

## SEA FROST SHORE ASSIST SA-1 R-12

### *THIS MANUAL IS SUPPLEMENTAL TO THE SEA FROST R-12 ENGINE DRIVE MANUAL*

## INSTALLATION INSTRUCTIONS

### CONDENSING UNIT LOCATION AND MOUNTING

The design of the Shore Assist allows placement of the air-cooled unit in a enclosed space such as a cabin locker, sail locker or engine room. Intake air should be drawn in from the cabin area to insure the coolest, driest air supply. Standard 4" duct hose may be used. Discharge does not need ducting if a vent in the area allows warm air to escape. (Intake ducting from the exterior of the boat may cause damp salt air to be drawn in which might reduce unit life. This will also increase below deck moisture.)

An un-ducted unit in a poorly ventilated small space will heat the air, lowering the capacity of the unit and possibly causing damage by overheating the compressor.

Service access and installation requires that the front and left end (inlet/outlet side) be exposed. The duct hose will require 4 inches of clearance past the end of the unit.

Mount the Shore Assist level. (The compressor is at the bottom). The unit may be bulkhead or platform mounted. Pilot holes have been pre-drilled for the #8 x 3/8" self-taping screws and aluminum angle clips included.

### INSTALLATION REQUIREMENTS

- ❖ Neither inlet nor outlet should ever be blocked.
- ❖ Provide for driest, coolest air for intake (top air port on housing.)
- ❖ Total combined air duct length for intake and discharge should not exceed six feet.

❖ Only the intake needs ducting if the area is vented to allow warm discharge to escape.

❖ For intake or exhaust through a finished panel order an extra black flange grill. One part is shipped with each system.

BEFORE BEGINNING THIS SECTION READ; "WORK HABITS", "TUBE HANDLING", "CUTTING and BENDING," and "SWAGELOK FITTINGS," in the SEA FROST ENGINE DRIVE INSTALLATION MANUAL.

## **EXPANSION VALVE**

Install the valve on one of the 3/8-inch tubes protruding from the block or plate. The valve should be located to allow access to screw cap on top of valve. It is preferable that the cap be up. Trim the tube ends on the block or plate as necessary. However, allow at least 3/4" to insert into the fitting. Refer to the Swagelok installation instructions.

## **RUNNING TUBING LINES**

Run the 1/4" liquid line between the valve and condensing unit. This 1/4" line makes up at the expansion valve. The 3/8" line connects to remaining Block or plate tube-end with 3/8" elbow fitting. The other end of this line connects at the compressor.

If possible, run the 1/4" liquid line in contact with 3/8" suction line for at least one foot from expansion valve. Wrap these two tubes tightly together with electrical tape. Insulate this section. This will improve operation and prevent moisture from condensing on the coldest section of these tubes. It is not necessary to insulate the remaining return line to the compressor. Support the tubing as necessary with tie wraps.

## **WARNING:**

**The SA unit is shipped under some refrigerant pressure. Before removing the caps on the connection ports, remove the screw caps on the service valve covers and depress the cores with a fingernail to vent any existing pressure.**

Working one line at a time, remove the Swagelok caps from compressor and drier. Attach the union fitting bodies. This is a pre-swaged connection...See the Swagelok fittings text in Engine Drive installation manual. Make up is 1/4 turn from wrench snug.

Connect the 1/4" line to the drier fitting and 3/8" line to compressor. Tighten these fittings 1-1/4 turns from wrench snug. (See refer to the Swagelok text in Engine Drive manual).

## THERMOSTAT & WIRING

For the best looking job, the thermostat should be recessed into a panel. A cutting template is provided. Locate the thermostat close enough for the bulb on the sensing tube (pig tail type coil) to reach the center of the block or a mounting ear on the plate. It is only necessary that the bulb end of the sensing tube be installed on the block. This bulb mounts with a copper clip to the tapped hole in bottom center of Block. Use one of the mount screws for attaching the copper clip on 809 plates.

The sensing tube is hollow; avoid bending it into kinks.

**WIRING:** The thermostat electrical leads are low voltage for safety. Connect the thermostat red wires to the red wires exiting the compressor unit.

## 110-VOLT CIRCUIT

A separate 15-amp breaker is required for the 110-volt supply. The Shore Assist is provided with a three wire male plug. A standard dedicated receptacle mounted next to the unit is recommended. Secure all wiring as necessary.

## COMMISSIONING

Attach clean, purged gauges to suction service port on compressor. (It is not necessary to connect to the high-pressure port when starting a new system. This is provided to aid in fault diagnosis.) Pressurize the system with R-12. **Check for leaks.** Refer to the Engine Drive instruction manual: Refrigerant Handling and Leak Checking sections.

After checking for leaks, evacuate. Pump down to the best vacuum.

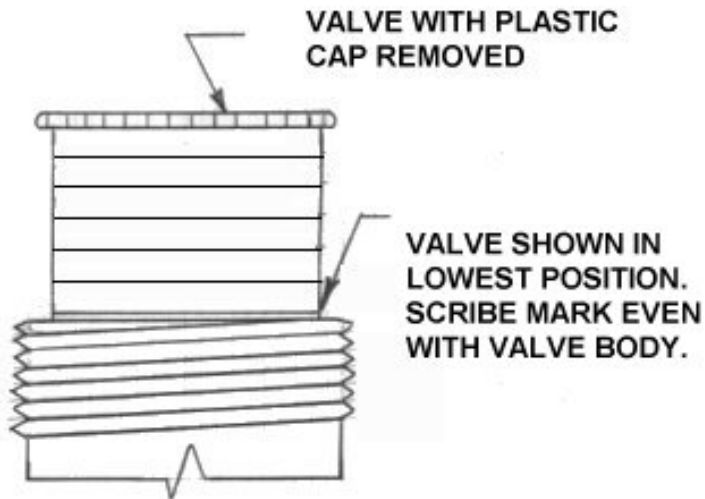
### Charge as follows:

- \* Single Block or plate systems with a short tube run.....5 oz
- \* Single Block or plate systems with over six foot tube run.....7 oz

This may be liquid-fed into the low side after evacuation, before the compressor is operated. Use a 14-ounce can of refrigerant in order to determine the amount of refrigerant being used. Shaking the can will allow you to estimate the amount of refrigerant being used.

The evaporator pressure is regulated by an automatic expansion valve. This valve is adjusted to maintain a constant evaporator pressure. The proper charge must be added before the valve can be accurately set.

## ADJUSTING THE VALVE



Before operating the compressor, unscrew the plastic cover on the valve body. Note the adjusting knob. Counter-clockwise rotation decreases the pressure.

Clockwise rotation increases the pressure. Check that the valve is set with the last groove (marked "O") close to the end of the valve body.

Start the compressor. The valve must be adjusted to 0 to 2 psi reading on the low side gauge port. Be sure your gauge is set at 0 before hook-up. Allow several

minutes between each adjustment. Moisture may form on the adjusting knob side of the valve and freeze causing the valve to malfunction. To prevent this replace the cap after each adjustment. Be sure valve is dry before final cap replacement.) Operate for 30 minutes to confirm proper valve setting and operation.

The valve may need to be cleared of dirt or chips if adjustment is not attainable. With the compressor running, turn the valve adjustment knob clockwise about 3 turns momentarily, and then back to proper the setting. Do not leave valve in open position (high back pressure) as this may cause the compressor to overload.

After satisfactory adjustment, turn off thermostat. Remove the gauges. (If the high side gauge is connected, wait until the pressure equalizes on both gauges before removal. Recap the service ports. Replace the service panel. When the valve has dried, insulate the valve body by cutting the insulating sleeve to fit the valve then wrap it with cork tape. This is to prevent condensation. Insulate the one-foot section of 3/8" tubing that exits the cabinet. The valve need not be insulated if the valve is in the icebox.

**Note:** The operating pressure of the system will not indicate the amount of refrigerant in the system. The valve will not give proper operation or pressure if it is undercharged. The valve scribe correlation is very close to the gauge pressure.

The system requires enough refrigerant to supply liquid to the valve. If the valve has a steady hissing sound, the charge is ok. If the valve is sputtering, it is low. If the valve is making a noticeable roar, it is low. If the low side pressure is properly set the high side pressure will be 80 to 135 psi depending on the air temperature (50 to 95 degrees F.) through the unit. Almost immediately upon start up the valve body will begin to frost.

## **OPERATION DESCRIPTION**

The SEA FROST Shore Assist SA-I is a very small system. It is efficient in its electrical conversion of energy to heat movement. Its rate of cooling is 1/20 th the rate of the engine drive system. By being small it is quiet, compact, has low electrical starting requirements and running power draw, and is able to be air cooled. The SA-I will operate in up to 120 degrees of ambient air temperature. Because of its size, it will operate 80 percent of the time in warm climates. The unit will freeze the holdover device (Block or plate) from warm but may take all day. If rapid cooling of the system is needed operate the Engine Drive to bring the system to its cooling temperature then let the SA-I take over. The unit will automatically operate if the thermostat, and proper panel switch is on and the boat shore power is plugged in. The Shore Assist and the Engine Drive are separate units. They may be operated simultaneous. Both units are controlled by separate controls.

## **THE THERMOSTAT**

The Shore Assist thermostat is variable. Turning the knob fully counterclockwise turns the unit "OFF". The one snowflake position is the warmest setting. The fully clockwise setting at three snowflakes is the coldest. The thermostat may be adjusted to obtain any temperature desired in the cabinet. The thermostat may be calibrated should the warmest setting be too cold.

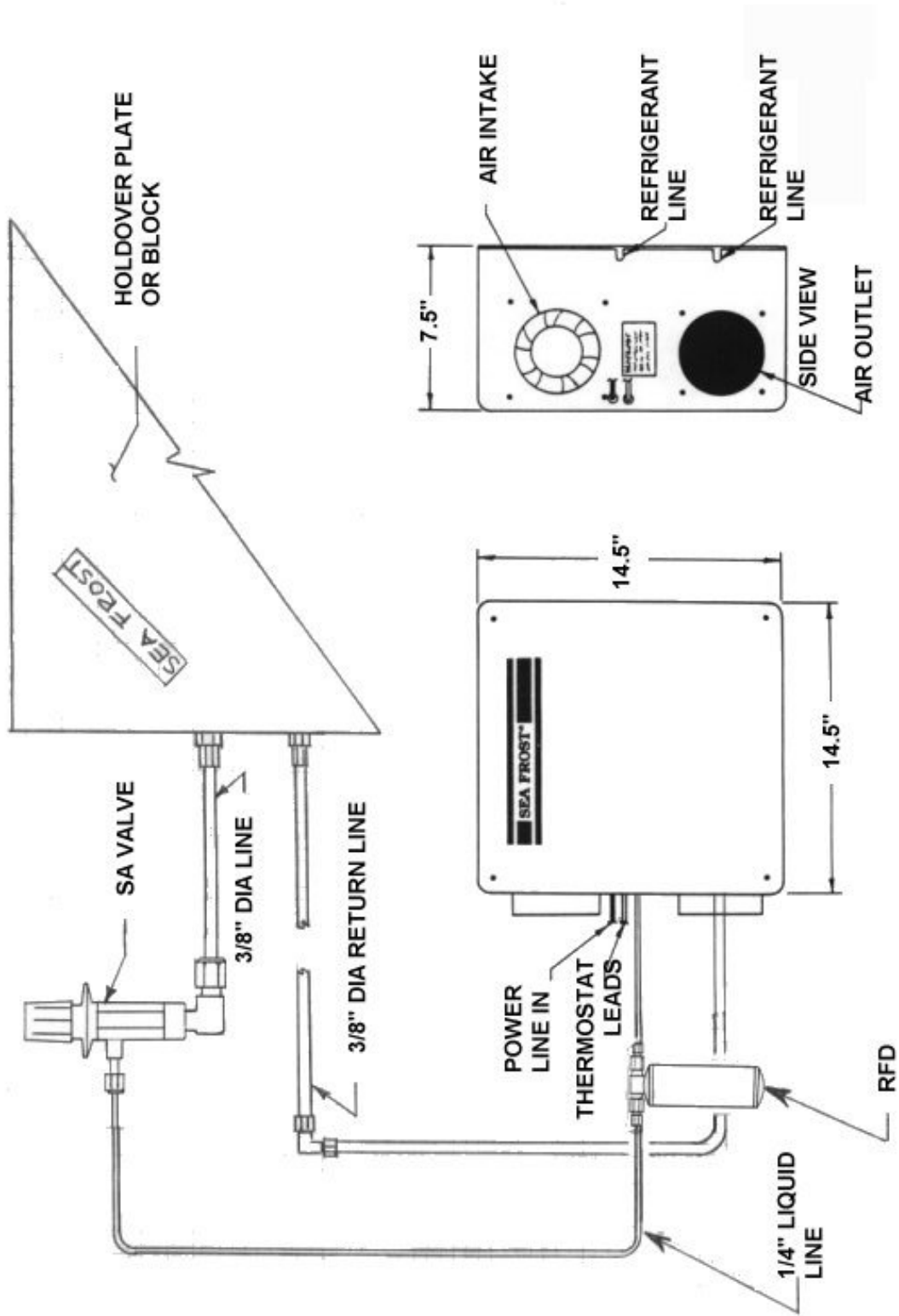
## **DEFROSTING**

The unit will require defrosting from time to time as the frost layer builds up on the holdover device.

Allowing the unit to warm above freezing is one method of defrosting. Warm water or a hair dryer is also a quick method. The SEA FROST holdover devices can be scraped with a spatula or ice scraper to remove excessive frost build up.

## **OPERATION INSPECTION**

Within a few minutes of starting the Shore Assist the tubing in close proximity to the valve and the valve itself will be noticeably cold. If after 20 minutes of operation this cooling in this area is not observed do not continue to operate the system.



SHORE ASSIST VALVE SCHEMATIC

## THERMOSTAT CALIBRATION INSTRUCTIONS

Be sure that the unit is operating properly before making any thermostat adjustments. The sensing bulb must be in excellent thermal contact with the plate or block.

The range of this control may be changed. To access the adjustment screw, remove the four mounting screws on the thermostat panel. Tip the panel forward and remove the protective tape to expose a slot in the case. Make the adjustment with a torx or small Phillips head screwdriver.

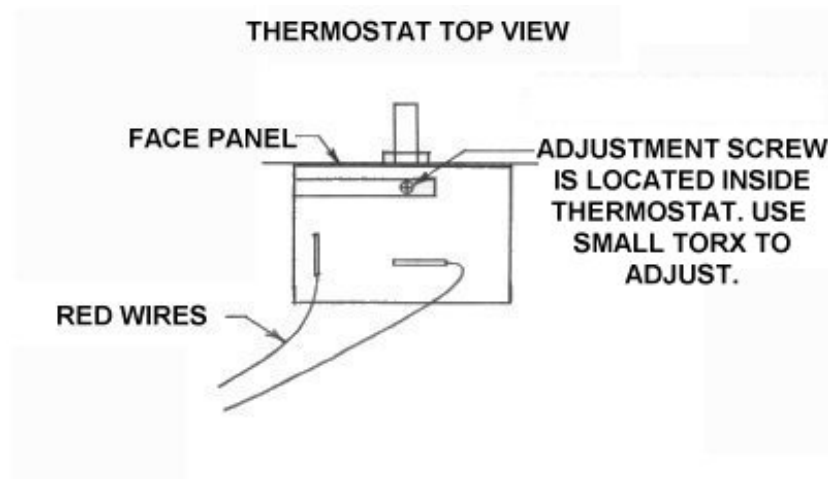
Make small adjustments. Record all adjustments.

If the lowest setting on the thermostat panel (1-snowflake) is too cold:

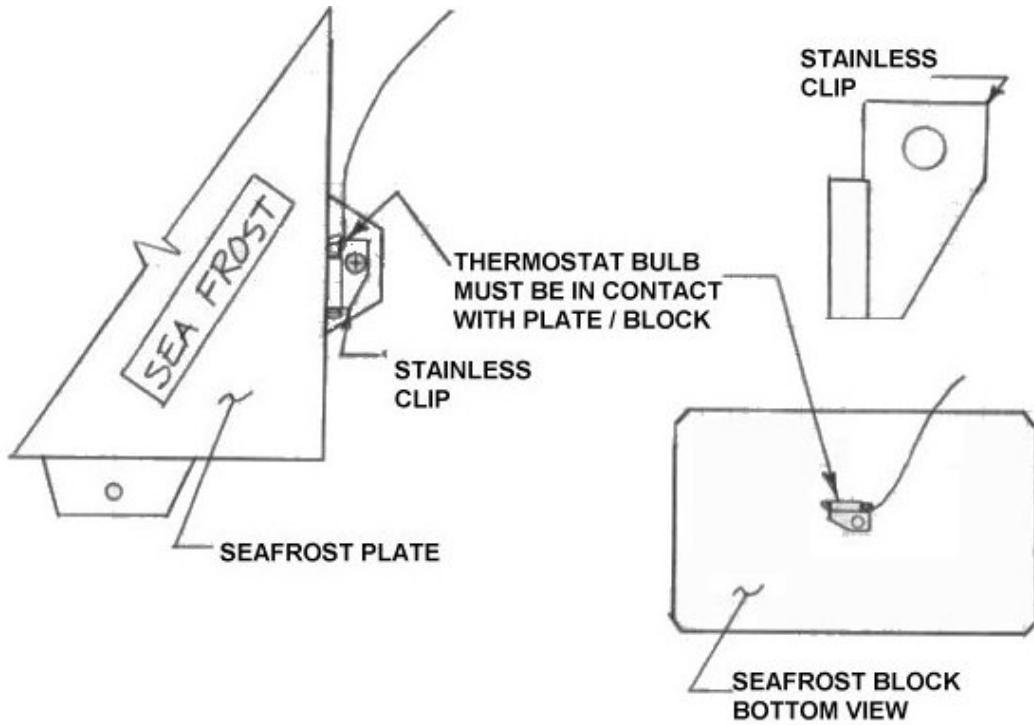
- Turn the adjustment screw clockwise. One 360-degree turn will raise the box temperature approximately 6 degrees f.

If the highest setting on the thermostat panel (3-snowflakes) is too warm:

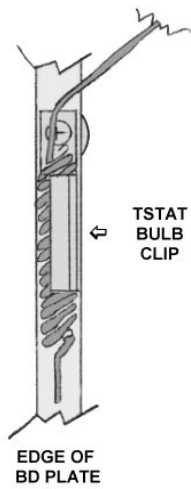
- Turn the adjustment screw counterclockwise.



# HOLDOVER PLATES



## STAINLESS STEEL EVAPORATOR PLATES



## THERMOSTAT MOUNTING TEMPLATE

CUT OUT