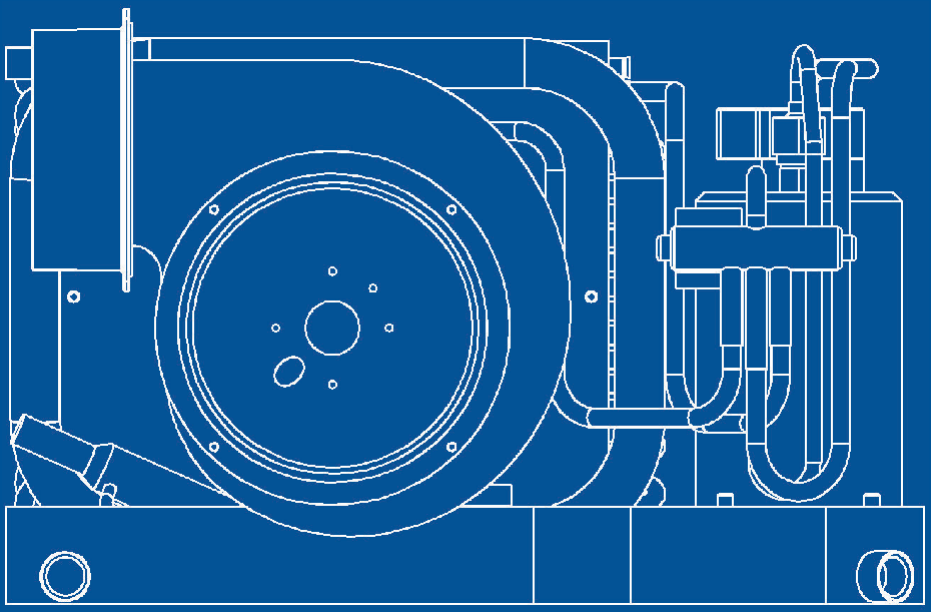
MARINE SELF CONTAINED AIR CONDITIONING SYSTEM



mabru

INSTALLATION MANUAL

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MBR250801MNLPDFP12

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CERTIFIED QUALITY. TRUSTED PERFORMANCE.

Every Mabru Power Systems unit is tested and certified to **CE** and **RoHS** standards, ensuring reliable performance and long-term durability.

Mabru Power Systems — Powering Comfort. Built on Trust.

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MABRU INSTALLATION MANUAL

INTRODUCTION

MABRU INSTALLATION MANUAL

Thank you very much for purchasing our self-contained marine air conditioner. This manual provides installation information for both the 12V DC and the International Voltage (VI) 110-240V AC Mabru air conditioners. Improper installation can result in unsatisfactory performance and or premature failure. **Before proceeding with the installation, please read this manual completely.**

If you need assistance, the please feel free to contact us by emailing support@mabrumarine.com or calling (888) 818-2814. Our hours of operation are M-F 8:00AM to 4:30 PM ET.

Warranty information is available on **page 39** of this manual.

Mabru Power System's specifications are subject to change without prior notice.

Sizing marine air conditioning systems involves more than just calculating the cubic footage of the space to be cooled.

Here are some key factors to consider:

1. Insulation Quality:
Poor insulation will allow more heat to enter the space, requiring a larger capacity unit to maintain a comfortable temperature.

2. Windows and Doors:
Windows, especially if they are not tinted or insulated, can let in significant amounts of heat from the sun. Doors that are frequently opened can also introduce warm air into the space.

3. Heat Load from Equipment:
Engines, generators, and other onboard equipment can generate significant heat, which the air conditioning system will need to offset. The more equipment running, the higher the heat load.

4. Location and Climate:
The environment where the vessel operates plays a significant role.Tropical climates require more cooling power compared to cooler regions.

5. Airflow and Ventilation:
Proper airflow and ventilation ensure that cool air is distributed evenly throughout the space and that hot air is effectively removed.

6. Occupancy:
The number of people onboard affects the cooling load, as human bodies generate heat.

7. Sun Exposure:
The amount of direct sunlight the vessel receives, especially on decks and cabins, can significantly increase the cooling demand.

8. Humidity:
High humidity levels can make the air feel warmer and require the air conditioning system to work harder to remove moisture from the air.

9. Hull Color:
The color of the hull can influence how much heat is absorbed by the vessel. Dark colored hulls absorb more heat from the sun, raising the interior temperature and the cooling load.

Taking all these factors into account will help in selecting the right size and type of marine air conditioning system for your vessel, ensuring optimal performance and comfort.

DESIGN CONSIDERATIONS

1. Carbon Monoxide Migration

It is critical to keep carbon monoxide out of living areas. Please be aware of possible carbon monoxide sources. Several are engine rooms and condensate drains that are connected to engine rooms through a bilge. For condensate drain requirements. A minimum of 5/8“ inside diameter hose should be used for the condensate drain hose. Condensate drains must be installed so they are continuously running downhill. A P-trap in the condensate drain line is acceptable and may help to seal out carbon monoxide. Never install air conditioners in engine rooms. For condensate drain requirements please see ABYC section A-6.5.11.

2. Ducting and Vents

Proper ductwork design is critical for the efficiency and effectiveness of the system. Here’s a breakdown of the key considerations:

- **Insulation:** Ductwork must be insulated to prevent condensation, which can lead to moisture problems, mold, and damage to the vessel’s interior. Insulation also helps maintain the temperature of the air as it travels through the ducts, ensuring efficient cooling.
- **Ductwork Design:**
  - **Length and Straightness:** Keeping ductwork as short and straight as possible minimizes resistance and en sures proper airflow. Minimize duct length and number of bends to conserve energy and increase efficiency.
  - **Fewer Vents:** Limiting the number of vents can enhance the cooling efficiency by concentrating airflow where it’s most needed. However, the placement and number of vents should also consider the size and layout of the space to ensure even distribution of cool air.
- **Return Air Vents:**
  - Positioning the return vent close to the air conditioning unit enhances system performance by improving airflow, temperature control, and energy efficiency.
- **Cold Air Vents:**
  - High Placement: Cold air vents should be located as high as possible since cool air descends. This placement allows the cool air to naturally flow downward, evenly distributing the temperaturethroughout the space.

By following these guidelines, you can maximize the efficiency of your marine air conditioning system, ensuring optimal airflow, consistent cooling, and reduced energy consumption. Proper ductwork design is essential for maintaining comfort aboard your vessel.

3. Air Filters

There is a filter in front of the evaporator, and possibly the return vent as well, which must be accessible for cleaning. When considering the location of the air conditioner, please keep this in mind.

4. Drain Pan

For optimal performance and longevity, it’s important to shim the air conditioner to facilitate drainage from the drain pan. Ensuring that water doesn’t accumulate in the drain pan is crucial, as stagnant water can shorten the lifespan of the unit. Specifically, Mabru 12V DC air conditioner models require that their drain pans be connected to the ship’s ground, using the designated green screw for grounding. This is a critical safety measure. However, for the International Voltage (VI) units, the grounding is integrated into the 110-240V AC wiring, so additional grounding of the drain pans is not required.

5. Water Flow to the Air Conditioner

A forward-facing speed scoop is mandatory as well as a proper seacock, strainer, and pump. These items must be installed correctly and at least 1 foot below the waterline. Mabru pumps are not self priming. A bleeding valve is recommended to facilitate the removal of trapped air. The strainer will need to be periodically cleaned and should be located in a space that is easy to access.

6. Electrical Box Location

The electrical box for both the DC units and VI units must be in the path of return air back to the unit. The electrical boxes rely on the flow of return air for proper heat dissipation.

SAFETY PRECAUTIONS

1. Engine Room and Condensate Drain

Never install air conditioning in engine rooms. If a condensate drain is draining into a bilge connected to an engine room, then a P-trap must be used. Follow ABYC standards for condensate drains. Do not terminate condensate drain lines within 3 feet, or 915 mm or from any engine or generator exhaust system. Do not install the air conditioner near LPG/CPG or gasoline engines. Please follow ABYC standard H-27 for hose types, Seacocks, and thru-hull connections.

2. Electrical Shock

Disconnect power at the panel or power source before opening any cover. Mistakes here may result in injury or death. If you are not sure, please call a qualified marine electrician. The electrical components associated with your marine air conditioning installation must be grounded and comply with the manufacturer's recommendations. This may include batteries, battery chargers, inverters, battery-to-battery chargers, as well as other devices.

3. Ignition Protection

Mabru air conditioners do not meet the requirements for ignition protection. Do not install in areas that are connected to gasoline engines, LPG/CPG, or other flammable materials.

4. Hose Clamps

Follow ISO standards for all marine air conditioning plumbing and use two hose clamps in reverse directions on all connections on the seawater pump circuit. Marine-grade, stainless steel hose clamps are required for all Mabru air conditioning installations.

SPECIFICATIONS
OVERVIEW

SC5DC

SC7DC

SC12DC

UNIT MODEL	SC5DC	SC7DC	SC12DC
Cooling Capacity (BTU/h)	5000	7000	12000
Heating Capacity (BTU/h)	5500	7200	12300
Power Source	12V DC		
Cooling Amp Draw	17-27.9	18-29.5	22-44
Heating Amp Draw	20-33.8	21.2-38.3	28-48
Fan Blower (CFM) (Low/Med/High)	100/180/220	210/305/370	410/495/525
Refrigerant	R-134a		
Minimum Air Duct Size (in) [mm]	4 [101.6]		5 [127]
Minimum Return Air Grille Size (sq in) [sq cm]	64 [412.9]		80 [516.13]
Minimum Supply Air Grille Size (sq in) [sq cm]	16 [103.23]		25 [161.29]
Seawater Pipe Inside Diameter (in) [mm]	5/8 [15.88]		
Unit Weight (lbs) [kg]	32 [14.52]	41 [18.6]	50 [22.68]
Unit Dimensions (LxWxH) (in) [mm]	15 x 8 x 10 [381x203.2x254]	16.5 x 10 x 11.5 [419.1x254x292.1]	16.5 x 10 x 11.5 [419.1x254x292.1]

Note: Amp draw is calculated with 12.8V DC

Download DC Specifications

SPECIFICATIONS
OVERVIEW

SC05VI

SC09VI

SC17VI

UNIT MODEL	SC05VI	SC09VI	SC17VI
Cooling Capacity (BTU/h)	5000	9000	17000
Heating Capacity (BTU/h)	5800	9800	17800
Power Source	110-240V AC (50/60Hz)		
Cooling Amp Draw 115V (230V) AC	1.9-4.2 (1.0-2.1)	1.3-5.2 (0.7-2.6)	2.9-9.0 (1.9-4.8)
Heating Amp Draw 115V (230V) AC	2.3-5.1 (1.2-2.6)	1.6-6.2 (0.9-3.1)	3.4-11.1 (2.2-5.6)
Fan Blower (CFM) (Low/Med/High)	100/200/300	300/400/500	570/670/800
Refrigerant	R-134a	R-410a	
Minimum Air Duct Size (in) [mm]	4 [101.6]	5 [127]	6 [152.4]
Minimum Return Air Grille Size (sq in) [sq cm]	64 [412.9]	80 [516.13]	100 [645.16]
Minimum Supply Air Grille Size (sq in) [sq cm]	16 [103.23]	25 [161.29]	36 [232.26]
Seawater Pipe Inside Diameter (in) [mm]	5/8 [15.88]		
Unit Weight (lbs) [kg]	29 [13.15]	43 [19.51]	59 [26.76]
Unit Dimensions (LxWxH) (in) [mm]	16.5 x 10 x 11.5 [419.1x254x292.1]	17 x 11 x 12 [431.8x279.4x304.8]	20 x 13.5 x 14 [508x342.9x355.6]

Download International Voltage (VI) Specifications

INSTALLATION OVERVIEW

Before installation, please read these instructions completely and then plan for all connections. This includes ducting, condensate drains, seawater inlet and outlet, seacock, sea strainer, pump, hoses, electrical power connections, and the location of the control panel. Please note: the blower on the Mabru air conditioner can be rotated to assist with ductwork installation.

INCLUDED ACCESSORIES WITH THE AIR CONDITIONER

1. Color touch screen display with black bezel.

2. (4) Drain pan mounting clamps. (Mounting screws are not provided.)

3. Roll of insulation tape, which can be used to wrap around the duct to reduce air leaks.

4. 15 ft display cable. (Standard CAT 5 ethernet cable can be used for a longer run, up to 50'.)

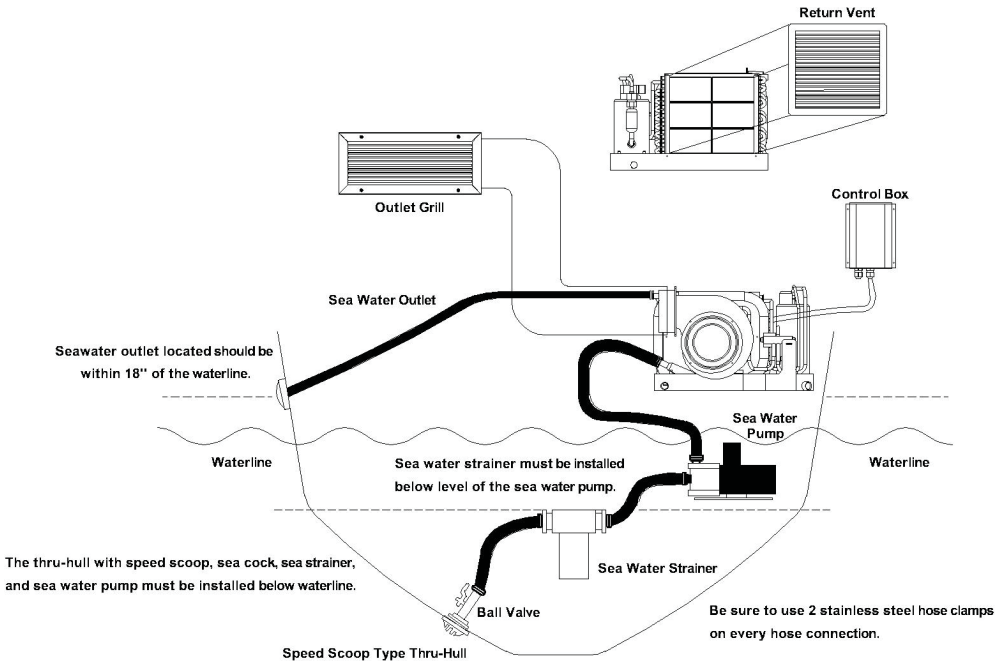
5. The SC5DC, SC7DC, SC12DC, and RadAir™ air conditioners come with a 350GPH 12V DC raw water pump.

6. (2) Rubber shims to be mounted under the drain pan to improve angle towards the plumbed drain.

7. 7 ft remote temperature sensor. (Loose item on AC voltage units and preinstalled on DC units.

***International Voltage (VI) 110-240V AC air conditioners do not come with a pump. A pump can be purchased as an additional item.*

INSTALLATION
OVERVIEW



PLACEMENT OF THE MABRU AIR CONDITIONER

1. Choose a low and flat location. This may be in a locker, or under a bench or bed. Shim the air conditioner toward the utilized drain to assist with draining the water that accumulates into the condensate pan. Typical installation locations are under a V berth, bunk, settee, or closet. Never mount the air conditioner by directly screwing it into the hull.

2. The air conditioner should be installed in or next to the room that it is going to be used to cool. The unit should draw its return air from the room being cooled and not pull in hot humid air from outside or bilge areas.

3. Do not install the air conditioner in the engine room or a bilge connected to the engine room.

4. If draining the condensate to a bilge, place the drain line as close to a bilge pump as possible. A P-trap is also recommended when draining to the bilge. A shower sump box and pump may also be used for the condensate drain, and this is the preferred method to eliminate sitting water in the bilge. Our marine air conditioners can produce as much as 5 gallons of condensate water per hour.

5. Mount the air conditioner horizontally on a floor or suitable shelf, with the pan drain tilted downhill towards the drain. It may be necessary to use shims under the drain pan to ensure proper drainage. There should be little to no sitting water in the pan while the unit is in operation. If there is ½" or more of sitting water in the pan, the unit must be shimmed to reduce the level of water in the pan.

6. Use a speed scoop on the outside of the intake thru-hull. The slotted side of the scoop must face forward and not be obstructed by any hull steps, intakes, or transducers in the hull forward of the air conditioner intake.

7. Install the thru-hull and seacock as low and as far back in the boat as possible in an accessible location for inspection and maintenance.

8. Install the air return as close to the unit as possible. It is important that the return air comes from the room being cooled.

9. Install cold air vents as high as possible and away from the return vent to prevent the cold air from being pulled back into the return.

10. Position the output of the blower by loosening the clamp on the blower support and rotating the blower. Tighten the hose clamp once the blower is in the optimal position.

11. Four mounting brackets are provided. They go over the edge of the drain pan and secure the unit to the floor. Mounting hardware is not included, but it is needed to properly secure the unit.

12. There must be at least 3" between the evaporator and the nearest wall, unless the evaporator is mounted directly against an appropriately sized return vent.

13. The color touch display should be installed in a dry location inside the boat. **The current color touch display is not water-proof.**

INSTALLATION/ DUCTING

Proper airflow is critical to the performance of your Mabru air conditioner. Ductwork should be designed to be as short and straight as possible with minimal 90-degree turns. This design approach reduces resistance to airflow, minimizes pressure losses, and improves overall system efficiency.

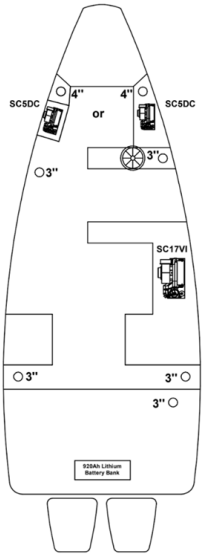
Sharp bends or longer duct runs can lead to airflow restrictions, which forces the system to work harder, resulting in higher energy consumption and reduced performance. If turns are necessary, using gradual bends (like 45-degree elbows) is often better than sharp 90-degree angles. (Two 90-degree bends can reduce airflow by 25%.)

MABRU DUCT SIZE, RETURN VENT, AND AIR GRILLE SIZE

Mabru Air Conditioner	Duct Size	Return Grill Size Sq. Inches	Minimum Supply Air Grill Size Sq. Inches
Mabru DC Units			
SC5DC	4”	64”	16”
SC7DC	4”	64”	16”
SC12DC	5”	80”	24”
Mabru Standard Units			
SC07 115 or 230 V AC	4”	64”	16”
SC12 115 or 230 V AC	5”	80”	24”
SC17 115 or 230 V AC	6”	100”	30”
Mabru International Voltage (VI) Units			
SC05VI	4”	64”	16”
SC09VI	5”	80”	24”
SC17VI	6”	100”	30”

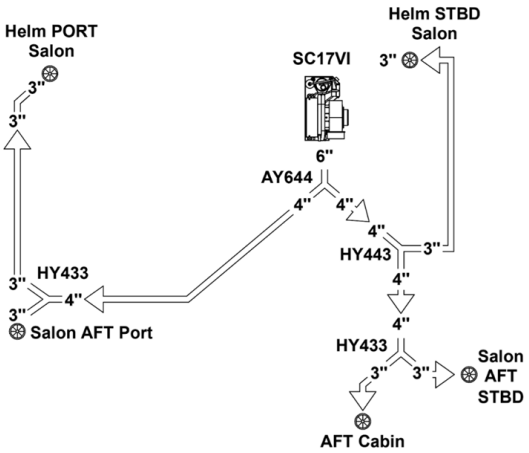
INSTALLATION/ DUCTING

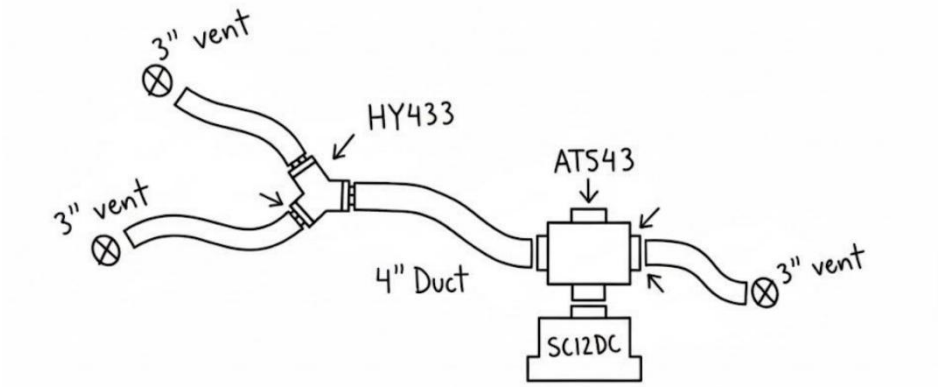
THE FOLLOWING ARE EXAMPLE INSTALLATION SKETCHES:



QTY. 5 Vents (3") - with Cabin Aft

QTY. 1 Vent (4") - without Cabin Aft





INSTALLATION/ DUCTING

THE FOLLOWING IS A SUMMARY OF PROPER DUCTING CONNECTIONS:

1. When working with an insulated duct and connecting it, Pull back the outside vinyl and insulation to expose the inside vinyl.

2. Fit the inside vinyl over the elbow, Y, T, or vent. Pull it up and then secure it with a hose clamp or wire tie.

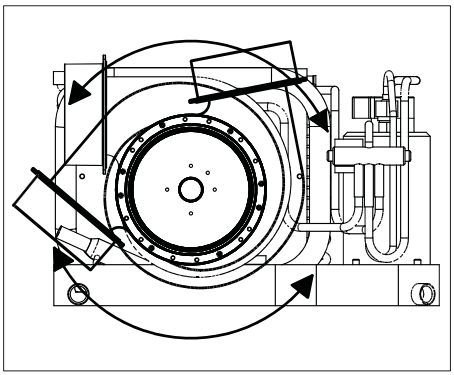
3. Pull the insulation and outer layer of the duct up and secure it with a hose clamp or cable tie.

4. Run the ducting as tight as possible to avoid bends and sags that may impede airflow.

5. Use insulated ducting for air conditioning ventilation to prevent condensation and loss of performance. Uninsulated heating ducts cannot be used.

6. Do not run air conditioning ducts through engine rooms.

7. Please note that the blower can be rotated to facilitate the duct installation. Blower rotation is adjustable up to 85 degrees vertically and 35 degrees to the left.



Loosen the circled adjustment screw before attempting to rotate the blower. Once the blower is in the desired position, tighten the hose clamp again.

INSTALLATION/ DUCTING

The pictures above show the ideal placement of the return air temperature sensor. The sensor should be place in the path of the return air to the evaporator. The control panel can also be used without the return air temperature sensor, but the reading will be much less accurate, due to the heat generated by the display.

INSTALLATION/ SEAWATER SYSTEM

All Mabru marine air conditioners are water-cooled and require a seawater intake system. This system is comprised of a speed scoop, intake thru-hull fitting, seacock, sea strainer, and water pump. These components must be installed at least one foot below the boat's waterline to ensure proper water intake for cooling and efficient operation.

The speed scoop should be facing the bow or front of the boat and as far underwater as possible. The speed scoop must remain underwater in all conditions. If air gets into the seawater inlet, the pump will stop pumping water. A bleeding valve can be used to clear the air from the pump.

Water inlets should not be shared with galleys, heads, or any other pumps. Each air conditioner should have its own thru-hull. The intake cannot be mounted aft of hull steps or any other hull obstruction that will affect the water flow to the intake. Components such as transducers, other intakes, or strikes can cause cavitation in the water flowing to the intake which will introduce air into the air conditioner's sea water intake and possibly cause airlocks.

Forward-Facing Speed Scoop Thru-Hull Recommended (Pictured)

Bronze Seacock Recommended (Pictured)

*ALL THRU-HULLS MUST HAVE THE APPROPRIATE SEACOCK THAT MEETS **ABYC** SPECIFICATIONS.*

A sea strainer is mandatory for air conditioning sea water systems. Sea strainers should be checked and cleaned regularly. A dirty sea strainer may damage your seawater pump and void its warranty as well as impact the performance of your air conditioner(s). All hoses must be reinforced and marine grade. Follow ABYC specifications for all thru-hulls and bonding of metallic thru-hulls.

INSTALLATION/
SEAWATER SYSTEM

Mabru ½" or ¾" Sea Strainers, Depending on Size of Water Lines (Pictured)

Mabru 350 GPH Pump (Pictured)

Mabru seawater pumps are not self-priming. The pump may be mounted horizontally or vertically, with the discharge higher than the inlet; otherwise, the pump will be prone to air-locks. The pump head should be rotated in the direction of the water flow. The pump should be mounted level with or above the sea strainer, but still 1 foot below the waterline. All Mabru 12V DC Air conditioners (SC5DC, SC7DC, SC12DC, and the RadAir™ (RT12DC)) use a Mabru 350 GPH 12V pump.

MABRU PUMP SIZING

Mabru Air Conditioner	Minimum Pump Size
Mabru 12V DC Units (Pumps are included)	
SC5DC	Mabru 350 GPH
SC7DC	Mabru 350 GPH
SC12DC	Mabru 350 GPH
RadAir™ (RTSC12DOME)	Mabru 350 GPH
Mabru Standard 115/230 V AC (Pumps are not included)	
SC07 115 or 230 V AC	250 GPH
SC12 115 or 230 V AC	500 GPH
SC17 115 or 230 V AC	500 GPH
Mabru International Voltage (VI) Units (Pumps are not included)	
SC05VI	500 GPH
SC09VI	250 GPH
SC17VI	500 GPH

MABRU PUMP INLET AND OUTLET THREAD

***250 PUMP** - NPT 1/2" inch*
***350 PUMP** - NPT 1/2" inch*
***950 PUMP** - NPT 3/4" inch*
***650 PUMP** - NPT 1/2" inch*
***1250 PUMP** - NPT 1" inch*

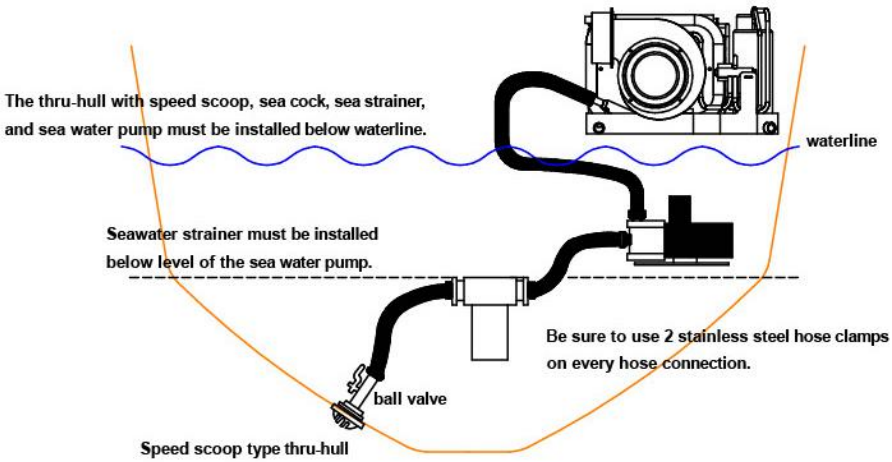
MABRU PUMP SPECIFICATIONS

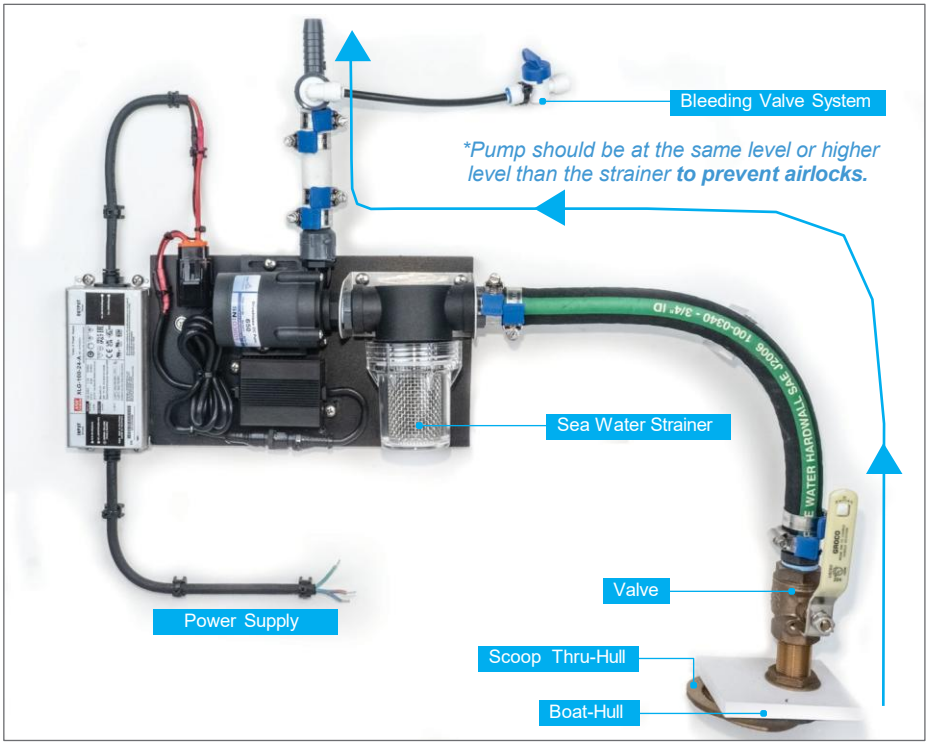
PUMP MODEL	250 GPH	350 GPH	650GPH	950 GPH	1250 GPH
Power Source	24V DC	12V DC	24V DC		
Amp Draw	1.3	4.5	3.3	5.0	6.3
Submersible	YES				
Max Head (ft) [m]	25 [7.6]	35 [10.7]	40 [12.2]	35 [10.7]	35 [10.7]
Gallons Per Hour [Liters Per Hour]	250 [946]	350 [1325]	650 [2461]	950 [3596]	1250 [4732]
Inlet & Outlet NPT (in) [mm]	0.5 [12.7]	0.5 [12.7]	0.5 [12.7]	0.75 [19.1]	1.0 [25.4]
Height (in) [mm]	3.0 [76.2]	3.19 [81]	3.19 [81]	4.33 [110]	5.33 [135.4]
Width (in) [mm]	2.69 [68.33]	3.19 [81.03]	3.19 [81.03]	3.5 [88.9]	4.0 [101.6]
Length (in) [mm]	3.5 [88.9]	4.0 [101.6]	4.0 [101.6]	6.0 [152.4]	7.25 [184.2]
Weight (lbs) [g]	0.5 [226.8]	1.55 [703.1]	1.55 [703.1]	2.5 [1134]	4.5 [2041.2]

INTERNATIONAL VOLTAGE (VI) PUMPS				
Pump Model	250 GPH	650 GPH	950 GPH	1250 GPH
Air Conditioning Unit Model	SC09VI	SC05VI & SC17VI	Multiple	Multiple
Power Supply Model #	LPV 60 24	XLG 100 24	XLG 200 24	XLG 200 24
Amp Draw (at 115V AC)	0.2	0.4	0.7	0.9

Download Pump Specifications

MABRU SEAWATER INSTALLATION



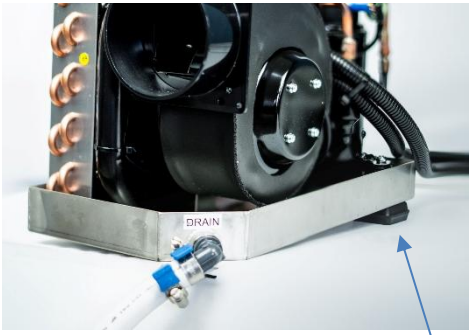


Above is a proper example of a pump installation with our ½" bleeding valve on the outlet of the pump.

The air conditioning water discharge should flow upward and exit through a thru-hull fitting located above the waterline to allow for visual inspection. The thru-hull should be mounted within 18 inches of the water-line to minimize water splashing noise. Use a reinforced marine-grade 5/8"inch hose for the discharge line, ensuring there are no high spots or loops to prevent air locks and maintain efficient water flow. All air conditioning water lines should be double hose clamped with the clamps reversed. Proper 316 stainless steel marine-grade hose clamps must be used.

PROPER CONDENSATE DRAIN AND CONDENSER OUT FLOW

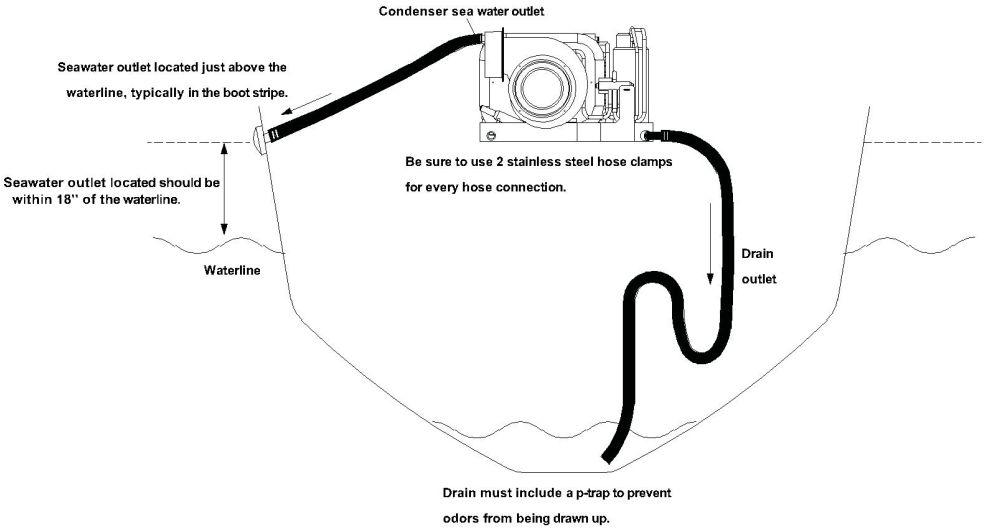
The drain pan must be angled toward the drain to ensure proper water flow and drainage, using shims if necessary to achieve the correct tilt. The goal is to minimize any standing water in the pan. If the condensate drains into the bilge, a P-trap must be installed to prevent vapors from entering the living space. Our air conditioners can produce up to 5 gallons of condensate per hour. The drain pan uses a standard ½ inch NPT pipe thread fitting for connection. After the installation is complete, please test the drain pan by pouring 1 gallon of water into it and ensure proper drainage.



In the above picture, shims have been used to improve the condensate drainage.

Do not connect condensate drains to the outflow of the air conditioner. If a blockage occurs, water could be pumped into the condensate drain pan, potentially flooding the boat and causing damage to the air conditioner.

Mabru 12V DC air conditioners require the drain pan to be grounded to the ship's ground, using the green grounding screw provided on the drain pan. Mabru International Voltage (VI) air conditioners are grounded through the 110-240V AC wiring.



An alternative to draining the condensation drip pan into the bilge would be to use a gray water sump box to pump the condensation overboard.

INSTALLATION/ ELECTRICAL

THE FOLLOWING IS A SUMMARY OF PROPER ELECTRICAL CONNECTIONS

1. All crimp connections should meet ABYC standards and be watertight. Heat shrink tubing should be used to ensure these connections are watertight. Fork or ring terminals must be used on all connections made within the electrical box. Bare wires cannot be connected to the power terminals.

2. All 110-240V AC power feeds must be installed and grounded following ABYC standards.

3. The proper circuit protection must be used. SC05DC/SC07DC 50A, SC12DC/ RadAir™ (RTSC12DOME) 60A, SC05VI / SC09VI 10A, SC17VI 15A.

4. If installing more than one air conditioner, each one will need to have a dedicated circuit breaker.

5. The color touch display is connected to the display and the air conditioner control box with a standard 15' CAT5 ethernet cable. If the cable is not long enough, a longer cable, up to 50', can be purchased from any electronics store. The color touch display should be installed in a dry location inside the boat. **The current color touch display is not water-proof.**

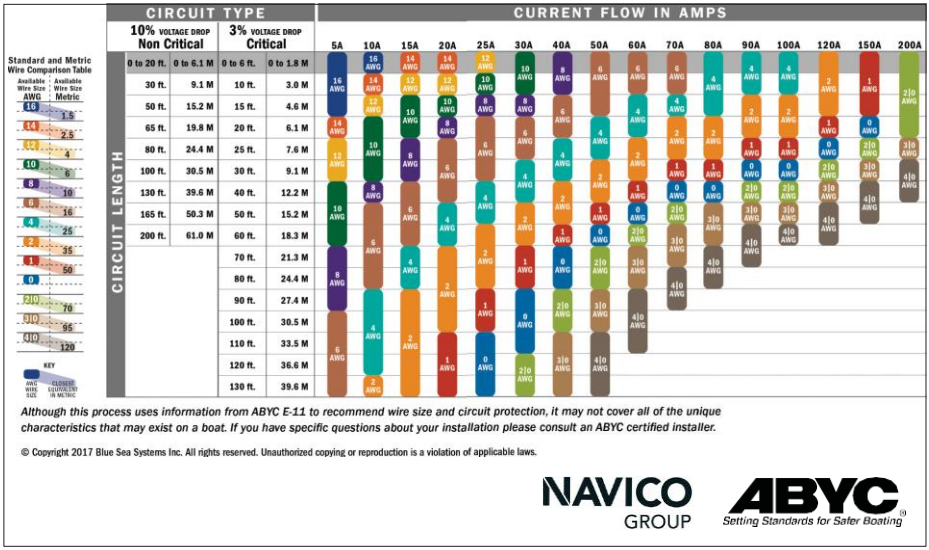
6. For proper wire sizes, please use a wire gauge calculator or ABYC chart. 3% is the maximum recommended voltage drop. On DC calculations, length is round trip, not one way.

7. Our 12V DC air Conditioners SC5DC, SC7DC, SC12DC, and RadAir™ (RTSC12DOME) need to have the drain pan grounded or bonded to the ship's ground. This is seen in the picture below.

DC GROUNDING SCREW

For Mabru 12V DC air conditioners (SC5DC, SC7DC, and SC12DC), bonding or grounding to the ship's ground is required. Failure to ground the DC air conditioner will void the unit's warranty and increase the risk of corrosion.

WIRE SIZING TABLE/ 3% LOSS



Although this process uses information from ABYC E-11 to recommend wire size and circuit protection, it may not cover all of the unique characteristics that may exist on a boat. If you have specific questions about your installation please consult an ABYC certified installer.

NAVICO GROUP

ABYC Setting Standards for Safer Boating

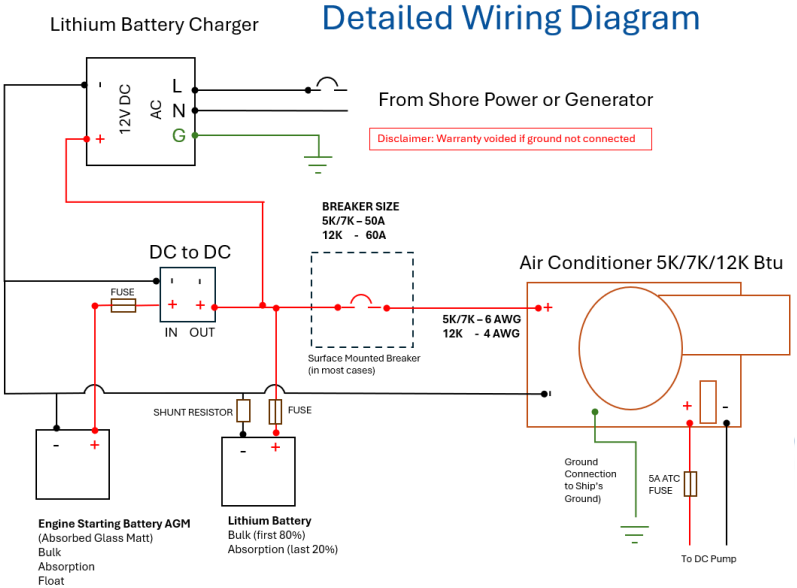
BATTERY BASICS

Model	Battery Size/Type	Minimum Runtime
SC5DC	300 Ah Lithium Battery	8 Hours (including 12V DC pump)
SC7DC	300 Ah Lithium Battery	8 Hours (including 12V DC pump)
SC12DC	300 Ah Lithium Battery	5 Hours (including 12V DC pump)
SC12DC	600 Ah Lithium Battery	10 Hours (including 12V DC pump)
SC05VI	300 Ah Lithium Battery	~ 5 hours (not including pump)
SC09VI	300 Ah Lithium Battery	~ 4 hours minimum (not including pump)
SC17VI	460 Ah Lithium Battery	~ 4 hours (not including pump)

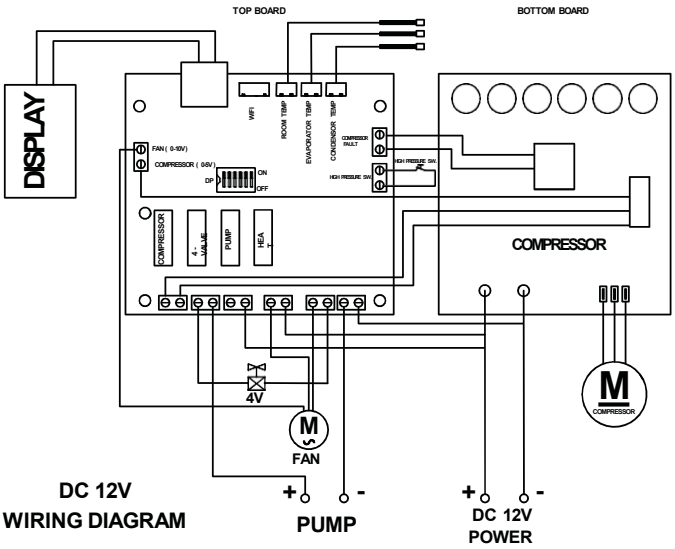
*__Battery Duration:__ The VI estimates reflect the system running at **full capacity**. Your actual runtime may differ due to inverter efficiency losses, the circulation pump's power draw, and your battery bank's condition. As a variable capacity unit, power draw will fluctuate based on real-time demand.

WIRING DIAGRAMS

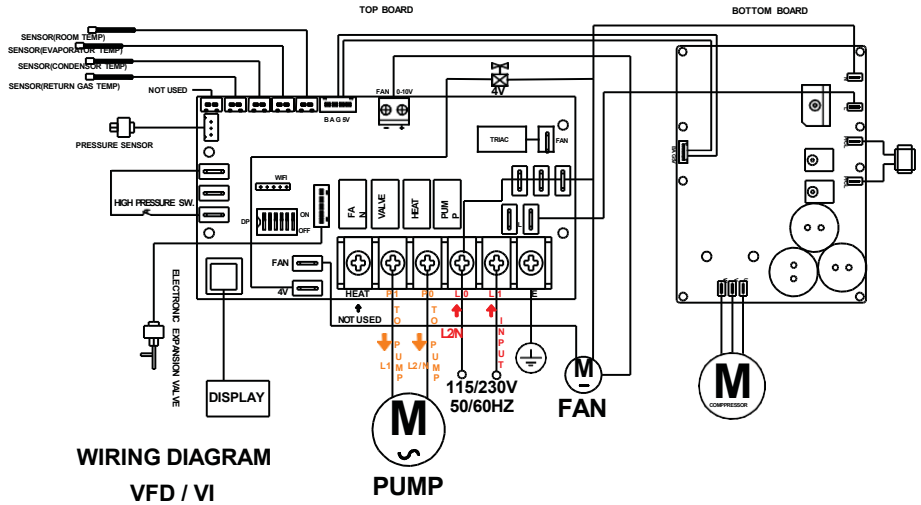
FULL 12V DC SYSTEM



WIRING DIAGRAM FOR SC5DC, SC7DC AND SC12DC

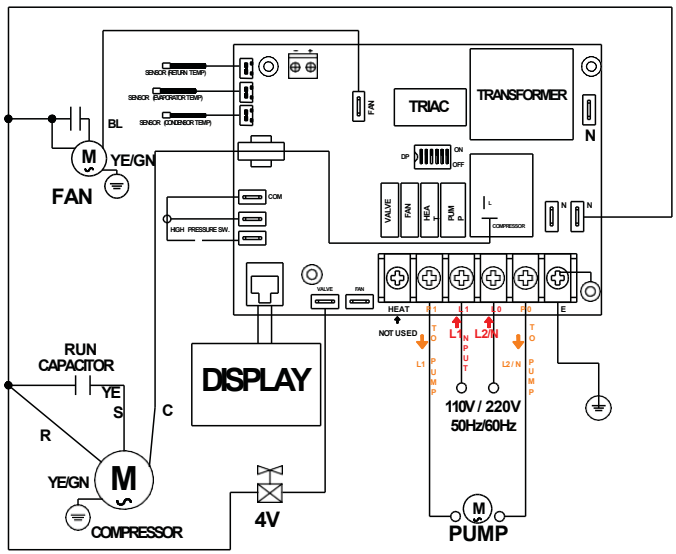


WIRING DIAGRAM FOR **SC05VI, SC09VI** AND **SC17VI**



NOTE: STANDARD UNIT CIRCUIT BOARDS WILL HAVE THE TERMINALS IN DIFFERENT LOCATIONS, BUT THE TERMINAL ID'S ARE THE SAME.
L1 = LINE L0 or N = NEUTRAL P1 = OUTPUT LINE TO PUMP P0 = L2/NEUTRAL TO PUMP E = GROUND HEAT = DON'T USE (INTENDED FOR ELECTRIC HEAT)

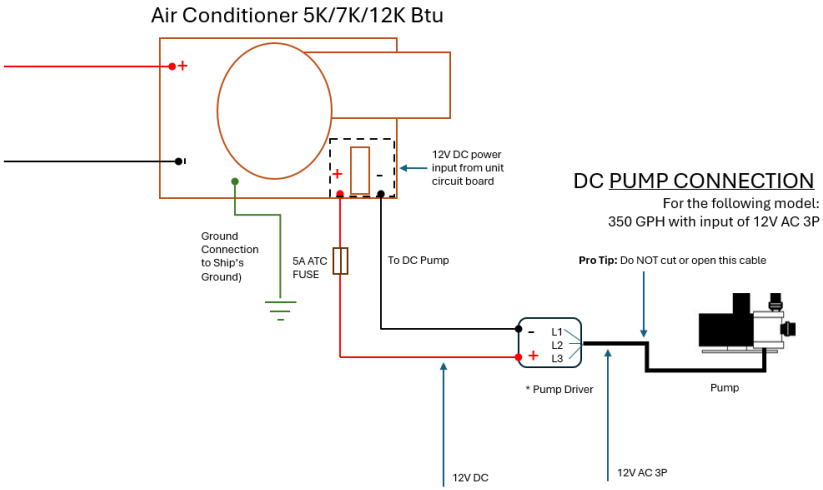
WIRING DIAGRAM FOR **STANDARD 115/230**, (NOT FOR VI)



STANDARD UNITS
115/230V AC WIRING DIAGRAM

NOTE: STANDARD UNIT CIRCUIT BOARDS WILL HAVE THE TERMINALS IN DIFFERENT LOCATIONS, BUT THE TERMINAL ID'S ARE THE SAME.
L1 = LINE L0 or N = NEUTRAL P1 = OUTPUT LINE TO PUMP P0 = L2/NEUTRAL TO PUMP E = GROUND HEAT = DON'T USE (INTENDED FOR ELECTRIC HEAT)

WIRING DIAGRAM FOR **12 V DC SEAWATER PUMP**



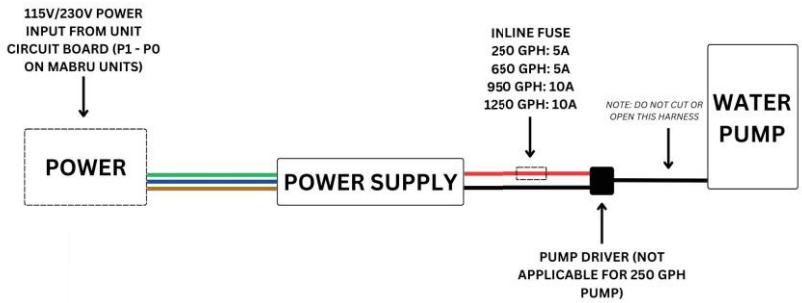
WIRING DIAGRAM FOR **VI 115/230 V AC AND STANDARD 115/230 V AC SEAWATER PUMP**

*Plastic case power supplies do not have ground connection.

Wiring Information:
Green - Ground
Blue - AC Neutral/L2
Brown - AC Line/L1

A/C PUMP CONNECTION

For the following models:
250 GPH with power supply input 110v/220v
650 GPH with power supply input 110v/220v
950 GPH with power supply input 110v/220v
1250 GPH with power supply input 110v/220v



XLG power supply has a ground connection as shown in the wiring above. LPV models will only have two wires, L1 and N/L2.

QUICK START/ OPERATIONS CHECKLIST

1. Ensure that the vessel is fully in the water and floating.

2. Ensure that the intake seacock is fully open and that the intake strainer is clear and free of any debris.

3. Inspect the intake components for salt buildup and/or corrosion which would indicate a water leak.

4. Turn on the circuit breaker. If the seawater pump has a separate circuit breaker, turn it on as well. The seawater pump will be on a separate breaker only in the event that a single pump is feeding multiple units.

5. Turn on the air conditioner with the included display by pressing the power button.

6. Set the desired temperature on the included display, making sure that the correct mode is selected (cool, heat, or fan only).

7. Check for a steady flow of water from the overboard discharge. If there is no water pumping overboard, verify that the intake is open and if yes, the pump may be airlocked. To bleed the air out of the pump, open the bleeding valve until a steady stream of water comes out if installed. Otherwise, the hose on the discharge of the pump must be removed to remove air from the pump. If removing the hose, the intake valve and pump must be off. Once hose is removed, open the valve until there is a clear stream of water and reinsert the hose while keeping the valve open. Once the clamps are secure, turn the pump back on and verify the overboard water flow.

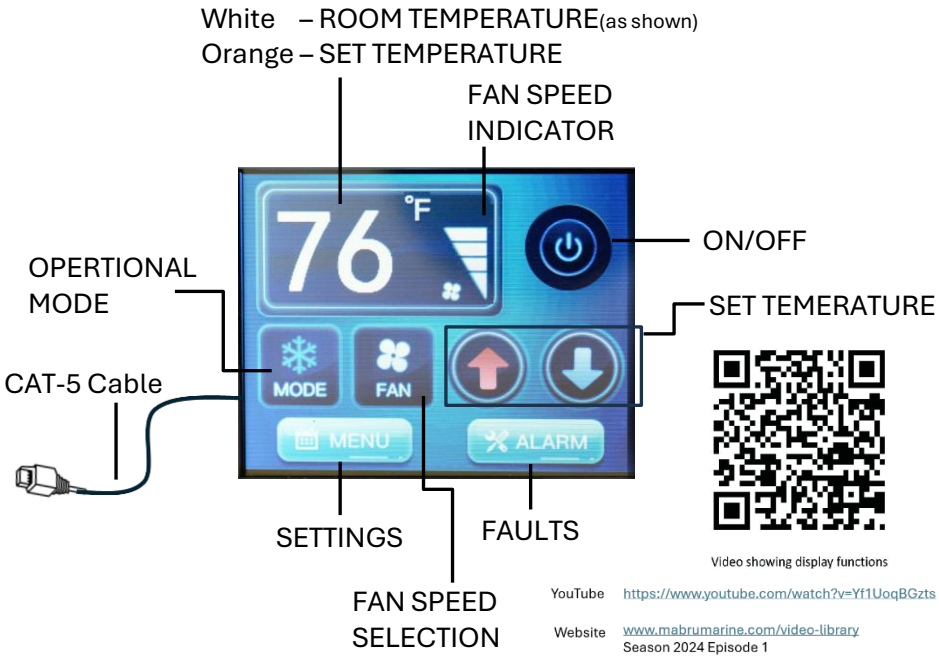
8. Verify cold (or warm) airflow from vents and that enough vents are open for the unit to function as designed.

9. Verify that the return vent is not obstructed and that any return filters are clean.

10. Inspect the drain pan to make sure that there is not 1/2” or more of condensate in the pan.

11. The units are designed to operate with sea water temperatures up to 95 degrees Fahrenheit in cool mode and down to 50 degrees Fahrenheit in heat mode.

DISPLAY MENU OPTIONS



Compressor, pump, heat and valve have a toggle that shows what components are being powered. Heat will never show ON, as it is for electric heat. Valve will show ON when heat is activated, as the units are heat pumps.

There are (3) temperatures displayed under MENU. These are return (reading from return air sensor), evaporator (reading from evaporator sensor, located on the evaporator coil), and cooling water or condenser (reading from condenser sensor, located on the condensing coil). The condenser is expected to read a temperature of no more than 15 degrees higher than inlet seawater temperature.

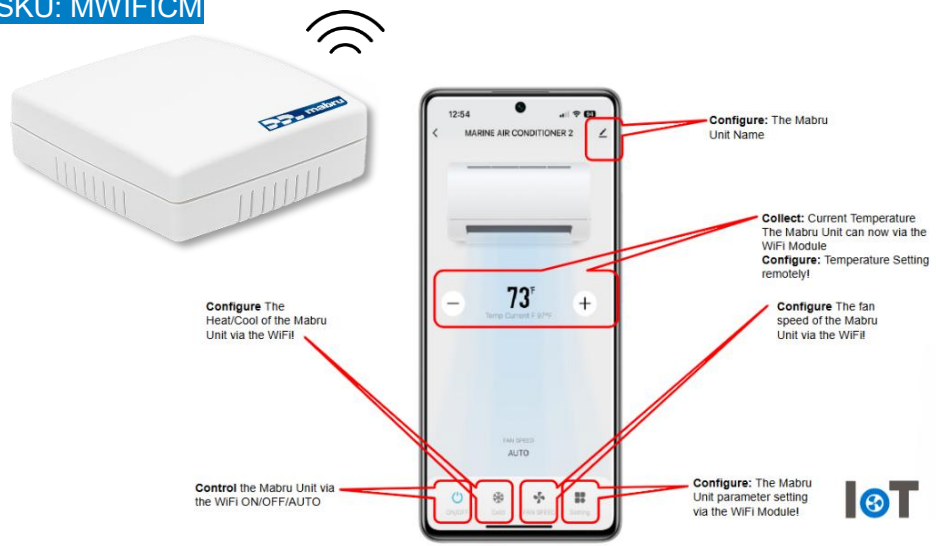
Control fan OFF as set from factory means that the fan will always be on, regardless of compressor state. It will slow down when compressor is off if set to AUTO. Control fan ON, the fan will not run if the compressor is off.

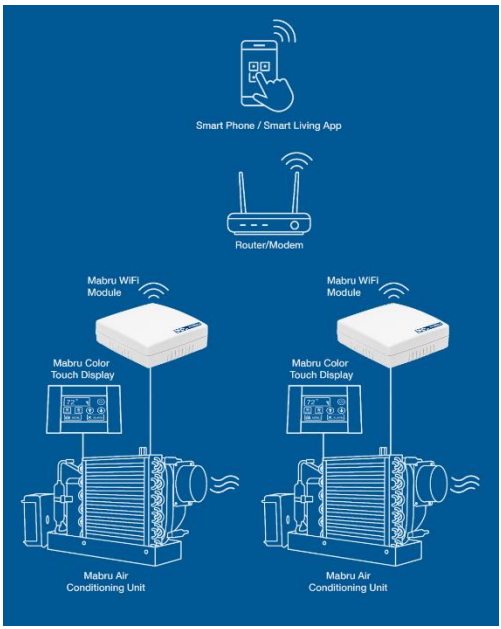
Temperature format: To change between temperature measurements, go to MENU and scroll down to TEMP FORMAT. There you can toggle between C or F.

On VI units, the fan speed setting is also used as an eco function to limit compressor speed. Fan speed 1 is the lowest eco setting. Fan speed 2 will allow the compressor to run slightly faster, and so on. Auto fan will give standard functionality where unit will output necessary capacity to maintain the set temperature.

OPTIONAL ADD-ON:
MABRU WIFI MODULE

SKU: MWIFICM





1:1

- Every Mabru Air Conditioning Unit requires a separate *Mabru WiFi Module*.
- Eliminates a single point of failure
- Simplifies integration and setup
- WiFi Modules can be powered on individually to make logical association within a single software platform

Download WiFi Module Specifications

PREVENTIVE MAINTENANCE & WINTERIZATION

WEEKLY

• Check/clean the sea strainer

• Check drain pan and sump pump if applicable. Sitting water in the unit's drain pan will cause premature wear on the unit and reduce lifespan. Make sure that drains are free-flowing and that no more than ½" of water is sitting in the drain pan.

ANNUALLY

- Visually inspect the unit for any signs of corrosion or damage.
- Blow out drain line(s).
- Clean return filter(s).
- Descale seawater cooling loop.
- Check all hose clamps and visually inspect all hoses for kinks, cracks, or chaffing damage, replace as needed.

WINTERIZATION

WHEN THE BOAT REMAINS IN THE WATER:

For in-water storage, it's essential to use a potable anti-freeze solution in both the water supply and discharge lines. Ensure compliance with state, local, and federal regulations before discharging antifreeze overboard.

1. Close the ball valve.
2. Disconnect the water line at the ball valve.
3. Submerge the line into a bucket of potable antifreeze.
4. Run the air conditioner until a consistent stream of antifreeze is discharged overboard.
5. Reconnect the water line at the ball valve.

WHEN THE BOAT IS OUT OF WATER IN DRY STORAGE:

When the boat is out of the water:

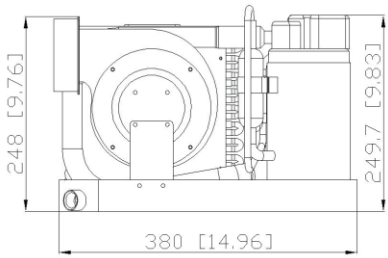
1. Open the seacock to allow all water to drain from the system through the thru-hull fitting.
2. Remove and empty the seawater strainer basin.
3. Loosen the screws on the pump head to facilitate water drainage from the pump and the water line between the pump and strainer.
4. Close the seacock.

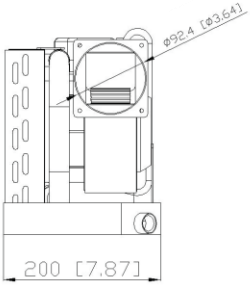
WHEN RETURNING THE BOAT BACK INTO THE WATER IN THE SPRING:

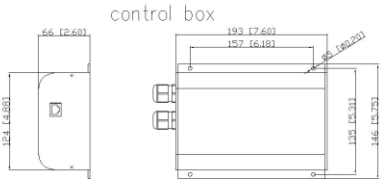
1. Gradually open the seacock to allow water to fill the system up to the pump's level.
2. Tighten the pump face to establish a seal.
3. Once the pump is primed, fully open the seacock valve.

DIMENSIONS

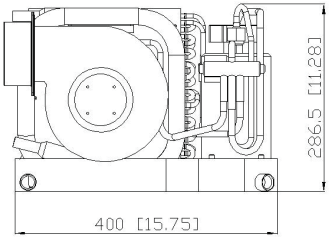
SC5DC DIMENSIONS

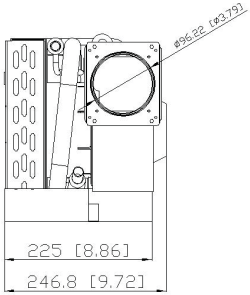


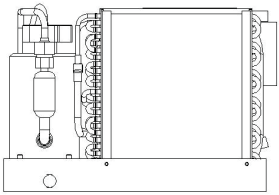


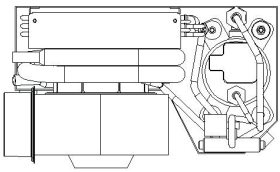


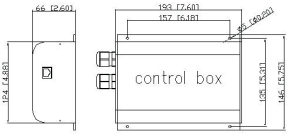
SC7DC DIMENSIONS





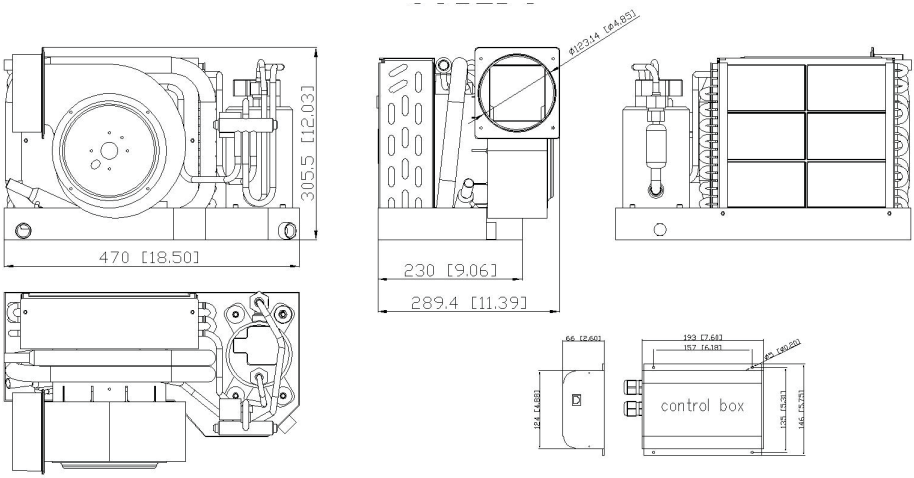




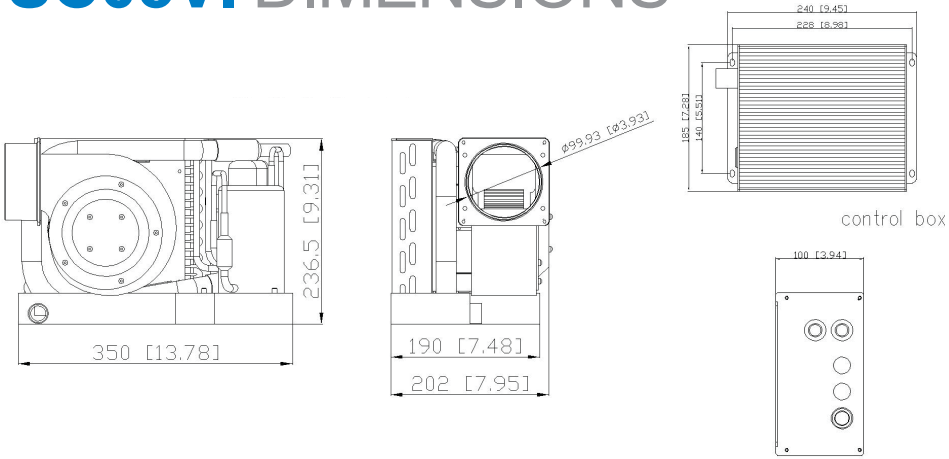


DIMENSIONS

SC12DC DIMENSIONS

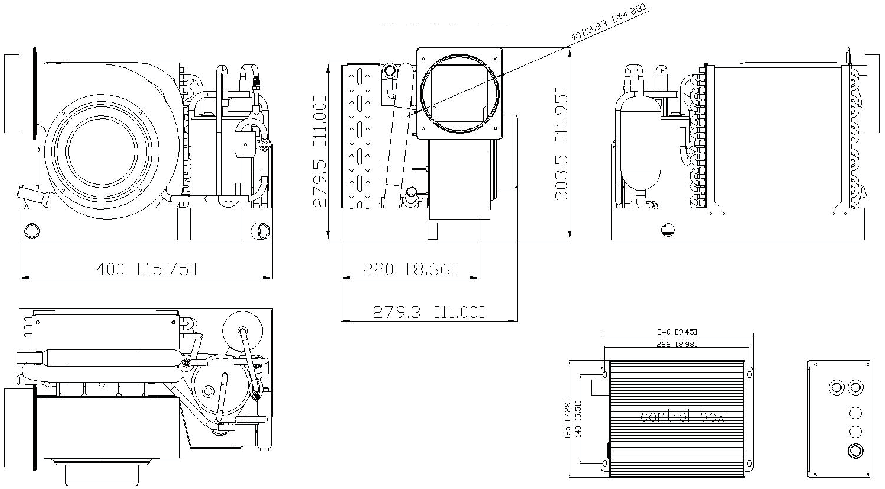


SC05VI DIMENSIONS

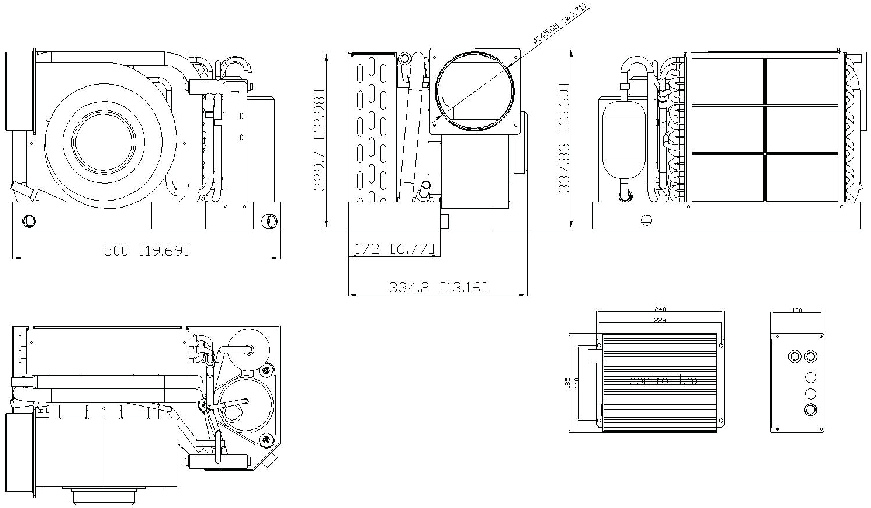


DIMENSIONS

SC09VI DIMENSIONS

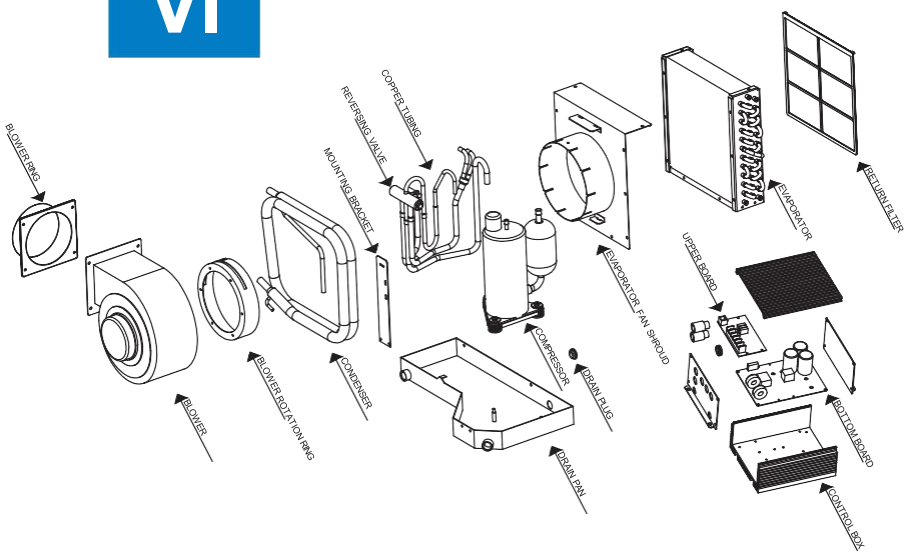


SC17VI DIMENSIONS

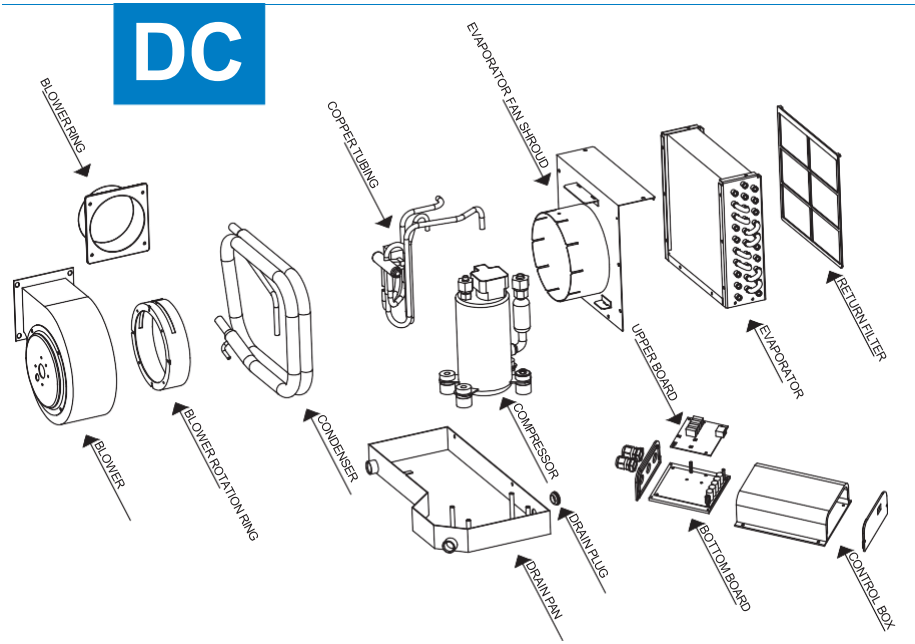


PARTS DIAGRAM

VI



DC



MABRU POWER SYSTEMS
ERROR CODES & MARINE TROUBLESHOOTING GUIDE

Error Code	Definition of Error	Possible Causes	Possible Corrections
1	Return temperature sensor error reading (Sensor should be located in front of the return vent)	• Possible failure of room temperature	• Confirm RJ45 terminals • Replace display cable (standard CAT5) • Replace return temperature sensor
2	Evaporator temperature Sensor error	• Possible damage or disconnected evaporator temperature sensor	• Check connections • Confirm the (blue) A12 connector in place • Replace sensor
3	Condenser (seawater) temperature sensor error (Located on condensor coil)	• Possible damage or disconnected condenser temperature sensor	• Confirm condenser temp sensor in place. Replace if necessary • Confirm A13 connector is in place
4	Evaporator high temperature alarm **(in heat mode only)**	• Air not circulating through unit • Clogged return grille • Fan isn't working	• Clean return grille and filter • Check for air restriction in ducting • Confirm fan is working
5	Possible refrigerant leak	• Evaporator sensor out of position • Refrigerant leak • Condenser temp. too high • 12V models: error could be caused by voltage outside of operating range - 11.5-14.2	• Evaporator sensor should be placed inside copper tube midway up evaporator • Additionally, for 12V DC models: turn off main breaker for 5 minutes (hard reset). Check voltage parameters; try again. • Verify condenser (cooling water) temp is below 110° F & verify voltage

Download Marine Troubleshooting Guide

MABRU POWER SYSTEMS
ERROR CODES & MARINE TROUBLESHOOTING GUIDE

Error Code	Definition of Error	Possible Causes	Possible Corrections
6	Error 6 on 12V DC models only	• Typically caused by voltage or water flow	• Verify voltage • Restart unit through circuit breaker • To confirm flashing sequence: Turn on unit • Look for flashing light on electrical box near cable inputs • The sequence will flash for one minute, then return to standby mode of one short, one long • Contact Mabru support and report sequence
6	Error 6 on VFD and VI units (Driver error = bottom board error)	• Poor water flow Electrical box location • Loose connections inside electrical box	• Restart unit through circuit breaker - Leave off for 5 minutes • Confirm proper water flow (clean strainer, bleed air from pump) • Open electrical box. confirm proper connections; confirm flashing sequence and contact Mabru support
7	VFD and VI units	• Poor connection of the blue 3 pin connector on top board.	• Reseat the blue 3 pin connector on top board.
8	High pressure protection	• **In cool mode only:** • Seawater restriction • Seawater pump is broken or airlocked • **In heat mode only:** • Air restriction in duct • Clogged or blocked return grille • Fan not working	• Clean seawater strainer • Bleed seawater pump Possible descale • Repair restriction in ducting • Clean return grille • Confirm fan working
9	Evaporator protection	• **In cool mode only:** • Poor air circulation • Clogged return grille • **In heat mode only:** • Air restriction in duct • Clogged or blocked return grille • Fan not working	• Repair restriction in ducting • Clean return grille • Change direction of supply grille, if air gets colder

MABRU POWER SYSTEMS
ERROR CODES & MARINE TROUBLESHOOTING GUIDE

Error Code	Definition of Error	Possible Causes	Possible Corrections
10	Condenser Temperature Error	• Seawater restriction • Operation mode is wrong - cooling mode in a cold. climate or heating mode in a warm climate	• Check flow at seawater thru-hull • Bleed seawater pump • Backflush or descale the system. • Check if selected mode is correct
11	**On standard AC models:** Pressure switch connection is incorrect	• DL3 jumper is damaged or missing	• While unit is off, check connectors are in correct location
	VFD/VI models	• Confirm correct location of return temperature sensor. Sensor should be located on the (white) terminal AI.1 • Possible leak	• Confirm sensor location • If leak, do not use unit. Contact dealer or Mabru support
12	**Standard AC models:** Compressor overcurrent error	• Bad capacitor or loose connection	• Check capacitor for signs of leaks or swelling. Replace if needed
	DC models: Low voltage protection - shown as “return gas sensor fault”	• Voltage below 10.5 volts to unit • Possible loose connection • Low battery voltage	• Confirm proper connections • Adjust voltage supply to unit • Charge battery bank
14	**VFD/VI models**	• Voltage instability • Can also be caused by an issue with the bottom board, if intermittent. Board replacement is required	• Turn off breaker for 30 minutes (hard reset) • Check voltage before restarting display
15	Communication error between circuit board and display panel	• Display control, RJ45 display cable CAT5), or circuit board is damaged • Possible water intrusion	• Check if the display control panel, RJ45 cable, and/or circuit board was affected by moisture

NOTE: *if the display reads -4 or -40 for any temperature readings, it could be an issue with the display cable or the sensor itself. Verify that the display cable is seated properly on the display and circuit board; if that does not resolve the issue, try a new CAT5 (ethernet) cable.*

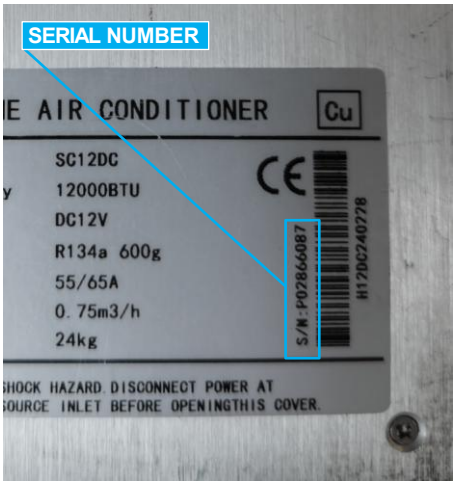
To speed up troubleshooting, please email the following information to: support@mabrumarine.com

1. Your contact information, name, email, and phone number
2. Model and Serial Number
3. Pictures of your installation
4. Any error code that is seen on the display.
5. Pictures of the 2 display screens or the information displayed there. Please include the information at startup and after running for 10 minutes.
   - Compressor on or off
   - Pump on or off
   - Valve on or off
   - Return temperature
   - Evaporator temperature
   - Scroll down to the next screen
   - Condenser temperature or cooling water temperature
   - Comp Current, this is the voltage on a DC model or the amperage on the VI models.
   - Temperature Format
   - Control Fan on or off

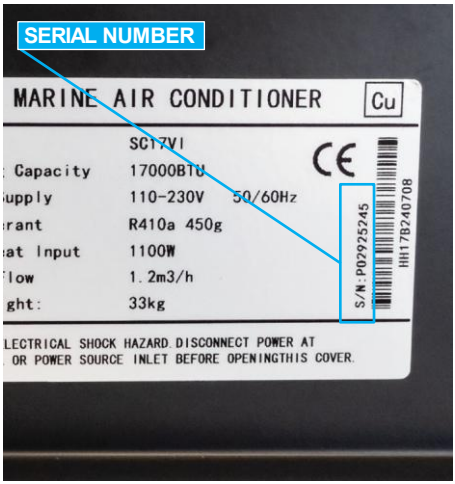
This is an example of an obstructed pump impeller. This was caused by a poorly maintained sea strainer. The symptom in this case was the substantial reduction in waterflow.

SERIAL NUMBER PLACEMENT

The unit label with the SN is located on the top of the VI electrical box and also located on top of the evaporator on units sold in 2024 and onward. The information label is located in back of the DC electrical box, which requires the box to be removed from the wall. In units sold in or after 2024, there will also be a SN located on top of the evaporator. On Standard units, the unit label is located on the cover of the electrical box. Please see examples below of the SN placement on our different models.

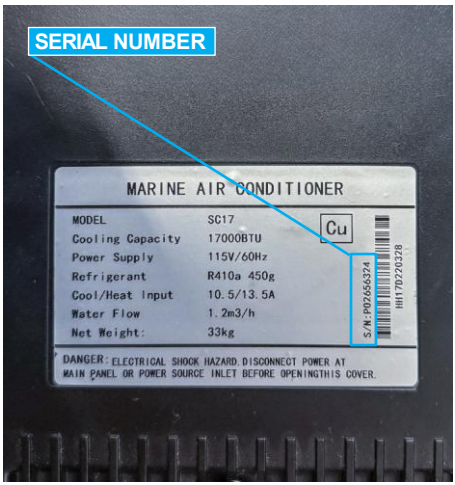


DC unit label



VI unit label

SN location on evaporator



Standard unit label

WARRANTY AND RETURN POLICY

Below are links to view or download Mabru's Warranty and Policy documents.

MABRU SHIPPING GUIDE & RETURN POLICY:

https://www.mabrumarine.com/support-marine

https://www.mabrumarine.com/support-rv

MABRU GENERAL PRODUCT LIMITED WARRANTY :

https://www.mabrumarine.com/support-marine

MABRU RV PRODUCT LIMITED WARRANTY :

https://www.mabrumarine.com/support-rv

MABRU LITHIUM BATTERY WARRANTY :

https://www.mabrumarine.com/support-marine

All warranty documents and policies can also be requested directly from our team.

MABRU CUSTOMER SERVICE DEPARTMENT

For customer and technical support, contact Mabru using the following:

Telephone: +1 888-818-2814
+1 954-467-1770

Email: support@mabrumarine.com

Mailing Address:
Mabru Power Systems
Warranty Department
1105 Old Griffin Road,
Dania Beach, FL 33004

For all other areas, visit our website to find your nearest dealer or distributor:

www.mabrumarine.com

We are open M-F 8:00AM to 4:30PM ET