
Self-contained Air Conditioning Systems Installation Manual For These Product Families:



**Turbo
(DTU/DTM)**



**Vector Compact
(DCU)**



**EnviroCool
(ECD)**



**Low Profile
(DLU)**

Dometic
Rev. 20170HG-H
L-4111 English
P/N 339708

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INTRODUCTION

Improper installation procedures can result in unsatisfactory performance and/or premature failure of these air conditioning (A/C) units. In the interest of product improvement, Dometic's specifications and design are subject to change without prior notice.

This installation can typically be done by one person with brief help from an additional person.

INSTALLATION

SAFETY CONSIDERATIONS

⚠ DANGER Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

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

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

NOTICE Indicates a situation which can cause damage to the engine, personal property and/or the environment, or cause the equipment to operate improperly.

⚠ WARNING CARBON MONOXIDE HAZARD. Never install your air conditioner in the bilge or engine room areas. Ensure that the selected location is sealed from direct access to bilge and/or engine room vapors. Do not terminate condensate drain line within 3' (0.91 m) of any outlet of engine or generator exhaust systems, nor in a compartment housing an engine or generator, nor in a bilge, unless the drain is connected properly to a sealed condensate or shower sump pump. If drain line is not properly installed, then dangerous fumes may travel up drain line and contaminate living quarters. Failure to follow this precaution could result in death or serious injury.

⚠ WARNING CARBON MONOXIDE HAZARD. Never install the A/C unit in a location where it can circulate carbon monoxide, fuel vapors or other noxious fumes into the boat's living spaces. Do not install or operate a self-contained unit in the engine room or near an internal combustion engine. Failure to follow this precaution could result in death or serious injury.

⚠ WARNING EXPLOSION HAZARD. Never install the A/C unit in a location containing gasoline engines, tanks, LPG/CPG cylinders, regulators, valves or fuel line fittings. Unless labeled otherwise, self-contained units do not meet federal requirements for ignition protection. Failure to follow this precaution could result in death or serious injury.

⚠ WARNING ELECTRICAL SHOCK HAZARD. Be sure to effectively ground the A/C unit. The A/C unit must be effectively grounded to minimize electrical shock hazard. Refer to the installation guidelines for further information. Failure to follow this precaution could result in death or serious injury.

NOTICE Contains fluorinated greenhouse gases in hermetically sealed equipment. Refer to the condensing unit's product data plate label for quantity of refrigerant shown in weight and GWP. Refrigerant added should be noted on unit label.

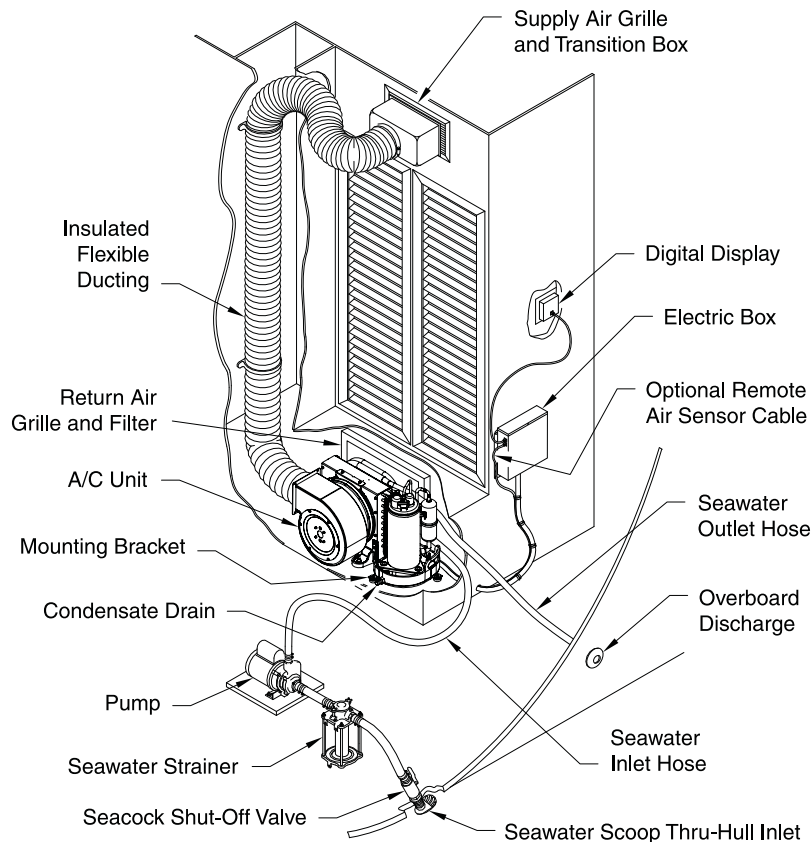
PRIOR TO INSTALLATION

Read these instructions completely and then plan all connections which must be made to the A/C unit including ducting, condensate drain line, seawater inlet and outlet hoses, electrical power connection, location of control, and seawater pump placement, to assure easy access for routing and future servicing.

INSTALLATION OVERVIEW

See Figure 1 for an overview of a typical self-contained A/C system installation.

Figure 1: Installation Overview



BLOWER ROTATION (IF APPLICABLE)

Rotate the blower to the direction which allows the most direct airflow discharge through the ducting.

- **For Turbo blowers** – Loosen the adjustment screw on blower mount ring, rotate blower to desired position, and then tighten adjustment screw. See Figure 2.
- **For EnviroCool/MCS/ECD blowers** – Remove screws on plate, rotate blower to vertical or horizontal position, and fasten plate using self-tapping screws. See Figure 2.
- **For Vector Compact blowers** – Remove mounting-ring screws and screws that attach the blower to the drain pan. Rotate the blower to the desired position, and then install self-tapping mounting screws. Plug any unused screw holes in the blower to prevent air loss. See Figure 2.

PLACEMENT OF A/C UNIT

IMPORTANT INSTALLATION NOTE: The turbo self-contained condensate base pan is equipped with vibration isolators installed in the bottom of the pan. These isolators are designed to dampen the vibration caused by the operating A/C unit from transferring into the mounted surface. Care must be taken when moving the A/C unit across mounting surfaces as isolators can be damaged.

NOTICE

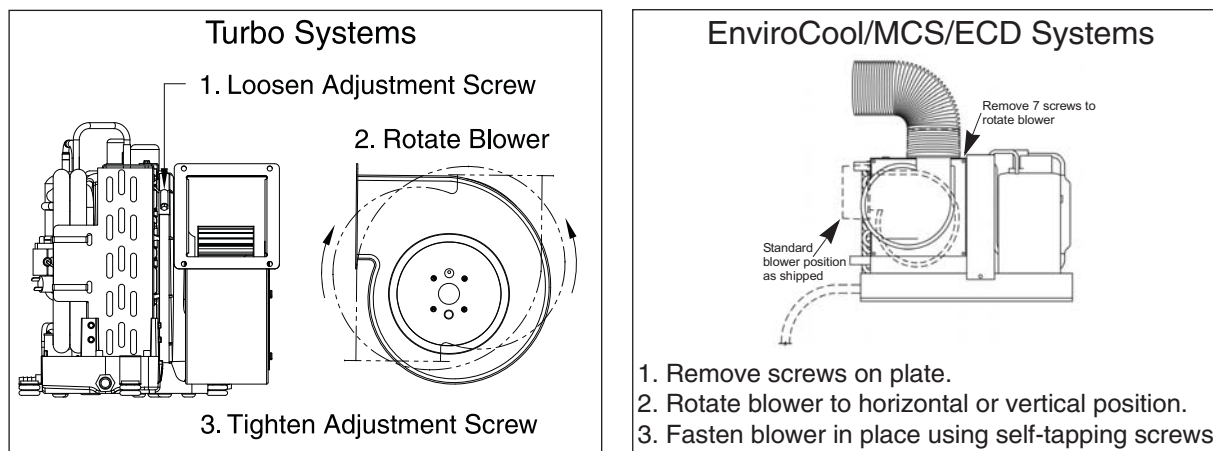
Isolators will not normally pull out of pan, but can turn sideways if dragged and may break if excessive dragging occurs. Unit must be picked up after moving to allow isolator to reset into well or vibration isolation will be ineffective.

The A/C unit must be mounted to a low flat level surface, in bottom of locker, under a bunk or dinette seat, or in a similar location. See Figure 1 before mounting unit.

WARNING

CARBON MONOXIDE HAZARD. Never install the A/C unit in the bilge or engine room areas. Read the safety considerations on page 2 and see Figure 1 before mounting unit.

Figure 2: Blower Rotation Procedures for Each System Type



Vector Compact Systems

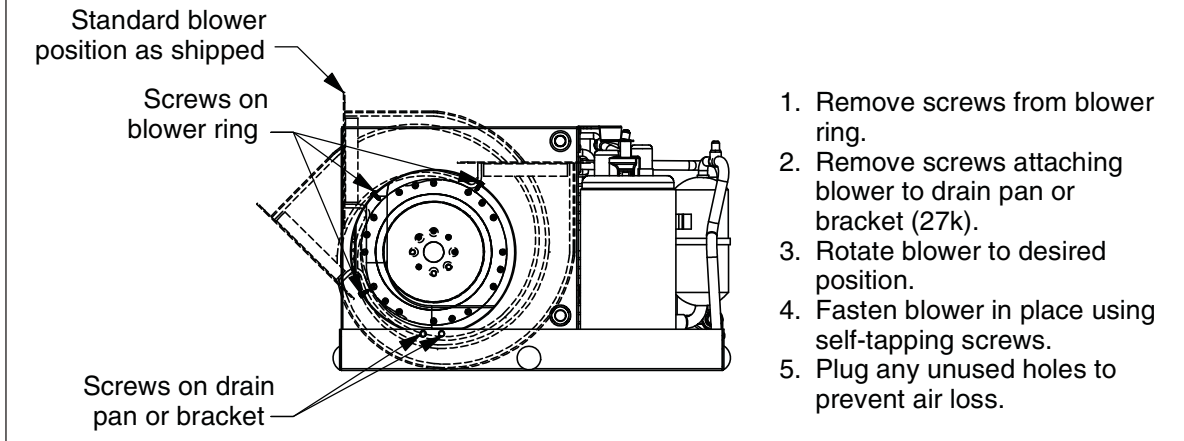
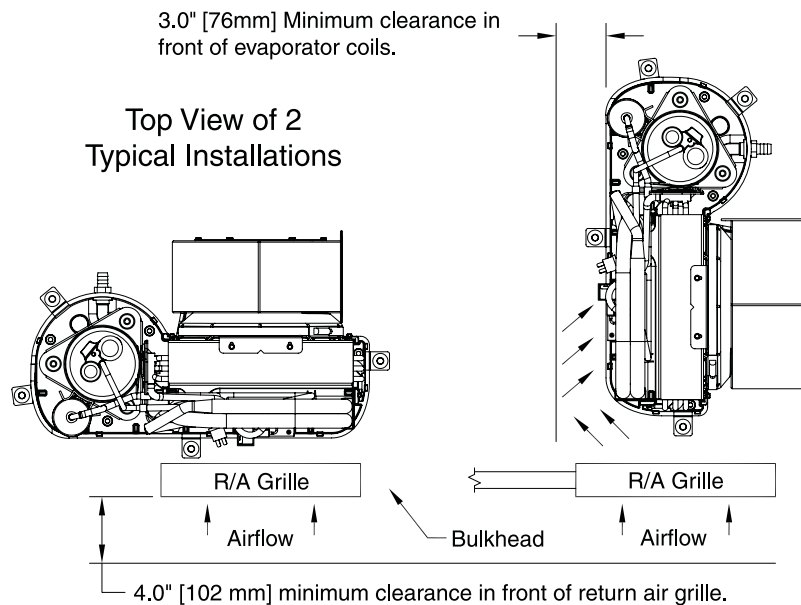


Figure 3: Placement Relating to Airflow



MOUNTING BRACKETS AND CONDENSATE DRAIN

Figure 4: Mounting Brackets and Condensate Drains

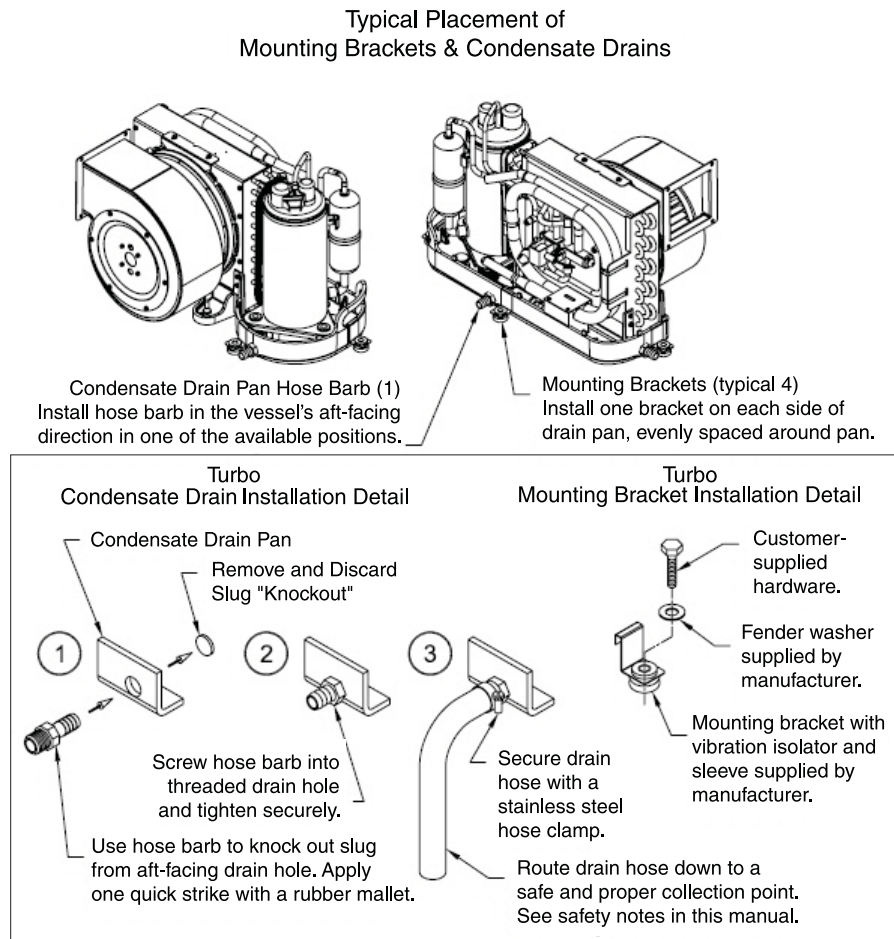
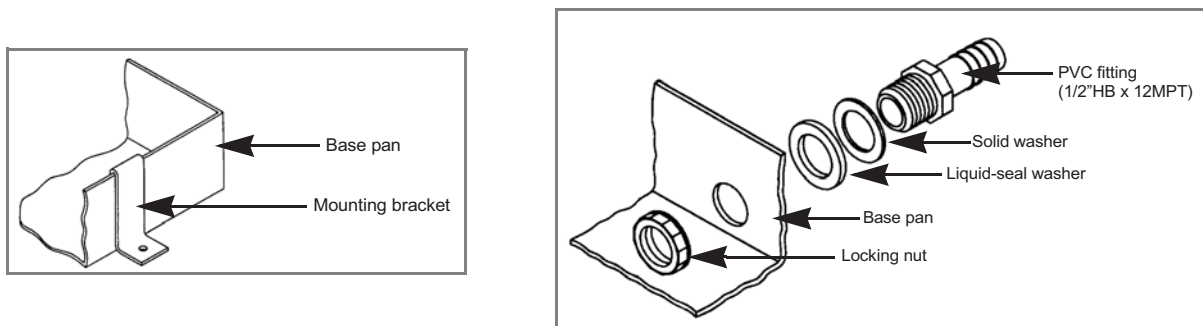


Figure 5: Mounting Brackets and Condensate Drains on Other Self-Contained Systems



⚠ WARNING CARBON MONOXIDE HAZARD. Verify the condensate drain line is properly installed and sealed. Do not terminate condensate drain line within 3' (0.91 m) of any outlet of engine or generator exhaust systems, nor in a compartment housing an engine or generator, nor in a bilge, unless the drain is connected properly to a sealed condensate or shower sump pump. If drain line is not properly installed, then dangerous fumes may travel up drain line and contaminate living quarters.

AIR FILTERS

Air filters remove airborne particulates from the cabin air and keep the evaporator coil clean. One, and only one, air filter must be installed for each air conditioner unit – either on the A/C unit or in the return air (RA) grille.

NOTICE Clean the air filter regularly per instructions in Owner's Control Manual to ensure proper operation.

GRILLES AND TRANSITION BOXES

Install the supply air grille as high as possible in a location that will provide uniform air distribution throughout the cabin; grille louvers should be directed upward. The return air grille should be installed as low and close to the A/C unit as possible to insure direct uninterrupted airflow to the evaporator.

NOTICE To ensure proper airflow, the return air grille should have a minimum 4" (101.6 mm) of air circulation clearance in front of it, free from any furniture or other obstructions. See Figure 3.

In no instance should a supply air discharge be directed towards a return air grille, as this will cause the system to short cycle. Allow for adequate clearance behind the supply air grille(s) for the transition box and ducting connection. See Table 1 for minimum grille sizes.

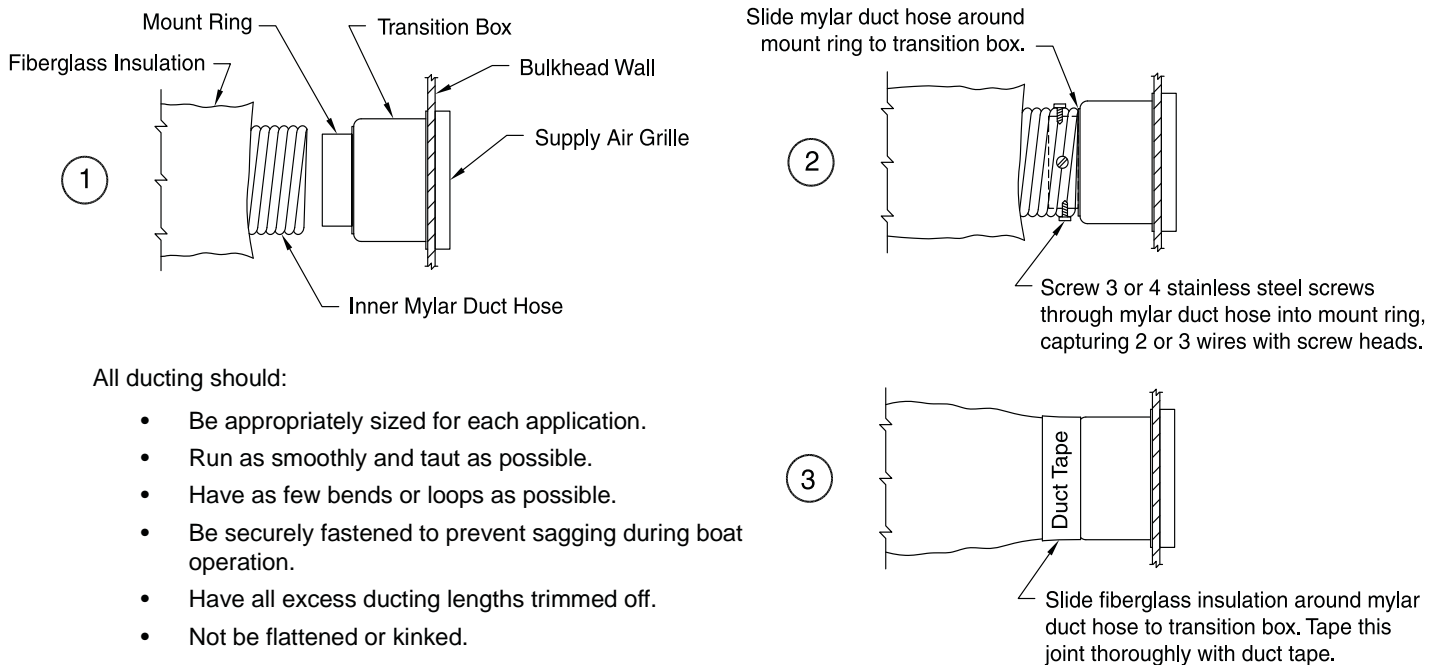
DUCTING

Good airflow is critical for the performance of the entire system. It is highly dependent on the quality of the ducting installation. The ducting should be run as straight, smooth and taut as possible minimizing the number of 90° bends (two 90° bends can reduce airflow by 25%). Table 1 shows minimum duct diameters and their corresponding supply and return air grille minimum areas in square inches. If a transition box is used, the total area of supply air ducts going out of the box should at least equal the area of the supply duct going into the box.

Table 1: Minimum Duct and Grille Sizes per BTU Capacity

	3.5K BTU	6K BTU	8K BTU	10K BTU	12K BTU	16K BTU	18K BTU	27K BTU
Minimum Duct Diameter (in/mm)	3/76	4/102	5/127	6/152	6/152	7/178	7/178	8/203
Minimum Duct Area (sq in/cm)	6.8/44	12.6/81	19.6/126	28.3/183	28.3/183	38.5/248	38.5/248	50.3/325
Minimum Return Air Grille (sq in/cm)	64/413	64/413	80/516	100/645	130/839	160/1032	200/1290	240/1548
Minimum Supply Air Grille (sq in/cm)	12/77	32/206	48/310	60/387	70/452	80/516	100/645	140/903

Figure 6: Proper Ducting Connections



All ducting should:

- Be appropriately sized for each application.
- Run as smoothly and taut as possible.
- Have as few bends or loops as possible.
- Be securely fastened to prevent sagging during boat operation.
- Have all excess ducting lengths trimmed off.
- Not be flattened or kinked.

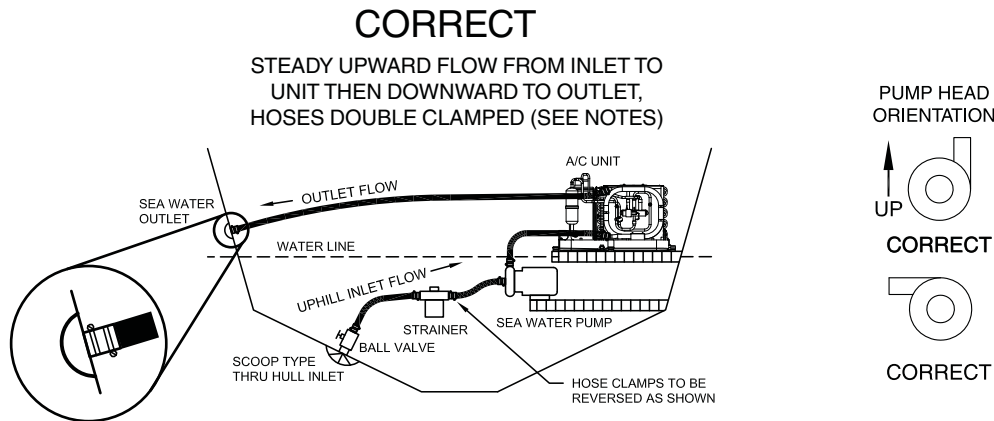
- Insulated when located in high heat load areas (hull side, mechanical compartments, etc.).
- Be properly protected against potential damage when routed through open areas.
- Not be routed through engine room or any area where it may be exposed to dangerous vapors or exhaust fumes.

SEAWATER SYSTEM

1. Install the seawater scoop thru-hull inlet as close to the keel and as far below the water line as possible, facing forward. Bed the scoop with a marine sealant designed for underwater use.
2. Install a bronze, full flow seacock on the seawater scoop thru-hull inlet.
3. Install a seawater strainer below the level of the pump with access to filter.
4. Mount the pump above the strainer and at least one foot below the waterline.
5. Connect the seacock and strainer with an uphill run of reinforced marine grade hose.
6. Connect the discharge from the pump uphill to the bottom inlet of the A/C unit's condenser coil with 5/8" (15.9 mm) reinforced marine grade hose. Connect the discharge from the condenser coil to the overboard discharge thru-hull fitting with 5/8" (15.9 mm) reinforced marine grade hose.
7. Avoid loops, high spots or the use of 90° elbows with seawater hose. Each 90° elbow is equivalent to 2.5' (0.762 m) of hose and a 90° elbow on the pump outlet is equivalent to 20' (6.1 m) of hose.
8. Double clamp all hose connections with two stainless steel clamps, reversing the clamps.
9. Use threaded seal tape on all threaded connections.
10. Connect all metallic parts in contact with seawater to the vessel's bonding system including the speed scoop inlet, strainer, pump and the air conditioner.

NOTICE Failure to follow the above procedure will void warranty.

Figure 7: Seawater System



- STRAINER MUST BE BELOW PUMP, HOSES MUST BE DOUBLE CLAMPED
- HOSES MUST NOT HAVE KINKS, LOOPS OR HIGH SPOTS WHERE AIR CAN BE TRAPPED
- PUMP & STRAINER MUST BE BELOW WATER LINE

NOTES:

- 1) THRU HULL INLET, BALL VALVE, HOSE AND STRAINER SHOULD BE SIZED NO SMALLER THAN PUMP INLET.
- 2) INSTALL THRU HULL FITTING AS FAR BELOW THE WATER LINE AS POSSIBLE.
- 3) PUMP NEEDS DEDICATED THRU HULL NOT SHARED WITH OTHER PUMPS.
- 4) AVOID OR MINIMIZE 90° ELBOW FITTINGS AS MUCH AS POSSIBLE, ROTATE PUMP HEAD TOWARDS DIRECTION OF WATER FLOW.

ELECTRICAL CONNECTIONS, GROUNDING AND BONDING

All A/C units have a terminal strip mounted inside the electric box. The terminal strip is labeled for proper connections of the electrical supply, ground wires and pump circuits. A wiring diagram is provided in the electrical box. The wiring diagram in the electrical box supersedes ABYC standards. The correct size circuit breaker should be used to protect the system as specified on the A/C unit's data plate label. A minimum of 12 AWG boat cable should be used to supply power to the A/C unit and the seawater pump. All connections shall be made with ring or captive fork terminals.

⚠ WARNING ELECTRICAL SHOCK HAZARD. Always turn off the A/C power supply breaker before opening the electrical box. All A/C units have a terminal strip mounted inside the electric box. The terminal strip is labeled for proper connections of the electrical supply, ground wires and pump circuits. A wiring diagram is provided in the electrical box. The wiring diagram in the electrical box supersedes ABYC standards. The correct size circuit breaker should be used to protect the system as specified on the A/C unit's data plate label. A minimum of 12 AWG boat cable should be used to supply power to the A/C unit and the seawater pump. All connections shall be made with ring or captive fork terminals.

Each A/C unit installed requires its own dedicated circuit breaker. If there is only one A/C unit installed, the seawater pump does not require a circuit breaker; the wiring from the seawater pump is connected to the terminal strip in the electric box. If two or more A/C units use the same seawater pump, the pump wires will be connected to a pump relay panel (PRP) which in turn has its own dedicated circuit breaker sized for the pump (20 amp max). Please see the wiring diagram furnished with the PRP (NOTE: PRP triac must have its mounting screw installed in order to dissipate heat). Electrical connections in the bilge and/or below the waterline should use heat shrink type butt splices.

Field wiring must comply with ABYC electrical codes. Power to the unit must be within the operating voltage range indicated on the data plate. Properly sized fuses or HACR circuit breakers must be installed for branch circuit protection. See data plate for maximum fuse/circuit breaker size (mfs) and minimum circuit ampacity (mca).

⚠ WARNING ELECTRICAL SHOCK HAZARD. The A/C unit must be effectively grounded to minimize electrical shock. Field wiring must comply with ABYC electrical codes. Power to the unit must be within the operating voltage range indicated on the data plate. Properly sized fuses or HACR circuit breakers must be installed for branch circuit protection. See data plate for maximum fuse/circuit breaker size (mfs) and minimum circuit ampacity (mca).

The following are to be observed:

1. Alternating Current (AC) grounding (green wire) must be provided with the AC power conductors and connected to the ground terminal (marked "GRND") at the AC power input terminal block of the unit(s), per ABYC standard E-8, or equivalent.
2. Connections between the vessel's AC system grounding conductor (green wire) and the vessel's Direct Current (DC) negative or bonding system should be made as part of the vessel's wiring, per ABYC standard E-9, or equivalent.
3. When servicing or replacing existing equipment that contains a chassis-mounted ground stud, the service person or installer must check the vessel's wiring for the existence of the connection required in item 2 above.

ABYC standards are available from:

American Boat and Yacht Council
613 Third Street, Suite 10
Annapolis, MD 21403
Phone: (410) 990-4460
Fax: (410) 990-4466

The air conditioning unit must be connected to the boat's bonding system to prevent corrosion due to stray electrical current. Ensure that the AC ground of the air conditioning unit is properly connected to the AC ground of the boat. Within the boat itself, ensure that the AC ground bus is connected to the DC ground bus at exactly one place (no more, no less). All pumps, metallic valves and fittings in the seawater circuit that are isolated from the air conditioning unit by PVC or rubber hoses must be individually bonded to the boat's bonding system also. This will help eliminate any possibility of corrosion due to stray electrical current.

NOTICE FAILURE TO PROPERLY GROUND AND BOND THE SYSTEM WILL VOID WARRANTY!