circulation pump (if required).
3. Wire the pump according to the manufacturers recommendations.
4. Cut the heater units' water/coolant hoses to length, attach them with hose clamps, and secure in place.

Note – *The hose clamps should be fastened near the end of the hose to prevent the hose end from "mushrooming" and to prevent coolant leakage.*

5. Proceed to "Testing The Installation" section.

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Frequently Asked Questions

Why does my heater cool down when I'm idling?

Open cooling system – The majority of applications have an open cooling system. This means that there is no pressure in the system. The water pressure is created by the engine's circulation pump. The engine must be at 1200 to 1500 rpm to create enough pressure for the circulation pump to circulate water to the heater.

Location of the heater unit – In your automobile, the heater is located close behind and below the engine. This allows optimum circulation. In your boat, the heater may be above the level of the engine and may have a greater distance between the engine and heater unit.

In-line circulation pump – If your engine is normally operated at low rpm's it may be necessary to install an in-line circulation pump.

My Heater has multiple speeds but the fan switch is wired properly.

Check the wiring diagram to be sure that the switch is wired properly.

There are several factory installations that use an in dash switch. The switch may not have enough positions to operate the fan motor on all speeds. This will not harm the fan motor.

Does it matter which way the hoses hook up to the heater core outlets?

No, it does not. The water/coolant will flow through the core in either direction.

I have luke warm air coming out of the heater.

The hot water pressure will increase with engine RPM. This means on some applications the heater will cool down during periods of extended idling. If you operate your engine at low engine RPM's, it may be necessary to install an in-line circulation pump

On an engine application it is necessary to increase the engine RPM to create effective hot water flow. Shop testing will not always provide adequate water temperature or flow to test the maximum air temperature output. Certain engine applications may require a water test to achieve actual heater output.

Hose routing – Check the routing of the hoses between the engine and heater unit for any kinks or restrictions.

In-line circulation pump – If your installation has more than 15 ft. of hose between the unit and the engine or if the heater unit is mounted more than 18" above the level of the engine, then it may be necessary to install an in-line circulation.

Heater Craft 2 Year Limited Warranty

Heater Craft warrants your hydronic Heater* system to be free from defects in material and craftsmanship under normal use and service by the original consumer purchaser for a period of (2) two years from the date of purchase. This limited warranty does not apply if the system has been damaged by accident, improper installation, unreasonable use, lack of proper maintenance, unauthorized repairs or modifications, or causes not arising from defects in materials and craftsmanship.

Heater Craft's obligation under this warranty are limited to repair of the product at Heater Craft's production facility, or the replacement of the product at Heater Craft's option and at Heater Craft's expense. Any expense involved in the removal, reinstallation, or transportation of the product is not covered by this warranty. Prior to return of any product to Heater Craft customer must first call Heater Craft customer service (208) 687-4400 and request a return authorization number. This number must be marked on exterior of carton for easy identification. ***Warranty product received at Heater Craft without a Return Authorization Number may be returned at expense of sender.***

Send defective product to:

Heater Craft
6672 Boekel Road
Rathdrum, ID 83858
Attn: Warranty Dept.

Postage must be prepaid, and the original dated proof-of-purchase must be included. Heater Craft will not be liable for any damages sustained in transport due to improper packaging or handling. The acceptance by Heater Craft of any product returned shall not be deemed as an admission that the product is defective or in any violation of any warranty.

This warranty is Heater Craft's only express warranty of this product. No implied warranty shall extend beyond (2) two years from the date of the original consumer purchase. Heater Craft will not be liable for any damages, for loss of use of this product, nor for any consequential damages, costs or expenses.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion of incidental or consequential damages, so the above limitations and exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights not mentioned here that vary from state to state.

****Any Heater product subjected to direct saltwater use will have a (1) one year warranty. Direct saltwater use is defined as having saltwater circulating through the heater core pipes.***