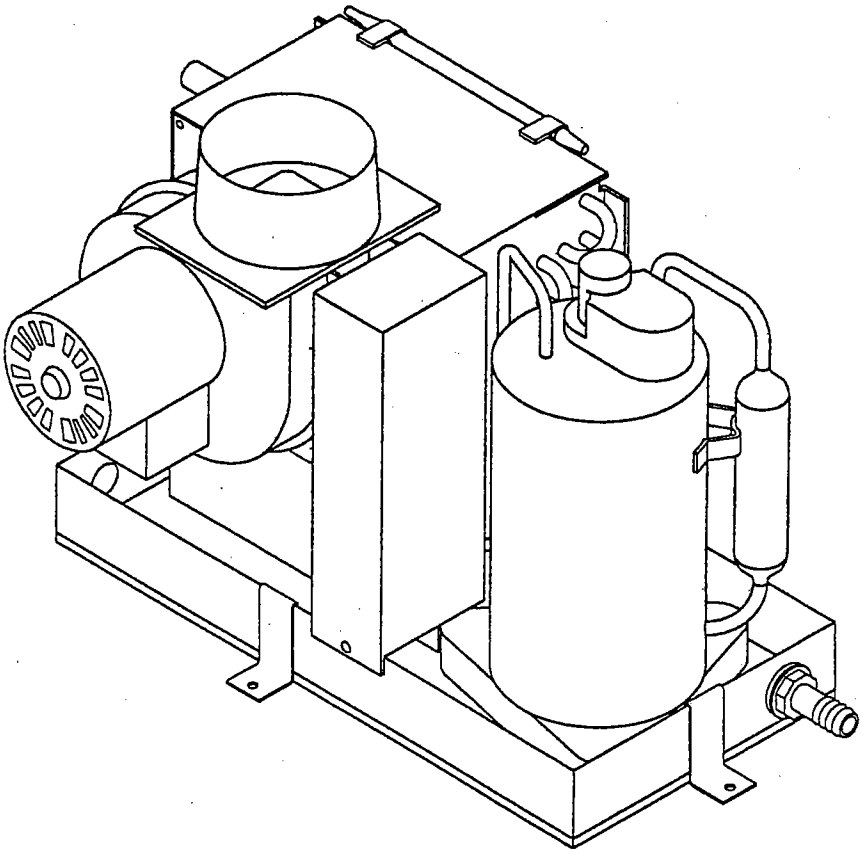
cool mate

INSTALLATION, OPERATION & MAINTENANCE



Patent Number: 5,848,536

MARINE AIR SYSTEMS®

AIR

A Member of

THE TAYLOR MADE GROUP

4/99

PREFACE

Congratulations on the purchase of your Marine Air Systems' COOL MATE. No matter which of the following features was the reason for your purchase of this air conditioner, we are sure it will meet your needs and will give you many years of efficient and trouble free use. The COOL MATE units are self-contained direct expansion air conditioners designed for marine applications incorporating the following features:

- High efficiency rotary compressor
- Cupro-nickel condenser coil
- Raised lance fin designed evaporator coil
- 1¾" deep drain pan with multiple condensate drain locations
- Stainless steel anti-vibration base pan
- Rotatable circulating blower motor
- Charge Guard® protection to insure integrity during handling and installation

This manual is intended to provide the information necessary to ensure proper installation, operation, and maintenance of the unit. Improper installation or misunderstood operating procedures can result in unsatisfactory performance and/or premature failure of these units, so before proceeding ***please read this manual completely.***

The Cool Mate units are covered under the existing Marine Air Systems' warranty policy contained in this manual. In the interest of product improvement, Marine Air Systems' specifications and design are subject to change without prior notice.

CLEAN AIR ACT AMENDMENTS OF 1990 [TITLE VI - SECTION 608(C-1)]

"Effective July 1, 1992, it shall be unlawful for any person, in the course of maintaining, servicing, repairing, or disposing of an appliance or industrial process refrigeration, to knowingly vent or otherwise knowingly release or dispose of any Class I* or Class II** substance used as a refrigerant in such appliance (or industrial process refrigeration) in a manner which permits such substance to enter the environment. De minimis releases associated with good faith attempts to recapture and recycle or safely dispose of any such substances shall not be subject to the prohibition set forth in the proceeding sentence."

*Class I substances include CFC-12

**Class II substances include HCFC-22

MARINE AIR SYSTEMS

Marine Air Systems, Inc. (MAS) is a manufacturer of air conditioning and refrigeration equipment for the marine industry. MAS is committed to innovative technology, competitively priced products and market leadership. The MAS team has many years of experience in the design, manufacture, application and support of marine air conditioning and refrigeration. Our practical experience and design capability allows our application engineers and sales representatives to offer optimum solutions for your environmental control requirements. Marine Air Systems, Inc. is ***A Member of the Taylor Made Group***$_{TM}$.

REVISION HISTORY

ORIGINAL PRINT: January 1997 Part Number: 297-200006 Document Name: coolmate.wpd
REVISED: 2/97, 5/97, 1/98, 3/99, 4/99

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INSTALLATION

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INSTALLATION KITS

INSTALLATION

UNPACKING AND INSPECTION

When the equipment is received, all items should be carefully checked against the packing list to ensure all cartons have been received. Move units in the normal "up" orientation as indicated by the arrows on each carton. Examine cartons for shipping damage, removing the units from the cartons if necessary. If the unit is damaged, the carrier should make the proper notation on the delivery receipt acknowledging the damage.

CAUTION: When unpacking and installing the 2 knob control, care must be taken not to kink or break the copper cap tube when uncoiling the sensing bulb. The cap tube is hollow and kinking or sharp bends will inhibit system operation.

SAFETY CONSIDERATIONS

Never install your air conditioner in the bilge or engine room areas. Insure that the selected location is sealed from direct access to bilge and/or engine room vapors. Do not terminate condensate drain line within three (3) feet 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.

Installation and servicing of this system can be hazardous due to system pressure and electrical components. When working on this equipment, always observe precautions described in the literature, tags and labels attached to the unit. Follow all safety codes. Wear safety glasses and work gloves and place a fire extinguisher close to the work area. The following is a summary of the labels on the unit:

! **DANGER** ELECTRICAL SHOCK HAZARD. DISCONNECT VOLTAGE AT MAIN PANEL OR POWER SOURCE BEFORE OPENING ANY COVER. FAILURE TO COMPLY MAY RESULT IN INJURY OR DEATH.

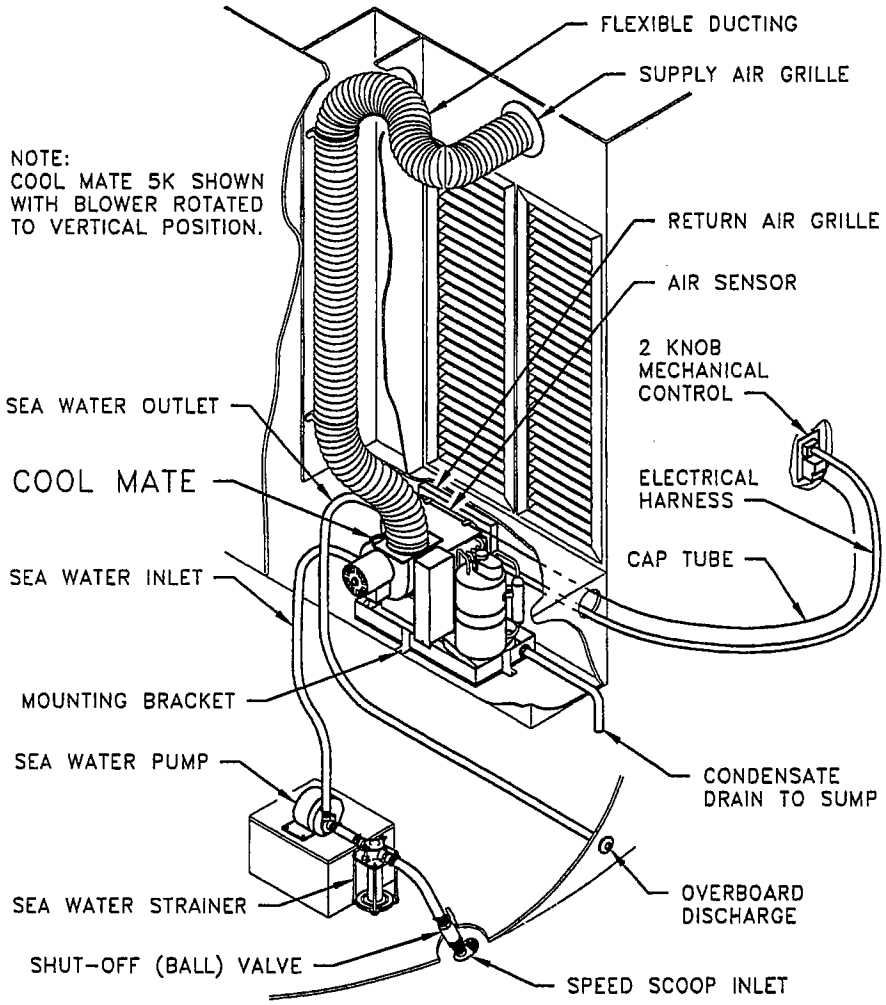
! **WARNING** THIS COMPONENT DOES NOT MEET FEDERAL REQUIREMENTS FOR IGNITION PROTECTION. DO NOT INSTALL IN SPACES CONTAINING GASOLINE ENGINES, TANKS, LPG/CPG CYLINDERS, REGULATORS, VALVES OR FUEL LINE FITTINGS. FAILURE TO COMPLY MAY RESULT IN INJURY OR DEATH

NOTICE THIS COMPONENT IS CHARGED WITH HYDROCHLOROFLUOROCARBON (HCFC) REFRIGERANT R22. EFFECTIVE JULY 1, 1992 IT SHALL BE UNLAWFUL FOR ANY PERSON TO KNOWINGLY VENT OR OTHERWISE KNOWINGLY RELEASE ANY CLASS 1 (CFC) OR CLASS 2 (HCFC) SUBSTANCE AS A REFRIGERANT IN A MANNER WHICH PERMITS SUCH SUBSTANCE TO ENTER THE ATMOSPHERE PER THE CLEAN AIR ACT OF 1990. PUBLIC LAW 101-549 TITLE IV SECTION 608-C. FAILURE TO COMPLY MAY RESULT IN SEVERE PENALTIES, INCLUDING FINES AND IMPRISONMENT.

! **WARNING** TO MINIMIZE THE HAZARD OF ELECTRICAL SHOCK AND PERSONAL INJURY, THIS COMPONENT MUST BE EFFECTIVELY GROUNDED. REFER TO THE INSTALLATION GUIDELINES FOR FURTHER INFORMATION.

PLACEMENT OF SYSTEM

Selecting a good location for your air conditioner is the most important part of your preparations. Be sure to consider the size of the area you are cooling, the air distribution needs, and the size of the unit you have chosen. Keeping in mind that cool air has a tendency to fall, it is highly recommended that you locate the supply air grille as high as possible in the cabin. The diagram below shows the Cool Mate 5K unit with a single duct application. Refer to the back of this manual for a dual duct installation drawing, used with the 10K-16K units.



TOOLS REQUIRED

- Screw drivers
- Pliers
- Pipe wrench
- Wire cutters/crimpers
- Drill & 7/8" bit
- Jig saw
- Duct tape
- Electrical tape
- Teflon tape
- Bedding compound to seal thru hull fittings
- Hardware to secure unit, pump, strainer, grilles & control panel

The COOL MATE unit should be installed as low as possible, **BUT NEVER IN THE BILGE OR ENGINE ROOM AREAS. INSURE THAT THE SELECTED LOCATION IS SEALED FROM DIRECT ACCESS TO BILGE AND/OR ENGINE ROOM VAPORS.** Installing the unit as low as possible (such as under a V-berth, dinette seat or bottom of a locker) and ducting the supply air as high as possible, creates an ideal air flow condition. This type of installation will prevent short or premature cycling.

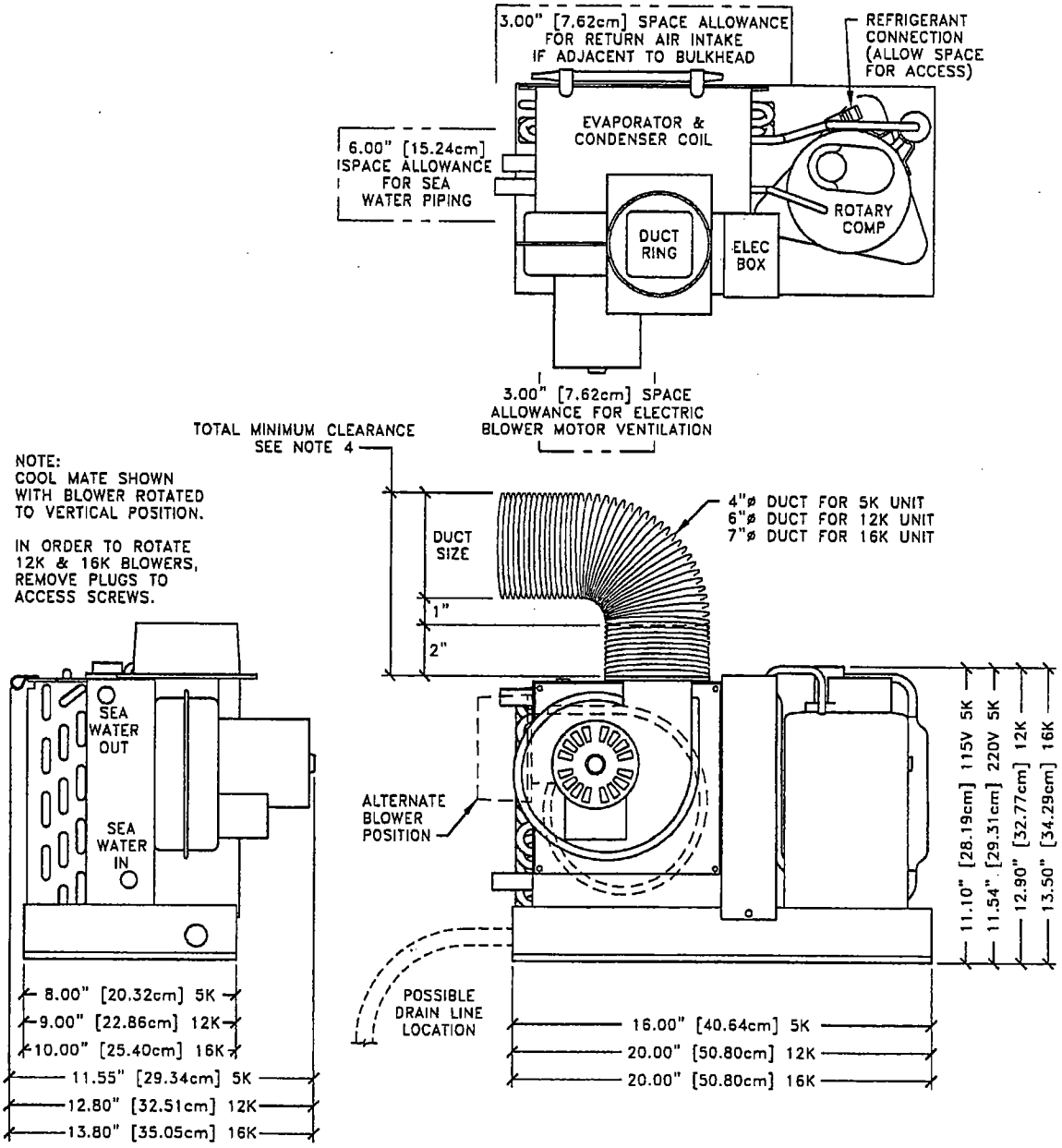
The unit should be positioned on a firm, level, horizontal surface and the condensate drain line should run downward from the unit to a suitable drain location. Plan all connections which must be made including ducting, condensate drain, seawater in and out, electrical power connections, location of control, and seawater pump placement, to assure easy access for routing and servicing.

SPACING ALLOWANCES & UNIT DIMENSIONS

The following space allowances should be considered when mounting the unit:

1) Allow a minimum of 6" around the perimeter of the unit in the area of the seawater and condensate drain piping.
2) Allow a minimum of 3" of air space in front of the evaporator coil for the return air intake if it is adjacent to a bulkhead.
3) Allow a minimum of 3" of air space for the electric blower motor ventilation.
4) For flexible ducting connection, allow 2" for the duct ring, 1" for the duct bend radius and add 4" or 6" for the diameter of the ducting to get the total distance as measured from the blower outlet. In other words, 7", 9" or 10" of clearance, depending on unit, is needed for the ducting connection (this also applies to clearance needed behind the supply air grille). Note that the blower and duct ring can be positioned either vertically or horizontally (see diagram below).

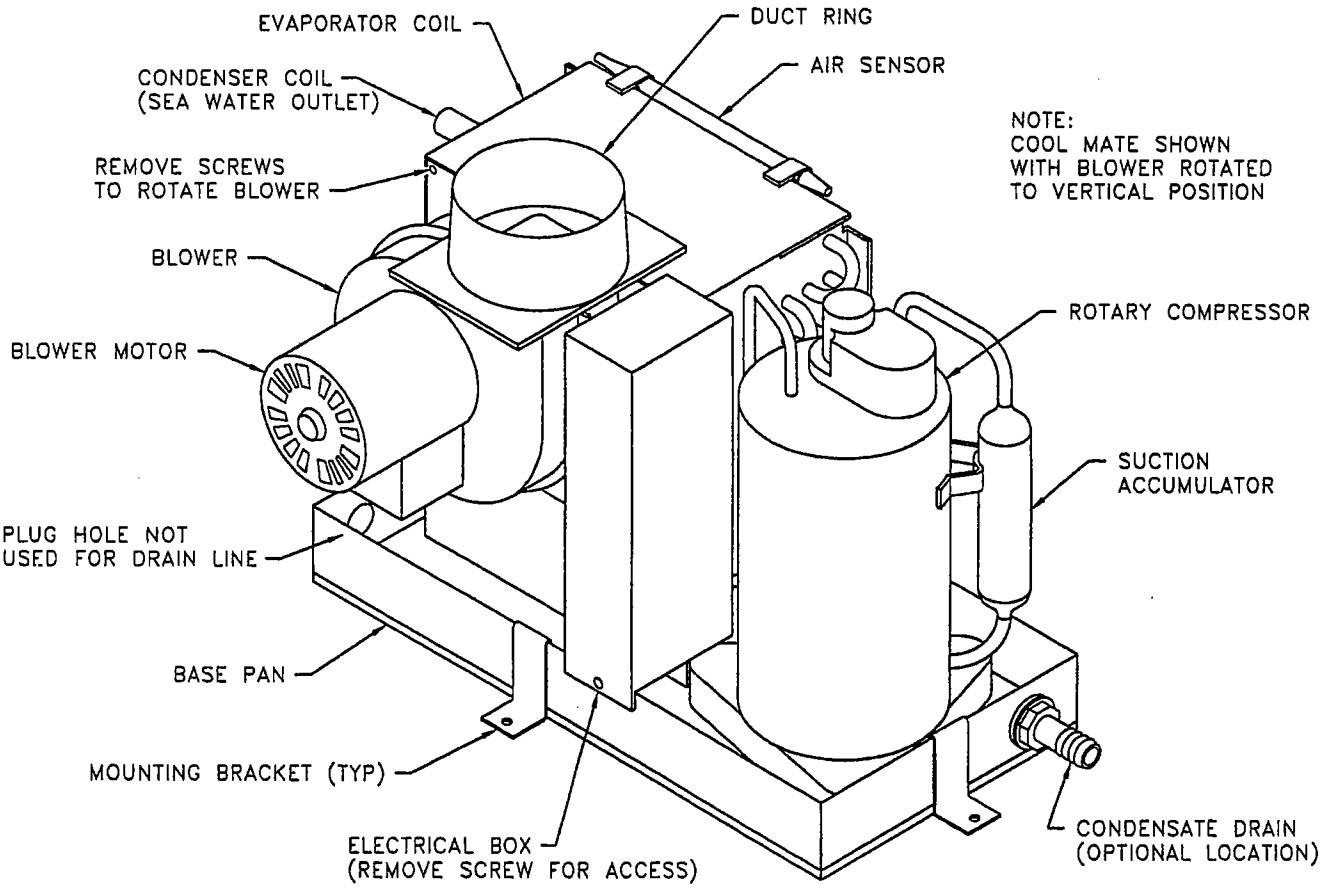
The above dimensions are suggested minimums. Enough space should be allocated for installation and serviceability. Below dimensions are for the 5K, 12K and 16K unit as specified, the 10K unit has the same dimensions as the 12K.



HOW IT WORKS

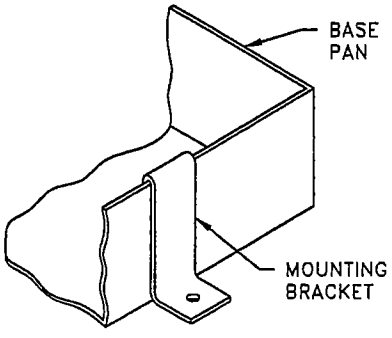
Your self-contained air conditioner consists of four main components and a refrigerant gas circulating through the system. The BLOWER draws warm cabin air across the fins on the EVAPORATOR where the heat from the air is transferred to the refrigerant in the evaporator coil. As the refrigerant evaporates from a liquid into a gas it absorbs the heat from the cabin air. The COMPRESSOR then compresses the refrigerant gas and pumps it through the outer tube in the CONDENSER COIL. The seawater pump circulates cool seawater through the inner tube in the condenser coil, this cools the refrigerant and condenses it into a liquid. The heat from the refrigerant is exchanged to the seawater and discharged overboard. The liquid refrigerant is then passed through the EVAPORATOR COIL and the cycle repeats. Removing heat from the cabin air lowers its temperature. The cooled air is blown through the ducting and out the supply air grille(s).

COOL MATE OVERVIEW

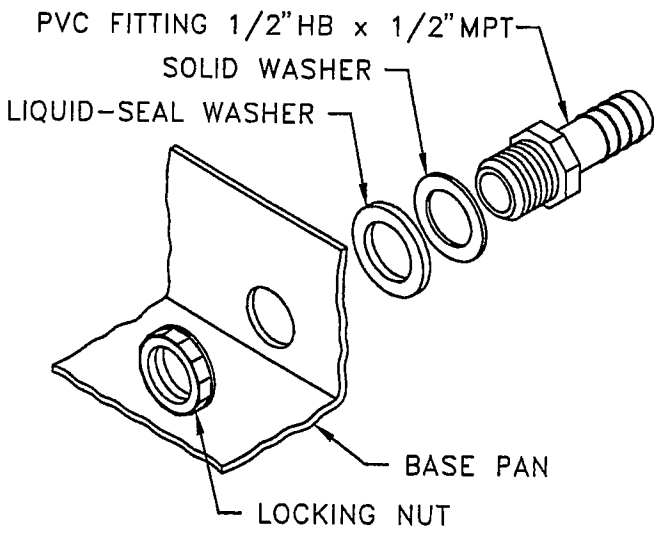


MOUNTING BRACKETS

The a/c unit is supplied with a base pan which also serves as a condensate pan. Mounting clip brackets and screws (4) are provided to secure the base pan onto a flat, horizontal surface.



CONDENSATE DRAINS



The condensate drain pan is 1¾" high with two drain locations. During conditions of high humidity, condensate may be produced at a rate of approximately ½ gallon per hour. With this in mind, it is important to route condensate drains downward to a sump pump. It is not recommended to route condensate drains to the bilge. After the condensate drain installation is complete, test the installation by pouring a quart of water into the pan and checking for good flow.

For installation of the condensate drain:

1. Remove the aft facing watertight plug from the base pan of the a/c unit.
2. Slip the solid washer and the liquid-seal washer onto the PVC fitting in that order.
3. Connect the fitting through the exposed hole in the base pan with the locking nut.
4. Securely tighten with two (2) wrenches to provide a proper seal.
5. Attach a ⅝" I.D. reinforced hose to the hose barb and secure with stainless steel hose clamps.
6. Install the condensate drain hose downhill from the unit and aft to a sump.
7. Two drain fittings may be used and the hoses teed together provided there is a minimum 2" drop form the bottom of the base pan to the tee connection.

NOTE: DO NOT TERMINATE CONDENSATE DRAIN LINE WITHIN THREE (3) FEET 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.

BLOWER ASSEMBLY

With the COOL MATE, you can achieve horizontal or vertical supply air discharge by rotating the blower as desired. Its design allows the blower to be rotated by removing the screws holding the blower plate to the evaporator coil shroud. Rotate the blower to allow the most direct flow of air to the supply air grille. **To rotate the 10-16K blowers, remove the two plastic plugs for access to the mounting screws.**

SUPPLY & RETURN AIR GRILLES

As previously indicated, install the supply air grille(s) as high as possible and the return air grille as low and close to the COOL MATE as possible to insure direct uninterrupted airflow to the evaporator. The cut out for the 4" supply air grille is 4" in diameter, the flange is 5½" in diameter. The cut out for the rectangular transition box used with the 10& 12K units is 12½" by 6½" and 14½" by 6½" for the 16K unit. Connect the 6" or 7" oblong duct ring to the transition box by first placing the ring on the box and tracing the hole. Cut the oblong hole out of the box. Secure the ring to the box with rivets (trim ¼" from ring flanges if necessary). Completely seal the joint between ring and box with silicone. A minimum clearance of 3" plus the duct diameter size is required behind the grille for attaching the ducting (see page 3). The return air filter, mounted to the front of the evaporator, removes debris from the air prior to the air being drawn across the evaporator coil and fins. Dust and lint can clog and reduce air flow across the evaporator coil resulting in poor performance. See MAINTENANCE section for filter cleaning instructions.

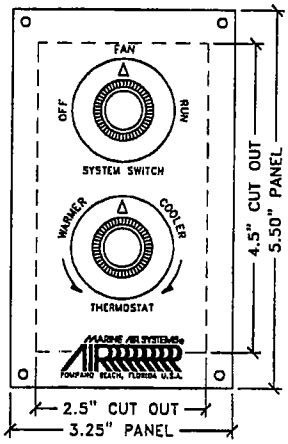
DUCTING

Good air flow 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 degree bends (two tight 90 degree bends can reduce airflow by 25%).

The following is a summary of proper ducting connections:

1. Pull back the fiberglass insulation exposing the inner mylar duct hose.
2. Slide the mylar duct hose around the mount ring until it bottoms out.
3. Screw 3 or 4 stainless steel sheet metal screws through the duct hose into the transition ring. Make sure to catch the wire in the duct hose with the heads of the screws. Do not use band clamps as the hose will slide off.
4. Wrap duct tape around the ducting and ring joint to prevent any air leaks.
5. Pull the insulation back up over the mylar to the ring and tape this joint.
6. Remove excess ducting and use the same connection method at the supply air grille.

2 KNOB MANUAL CONTROL PANEL (2KB MCP)



The 2 knob MCP should be located within 10' (cap tube length) of the COOL MATE unit. The cut out size for the MCP is 2.5" wide by 4.5" tall. Once the cut out is made, route the control wires and the cap tube with return air sensor (copper bulb) through the hole and back to the unit ***using caution not to kink the cap tube***. Slide the sensor into the mounting loops provided on the evaporator coil. Make electrical connections to the electrical box mounted on the unit. See OPERATION section for instructions.

ELECTRICAL CONNECTIONS, GROUNDING & BONDING

All Cool Mate units have a five position terminal strip mounted inside the electric box. The terminal strip is labeled for proper connections of the electrical supply, ground wires and pump circuits. Wiring diagrams are provided in the electrical box and in this manual. 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 to the seawater pump (see next paragraph). All connections to the terminal strip shall be made with ring terminals supplied with the Cool Mate kit. **Turn off a/c power supply circuit breaker before opening electrical box and accessing the terminal strip.**

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 on the unit. A minimum of 12 AWG boat cable should be used to extend the wires on the pump, if necessary, using the butt slices included with the kit. 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 (see the wiring diagram furnished with the PRP). Any electrical connections in the bilge below the waterline should use heat shrink type butt splices.

The a/c unit must be connected to the boat's bonding system to prevent corrosion due to stray electrical current. All pumps, metallic valves and fittings in the seawater circuit that are isolated from the a/c 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 current.

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

INVERTER APPLICATION WITH THE COOL MATE 5K

An inverter is essentially the reverse of a battery charger, it converts 12VDC power into 115VAC power through the use of electrical circuitry and a step up transformer. When using an inverter in an air conditioning application, the compressor locked rotor (start-up) amperage determines the peak power output required and therefore the size of the inverter. The continuous power requirement of the air conditioner, the output of the alternator and the capacity of the selected battery(ies) determines the available run times.

To choose an inverter for your application, there are several characteristics you should consider. A minimum of 3300 watts of peak power is required. You should choose a larger inverter if you plan on utilizing any other AC equipment while the air conditioner is running. Remember that the Cool Mate 5K compressor will cycle on and off, briefly using the peak capacity with every restart. Specific inverter characteristics such as battery charging capability, voltage frequency and physical size should also be considered. The Cool Mate 5K has been tested and approved for use with both line frequency and high frequency inverters. The continuous current required to run the Cool Mate 5K and a seawater pump is 4.7 amps (measured at 88°F seawater and 82°F free air return with standard 115VAC commercial power).

Storage batteries should maintain a full charge on standard 55 amp alternators. Do not use your normal starting battery to power the inverter! Utilizing three small storage batteries in parallel will result in longer endurance than one large storage battery of equal capacity due higher efficiencies at lower currents. Proper battery cable and terminal sizes are critical for both safety and efficiency. The Cool Mate 5K will draw between 40 and 50 amps DC depending on the battery charge and other ambient conditions.

Note: Inverter use is not practical with the Cool Mate 10K, 12K or 16K units.

NOTICE AND ABYC STANDARDS:

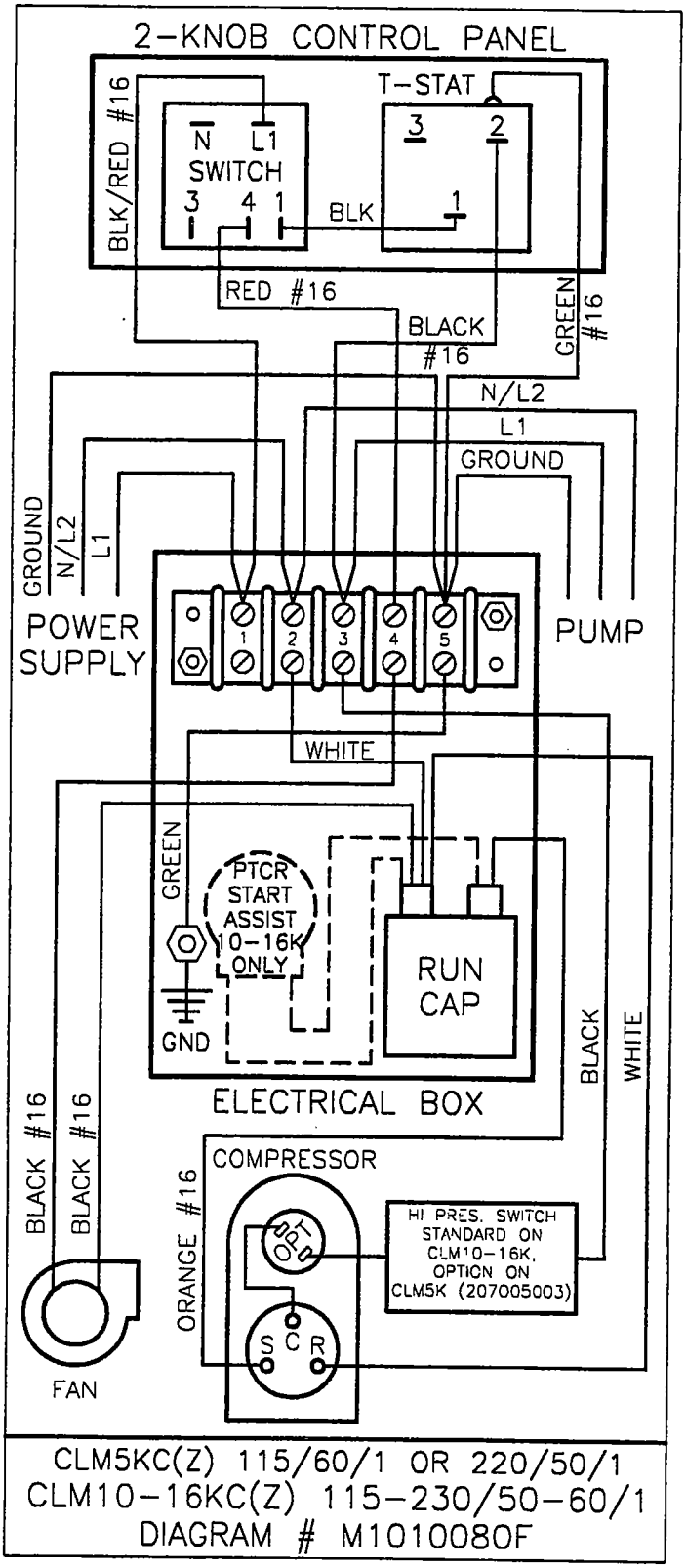
Field wiring must comply with ABYC (American Boat and Yacht Council) electrical standards. Power to the unit must be within the operating voltage range indicated on the data plate. Properly sized fuses and circuit breakers must be installed for branch circuit protection. See equipment rating plate for maximum size. All a/c units must be effectively grounded to minimize the hazard of electric shock and personal injury. The following standards apply:

1. AC (alternating current) 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.
2. Connections between the vessel's AC system grounding conductor (green wire) and the vessel's DC (Direct Current) negative or bonding system should be made as part of the vessel's wiring, per ABYC standard E-9.
3. When servicing or replacing existing equipment containing 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
3069 Solomon's Island Road
Edgewater, MD 21036
Telephone: (410) 956-1050

REV	DATE	REVISION	DWG	APR
D	1/12/99	ADDED 16K TO DESCRIPTION	RMW	D D
E	2/17/99	MOVED TERM STRIP INTO BOX	RMW	D D
F	4/23/99	REV DESCR. TO INCLUDE 10K, (CAD031-99)	RMW	R P

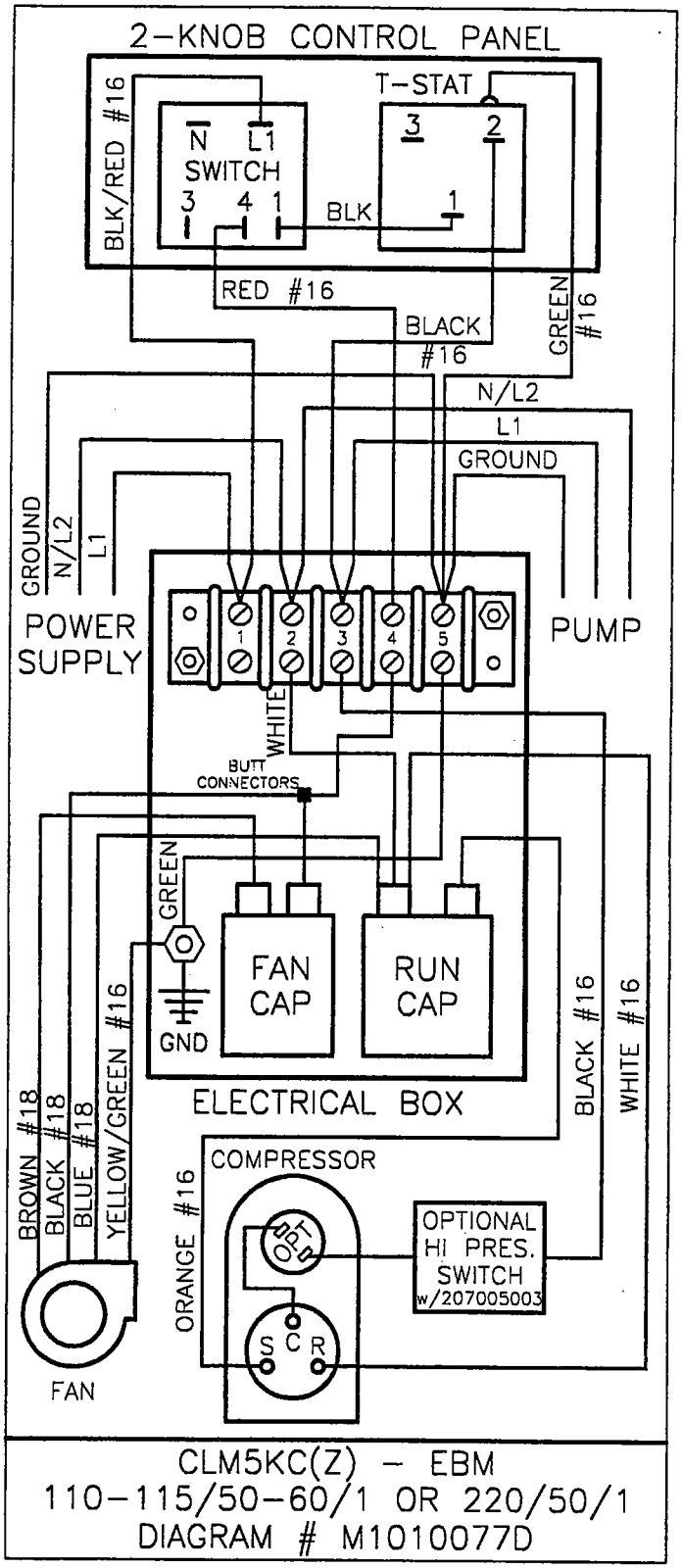


ALL WIRES ARE 12 GA UNLESS OTHERWISE NOTED.

CLM5KC(Z) 115/60/1 OR 220/50/1
CLM10-16KC(Z) 115-230/50-60/1
DIAGRAM # M1010080F

DATE: 8/25/97	CLM5KC(Z) 115/50-60HZ/1ø OR 220/50HZ/1ø CLM10-16KC(Z) 115-230VAC/50-60HZ/1ø	MARINE AIR SYSTEMS®
SCALE: N.T.S. (P)		
STATUS: CURRENT		
DRAWN BY: RMW / APPROVED BY: D D	DRAWING NO: M1010080F	

REV	DATE	REVISION	DWG	APR
A	1/23/98	CHANGED DESCR. FROM CMM TO CLM	RMW	
B		REVISED DESCRIPTION FOR VOLTAGE	RMW	
C	11/24/98	REVISED DESCRIPTION FOR VOLTAGE	DKM	D D
D	2/19/99	MOVED TERM STRIP INTO BOX	RMW	D D



CLM5KC(Z) - EBM
110-115/50-60/1 OR 220/50/1
DIAGRAM # M1010077D

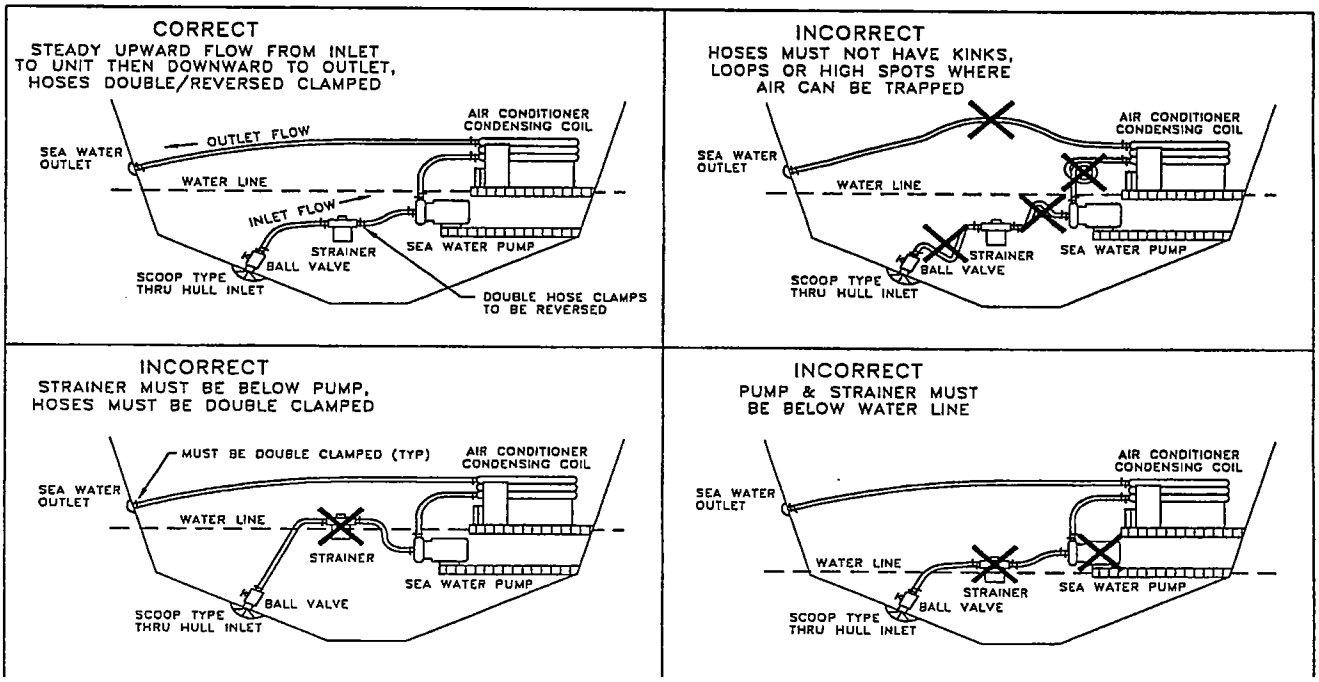
DATE: 7/23/97	WIRING DIAGRAM CLM5KC(Z) - EBM SELF CONTAINED, COOL ONLY, 2-KNOB 110-115/50-60/1 OR 220/50/1	MARINE AIR SYSTEMS®
SCALE: N.T.S. (P)		
STATUS: CURRENT		
DRAWN BY: RMW / APPROVED BY: D D	DRAWING NO: M1010077D	POMPANO BEACH, FLORIDA, U.S.A.

SEAWATER PUMP AND PLUMBING

Several guidelines should be followed during the installation of the seawater system. Since the circulation pump is centrifugal and not self-priming, it must be mounted so that it is always at least one foot below the water line regardless of which tack the vessel is on. Pump may be mounted horizontally or vertically, however the discharge must always be above the inlet. Pump head should be rotated toward the direction of water flow. ***Install the seawater speed scoop intake as far below the water line and as close to the keel as possible in any application, but especially on a sail boat, to keep the intake in the water when the boat heels over so that air does not get into the system.*** The speed scoop intake must face forward and not be shared with any other pump. A seawater strainer is mandatory between the shut off valve (sea cock) and the pump to protect the pump from any foreign matter. ***Failure to install a seawater strainer will void the pump warranty***. The seawater system should be installed with an upward incline from the speed scoop & sea cock, through the strainer, to the inlet of the pump and then up to the inlet of the a/c unit's condenser coil. The discharge from the a/c unit should then run to the seawater outlet thru-hull fitting which should be located where it can be visually checked for water flow and as close as practicable to the waterline to reduce noise. All hose connections shall be secured by means of double/reversed stainless steel hose clamps. Use teflon tape on all threaded connections.

The following is a summary of the seawater system installation:

1. Install the speed 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 sea cock on the speed 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 sea cock and strainer with an uphill run of ⅝" 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 ⅝" hose. Connect the discharge from the condenser coil to the overboard discharge thru-hull fitting with ⅝" hose.
7. Avoid loops, high spots or the use of 90° elbows with seawater hose (each 90° elbow is equivalent to 2.5' of hose and a 90° elbow on the pump outlet is equivalent to 20' of hose).
8. Double clamp all hose connections with stainless steel clamps, reversing the clamps.
9. Use teflon 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.***



INSTALLATION CHECKLIST (review prior to and after installation)

Seawater cooling system

- ☐ Speed scoop located as far below the water line and as close to the keel as possible
- ☐ Shut off valve and speed scoop properly sealed and tight
- ☐ Seawater pump at least one foot below water line and securely mounted
- ☐ Strainer mounted below pump with access to filter
- ☐ Double/reversed stainless steel hose clamps on all hose connections
- ☐ Teflon tape on all threaded connections
- ☐ Hose runs uphill from speed scoop to strainer, pump and a/c unit
- ☐ Water flowing freely from overboard discharge while pump is running

Mounting

- ☐ Not in engine room or bilge areas, must be sealed away from exhaust or fumes
- ☐ Proper spacing allowed around unit
- ☐ Attached to solid level platform with four hold down clips provided
- ☐ Condensate drain routed aft and down hill to a sealed sump (not bilge)

Electrical

- ☐ All butt connections on pump wire tightly crimped and heat shrunk
- ☐ AC power source installed and grounded/bonded in accordance with ABYC standards
- ☐ Control wires connected to terminal strip with ring terminals
- ☐ 15 amp circuit breaker utilized for 115VAC power supply

Grilles and Ducting

- ☐ Supply air grille mounted as high as possible
- ☐ Return air grille mounted as low and as close to the unit as possible
- ☐ Return air grille mounted away from exhaust and bilge vapors
- ☐ Ducting is pulled taut, straight and properly connected with no excess

OPERATION

COOL MATE OPERATION

- ☐ Ensure seawater intake ball valve (sea cock) is open.
- ☐ Turn SYSTEM SWITCH control knob to OFF.
- ☐ Turn on the A/C circuit breaker. If the seawater pump has its own circuit breaker, turn that on too.
- ☐ Turn the SYSTEM SWITCH control knob to FAN, this energizes the fan.
- ☐ Turn THERMOSTAT control knob to the coolest position by rotating it fully clockwise.
- ☐ Verify that the fan is running and that there is steady airflow out of the supply air grille.
- ☐ Turn the SYSTEM SWITCH to RUN, this will start the compressor and seawater pump.
- ☐ Check for a steady solid stream of water from the overboard discharge.
- ☐ To set the thermostat allow sufficient time for the unit to cool the area to the desired temperature. When the area is sufficiently cooled, turn the thermostat knob slowly toward the center position until it clicks once. The thermostat is now set to maintain a constant temperature.
- ☐ If the unit does not appear to be operating properly, refer to troubleshooting guidelines.
  Note: Do not turn the unit off and immediately turn it back on. Allow at least 30 seconds for refrigerant pressure equalization.

TROUBLESHOOTING GUIDELINES

FAULT	POSSIBLE REASON	CORRECTION
System will not start	Air conditioner circuit breaker is off.	Turn circuit breaker on at ship's panel.
	Wiring at terminal strip is mis-wired.	Check wiring diagram; correct if necessary.
	Input line voltage is insufficient.	Check power source for proper voltage. Check wiring and terminals for proper sizes and connections.
No cooling.	Selector knob may not be in "cool" position.	Reset selector knob.
	Temperature set point is above ambient temperature.	Lower temperature setting.
	Obstructed water flow.	Clean seawater strainer. Check for good steady flow from overboard discharge.
	Pump may be air locked.	Remove hose from pump discharge to purge air from line.
	Coil iced.	See below.
Coil iced.	Thermostat set point is too low.	Check setting on temperature knob. If setting is extreme for conditions, raise set point.
	Improper air flow.	Clean return air filter or remove obstructions from return air stream.
		Check for crushed or restricted ducting. Ducting run must be as straight as possible, remove any excess ducting.
Short cycling compressor.	Cold supply air returning directly to return air grille.	Redirect supply air so that it is not directed into the return air stream.
System runs continuously.	Port hole or hatch open.	Close all port holes and hatches.
	Thermostat setting is excessive for conditions.	Raise thermostat setting to cycle compressor.

MAINTENANCE

Seawater Strainer

Insure that your pump receives adequate seawater flow by regularly cleaning the strainer basket. Periodically check the overboard discharge for a steady stream of water. Check seawater intake speed scoop for obstructions. Make sure hoses are not looped, kinked or crushed.

Condenser Coil Cleaning

Coils can become fouled over a period of time due to marine growth or scale build-up. This both obstructs water flow and prohibits proper heat transfer. To clean coils, flush with a 5% muriatic or hydrochloric acid and fresh water solution. Disconnect system hoses from coil and pump solution through until clean. Rinse with fresh water and reconnect hoses. Follow manufacturer's safety guidelines for all cleaning solutions.

Return Air Filters

Check the return air filter about once a month and clean as necessary. To clean the filter, remove it from the unit, rinse with water, air dry and reinstall.

Winterization

There are several methods of winterization, some of which work better than others. The four various methods employed using a 50/50 non-polluting biodegradable anti-freeze/water solution are:

1. Pumping of anti-freeze solution into the overboard thru-hull fitting, and discharging through the intake thru-hull fitting.
2. Use of the seawater pump to pump anti-freeze solution through the system and discharging through the overboard thru-hull fitting. Close sea cock, remove hose from strainer discharge, raise hose above pump (so pump does not lose its prime) and pour in anti-freeze solution. Pump solution through system. The strainer and hose to sea cock will also need to be drained of water.
3. Use of pressurized air injected at the overboard discharge fitting and the water being discharged through the seawater intake fitting.
4. Use of pressurized air to force water from the intake through the overboard discharge.

Note: Collect all discharged liquids and recycle or dispose of in a proper manner.

Any method which causes the anti-freeze solution to flow downward is the method of choice. By this means, the anti-freeze solution will displace any water trapped and eliminate the possibility of freezing in hidden areas.

In addition, since the seawater pump utilizes a magnetically driven impeller, the impeller should be removed from the wet end assembly, wiped with an alcohol solution, and stored in a warm, dry area until commissioning takes place.

MANUFACTURERS LIMITED WARRANTY AGREEMENT

The following warranty is extended to cover the COOL MATE series of self-contained air conditioners manufactured or supplied by Marine Air Systems Inc., and is subject to qualifications as indicated.

Marine Air Systems warrants for the periods set forth below that products manufactured or supplied by it will be free from defects in workmanship and material, provided such products are installed, operated and maintained in accordance with Marine Air Systems' written instructions.

ALL IMPLIED WARRANTIES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO THE TERMS AND PERIODS OF WARRANTY SET FORTH BELOW AND, TO THE EXTENT PERMITTED BY LAW, ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED.

Components comprising a complete system or a new installation are covered by a limited one (1) year warranty from date of installation, but not to exceed two (2) years from date of manufacture. Labor costs are covered for six (6) months from the date of installation. OEM installed systems are warranted for a period of one (1) year from the date of sale of the vessel. Warranty will be paid in accordance with our established schedule of allowances.

Marine Air Systems Inc. will repair or replace at its option, components found to be defective due to faulty materials or workmanship, when such components, examined by an authorized service dealer or a factory service representative, are found to have a defect for which the company is responsible. In addition, Marine Air Systems will pay labor costs as outlined in its Schedule of Limited Warranty Allowances for removal and re-installation of such components. Refer to Manufacturer's Limited Warranty Policy for complete coverage and exclusions. Replacement components are warranted for the duration of the remaining warranty period in effect on the original component.

This limited warranty is extended in lieu of all other warranties, agreements or obligations, expressed or implied, concerning Marine Air Systems' components. This limited warranty is extended only to the original purchaser and is not transferable. This warranty shall be governed by the laws of the State of Florida and gives the original first end user definite legal rights.

This warranty does not cover damages incidental and or consequential to the failure of Marine Air Systems' equipment including but not limited to; normal wear, accident, misuse, abuse, negligence or improper installation, lack of reasonable and necessary maintenance, alteration, civil disturbance or act of God.

No person or dealer is authorized to extend any other warranties or to assume any other liabilities on Marine Air Systems' behalf, unless made or assumed in writing by an officer of Marine Air Systems.

US Distributors

Alabama
Arkansas
Colorado
Kansas
Mississippi
Missouri
Nevada
New Mexico
Oklahoma
Texas
Utah

AER Marine Supply
2301 Nasa Road One
Seabrook, TX 77586
Contact: Richard S. Miller
Tel: (800) 767-7606
(281) 474-3276
Fax: (281) 474-2714
E-mail: rsmiller@aersupply.com
Website: www.aersupply.com

Georgia
Northern Florida
North Carolina
South Carolina
Tennessee

Beard Marine Savannah
3101 River Drive
Savannah, GA 31404
Contact: Lynn Stork
Tel: (800) 286-2674
(912) 356-5222
Fax: (912) 692-1006
E-mail: beardsav@aol.com
Website: www.beardmarine.com

Illinois
Indiana
Iowa
Kentucky
Michigan
Minnesota
Ohio
Wisconsin

Midwest Marine Supply
24300 Jefferson Avenue
St. Clair Shores, MI 48080
Contact: Dan Gruninger
Tel: (810) 778-8950
Fax: (810) 778-6108

Idaho
Montana
Oregon
Washington
Wyoming

American Marine Contractors
8313 46th Place West
Mukilteo, WA 98275
Contact: Gene Lawing
Tel: (206) 660-2240
Fax: (425) 740-0246
E-mail: glawing@earthlink.net

Delaware
Maryland
Pennsylvania
Virginia

Ocean Options - Mid Atlantic
2830 Solomons Island Road
Edgewater, MD 21037
Contact: Mike Bowden
Tel: (800) 400-8043
(410) 266-8033
Fax: (410) 841-2461
E-mail: Sales@oceanoptions.com
Website: www.oceanoptions.com

New York
New Jersey

Marine Specialists
2231 5th Avenue, Unit 17
Ronkonkoma, NY 11779
Contact: Mike Budney
Tel: (631) 580-0545
Fax: (631) 580-0551
E-mail: Sales@marinespecialists.com
Website: www.marinespecialists.com

Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

Ocean Options
95 Riverside Drive
Tiverton, RI 02878
Contact: Mike Bowden
Tel: (401) 624-7334
Fax: (401) 624-8050
E-mail: Sales@oceanoptions.com
Website: www.oceanoptions.com

Arizona
California
Mexico

A to Z Marine Services
2330 Shelter Island Drive
Suite 104
San Diego, CA 92106
Contact: David Wicks
Tel: (619) 224-1606
Fax: (619) 226-0496
E-mail: dwicks@atozmarine.net

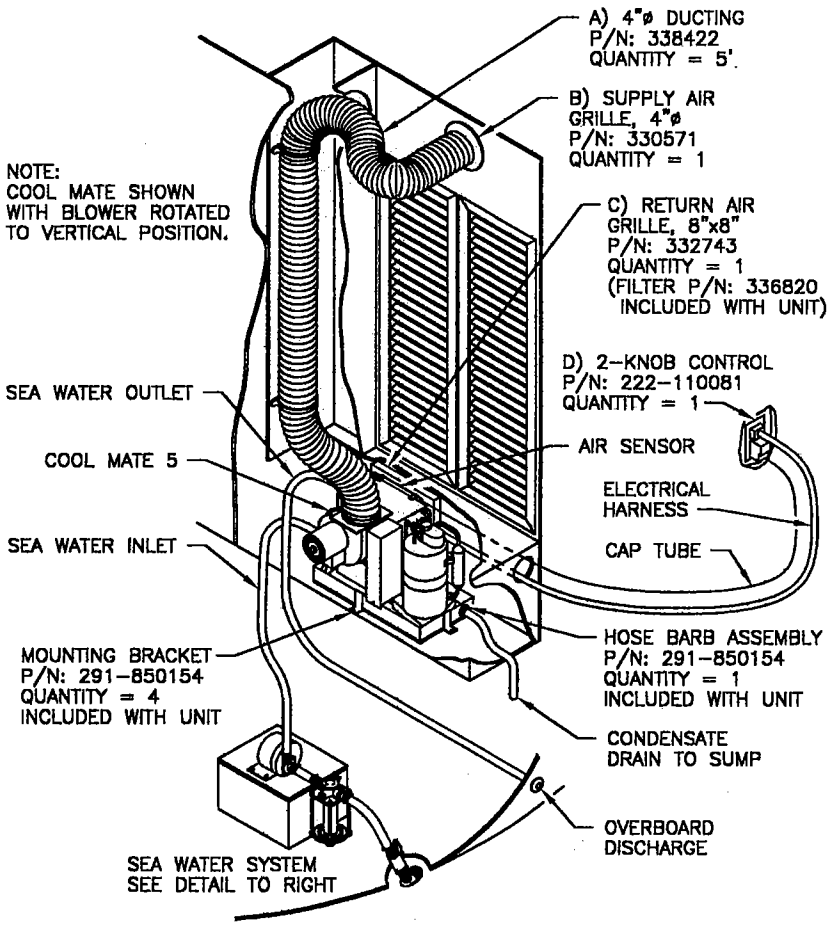
International

Please contact us for other international dealers & distributors.

MARINE AIR SYSTEMS COOL MATE 5K KITS

CLM5KC 115V KIT P/N 207-005005 OR CLM5KCZ-50 220V/50ø KIT P/N 207-005007 INCLUDES SEA WATER & SINGLE DUCT KITS (DUAL DUCT KIT OPTIONAL)
(INDIVIDUAL PART NUMBERS: CLM5KC 115V P/N 207-005000 OR CLM5KCZ-50 220V/50ø P/N 207-005004,
MCP 2-KNOB 115V/220V CONTROL P/N 222-110081, SEA WATER & SINGLE DUCT KIT 115V P/N 225-600017 & 230V P/N 225-600018

DUCT KIT INSTALLATION

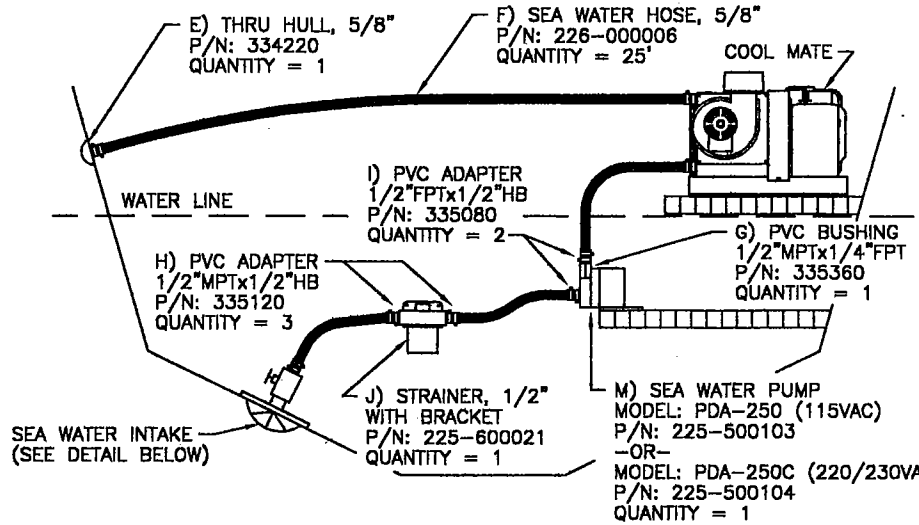


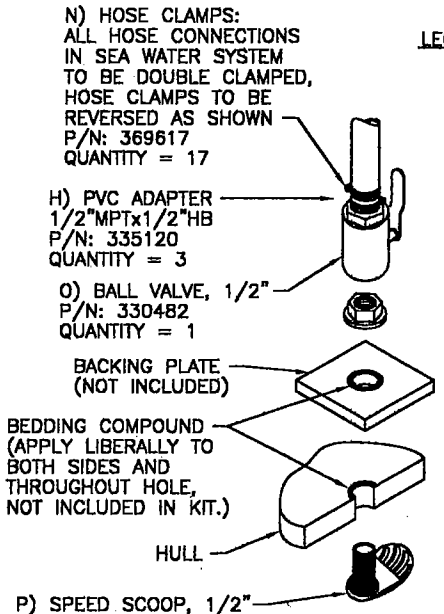
LEGEND:

	QTY	P/N	DESCRIPTION
A	5'	338422	DUCTING, INSULATED 4"
B	1	330571	GRILLE, CIRCULAR OFF WHT
C	1	332743	GRILLE, 8X8T-RA ANODIZED
D	1	222-110081	MCP 2-KNOB MECHANICAL CONTROL

INSTALLATION NOTES:
1) DO NOT INSTALL AIR CONDITIONER IN BILGE OR ENGINE ROOM AREAS, DO NOT TERMINATE CONDENSATE DRAIN LINE IN BILGE OR ANY AREA THAT MAY BE EXPOSED TO ENGINE OR GENERATOR EXHAUST FUMES. A/C UNIT MUST BE SEALED FROM ANY EXHAUST OR BILGE VAPORS.
2) INSTALL RETURN AIR GRILLE LOW AND SUPPLY AIR GRILLE HIGH.
3) SUPPLY AIR GRILLE SHOULD NOT BLOW TOWARD RETURN AIR GRILLE.
4) DUCTING SHOULD BE INSTALLED AS SMOOTH AND TAUT AS POSSIBLE, TRIM ANY EXCESS, AVOID ANY UNNECESSARY BENDS OR LOOPS.

SEA WATER KIT INSTALLATION





LEGEND	QTY	P/N	DESCRIPTION
E	1	334220	THRU HULL, 5/8" PLASTIC
F	25'	226-000006	HOSE SEA WATER 5/8"
G	1	335360	BUSH, PVC RED 1/2"MPTx1/4"FPT
H	3	335120	ADAPT, PVC 1/2"MPTx1/2"HB
I	2	335080	ADAPT, PVC 1/2"FPTx1/2"HB
J	1	225-600021	STRAINER W/BRACKET 1/2"FPT
K	-	N/A	
L	-	N/A	
M	1	225-500103	PUMP, PDA-250 115V SEA WATER
		225-500104	PUMP, PDA-250C 220/230V SEA WATER
N	17	369617	CLAMP, HOSE #06SS THIN
O	1	330482	BALL VALVE 1/2" SS HNDL (BRONZE)
P	1	369699	STRAINER, SPEED SCOOP 1/2" BRONZE
Q	3	338439	TERMINAL BUTT SPLICE 16-14
R	6	336750	TERMINAL RING 10-12 YELLOW

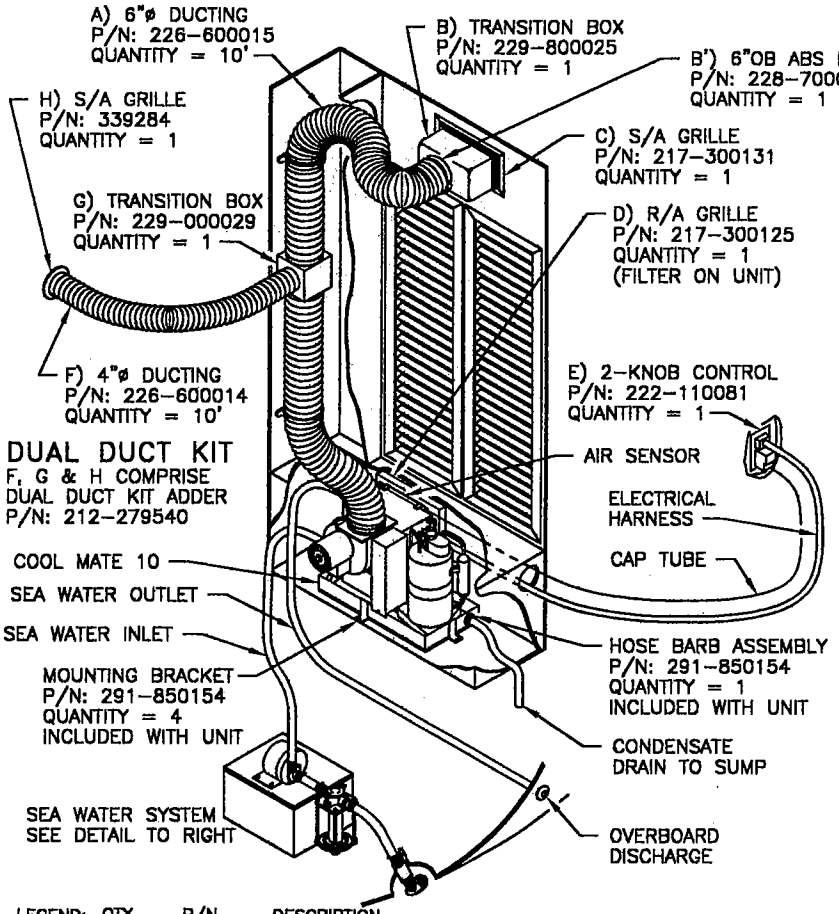
NOTES:
1) SEA WATER SYSTEM MUST HAVE A STEADY UPWARD FLOW FROM INLET TO AIR CONDITIONER.
2) HOSES MUST NOT HAVE KINKS, LOOPS OR HIGH SPOTS WHERE AIR CAN BE TRAPPED.
3) PUMP AND STRAINER MUST BE BELOW WATER LINE AND STRAINER MUST BE BELOW PUMP.
4) SPEED SCOOP SHOULD BE INSTALLED AS FAR BELOW THE WATER LINE AND AS CLOSE TO THE KEEL AS POSSIBLE, FACING FORWARD.
5) AVOID OR MINIMIZE 90° BENDS OR ELBOWS AS MUCH AS POSSIBLE, ROTATE PUMP HEAD TOWARD DIRECTION OF WATER FLOW.
6) ELECTRICAL CONNECTIONS USING ITEMS Q & R ARE TO BE DONE BY QUALIFIED PERSONNEL ONLY.

CLM5K DWG # M1030023F 08/24/01

MARINE AIR SYSTEMS COOL MATE 10K KITS

CLM10KC 115V KIT P/N 207-005024 OR CLM10KCZ 230V KIT P/N 207-005025 INCLUDES SEA WATER & SINGLE DUCT KITS (DUAL DUCT KIT OPTIONAL)
(INDIVIDUAL PART NUMBERS: CLM10KC 115V P/N 207-005010 OR CLM10KCZ 230V P/N 207-005011, MCP 2-KNOB CONTROL P/N 222-110081
SEA WATER & SINGLE DUCT KIT 115V P/N 225-600022 & 230V P/N 225-600023, DUAL DUCT KIT ADDER P/N 212-279540)

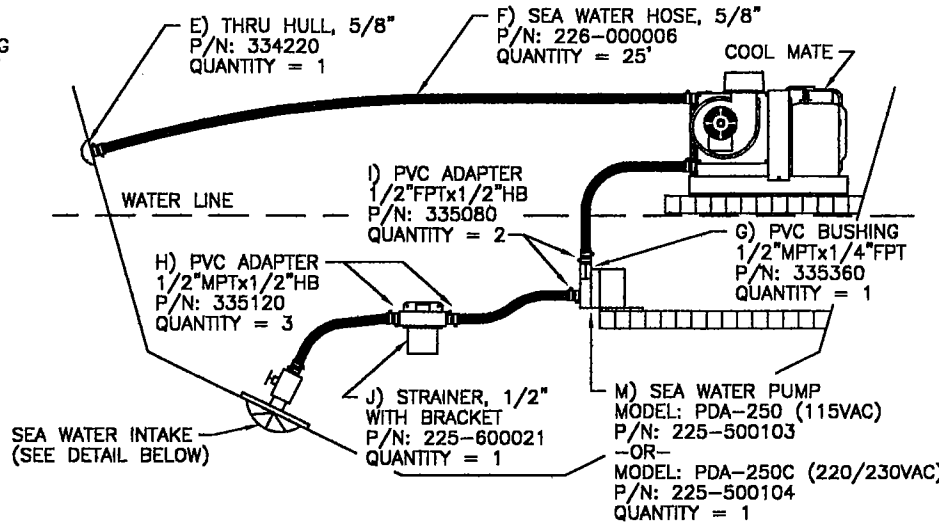
DUCT KIT(S) INSTALLATION

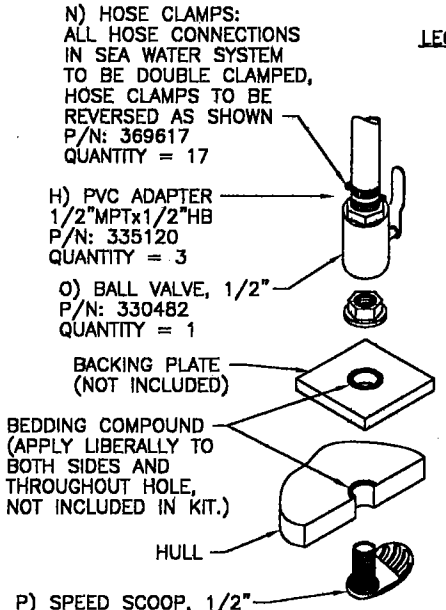


LEGEND:	QTY	P/N	DESCRIPTION
A	10'	226-600015	6" DUCTING, INSULATED FLEXIBLE
B	1	229-800025	TRANSITION BOX ABS 12x6x4.5
B'	1	228-700017	6" ABS OBLONG TRANSITION RING
C	1	217-300131	12x6TV ALUM SUPPLY AIR GRILLE
D	1	217-300125	12x12TRA ALUM RETURN AIR GRILLE
E	1	222-110081	MCP 2-KNOB MECHANICAL CONTROL
DUAL DUCT KIT ADD-ON (F-H) P/N: 212-279540			
F	10'	226-600014	4" DUCTING, INSULATED FLEXIBLE
G	1	229-000029	TRANSITION BOX AE/B6.D6.E4-Z X33
H	1	339284	4SA GRILLE, 4" ROUND WHITE CLOSABLE

INSTALLATION NOTES:
1) DO NOT INSTALL AIR CONDITIONER IN BILGE OR ENGINE ROOM AREAS. DO NOT TERMINATE CONDENSATE DRAIN LINE IN BILGE OR ANY AREA THAT MAY BE EXPOSED TO ENGINE OR GENERATOR EXHAUST FUMES. A/C UNIT MUST BE SEALED FROM ANY EXHAUST OR BILGE VAPORS.
2) INSTALL RETURN AIR GRILLE LOW AND SUPPLY AIR GRILLE HIGH.
3) SUPPLY AIR GRILLE SHOULD NOT BLOW TOWARD RETURN AIR GRILLE.
4) DUCTING SHOULD BE INSTALLED AS SMOOTH AND TAUT AS POSSIBLE, TRIM ANY EXCESS, AVOID ANY UNNECESSARY BENDS OR LOOPS.

SEA WATER KIT INSTALLATION





LEGEND	QTY	P/N	DESCRIPTION
E	1	334220	THRU HULL, 5/8" PLASTIC
F	25'	226-600006	HOSE SEA WATER 5/8"
G	1	335360	BUSH, PVC RED 1/2"MPTx1/4"FPT
H	3	335120	ADAPT, PVC 1/2"MPTx1/2"HB
I	2	335080	ADAPT, PVC 1/2"FPTx1/2"HB
J	1	225-600021	STRAINER W/BRACKET 1/2"FPT
K	-	N/A	
L	-	N/A	
M	1	225-500103	PUMP, PDA-250 115V SEA WATER
		225-500104	PUMP, PDA-250C 220/230V SEA WATER
N	17	369617	CLAMP, HOSE #06SS THIN
O	1	330482	BALL VALVE 1/2" SS HNDL (BRONZE)
P	1	369699	STRAINER, SPEED SCOOP 1/2" BRONZE
Q	3	338439	TERMINAL BUTT SPLICE 16-14
R	6	336750	TERMINAL RING 10-12 YELLOW

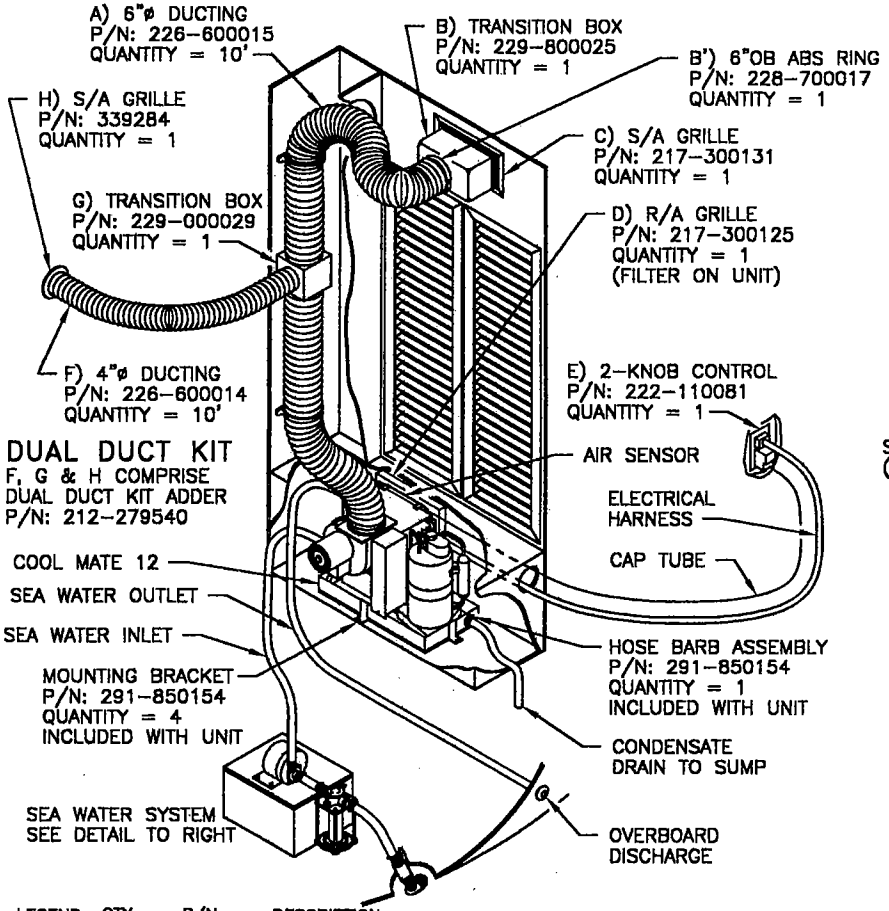
NOTES:
1) SEA WATER SYSTEM MUST HAVE A STEADY UPWARD FLOW FROM INLET TO AIR CONDITIONER.
2) HOSES MUST NOT HAVE KINKS, LOOPS OR HIGH SPOTS WHERE AIR CAN BE TRAPPED.
3) PUMP AND STRAINER MUST BE BELOW WATER LINE, STRAINER MUST BE BELOW PUMP AND ABOVE INLET.
4) SPEED SCOOP INLET SHOULD BE INSTALLED AS FAR BELOW THE WATER LINE AND AS CLOSE TO THE KEEL AS POSSIBLE, FACING FORWARD.
5) AVOID OR MINIMIZE 90° BENDS OR ELBOWS AS MUCH AS POSSIBLE, ROTATE PUMP HEAD TOWARD DIRECTION OF WATER FLOW.
6) ELECTRICAL CONNECTIONS USING ITEMS Q & R ARE TO BE DONE BY QUALIFIED PERSONNEL ONLY.

CLM10K DWG # M1030078A 08/24/01

MARINE AIR SYSTEMS COOL MATE 12K KITS

CLM12KC 115V KIT P/N 207-005014 OR CLM12KCZ 230V KIT P/N 207-005015 INCLUDES SEA WATER & SINGLE DUCT KITS (DUAL DUCT KIT OPTIONAL)
(INDIVIDUAL PART NUMBERS: CLM12KC 115V P/N 207-005012 OR CLM12KCZ 230V P/N 207-005013, MCP 2-KNOB CONTROL P/N 222-110081
SEA WATER & SINGLE DUCT KIT 115V P/N 225-600022 & 230V P/N 225-600023, DUAL DUCT KIT ADDER P/N 212-279540)

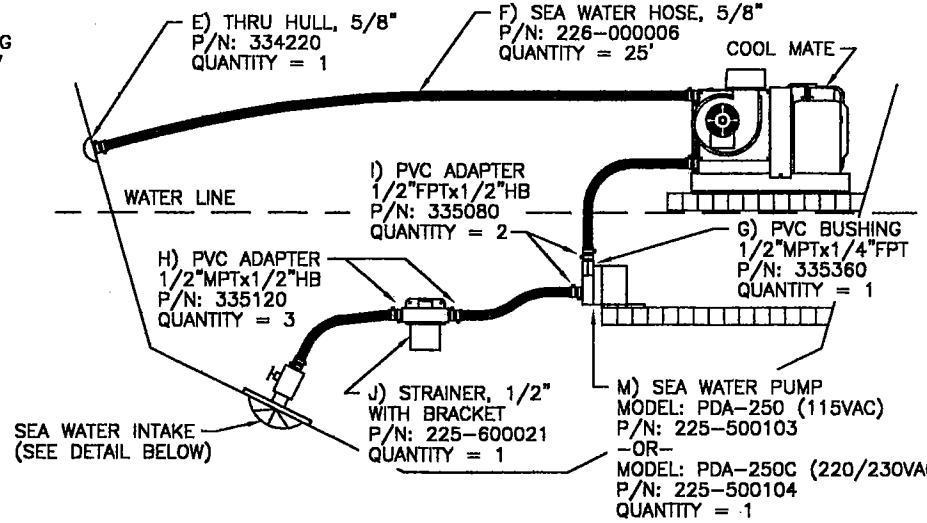
DUCT KIT(S) INSTALLATION

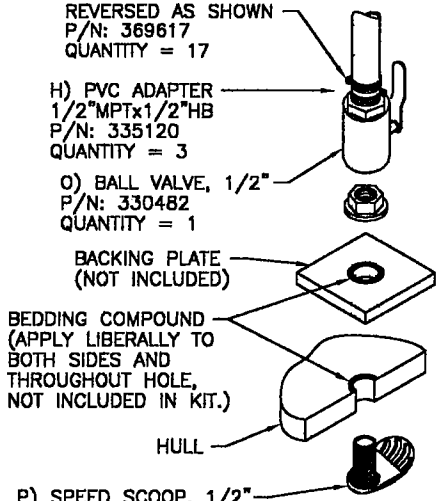


LEGEND:	QTY	P/N	DESCRIPTION
A	10'	226-600015	6" DUCTING, INSULATED FLEXIBLE
B	1	229-800025	TRANSITION BOX ABS 12x6x4.5
B'	1	228-700017	6" ABS OBLONG TRANSITION RING
C	1	217-300131	12x6TV ALUM SUPPLY AIR GRILLE
D	1	217-300125	12x12TRA ALUM RETURN AIR GRILLE
E	1	222-110081	MCP 2-KNOB MECHANICAL CONTROL
DUAL DUCT KIT ADD-ON (F-H) P/N: 212-279540			
F	10'	226-600014	4" DUCTING, INSULATED FLEXIBLE
G	1	229-000029	TRANSITION BOX AE/B6.D6.E4-Z X33
H	1	339284	4SA GRILLE, 4" ROUND WHITE CLOSABLE

INSTALLATION NOTES:
1) DO NOT INSTALL AIR CONDITIONER IN BILGE OR ENGINE ROOM AREAS. DO NOT TERMINATE CONDENSATE DRAIN LINE IN BILGE OR ANY AREA THAT MAY BE EXPOSED TO ENGINE OR GENERATOR EXHAUST FUMES. A/C UNIT MUST BE SEALED FROM ANY EXHAUST OR BILGE VAPORS.
2) INSTALL RETURN AIR GRILLE LOW AND SUPPLY AIR GRILLE HIGH.
3) SUPPLY AIR GRILLE SHOULD NOT BLOW TOWARD RETURN AIR GRILLE.
4) DUCTING SHOULD BE INSTALLED AS SMOOTH AND TAUT AS POSSIBLE, TRIM ANY EXCESS, AVOID ANY UNNECESSARY BENDS OR LOOPS.

SEA WATER KIT INSTALLATION





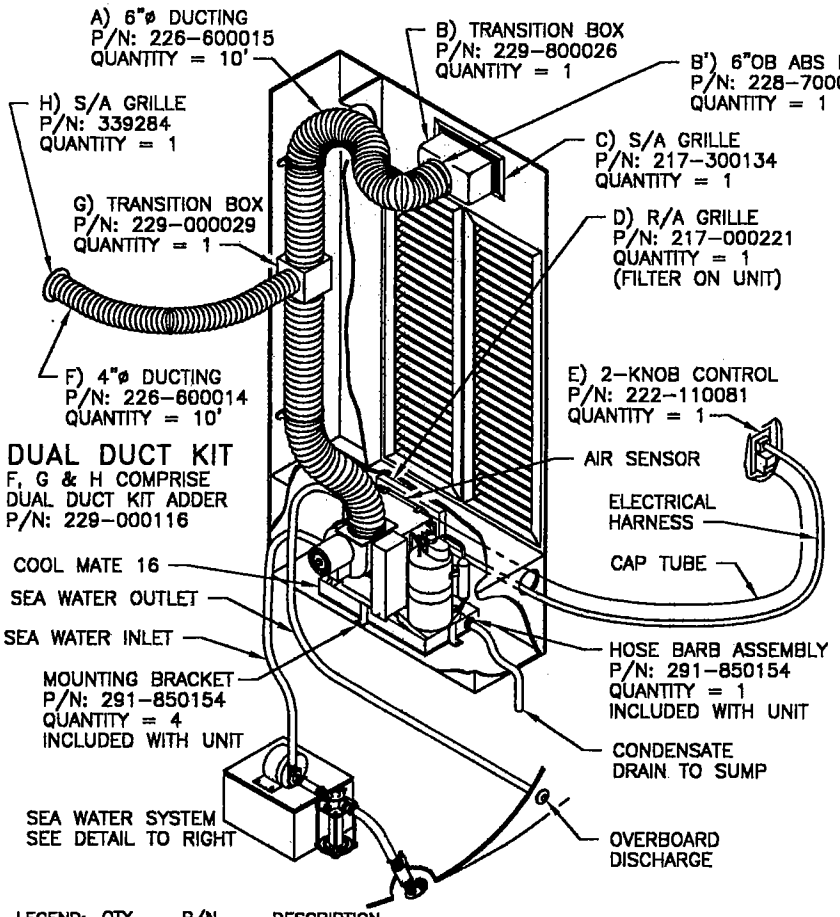
LEGEND	QTY	P/N	DESCRIPTION
E	1	334220	THRU HULL, 5/8" PLASTIC
F	25'	226-600006	HOSE SEA WATER 5/8"
G	1	335360	BUSH, PVC RED 1/2"MPTx1/4"FPT
H	3	335120	ADAPT, PVC 1/2"MPTx1/2"HB
I	2	335080	ADAPT, PVC 1/2"FPTx1/2"HB
J	1	225-600021	STRAINER W/BRACKET 1/2"FPT
K	-	N/A	
L	-	N/A	
M	1	225-500103	PUMP, PDA-250 115V SEA WATER
		225-500104	PUMP, PDA-250C 220/230V SEA WATER
N	17	369617	CLAMP, HOSE #06SS THIN
O	1	330482	BALL VALVE 1/2" SS HNDL (BRONZE)
P	1	369699	STRAINER, SPEED SCOOP 1/2" BRONZE
Q	3	338439	TERMINAL BUTT SPLICE 16-14
R	6	336750	TERMINAL RING 10-12 YELLOW

NOTES:
1) SEA WATER SYSTEM MUST HAVE A STEADY UPWARD FLOW FROM INLET TO AIR CONDITIONER.
2) HOSES MUST NOT HAVE KINKS, LOOPS OR HIGH SPOTS WHERE AIR CAN BE TRAPPED.
3) PUMP AND STRAINER MUST BE BELOW WATER LINE, STRAINER MUST BE BELOW PUMP AND ABOVE INLET.
4) SPEED SCOOP INLET SHOULD BE INSTALLED AS FAR BELOW THE WATER LINE AND AS CLOSE TO THE KEEL AS POSSIBLE, FACING FORWARD.
5) AVOID OR MINIMIZE 90° BENDS OR ELBOWS AS MUCH AS POSSIBLE, ROTATE PUMP HEAD TOWARD DIRECTION OF WATER FLOW.
6) ELECTRICAL CONNECTIONS USING ITEMS Q & R ARE TO BE DONE BY QUALIFIED PERSONNEL ONLY.

MARINE AIR SYSTEMS COOL MATE 16K KITS

CLM16KC 115V KIT P/N 207-005018 OR CLM16KCZ 230V KIT P/N 207-005019 INCLUDES SEA WATER & SINGLE DUCT KITS (DUAL DUCT KIT OPTIONAL)
(INDIVIDUAL PART NUMBERS: CLM16KC 115V P/N 207-005016 OR CLM16KCZ 230V P/N 207-005017, MCP 2-KNOB CONTROL P/N 222-110081
SEA WATER & SINGLE DUCT KIT 115V P/N 225-600024 & 230V P/N 225-600025, DUAL DUCT KIT ADDER P/N 229-000116)

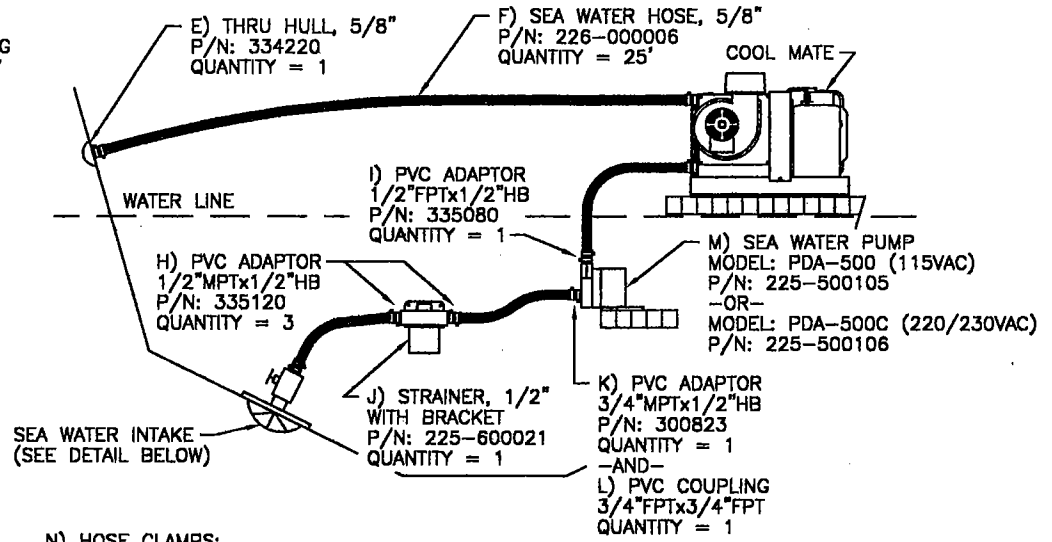
DUCT KIT(S) INSTALLATION



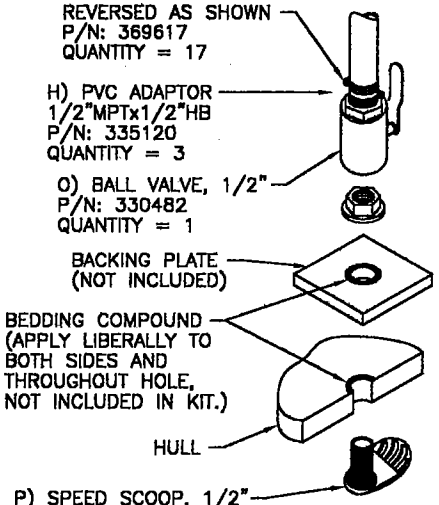
LEGEND:	QTY	P/N	DESCRIPTION
A	10'	226-600015	6" DUCTING, INSULATED FLEXIBLE
B	1	229-800026	TRANSITION BOX ABS 14x6x4.5
B'	1	228-700017	6" ABS OBLONG TRANSITION RING
C	1	217-300134	14x6TV ALUM SUPPLY AIR GRILLE
D	1	217-000221	14x12TRA ALUM RETURN AIR GRILLE
E	1	222-110081	MCP 2-KNOB MECHANICAL CONTROL
DUAL DUCT KIT ADD-ON (F, G & H) P/N: 216-139654			
F	10'	226-600014	4" DUCTING, INSULATED FLEXIBLE
G	1	229-000029	TRANSITION BOX AE/B6.D6.E4-Z X33
H	1	339284	4SA GRILLE, 4" ROUND WHITE CLOSABLE

INSTALLATION NOTES:
1) DO NOT INSTALL AIR CONDITIONER IN BILGE OR ENGINE ROOM AREAS. DO NOT TERMINATE CONDENSATE DRAIN LINE IN BILGE OR ANY AREA THAT MAY BE EXPOSED TO ENGINE OR GENERATOR EXHAUST FUMES. A/C UNIT MUST BE SEALED FROM ANY EXHAUST OR BILGE VAPORS.
2) INSTALL RETURN AIR GRILLE LOW AND SUPPLY AIR GRILLE HIGH.
3) SUPPLY AIR GRILLE SHOULD NOT BLOW TOWARD RETURN AIR GRILLE.
4) DUCTING SHOULD BE INSTALLED AS SMOOTH AND TAUT AS POSSIBLE, TRIM ANY EXCESS, AVOID ANY UNNECESSARY BENDS OR LOOPS.

SEA WATER KIT INSTALLATION



N) HOSE CLAMPS:
ALL HOSE CONNECTIONS IN SEA WATER SYSTEM TO BE DOUBLE CLAMPED, HOSE CLAMPS TO BE REVERSED AS SHOWN
P/N: 369617
QUANTITY = 17



LEGEND	QTY	P/N	DESCRIPTION
E	1	334220	THRU HULL, 5/8" PLASTIC
F	25'	226-600006	HOSE SEA WATER 5/8"
G	-	N/A	
H	3	335120	ADAPT, PVC 1/2"MPTx1/2"HB
I	1	335080	ADAPT, PVC 1/2"FPTx1/2"HB
J	1	225-600021	STRAINER W/BRACKET 1/2"FPT
K	1	300823	ADAPT, PVC 3/4"MPTx1/2"HB
L	1	332724	COUPLING, PVC 3/4"FPTx3/4"FPT
M	1	225-500105	PUMP, PDA-500 115V SEA WATER
		225-500106	PUMP, PDA-500C 220/230V SEA WATER
N	17	369617	CLAMP, HOSE #06SS THIN
O	1	330482	BALL VALVE 1/2" SS HNDL (BRONZE)
P	1	369699	STRAINER, SPEED SCOOP 1/2" BRONZE
Q	3	338439	TERMINAL BUTT SPLICE 16-14
R	6	336750	TERMINAL RING 10-12 YELLOW

NOTES:
1) SEA WATER SYSTEM MUST HAVE A STEADY UPWARD FLOW FROM INLET TO AIR CONDITIONER.
2) HOSES MUST NOT HAVE KINKS, LOOPS OR HIGH SPOTS WHERE AIR CAN BE TRAPPED.
3) PUMP AND STRAINER MUST BE BELOW WATER LINE, STRAINER MUST BE BELOW PUMP AND ABOVE INLET.
4) SPEED SCOOP INLET SHOULD BE INSTALLED AS FAR BELOW THE WATER LINE AND AS CLOSE TO THE KEEL AS POSSIBLE, FACING FORWARD.
5) AVOID OR MINIMIZE 90° BENDS OR ELBOWS AS MUCH AS POSSIBLE, ROTATE PUMP HEAD TOWARD DIRECTION OF WATER FLOW.
6) ELECTRICAL CONNECTIONS USING ITEMS Q & R ARE TO BE DONE BY QUALIFIED PERSONNEL ONLY.

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