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# The SuperColdMachine Installation and Operating Manual

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**Adler/Barbour**

Div of Kenyon Marine Inc

PO Box 308

New Whitfield Street

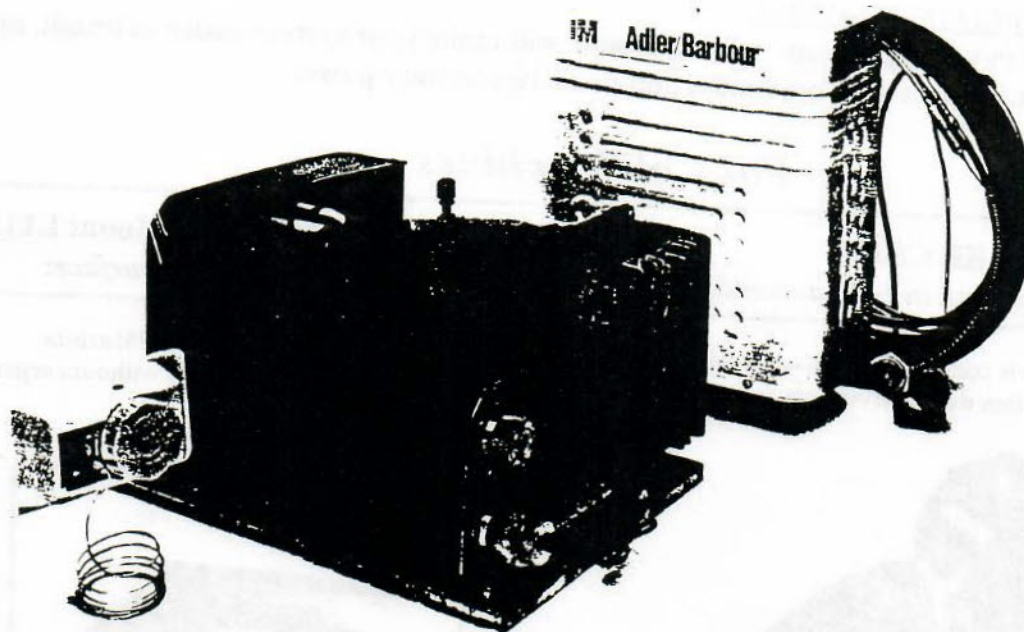
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# Your new Adler/Barbour SuperColdMachine contains ozone-benign Refrigerant HFC134a



## INTRODUCTION

You are now the owner of the finest DC refrigeration system available. Every SuperColdMachine system we build must pass stringent testing before shipment. All our components are true state of the art for lowest possible power consumption and long service life. Our standards of quality assurance are the highest in the industry. In short, you will get what you paid for: years of trouble free performance from a responsible manufacturer.

*If your SuperColdMachine is to operate properly FIVE things are essential:*

- Careful reading of these instructions
- Good air supply to the condensing unit
- The best batteries and an adequate charging system
- Tight refrigerant couplings
- Adequate icebox insulation

*This manual covers these SuperColdMachine versions:*

- PB220 Vertical freezer with 2 VertiCube ice trays
- PB221 Horizontal freezer w/2 standard trays and door
- PB230 Large vertical freezer w/3 VertiCube trays
- PB231 Large Horizontal freezer w/3 std trays & door
- PB931 PowerPlate System

*WHEN UNPACKING carefully check for shipping damage and identify all components:*

- Evaporator ("freezer") assembly
- Condensing unit ("compressor")
- Thermostatic control w/ wire harness
- Installation/small parts package
- Template for evaporator mounting hole location

*If you ordered any of our OPTIONS KITS:*

- Pt No C8070 Ventilation Duct Kit: 3 ft of flex ducting, 2 plastic adaptor flanges, 2 hose clamps, grille, screws
- Pt No C8071 PowerDuct Kit: 8 ft of flex duct, 2 plastic flanges, grille, fan, screws, 2 hose clamps
- Pt No C8350 Water Cooling Kit: 12VDC (or 24VDC) pump, hoses, clamps, strainer, thruhull, switch panel

*TOOLS AND MATERIALS needed for installation:*

- Electric drill with asst small bits including 9/64" "Stubby" screwdriver
- Hole saw 2" diameter
- Electrical wire 2 conductor stranded marine approved (see Wire Size Table)
- 12" and 10" adjustable wrenches & usual hand tools

# ColdMachine™ and SuperColdMachine™ Options and Accessories

FOR EXTRA PERFORMANCE, IMPROVED ENERGY EFFICIENCY, EASIER INSTALLATION

## FOR NEW OR EXISTING INSTALLATIONS:

These popular option packages from Adler/Barbour will make your system easier to install, more efficient. Your unit will run less frequently, and draw less battery power.

## *For ColdMachines*

### **PowerDuct Option Kit C8075**

*Allows you to mount unit in hot, inaccessible space:*

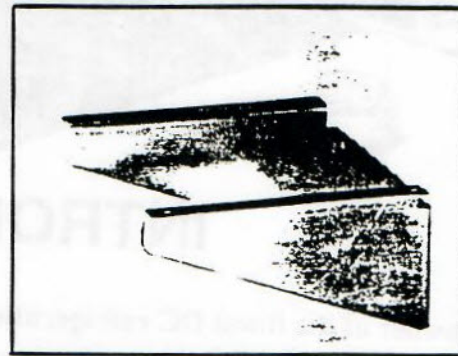
separate booster fan is concealed in the moulded housing, and a 5 ft long 4" dia flex duct delivers air from another cooler compartment.



### **Stainless Steel Bulkhead Mount E1135**

*No need for a flat mounting surface:*

A simple way to mount your ColdMachine Condensing Unit on a bulkhead without carpentry or welding.



## *For SuperColdMachines*

### **Water Cooling Kit C8350**

*Eliminates capacity losses in the tropics:*

12 VDC pump draws less than one amp, is submersible, comes with seawater strainer, all hoses and fittings, illuminated switch panel

### **PowerDuct Kit C8071**

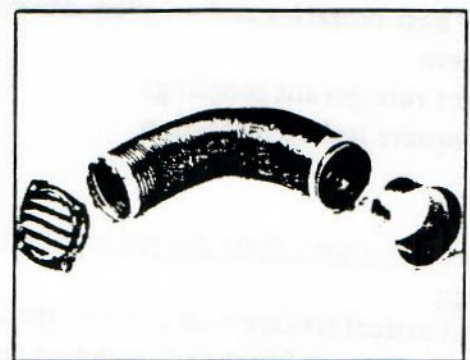
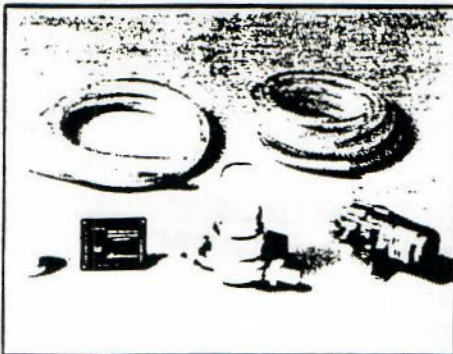
*Solves Installation airflow and location problems:*

10 ft of 4" flex duct with reversible second 12VDC fan and adaptors allows you to bring in cooler air- or dump warmed air elsewhere

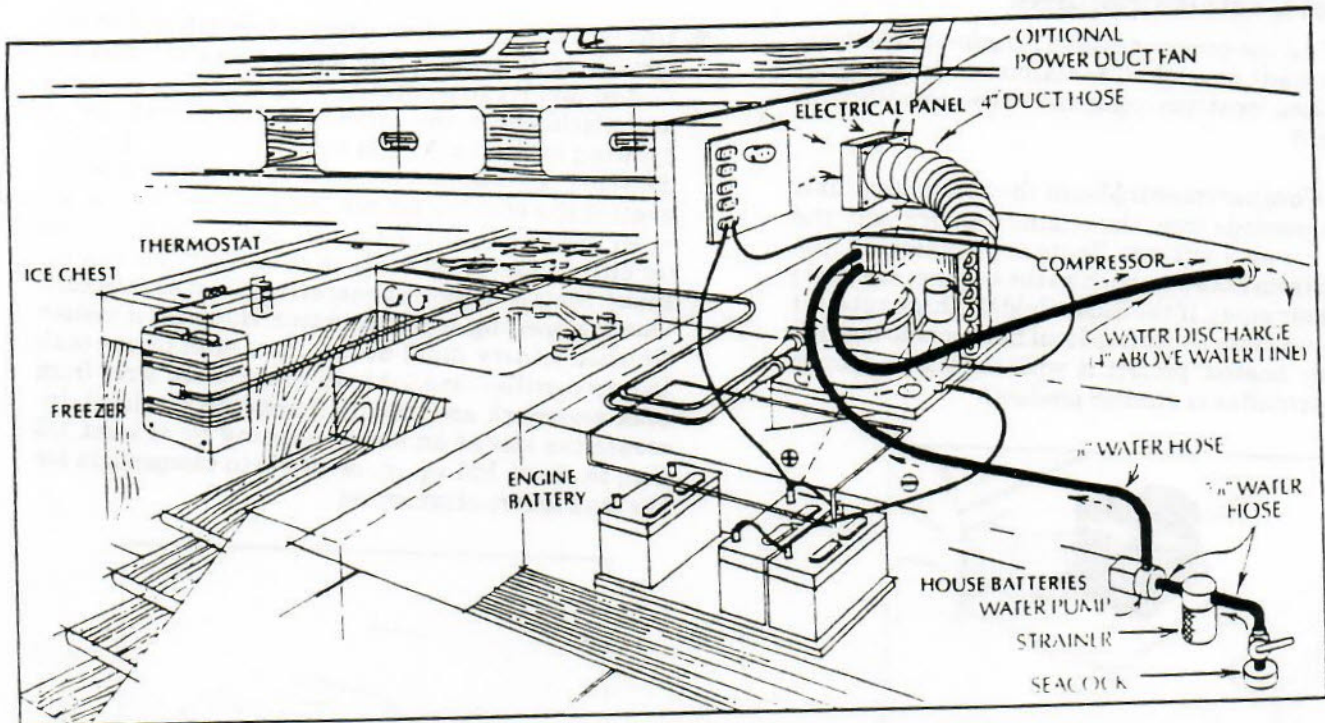
### **Ventilation Duct Kit C8070**

*Simple, inexpensive solution for condensing unit cooling:*

3 ft of 4" flex duct with adaptors and trim grille. Same function as the C8071 but limited to a shorter distance



CALL US (203) 453 43874 FOR THE NAME OF YOUR LOCAL Adler/Babour DEALER



## INSTALLATION

### COMPRESSOR UNIT

Keep the following in mind while planning your installation:

- The connecting refrigerant tube set between the compressor unit and the freezer unit is 15' long. Plan locations of the two units accordingly.
- The route of the refrigerant tube set through the boat from the compressor unit to the icebox must be determined before starting any work. The tube set must be kept clear of bilge water and protected from chafe and damage.
- Ventilation openings or ventilation duct options will be required if the compressor unit is located in a small, confined compartment.
- Engine room location of the compressor unit is okay if the continuous environment is not over 100°F. But remember, a cooler location = less running time = lower average amp draw.
- Accessibility is important.
- All components must be protected from bilge water, spray or possible damage.

### Ventilation Requirements

The SuperColdMachine is a device that moves heat from one place to another. It does not "create cold." The heat it removes from your ice box via the freezer unit is transferred to the air around the compressor unit.

If you locate the compressor in a small, hot or confined enclosure it will suffocate. Its built-in fan will have to recirculate hotter air, round and round. It will run con-

tinuously, draw excess amps and not cool efficiently. It will never shut off and you will not be pleased with its performance.

**LET THE UNIT BREATHE!** Position the compressor so that its fan can intake air from one space and discharge it into another. *Don't recirculate the same air, unless the compartment in which you mount the compressor is 100 cubic feet or larger in volume.*

### Duct Kits and PowerDuct Kits

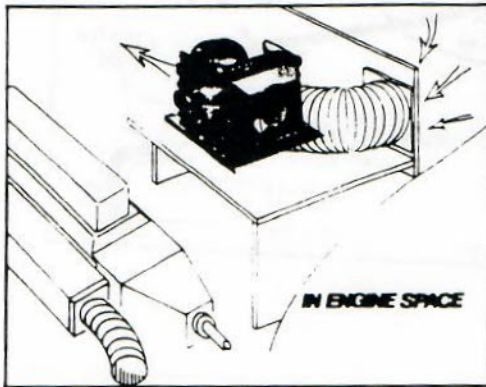
To deal with the difficulties of obtaining good cool air flow thru your SuperColdMachine, we offer two different ventilating assist packages:

- 1) **Part #C8070: Ventilation Duct Kit** with 3 ft. of 4" flex duct and 2 adaptor flanges—attaches to SuperColdMachine unit with 4 existing fan mounting screws—use to bring air to SuperColdMachine from a cooler location—bilge, yacht interior, cool ventilated locker, etc., or you can physically reverse the SuperColdMachine's fan and use duct to exhaust air from the SuperColdMachine to another space. This is preferred if the SuperColdMachine location has cool air available but no way to get rid of the warmer air after it's passed thru the SuperColdMachine unit.
- 2) **Part #C8071: PowerDuct Booster Duct Kit** with 8 ft. of 4" flex duct, 2 adaptor flanges *plus additional booster fan*. Used exactly like (1) above except longer length and "push pull fan" allows you to go a greater distance through the boat to pick up cool air or get rid of warmed air.

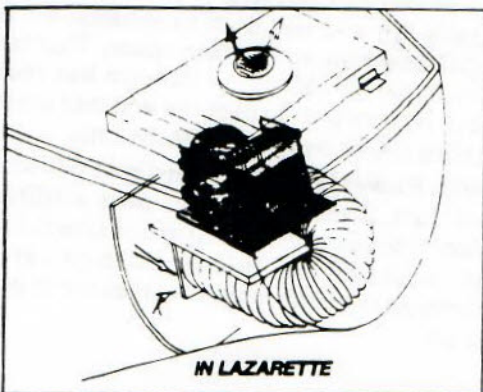
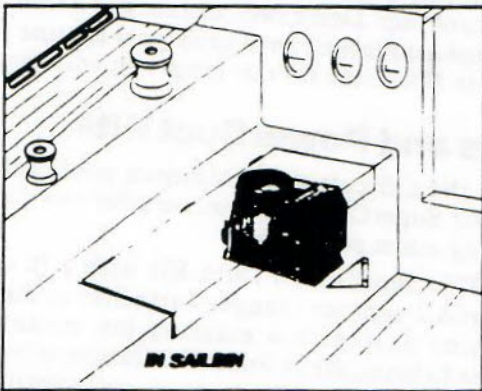
## Location Considerations

Generally, find the coolest possible location in the largest compartment available. Installation drawings of some suggested locations are given below. See illustration on page 5

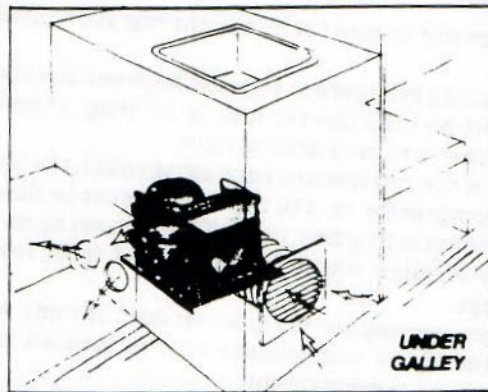
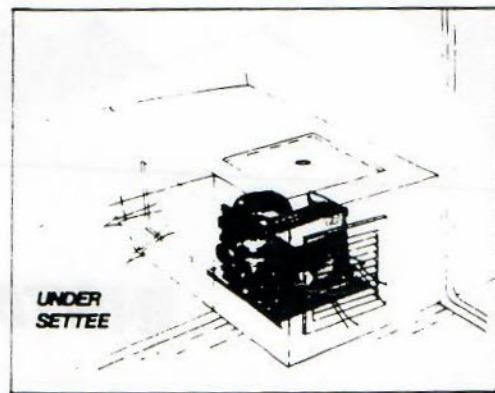
- **Engine Compartment:** Mount the compressor unit as far as possible from the engine, particularly the hot exhaust pipe sections. Route the connecting tubing away from hot spots such as the engine, manifold or hot water pipes. If the SuperColdMachine tube set must be run close enough to local hot spots to become noticeably heated, protect it with insulated sponge tubing (Armaflex or similar product).



- **Sailbin or Large Lazarette:** Generally okay without additional ventilation. Position the unit so that it can still move air freely despite an occasional sail bag or two dropped nearby.



- **Under a Settee, Galley Counter, Berth or Locker (or any space under 100 cubic feet):** Position the unit so that it can positively draw air from one space and discharge it into another. Cut a rectangular opening in the bulkhead equal in size to the condenser (8" x 8"). Mount the unit with its condenser up against the opening for air intake. Now provide another opening of at least equal size at the other end (or either side) of the unit so that warm air can exhaust. Slots or airholes generally are not satisfactory. One big opening is much better. However, if visible finished joinery must be cut into, plan to use teak louvered grilles (available in many stock sizes from teak woodwork and marine hardware catalogs). Increase the size of an outlet opening by at least 1/3 (i.e., to about 100 sq. in. or more) to compensate for the teak louvre obstruction.



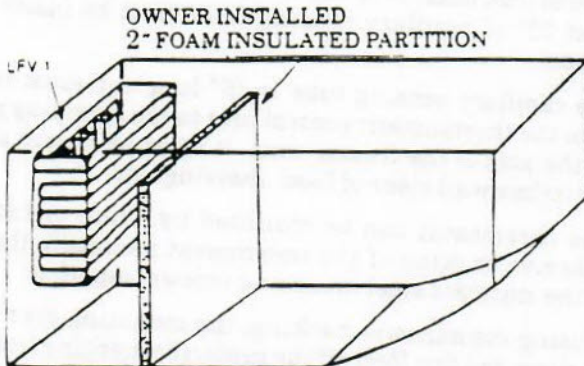
- **Any Closed Compartment:** Generally OK provided there is 100 cubic feet of volume or more. In such case heat will transfer outside the compartment via conduction. Be sure that airflow into and out of the condenser is unobstructed (by sailbag, lines, etc.)

## THE FREEZER UNIT

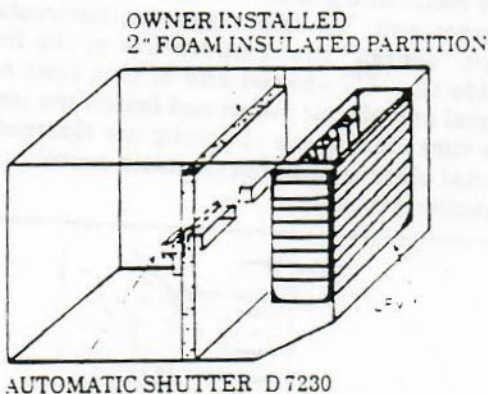
### Vertical Freezers

Locate the freezer unit vertically as high as possible on any side wall in the icebox. Standoffs (1") and mounting screws (1-3/4") are supplied.

Allow sufficient space for access to the freezer interior, insertion and removal of the VertiCube icetrays and periodic cleaning.



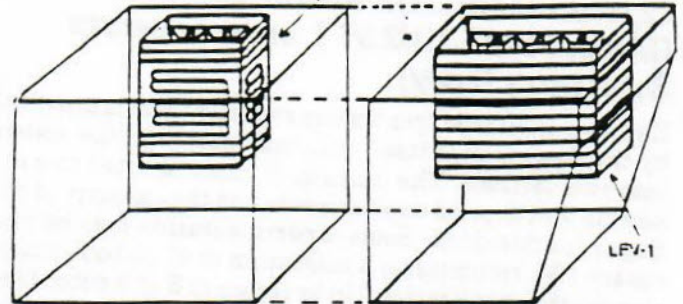
Large Refrigerator (9-16 cu. ft.) with Optional Partition utilizing the SuperColdMachine 15. Ample capacity for 9 ice trays (3 standard) plus frozen foods. A minimum of 3" insulation is recommended. The drawing illustrates a customer-installed partition providing additional freezer capacity (up to approximately 2 cu. ft.)



Refrigerator/Freezer spillover arrangement for freezer compartment up to 4 cu. ft. and refrigerator up to 6 cu. ft. utilizing the SuperColdMachine 15. The partition is constructed of 1" foam core with fiberglass or formica faces. There's a 1" opening across the top for convection air flow return.

Our optional Automatic Shutter #7230 (thermostatically controlled, non-electrical) provides adjustable temperature control for the refrigerator, and mounts over a slot through a partition. One automatic shutter is used for up to 4 cu. ft. of refrigerator; two for larger volumes. A minimum of 4" insulation is recommended for this application.

SFV-1 STANDARD FREEZER



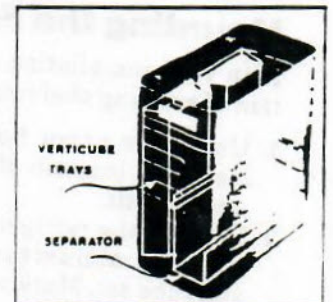
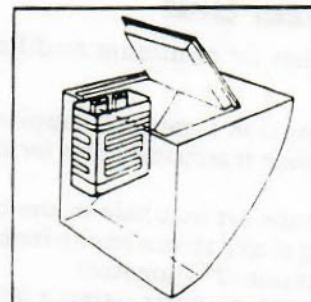
NOTE: Since each box is completely independent and adjustable in temperature, either unit can be shut off and the other used as a Refrigerator with small Freezer —useful when only one or two people are aboard.

Separate Refrigerator and Freezer boxes utilizing two separate independent systems. Use this arrangement for a single, large, fully-partitioned ice box, or two separate boxes in different locations.

Freezer: The large capacity LFV-1 system is used for freezer applications up to 6 cu. ft. with box insulation of 4" or better. 8 cu. ft. with insulation of 6" or better.

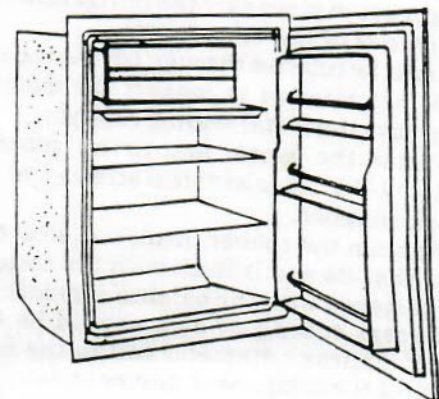
Refrigerator: The standard SFV-1 or SFH-1 (vertical or horizontal freezer) is used for Refrigerators up to 9-1/2 cu. ft. The LFV-1 is for larger boxes 9-16 cu. ft.

See photo for proper use of the Verticube icecube tray separator.



### Horizontal Freezers

Mount the freezer unit horizontally from the roof of the icebox. Standoffs (1") and mounting screws (1-3/4") are supplied. Allow a clearance for the freezer door to swing open.



## Optional Icebox Modifications (Model PB230/231 Large Freezer Systems Only)

If you would like larger freezer capacity than is provided by the freezer unit itself, you may partition the icebox into two sections. The amount of space allotted to each section will depend on your needs and the capacity of the SuperColdMachine. Some experimentation may be necessary. (We recommend a minimum of 4" icebox insulation for this application.) In boxes up to 8 or 9 cubic feet, it is generally possible to obtain 4 cubic feet of below freezing space with a suitable partition.

For the partition, use a sheet of 2" foam core with fiberglass or formica faces.

Drill a 3" diameter hole halfway up in the partition and leave about a 1" gap at the top. This will provide for natural convection airflow from the freezer to the refrigerator section.

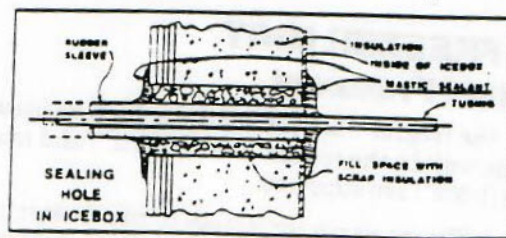
You may need to install a manual damper over the hole to better control individual compartment temperatures. As an alternative, you can use our self-powered thermostatically controlled Automatic Shutter (Part #D7230). Use one Automatic Shutter for each four cubic feet of refrigerator space. For the shutter cut a slot 1-1/8" high x 4" wide instead of 3" hole.

The necessary materials should be obtainable locally and are relatively easy to work with.

## Mounting the Freezer Unit

Plan your installation to allow for minimum modification of existing shelving.

1. Using the paper hole location template supplied, mark the location of the four mounting holes for the freezer unit.
2. Position the refrigerant tube set exit hole in the icebox for minimum bending of and strain on the freezer and tube set. Mark its location (2" diameter).
3. Drill the freezer unit mounting holes using a 9/64" drill, and the tube set exit hole using a 2" hole saw.
4. Unroll the entire tube set. An assistant is very helpful here. It is often easier if you unroll the entire tube set and stretch it out inside the boat. You can then feed the tube set and couplings through the holes in the icebox and bulkheads while your helper supports the freezer unit and keeps the tubing feeding smoothly without damage to it. **Be careful not to kink, flatten or strain joints.** Make sure the metal sealing caps are in place over the refrigerant couplings. **Keep dirt out of the couplings!**
5. Feed the tube set through boat to the compressor unit. Do not attempt to connect the mating couplings or remove the metal sealing caps yet.
6. Fasten the freezer unit to the icebox liner with the four 1-3/4" stainless steel screws and 1" plastic stand-offs supplied.
7. Position the rubber insulation sleeve on the tube set so that its end is flush with the inside of the liner of the icebox with the balance extending *outside*.
8. Excess tubing, if any, should be formed into an 18" (approx.) diameter coil in the horizontal plane above the compressor unit or at any other convenient location.



## THERMOSTAT

Mount the thermostatic control unit high in the icebox, away from moisture and spillage. It should also be visible and accessible. It is okay to mount the thermostatic control unit outside of the icebox space if you prefer. At least 12" of capillary sensing tube must be inside the icebox.

The capillary sensing tube is 36" long and must reach from the thermostatic control unit to the clamping plate on the side of the freezer unit. It must be routed along the icebox wall clear of food, shelving, etc.

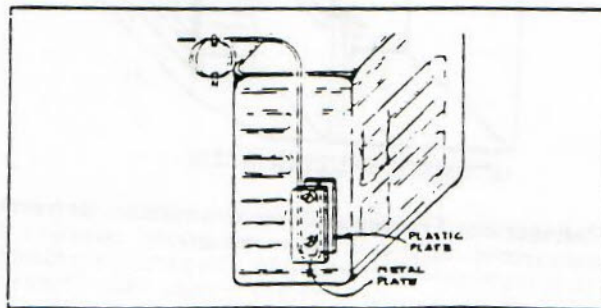
The thermostat can be mounted by using either the adhesive backing of the thermostat mounting flanges or the stainless steel mounting screws (supplied).

If using the adhesive backing, the mounting area must be clean and dry. Peel off the protective backing from the adhesive foam on both mounting flanges of the thermostatic control unit, position carefully and press firmly to adhere.

If you wish you may also use the mounting screws by drilling two 9/64 holes through the thermostat flange holes.

## Installation Procedure

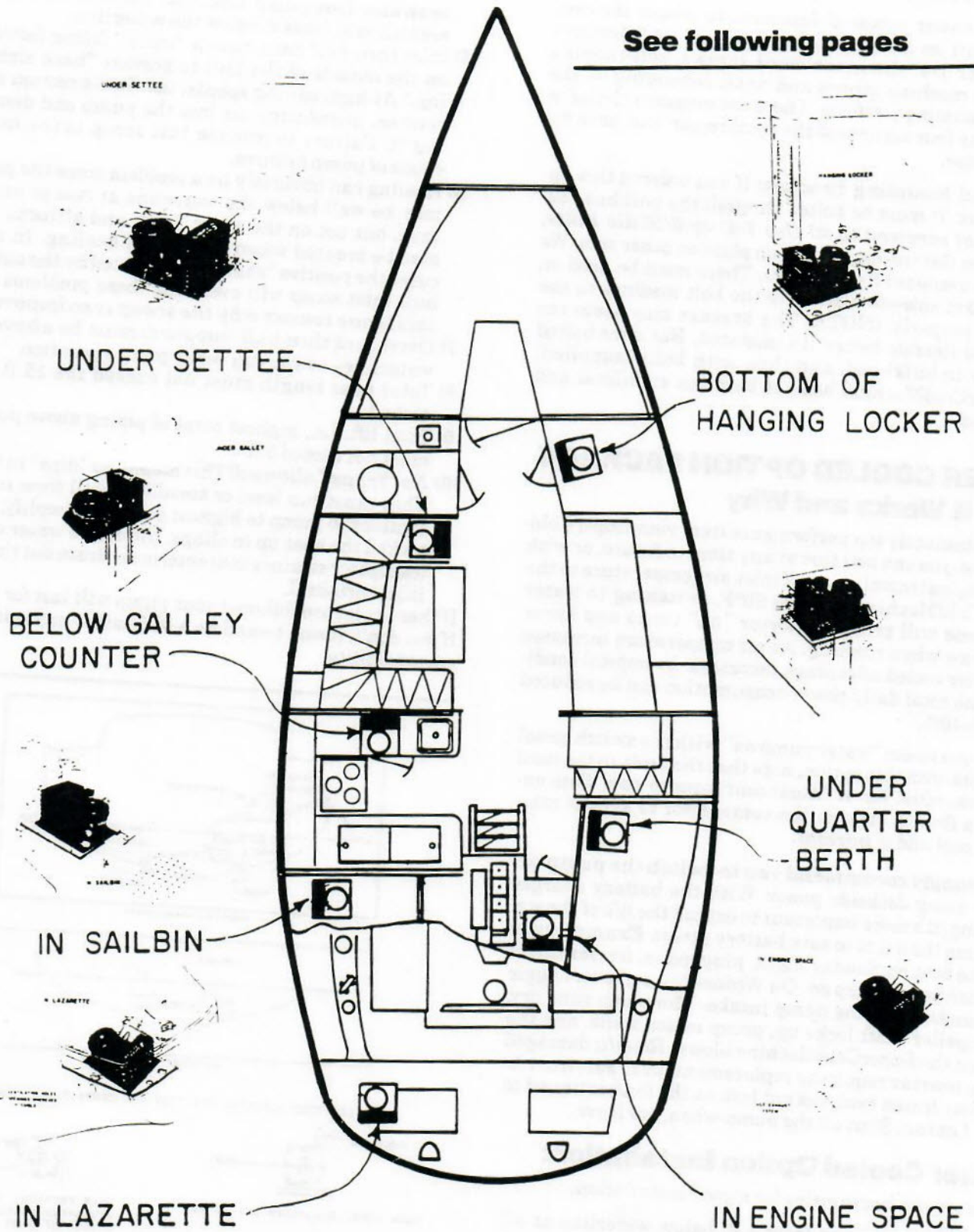
1. Carefully unroll just enough capillary tubing to reach the metal and plastic clamp plates on the side of the freezer unit. Via this tube, the thermostatic control unit "senses" the temperature of the freezer unit. Slide the "U" shaped end of this tube *between* the metal and plastic plates and fasten the screws firmly. Be sure four inches of tubing are clamped under the metal plate or the thermostatic control unit will not function properly.



2. Secure the coil and tube against chafing. (Leave the excess capillary tubing uncoiled.) **The tube must not touch the freezer unit at any point except clamp plates or an erratic control cycle result.**
3. Uncoil the 15' thermostat electrical harness and run it alongside the refrigerant tube set to the compressor unit. Plug this harness into its mating end attached to the terminal strip.

# Typical Locations for your SuperColdMachine

See following pages





## Mounting

Handle the compressor unit carefully. Don't pick it up by the tubing. The cooling fins on the condenser (the radiator like object) are very thin for maximum efficiency and bend easily. If bent they should be straightened using the flat blade of a screwdriver or "combed" (using a "fin comb" obtainable at a refrigeration supply house).

Use four (owner supplied) fasteners to mount the compressor unit on a suitable, sturdy horizontal platform. Use either 1/4" diameter wood screws, self-tapping screws or machine screws and nuts, depending on the type of mounting platform. There are mounting holes in each of the four corners of the compressor unit base for this purpose.

**Bulkhead Mounting Bracket:** If you ordered this optional part: It must be bolted through the bulkhead selected, *not screwed to it!* Use 1/4" or 5/16 dia bolts, with large flat washer or backup plate on other side. We supply 4 oversized flat washers. These must be used on the bracket side—to distribute the bolt loadings to the bracket properly. (NOTE: The bracket may seem too light and flexible before it's mounted. But once bolted securely to bulkhead, and then with bolts [supplied] to SuperColdMachine base, it becomes stabilized and very rigid.

## WATER COOLED OPTION PACKAGE How It Works and Why

To get absolutely top performance from your SuperColdMachine, you can add this at any time in future, or with your original installation. If inlet air temperature to the SuperColdMachine exceeds 90°F, switching to water cool mode will produce shorter "on" times and lower amp draw when running. As air temperature increases the water cooled advantage increases. In tropical conditions the total daily power consumption can be reduced by 25%-40%.

When you select "water pump on" with the switch panel provided with this option, note that the built-in fan (and the Powerduct fan if fitted) continues to run. This ensures a flow of air over the compressor to keep it relatively cool and is *normal*.

**We strongly recommend you to switch the pump off while using dockside power.** With the battery charger working, it's more important to extend the life of the waterpump than it is to save battery power. **Example:** you left the boat on Sunday night, plugged in, freezer full of food; left waterpump *on*. On Wednesday, a plastic baggie gets sucked into the pump intake. The pump runs dry, its impeller shaft locks up, pump motor stalls, and the fuse on the SuperColdMachine blows. **Result:** damaged pump bearing requiring replacement (available from A/B). Your frozen food was not lost, as the fan continued to run. **Lesson:** Shut off the pump when you leave.

## Water Cooled Option Installation:

Here are the *basic rules* for a good installation:

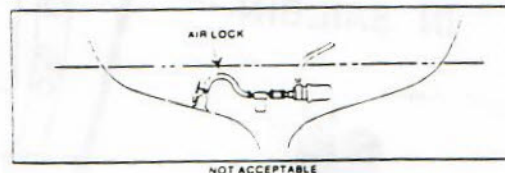
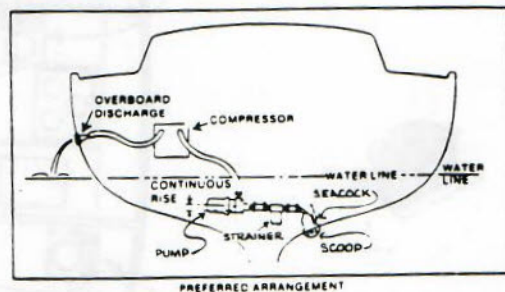
- 1) Pump must be at least 1 ft. below waterline at all times (regardless of which tack you're on).
- 2) Pump orientation must be as pictured—no other positions will work!

- 3) The strainer should be mounted with the bowl pointing downwards, otherwise it will trap air and possibly airlock the water pump.
- 4) Inlet thru hull must not be "shared" with any power-driven pump, **and absolutely not the engine's intake!**

You may "tee off" a toilet inlet, cockpit drain, galley seawater foot-pump line, etc. **provided** that the seacock is at least 2' below the waterline.

- 5) Inlet thru-hull must have a "scoop," facing forward, on the outside of the hull to prevent "back siphoning." At high sailing speeds, the flow direction may reverse, introducing air into the pump and damaging it. Failure to provide this scoop is the major cause of pump failures.
- 6) Heeling can obviously be a problem since the pump may be well below the waterline at rest or on one tack, but not on the other. Traps and airlocks may also be created when the boat is heeling. In most cases the positive "ram effect" created by the outside hull inlet scoop will overcome these problems **and this is one reason why the scoop is so important!**
- 7) Overboard thru-hull (supplied) must be **above** the waterline—so you can verify pump operation.
- 8) Total hose length must not exceed the 15 ft. furnished.
- 9) Total lift, i.e., highest point of piping above pump—must not exceed 5 ft.
- 10) **No "traps" allowed!** This means no "dips" in hoses. They must run level or steadily uphill from inlet to strainer to pump to highest point. To simplify, if you picked the boat up in slings, the entire water circuit (except for strainer contents) must drain out thru the inlet thru-hull.

If these rules are followed your pump will last for years. If you don't, it won't—and we will disallow any warranty responsibility.



PERMITTED MOUNTING POSITION FOR CENTRIFUGAL PUMPS



Base Down. Discharge points up.



Base vertical on left, discharge points right, on top of pump housing.

**NO OTHER POSITIONS ARE PERMITTED!**

# **ADDENDUM: TIGHTENING THE REFRIGERANT COUPLINGS**

version 01.05.95

## **TO THE INSTALLER:**

Occasionally we hear from installers who have "followed the manual" but nevertheless left the couplings loose and lost all or part of the refrigerant charge as a result.

## **DON'T LET THIS HAPPEN TO YOU!!!**

The couplings have to be wrenched up tight... VERY TIGHT. The best way to ensure this is to use TWO 12" LONG ADJUSTABLE WRENCHES and get them as TIGHT AS YOU CAN .

Don't worry: as long as you do not twist the copper tubing you will not damage the couplings.

SO: after you have reviewed steps 1 thru 4 under "REFRIGERANT COUPLINGS" in this Manual, do this:

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## **START WITH THE LOWER PAIR FIRST:**

a- Perform steps 1, 2, 3

b- Apply one of your big wrenches to the hex part of the STATIONARY (male) coupling

c- Apply the other wrench to the ROTATING (female ) coupling

d- Now- apply as much force as you can. BE SURE THAT THE WRENCH HOLDING THE MALE COUPLING DOES NOT SLIP

**PROCEED TO THE UPPER SET OF COUPLINGS:** Note that the STATIONARY (male) half is held by a steel socket so it cannot turn and you do not have to hold it:

a- Perform steps 1, 2, 3

b- Apply a wrench to the ROTATING (female) coupling and pull up very tight

NOW: complete STEP 4 in the Manual

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**THE COUPLING PROCEDURE IS NOW COMPLETE**

**QUESTIONS? CALL ADLER/BARBOUR SERVICE AT 203 453 4375**

## REFRIGERANT COUPLINGS

*It is especially important that the following instructions be read in their entirety before proceeding with further work!*

Prepare yourself by having at hand two separate open end or adjustable wrenches:

- One 1-3/16"/30mm hex or 12" adjustable wrench
- One 1-1/8"/29mm hex or 10" adjustable wrench

**Keep the refrigerant couplings dry and clean.** Leave the metal sealing caps in place until you are ready to install.

1. Carefully wipe off the fittings with caps and plugs in place to remove dirt, dust and moisture. Remove the metal sealing caps from the refrigerant couplings on the compressor unit, and from the mating refrigerant couplings at the end of the 15 foot tube set. Thread the coupling halves together by hand to insure proper mating of threads. Connect the lower refrigerant coupling first.

Turn only the female coupling. **Do not turn the male coupling.** If you twist the male coupling from its base, you will have a refrigerant leak. (That is why you must use two wrenches.)

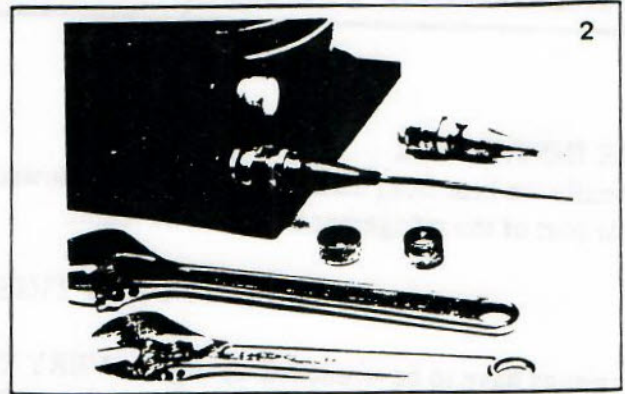
When screwing the refrigerant coupling male and female halves together, align them carefully to avoid strain and cross-threading. If you have difficulty aligning the coupling halves properly, it may be necessary to temporarily shift the compressor unit for better alignment.

Using the 1-1/8" hex wrench on the male coupling body hex and the 1-3/16" hex wrench on the female union nut (holding the male coupling hex fast), rotate the female nut until the coupling body halves bottom out and definite resistance is felt (approximately five turns). If you lose count of the turns, you may start over. No freon gas will be lost providing you complete this step promptly. (See Photo #1).

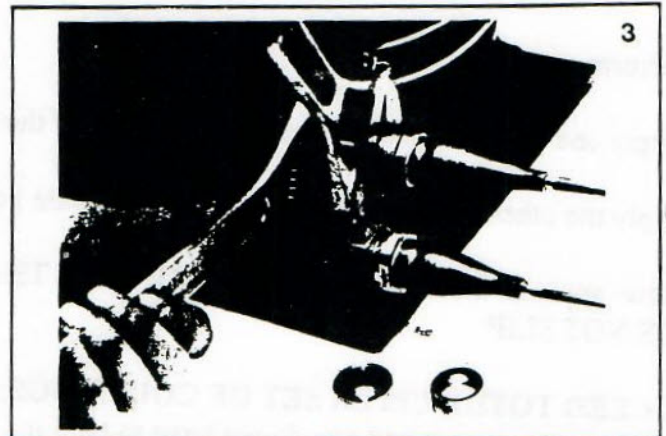


Ignore the sudden increase in resistance that occurs within the first two turns. This merely indicates that the two spring-loaded poppet valves are in contact and beginning to push each other open.

2. Using a marker pen or crayon, draw a line from the male coupling body to and over the female union nut to act as a reference point. (See Photo #2.)



3. This step must be performed correctly or a leak-proof joint will not be made. Using the lines you have drawn as reference points, tighten the female union nut one hex flat (1/6 turn) while holding the male coupling hex fast (refer to photos). This 1/6 turn is necessary to insure that the metal seal ring in the male coupling half "bites" into the brass seat of the female coupling half, forming a leak proof joint. (See Photo #3.)



Work rapidly to minimize possible escape of refrigerant. Occasionally there may be a slight hiss and/or a drop or two of refrigerant oil when making these connections. This will stop when the couplings are tightened.

4. Support the refrigerant tube set and thermostat wiring harness with clamps and wire ties (four supplied). Keep the tube set and harness out of bilge water, and protected from chafe and vibration. Coil the excess tubing and wiring, and secure in a horizontal orientation. The tubing must not be allowed to vibrate or chafe. Seal the exit hole in the icebox with the supplied mastic.

The system is fully charged with refrigerant at the factory and requires no charging in the field.

Retain the metal sealing caps in event the unit is ever returned for service.

## ELECTRICAL CONSIDERATIONS

### Battery Recommendations

We strongly recommend a minimum of two marine batteries, one exclusively for engine starting and a second for all other DC electrical devices such as lights, electronics and your SuperColdMachine. The second battery or group of batteries (wired in series or parallel depending on voltage) is commonly called the "house bank." A standard marine battery selector switch should be installed to isolate each battery or battery bank.

The house bank should be at least 100 amp/hour capacity. More is desirable. The larger the battery bank, the longer you can operate the various loads between engine charging, and the faster you can recharge. This is because the alternator's actual output in amps is greater into a larger battery bank.

We recommend the following amperage/hour capacity for the house bank, which services the SuperCold Machine:

For the "casual cruiser"  
25 to 35 ft., seldom away  
from dock longer than  
overnight . . . . . Minimum 100 amp/hours

For the "serious cruiser"  
30-50 ft., often cruising  
for a week or more . . . . . Minimum 200 amp/hours

For the charter yacht or  
ice-based "serious  
cruiser" operating in hot  
climates and requiring  
greater quantities of ice  
cubes and frozen foods . . . . . Minimum 300 amp/hours

### Alternator Recommendations

A 55 amp alternator is generally standard on and adequate for most cruising yachts. However, we strongly recommend a larger alternator of 90 amps or more (rated capacity) for charter boat applications.

### "Fast-Charge" Devices, Alternator Controllers and Batteries

The continuing proliferation of electrical and electronic devices aboard boats has produced great interest in reducing engine running time required for battery charging.

If top-quality batteries are installed in the boat, one of several available types of alternator controllers (or "regulator bypasses") can be installed and will substantially shorten charging times. The acceptable versions of these products are fully protected and automatically revert to standard regulator control before battery voltages and temperatures rise to damaging levels.

No batteries, a good deal of misinformation still exists regarding "marine," "deep-cycle" and "deep-discharge" batteries. These terms generally describe a battery constructed to provide small to moderate currents for long

periods of time, as opposed to short bursts of high current to start engines. While "deep-cycle" batteries will, nevertheless, start engines quite satisfactorily, engine-starting batteries are very poor at small-current long-term tasks. Automotive, sealed, or so-called "maintenance-free" batteries are okay for the engine start battery but are not suitable for the house or service battery bank that runs all the other equipment on your boat *regardless of how they are labeled*. A few manufacturers of genuine marine heavy-duty deep-cycle batteries are creating a public awareness of the inadequacies of disguised, re-labeled automotive batteries for marine use, particularly as house batteries in sailing yachts.

What all this means is that a boat owner with a full complement of equipment aboard such as electronics, refrigeration, autopilot, stereo, etc., and who feels the engine must be run too long for battery charging, can get very substantial improvements by using the technology and equipment now available to him.

### Wiring the System

The SuperColdMachine has a hermetically sealed DC motor compressor. It will operate normally from about 10 to 15.5 volts. Below 10 volts DC the compressor will vibrate and occasionally rattle and this clearly audible sound indicates substandard voltage. Over a long period of time—say hundreds of hours of operation—this condition may cause damage to parts within the compressor. This type of failure is not normally warranted by A/B.

To avoid low voltage problems you must provide:

- adequate battery capacity
- properly-sized wiring, good connections, minimum voltage drop
- adequate battery charging, cruising or at dock
- minimum number of switches and connections between unit and battery

Therefore, to avoid damage to The SuperColdMachine, wiring connections must be made in one of three ways:

1. Directly to the battery (refer to page 14)
2. To the battery via the battery selector switch. This is recommended. (refer to page 14)
3. Through the ship's distribution panel via the battery selector switch to the battery (refer to page 14)

Use the shortest possible route for wiring between unit and battery to avoid voltage drops.

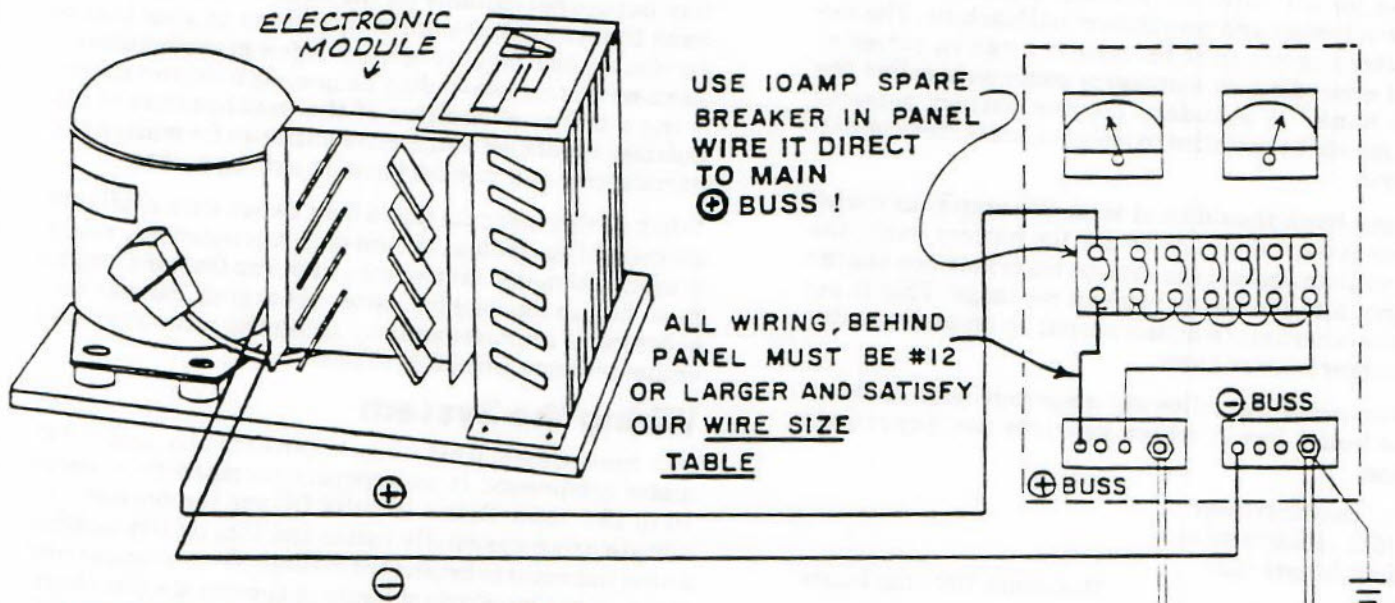
Install a 20 amp in-line fuse with an on/off switch or a 20 amp circuit breaker in the positive leg for line protection.

Make sure that all wiring conforms to applicable Federal and State safety regulations.

Use marine quality connectors and switch or circuit breaker to minimize voltage drops in the supply circuit to the SuperColdMachine. Also do not install voltage dropping devices such as indicator lights, volt and amp meters, etc., in the 12 volt DC wiring circuit.

Correct polarity is critical. If you connect in reverse, the compressor motor will run backwards. Poor lubrication and rapid wear will result. Check your connections! Terminal strip is marked to identify each connection.

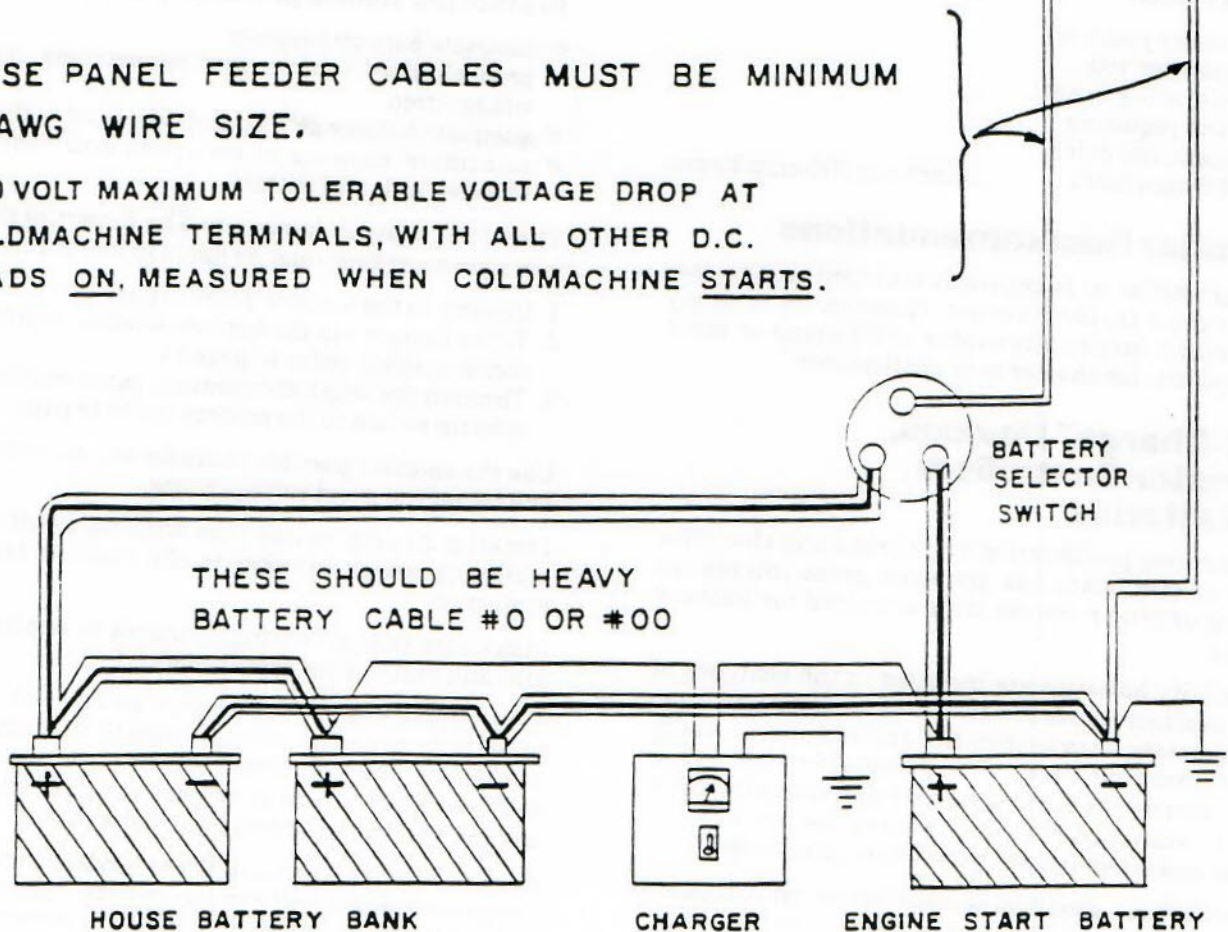
# CONNECTION TO EXISTING PANEL BREAKER



SEE TABLE FOR WIRE SIZES

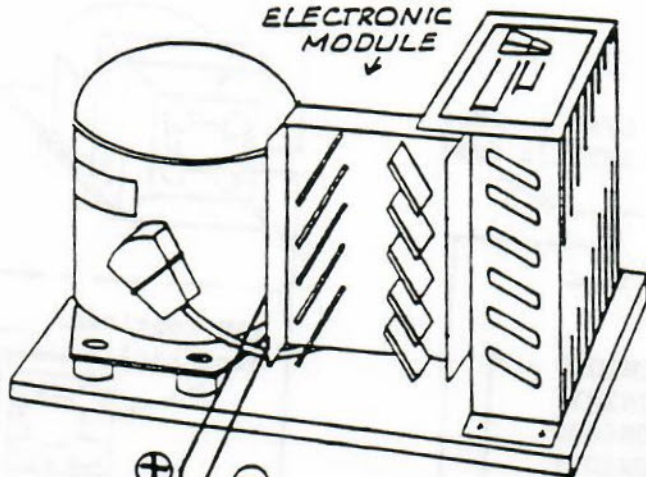
THESE PANEL FEEDER CABLES MUST BE MINIMUM = 8 AWG WIRE SIZE.

2/10 VOLT MAXIMUM TOLERABLE VOLTAGE DROP AT COLDMACHINE TERMINALS, WITH ALL OTHER D.C. LOADS ON, MEASURED WHEN COLDMACHINE STARTS.

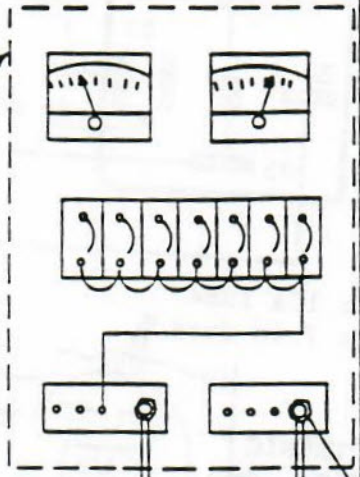


# DIRECT CONNECTION TO BATTERY

**RECOMMENDED!**



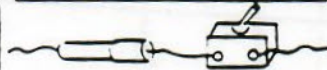
PANEL



SEE TABLE FOR WIRE SIZES

BEST:  
10AMP. CIRCUIT BREAKER SHOWN

NOT SATISFACTORY:



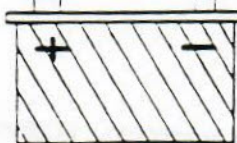
FUSE & TOGGLE SWITCH

OWNER-INSTALLED POWER LEADS FOR THE COLDMACHINE - MUST BE HEAVY WIRE AS SPECIFIED IN WIRE SIZE TABLE

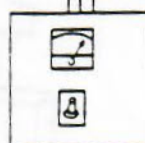
CONNECT: { EITHER TO SELECTOR SWITCH OUTPUT  
OR TO BATTERY POST }

BATTERY  
SELECTOR  
SWITCH

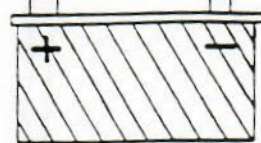
MAIN BATTERY CABLES



HOUSE BATTERY BANK

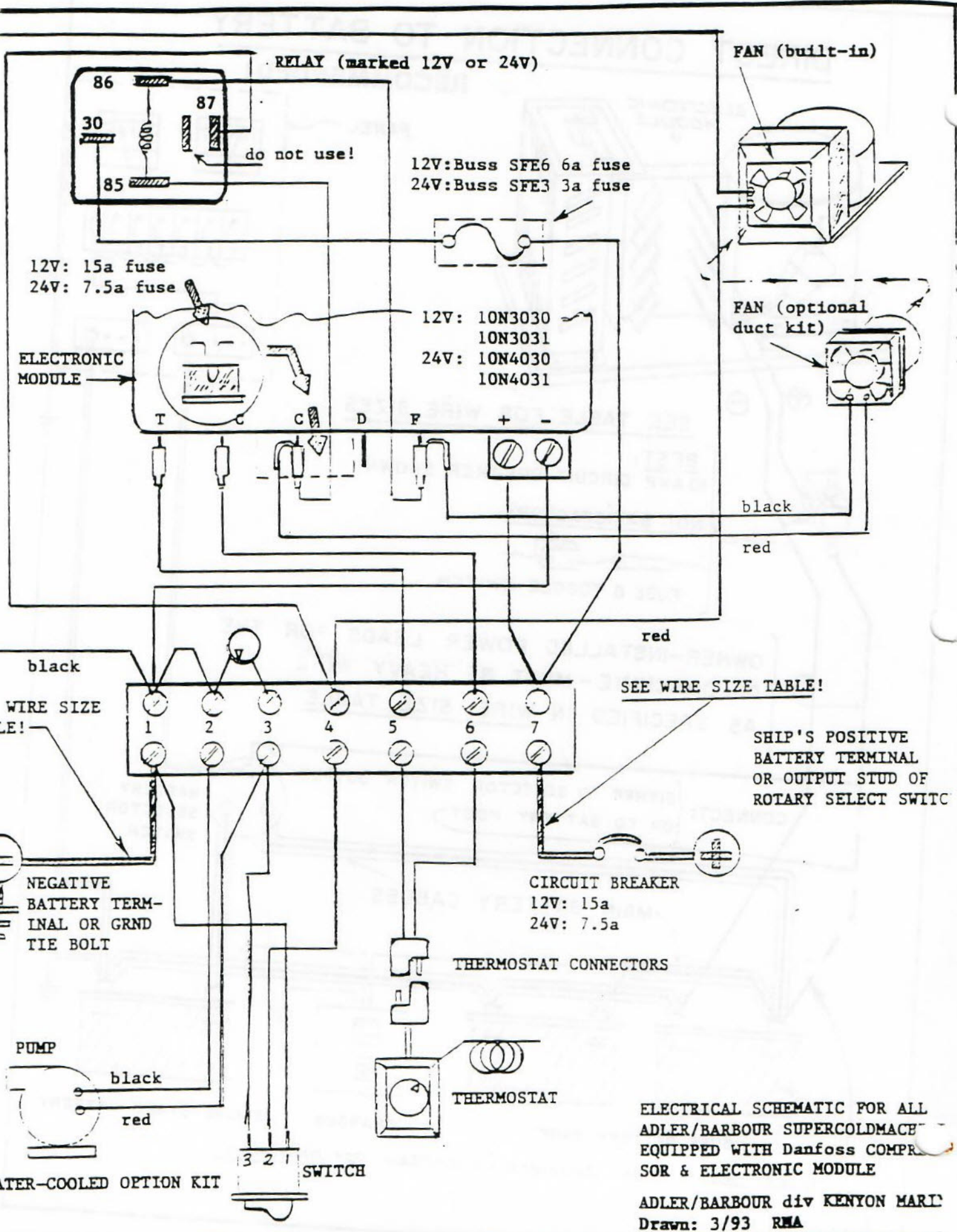


CHARGER



ENGINE START BATTERY

WIRE LENGTH FROM BREAKER TO BATTERY 72" MAXIMUM!



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# OPERATION OF SYSTEM

## TART UP

Turn the thermostatic control clockwise to about #2 or #3 (#1 on the thermostatic control is the warmest setting, #7 is the coldest).

The SuperColdMachine system will now start. Within a few minutes, the freezer unit will begin to frost. The system will operate continuously until the icebox cabinet and contents have been brought to the selected temperature. The system will then cycle off, and thereafter cycle on and off maintaining proper temperature (like a home refrigerator).

## AC/DC OPERATION

The SuperColdMachine will also operate automatically at dockside with the addition of a battery charger. We recommend a quality marine battery charger of sufficient size to handle your SuperColdMachine along with the other on-board DC loads (such as lights, stereo and electronics). For the SuperColdMachine, figure approximately 7 amps when running. The average draw, as the SuperColdMachine cycles on and off, is 1.8 to 2.4 amps for most 6 to 10 cubic foot iceboxes with good insulation.

## MAINTENANCE

Regular or seasonal maintenance is normally not needed, nor is maintenance required for winter storage or decommissioning. However, you should wash the freezer unit occasionally, and again before winter storage (use a mild detergent such as Joy or Ivory). Also the condenser (the radiator-like object on the compressor unit) can become clogged with dirt and should be carefully vacuumed seasonally with a soft brush attachment. Be careful not to bend the cooling fins.

## Defrosting

Defrost your refrigerator when frost gets over 1/4" thick. This should not occur in less than a month or so. Excessively fast or thick frost formation is an indication of moist outside air entering through a poorly sealed lid, doors or liner joints. These conditions must be eliminated for proper performance.

The best way to defrost is to turn your thermostatic control to the "OFF" position or disconnect the SuperColdMachine from the power source. Open the icebox lid or door and allow sufficient time for the freezer unit to defrost naturally. *Never use an ice pick, knife or other metal object—you may pierce the refrigerant coils.*

## Battery Care

Batteries are one of the most neglected and abused items on boats. Unlike automobiles, boat engines run slowly and not very often. The batteries tend to be buried in the bilge, are damp, dirty and chronically undercharged. Boat wiring is subject to corrosion at various connections, which creates voltage drops as we add more electrical devices each season. As these electrical loads grow, it becomes even more important that you keep your battery and charging system at top efficiency.

Also batteries can be deceptive. They may look good and read normal voltage, but may have deteriorated internally and be no longer able to deliver adequate power for more than short periods of time.

Check your batteries at least monthly with a hydrometer (inexpensive and available from automotive supply stores). The readings of each cell should be approximately the same. If one reading is lower than the others, it indicates a defective battery.

Also check your batteries seasonally with a "Battery Load Tester" (which your boatyard or mechanic probably has). This tests the battery's condition and capacity under a simulated actual load.

If your batteries do not pass these tests, **replace them**. You are just wasting valuable fuel, engine hours and time in trying to charge them.

Observing the following points can add to your battery's dependability and operational life:

- Keep the tops of batteries clean and dry. A damp battery can lose 20% of its charge in a day!
- Keep the battery post clamps tight, clean and free from corrosion.
- Use distilled water only.

## Winter Operation

When ambient temperatures drop below 65 degrees F in the operational area of the compressor unit, it becomes necessary to block off 1/2 of the condenser coil face area (on the side opposite the condenser fan motor) with a piece of cardboard to maintain system efficiency. The cardboard can be simply taped in place for the winter season and removed in the spring when seasonal temperatures return to above 65 degrees F.

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# TROUBLE SHOOTING

This chart is a simple guide to field level trouble-shooting of the Super ColdMachine system. It covers diagnosis and simple parts replacement and/or adjustments. These repairs can be handled by the average owner.

Service kits, parts, manuals and additional support services can be obtained from:

Adler-Barbour ServiCenter  
Div. Int'l. Marine Industries, Inc.  
New Whitfield Street  
Guilford, CT 06437



# Adler/Barbour

## R134a SUPPLEMENT FOR COLDMACHINE, SUPERCOLDMACHINE, AND POWERPLATE version 7.22.94

### TO THE OWNER:

**CONGRATULATIONS FOR SPECIFYING YOUR NEW ADLER/BARBOUR REFRIGERATION SYSTEM WITH HFC 134a NON-OZONE-DEPLETING REFRIGERANT.**

There will be little or no noticeable difference in the way your new system performs compared to an identical system charged with CFC-12 ("FREON 12"). HOWEVER: should it ever become necessary to service the refrigeration circuit, you or your authorized Adler/Barbour technician must read the information in this section BEFORE ATTEMPTING SERVICE.

### FIRST, SOME BACKGROUND INFORMATION AND GUIDELINES:

HFC-134a ("R134a") is a non-chlorine-containing refrigerant gas, developed by the nations' signatory to the Montreal Protocols to replace CFC-12, now positively identified as a major factor in global ozone depletion.

While HFC-134a has zero ODP (Ozone Depletion Potential), it does have a substantial GWP (Global Warming Potential) if released into the environment. The EPA advises that by 10/95 it will become a controlled substance, and at that time it will become mandatory to recover HFC-134a. At the present time (7/94) it can be purchased over the counter by consumers, in disposable 12 oz cans, and can legally be released into the atmosphere while servicing refrigeration systems. For this reason we have provided instructions for owner-servicing of the refrigeration circuit, with the following comments:

- Adler/Barbour does NOT recommend discharge of HFC-134a into the environment. We suggest, in the absence of restrictive regulations, that ALL refrigerant handling be performed by a competent technician possessing a certification to handle refrigerants.
- Adler/Barbour believes ALL refrigerants should be RECOVERED using EPA-approved recovery equipment.

### SERVICE BASICS:

- ONLY HFC 134a is acceptable for charging this unit.
- ONLY Polyol Ester SUS 80 or 100 viscosity lubricant is acceptable for use in this unit.
- ONLY TOOLS (gauges, hoses, etc.) not previously used on, and therefore not contaminated by, systems containing other refrigerants or lubricants are acceptable for connection to this unit.

REASON: Even minute amounts of other lubricants will create blockage of the tiny capillary metering tube in your evaporator, resulting in system failure.

IF A VACUUM PUMP is connected to this system it shall be operated in a manner that absolutely prevents any vacuum pump oil from migrating into the refrigeration system:

- Vacuum pump must always be LOWER THAN COMPRESSOR
- Vacuum pump must NEVER be shut off while refrigeration system internal pressure is below atmosphere (negative PSIG, in vacuum on gauge)

# Adler/Barbour

REASON: Even tiny amounts of other oils (mineral based, alkybenzene, paraffin, etc.) in this system will cause clogging of the capillary metering tube and eventually complete system failure.

## IF THIS SYSTEM WILL BE OPEN TO ATMOSPHERE FOR MORE THAN FIVE (5) MINUTES:

- All openings must be capped off or soldered shut, thus remaining airtight
- A new replacement DRIER must be installed in any such system or any system discovered to be out of refrigerant (or if system pressure is negative). All such systems must be assumed to be contaminated with air and moisture.

REASON: P/E oil is 100 times more hygroscopic (absorbs moisture from the atmosphere) compared to conventional R12 oils.

ONLY Adler/Barbour-supplied or approved drier is acceptable. These contain UOP desiccant XH-9 Molecular Sieve (for ColdMachine) or Sporlan solid core "Catch-All" flare type (for SuperColdMachine)

## SERVICE PROCEDURES FOR REFRIGERANT CIRCUIT:

All refrigerant circuit problems fall into just **TWO TYPES**: those that **DO NOT** require repair and evacuation, and those that **DO**:

### TYPE 1: OK FOR OWNER-SERVICING:

- **LOW REFRIGERANT CHARGE (BUT NOT EMPTY)** FROM LOOSE COUPLINGS OR LOOSE SERVICE ACCESS VALVE CAP (some refrigerating effect, hiss when depressing Schraeder valve pin, cold and or frosted area on evaporator).
- **OVERCHARGE FOR YOUR PARTICULAR APPLICATION** (heavy frosting of return tubing outside of refrigerated cabinet).

**THESE PROBLEMS CAN BE CORRECTED BY ADDING OR BLEEDING REFRIGERANT, OBSERVING THE FROST PATTERNS PER TABLE 1 AND NOTES.** (Owners can repair systems with electrical faults: failed electronic module, fan, thermostat, fuse, corroded wiring, etc. See Manual)

### TYPE 2: REQUIRING A PROFESSIONAL TECHNICIAN TO SERVICE:

- **EMPTY SYSTEM**, no refrigerant, due to leaks, broken tubing and or punctured evaporator, etc. Compressor runs but **NO COOLING** at evaporator.
- **SYSTEM IN VACUUM**, little or no refrigerant or cooling, due to leak(s) that allowed refrigerant to exit and probably some air and or moisture to enter.
- **WET SYSTEM**, erratic cooling, compressor may run long periods with no cooling, no hiss in evaporator, may run OK after some time shut off.

**THESE PROBLEMS REQUIRE EVACUATION, LEAK DETECTION, BRAZING, PROFESSIONAL TOOLS AND EQUIPMENT. REPAIRS CAN BE DONE ON BOARD OR THE ENTIRE SYSTEM CAN BE RETURNED TO US FOR FACTORY SERVICE. PROCEED AS FOLLOWS:**

1. **LOCATE AND REPAIR ALL LEAKS. CONFIRM BY PRESSURIZING SYSTEM WITH MIX OF R134a AND NITROGEN TO 150 PSIG. USE DEDICATED R134a GAUGES ONLY! IF SYSTEM HAS LOST A SIGNIFICANT AMOUNT OF OIL CALL OUR FACTORY BEFORE PROCEEDING**

# Adler/Barbour

## R-134a FIELD SERVICE DATA SHEET

R-134a CHARGING DATA FOR ALL ADLER/BARBOUR SYSTEMS version 7.1.94

Use this table for field charging or adjustment of refrigerant charge on all A/B systems with either aluminum (rollbond) evaporators or PowerPlate evaporators (\*)

- ALL PRESSURES ARE IN PSIG.
- AMBIENT AIR TEMPERATURE IS ASSUMED +75F.
- CORRECTIONS FOR OTHER LOCAL AMBIENTS: SEE NOTES, CHARGE BY FROST LINE.
- TYPICAL FROST PATTERNS ARE DESCRIBED AT +75F AMBIENT WITH BOX HATCH OPEN. (THESE FROSTED AREAS WILL BE SMALLER AT HIGHER AMBIENTS)
- ALL EVAPORATORS SHOULD BE 100% FROSTED WITH HATCH CLOSED. UNIT CYCLING

### PRODUCT IDENTIFICATION:

CM = ColdMachine (air-cooled only)

→ SCM = SuperColdMachine (air/water cooled)

→ P/P = PowerPlate

STANDARD EVAPORATOR measures 11" x 6" x 12" (11" x 30" before forming into box)

LARGE EVAPORATOR measures 12" x 6" x 15" (12" x 40" before forming into box)

### REFRIGERANT CHARGE:

VARIES FROM 3.5 TO 5.0 OUNCES (BY PRODUCT). CHARGE IS CRITICAL TO 1/10th OUNCE. THEREFORE UNITS CANNOT BE CORRECTLY CHARGED IN FIELD BY WEIGHING IN THE CHARGE. USE THIS TABLE, OBSERVE FROST PATTERNS AND SUCTION PRESSURE.

TABLE 1- SUCTION GAS PRESSURE (PSIG):

UNIT IS RUNNING CONTINUOUSLY

UNIT	EVAP	LID OPEN AFTER 15 MIN.	FROST SEE NOTES	LID CLOSED AFTER 30 MIN.	LID CLOSED AFTER 60 MIN.	LID CLOSED CYCLING ON TSTAT
CM	STD	8 to 10	1/4 note A	5 to 7	4 to 6	4 to 6
CM	LG.	12 to 13	1/8 note B	7 to 10	5 to 7	5 to 7
CM	P/P	8 to 10	couplings note C	7 to 9	4 to 7	4 to 7
SCM	STD	8 to 10	1/4 note A	5 to 7	4 to 6	4 to 6
SCM	LG.	12 to 13	1/8 note B	7 to 10	5 to 7	5 to 7
→ SCM	P/P	8 to 10	couplings note C	4 to 7	4 to 7	4 to 7

### NOTES:

INITIAL FROST PATTERNS WITH LID OF CABINET OPEN:

(A) STANDARD EVAPORATORS: Normal frost pattern is approx. 4-5" of evaporator frosted about 1/2 way around from tube entry point. This is about 1/4 of the total evaporator surface in +75F moist ambient, lid open.

(B) LARGE EVAPORATORS: Normal frost pattern is approx. a 2" to 2.5" band all the way around the evaporator. This is about 1/8th of the total evaporator surface in +75F moist ambient, lid open.

(C) POWERPLATE: Normal frost pattern is both couplings frosted, in approximately 60 minutes. Because of the warm solution inside, it takes MUCH LONGER to frost a part of the plate surface, vs. an aluminum evaporator.

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2. **LEAK CHECK SYSTEM THOROUGHLY** using an electronic leak detector specifically designed for HFC-134A. **WE RECOMMEND THE CPS MODEL L-790a LEAK-SEEKER. FOR INFORMATION CALL (305) 687 4121**
3. **DO NOT USE A LEAK DETECTOR DESIGNED FOR CFC's OR HCFC's ONLY IT WILL NOT DETECT GASES LACKING CHLORINE!**
4. **INSTALL A NEW DRIER. DO NOT ATTEMPT TO RE-COMMISSION THIS SYSTEM WITH THE OLD DRIER.** If you do not have a replacement XH-9 molecular sieve drier, STOP NOW. Call factory for assistance.
5. **EVACUATE** for at least one hour to < 1000 microns Hg using an accurate, correctly calibrated high-vacuum gauge (or a carefully zeroed-out compound gauge to 30" Hg for 2 hours)..
6. **BREAK VACUUM** with HFC-134a GAS ONLY (cylinder upright) to approx. 70 PSIG.
7. **START COMPRESSOR.** observe suction pressures, compare to TABLE of typical HFC 134a pressures (attached). Adjust as necessary to obtain frost pattern described in table and notes.
8. **REMOVE GAUGES, REPLACE ORIGINAL HEX BRASS CAP** (not a knurled rubber gasket cap!), tighten securely using **TWO WRENCHES**
9. **IMPORTANT:** Leave a record of the service you performed.

## Adler/Barbour

### HOW TO USE THIS DATA:

THE PRESSURES SHOWN IN TABLE 1 WILL BE AFFECTED BY LOCAL AIR TEMPERATURE, INSULATION THICKNESS AND TYPE, CABINET SIZE, REFRIGERANT CHARGE.

VISIBLE FROST PATTERNS are generally better indicators of correct charge in field conditions than strict adherence to low side pressures. A CORRECTLY CHARGED UNIT CYCLING ON THE TSTAT WITH LIDS CLOSED will display a fully frosted evaporator plus a few inches of frost on the suction tube inside the cabinet. IF FROST APPEARS downstream of the 3 ft insulating sleeve outside the cabinet, the unit is slightly overcharged (see below for exception)

CONDENSING UNIT LOCATION AND VENTILATION: if condensing unit is in a location which at times becomes extremely hot (110F or higher) a correctly charged unit will develop abnormally high head pressures and increased flow through the metering tube. Such a system may display frost on the suction line, sometimes all the way back to the couplings. When the condensing unit area cools off, this frost will retreat into the refrigerated cabinet. If this is observed, it is NOT an indication of overcharge.

SUGGESTION: ORDER A VENTILATION DUCT KIT to bring cooler air to the condensing unit. Just call our Service Dept. and identify the unit: ColdMachine or SuperColdMachine.

QUESTIONS OR PROBLEMS?  
CALL FACTORY CUSTOMER SERVICE FOR HELP:  
TEL: (203) 453 4374      FAX: (203) 458 2998

**SUPERCOLDMACHINE TROUBLESHOOTING GUIDE**

<b>SYMPTOM</b>	<b>DIAGNOSIS</b>	<b>CORRECTIVE ACTION</b>
COMPRESSOR AND FAN DO NOT MAKE AN ATTEMPT TO START	CHECK FUSE CHECK ALL WIRING CHECK THERMOSTAT (BYPASSING IT) FAULTY ELECTRONIC MODULE FAULTY COMPRESSOR	REPLACE FUSE CORRECT WIRING REPLACE THERMOSTAT REPLACE ELECTRONIC MODULE RETURN CONDENSING UNIT TO FACTORY
COMPRESSOR AND FAN ATTEMPT TO START, AS EVIDENCED BY MOMENTARY VOLTAGE DIP, FAN MOVEMENT OR COMPRESSOR VIBRATION	LOW VOLTAGE AT ELECTRONIC MODULE EXCESSIVE VOLTAGE DROP IN WIRING INTERNAL REFRIGERANT PRESSURES NOT YET EQUALIZED FAULTY ELECTRONIC MODULE FAULTY COMPRESSOR	REVIEW "ELECTRICAL CONNECTIONS" RUN TEMPORARY AWG 10 HOT-WIRE DIRECT TO BATTERY WAIT 15 MINUTES BEFORE ATTEMPTING ANOTHER START REPLACE ELECTRONIC MODULE RETURN CONDENSING UNIT TO FACTORY
COMPRESSOR AND FAN START BUT SHUT DOWN AFTER 1 TO 30 SECONDS	CHECK FAN MOTOR (DISCONNECT FAN MOTOR FROM MODULE. TURN ON COMPRESSOR AND SEE IF IT RUNS LONGER THAN 30 SECONDS. WARNING! DO NOT RUN UNIT ANY LONGER THAN 10 MINUTES WITHOUT THE FAN.	REPLACE FAN MOTOR
COMPRESSOR RUNS, FAN DOES NOT	CHECK FAN MOTOR WIRING FAN CONTROL CIRCUIT CHECK FAN MOTOR (TEST WITH 12 V.D.C. POWER SOURCE)	CORRECT WIRING REPLACE ELECTRONIC MODULE DEFECTIVE REPLACE FAN MOTOR

### SUPERCOLDMACHINE TROUBLESHOOTING GUIDE

<p>INTERMITTENT COMPRESSOR AND FAN OPERATION</p>	<p>POOR ELECTRICAL SUPPLY, CHRONIC VOLTAGE FLUCTUATIONS</p> <p>CHECK THE THERMOSTAT (BY BYPASSING IT)</p> <p>FAULTY ELECTRONIC MODULE</p> <p>FAULTY COMPRESSOR</p>	<p>REVIEW "ELECTRICAL CONNECTIONS" IN THE MANUAL</p> <p>REPLACE THERMOSTAT</p> <p>REPLACE ELECTRONIC MODULE</p> <p>RETURN CONDENSING UNIT TO FACTORY</p>
<p>COMPRESSOR AND FAN CYCLE, SYSTEM NOT ADEQUATELY COOLING BOX</p>	<p>CHECK THERMOSTAT (ADJUSTMENT)</p> <p>IS TEMPERATURE SENSING TUBE PROPERLY CLAMPED TO EVAPORATOR?</p>	<p>ADJUST SENSING TUBE POSITION</p>
<p>COMPRESSOR AND FAN RUN CONTINUOUSLY, SYSTEM NOT ADEQUATELY COOLING BOX</p>	<p>INADEQUATE VENTILATION AT CONDENSING UNIT</p> <p>REFRIGERANT CHARGE TOO HIGH OR TOO LOW</p> <p>BOX INADEQUATELY INSULATED</p> <p>PARTIAL CLOG IN REFRIGERANT CIRCUIT (CHARGE AND PRESSURES ARE NORMAL, AS CONFIRMED BY USE OF REFRIGERANT GAUGES AND ONLY PART OF EVAPORATOR IS FROSTING)</p>	<p>PROVIDE IMPROVED AIR FLOW (CONSULT MANUAL FOR SUGGESTIONS)</p> <p>CALL FACTORY</p> <p>ADD INSULATION TO BOX. (WALLS, TOP AND LIDS MUST HAVE MINIMUM 2" - OF URETHANE FOAM)</p> <p>RETURN ENTIRE UNIT TO FACTORY (INCLUDING EVAPORATOR AND CONDENSING UNIT)</p>
<p>COMPRESSOR AND FAN RUN CONTINUOUSLY, NO COOLING AT ALL</p>	<p>NO AUDIBLE "HISS" AT EVAPORATOR. COMPLETE CLOG IN CIRCUIT (MOISTURE, DIRT OR PINCHED TUBE)</p>	<p>RETURN ENTIRE UNIT TO FACTORY INCLUDING EVAPORATOR AND CONDENSING UNIT</p>
<p>COMPRESSOR AND FAN RUN CONTINUOUSLY, FOOD IN REFRIGERATOR FREEZES</p>	<p>CHECK THERMOSTAT (ADJUSTMENT)</p> <p>THERMOSTAT STICKS CLOSED, CHECK BY REMOVING ONE TERMINAL FROM THERMOSTAT</p> <p>TEMPERATURE SENSING TUBE IMPROPERLY CLAMPED</p>	<p>REPLACE THERMOSTAT</p> <p>ADJUST SENSING TUBE POSITION</p>

**SUPERCOLDMACHINE TROUBLESHOOTING GUIDE**

<b>SYMPTOM</b>	<b>DIAGNOSIS</b>	<b>CORRECTIVE ACTION</b>
WATERPUMP RUNS, DOES NOT PUMP	AIR IN PUMP, CAN'T SELF-PURGE	CHECK PIPING FOR LEAKS, AIR ENTRY, RE-PRIME PUMP, RE-PIPE, SEE INSTRUCTIONS
	IMPELLER SPINDLE BEARING DAMAGED FROM DRY RUNNING	OBTAIN SERVICE PARTS FROM FACTORY
	OBSTRUCTION IN INLET PIPE, STRAINER, OR OUTLET PIPING	LOCATE AND ELIMINATE
WATERPUMP DOES NOT RUN	BLOWN FUSE (ON UNIT BASE)	REPLACE WITH 7 1/2 AMP FUSE
	DEFECTIVE WIRING	LOCATE & REPAIR
	DEFECTIVE PUMP MOTOR	REPLACE ENTIRE PUMP
	FOREIGN MATERIAL JAMMED PUMP IMPELLER	DISASSEMBLE & REMOVE
INTERMITTENT COMPRESSOR AND FAN OPERATION, COMPRESSOR TEMPERATURE NORMAL (NOT TOO HOT TO TOUCH)	POOR ELECTRICAL SUPPLY, CHRONIC VOLTAGE FLUCTUATIONS	REVIEW "ELECTRICAL CONNECTIONS" IN THE MANUAL
	CHECK THE THERMOSTAT (BY BYPASSING IT)	REPLACE THERMOSTAT
	FAULTY COMPRESSOR	RETURN CONDENSING UNIT TO FACTORY
COMPRESSOR AND FAN RUN CONTINUOUSLY, FOOD IN REFRIGERATOR FREEZES	CHECK THERMOSTAT	FOR ADDITIONAL ADJUSTMENT SEE
	THERMOSTAT STICKS CLOSED, CHECK BY REMOVING ONE TERMINAL FROM THERMOSTAT	REPLACE THERMOSTAT
	TEMPERATURE SENSING TUBE IMPROPERLY CLAMPED	ADJUST SENSING TUBE POSITION (SEE PAGE 10)
COMPRESSOR AND FAN CYCLE, FOOD IN REFRIGERATOR FREEZES	BOX TOO SMALL OR TOO WELL INSULATED	PARTITION REQUIRED BETWEEN EVAPORATOR AND REFRIGERATED FOOD (SEE OPTIONAL ICEBOX MODIFICATIONS PAGE 9)
	CHECK THERMOSTAT	FOR ADDITIONAL ADJUSTMENT SEE

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# PROCEDURE FOR REMOVING COMPRESSOR UNIT

1. Turn off DC power supply to unit.
2. Disconnect the mating plugs of the thermostatic control wire harness about one foot from compressor unit.
3. Remove both DC power leads from terminal strip.
4. Disconnect both refrigerant couplings. Use two open-end wrenches:  
One 1-3/16"/30mm hex or 12" adjustable to turn the female coupling. One 1-1/8"/29mm hex or 10" adjustable to hold the male coupling.
5. Turn only the female coupling. Don't turn the male coupling. If you twist the coupling from its soldered tubing connection, you will have a refrigerant leak. This is why you must use two wrenches.
6. Work quickly to avoid loss of refrigerant gas. A slight

hiss and loss of a drop or two of refrigerant oil may or may not occur. This stops when the coupling halves are completely separated. Screw the metal caps into the couplings to keep dirt out and prevent freon leakage.

7. Shut inlet seacock (if water cooled option is installed). Remove 2 hoses from condenser.
8. Remove duct kit from SuperColdMachine unit (if equipped).
9. Now remove the compressor unit from the boat. Handle carefully. Don't pick it up by the tubing or fan shroud. Be careful not to cut your fingers on the cooling fins, and do not bend them. (The fins are soft and thin for maximum efficiency.)

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# PROCEDURE FOR REMOVING FREEZER UNIT

1. Turn the thermostatic control to OFF (until click).
2. Disconnect the 12 volt DC power supply to the compressor unit. Carefully remove the sensing tube of the thermostatic control from its clamp on the side of freezer by loosening two screws and sliding out the "U" bend section of the tube.  
Now disconnect both pairs of refrigerant couplings at the compressor unit (see "Procedure for Removing Compressor Unit," above).
4. Disconnect the mating plugs of the thermostatic control unit (about 1 foot from compressor unit).
5. Remove the soft mastic caulking material from the

exit hole in the icebox where the tubing and wire harness pass through.

6. Using a "stubby" screwdriver, unscrew the four mounting screws (save these) and carefully withdraw the entire freezer and its 15 ft. tubing set from the icebox.
7. Be careful not to kink or flatten the tubing! Screw the metal sealing caps into the couplings to keep them clean and prevent freon leakage.
8. Now carefully roll up the entire coil by rolling it around a cylindrical object of about 12" diameter.

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## SERVICE

The Super ColdMachine has a Limited 24 Month Warranty. Should it need service, during or after the warranty period, simply call 203-453-4374 for the name of the nearest Authorized Adler-Barbour Servicing Dealer. Should it become necessary for repair or replacement carefully repackage the unit in its original carton and return unit to: Adler-Barbour ServiCenter, Div. Int'l. Marine Indus., Inc., New Whitfield Street, Guilford, CT 06437. Enclose a note telling why the unit needs repair. If the unit is being returned under warranty, it must be accompanied by a copy of the original sales ticket or shipping documents to establish date of purchase. If your unit is out of warranty, we will notify you of the cost of repairs before repair work begins. Any damage to the unit in shipment to the factory is the responsibility of the sender. For your protection when mailing packages, please use insured Parcel Post or United Parcel Service.

### Limited 24 Month Warranty

International Marine Industries, Inc. warrants to the owner of this Adler-Barbour Super ColdMachine that it is free from defects in materials and workmanship for a period of 24 months from the original date of con-

sumer purchase. This warranty does not include damage to the product as a result of misuse or accident. The warranty does not apply in the event of failure to follow the Installation and Operation Manual. **IT IS YOUR OBLIGATION TO PROPERLY INSTALL AND MAINTAIN THE SUPER COLDMACHINE.**

If the unit should become defective during the warranty period, call 203-453-4374 for the nearest Authorized Adler-Barbour Servicing Dealer or return it prepaid to Adler-Barbour ServiCenter, Div. Int'l. Marine Industries, Inc., New Whitfield Street, Guilford, CT 06437 for repair or replacement at no charge. For your protection when mailing packages, please use insured Parcel Post or United Parcel Service.

In the event of on-board service, expenses for travel time to and from the vessel shall be borne by the consumer.

This warranty gives you specific legal rights and you may have other rights which vary from state to state.

**RECORD YOUR SERIAL NUMBER HERE:**

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**KEEP THIS BOOK FOR YOUR RECORDS.**



## WARRANTY

version 11.07.94

**Adler/Barbour-Crosby (the "Company") warrants its products in normal usage to be free of defects in materials and workmanship subject to the conditions and limitations below. Any part which proves to be defective in normal usage during the Warranty period will be repaired or replaced by the Company.**

**This Warranty is subject to the following conditions and limitations:**

- 1- The Company's liability shall be limited to repair or replacement (choice of remedy at Company's option) of goods or parts as may be defective in materials or workmanship. This liability is limited to **ONE YEAR for labor and TWO YEARS for parts**
- 2- Determination of suitability of the product for the use contemplated by the buyer is the sole responsibility of the buyer, and the Company shall have no responsibility in connection with such suitability
- 3- The Company shall not be liable for any damage resulting from:
  - failures due to use of the products in applications for which they are not intended
  - Failures due to corrosion, wear and tear, abuse or improper installation or maintenance
- 4- The Company shall be responsible for ground shipping charges to the location of the vessel within the contiguous United States, Hawaii and Alaska. Any other or express or special shipping charges are at the expense of the buyer.
- 5- Service by anyone other than authorized Company representatives shall void this Warranty unless such service accords with the Company's guidelines and standards of workmanship.

THERE ARE NO OTHER WARRANTIES OF MERCHANTABILITY, FITNESS FOR PURPOSE, OR ANY OTHER KIND, EXPRESS OR IMPLIED, AND NONE SHALL BE IMPLIED BY LAW. The durations of any such warranties that are nevertheless implied by law for the benefit of a consumer shall be limited to a period of two years from original purchase by the user. Some countries do not allow limitations on how long an implied warranty lasts, so this limitation may not apply to you.

THE COMPANY SHALL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES TO YACHTS, EQUIPMENT, OR OTHER PROPERTY OR PERSONS, DUE TO ANY FAILURE OF ADLER/BARBOUR-CROSBY PRODUCTS. Some countries do not allow exclusion or limitation of coincidental or consequential damages, so this limitation or exclusion may not apply to you.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH MAY VARY FROM COUNTRY TO COUNTRY.

**This Warranty applies to units purchased after July 1 1992**

# WARRANTY

Form 1000

This Warranty is given by the Company to the purchaser of the product... The Company warrants that the product is free from defects in material and workmanship... The Company's obligation under this warranty is limited to the repair or replacement of the product...

This Warranty is subject to the following conditions and limitations:

1. The Company's liability shall be limited to the repair or replacement of the product... The Company's obligation under this warranty is limited to the repair or replacement of the product...

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10. The Company's liability shall be limited to the repair or replacement of the product... The Company's obligation under this warranty is limited to the repair or replacement of the product...

# PROCEDURE FOR REMOVING COMPRESSOR UNIT

1. Turn off the power to the unit.  
2. Disconnect the refrigerant lines from the compressor.  
3. Remove the compressor from the unit.  
4. Clean the area where the compressor was located.  
5. Reassemble the unit.

1. Turn off the power to the unit.  
2. Disconnect the refrigerant lines from the compressor.  
3. Remove the compressor from the unit.  
4. Clean the area where the compressor was located.  
5. Reassemble the unit.

# PROCEDURE FOR REMOVING FREEZER UNIT

1. Turn off the power to the unit.  
2. Disconnect the refrigerant lines from the freezer unit.  
3. Remove the freezer unit from the unit.  
4. Clean the area where the freezer unit was located.  
5. Reassemble the unit.

1. Turn off the power to the unit.  
2. Disconnect the refrigerant lines from the freezer unit.  
3. Remove the freezer unit from the unit.  
4. Clean the area where the freezer unit was located.  
5. Reassemble the unit.

# SERVICE

The service technician should follow the following steps when performing service on the unit:  
1. Turn off the power to the unit.  
2. Disconnect the refrigerant lines from the unit.  
3. Remove the unit from the unit.  
4. Clean the area where the unit was located.  
5. Reassemble the unit.

The service technician should follow the following steps when performing service on the unit:  
1. Turn off the power to the unit.  
2. Disconnect the refrigerant lines from the unit.  
3. Remove the unit from the unit.  
4. Clean the area where the unit was located.  
5. Reassemble the unit.