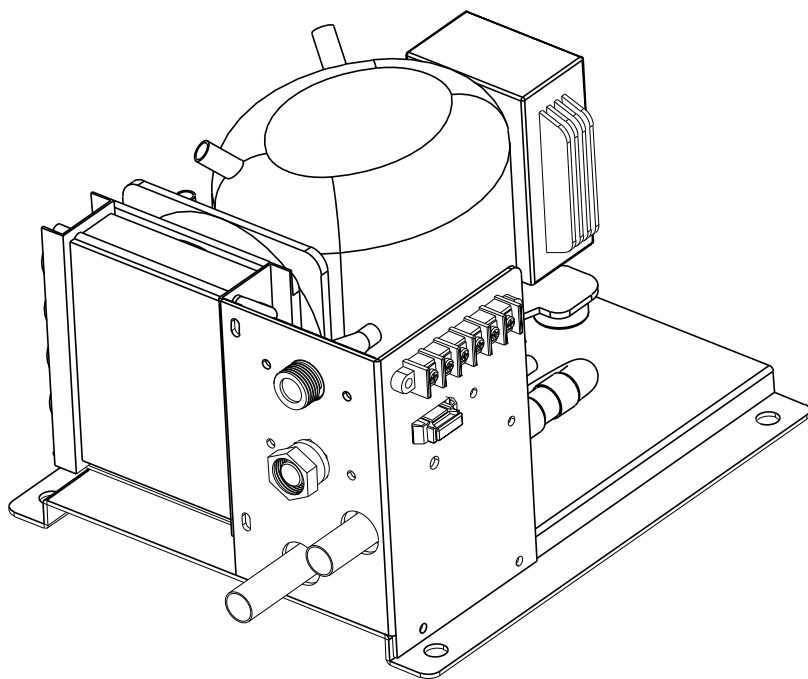


polar mate

Installation & Operation



 **Dometic**[®] 

Grunert Refrigeration Systems
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INTRODUCTION

Congratulations on the purchase of your Grunert® Polar Mate® 2001 Series. No matter which of the following features was the reason for your purchase of this refrigeration system, we are sure it will meet your needs and will give you many years of efficient and trouble free use. The Polar Mate units are high efficiency refrigeration systems designed for marine applications incorporating the following features:

- Cupronickel condenser coil on the water cooled units
- Hermetically sealed compressor for quiet efficient operation
- Models available in either 115VAC or dual voltage 12/24VDC
- Advanced compressor protection system
- LED diagnostic light for trouble shooting
- Units can be shelf or bulkhead mounted (with optional mounting bracket)
- Charge Guard® protection to ensure refrigeration circuit integrity during handling and installation
- Unit protected by built-in fuse
- Unit and evaporator plates equipped with Quick Connects and pre-charged with R134a
- Optional digital control
- Each unit is equipped with Leak View, an ultraviolet dye system which enables small leaks to be located visually with UV light.

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

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 Grunert brand, established in 1954, is manufactured for the marine industry by Dometic Corporation. Dometic is committed to innovative technology, competitively priced products and market leadership. The Grunert design team has many years of experience in the manufacture, application and support of marine refrigeration. Practical experience and design capability allow the application engineers and customer support team to offer optimum solutions for any refrigeration requirements.

Drawings and Diagrams

The figures that are referenced throughout this manual can be found immediately after the warranty section. In addition, some equipment will be shipped with specific installation sheets or wiring diagrams that may supercede the information located in this manual.

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 thermostat, 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

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.

Tools & Materials Required

- Screw drivers including stubby Phillips head
- 15/16" open-end wrench
- 7/8" open end wrench
- Wire cutter/crimper
- Drill with assorted bits including 1/8", 13/16" and 1-3/4" hole saw
- Hole punch
- Hammer
- Tape measure
- Jig saw
- Duct tape, electrical tape and teflon tape

The customer shall supply hardware to secure unit, pump strainer, grille, ducting, and thermostat. Bedding compound must be used to seal thru-hull fittings. If pump wire is not long enough to connect to unit, #16 gauge stranded tinned copper wire should be used.

Plan Ahead

- 1) Plan tubing and wire run before starting.
- 2) Consider location of thru-hulls, pump and plumbing for water cooled units.
- 3) Avoid getting dirt or moisture on coupling ends. Leave dust caps on until ready to connect.
- 4) Provide sufficient air circulation for air cooled condenser.
- 5) Use a dedicated 15 amp circuit breaker for a 12V System or use a dedicated 7.5 amp circuit breaker for a 24V System.

Locating and Installing the Evaporator

The evaporator should be mounted vertically on a side wall near the top of the box, accessible from the box opening. The evaporator may also be mounted horizontally on the top of a side loading box. See Figure 1 for evaporator mounting orientation. In positioning the evaporator consider:

- 1) The routing of the refrigerant lines out of the box.
- 2) Accessibility inside the box for securing a thermostat sensor to the side of the unit.

Use the evaporator mounting template to locate and mark the mounting holes. Tape the template in place on the desired wall. Mark the wall at the four holes indicated. Drill the four holes with a 1/8" drill bit (for best results, make a starter hole with a hole punch and hammer). Drill through the box surface into the insulation, but do not go completely through the insulation.

When the evaporator mounting holes are completed, locate the exit hole for the refrigerant lines. Use a 1^{3/4}" diameter hole saw to make a passage way through the box for the copper tubing. In locating the hole, consider the routing of the tubing, both inside and outside the box. Try to avoid sharp bends outside the box which will make it difficult to run the tubing to the condensing unit. **Before bending the tubing near the evaporator, slide back the insulation (away from the freezer) to expose the aluminum to copper transition joint. Do not make a hard bend at this location. The aluminum tube may be bent to a minimum of 1^{1/2}" radius by hand. Repeated bending should be avoided.**

Uncoil the refrigerant lines from the evaporator, passing the copper tubing progressively through the hole. To feed the coupling through, stagger them one behind the other. Route the refrigerant lines to the condensing unit location. Avoid flattening, kinking, or bending the tubing

sharply. The excess tubing should be recoiled in a horizontal plane and secured to prevent vibration. Mount the evaporator using the four 1 inch delron spacers with the four #10, 1¾" stainless steel screws and washers provided. A stick of latex putty is provided to seal the hole through the box wall.

If separate refrigerator and freezer compartments are desirable, the optional spillover fan kit or damper must be used. The spillover fan kit includes a thermostat that must be wired to the condensing unit. See the wiring diagram Figures 7 and 8 and the installation diagram Figure 6.

Thermostat Installation

When locating the thermostat make sure it is in a dry area and will not be subjected to damage. After mounting the thermostat housing, turn the control knob completely counterclockwise to the off position. Uncoil the required length of capillary tubing and secure the excess in a coil. Avoid bending or twisting the capillary tube repeatedly to prevent kinking or cracking the tube. The capillary tube should be clamped between the two plastic plates on the side of the evaporator compartment. **The capillary tube should not touch any part of the evaporator.**

Use the included wires to connect the thermostat to the condensing unit terminal strip marked "TSTAT." The thermostat completes a ground circuit for the relay, so polarity does not apply. If the spillover fan kit option is selected, connect the refrigerator thermostat and fan to the DC power input on the Polar Mate terminal strip per the wiring diagrams shown in Figures 7 and 8.

Locating and Installing the Condensing Unit

The Polar Mate series condensing units are available as an air cooled unit or a combination air/water cooled unit. The proper unit should be selected based on unit location, available power and efficiency requirements.

It is very important that the AIR COOLED unit has plenty of air ventilation. The unit must be installed in an area where the ambient air temperature is less than 95°F and there is at least 100 cubic feet of space in the enclosed area. If this criteria cannot be met, then the efficiency and capacity of the unit will be greatly reduced, and the optional ducting kit (or an air/water cooled unit) must be utilized. The fan on the condensing unit can be reversed to either blow air through or draw air across the condenser coil. The Polar Mate is shipped with the fan drawing air across the coil from the outside of the unit and across the compressor.

If the air cooled unit is located in a small enclosed area or a warm area (above 95°F ambient air temperature) then use the optional ducting kit. Connect the ducting to

the coil using the coupling enclosed in the optional ducting kit. Route the ducting to a cooler area and install the 4" round grille by cutting a 4" diameter hole through to the return air supply area. There should be a minimum clearance of 6" behind the grille to accommodate the ducting connection. See example, Figure 5.

No matter where the unit is mounted, there still needs to be adequate air ventilation through the area. In other words, the Air Cooled Polar Mate is not to be installed in an air tight area even if the optional ducting is used. There should be at least 50 square inches of open area for ventilation into the area in question.

The following is a summary of proper ducting connections:

1. Slide the duct hose around the mount ring until it bottoms out.
2. Screw 3 or 4 stainless steel sheet metal screws through the duct hose into the ring catching the wire in the duct hose with the heads of the screws. Do not use band clamps.
3. Remove excess ducting and use the same connection method at the grille.

The AIR/WATER COOLED unit must be installed above the seawater pump. The pump must be below the water line and above the strainer. The strainer must be installed above the sea cock. See Figure 3.

The condensing unit should be installed lower than the evaporator and there should be no vertical loops or traps in the copper tubing. If the copper tubing is longer than needed, coil the excess and secure it in a horizontal plane. Oil circulating with the refrigerant must be returned to the compressor; a downhill tubing run assists in this return. Keep the tubing clear of bilge water, steering cables and similar obstructions. Secure tubing approximately every 12" to prevent vibration or chafing.

The condensing unit can be either base mounted or bulkhead mounted by using the optional mounting flange. The condensing unit must be mounted upright.

Making the Refrigerant Connection

The evaporator is supplied with 15 feet of pre-charged copper tubing, terminating with self-sealing quick connect couplings, one male and one female. The condensing unit also has these couplings. By joining the quick connect couplings together, the refrigerant circuit is completed without any refrigerant being lost to the atmosphere.

Make certain all quick connect couplings are free of dirt and moisture when removing the dust caps. Save the caps in the event that one portion of the system should need to be removed for service.

Thread the clean couplings together by hand until you are sure the couplings are properly mated. Continue tightening with a 15/16" open end wrench (or suitably large crescent wrench) until positive resistance is felt. Remove the wrench and mark a single line (using a marker or pen) lengthwise along both couplings. Tighten the female coupling another 1/6 to 1/4 turn to insure a leak proof joint. If a torque wrench is used, apply 10-12 pounds of pressure.

REMINDER: Keep all lines away from any moving or sharp objects, avoid sharp bends, kinks, or flattening of tubing. See Figure 2.

Seawater System Installation - Water Cooled

The model P-800 seawater pump, supplied with the Grunert seawater kit, is recommended for the Polar Mate. This is a centrifugal pump and must be mounted below the water line. All plumbing for the pump, strainer, thru hull, and condensing unit should be 5/8" reinforced vinyl hose. All fittings should be double/reversed clamped with stainless steel hose clamps. The 5/8" reinforced hose used to plumb the system should be on an uphill grade from the intake thru hull, the sea cock, the seawater strainer, the pump, and then to the condensing unit in that order. By maintaining this upward slope, any air entering the thru hull will be able to travel unobstructed up and through the pump. If loops or traps are left in the circuit, the pump may become air-locked, causing poor performance, shutting down the system or causing component failure. The use of a forward facing clam shell scoop is mandatory to overcome the suction pressure (siphon effect) occurring when the boat is moving through the water.

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. Use a 13/16" drill bit for both thru-hull fittings. Sharing a thru hull for the pump circuit is not recommended because of the pump's tendency to pull both air and water out of the second circuit, and subsequently losing its prime. See Figure 3.

NOTE: A pump on/off switch should be used with an air/water cooled unit to turn the pump off while still using the refrigeration system air cooled condenser when the boat is hauled in dry dock.

For quiet vibration free operation, the pump assembly should be mounted to a solid surface. The mounting position of the pump should always be horizontal, with the discharge outlet oriented at the top of the wet end assembly.

Spillover System Operation

A spillover kit is used with a refrigerator/freezer configuration (one box divided into two compartments) as illustrated in Figure 6. The evaporator is installed in the freezer side of the box and the spillover fan/damper is installed in the dividing wall between the two compartments. When the refrigerator temperature rises above the set point, the spillover fan will start running and move cold air from the freezer side into the refrigerator side until the refrigerator thermostat is satisfied.

In order to achieve the proper performance of this system, please follow these guidelines:

Upon initial start up of this system the refrigerator thermostat must be off. Turn on the freezer thermostat to #6 and allow time for the freezer to reach approximately 25°F. Once the freezer reaches 25°F, set the refrigerator thermostat between #2 and #3. Do not set the refrigerator thermostat down to its lowest setting as that will cause freezing in the refrigerator and warmer temperatures in the freezer. Keep in mind in freezer box temperature is normal until the refrigeration thermostat is satisfied. Once the fan cycles off, the freezer temperature will gradually drop again.

You may experience long duty cycles depending on water and air temperatures and usage of the box. This system is not frost-free and will develop frost on the evaporator plate, which will require periodic defrosting. If it becomes necessary to defrost the plate, see the "Operation" section of this manual for instructions. After defrosting, turn the system on and repeat the above start up procedures.

Live-aboards may experience the need for more frequent defrosting due to the heavier use. Under these conditions they may also experience extended duty cycles.

The Boat DC Electrical System

A minimum of 100 amp hours of additional battery capacity should be provided for the refrigeration system, and more when cruising offshore for extended periods. Without this additional capacity, batteries may have to be recharged more than once a day. Deep cycle batteries are highly recommended because they are specifically designed for long life under deep discharge and cycling operations. A minimum of two batteries, one for engine starting and the other for the house, is required. For extended cruising, three batteries are recommended.

As batteries age, their peak voltage lowers and they discharge quicker. This, of course, can affect refrigerator performance as well as other DC devices. The battery condition should be maintained and monitored regularly and weak batteries should be replaced.

A battery isolator or selector switch between any two batteries will allow simultaneous charging while preventing the discharge of a fully charged battery into a depleted one.

Insure that all DC electrical connections are made in compliance with ABYC standards section E-9. Call ABYC at (410) 956-1050.

DC Electrical Wiring

The DC motor in the compressor runs by electronic commutation. Due to this design, it is necessary for the current to travel freely between the unit and battery. The unit should be connected directly to the battery selector switch terminals. Do not connect other electrical devices (i.e. AC or DC converters, generators, etc.) between the control unit, the selector switch, and the battery. Any deviation from this procedure could damage the compressor or the control module and would not be covered under the warranty policy in the back of the manual.

When connecting the electronic control module to the battery selector switch, maintain correct wire size as shown in the table below, keep wire runs as short as possible to avoid unnecessary resistance or voltage drop. Do not forget to maintain proper color coding, (red = positive, black = negative) to aid in future electrical troubleshooting. If the wires are incorrectly connected (positive and negative reversed), the unit will not start.

Over current protection in addition to fuse provided, must be supplied for the ungrounded conductor at the main switchboard, per ABYC E-9. Use a 15 amp breaker for 12 VDC systems, or a 7.5 amp breaker for 24 VDC systems. This provides protection from possible short circuits. **Because there is a constant milli-amp current applied to the control module even when the thermostat is off, it is recommended to turn the circuit breaker or toggle switch off to protect your battery from discharge when the unit is not in use.** When dockside, the Polar Mate can operate against the batteries while using the AC battery charger as a backup (most marine battery chargers will shut off when the battery is fully charged).

Use the included wires to connect to terminals #3 and #4 (#4 has two spades bridged together) of the thermostat to the condensing unit terminal strip positions marked "TSTAT." The thermostat completes a ground circuit for the relay, so polarity does not apply.

See the wiring diagram, Figure 7.

AC Electrical Wiring

Size AC voltage electrical system per ABYC E-8. Use minimum 14GA wires with maximum 15amp circuit breaker. See Figure 8.

DC Wire Size Table*

Distance from battery (power source) to Polar Mate	Total length of both positive and negative wires added together	Wire Size, AWG
7.5 feet and under	15 feet and under	#12
7.5 feet to 15 feet	15 feet to 30 feet	#10
16 feet to 20 feet	32 feet to 40 feet	#8
20 feet to 40 feet	40 feet to 80 feet	#6
40 feet to 60 feet	80 feet to 120 feet	#4

*Table derived from ABYC section E9, table 9 for 12 VDC systems. These specifications were calculated using 3% voltage drop and a maximum Polar Mate current draw of 9.1 amps.

OPERATION

Start Up

When the installation is complete, make a final inspection. Check all hoses for kinks and leaks. Disconnect the hose from the discharge port of the pump and open the sea cock until water flows through the pump and then reconnect the hose to the pump. Check wiring connections for correct polarity.

The thermostat control knob will rotate almost one complete revolution (turning it fully clockwise would be the coldest setting). Initially rotate the knob one-half turn. At this point, the unit will run until the box temperature satisfies the thermostat and then it will cycle off. Adjust the thermostat for warmer or cooler box temperatures as required.

The warmer the setting, the more efficient (less work being done) the condensing unit will operate. The coldest thermostat setting should be reserved for quicker pull down or ice making; this is best done while the alternator or battery charger are compensating for the load. Allow a reasonable time span for all warm food and liquid to chill.

See the section Spillover Systems Operation in this manual if applicable.

Protection System for DC Units Only

The Polar Mate compressor is equipped with an electronic protection system. The system is activated when the compressor is overloaded and fails to start for any reason. It is also activated if the batteries are under/over charged.

To avoid permanent battery damage due to deep discharge, the protection system will shut off the compressor when the input voltage drops below 10.4 volts for a 12 volt system or below 22.8 volts for a 24 volt system. If the voltage drops too low and cutout occurs, the compressor will not start again until the input voltage rises to 11.7 for the 12 volt system or 24.2 for the 24 volt system.

Defrosting

Turn the unit off by disconnecting power from the unit by switching the circuit breaker or toggle switch off. Open the door or hatch, remove drain plug and allow for defrosting. **Do not clear ice off of evaporator with a sharp metal object (ice pick, knife) as that will damage the evaporator and possibly puncture the refrigerant channel and cause a leak.** To speed up thawing, pour hot water over the evaporator or use a hair dryer to melt the ice. Wipe with a clean cloth and then replace the drain plug. The drain plug must be in place or heat and fumes can travel up the drain line from the bilge and contaminate the box.

If frost builds up quickly on the evaporator or the box, this would indicate a poor seal on the door or hatch gaskets.

MAINTENANCE

Seawater Strainer (Water & Air/Water Cooled Units)

Insure that your pump receives adequate seawater flow by regularly cleaning the strainer basket.

Winterization (Water & Air/Water Cooled Units)

There are several methods of winterization, some of which work better than others. The four various methods employed using a 50/50 nonpolluting biodegradable antifreeze/water solution are:

1. Close the sea cock and disconnect the hose, this will allow the water to drain from the system. Place hose in a large bucket to catch overflow. Pump or pour the antifreeze solution into the overboard discharge thru-hull fitting on the outside of the boat. When system is full of the antifreeze solution, replace hose onto sea cock.
2. Use of the seawater pump to pump antifreeze 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 antifreeze solution to flow downward is the method of choice. By this means, the antifreeze 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.

Air & Air/Water Cooled Units

Once a year, remove the condenser fan and clean the condenser coil fins with a soft bristled brush, be sure to brush up and down in line with the fins, or use a vacuum cleaner taking care not to bend the fins. Wipe the fan blades clean as needed.

Thermostats

Check terminal fittings and crimps to ensure tight and proper connections. Avoid the use of ammonia cleaning agents, which may cause the silver contacts to corrode and reduce the life of the thermostat.

Refrigerator/Freezer Boxes

Drain and clean box of excess water when system is shut down or while defrosting. Plug box drain after cleaning.

Condenser Coil Cleaning (Air/Water Cooled)

Coils can become fouled over a period of time due to marine growth or scale buildup. 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.*

Polar Mate Specifications

Specification	Measure	DC Air-cooled ⁽¹⁾	DC Air/Water ⁽²⁾	AC Air/Water ⁽²⁾
Capacity	Btu/hr	433	538	582
Power Consumption	Watt	65.4	68.5	212.8
Current Consumption (12VDC)	Amp.	5.45	5.71	1.85@115V
Current Consumption (24VDC)	Amp.	2.7	2.9	N/A
Sound power level at one meter	dB(A)	30	30	35
Displacement cu.in.(cc.)	0.15 (2.5)			

⁽¹⁾ compressor & fan

⁽²⁾ compressor, fan & pump

Technical Data

Evaporating temperature: -22°F to 23°F (-30°C to 5°C)
 Refrigerant R-134A charge: 6.0 oz. (113.4g) Polar Mate Air Cooled 12/24VDC
 6.5 oz. (141.7g) Polar Mate Air/Water Cooled 12/24VDC
 8.0 oz. (226.8g) Polar Mate Air/Water Cooled 115 VAC
 0.5 oz. (14.2g) Polar Evap (U-shaped evaporator plates)
 0.5 oz. (14.2g) Evap I (small 4-sided evaporator plate)
 0.5 oz. (14.2g) Evap II (large 4-sided evaporator plate)
 See data plate for charge on custom plates.
Note: Add Polar Mate charge plus evaporator plate charge for total system charge.

Refrigerant metering device: capillary tube 0.025" x 10.8' (0.63 x 3550 mm)

Voltage range: 12VDC: 10.4-17.0
 24VDC: 22.8-31.5
 115VAC: Do not operate below 100VAC

Condensing temperature: Max. 140°F (6°C) at stable conditions
 Max. 158°F (70°C) at peak load

Ratings Condition

	Air/Water Cooled	Air Cooled
Evaporating temperature	20°F (-6.7°C)	20°F (-6.7°C)
Condensing temperature	100°F (37.8°C)	120°F (48.9°C)

TROUBLESHOOTING

Fault: Compressor does not run.

Possible Reason/Correction

- 1. Too low a voltage on the condensing unit terminal, battery protection cutout (DC Only).**

Check to see if the lead wire gauge between unit and battery is correct. Is there a loose connection in the plug of the leads? Is there corrosion on the battery poles or on contacts?
- 2. Battery voltage too low (DC Only).**

Charge the battery.
- 3. Thermostat.**

Is the thermostat connected to terminal strip on condensing unit, and does thermostat function correctly?
- 4. Loose Fuse.**

Place fuse in firmly.
- 5. Blown fuse.**

Replace fuse and check for faults. Monitor current draw and confirm that it is normal.
- 6. Defective fuse on unit (DC Only).**

Replace fuse. If new fuse blows, the module may be defective.

Fault: DC Unit does not run.

Possible Reason/Correction

- 1. Defective compressor, fan or module**

First, check diagnostic LED for possible indications of problem. Disconnect the fan and pump relay. If the unit works the fan or the pump relay is defective.

Disconnect the module from the compressor. With an ohmmeter check the resistance readings between the three terminals, two at a time in all combinations. If there is no continuity between any two terminals then the compressor has failed. Ohm readings between each terminal should be close to the same.

Turn on the unit with the compressor disconnected. If the fan does not work, then the module is defective.

Replace the module. If the compressor does not work, then the compressor has failed.

Fault: AC Unit does not run.

Possible Reason/Correction

- 1. Defective compressor, thermostat or fan**

First, check voltage at unit. Make sure that voltage is returning to the terminal strip from the thermostat. If no power is present leaving the thermostat, and the thermostat is getting power, then check the settings to make sure that the thermostat is calling for the unit to run. If it is not, then properly set the thermostat. If the thermostat is properly set, but no power is leaving the thermostat, then replace thermostat. If power is coming back, then proceed to check the compressor. The fan should be running at this time. If it is not, then replace the fan.

Disconnect power from the unit. Pull the cover from the back of the compressor and remove the wires to expose the three compressor terminals. Pay attention where the wires were connected. With an ohmmeter check the resistance readings between the three terminals, two at a time in all combinations. Ohm reading between each terminal should be the same. There should be no reading from any terminal to the compressor shell. If there is no continuity between any two terminals or there is continuity to ground, then the compressor has failed. If the windings check good, then you may need to replace the start relay of the compressor.

Fault: Compressor does not run.

Possible Reason/Correction

- 1. Cut out on overload protection**

Disconnect thermostat or switch off for a few seconds and then switch on again. Determine if compressor starts.
- 2. Too high an ambient temperature.**

Lower the ambient temperature by improving ventilation around the unit, this can be achieved by installing the optional ducting kit.
- 3. Too high a condensing temperature.**

Clean the air and water cooled condenser coil. Check fan, pump, and seawater strainer.
- 4. AC unit start relay may be defective.**

Replace start relay.

Fault: Pump not operating.

Possible Reason/Correction

- 1. Dirty seawater strainer basket.**
Clean basket out.
- 2. Air lock in seawater system.**
Check hose for kinks, leaks, vertical bends or loops.
Make sure scoop is facing forward.
- 3. Loose connections on pump leads.**
Check wire leads and fix.

Fault: Radio or TV interference (DC Only).

Possible Reason/Correction

- 1. Unit not connected directly to battery.**
Connect unit directly to battery. Insert a 4mH coil at 0.5 amp in the lead to the radio and TV. Reroute power cables away from radio/TV cables.
- 2. Power cables inducing a magnetic field into radio/TV cables.**
Encase power cables in shielded jacket.

Flashing LED Diagnostic Light (DC Only)

No. of Flashes	Type of Error
1	Low battery voltage (less than 10.4V for 12V system or less than 22.8V for 24V system)
2	Fan/relay overload (fan load is 1 amp or more, fan load should be 0.5 amp max).
3	Compressor overload (rotor is blocked or refrigeration pressure is too high).
4	Motor RPMs too low (less than 1800 rpm due to refrigeration system being overloaded).
5	Overheated (refrigeration system is overloaded or the ambient temperature is too high).

MANUFACTURER'S LIMITED WARRANTY AGREEMENT

The following warranty is extended to cover the Polar Mate series of self-contained air conditioners manufactured or supplied by Dometic Corporation and is subject to qualifications as indicated.

Dometic Corporation 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 Dometic Corporation's 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, not to exceed two (2) years from the date of manufacture. Warranty will be paid in accordance with our established schedule of allowances.

Dometic Corporation will repair or replace at its option, components found to be defective due to faulty materi-

als 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, Dometic Corporation will pay labor costs as outlined in its Schedule of Limited Warranty Allowances for removal and reinstallation 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 Polar Mate components. This limited warranty is extended to the original purchaser and is transferable, providing original proof of purchase is shown. This warranty shall be governed by the laws of the State of Florida and gives the original, first, and end user definite legal rights.

This warranty does not cover damages incidental and or consequential to the failure of Dometic Corporation's 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 Dometic Corporation's behalf, unless made or assumed in writing by an officer of Dometic Corporation.

DESCRIPTION OF FIGURES

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- Fig. 2 Polar Mate Installation**
- Fig. 3 Seawater System Installation Diagram**
- Fig. 4 Polar Mate Overview**
- Fig. 5 Example of Air Cooled System**
- Fig. 6 Refrigerator/Freezer Configuration with Optional Spillover Kit**
- Fig. 7 Polar Mate Wiring Diagrams 12/24VDC**
- Fig. 8 Polar Mate Wiring Diagram 115VAC**
- Fig. 9 Polar Mate - Air & Air/Water Cooled Kits**

Fig. 1 Evaporator Orientation

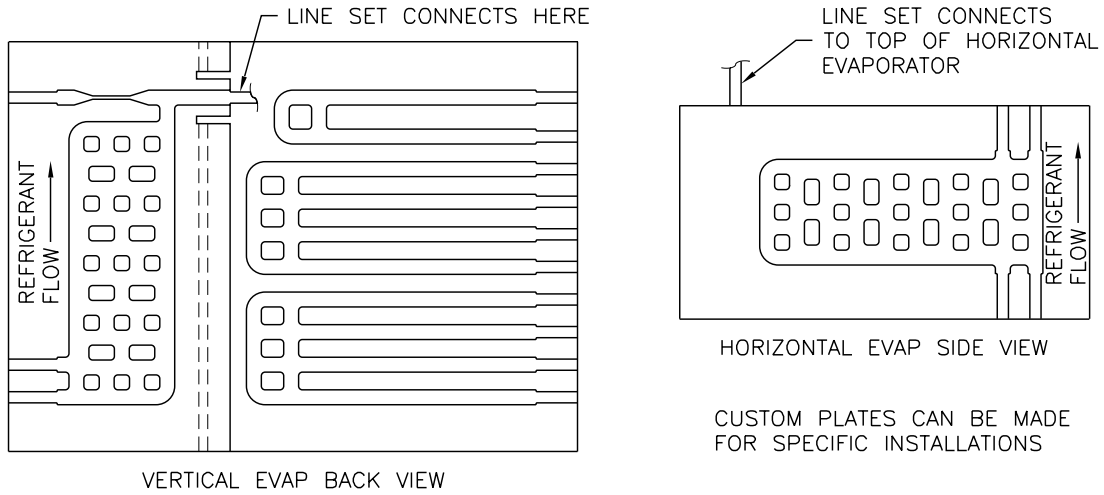


Fig. 2 Polar Mate Installation

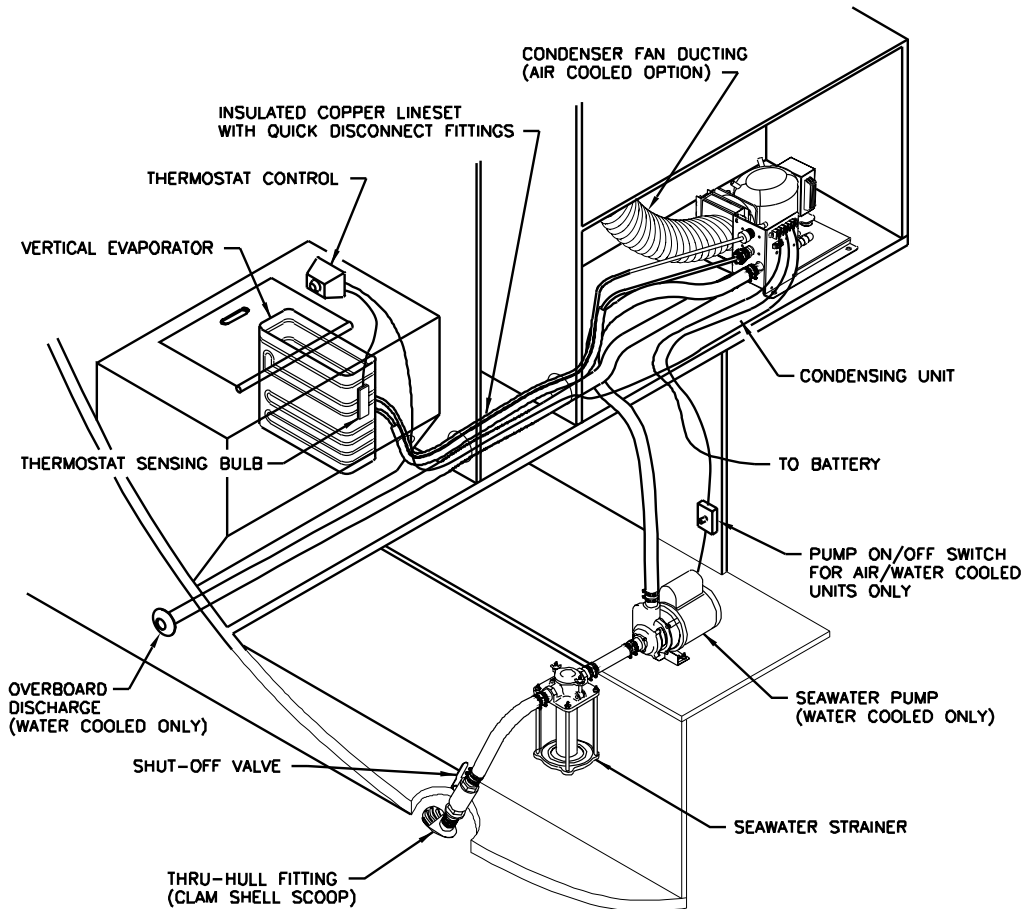


Fig. 3 Seawater System Installation Diagram

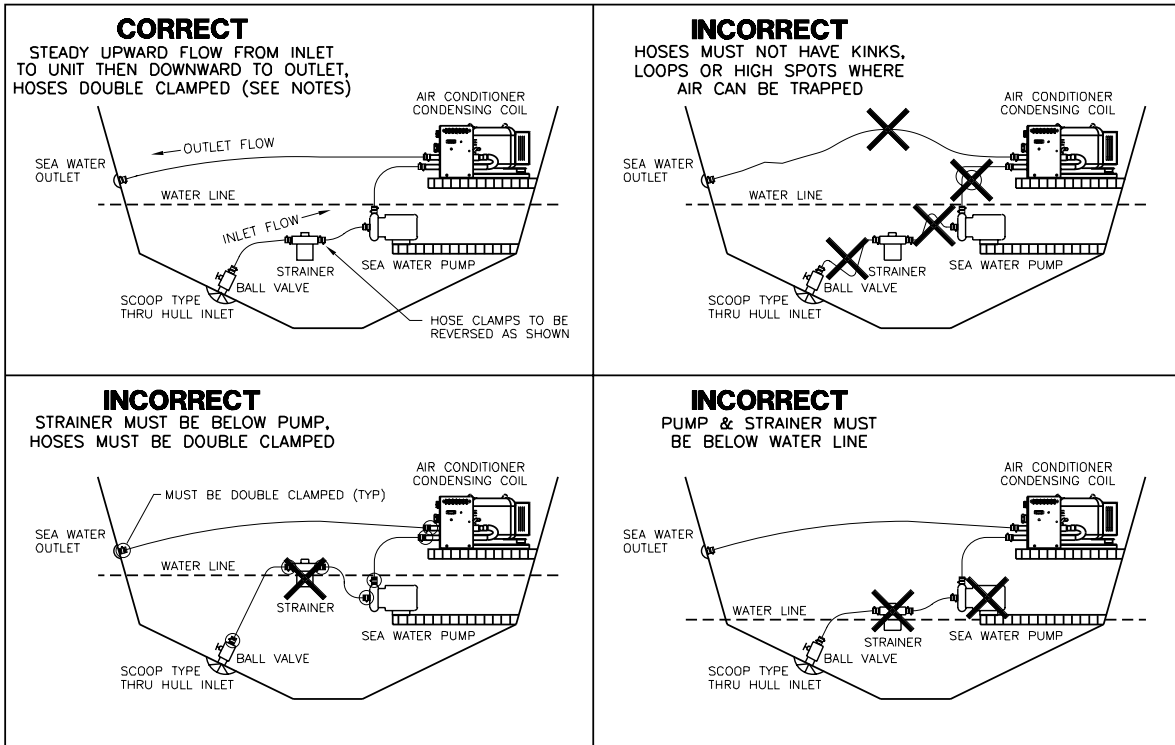
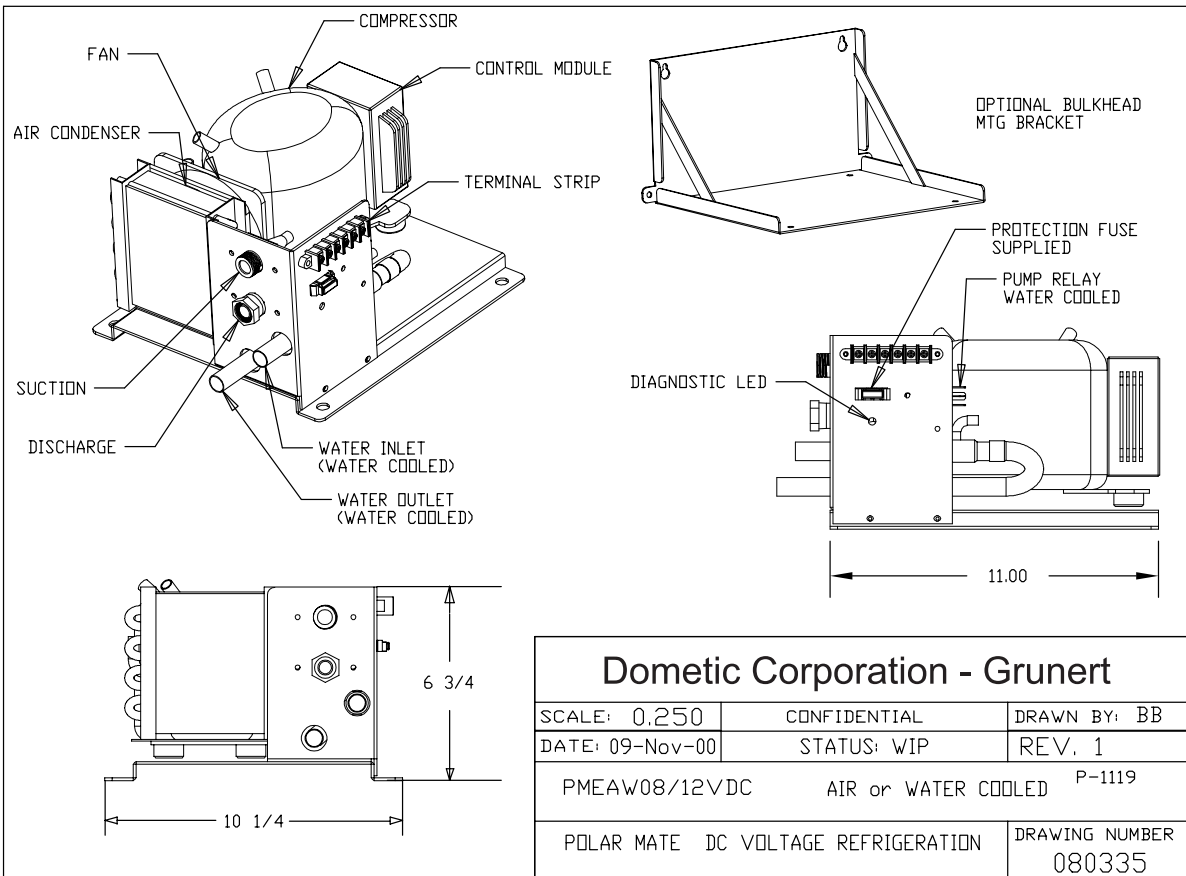


Fig. 4 Polar Mate Overview



Pro/E

Fig. 5. Example of Air Cooled System

Air Cooled System Example 1

IF THE AIR OR AIR/WATER COOLED POLAR MATE IS INSTALLED IN A CONFINED AREA, LESS THAN 100 CUBIC FEET, AND THE AMBIENT TEMPERATURE IS GREATER THAN 95°F, FOLLOW THIS EXAMPLE.

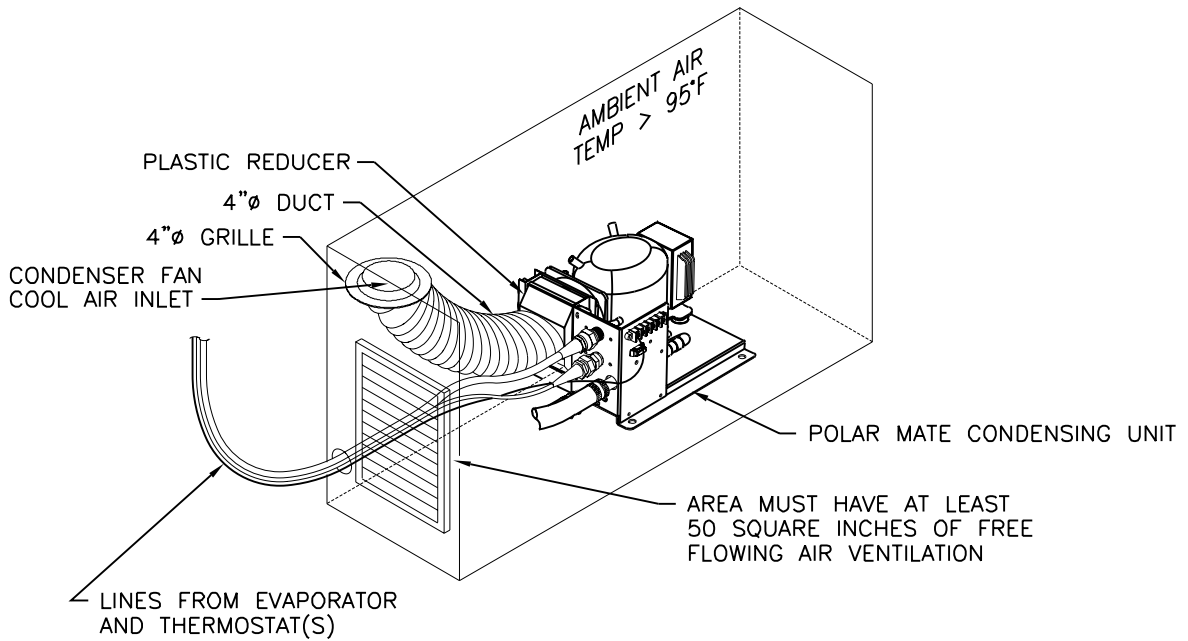


Fig. 6 Refrigerator/Freezer Configuration with Optional Spillover Kit.

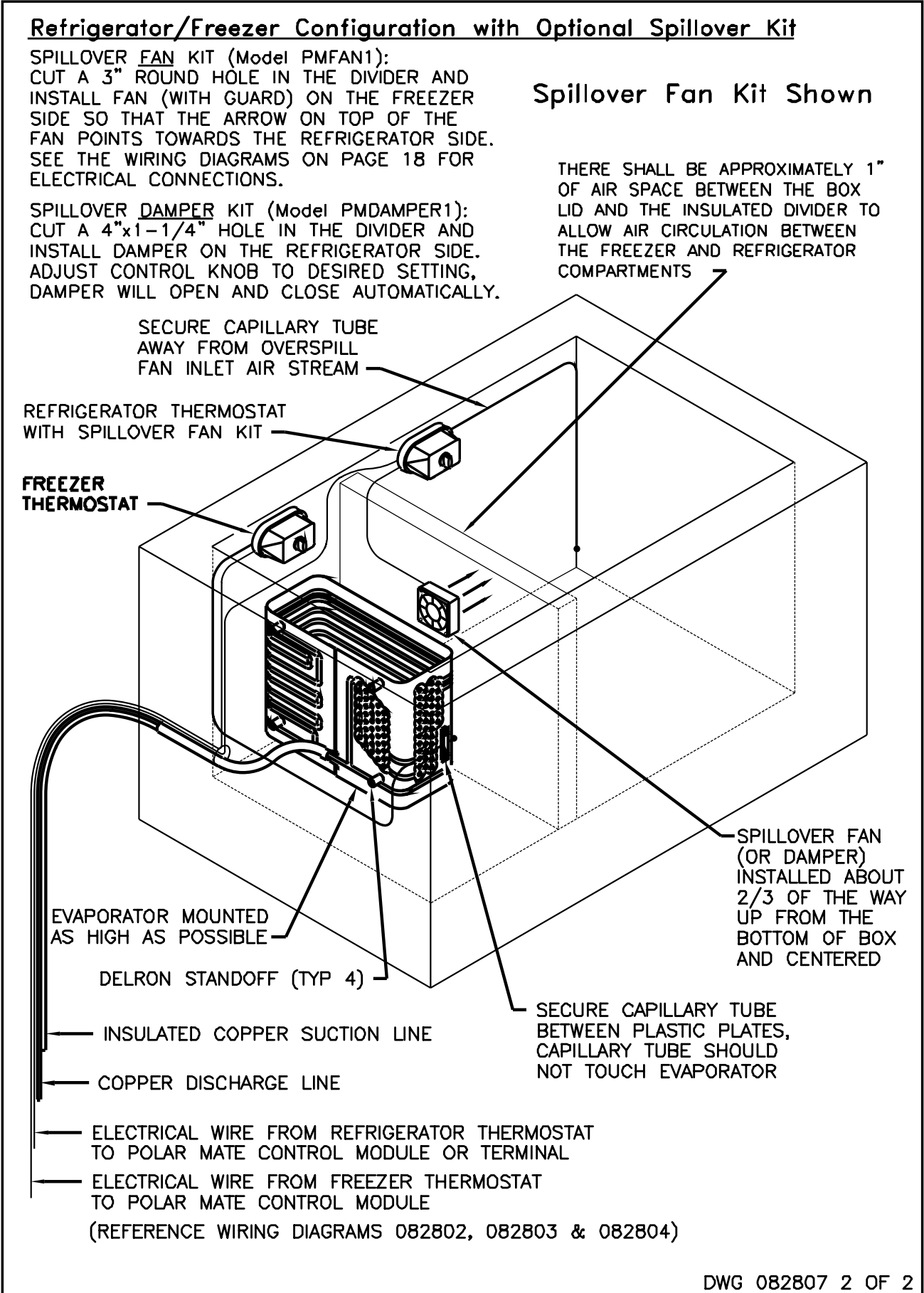
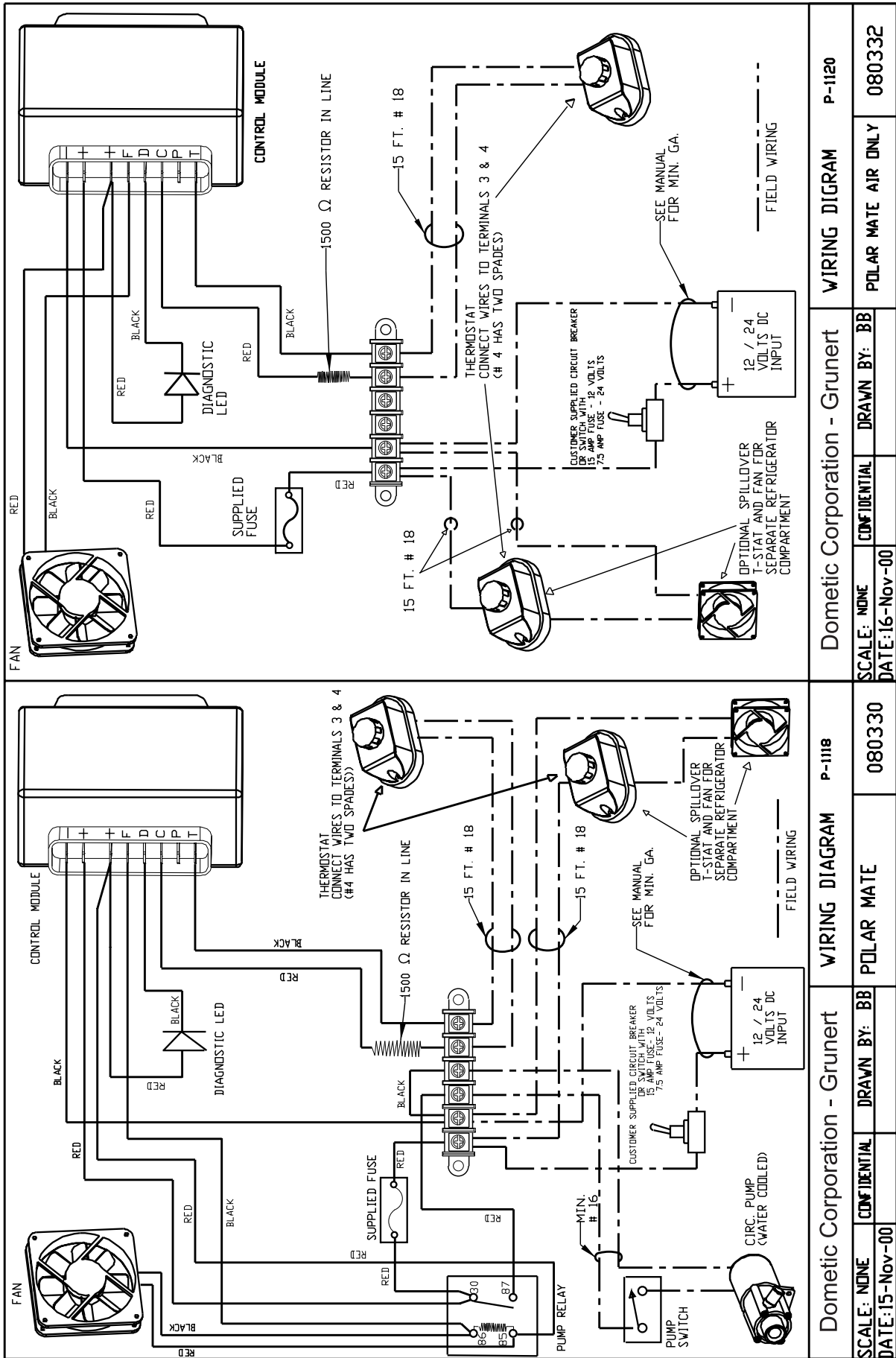


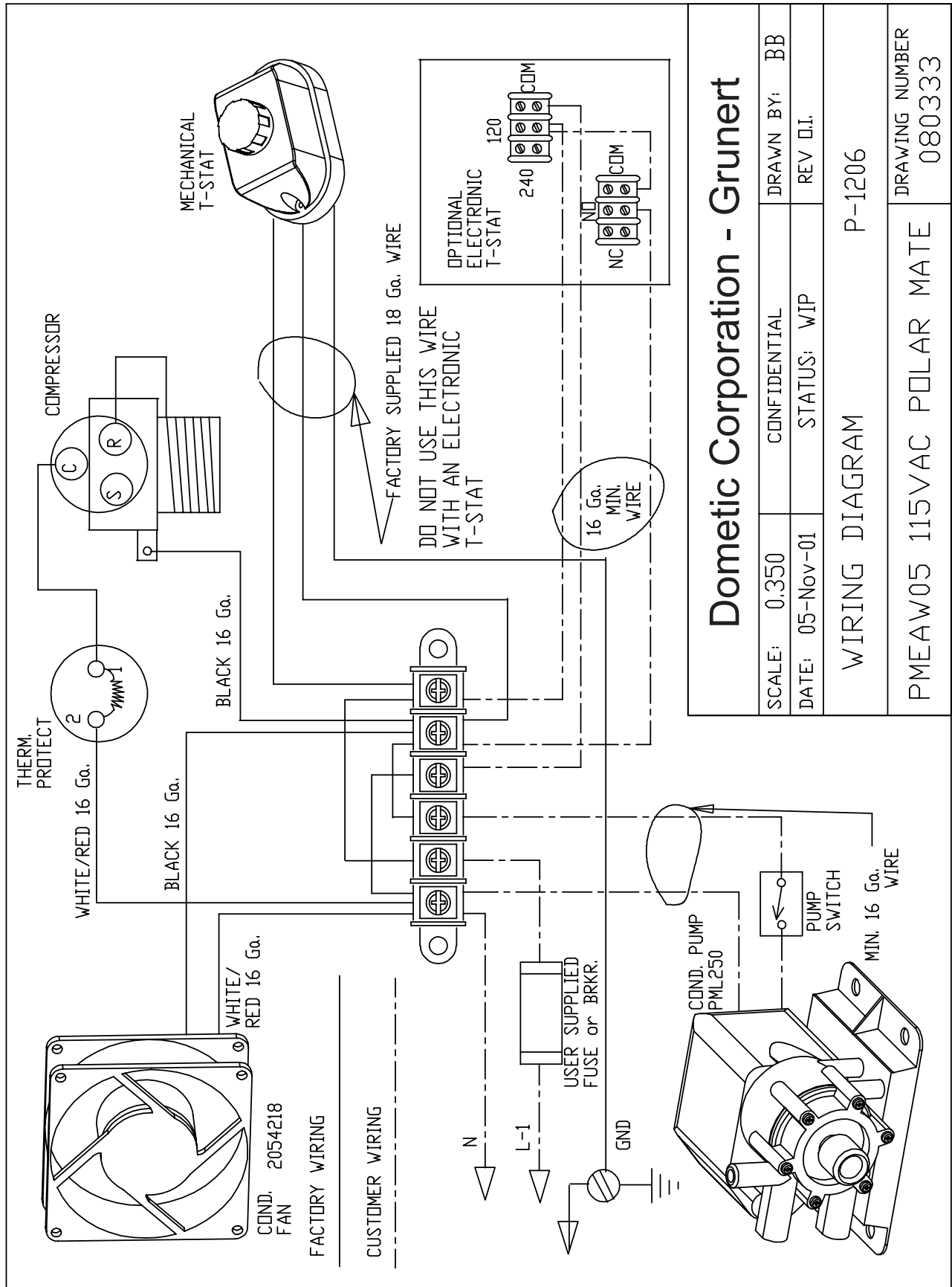
Fig. 7 Polar Mate Wiring Diagrams - 12/24VDC



Dometic Corporation - Grunert		WIRING DIAGRAM		P-1120	
SCALE: NONE	CONFIDENTIAL	DRAWN BY: BB	POLAR MATE AIR ONLY		
DATE: 16-Nov-00		080332			

Dometic Corporation - Grunert		WIRING DIAGRAM		P-1118	
SCALE: NONE	CONFIDENTIAL	DRAWN BY: BB	POLAR MATE		
DATE: 15-Nov-00		080330			

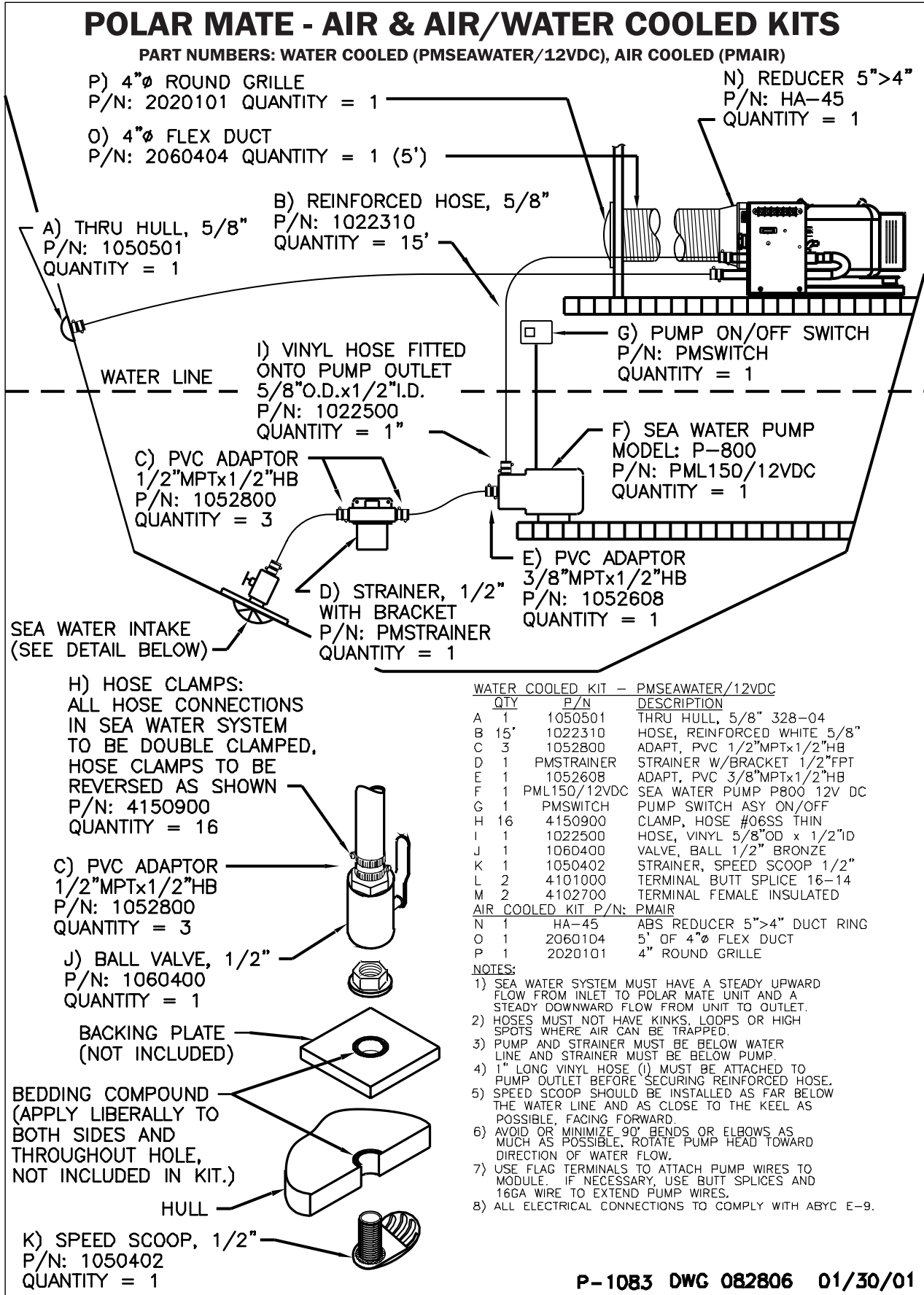
Fig. 8 Polar Mate Wiring Diagram - 115VAC



Dometic Corporation - Grunert

SCALE: 0.350	CONFIDENTIAL	DRAWN BY: BB
DATE: 05-Nov-01	STATUS: WIP	REV D.I.
WIRING DIAGRAM		P-1206
PMEAW05 115VAC POLAR MATE		DRAWING NUMBER 080333

Fig. 9 Polar Mate - Air & Air/Water Cooled Kits



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Arizona
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Mexico

A to Z Marine Services
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San Diego, CA 92106
Contact: David Wicks
Tel: (619) 224-1606
Fax: (619) 226-0496
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Website: www.atozmarine.net

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