SYSTEM 2

MOUNTING THE COMPONENTS

This section will discuss the mounting and installation of the following:

1. Mounting the Condensor/Compressor Assembly
2. Mounting the Holdover Plate and Expansion Valve
3. Mounting the Receiver/Drier
4. Connecting the Holdover Plate, Receiver/Drier and Condensor/Compressor Assembly
5. Installing The Raw Water Circuit
    1. Mount the Raw Water Pump
    2. Water Line Connections
6. Electrical Connections

Materials Required

- Assorted stainless steel or bronze wood screws
- Wood or plastic block for evaporator spacers
- Wood blocks and epoxy (if mounting to fiberglass hull)

Tools Required

- Marking pencil
- Tape measure
- Drill and drill bits
- Flathead screw driver
- wrenches

Mounting the Condensor/Compressor Assembly

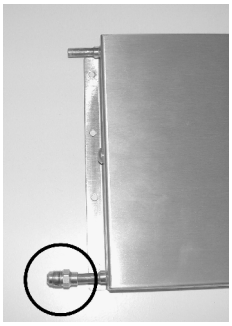
Mount the Condensor/Compressor assembly on a level surface when the boat is at rest. Securely bolt the assembly to the boat through the four holes on the corners of the assembly.

1. The assembly may be mounted in any alignment, either fore and aft or athwartship. Be sure that the unit is aligned for attachment of the refrigerant lines and the raw water cooling hoses.
2. Be sure to mount it on a sturdy platform that will not amplify noise through vibration and that it is solidly attached to the hull.
3. Also, be sure that the area is well ventilated if the space is small. It is important to have a way for the air to flow in and out of small spaces.
4. Be sure that there is room to access the unit, for any necessary maintenance.
5. Be sure there is access to connect the service gauges for charging the system.

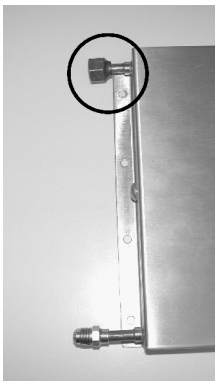
Attaching the Expansion Valve and Mounting the Holdover Plate Assembly

1. The holdover plate should be mounted in the freezer box near the top. It can be mounted with the tubing facing either side or the top. Do not mount with the tubing facing down. Mounting the holdover plate high in the box takes advantage of the convection currents that occurs when heat rises. Place the holdover plate into position and mark the position of the mounting holes by using the holes in the holdover plate as a guide. Be sure to leave enough room for the expansion valve. Remove the plate and then, drill the necessary holes.

2. Once you have determined the orientation of the plate, you can install the two connections to the tubing extending from the plate. Place the 3/8" flare to solder adaptor (027 0150) on the lower tubing of the plate and solder in place.

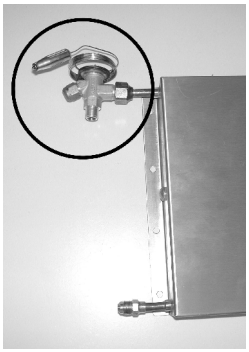


3. Place the 1/2” flare nut (027-0003) over the other tubing on the plate. Then flare the tubing. Be sure the nut is placed onto the tubing before you make your flare.



4. If you have purchased your plate without solution, you will need to fill the plate now. To determine mixing ratio of your water/glycol solution see the chart on the RParts.com web site at: *http://www.rparts.com/Catalog/Major_Components/holdover_plates/glycol.PDF*. You should mix your solution to achieve a 0 to -5 degree freezing point. Remove the allen head plug located between the two copper tubes exiting your plate. Fill the plate with the solution that you have determined. Be sure to leave approximately one inch of free space inside the plate to allow for expansion of the solution due to freezing. Replace and tighten the cap.

5. Attach the expansion valve to the flare nut on the upper fitting of the plate and tighten. Use a small amount of leak-loc (079-0875) on the face of the flare. Do not over do it as you do not want the leak -loc to enter the system. The expansion valve may be placed in any convenient orientation. You will need to connect copper refrigerant tubing to the other end of the expansion valve, so be sure to allocate room to tighten the fitting.



6. Mount the plate in the freezer box using the holes that you previously drilled. Use Bronze or stainless steel screws to attach the holdover plate to the wall

7. The copper refrigerant tubing needs to be run out of the freezer box to the receiver/drier and condensor/compressor assembly. It is best to exit the refrigerator box near the top. After running the refrigerant tubing through this hole, be sure to seal the hole to prevent leakage of cold air.

Mounting the Receiver/Drier

1. Mount the receiver/drier using the supplied bracket, to a secure location close to the condensor/compressor assembly with the “IN” side of the inlet facing the condensor/compressor assembly. Be sure to mount the receiver/drier with the fittings up and in a location that allows you to see the sight glass on the top of the unit.

Connecting the Holdover Plate, Receiver/Drier and Condensor/Compressor Assembly

1. Cut a 1/4" cooper tube long enough to reach from the high pressure base valve (the outside valve on the Condensor/Compressor assembly) to the “IN” side of the drier. Bend the tubing to fit your boat.

2. Place 3/8" x 1/4" Reducing Flare Nuts (027-0006) on the receiver/drier end of the tubing and flare that end.

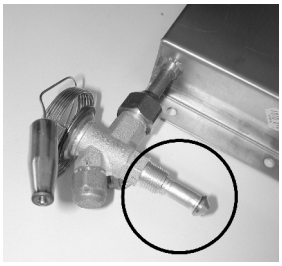
3. Place a 1/4" Flare Nut (027-0001) on the other end of this tubing and flare that end.

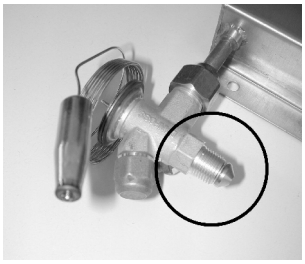
4. Connect the copper tube to the “IN” side of the receiver/drier and the high pressure base valve and tighten. Use a small amount of leak-loc (079-0875) on the face of the flare. Do not over do it as you do not want the leak -loc to enter the system.

5. Cut a 1/4" cooper tube long enough to reach from the expansion valve on the holdover plate to the outlet side of the receiver/drier. Bend the tubing to fit your boat

6. Place a 3/8" x 1/4" Reducing Flare Nut (027-0006) on each end of the tubing that you just cut and flare each end.

7. Insert the Orifice (095-0002) into the end of the expansion valve. Attach one end of the 1/4" tubing to the expansion valve and the other end to the receiver/drier and tighten. Use a small amount of leak-loc (079-0875) on the face of each flare. Do not over do it as you do not want the leak -loc to enter the system.





8. The lines FROM the holding plate to the condensor/compressor assembly will sweat in humid weather unless they are insulated. All lines outside the box should be covered with a “slip on” neoprene foam pipe insulation to prevent condensation Slip-on foam tube insulation can be purchased from hardware stores, plumbing and

refrigeration equipment supply stores. When installing the insulation DO NOT LEAVE gaps between sections. Insulation sleeves should be sealed together with rubber cement. .

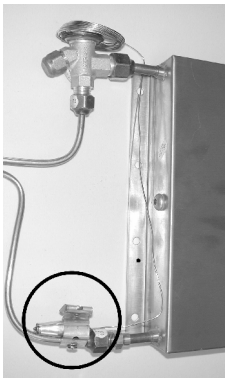
9. Cut a 1/4" cooper tube long enough to reach from the holdover plate to the suction base valves on the Condensor/Compressor assembly (the base valve that is closest to the air cooled condensor). Bend the tubing to fit your boat.

10. Place a 3/8" x 1/4" Reducing Flare Nut (027-0006) on the end that attaches to the plate and flare the end.

11. Place a 1/4" Flare Nut (027-0001) on the other end of this tubing and flare that end.

12. Attach the 1/4" tubing to the holdover plate and the suction side base valve. Use a small amount of leak-loc (079-0875) on the face of the flare. Do not over do it as you do not want the leak -loc to enter the system.

13. Run the Temperature Sensing Bulb that is attached to the Expansion Valve to the 1/4" suction line tubing. Attach the bulb to the tubing using the supplied clamp. Be sure that the bulb is at the 2 o'clock or 11 o'clock position and that the clamp is tight. Leave the excess tubing atttached to the bulb coiled near the expansion valve.



Installing The Raw Water Circuit

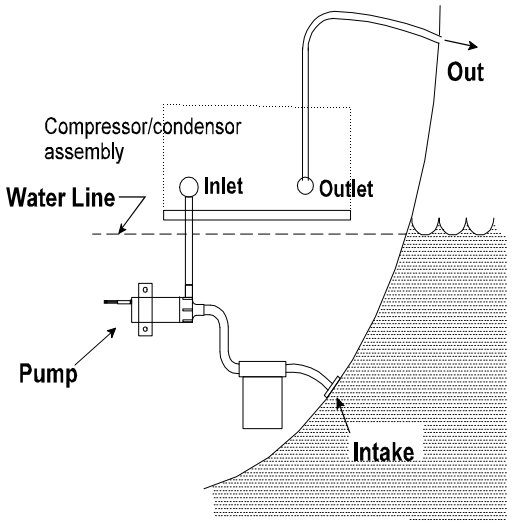
1. Pumps should be mounted horizontally or with the head facing downwards - never with the head up.
2. The recommended through-hull size for the pump is 3/4"
3. Protect pumps from exterior water exposure.
4. Be sure to use a sea strainers with a filter mesh that is not too coarse .

Mount the Raw Water Pump

Mount the raw water pump to a solid surface with the head down. The self-priming pump may be mounted above or below the waterline. The pump does vibrate when running. Do not mount it to any bulkhead or platform which may amplify pump noise into the cabin interior. The pump is designed to push rather than pull. Therefore, it is best to mount the pump near the through-hull.

Water line connections

1. Run 3/8" rubber hose from the water inlet to the inlet side of the strainer and then to the inlet side of the raw water pump. You may tee into any raw water *intake* supply after a strainer, including head, galley, engine, watermaker or deck wash. If the engine intake is used, the tee should be made as close to the thru-hull as possible. If you use an existing thru-hull you can eliminate the need to add a thru-hull. Then you will only need to run a 3/8" hose from the tee to the inlet side of the raw water pump.



Be sure to leave room for a suitable seawater strainer, if one does not already exist. The strainer will need to be checked for periodic cleaning so make sure you can get to it.

2. Run 3/8" rubber hose from the raw water pump discharge to the water fitting on the water cooled condensor furthest from the air cooled condensor. Place two stainless steel hose clamps on the hose and tighten.

3. Run 3/8" rubber hose from the water discharge fitting on the water cooled condensor closest to your raw water discharge point. The raw water discharge line may be teed into almost any existing through-hull exit lines including galley sink drains and cockpit drains. Choosing a discharge through-hull below the water line will minimize noise when the unit is running but may, under certain conditions, cause priming problems with a centrifugal pump.

ELECTRICAL CONNECTIONS

Materials Required

- Tinned copper wire
- Spade Connectors
- Rosin core solder
- Heat shrink tubing
- Cable ties w/screws

Tools Required

- Screw driver
- Wire cutters/strippers
- Soldering iron
- Lighter or heat gun

Introduction

With the holdover plate and compressor/cpndensor assembly mounted and connected and the raw water connected, it is now time to make the electrical connections. Refer to the “Basic Electrical Wiring” manual to determine appropriate wire size. Longer runs (always use the combined length of the positive and negative wire) will require heavier wire. To retain the reliability of your RParts system, it is important that all connections are done in proper fashion using a high strand count 100% tinned marine-grade wire.

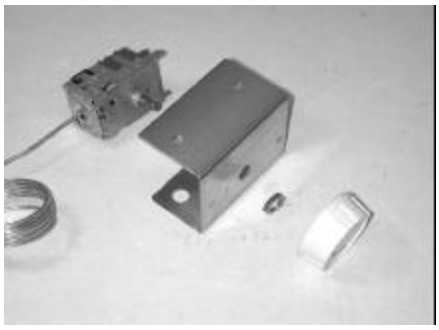
Use appropriate sized spade and butt terminals for all connections and be sure to get a good crimp. It is advisable to us heat shrink tubing and marine grade terminals.

Wiring the Electronic Control Module

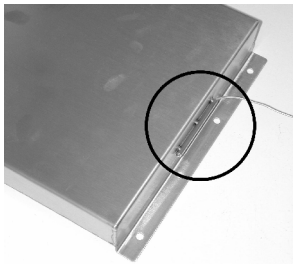
Wire the Electronic Control Module according to the Instructions included in the box for the Danfoss Electronic Unit. Both the air cooled condensor cooling fan and the electronic control module cooling fan, as well as the wires to the raw water pump relay, need to be connected to the "+" and "F" terminals on the control module. Be sure that the red wires from the fans are connected to the "+" terminal and the black wires are connected to the "F terminal.

When wiring the electronic control module, it is important to ensure that all wires are fully inserted into their proper terminal locations. Because strands from frayed wires can create electrical shorts and poor contacts, it is advisable that all wires be "tinned" with solder before inserting them into the spade terminals. Additionally, tinned wire is less prone to corrosion and less likely to loosen up over time.

We can now assemble the thermostat ready for mounting. There are two sets of holes in the SS mounting bracket. The larger ones are for screw driver access to tighten the screws that mount the bracket on the wall or inner liner of the refrigerator box. The thermostat can also be mounted outside the box as long as the cap tube attached to the thermostat reaches inside the box and can be attached to the holdover plate. You must mount the bracket before assembly of the thermostat to the bracket. Once the bracket is mounted, you can assemble the thermostat to the bracket.

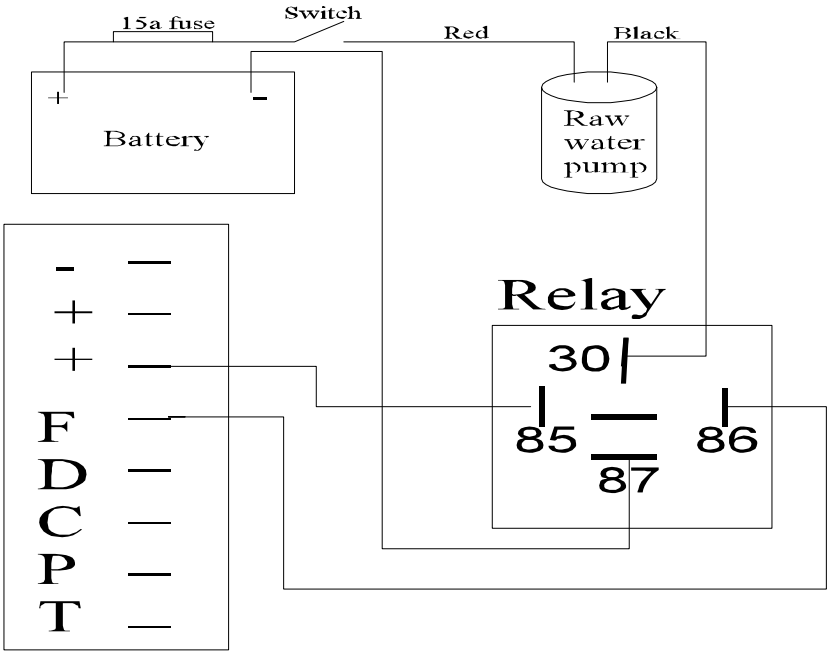


You can now attach the capillary tube from the thermostat onto the holdover plate. There is a tube on the side of the holdover plate opposite of the copper tubes that the capillary tube fits into..



Wiring the Raw Water Pump and Relay

1. Mount the relay in a convenient location.
2. Connect the red wire from the raw water pump to the positive terminal of the battery. Be sure to insert a 15 amp fuse or circuit breaker as close to the battery as possible. If you would like to be able to turn the raw water pump off and only use the air cooled condensor, install a switch in this line.
3. Connect the black wire from the raw water pump to terminal “30" on the relay.
4. Connect terminal “87" to the negative post of the battery.
5. Connect terminal “85" to terminal “+” on the electronic control module. There will be three wires to this terminal, including wires from both cooling fans on the condensor/compressor assembly.
6. Connect terminal “86" to terminal “F” on the electronic control module. There will be three wires to this terminal, including wires from both cooling fans on the condensor/compressor assembly.



Evacuation and Charging

Now that you have the complete system installed and hooked up, it is time to evacuate and charge the system and enjoy the benefits of a superior refrigeration system. Please see the section on evacuation and charging and read it completely before beginning**.**