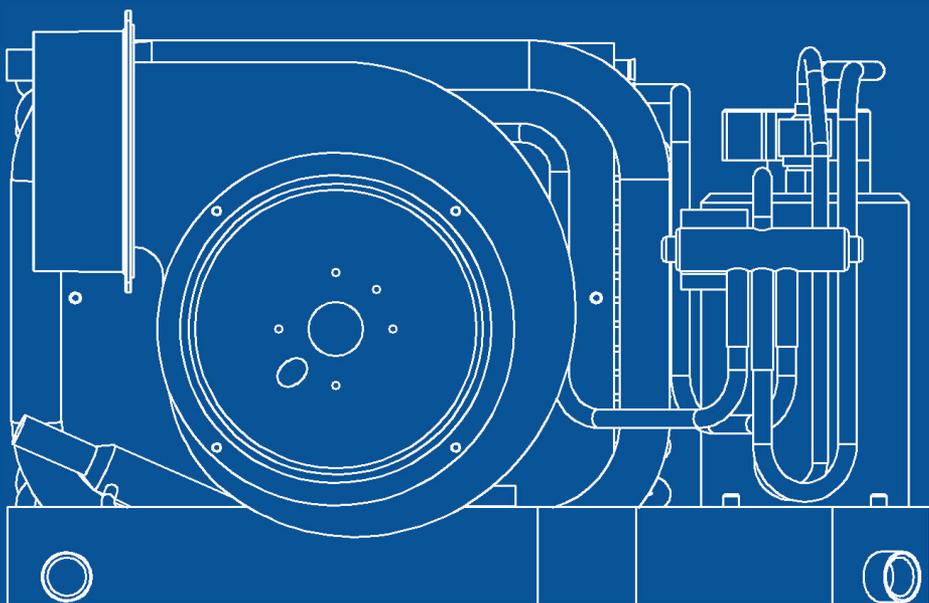

MARINE SELF CONTAINED AIR CONDITIONING SYSTEM



2025



INSTALLATION MANUAL

MABRU[®]

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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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 Voltage International (115/230 V AC) VI 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, please feel free to contact us by emailing support@mabrumarine.com or calling (888) 818-2814. Our hours of operation are 8:00AM to 4:30 PM ET.

Warranty information is available on [page 35](#) 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 ensures 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 temperature throughout 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, Mabrü 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 115/230 V AC units, the grounding is integrated into the 115/230 V 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.

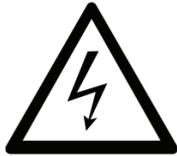
SAFETY PRECAUTIONS

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

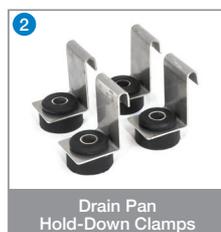
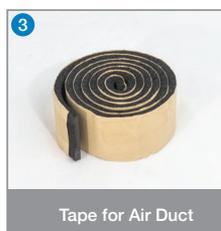
Follow ISO standards for all marine air conditioning plumbing and use two hose clamps in reverse directions on all connections on the seawater pump circuit. Marine-grade, stainless steel hose clamps are required for all Mabru air conditioning installations.

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'.)

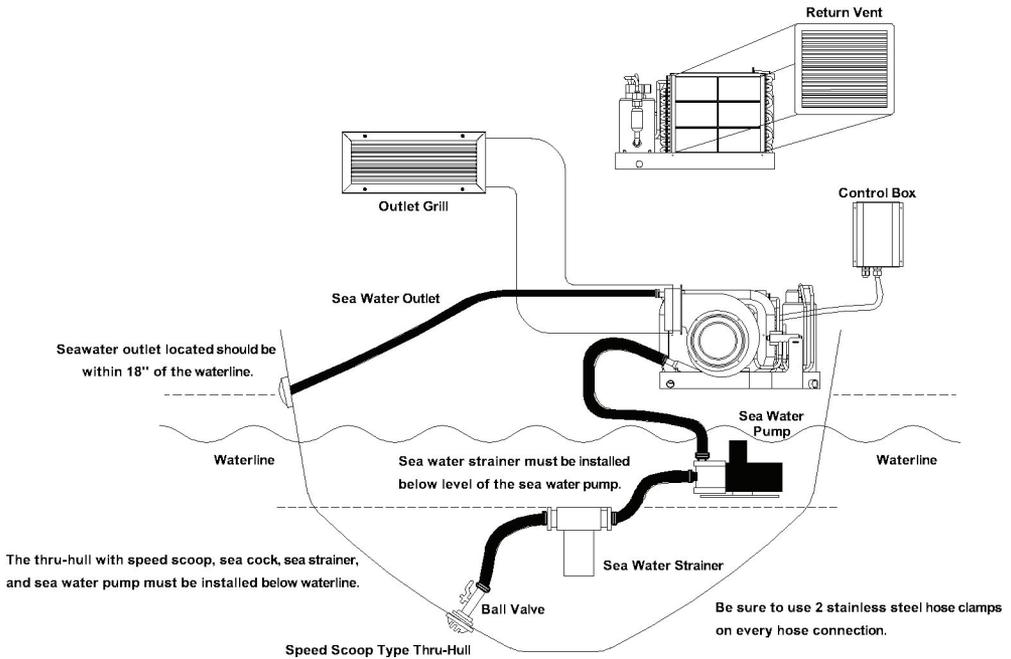
5. The SC5DC, SC7DC, SC12DC, and RadAir™ (RT12DC) air conditioners come with a 350 GPH 12V raw water pump.

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.)

****115/230 V 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 $\frac{1}{2}$ " 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 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%.)

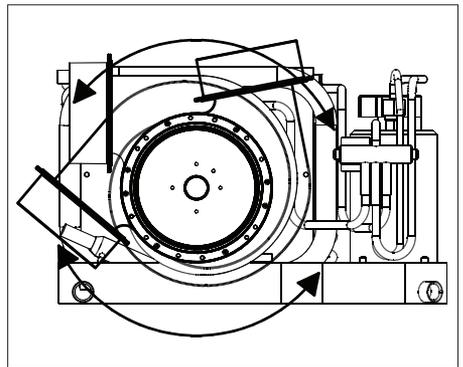
MABRU DUCT SIZE, RETURN VENT, AND AIR GRILLE SIZE

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 VI Voltage International Units			
SC05VI	4"	64"	16"
SC09VI	5"	80"	24"
SC17VI	6"	100"	30"

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

RETURN SENSOR



The pictures above show the ideal placement of the return air temperature sensor. The sensor should be placed 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 1/2" or 3/4" Sea Strainers, Depending on Size of Water Lines (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



Mabru 350 GPH Pump (Pictured)

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 AND SPECS

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™ (RT12DC)	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 VI International (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

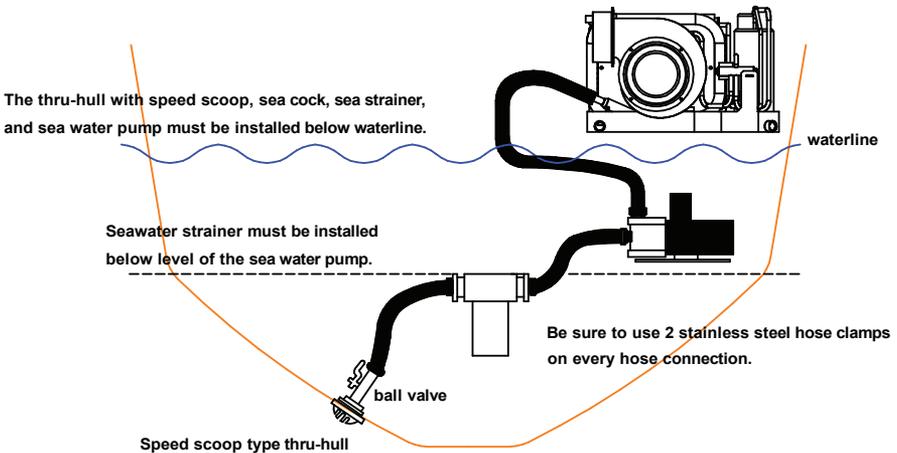
950 PUMP - NPT 3/4" inch
650 PUMP - NPT 1/2" inch

1250 PUMP - NPT 1" inch

MABRU PUMP SPECIFICATIONS

	250 GPH	350 GPH	650 GPH	950 GPH	1250 GPH
Voltage	24V	12V	24V	24V	24V
Amperage Draw (amps)	1.3A	4.5A	3.3A	5A	6.3A
Waterproof	Yes				
Max Head (ft)	25ft	35ft	40ft	35ft	35ft
Gallons Per Hour (GPH)	250 GPH	350 GPH	650 GPH	950 GPH	1250 GPH
Inlet x Outlet (inch)	1/2"	1/2"	1/2"	3/4"	1"
Height (inch)	3"	3.19"	3.19"	4.33"	5.33"
Width (inch)	2.69"	3.19"	3.19"	3.5"	4"
Length (inch)	3.5"	4"	4"	6"	7.25"
Weight (lbs)	0.5lbs	1.55lbs	1.55lbs	2.5lbs	4.50lbs
AC Power Supply	Yes	No	Yes	Yes	Yes

MABRU SEAWATER INSTALLATION



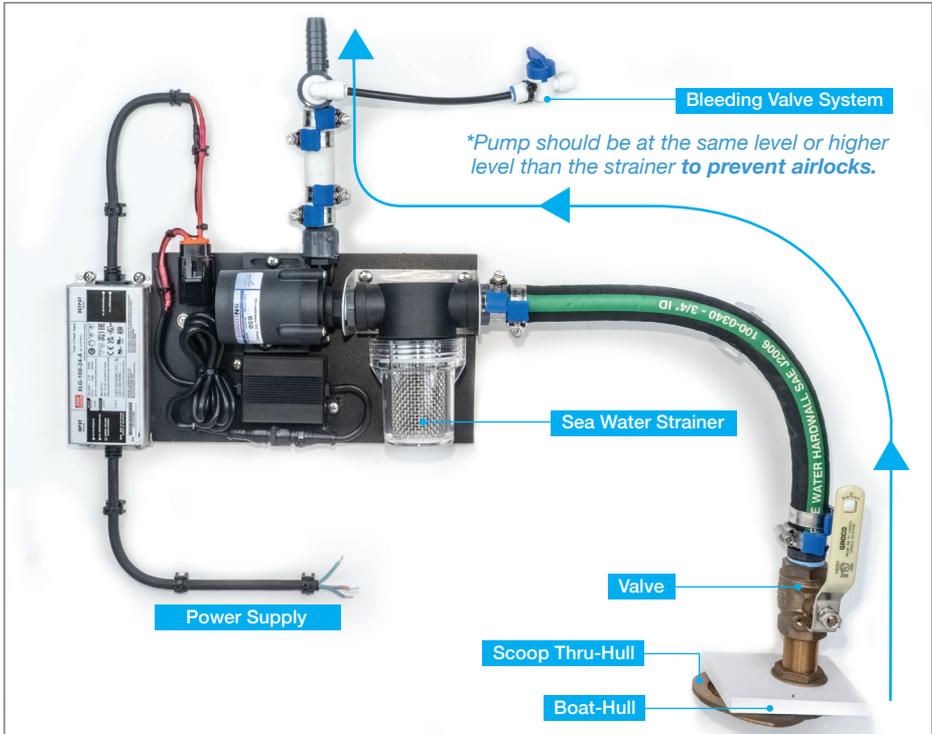
MABRU PUMP SPECIFICATIONS

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 waterline 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.



Above is a proper example of a pump installation with our 1/2" bleeding valve on the outlet of the pump.



Above is a proper example of a pump installation with our 1/2" bleeding valve on the outlet of the pump.



1/2" inch NPT pipe thread fitting



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

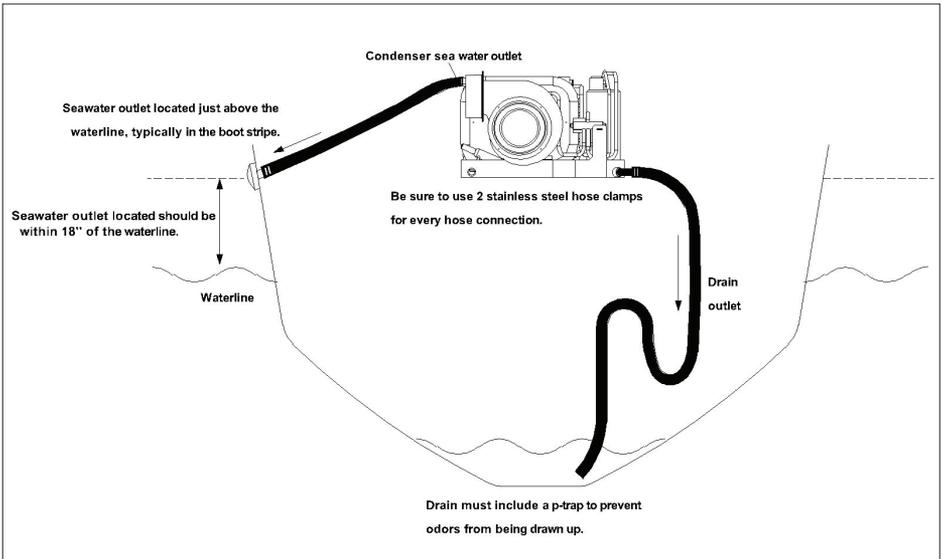
The drain pan must be angled toward the drain to ensure proper water flow and drainage, using shims if necessary to achieve the correct tilt. The goal is to minimize any standing water in the pan. If the condensate drains into the bilge, a P-trap must be installed to prevent vapors from entering the living space. Alternatively, the ideal method for removing condensate is by

using a sump box and pump system to discharge the water overboard. Our air conditioners can produce up to 5 gallons of condensate per hour. The drain pan uses a standard 1/2" inch NPT pipe thread fitting for connection. After the installation is complete, please test the drain by pouring 1 gallon of water into the drain pan as a test for proper drainage.

PROPER CONDENSATE DRAIN AND CONDENSER OUT FLOW

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 115/230 V AC air conditioners are grounded through the 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 115/230 V AC power feeds must be installed and grounded following ABYC standards.
3. The proper circuit protection must be used. SC05DC/SC07DC 50A, SC12DC/RadAir™ (RT12DC) 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 12 V DC air Conditioners SC5DC, SC7DC, SC12DC, and RadAir™ (RT12DC) 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

CIRCUIT LENGTH	CIRCUIT TYPE				CURRENT FLOW IN AMPS															
	10% VOLTAGE DROP Non Critical		3% VOLTAGE DROP Critical		5A	10A	15A	20A	25A	30A	40A	50A	60A	70A	80A	90A	100A	120A	150A	200A
	0 to 20 ft.	0 to 6.1 M	0 to 6 ft.	0 to 1.8 M	16 AWG	14 AWG	12 AWG	10 AWG	8 AWG	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG
30 ft.	9.1 M	10 ft.	3.0 M	16 AWG	14 AWG	12 AWG	10 AWG	8 AWG	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG
50 ft.	15.2 M	15 ft.	4.6 M	16 AWG	14 AWG	12 AWG	10 AWG	8 AWG	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG
65 ft.	19.8 M	20 ft.	6.1 M	14 AWG	12 AWG	10 AWG	8 AWG	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	0 AWG
80 ft.	24.4 M	25 ft.	7.6 M	12 AWG	10 AWG	8 AWG	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	0 AWG	0 AWG
100 ft.	30.5 M	30 ft.	9.1 M	12 AWG	10 AWG	8 AWG	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	0 AWG	0 AWG
130 ft.	39.6 M	40 ft.	12.2 M	10 AWG	8 AWG	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG				
165 ft.	50.3 M	50 ft.	15.2 M	10 AWG	8 AWG	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG				
200 ft.	61.0 M	60 ft.	18.3 M	8 AWG	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG					
		70 ft.	21.3 M	8 AWG	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG					
		80 ft.	24.4 M	8 AWG	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG					
		90 ft.	27.4 M	8 AWG	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG					
		100 ft.	30.5 M	8 AWG	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG					
		110 ft.	33.5 M	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG						
		120 ft.	36.6 M	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG						
		130 ft.	39.6 M	6 AWG	4 AWG	2 AWG	1 AWG	0 AWG	0 AWG	4 AWG	4 AWG	2 AWG	1 AWG	0 AWG						

Standard and Metric Wire Comparison Table

American Wire Gauge (AWG) Metric

1.5 4 6 8 10 16 25 35 50 60 70 95 120

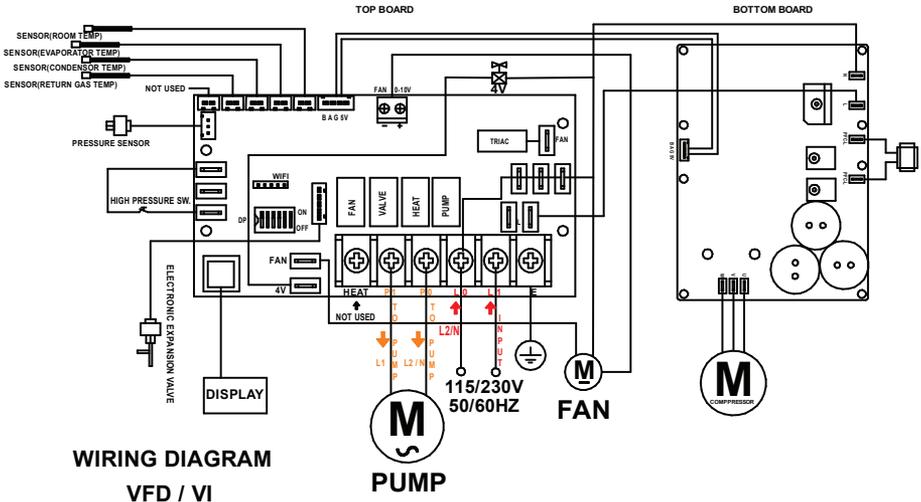
KEY

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.

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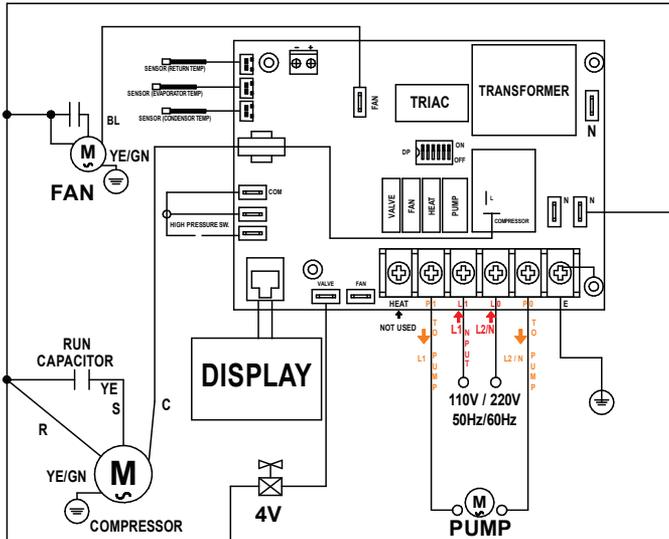


WIRING DIAGRAM FOR SC05VI, SC09VI AND SC17VI



NOTE: STANDARD UNIT CIRCUIT BOARDS WILL HAVE THE TERMINALS IN DIFFERENT LOCATIONS, BUT THE TERMINAL ID'S ARE THE SAME.
L1 = LINE L2 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)



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

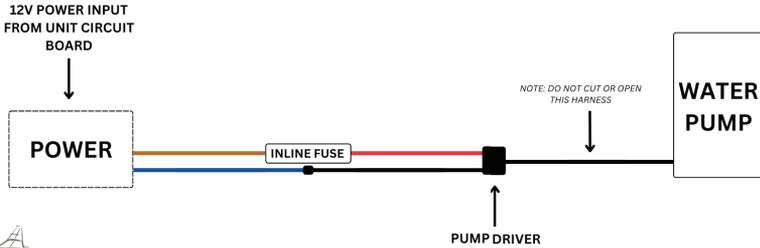
WIRING DIAGRAM FOR 12 V DC SEAWATER PUMP

DC PUMP CONNECTION

Wiring Information:

Blue - Negative 
Brown - Positive 

For the following model:
350 GPH with input of 12v



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

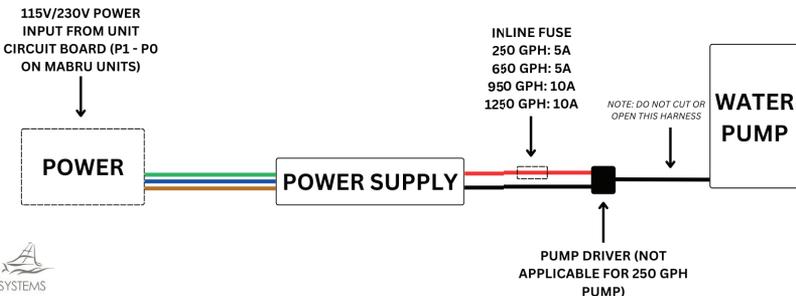
A/C PUMP CONNECTION

*Plastic case power supplies do not have ground connection.

Wiring Information:

Green - Ground 
Blue - AC Neutral/L2 
Brown - AC Line/L1 

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

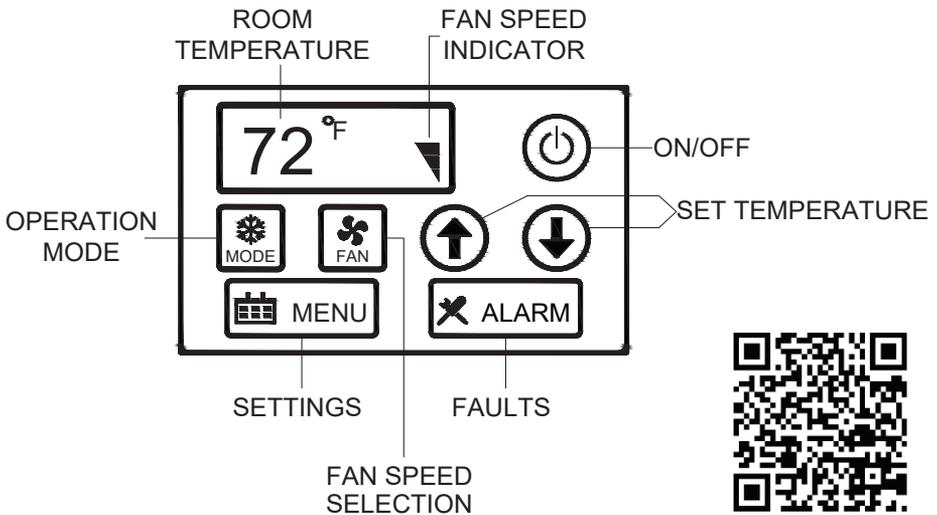


XLG power supply has a ground connection as shown in the wiring above. LPV models will only have two wires, L1 and N/L2.

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



Video showing display functions

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.

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:

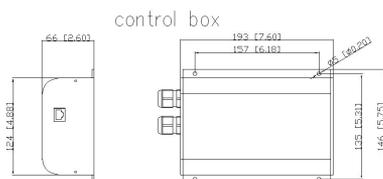
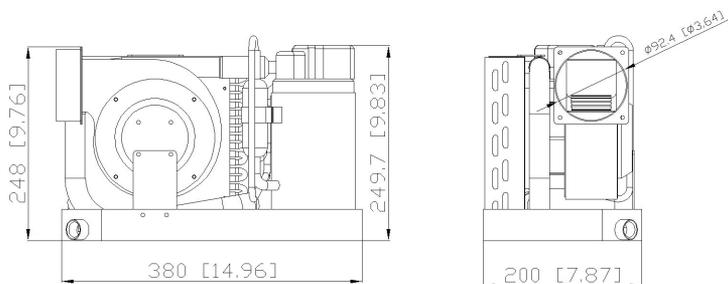
1. Open the seacock to allow all water to drain from the system through the thru-hull fitting.
2. Remove and empty the seawater strainer basin.
3. Loosen the screws on the pump head to facilitate water drainage from the pump and the water line between the pump and strainer.
4. Close the seacock.

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

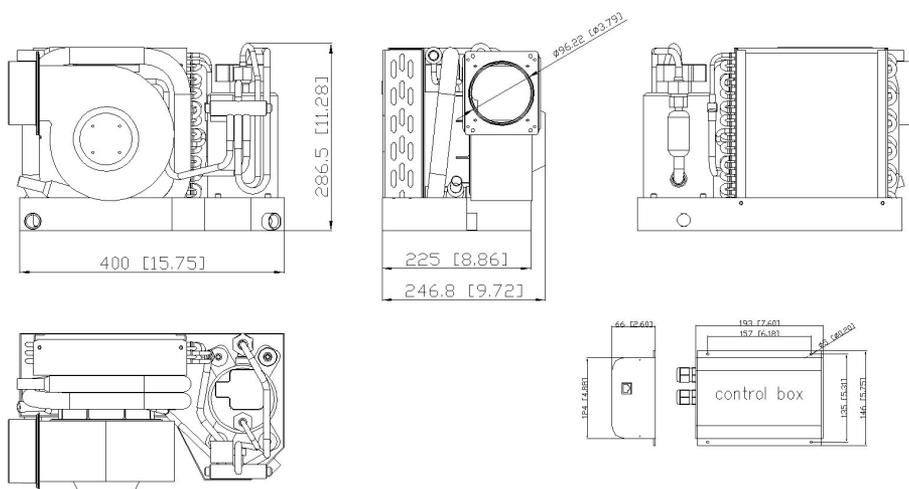
1. Gradually open the seacock to allow water to fill the system up to the pump's level.
2. Tighten the pump face to establish a seal.
3. Once the pump is primed, fully open the seacock valve.

DIMENSIONS

SC5DC DIMENSIONS

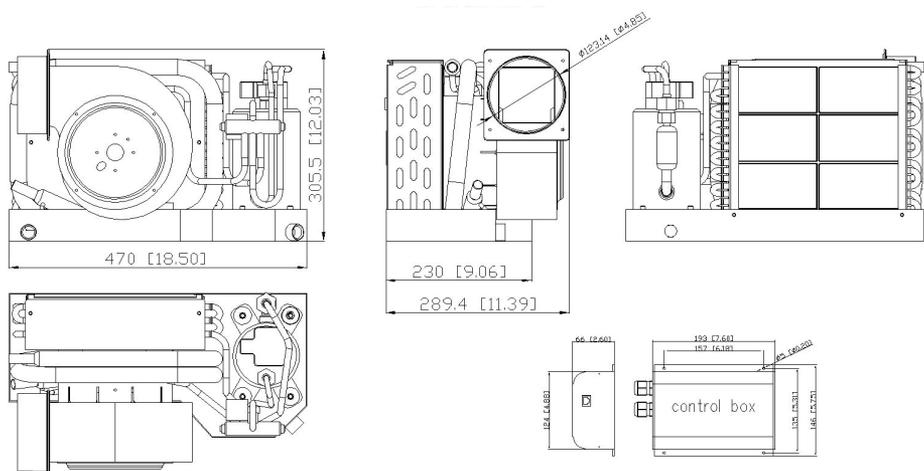


SC7DC DIMENSIONS

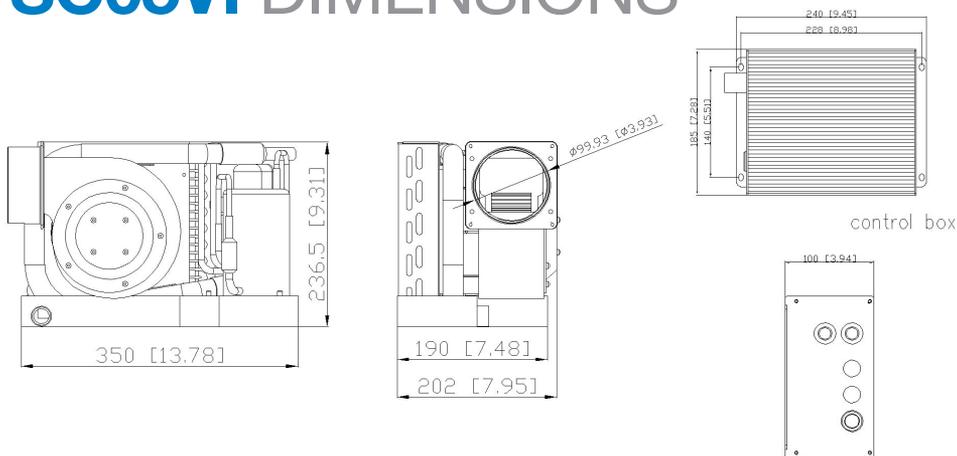


DIMENSIONS

SC12DC DIMENSIONS

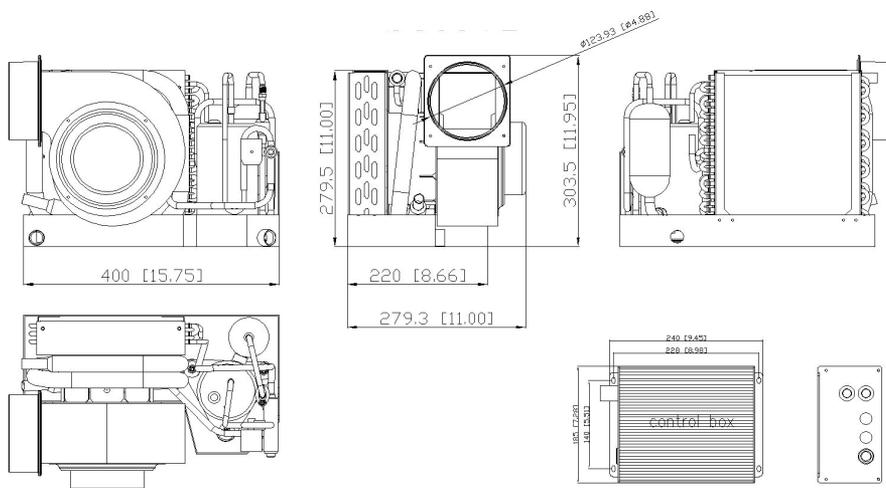


SC05VI DIMENSIONS

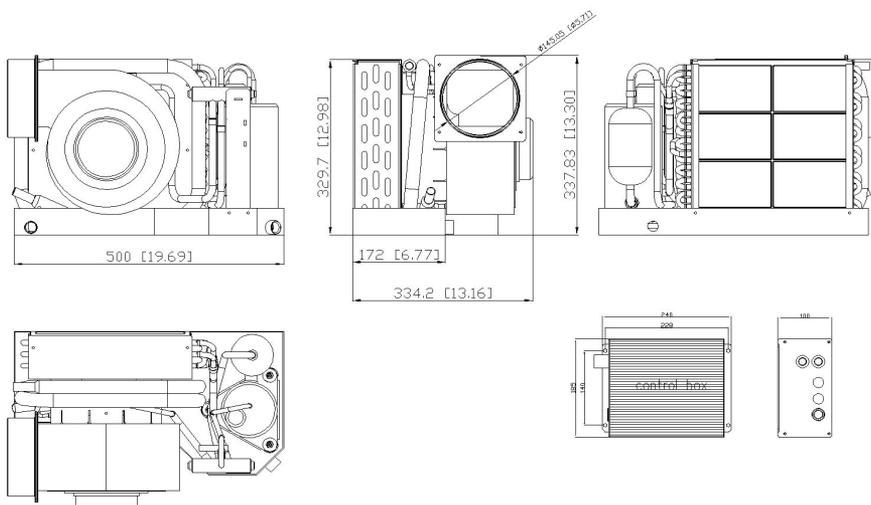


DIMENSIONS

SC09VI DIMENSIONS

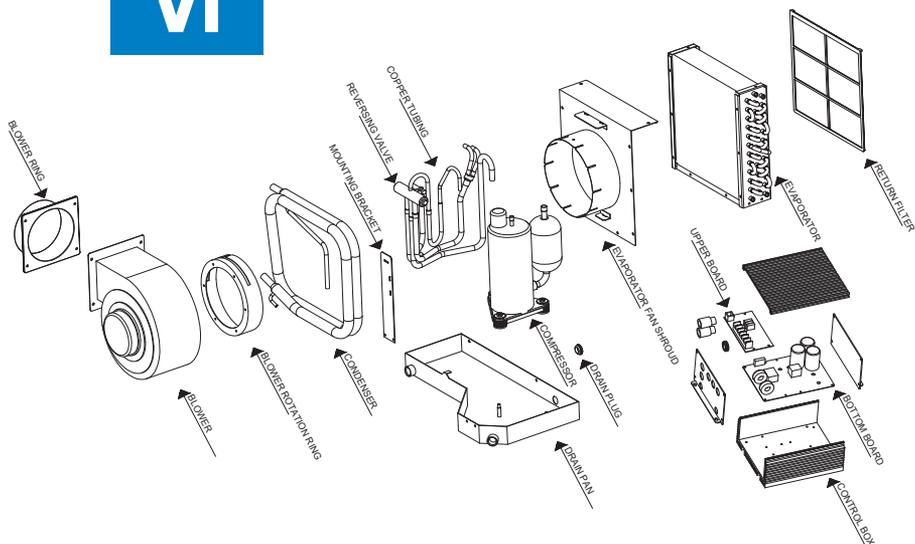


SC17VI DIMENSIONS

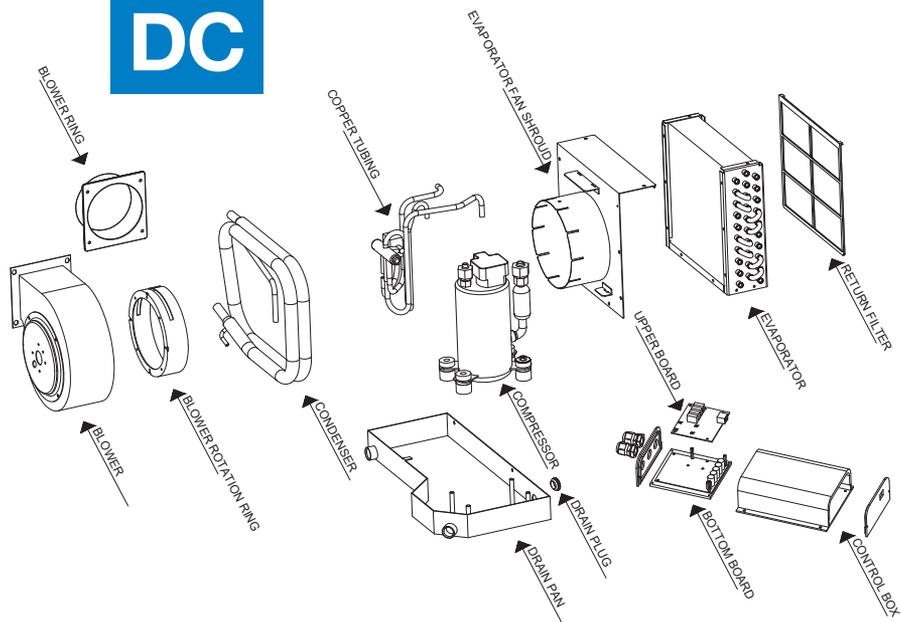


PARTS DIAGRAM

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)	<ul style="list-style-type: none"> Possible failure of room temperature 	<ul style="list-style-type: none"> Confirm RJ45 terminals Replace display cable (standard CAT5) Replace return temperature sensor
2	Evaporator temperature Sensor error	<ul style="list-style-type: none"> Possible damage or disconnected evaporator temperature sensor 	<ul style="list-style-type: none"> Check connections Confirm the (blue) A12 connector in place Replace sensor
3	Condenser (seawater) temperature sensor error (Located on condensor coil)	<ul style="list-style-type: none"> Possible damage or disconnected condenser temperature sensor 	<ul style="list-style-type: none"> Confirm condenser temp sensor in place. Replace if necessary Confirm A13 connector is in place
4	Evaporator high temperature alarm (in heat mode only)	<ul style="list-style-type: none"> Air not circulating through unit Clogged return grille Fan isn't working 	<ul style="list-style-type: none"> Clean return grille and filter Check for air restriction in ducting Confirm fan is working
5	Possible refrigerant leak	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Evaporator sensor should be placed inside copper tube midway up evaporator Additionally for 12V 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

MABRU POWER SYSTEMS

ERROR CODES & MARINE TROUBLESHOOTING GUIDE

Error Code	Definition of Error	Possible Causes	Possible Corrections
6	Error 6 on 12V models only	<ul style="list-style-type: none"> Typically caused by voltage or water flow 	<ul style="list-style-type: none"> 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)	<ul style="list-style-type: none"> Poor water flow Electrical box location Loose connections inside electrical box 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Poor connection of the blue 3 pin connector on top board. 	<ul style="list-style-type: none"> Reseat the blue 3 pin connector on top board.
8	High pressure protection	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Clean seawater strainer Bleed seawater pump Possible descale Repair restriction in ducting Clean return grille Confirm fan working
9	Evaporator protection	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Seawater restriction Operation mode is wrong - cooling mode in a cold climate or heating mode in a warm climate 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> DL3 jumper is damaged or missing 	<ul style="list-style-type: none"> While unit is off, check connectors are in correct location
	VFD/VI models	<ul style="list-style-type: none"> Confirm correct location of return temperature sensor. Sensor should be located on the (white) terminal Al.1 Possible leak 	<ul style="list-style-type: none"> Confirm sensor location If leak, do not use unit. Contact dealer or Mabru support
12	Standard AC models: Compressor overcurrent error	<ul style="list-style-type: none"> Bad capacitor or loose connection 	<ul style="list-style-type: none"> Check capacitor for signs of leaks or swelling. Replace if needed
	DC models: Low voltage protection - shown as "return gas sensor fault"	<ul style="list-style-type: none"> Voltage below 10.5 volts to unit Possible loose connection Low battery voltage 	<ul style="list-style-type: none"> Confirm proper connections Adjust voltage supply to unit Charge battery bank
14	VFD/VI models	<ul style="list-style-type: none"> Voltage instability Can also be caused by an issue with the bottom board, if intermittent. Board replacement is required 	<ul style="list-style-type: none"> Turn off breaker for 30 minutes (hard reset) Check voltage before restarting display
15	Communication error between circuit board and display panel	<ul style="list-style-type: none"> Display control, RJ45 display cable CAT5), or circuit board is damaged Possible water intrusion 	<ul style="list-style-type: none"> 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.

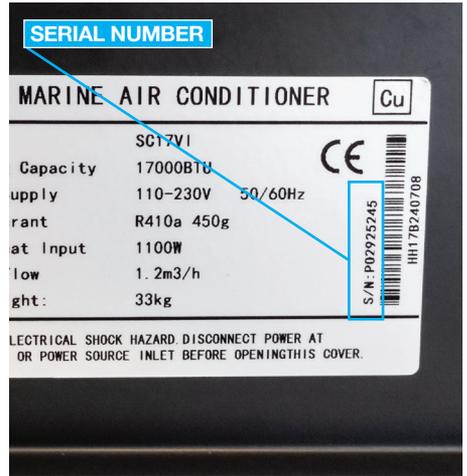
SERIAL NUMBER PLACEMENT

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.



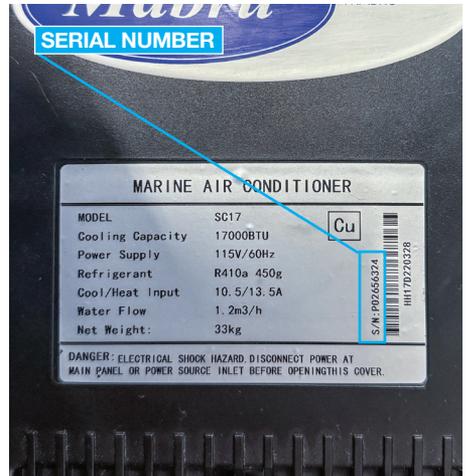
DC unit label



VI unit label



SN location on evaporator



Standard unit label

WARRANTY AND RETURN POLICY

SHIPPING:

We can ship to virtually any address in the world. There are restrictions on some products and some products cannot be shipped to international destinations. Mabru Power Systems, Inc. is not responsible for products shipped and detained at customs due to international regulations. When you place an order, we will estimate shipping and delivery dates based on the availability of your items and the shipping options you choose. Shipping charges can fluctuate daily and estimated costs are not a guarantee of final charges. Mabru Power Systems, Inc. is not responsible for delays in shipping or costs associated with rerouted packages or storage fees due to undelivered items. Import duties, taxes, and charges are not included in the item price or shipping cost. These charges are the purchaser's responsibility. Please check with your country's customs office to determine what your additional costs will be prior to buying. Do not accept visibly damaged packages from carriers. Refuse the delivery due to damage and contact Mabru Power Systems, Inc. Acceptance of visibly damaged packages will become the responsibility of the customer and a claim will need to be filed with the carrier for reimbursement. Mabru Power Systems, Inc. is not responsible for damage incurred during shipping. The customer accepts the risk of lost or damaged products during the shipping process.

Shipping Units for Repair Service:

Customers must first contact Mabru Power Systems, Inc., and Mabru Power Systems, Inc. will review all details and reasons for shipping a unit to Mabru Power Systems, Inc. for service. The customer will then be given an RMA number. The customer will be responsible for all shipping charges.

The customer will be responsible for all fees incurred due to shipping. The customer will accept all risks and costs associated with shipping. Mabru Power Systems, Inc. recommends purchasing insurance on all shipments to Mabru Power Systems, Inc. due to potential loss or damage during shipping. Mabru Power Systems, Inc. is not responsible for damage incurred during shipping. Customers accept the risk of lost or damaged products during the shipping process.

*Please see the guide for shipping to Mabru Power Systems, Inc.

RETURNS:

You may return most new, unopened items within 30 days of delivery for a full refund less a 25% restocking fee; No Exceptions. Do not accept visibly damaged packages from carriers. Refuse the delivery due to damage and contact Mabru Power Systems, Inc. Acceptance of visibly damaged packages will become the responsibility of the customer and a claim will need to be filed with the carrier for reimbursement. If a product is found to be damaged after it is opened, customers should contact Mabru Power Systems, Inc. within 72 hours to report it. Photos of the box and areas of damage will be required and Mabru Power Systems, Inc. will review the next steps. If the product is found to be defective, the customer may receive a refund of return shipping at Mabru Power Systems, Inc.'s sole discretion. The customer will be responsible for return shipping charges and a refund will be granted only after the product is received and examined by staff for prior use or damage. The customer will accept all risks and costs associated with return shipping. Mabru Power Systems, Inc.

recommends purchasing insurance on all returns to Mabru Power Systems, Inc. due to potential loss or damage during shipping. Refunds will be applied to the original form of payment unless otherwise agreed upon by both parties. Mabru Power Systems, Inc. is not responsible for damage incurred during shipping. Customers accept the risk of lost or damaged products during the shipping process. If you received the incorrect product due to Mabru Power Systems, Inc.'s error, return shipping will be refunded and the item replaced. You should expect to receive your refund within four weeks of giving your package to the return shipper, however, in many cases, you will receive a refund more quickly. This time period includes the transit time for us to receive your return from the shipper **5 to 10 business days**, the time it takes us to process your return once we receive it (**3 to 5 business days**), and the time it takes your bank to process our refund request (**5 to 10 business days**). On returns of all electronics, serial numbers must match with the serial number of the product originally shipped and will undergo inspection; if serial numbers are not matching, a refund will not be issued.

*Please see the guide for shipping to Mabru Power Systems, Inc.

LITHIUM BATTERY RETURNS:

Mabru Power Systems, Inc. will not accept lithium battery returns unless otherwise agreed upon prior to returning shipping. Customers must first contact Mabru Power Systems, Inc., and Mabru Power Systems, Inc. will review all details and reasons for return prior to return shipment. Mabru Power Systems, Inc.'s goal will be to troubleshoot possible issues with the battery which may include a third-party technician prior to offering a return option. Customers should keep their original packaging in case of possible return. Lithium batteries should be shipped in their original box and packing materials to ensure proper marking and safety. If a return is approved by

Mabru Power Systems, Inc., customers must ship their package through a facility certified in shipping hazardous materials, such as FedEx or UPS. Please check with your local shipping facility prior to shipping to ensure they can ship large stand-alone lithium batteries. Mabru Power Systems, Inc. recommends purchasing insurance for all returned items in case of loss or damage during shipping. Customers CANNOT return damaged lithium batteries, no exceptions. Mabru Power Systems, Inc. will review the reasons for the damage and at its sole discretion determine a refund or replacement. Mabru Power Systems, Inc. will not accept visibly damaged boxes containing lithium batteries and the customer will be responsible for all fees incurred due to return shipping. Customers are responsible for filing a claim for the package(s) damaged during shipping.

*Please see the lithium battery disclaimer and safety tips for full information

LITHIUM BATTERY DISCLAIMER:

Mabru Power Systems, Inc. Disclaimer, and Acceptance Policy:

All advice, information, recommendations, warnings, presentations, media and information materials, etc. provided by Mabru Power Systems, Inc. should be deemed ineligible, apply the information provided at your own risk. Except for the replacement of the battery itself or of equivalent value, Mabru Power Systems, Inc., its owners, employees, and all other dealers (collectively referred to hereinafter as Mabru Power Systems, Inc.), will not be responsible for any damage, harm, or problems arising or alleged to be caused by the installation or misuse of our batteries, by any method and means. You agree to these terms by utilizing our batteries.

Mabru Power Systems, Inc. is not responsible for injury, death, or damage caused by the performance characteristics of the

application (boat or RV) in which the battery is used. Please refer to the information provided on the website for more details before use.

You are solely responsible for and at your own risk when using the safety resources available on or through our website. Mabru Power Systems, Inc. is not responsible for the materials, information, and opinions provided or made available through this website (or these forums). No advice or information provided by Mabru Power Systems, Inc or its employees shall create any warranty. You rely on the advice, information, or content of this website at your own risk, including but not limited to any safety instructions, resources, or precautions relating to the installation, operation, maintenance, or repair of any Mabru Power Systems, Inc product or any other safety-related information that may be available on or through this website. If you do not accept and agree to this policy, return your products immediately prior to installing them, otherwise, it is considered confirmed you have accepted these terms and policies.

BATTERY WARNING AND USE AGREEMENT:

By purchasing ANY Mabru Power Systems, Inc. lithium-ion battery, the buyer:

- Assumes all risks associated with lithium-ion batteries
- Is responsible for reading all instructions and safety warnings before charging or use of lithium-ion batteries.
- Understands failure to read and follow safety instructions for lithium-ion batteries may result in fire, explosion, personal injury, and damage to property if used or charged improperly.
- Understands Mabru Power Systems, Inc. is not responsible for any personal injury or property damage caused by the negligence of these products and their applications.
- Will contact Mabru Power Systems, Inc. with any questions or concerns about the product and their applications.

IMPORTANT SAFETY INSTRUCTIONS AND WARNINGS:

- Improper use, mishandling, or use of defective batteries may result in residual fluid leakage, fire, or explosion.
- Always follow the manufacturer's care and use instructions in compliance with all regulations and applicable laws.
- It is the user's responsibility to ensure that all equipment has the necessary protective circuitry (installed with the battery).
- Always store batteries in fireproof containers and charge in an isolated area away from carpets, wood, paper, and other combustible materials.
- Do not disassemble, crush, cut, puncture, short circuit, incinerate, or expose the battery to fire, water, extreme temperatures, heat, or cold.
- Do not use damaged, peeled, punctured, dented, or disfigured batteries.
- Do not use batteries in products that use high current.
- Do not store or put the battery in a container where the battery may come into contact with metal or cause a short circuit.
- Keep batteries out of reach of children and pets.
- Do not combine old and new batteries or different brands (or types) of batteries.
- Do not construct your own battery charger or battery pack.
- Do not alter a battery or charger.
- Always use a smart charger with protection circuitry.

LITHIUM BATTERY WARRANTY:

2-Year Limited Warranty. All claims must be filed with Mabru Power Systems, Inc. directly. The warranty does not cover any improper use or handling of batteries as described in the above safety and warnings. The customer will be responsible for shipping of replacement battery if the warranty is accepted. The customer is responsible for disposing of the original battery.

SHIPPING GUIDE

Customers must ship their package through a facility certified in shipping materials, such as FedEx or UPS. Please check with your local shipping facility prior to shipping to ensure they can ship large stand-alone packages. Mabru Power Systems, Inc. recommends purchasing insurance for all returned items in case of loss or damage during shipping.

HOW TO SHIP A PACKAGE

STEP 1: Pick Your Box

Use a box that's big enough to safely fit what you're sending. Use a sturdy box with enough room to add cushioning for fragile items and to prevent items from shifting. Remember, size and weight determine the price.

STEP 2: Pack Your Box

Pack your box to protect your contents and make sure the box arrives intact. Tape your box so that it closes flat on all sides without bulging and reinforce the flaps with 2-inch wide packing tape.

Do not use cord, string, or twine.

TIP: Include a packing slip or a piece of paper with the destination address inside the box.

STEP 3: Address your Package

The address format for a box is the same as for envelopes. Write or print address labels clearly. Use ink that doesn't smear and include your return address and ZIP Codes™ for you and your recipient.

Use a permanent marker for handwritten addresses.

STEP 4: Choose a Mail Service

The best way to send your package depends on how quickly you want it to arrive and its size and weight.

There are several things to consider when choosing a shipping service.

- Package contents
- Destination
- Speed
- Shape, size, and weight
- Tracking
- Insurance
- Delivery Confirmation receipts

SHIPPING LABELS

Postal labels show mail handlers and carriers the mail service and extra services you purchase. Be sure to match the label to the mail service you buy.

SHIPPING INSURANCE

For particularly valuable items, you can insure your package.

STEP 5: Calculate & Apply Postage

Correct postage helps your packages arrive on time. Shipping costs depend on several factors.

Make sure you're not underpaying on postage. When a package is sent without enough postage, it may be returned to you or the person receiving it may need to pay the difference.

MABRU CUSTOMER SERVICE DEPARTMENT

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

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

Email: sales@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 distributor:

www.mabrumarine.com

[We are open from 8:00AM to 4:30PM ET](#)



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