

### OPERATIONAL CYCLE (for internal protection of pump electronics)

**Under current protection** (run dry or air locked) – Pump shuts off for 5 seconds if current is lower than preset internal limit. It will automatically restart after 10 seconds. If current is lower than limit for another 5 seconds, the pump will shut down again for 10 seconds and then start up again. If current is lower than limit for 5 more seconds, the pump will shut down again and stay off until main power is turned off. Turn power on to restart.

**Over current protection** (debris or impeller jammed) – Pump shuts off if current is higher than preset internal limit for two seconds. It will automatically restart in reverse direction to clear a possible jam after 10 seconds. If current is normal, the pump will stop and start up in the forward (C.W.) direction. If current is higher than limit for another 2 seconds, the pump will shut down again for 10 seconds and then start up again in the normal direction. If current is higher than limit for 2 seconds, the pump will shut down and stay off until main power is turned off. Clear debris and turn power on to restart.

**Over temperature protection** – Pump shuts down after 10 seconds of an over temperature condition. It will attempt 2 start-ups before shutting down. It must be allowed to cool down. To restart, the main power must be turned off. Turn power on to restart.

### SPECIFICATIONS

**Inlet/Outlet Ports:** 3/4" & 1/2" NPT-F  
**Voltage:** 115 V a.c. - 230 V a.c. 50-60 Hz, 1 Ø (Lower voltage/Hz will affect flow, but not harm unit. Unit may shut down at very low voltage conditions.)

**Maximum Amps:** 2.0 @ 115 V a.c. – 1.4 A @ 230 V a.c.

**Fuse/Breaker:** 2.5 AMP fuse, maximum

**Duty Cycle:** Continuous

**Thermal Protection:** Automatic @ 260°F [126°C]

**High Pot:** V d.c. (factory tested)

**Ambient Temp. Limit:** 33° to 140°F [5° to 60°C]

**Leads:** 6 ft. [1.8 m] three #18 strand, 105°C max. dry, 60°C max. wet. Cord is non-replaceable.

**Weight:** 5 lbs. [2.25 Kg]

#### Materials of Construction:

Pump cover/impeller – nylon

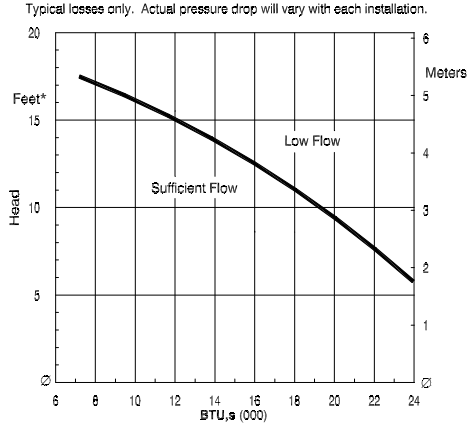
Driver/hsg – 316 S.S.

"O" rings – Buna

Thrust axle – ceramic

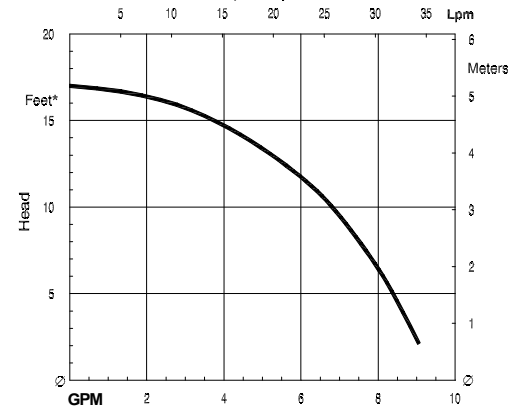
**H Min:** Ø ft. [Øm]  
**H Max:** 17 ft. [5m]  
IP24

A/C UNIT vs. HEAD LOSSES



\*Max. head from sea level to highest point of plumbing system.

PUMP (ONLY) FLOW\*



\*Does not include A/C condenser coil.  
Tested at 70°F with 3/4" inlet and 1/2" outlet, NPT fittings.  
Additional plumbing losses may/can/will decrease actual flow rate.

### WINTERIZING

If the A/C system and pump are subject to freezing weather, serious damage may occur to the components. It is best to completely drain the pump and all other related components. It may be necessary to remove the inlet tubing from the pump to prevent water from draining back into the pump chamber and freezing.

**CAUTION** Whenever the A/C is not in use, the seacock valve should be closed! If the boat is stored out of the water, the seacock should be open.

### LIMITED WARRANTY

SHURflo 1600 series air conditioning/refrigeration/circulation pump(s) have a one (1) year warranty with proof of purchase. The warranty time period will not exceed two (2) years from the date of manufacture. Returns are to be shipped prepaid to SHURflo. This warranty is only a representation of the complete marine product limited warranty outlined by Service Bulletin #1050. Please contact SHURflo for complete warranty information.



SHURflo reserves the right to update specifications, prices, or make substitutions.

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## 1600 MARINE DUTY

### Air Conditioning/Refrigeration Circulation Pump INSTALLATION AND OPERATION INSTRUCTIONS

The 1600 series is a brushless electrical magnet-driven centrifugal pump controlled by an electronic module sealed inside the 316 stainless steel motor housing. The advantages of this design are:

- Quiet operation.
- Proper operation with voltages from 115 - 230 V a.c., 50/60 Hz, 1 Ø.
- No moving seals to wear out or leak. The impeller is magnetically driven.
- True marine "below the water line" construction.
- Unit will automatically reverse impeller and restart if jammed with debris. If run dry or is air locked it will start/stop three times automatically. If not successful, unit will then shutdown. See Operational Cycle (page 3)
- Pumphead is easily disassembled if cleaning is needed.
- Extreme long life in the harsh marine environment, 5 years @ 50% duty cycle approx. 22,000 hour.
- Can be mounted in various configurations.

**WARNING** Never pump flammable liquids with this unit.

### ELECTRICAL WIRING

Wiring colors for this unit conform to recent standards enacted for various geographic markets. Please note as to proper color orientation with existing color codes for power (hot), neutral, and ground connections as note in the diagram found on page 2.

**WARNING** To prevent electrical shock, turn off power before initiating installation or maintenance. A qualified marine electrician must perform all electrical connections in accordance with marine electrical codes. The green/yellow wire must be connected to the boat grounding system. Consult with the O.E.M. boat wiring schematic for proper connections.

### OPERATIONAL FLOW

The SHURflo 1600 pump is designed to provide raw water to marine A/C units rated up to 24,000 BTUs. The graphs on page 3 give general flow vs. head information based on BTU rating.

The flow/output of any centrifugal pump **decreases** with head or restrictive plumbing. In the case of A/C units, the condensing coil may be the greatest restriction. Refer to the A/C manufacturer's information for flow requirements. Once the 1600 pump has been installed actual flow/output through the entire system should be verified.

There are two rules that **must** be followed when installing any centrifugal pump to a marine, A/C condensing cooling system.

1. The pump **must** be mounted below the water line of the vessel.
2. All plumbing (from sea-cock valve, to the pump, through the air conditioning coil, out to the thru-hull above the water line) **must** go up, so as not to trap air. Refer to diagram on page 2.

SHURflo's 1600 pump is designed to prevent water intrusion. This unit is not classed as a "submersible" pump. Always mount above any possible bilge water accumulation.

**General Safety Information**

Special attention notices are used to notify and advise the installer/user of this product of procedures that may be dangerous or may result in damage to the product.



**WARNING**

Warning denotes that a potential hazard exists and indicates procedures that must be followed exactly to either eliminate or reduce the hazard, and to avoid serious personal injury, or prevent future safety problems with the product.

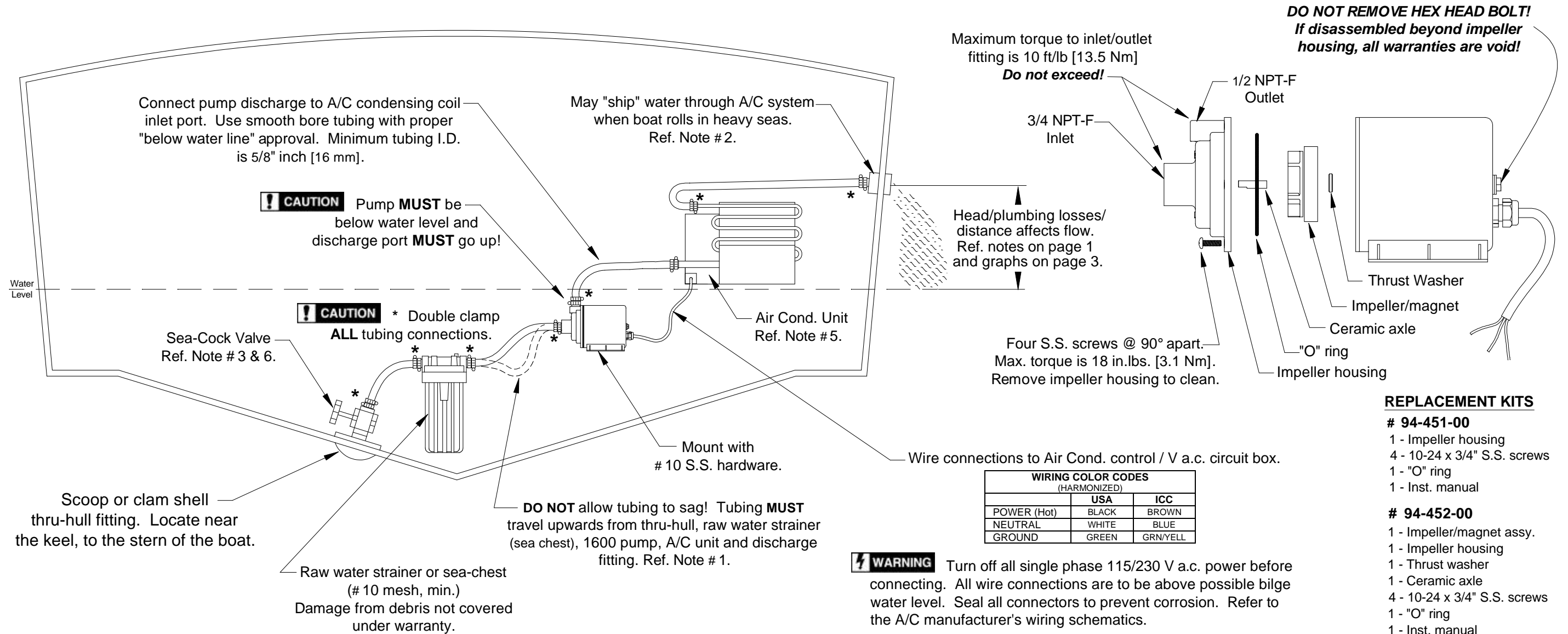


**WARNING**



**CAUTION**

Caution is used to indicate the presence of a hazard, which will or can cause minor injury or property damage if the notice is ignored.



1. Use **ONLY** flexible "below water line" rated tubing on pump inlet and discharge port. **DO NOT** use rigid plumbing! Failure and leaks may occur. Do not use elbow (90°) fittings in the plumbing system as they cause a significant loss of water flow/pressure.
2. If plumbed correctly, "shipping water" will not affect system. **ALL** plumbing must be per marine below water line standards. Double clamp all tubing connections.
3. If run dry or air locked for more than 2-5 seconds, the pump will automatically turn off/on/off/on/off to attempt to clear an air lock or debris. **Turn pump circuit OFF.** Check for debris on thru-hull or in raw water strainer (refer to not 4). To restart make sure seacock is open, there is water in the pump, and no kinks in the tubing, etc. Turn pump circuit on. Refer to Operational Cycle outlined on page 3.
4. If plugged with debris, (A) turn off power, (B) close sea-cock valve, (C) remove the four #10 screws on pumphead face, (D) pull off impeller housing and remove debris from impeller.
5. Electrical components located in an engine or fuel compartment, should be rated as "ignition protected".
6. **CAUTION** If the boat or A/C is not in use, close the seacock valve that feeds the pump.
7. If alternating current voltage (A.C.V.) polarity is reversed and the boat is equipped with single-pole circuit breakers, the circuit protection is on the wrong side of the system (the wiring is not protected if a short occurs). Always use double-pole circuit breakers that protect both the neutral and power (hot) wires. Polarity indicators on the V a.c. circuit box are recommended. On/off switch must have at least a 3mm contact separation.