INSTRUCTION MANUAL

Self-Contained Unit SDC15V12E

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SOMMARIO

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Thank you for choosing our product. The product that you have purchased has been manufactured with great care employing high-quality components, materials and the best technology in order to offer you the highest performances and energy saving over the time. The product has passed all the quality and performance tests before leaving the factory.

This document is confidential by law and shall not be copied or transferred to any third party without written the authorization of the manufacturer. The manufacturer reserves the right to make changes at any time to the products and manuals without notice.

1.0 INTRODUCTION

This manual provides you with the explanations necessary to install correctly the product and to run it safely and efficiently. You are requested to read this instruction manual carefully before installation and first use. Keep it in a safe and reachable please and in case you pass the product to another person please transfer to him the manual as well. Should you have any doubt or wish more details please contact the authorized local distributor or contact us directly by email at: info@blue-airco.com.
The installing instructions given in this manual are intended for qualified personnel used to carefully follow safety precautions and guidelines.

2.0 SAFETY AND PROHIBITIONS

DANGER! Risk of fire or explosion.
This appliance contains R454C mildly flammable refrigerant (safety class A2L).
Failure to follow these safety instructions may result in death, serious injury, fire, explosion or damage to the appliance.

Refrigerant and fire safety

- Installation, servicing and repair of the appliance shall only be carried out by trained and qualified personnel familiar with A2L refrigerants.
- Do not use potential sources of ignition to detect or search for refrigerant leaks.
- Do not use a halide torch or any leak detector that uses a naked flame.
- Only use leak-detection equipment and service tools suitable for use with R454C and A2L refrigerants.
- Do not smoke or use open flames or other potential sources of ignition while carrying out installation, servicing, maintenance, refrigerant recovery, charging or other operations during which refrigerant may be released.
- Do not install or store the appliance in the vicinity of continuously operating sources of ignition.
- Do not puncture, cut, crush, deform or otherwise damage the refrigerant tubing.
- Do not modify the refrigerant circuit or the appliance in any way that could affect its safety.
- Electrical components that may produce arcs or sparks shall only be replaced with components specified by Blue-Airco for this appliance. Replacement with other components may result in ignition of the R454C refrigerant in the event of a refrigerant leak.

Installation location

- The appliance is designed for installation in occupied spaces and may be installed as a built-in appliance, including under beds, sofas, stairs or inside lockers, provided that all installation requirements specified in this manual are respected.
- The appliance enclosure shall not be sealed inside an airtight compartment. The installation shall allow the required airflow and provide sufficient access for inspection, maintenance and removal of the appliance.
- Do not obstruct, modify or reduce the required air inlet and outlet openings or the air ducts connected to the appliance.

- Do not install the appliance in the bilge or engine room.
- Do not install the appliance in locations where fuel, flammable vapours or other materials may be present in a manner that could create a fire or explosion hazard.
- Do not install the appliance where it may be exposed to gasoline engines, fuel systems, LPG/CPG cylinders or other equipment that may constitute a potential ignition source, unless the installation has been specifically evaluated and approved for such an environment.
- Keep suitable fire-extinguishing equipment readily available when carrying out service operations involving a potential ignition source or hot work.

Electrical safety

- Disconnect the electrical power supply at the source before removing any cover or carrying out installation, maintenance or servicing. Ensure that the power supply cannot be accidentally restored during service.
- Connect the DC negative input of the appliance to the vessel's designated DC negative in accordance with the electrical installation requirements specified in this manual.
- Do not modify the appliance or bypass, disable or remove any safety device.
- Do not pull, detach, twist or otherwise mechanically stress the electrical cables connected to the appliance.
- Route and secure all cables so that they cannot be damaged, pinched, chafed or become a tripping hazard.
- Where cables pass through bulkheads, panels or other structures with sharp edges, use suitable cable protection such as grommets or cable ducts.

Condensate and exhaust gases

- Do not discharge condensate into the bilge.
- Do not terminate the condensate drain near engine or exhaust outlets. Maintain a minimum distance of 2 m from exhaust outlets.
- Install the condensate drainage system so that exhaust gases, carbon monoxide or other harmful gases cannot be drawn into the air-conditioning system or discharged into occupied spaces.
- Where required by the installation configuration, install a suitable trap in the condensate drain line to prevent the migration of gases through the condensate drain.

Service and maintenance

- The refrigerant circuit is pressurized. Installation, servicing and repair shall only be carried out by qualified personnel using appropriate tools and procedures.
- Before opening the refrigerant circuit, ensure that the work area is adequately ventilated and that all potential ignition sources have been eliminated or controlled.
- Wear appropriate personal protective equipment, including safety glasses and protective gloves, when working on the refrigerant circuit.
- Use only refrigerant, components, tools and service equipment specified or approved by Blue-Airco for this appliance.
- Do not intentionally release R454C refrigerant into the atmosphere. Refrigerant recovery shall be carried out using suitable equipment and in accordance with applicable regulations.

General prohibitions

- Do not operate the appliance if the refrigerant circuit, electrical wiring, casing or safety components are damaged.
- Do not drill, cut or otherwise modify the appliance enclosure or the surrounding installation without following the installation requirements specified by Blue-Airco.
- Do not dispose of, abandon or leave packaging materials within the reach of children, as they may present a potential hazard.

Failure to comply with these instructions may result in injury, death, fire, explosion or damage to the appliance.

3.0 RESPONSIBILITY

Blue-Airco S.r.l. shall not be held responsible for damage to persons, animals or property resulting from **incorrect installation, improper use, unauthorized modifications, inadequate maintenance or failure to comply with the instructions, warnings and requirements provided in this manual**, except where otherwise required by applicable law.

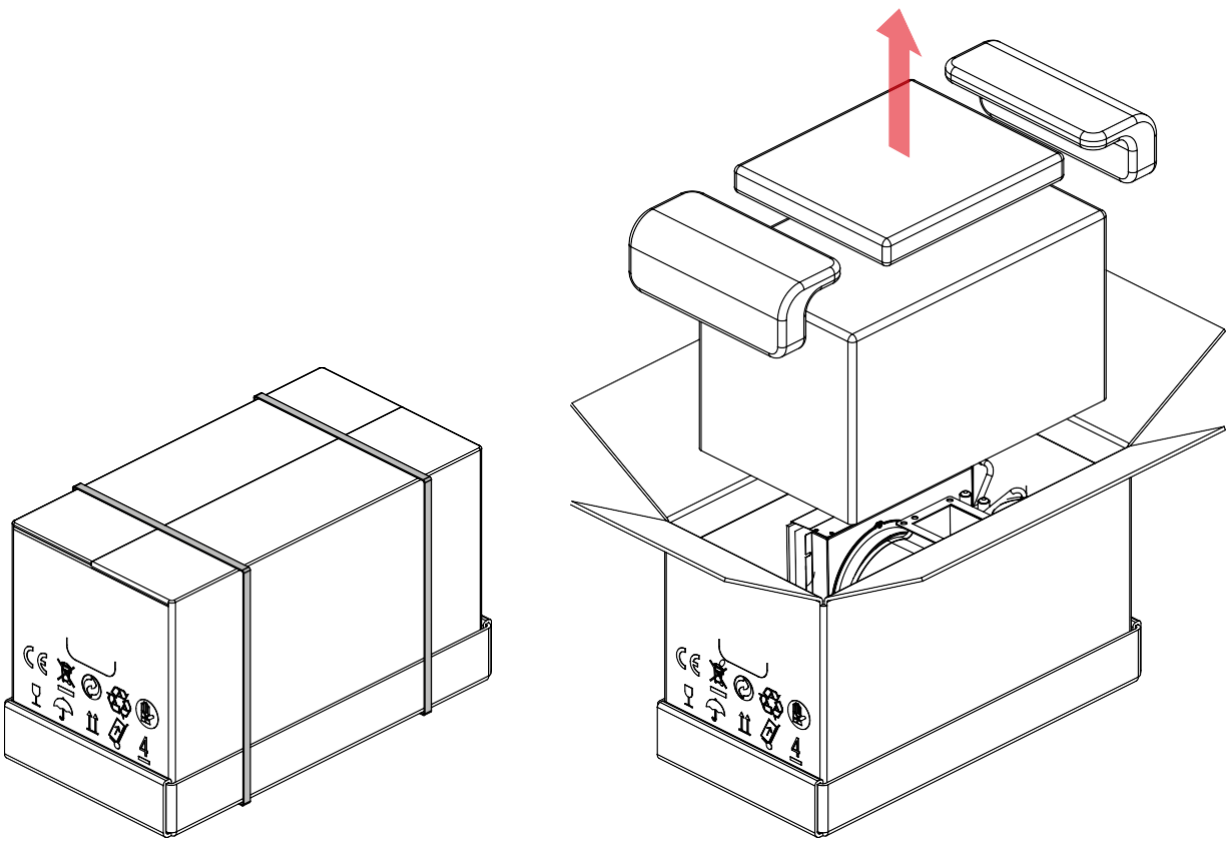
The manufacturer shall not be responsible for damage or malfunction resulting from:

- Incorrect assembly, installation, connection or commissioning of the air-conditioning system.
- Use of the product in a manner or for purposes other than those specified in this manual.
- Damage resulting from mechanical impacts, incorrect handling, excessive voltage, incorrect electrical connections or other conditions outside the specified operating limits.
- Modifications, alterations or repairs to the product carried out without the manufacturer's written authorization.
- Use of components, spare parts, accessories, refrigerant or service equipment not specified or approved by Blue-Airco S.r.l.
- Failure to perform the maintenance and inspections specified in this manual.
- Failure to comply with the safety instructions, installation requirements and operating limitations specified in this manual.

The manufacturer reserves the right to modify the product, its components and its technical documentation without prior notice, provided that such modifications do not affect the essential safety and performance requirements applicable to the product.

The above provisions do not limit any liability that cannot legally be excluded or limited under applicable law.

4.0 PACKAGING AND IDENTIFICATION



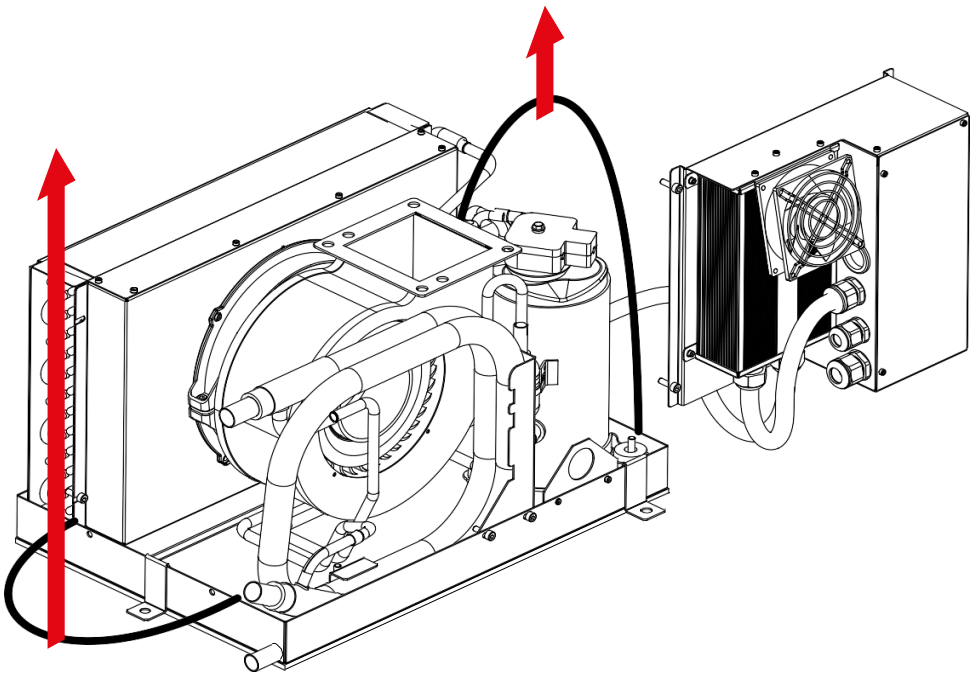
The packaging is made of suitable materials to protect the products during transport and handling.

Each unit includes a touch display with cable, 4 mounting brackets, and one plastic air exit adapter with 4 screws.
For unpacking and inspection proceed as below indicated:

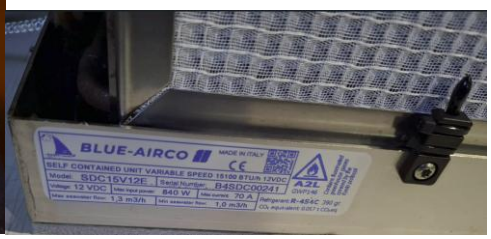
Check the cardboard box for shipping damage, removing the components from the box if necessary. If the cardboard box is damaged, or the normal “up” orientation as indicated by the arrows has not been respected by the forwarder, immediately report it to the carrier, expressly indicating on the delivery note that the goods are accepted with reservation and possibly keep photographic evidence of any damage found.

- Unpack and check that all the components have been received.
- Check that all the components have not been damaged during transport.
- If the unit is damaged, the forwarder shall make the proper notation on the delivery receipt acknowledging the damage.

IMPORTANT! Lift the unit exclusively by means of the dedicated rope handles, avoiding to grab it from tubing and any other component. Keep the unit always in the normal “up” orientation, during the transport and installation, in fact the compressor must remain always upright to avoid tubing deformation and oil migration.



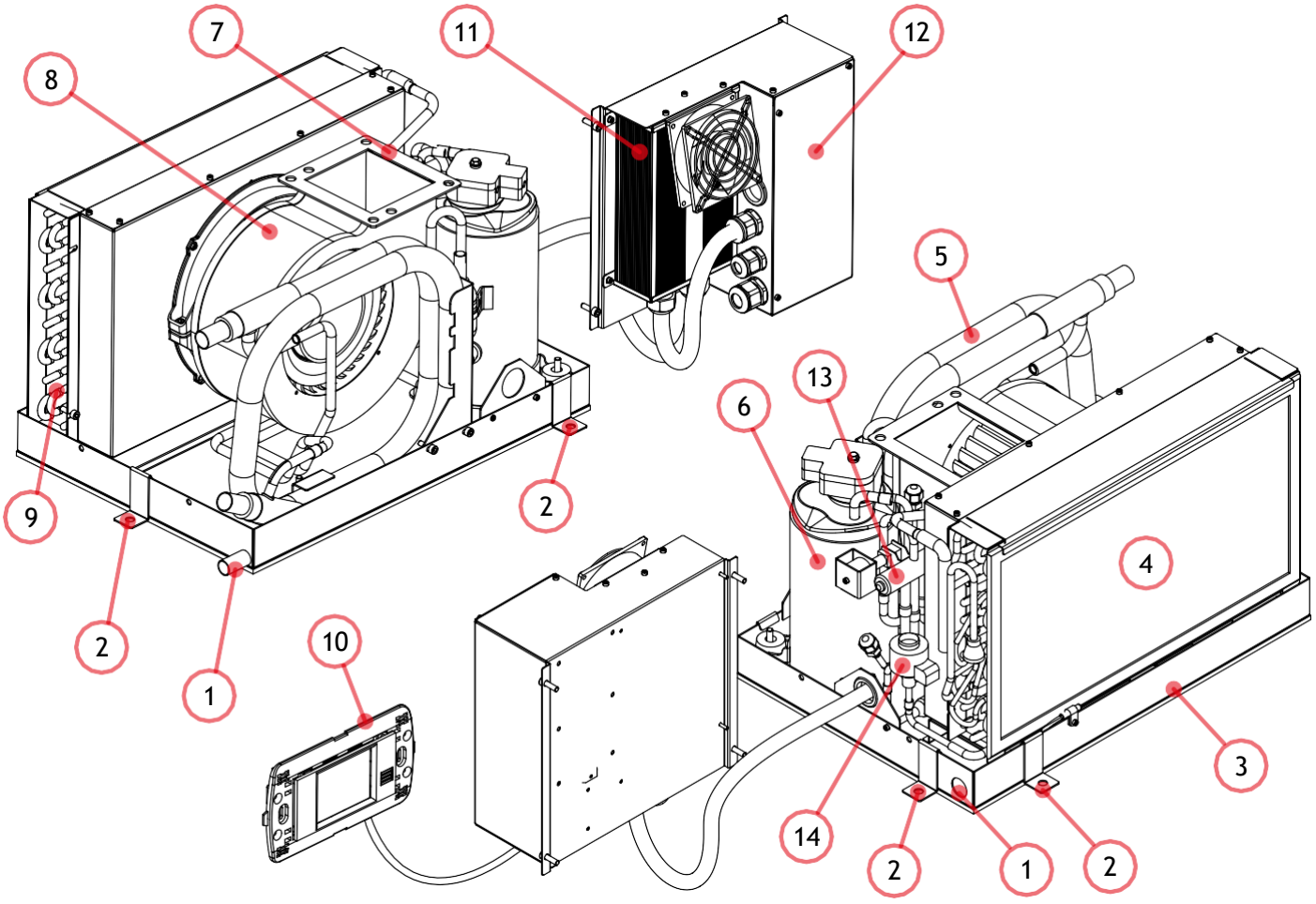
Each product is identified by a product identification label, as shown below, which includes the model and serial number.



UNIT DESCRIPTION

The unit is a seawater cooled marine air conditioner designed to run at the specified low voltage: 12 VDC or 24 VDC, or 48 VDC depending on the model. It consists of the following components:

1. Condensate drain (two locations shown)
2. Mounting brackets
3. Stainless steel base (drain pan)
4. Air return filter
5. Titanium condenser coil
6. Rotary BLDC compressor
7. Fan air exit (flange for round adapters)
8. Rotatable blower assembly with BLDC fan motor
9. Finned evaporator
10. Capacitive Touch Display
11. Driver board
12. Main MCU PCB
13. Reversing valve (4-way)
14. EEV (electronic expansion valve)



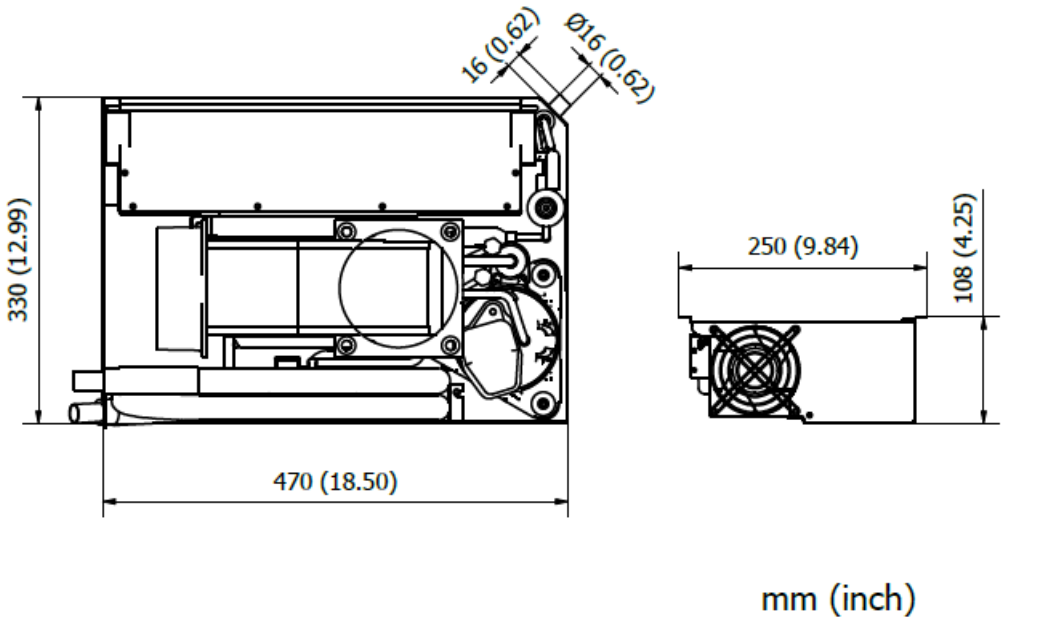
5.0 INSTALLATION

This product has been specifically designed for yachts and boats air-conditioning. It is suitable to cool down or warm up the interior of the vessel. Other uses are not admitted unless expressly authorized by the manufacturer.

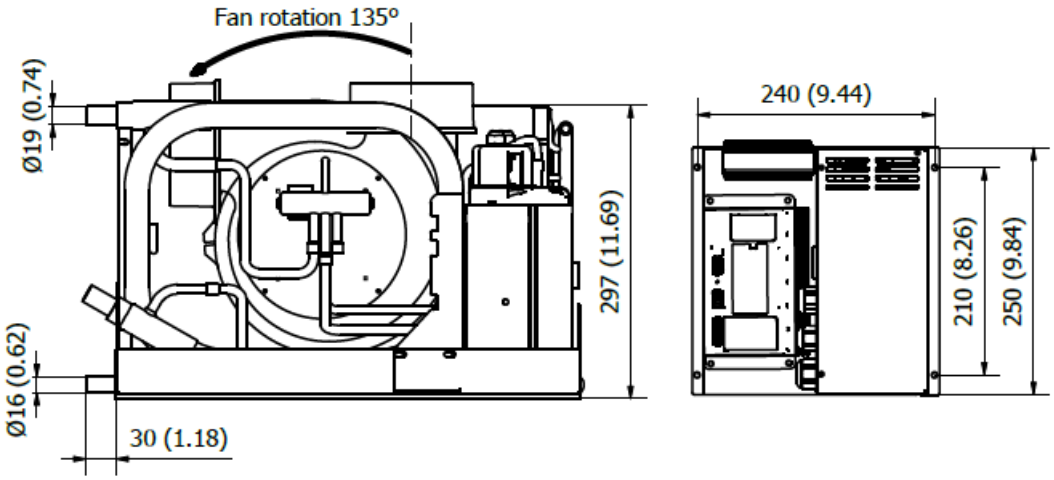
IMPORTANT! The installation must be carried out by qualified personnel only, complying with the instructions given in this manual and with the rules of good technique and legislation in force. The selection of the components for the complete air-conditioning system is under the installer's responsibility.

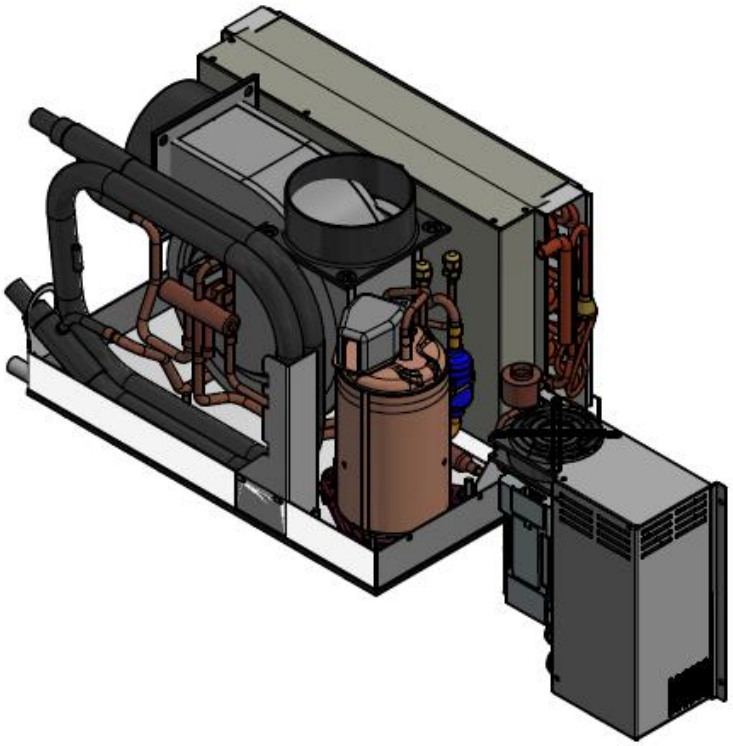
The failure to apply the rules indicated will void the guarantee and the manufacturer will not be liable for any damage caused to people, animals or things.

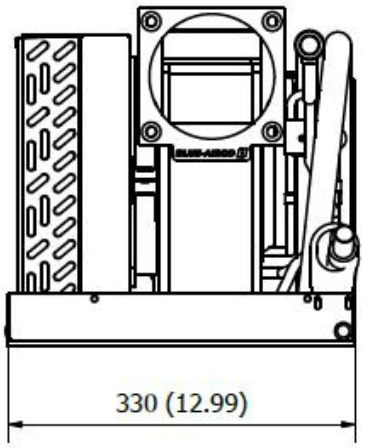
5.1. DIMENSIONAL DRAWING AND PLACEMENT OF THE UNIT (SDC15V12E)



mm (inch)



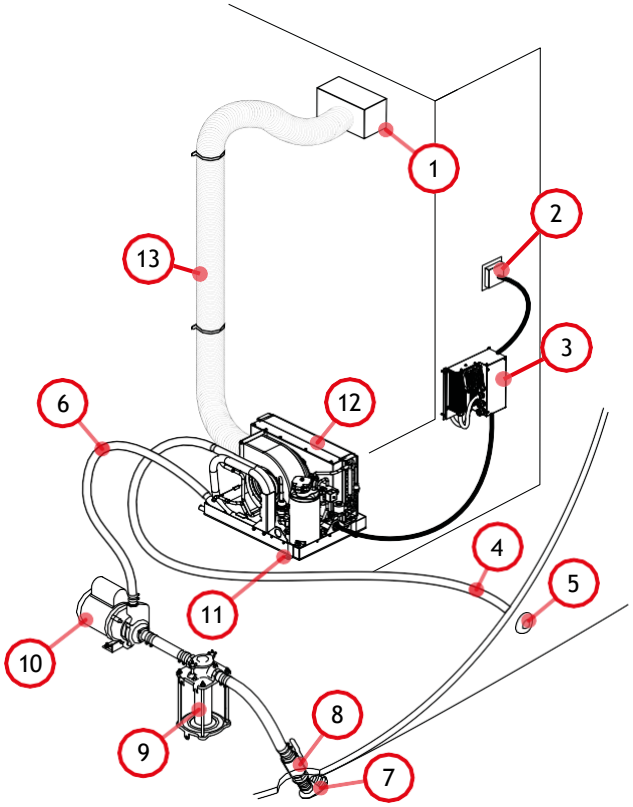




The installation of the air conditioning system on board must be carefully planned before starting the installation. In particular the following connections must be taken into account:

- Electrical box of the unit.
- Electrical power connections.
- Control panel.
- Air ducts and grilles and any other accessory for the air distribution.
- Condensate drain.
- Seawater pump.
- Seawater circuit (speed scoop, sweater intake, shut-off valve, strainer, pump, unit coil inlet and outlet, overboard discharge).

1. Supply air grille and transition box
2. Digital display
3. Electrical box
4. Seawater outlet hose
5. Overboard discharge
6. Seawater inlet hose
7. Seawater scoop thru-hull inlet
8. Seacock shut-off valve
9. Seawater strainer
10. Pump
11. Mounting bracket
12. Return air grille and filter
13. Insulated flexible ducting

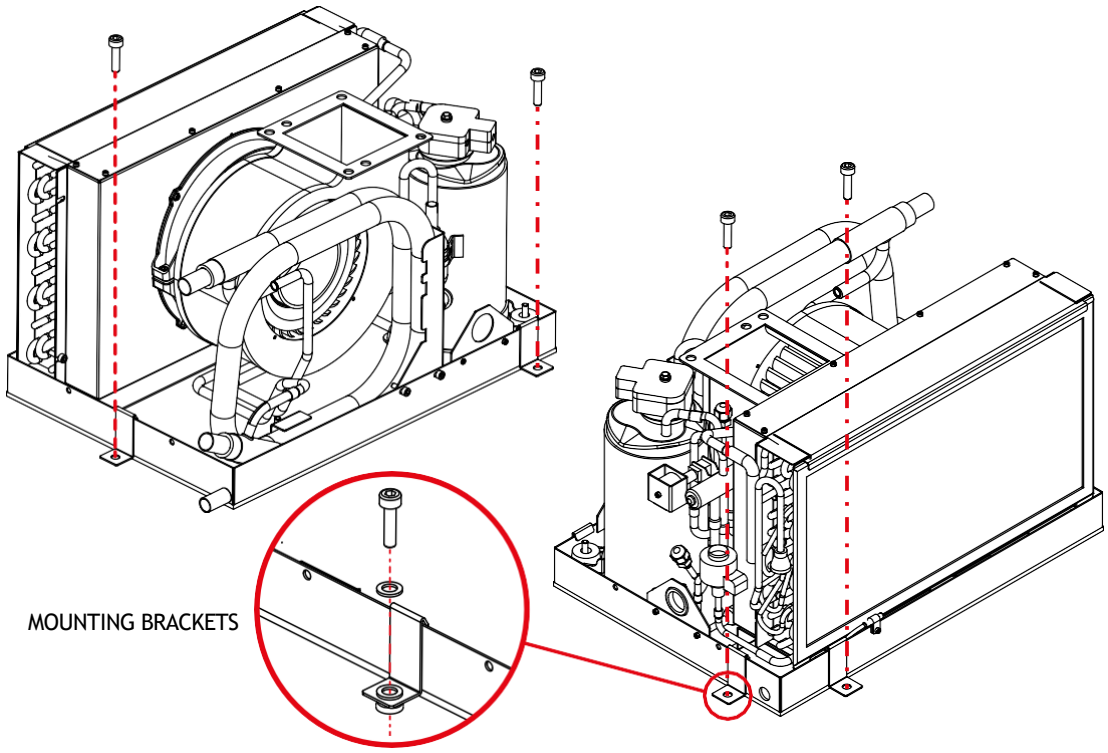


When installing the unit the following space margins should be considered:

- Allow at least 150 mm clearance around the unit in the area of the seawater and condensate drain pipe.
- Allow at least 100 mm of air space in front of the air filter (on the finned evaporator) for the return-air intake.
- For flexible insulated ducts on supply air section consider to add 50 mm clearance for the duct ring and 25 mm for the duct bend radius and duct diameters.
- Allow at least 150 mm clearance around the electrical box.
- Allocate enough space for installation, maintenance and service.

The unit, as well as its electrical box and the pump must be installed in dry and ventilated places where the MAXIMUM AMBIENT TEMPERATURE does not overcome 50°C (122°F).

- Attach the air conditioner unit to a solid level platform with the four mounting brackets provided. The recommended minimum base dimensions are 390 × 530 mm
- It is recommended to install vibration dampers / anti-vibration mounts between the mounting plate and the supporting surface where the unit is installed.
- The air conditioning unit should be installed in the lowest possible location, but never in the bilge or engine room or any other area not totally sealed from the bilge or engine room.



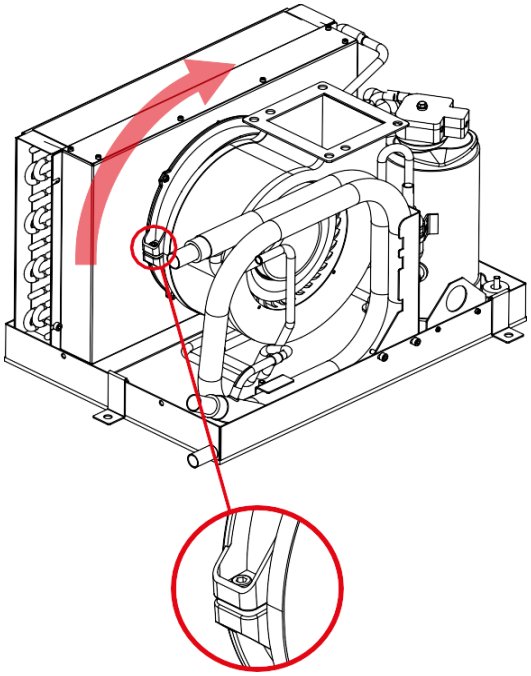
5.2. DUCTING AND GRILLES

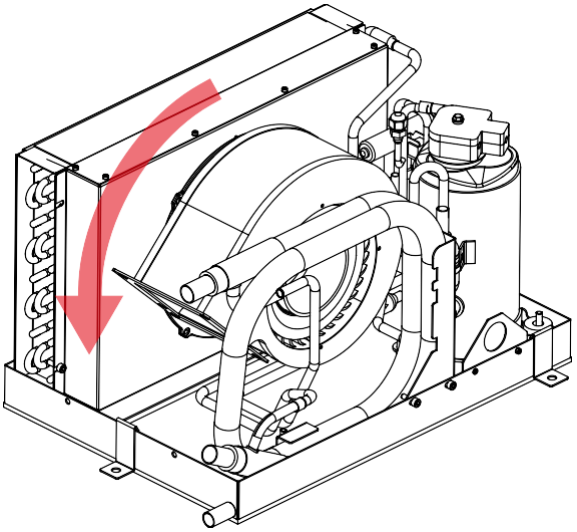
WARNING! Risk of fire or explosion

- Do not install auxiliary devices or electrical components that may constitute potential ignition sources inside the air ductwork, unless they are specifically approved or listed by Blue-Airco for use with this appliance.
- The supply and return air shall be ducted directly to the spaces served by the appliance. Do not use false ceilings, wall cavities, furniture voids or other open building spaces as return-air ducts.
- Do not route supply or return air ducting through an engine room, bilge or any area where the ductwork may be exposed to fuel, flammable vapours, exhaust gases or other hazardous substances.
- Ensure that the air inlet and outlet ducts are correctly connected and that the required airflow is not obstructed or restricted.

The blower is rotatable by 135 degrees, to ease installation and improve air flow. Rotate the blower to allow the most direct flow of air to the supply-air grille:

- Loosen the adjustment screw.
- Rotate the blower.
- Tighten the adjustment screw.





RECOMMENDED DIMENSIONS FOR AIR GRILL AND DUCTS

kBTU/h	5	8	10	12	16	18
Duct Diameter [in/cm]	4/10.6	5/12.7	5/12.7	6/15.2	6/15.2	6/15.2
Duct Area [sq.in/sq.cm]	12.6/81	19.6/126	19.6/126	28/181	28/181	28/181
Return air grille, free area [sq.in/sq.cm]	70/450	78/500	86/550	93/600	134/866	155/1000
Supply air grille, free area [sq.in/sq.cm]	40/260	46/300	50/320	75/480	81/520	109/700
Min clearance in front of the return grille [in/cm]	4/10	4/11	5/12	5/13	6/14	6/15

Important! If smaller grills or ducting are used than recommended, the performance of the units will be reduced.

GRILLES

- Supply-air grille shall be installed as high as possible, avoiding direct flow towards the persons. Also avoid that air from supply grille is directed towards the return-air grille (short cycle).
- A minimum clearance of 230 mm is required behind the supply-air grille to connect the duct.
- The return-air grille shall be installed as low as possible and very close to the unit.
- Install the return-air grille away from exhaust and bilge vapors.
- A minimum clearance of 110 mm is required in front of the return-air grille in the cabin area.

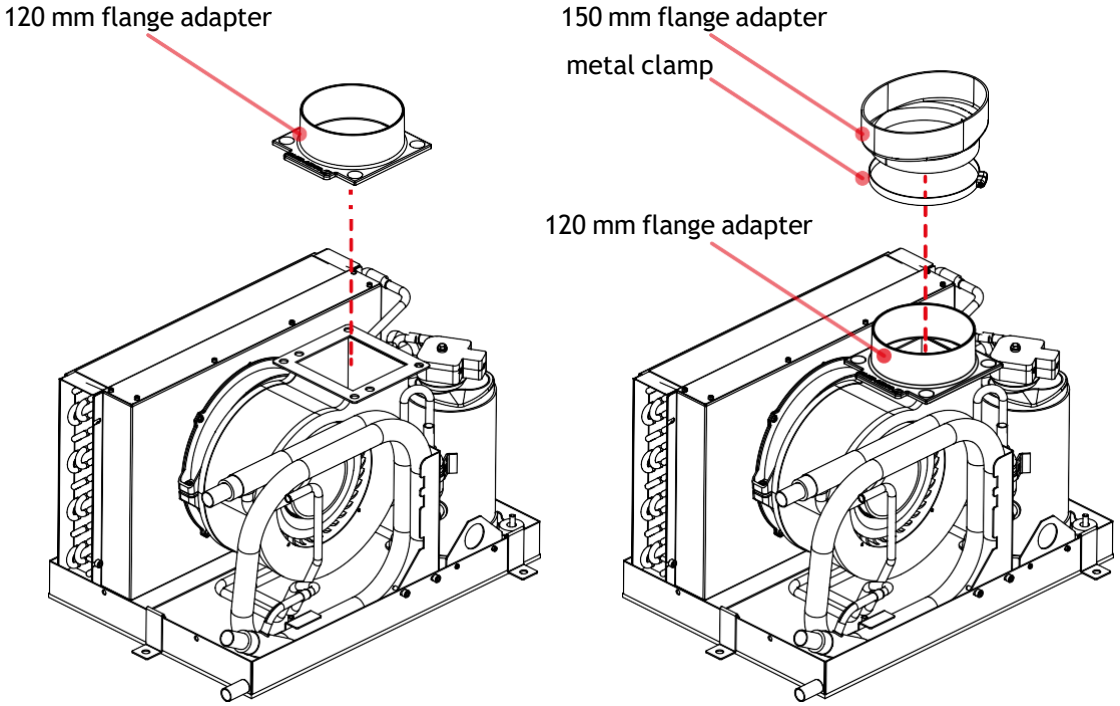
AIR DUCTS CONNECTION

IMPORTANT! The diameter of the duct should not be less than the diameter of the outlet nozzle

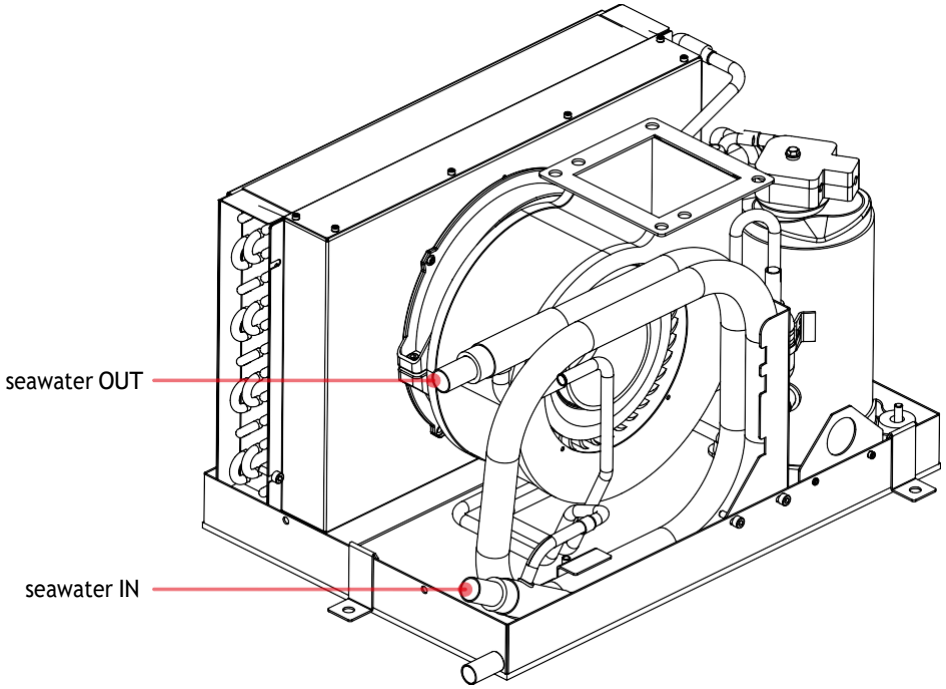
- **SELF-CONTAINED SDC15V12E (15.100 BTU/h) ducts diameter 152 mm (6'')**

120 mm / 150 mm flange adapters (optional)
The ring adapter (with external diameter 120mm) shall be fixed directly to the fan outlet flange. If employing Ø152mm duct, after installing the Ø120mm ring adapter, an additional oval adapter (oval shape) shall be fixed on it by a metal clamp. In this case the smaller axes of the oval shape shall be kept horizontal thus permitting to rotate the fan.

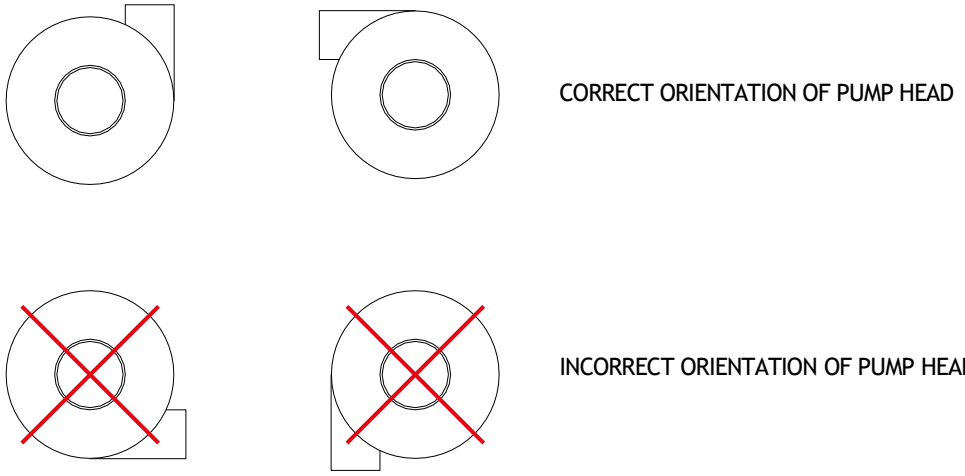
- The ducting should be placed as straight, smooth and stretched as possible.
- Avoid as much as possible bends and loops, considering the possibility to rotate the fan.
- Minimize the number of 90° bends in order to minimize air pressure losses and airflow rate decreasing (e.g. 2 bends 90° on a duct may cause 25% air flow reduction)
- Ensure the ducting is properly connected with no excess. Eliminate any air leaks from the connecting zones by wrapping duct tape all around.
- Ensure that ducts are correctly insulated preventing condensate.



5.3. SEAWATER CIRCUIT



The seawater flow must go steadily upwards from the seawater intake, through the strainer, through the pump up to the unit (seawater IN) avoiding any high spot where the air could be trapped. The seawater pump must be placed below the seawater line and its head correctly oriented as below:

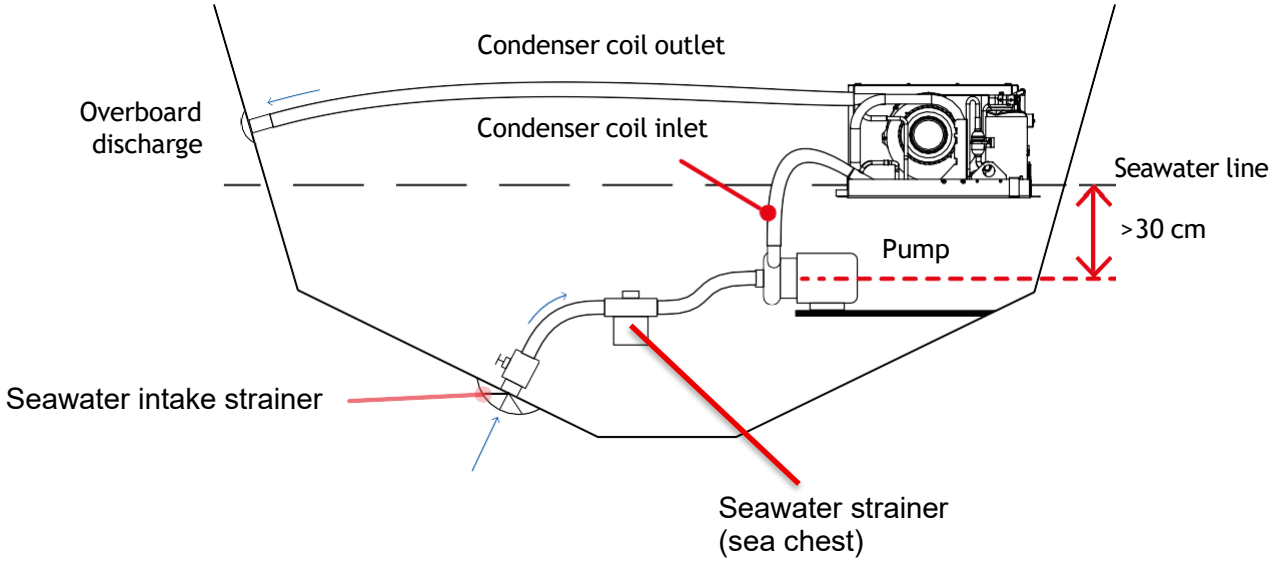


CORRECT ORIENTATION OF PUMP HEAD

INCORRECT ORIENTATION OF PUMP HEAD

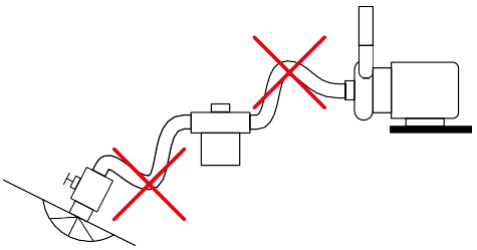
The strainer must be placed below the pump. The seawater intake shall be provided with a speed scoop and ball valve connected to the through-hull fitting.
The hoses must be double clamped with reversed clamps and must be placed carefully uphill from the through-hull fitting to the unit, avoiding loops, tight bends and crushing.

CORRECT INSTALLATION

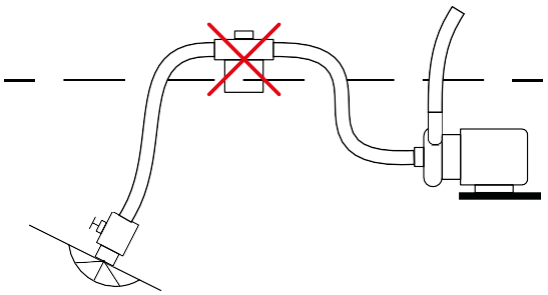


EXAMPLE OF INCORRECT INSTALLATIONS

Air traps between seawater intake and strainer and between the strainer and the pump.



Air trap due to the strainer placed above the pump and above the water line.



Important notes:

- The seawater pump must be placed at least 300 mm below the water line.
- The pump must always be protected from any foreign matter by a seawater filter (strainer) which must be often checked and cleaned if necessary.
  The failure to install a strainer before the pump inlet will void the pump warranty.
- The seawater pump may be installed horizontally or vertically as long as the correct orientation of the pump head is respected, as shown on the above picture.
- Ensure the seawater is flowing freely from overboard discharge while the pump is running. The unit overboard discharge must be installed as close as possible to the waterline to reduce noise and making it possible to visually check the seawater flow.
- Connect all metallic parts in contact with seawater to the vessel's bonding system.

WARNING:

- Do not tighten the threaded connections too much, otherwise cracks may form within hours or days.
- Turn off the air conditioning always when the sea is very rough in order to avoid losing pump priming.

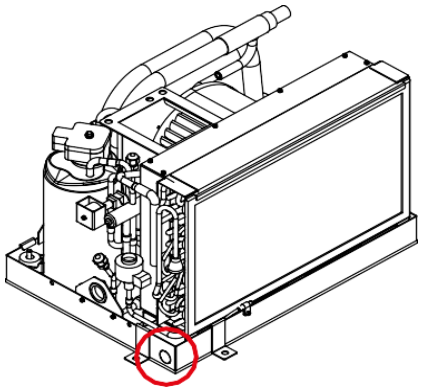
5.4. CONDENSATE DRAIN

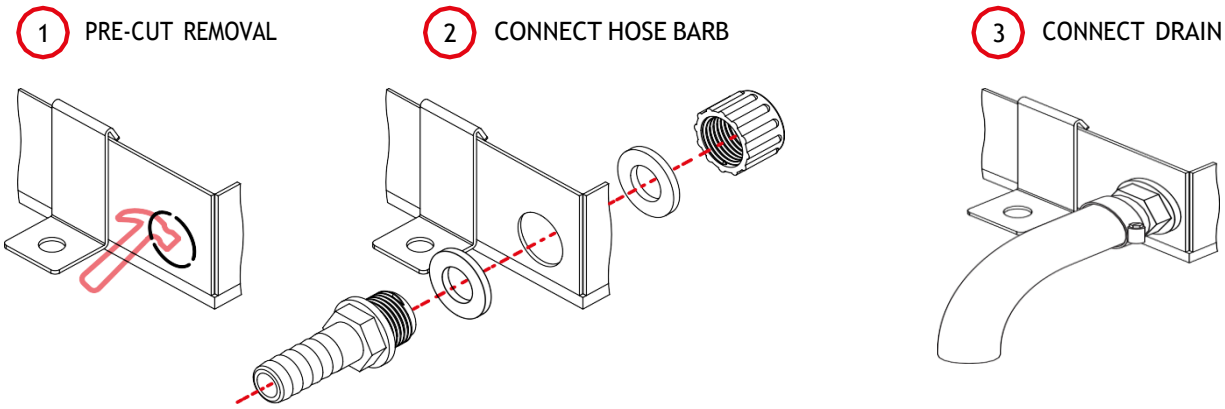
The air treatment involves dehumidification causing the separation of water from the wet air. Such condensate collecting in the drain pan must be properly evacuated.
Do not discharge the condensate to the bilge, but run instead the drain line downward from the self-contained unit to a suitable drain location. Such drain location must be totally safe, considering that the drain pipe could suck in vapors from there to any occupied areas of the vessel. The drain hose should have a trap.

Each self-contained unit is equipped with one stainless steel smooth drain welded to the pan at the base level permitting to connect the drain line and fully evacuate the condensing water. Ensure a slope on the long side to facilitate proper drainage of the condensate collection tray.

Depending on the unit configuration, the drain pan is equipped with one of the following condensate drain arrangements:

Configuration 1 – Main drain with pre-cut hole
The drain pan is equipped with one main drain outlet. A pre-cut hole is provided on the opposite side of the drain pan and can be used to connect a second drain if required.
The pre-cut hole is located a few millimeters above the base of the drain pan. If this drain is to be used, remove the pre-cut sheet and install a suitable plastic hose barb (accessory not supplied, available upon request). Screw the hose barb into the drain hole and tighten it securely before connecting the condensate drain hose.





Configuration 2 – Two drain outlets
The drain pan is equipped with two stainless-steel drain outlets, welded directly to the pan and located on opposite sides of the unit. The drain outlet located opposite the seawater inlet and outlet is fitted with a rubber cap.
The unit can be drained through either outlet. If the outlet fitted with the rubber cap is required for the installation, remove the cap and connect the condensate drain hose. Both drain outlets can also be used simultaneously, where required by the installation.

In all cases, ensure that the condensate drain hose(s) are properly routed to allow free drainage and prevent water from accumulating in the drain pan.

Secure the drain hose with a stainless-steel hose clamp.
To verify proper drainage, pour 1 liter of water into the base pan and confirm that it drains completely. During normal operation, the drain pan should remain empty, indicating that the drainage system is working correctly and effectively removing all the condensate produced by the evaporator coil.

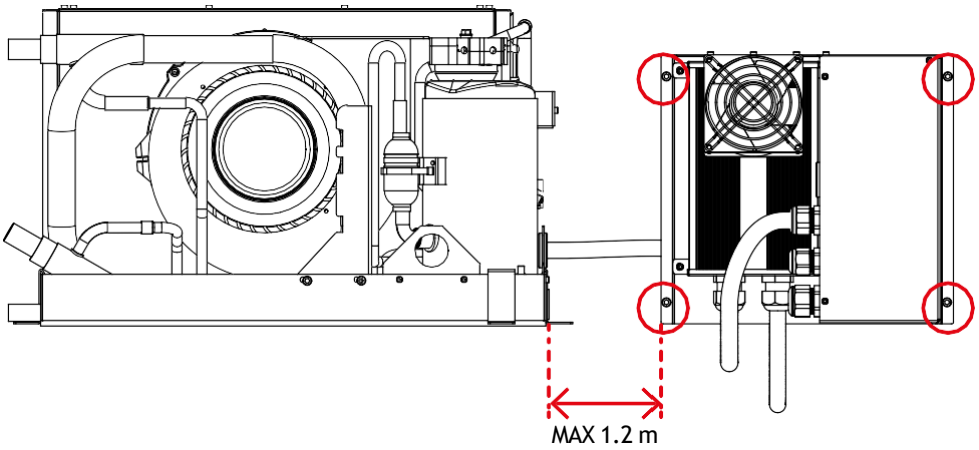
The drain pan is equipped with a zinc anode to protect metal components in case of accidental contact with salty water. The zinc anode should be inspected annually and replaced if worn.

WARNING

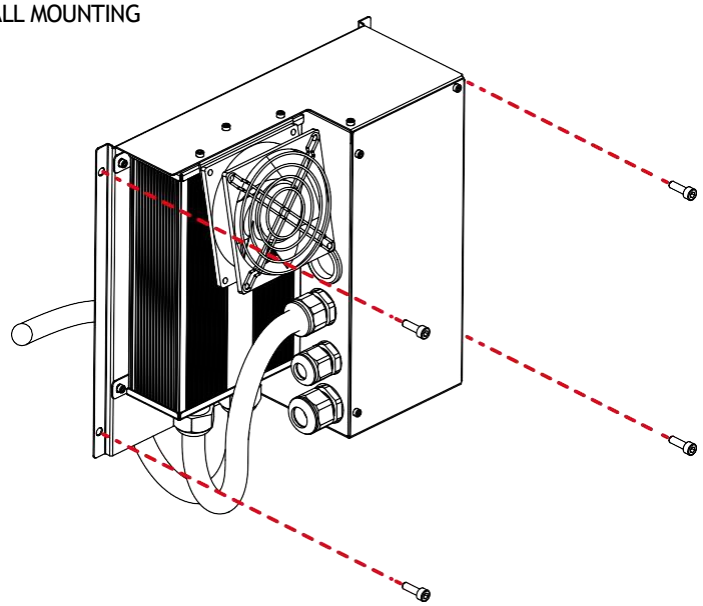
- Do **not** terminate the condensate drain line in the engine room or within 1 m of any outlet of engine or genset exhaust.
- Do not terminate the drain line in the bilge unless the collection point is completely sealed and equipped with a sump pump.
- Failure to comply to such rules may allow bilge or engine room harmful vapors to mix with the air conditioners return-air and contaminate living areas which could cause injury or death.
- Do not tighten the threaded connections too much, otherwise cracks may form within days.
- Ensure that seawater does not enter the drain pan under any circumstances, as it could damage the components. In the event of accidental seawater ingress, remove it promptly and rinse the area thoroughly with fresh water.

5.5. ELECTRICAL BOX

The following rules must be respected for installing electrical box.



ELECTRICAL BOX WALL MOUNTING



- Install the electrical box in a dry and ventilated location where the environmental temperature does not exceed 50°C (122 °F).
- Fix the electrical box to a flat, solid surface within 1 m distant from the unit and within 6 m distant from the location where the touch display will be installed.
- Use the 4 mounting holes in the back of the electric box to fix it to a suitable surface by means of screws (not supplied).
- The electrical cables responsible for transmitting power from the battery to the unit must be appropriately sized in terms of both length and cross-sectional area, conforming to the maximum current draw, and kept isolated from other cables. The cable insulation shall be designed to prevent the accumulation of heat generated by the Joule effect and permit the efficient dissipation of heat, preventing any potential issues related to overheating. It is recommended to have dedicated batteries solely for the air-conditioning system. **The air conditioning system shall be supplied with a stable DC voltage at all times.**

5.5.1. WIRING

Electrical Protection Requirements

Important: To ensure the safety and longevity of your DC air conditioning units and DC pumps, it is crucial to protect these devices with appropriate electrical protection mechanisms.

High Current Breakers:

- DC air conditioning units and DC pumps should be installed with high current breakers. These breakers are designed to prevent electrical overloads by interrupting the flow of electricity if the current exceeds a safe level.
- The current rating of the breaker should match the specifications provided in the technical documentation of the respective DC device.
- Regularly inspect the breakers to ensure they are functioning correctly and replace them immediately if any signs of wear or damage are observed.

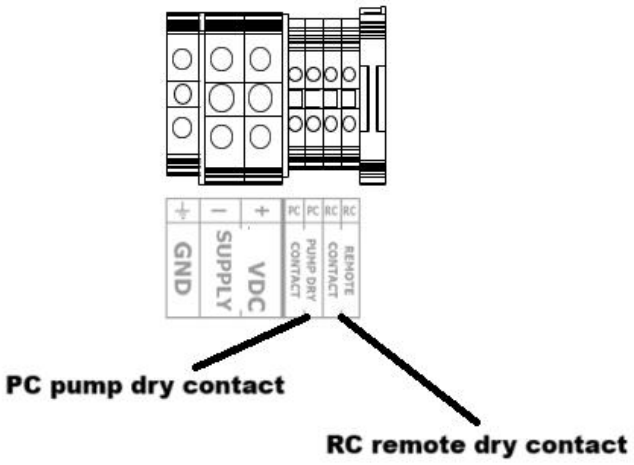
Fuses:

- Alternatively, fuses can be used as circuit protection. Ensure the fuse ratings correspond to the power requirements of the DC air conditioning units and pumps.
- Fuses must be checked periodically and replaced as needed to maintain optimal protection.

Air-conditioner	Max Power (W)	Nominal Voltage (V)	Max Current (A)	Recommended Fuse / Breaker (AC unit)
SDC15V12E	840	12	70	75 A

A dedicated circuit breaker or fuse shall be installed for each pump, sized according to the pump's maximum power consumption, to provide protection against overcurrent conditions

By following these safety instructions and using appropriate protective devices, you can help ensure the reliable and safe operation of your DC air conditioning units and DC pumps. Always refer to the product-specific manuals for detailed technical specifications and additional safety information.



PC Terminals Functionality

The PC terminals represent the PUMP dry contact and must be used exclusively to provide the control signal to the pump relay that supplies power to the pump.
The pump must be powered through a suitable device (e.g., relay, PCB, etc.) that receives the open/close signal from the low-power PC circuit.
Important: The PC contact must not be used as a direct switch to power the pump. Doing so will damage the main control PCB and will void the warranty.

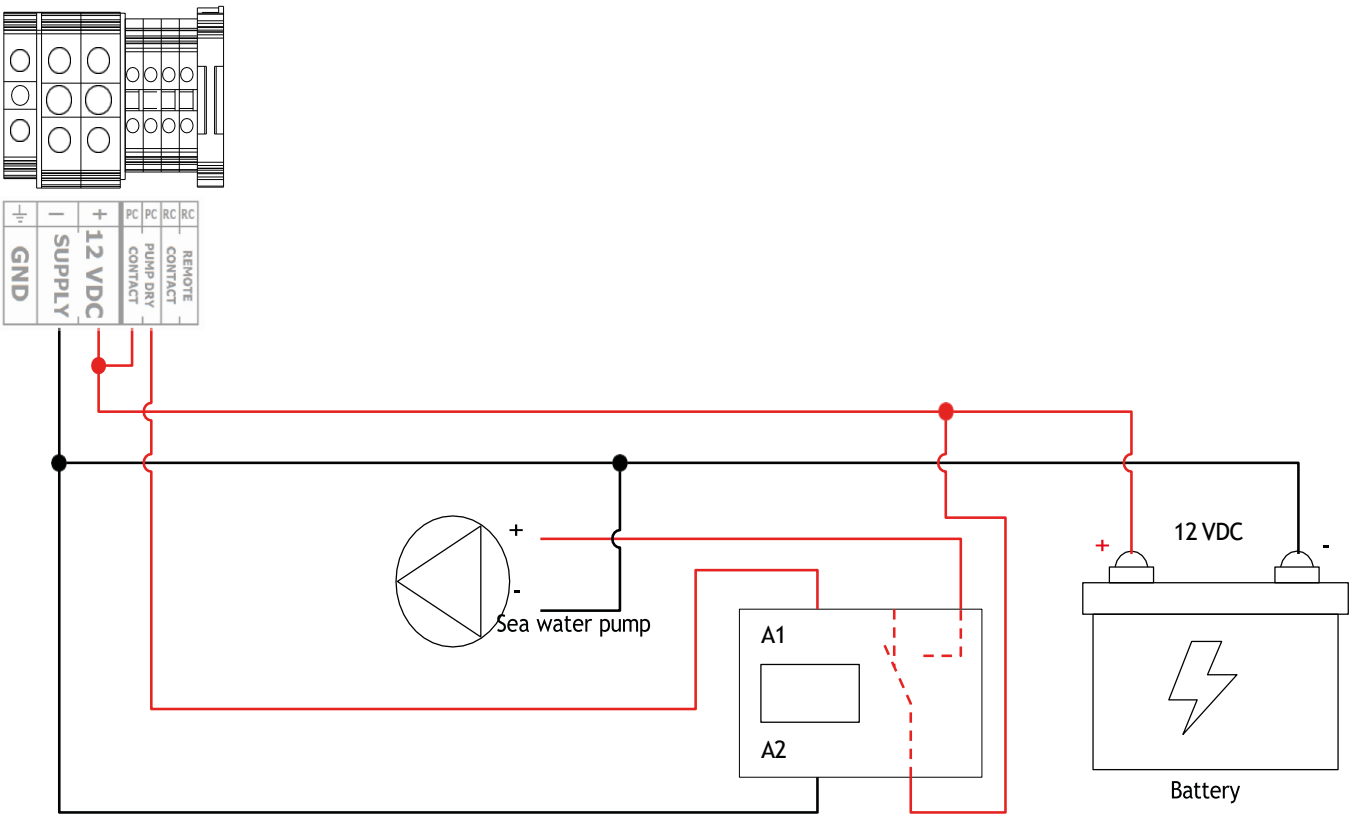
RC Terminals Functionality

The RC terminals serve as a remote contact input for compressor activation. When the contact is closed, the unit operates normally and can be controlled via the touch display.
When the contact is open, the unit enters standby mode: it stops operating and cannot be activated from the display. If the remote contact is not intended to be used, then the RC terminals

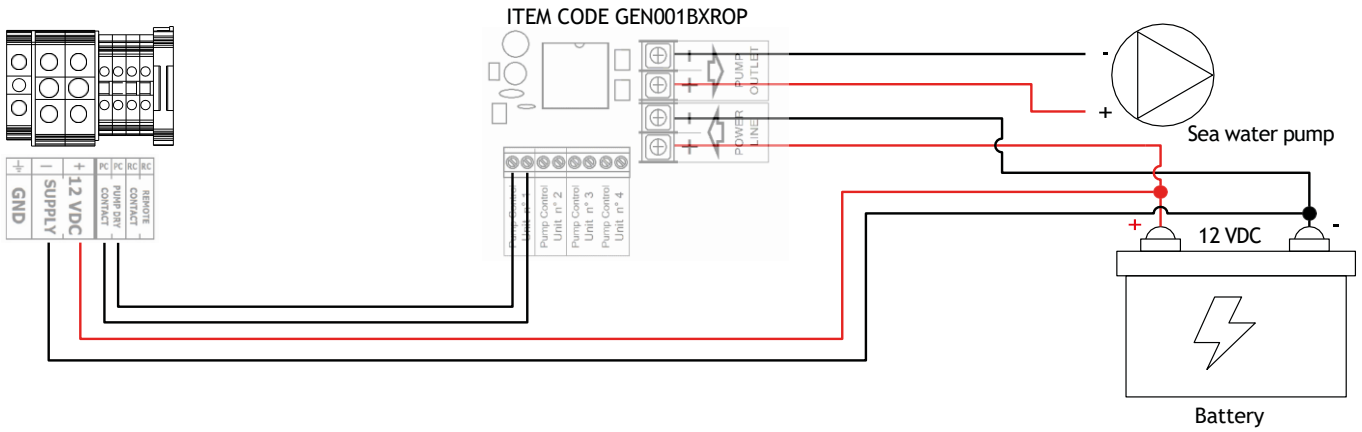
must be bridged. Please note that through the remote contact it is not possible to change the operating mode, setpoint, or fan speed, only start and stop (stand-by), while maintaining the last settings from the display
In this state, ”58” is shown on the display to indicate standby mode.

Important: in case of connecting two or more units in parallel the RC digital inputs of each unit must be kept separated.

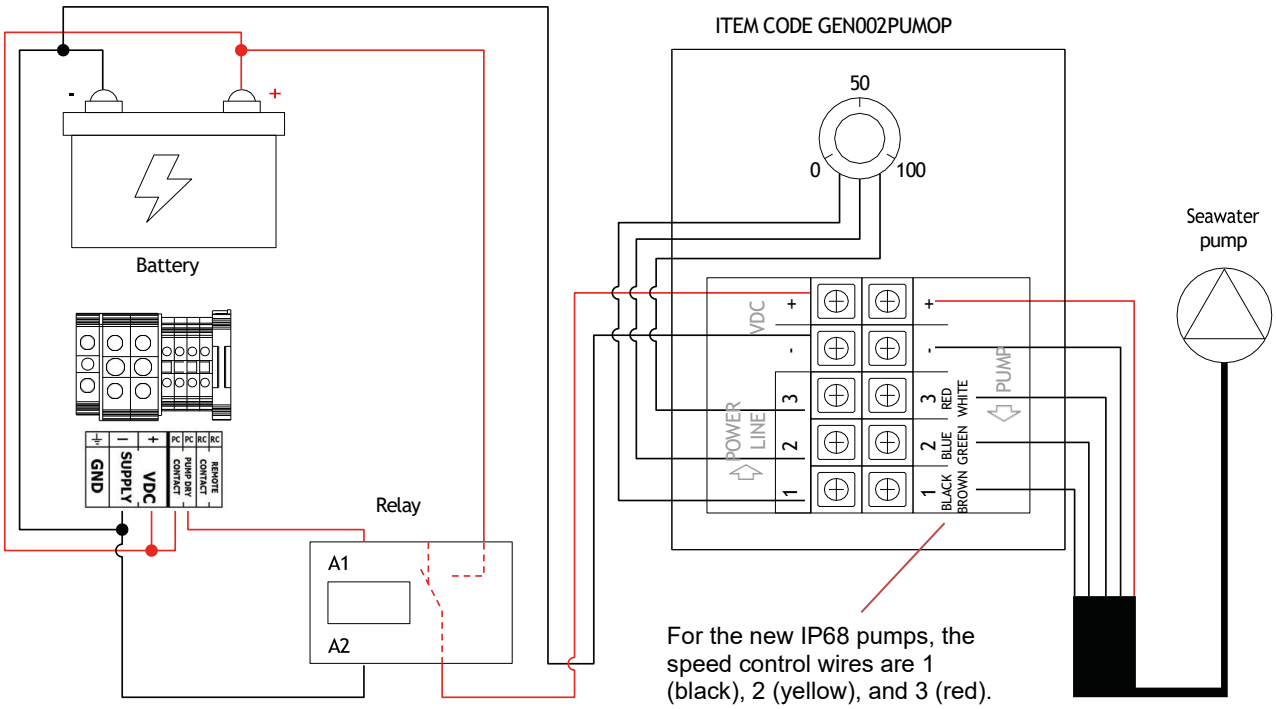
A) General wiring schematic for a single air conditioning unit with one pump.



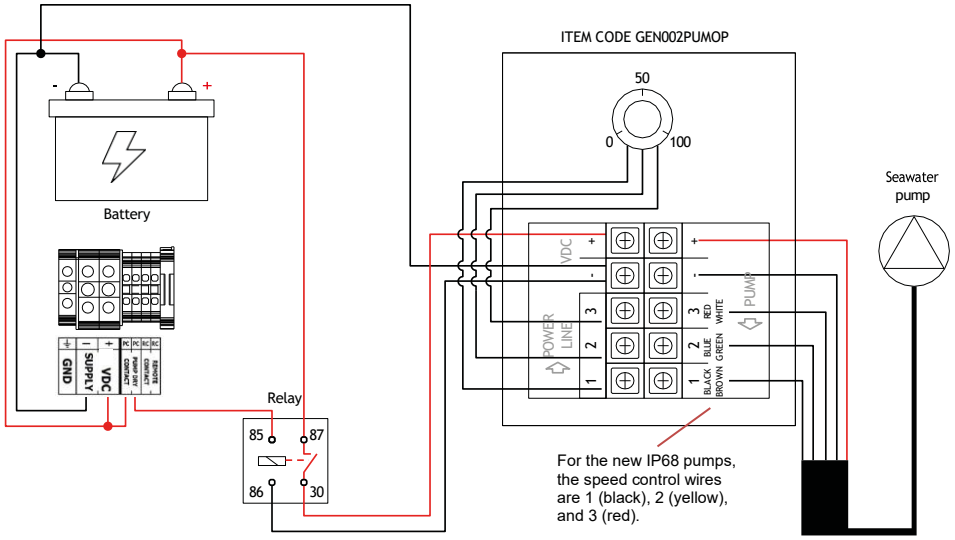
B) General wiring schematic for multiple air conditioning units (up to 4) using a single pump and the Blue-Airco pump control box (item GEN001BXROP)



C) Wiring Schematic - pump control box with DC 12V relay and potentiometer for a single self-contained unit.

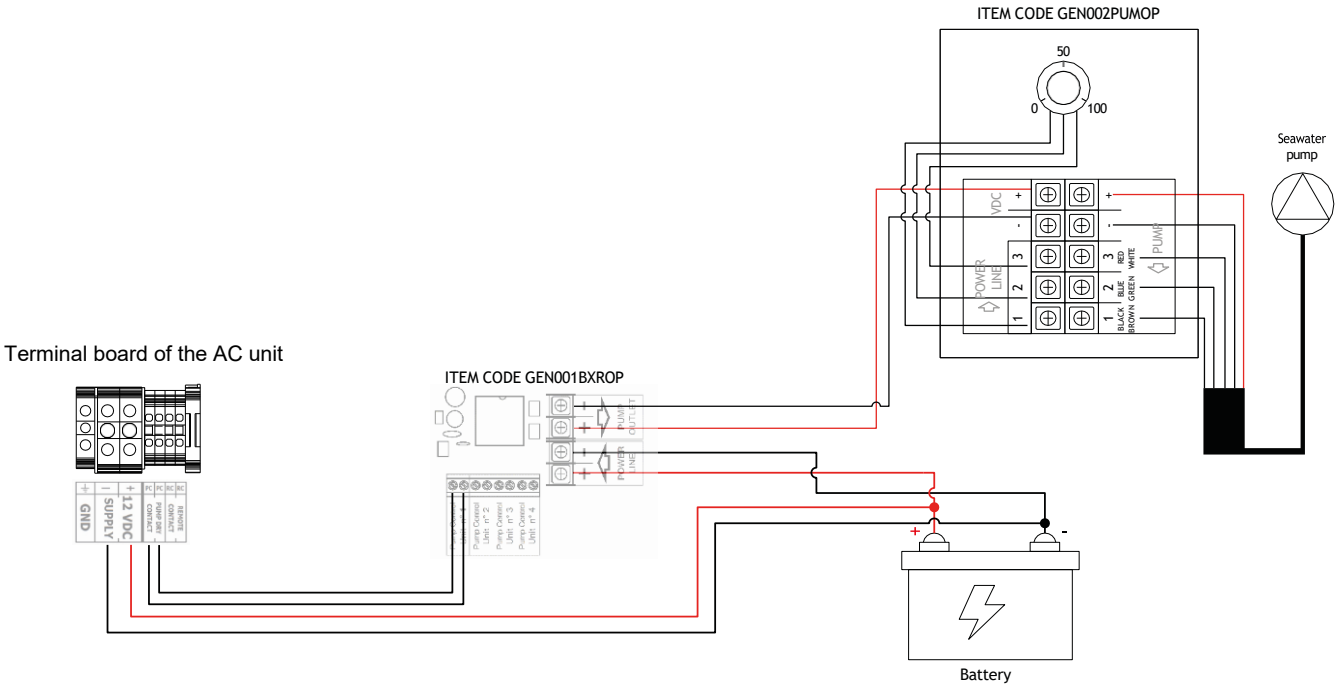


D) Wiring Schematic - pump control box with DC 12V relay and potentiometer for a single self-contained unit. Item code GEN001BRPOP12V

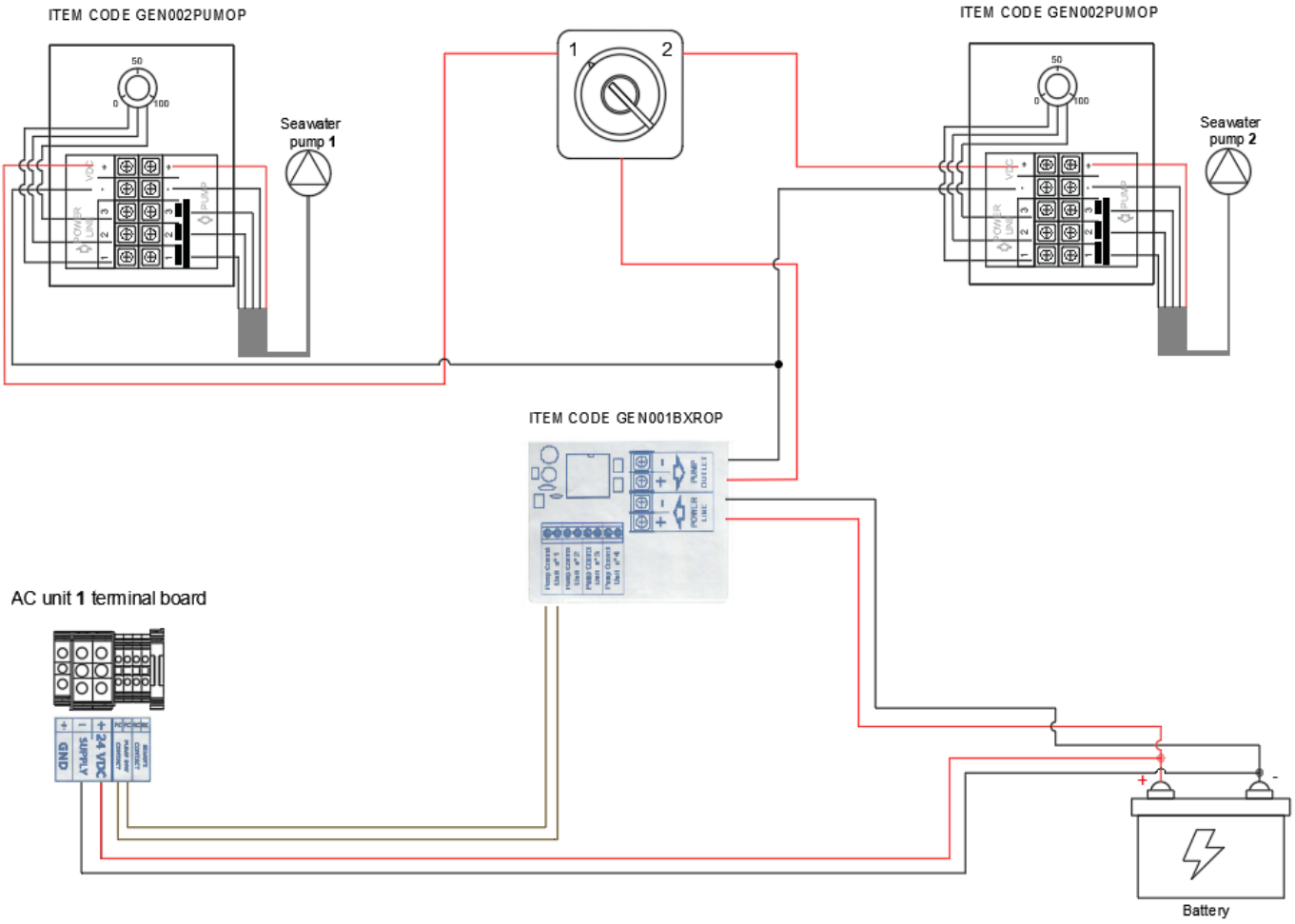


- Relay terminal 85 shall be connected to one of the PC terminals (pump control, dry contacts) on the self-contained unit terminal board.
- The other PC terminal on the self-contained unit shall be connected to the battery positive (+) line.
- Relay terminal 87 shall be connected to the battery positive (+) line.
- The pump cable (3 control wires plus positive [+] and negative [-]) shall be connected to the lower terminals of the potentiometer's terminal board.
- The negative [-] terminal on the upper side of the potentiometer's terminal board shall be connected to the battery negative (-) line.

E) Wiring schematic for multiple air conditioning units (up to 4) using a single pump with potentiometer (item GEN002PUMOP) and the pump control box (item GEN001BXROP)



F) Wiring schematic for multiple air-conditioning units with a dual pump system, where only one pump operates at a time and is selectable via a 1-2 selector switch



This schematic also includes a potentiometer for speed control for each pump, though it may not be necessary.

5.5.2. GROUNDING

It is mandatory to connect the GND cable to the self-contained unit terminal board. The DC grounding conductor shall be same size as the one required for current-carrying conductors supplying the device.

5.5.3. BONDING

Connect all metallic parts in contact with seawater to the vessel's bonding system, in accordance with ABYC standards.

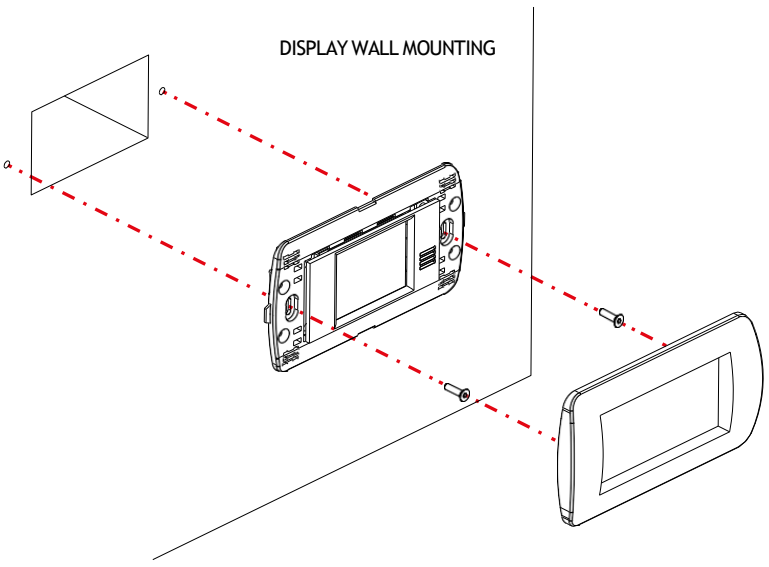
5.6. TOUCH DISPLAY INSTALLATION (CONTROL PANEL)

Mind the following notes on the installation of the touch display (control panel)

- Consider the max distance 6 m from the display to the electrical box.
- The display is equipped with an internal temperature probe sensing the ambient temperature; therefore, it should be installed in a proper location inside the cabin, possibly at mid-height, permitting to sense the average temperature.
- Do not install the display close to any heat source that could affect the temperature sensor reading.
- Do not install the display in direct air stream from the supply grille.
- Do not install the display in direct solar radiation.

Plug the free end of the display cable (6-pin RJ-45 connector) into the display socket J1 located in the back of the control panel.

The display is supplied mounted on Bticino LN4704 support compliant with built-in wall box 504 and aesthetic covers Bticino. Upon request the display can be also supplied mounted on Vimar support.

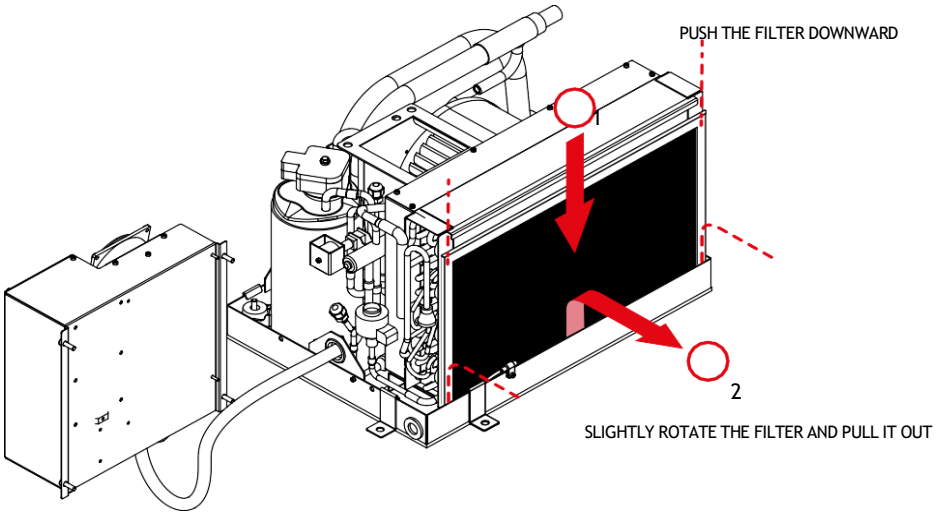


5.7. ENVIRONMENT OPERATING CONDITIONS AND WORKING LIMITS

Maximum ambient temperature: 50°C (122°F).
Minimum seawater temperature in winter (heating mode): 4 °C (39°F)
Maximum seawater temperature in summer (cooling mode): 45 °C (113°F)

5.8. MAINTENANCE

- Remove and clean the air-return filter at least once a month.



- Check all the seawater connections against leakages.
- Check every 2-3 months that condensate drains are not clogged, by pouring half a liter of water in the condensate pan: water should be evacuated in a few seconds.
- Check daily the seawater strainer and clean it if necessary.
- Check visually the seawater flow from the overboard discharge.
- Winterization: close the seawater intake and drain the water from the unit, pump and strainer.
- Clean the seawater coil (descaling) using products.
- The zinc anode in the drain pan should be inspected annually and replaced if worn.
- In case of replacement of parts, use only original ones from authorized service dealers.

5.9. GENERAL NOTICES AND SAFETY MEASURES

- Always use appropriate personal protective equipment (PPE) when installing, commissioning, servicing or repairing the appliance. Safety glasses and protective gloves shall be worn when working on the refrigerant or seawater circuits.
- Installation, commissioning, maintenance and repair of the air-conditioning system may be hazardous due to the presence of pressurized refrigerant, electrical components and seawater. These operations shall only be carried out by authorized and qualified personnel with appropriate training and equipment.
- This appliance contains R454C mildly flammable refrigerant (safety class A2L). In the event of a suspected refrigerant leak, immediately switch off the appliance, eliminate all possible sources of ignition, ventilate the area adequately and keep away from the affected area until it has been determined that the refrigerant has dispersed. Do not use open flames or equipment that may produce sparks to detect a refrigerant leak. Contact qualified service personnel for inspection

and repair.

- If refrigerant comes into contact with a flame or high-temperature surface, hazardous decomposition products may be produced. Do not smoke or use open flames during installation, servicing, refrigerant recovery or charging.
- In the event of a seawater circuit leak, immediately switch off the air-conditioning unit, the compressor and the seawater pump. Close the manual seawater valves to stop the flow of seawater. Before restarting the system, identify and repair the cause of the leak and check that no water has entered electrical components.
- Some components of the appliance may become hot during operation. Ensure that the installation location provides adequate ventilation and that the required air circulation around the appliance is not obstructed.
- Do not intentionally release R454C refrigerant into the atmosphere. Recovery, charging and other operations involving the refrigerant circuit shall be carried out only by qualified personnel using suitable equipment and in accordance with applicable regulations.
- R454C is a fluorinated greenhouse gas. Refer to the product data plate for the refrigerant type and charge and to the applicable environmental regulations for handling, recovery and disposal requirements.
- Do not modify the appliance, bypass safety devices or use components other than those specified or approved by Blue-Airco.

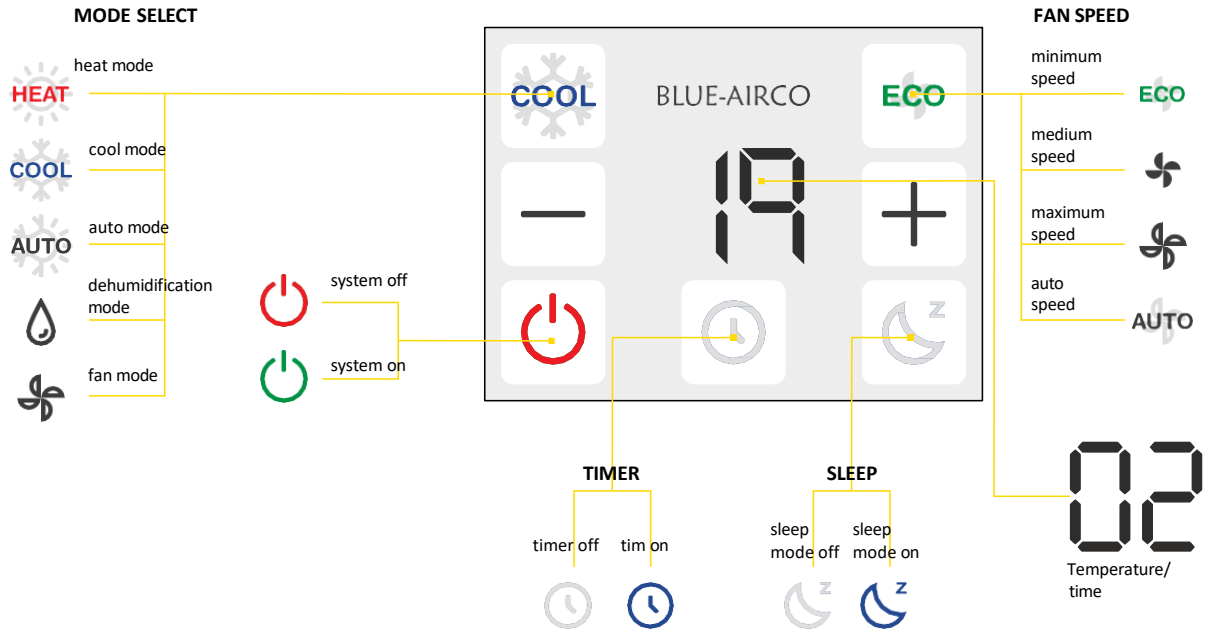
UNI EN 378-3 (Installation site requirements and protection of persons) recommends that, in areas containing equipment charged with flammable refrigerant (A2L classification), the following pictograms/signs be displayed in the installation and maintenance area, in addition to the textual warnings already provided in this manual:

- **“No open flames” prohibition sign** near access points to the refrigeration circuit (service valves / charging connections).
- **General “Fire hazard” warning sign** in the area where the unit is installed, if accessible to non-authorized personnel.
- **Refrigerant classification (A2L)** clearly indicated near the unit, in addition to the information provided on the unit rating plate.
- **PPE signage** (safety glasses, protective gloves) at points where maintenance work is carried out on the refrigeration circuit.

WARNING

Before you start up the boat, check carefully for any water leakage from the air-conditioning system, in case of any doubt contact a qualified ship’s technician. Otherwise, there is a danger of the boat sinking, that can result in injury or death.

6.0 TOUCH SCREEN DISPLAY:



When the unit is powered, independently if the compressor is running or in stand-by, the back light of the display will be activated only by touching the screen.
The ON/OFF button located in the low left corner of the display permits to start and stop the air conditioner, it is suggested to set the unit (mode, fan speed, set point temperature, etc) before starting the unit. The last setting will be maintained after powering OFF and ON again the unit.
Note that any alarm activation will be shown on the display after touching it.

6.1. MODE

Mode button permits to select cooling / heating / dehumidifying / AUTO.
Additional function of the Mode button: with the unit OFF (stand-by), by pressing and holding 10 s the MODE button, the pump output will be activated, and the following icon will be displayed:

This function is useful during the installation in order to prime the pump and fill the sweater circuit before starting the compressor. By pressing again the MODE button, the pump output will be disabled.

COOLING: Set point range: 18-30°C. If Troom>Tset+3°C the compressor will run at the max frequency, if Tset+1<Troom<Tset+3°C the compressor will adjust the frequency , slowing down to the min value when Troom=Tset+1°C and then stopping when Troom=Tset, with the fan keeping running at the speed selected. Min running time of the compressor after start-up is 3 min, except in case of alarms.

DEHUMIDIFICATION: The SET point will be selected automatically by the unit, 2°C below the room temperature sensed and recorded immediately after the mode activation. The fan will run exclusively at the min speed. When reaching the set point temperature, the compressor will stop.

AUTO: in such case the unit will decide automatically the operation mode, based on the ambient temperature. Default setting is 23 °C and it can be varied manually by ± 3°C and the fan speed can be varied manually unless selecting AUTO fan speed as well, in such case the unit operation will be totally automatic.

HEATING: Set point range: 18-30°C. If Troom<Tset-3°C the compressor will run at the max frequency, if Tset-3<Troom<Tset-1°C the compressor will adjust the frequency slowing down to the min value when Troom=Tset-1°C and then stopping when Troom=Tset. The fan after the compressor start-up will start running as well provided the air is warm enough. Min running time of the compressor after start-up is 3 min, except in case of alarms.

6.2. FAN SPEED

The fan speed selectable in heating or cooling mode is associated to the compressor frequency; if selecting the minimum fan speed (ECO) the compressor frequency will be limited to the minimum value, if selecting the medium fan speed the compressor frequency will not overcome the medium value, while if selecting the max fan speed the compressor frequency will be allowed to reach the max value depending on the gap between the room temperature and the setpoint temperature, as explained in the paragraph 7.1.

If selecting AUTO the speed of the fan will be adjusted automatically based on the gap between the room temperature and the setpoint temperature.

The ECO function can be activated by this button, limiting the fan speed and the compressor frequency to the minimum established values, thus minimizing the power consumption of the unit.

6.3. TEMPERATURE SET POINT

The temperature set point can be modified by pressing + or – buttons. When the temperature value is blinking it can be increased by pressing + or decreased by pressing - button. The new value will be automatically downloading after blinking for a few seconds.

Note that the value usually shown on display is the real room temperature, while the set point value will be displayed only by pressing once one of the buttons + or -.

6.4. SLEEP MODE

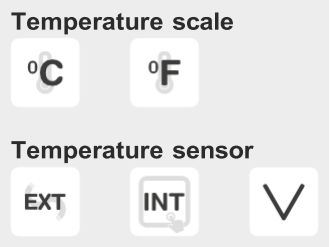
The sleep mode is activated by pressing the button and the fan speed will be switched automatically to min (ECO).
In cooling mode, the set point temperature will be raised by 1°C automatically 1 hour after the sleep mode activation. After 2 hours the set point will be further raised by 1°C and then maintained for the next 6 hours operation.
In heating mode, the set point temperature will be decreased by 2°C automatically 1 hour after the sleep mode activation. After 2 hours the set point will be further decreased by 2°C and then maintained for the next 6 hours operation.

6.5. TIMER FUNCTION

This function is activated by pressing the clock icon.
When the unit is ON, the Timer OFF can be set by pressing the timer symbol and the relative stop time will start blinking in the temperature field, showing first the value 1 (i.e., the unit will stop after 1 h), by pressing + or - buttons the value can be increased or decreased. Then by pressing the timer symbol again the setting will be confirmed starting the countdown.
By pressing again the timer symbol the setting will be erased.
When the unit is OFF (stand-by), the Timer ON can be set by pressing the timer symbol and the relative stop time will start blinking in the temperature field, showing first the value 1 (i.e., the unit will start after 1 h), by pressing + or - buttons the value can be increased or decreased. Then by pressing the timer symbol again the setting will be confirmed starting the countdown.
By pressing again the timer symbol the setting will be erased.

6.6. SETTINGS

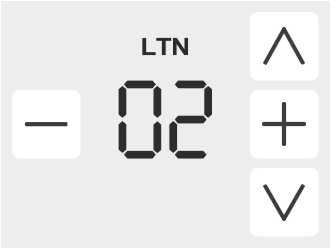
The setting menu will appear by pressing the setting button.
The current choices will be shown in the first page:



- Temperature unit °C or °F
- Temperature sensor external (probe located in the air suction section or temperature sensor internal (probe located inside the display)

The selected buttons will be highlighted.

In the next pages the following parameters are available:



- Ltn (display backlight duration in seconds) with setting range 10-99, default value 60

- Buzzer activated / disabled

- Def (default settings restore) setting and exit page

6.7. ALARMS AND TOUCH SCREEN DISPLAY 2.4'', 3.5''

6.7.1 Alarm List and possible causes (version E)

E0: Display – Main Board Communication Error
Possible Causes: Display cable not properly inserted into the main board or display; dust accumulation on the female connector (main board or display side); damaged display cable. If the error persists, contact service.

E1: Temperature Sensor (RT) Error
Possible Causes: Damaged or disconnected NTC sensor. If the error persists, contact service.

E2: Temperature Sensor (IPT) Error
Possible Causes: Damaged or disconnected NTC sensor. If the error persists, contact service.

E3: Temperature Sensor (OPT) Error
Possible Causes: Damaged or disconnected NTC sensor. If the error persists, contact service.

E4: Fan Blower Fault
Possible Causes: Fan cable not properly connected to the main board (one of the 4 wires); damaged fan motor; blocked rotor. If the error persists, contact service.

E6: Driver PCB – Main Board Communication Error
Possible Causes: 2-wire cable not properly inserted into the main board or driver board; damaged cable; damaged PCB. If the error persists, contact service.

E7: Temperature Sensor (OT) Error
Possible Causes: Damaged or disconnected NTC sensor. If the error persists, contact service.

E8: OPT Temperature Too Low
Possible Causes: In heating mode, evaporator temperature is too low (OPT < -5°C) due to insufficient seawater flow; seawater temperature is below 5°C. If the error persists, contact service.

E9: Low evaporation temperature

Possible Causes:

- IPT (evaporator coil probe temperature) drops below -1°C, triggering the E9 alarm and stopping the unit and pump.
- Ensure the fan starts ventilation before the compressor starts.
- Poor ventilation through the evaporator.

If the error persists, contact service.

E10: High HP Gas Pressure
Possible Causes:

- In cooling mode: Insufficient seawater flow causes high condensing temperature (OPT > 53°C).
- In heating mode: Insufficient airflow through the condenser causes IPT > 52°C.

If the error persists, contact service.

E16: On/Off Enable from Remote Switch
Possible Causes: Compressor does not start due to open contact RC on the terminal board.

E18: Compressor Block and E11: High Current
Possible Causes: In cooling (heating) mode, insufficient seawater flow (air flow) causes rapid increase in condensing temperature and input current. If the error persists, contact service.

E19: Driver Temperature Sensor Error
Possible Causes: Fault in the driver temperature sensor. If the error persists, contact service.

E20: Driver Temperature Too High
Possible Causes: Excessive temperature detected in the driver. If the error persists, contact service.

E21: Input Voltage Dropping Rapidly
Possible Causes: Rapid voltage fluctuation detected. Check power source stability.

E22: Input Voltage Too High
Possible Causes: Voltage input exceeds acceptable limits. Check power supply.

E23: Output Out of Phase
Possible Causes: Output phase error detected. If the error persists, contact service.

E24: Input Out of Phase
Possible Causes: Input phase error detected. If the error persists, contact service.

E25: Software Overcurrent / Overload
Possible Causes: System overload or current surge detected. If the error persists, contact service.

E26: Communication Failure
Possible Causes: General communication error. Inspect all data cables and connections. If the error persists, contact service.

E27: Bus Imbalance
Possible Causes: Electrical imbalance on the bus detected. If the error persists, contact service.

E28: Input Voltage Too Low
Possible Causes: Voltage input is below minimum required level. Inspect power source.

E32: Current Detection Circuit Error

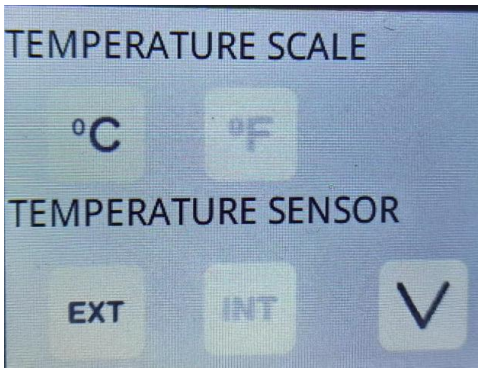
Possible Causes: Fault in the current detection circuitry. If the error persists, contact service.

ALARM RESET
After resolving the issues that triggered the alarm, it can be reset without shutting down the unit. To reset the alarm, turn the unit off using the display and then turn it back on

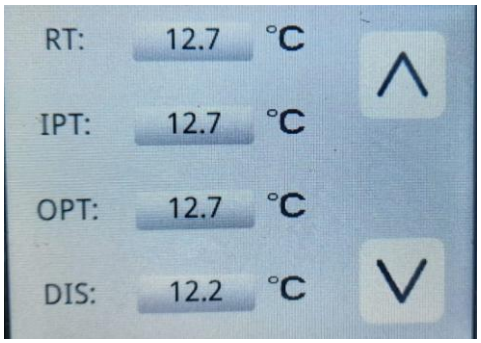
6.7.2 DISPLAY 2.4”

SETTINGS: Access the settings menu by pressing the settings button and entering the default password: 1111

From the settings menu you can: Set the temperature unit to °C or °F, Choose the temperature sensor: External Sensor: Located in the air suction section, Internal Sensor: Located inside the display.



From the setting menu you can view the real-time temperature readings from the sensors

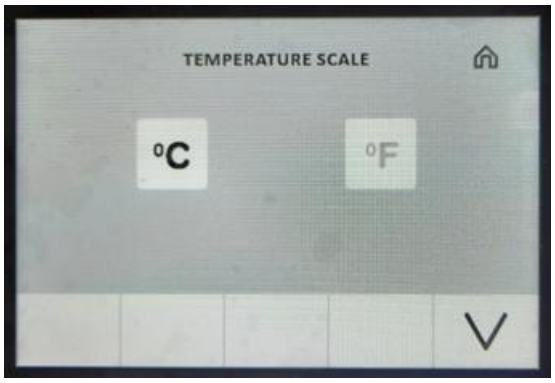


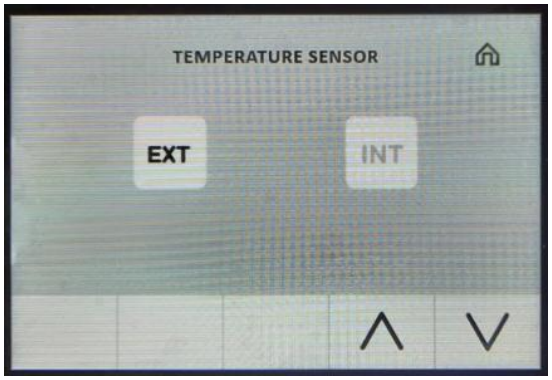
Use the Mode button to select the operational mode: cooling / heating / dehumidifying / auto/fan.
Additional function of the Mode button: with the unit OFF (stand-by), by pressing and holding 15 s the MODE button, the pump output will be activated, and the following icon will be displayed: This function is useful during the installation in order to prime the pump and fill the sweater circuit before starting the compressor. By pressing again the MODE button, the pump output will be disabled.

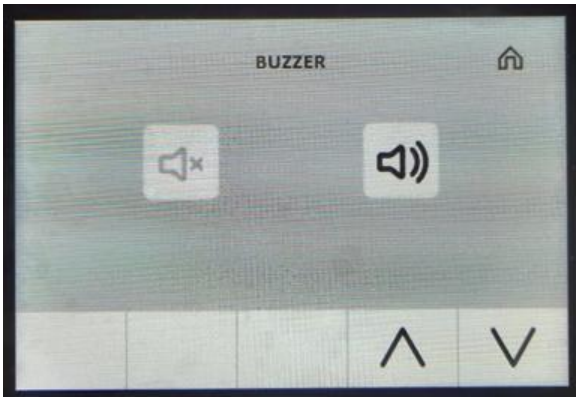
6.7.3 DISPLAY 3.5” (optional)

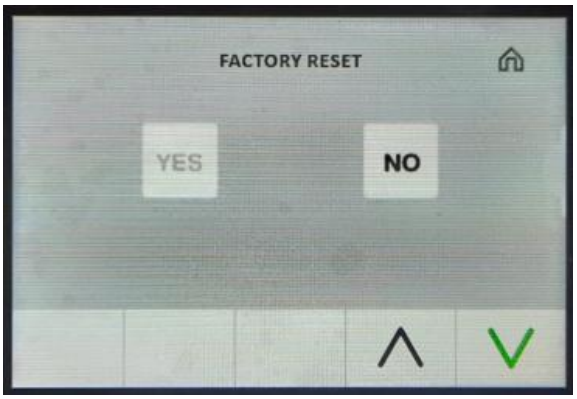
Mode: cool, heat, dehumidification, AUTO, FAN
Speed: max, medium, ECO, AUTO

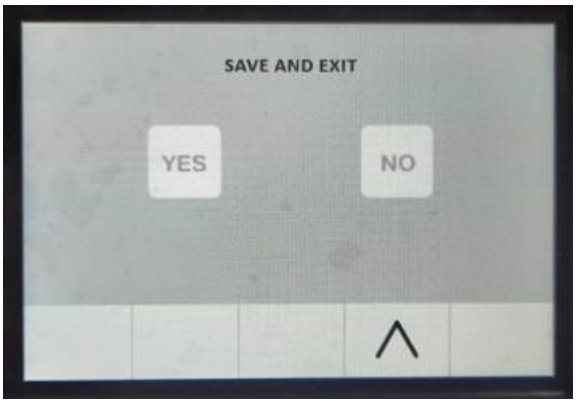
From the settings menu you can: Set the temperature unit to °C or °F, Choose the temperature sensor: External Sensor: Located in the air suction section, Internal Sensor: Located inside the display.


TEMPERATURE SCALE
°C
°F


TEMPERATURE SENSOR
EXT
INT

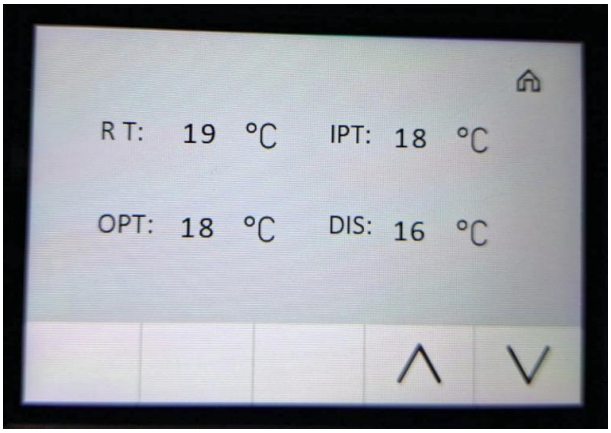

BUZZER


FACTORY RESET
YES
NO



Additional function of the SETTING button: by pressing and holding 5 s the SETTING button, the following pages will be shown:

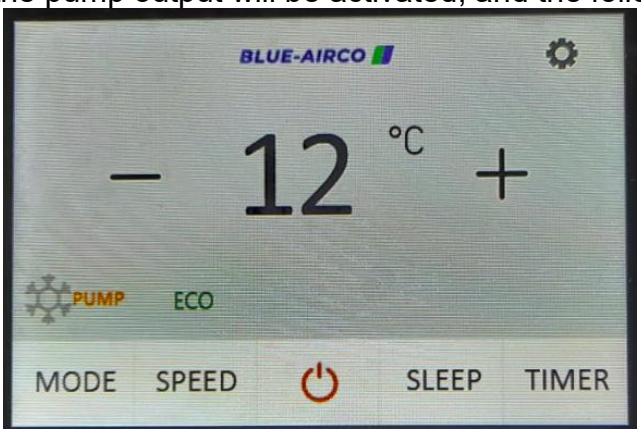
Temperature sensor calibration



Real-time temperature readings from the sensors

Alarm history

Additional function of the Mode button: with the unit OFF (stand-by), by pressing and holding 15 s the MODE button, the pump output will be activated, and the following icon will be displayed:



This function is useful during the installation in order to prime the pump and fill the sweater circuit before starting the compressor. By pressing again the MODE button, the pump output will be disabled.

7.0 WARRANTY TERMS

7.1. LIMITED WARRANTY:

The manufacturer has tested each unit before delivery and guarantees that all the products are free from defects in materials or workmanship.
Warranty is limited in term of duration as specified below.

This Limited Warranty totally replaces any other express warranties, obligations, or liabilities from the manufacturer (i.e. Blue-Airco Srl) side. In those instances, in which the manufacturer chooses to make a cash refund of the original purchase price, such refund shall affect the cancellation of the contract of sale without reservation of rights on the part of the owner. Such refund shall constitute full and final satisfaction of all claims which the owner has or may have against the manufacturer resulting from any actual or alleged breach of warranty, either express or implied. The manufacturer disclaims any liability for either incidental or consequential damages. This includes any damage to another product or products resulting from such a defect. Any implied warranties of merchantability, satisfactory quality or fitness for any purpose is limited to the duration of this limited warranty.

The manufacturer does not authorize the dealer or any other person to assume for him any liability in connection with the warranty, or any liability or expense incurred in the replacement or repair of its products other than those expressly authorized by him. The manufacturer shall not be responsible for any liability or expense except as is specifically authorized in the following sections.

The manufacturer reserves the right to improve or modify the products without notice.

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7.2. WARRANTY DURATION:

The Blue-Airco product's Warranty Coverage Period is 2 years and it begins, from the date of possession of the boat by the original owner or from the date of the first installation.
However, the Warranty Coverage Period will not exceed 3 years from date of manufacturing. In the case of direct sale to the boat owner, the warranty period begins from the shipping date of the product.
The Warranty is transferable and will carry any remaining Warranty Coverage Period. The Warranty Coverage Period does not restart after any repair or replacement of the product.

All the Blue-Airco products bear a data plate showing the product model and serial numbers. The serial number is related to the production date (date-coded) To determine whether any product is covered by Warranty, please send a picture of the data plate to the customer service.

For proof of the date of the initial installation, the manufacturer will require a copy of the bill of sale from the dealer to the original owner.

- **Self-contained units:** If any part of the product fails due to a manufacturing defect within 24 months from the date of possession of the boat by the first owner, the manufacturer will supply without charge the required replacement part. The service labor will be covered as well within 12 months from the data of possession of the boat by the first owner, provided the conditions specified in the following chapter are fulfilled.

- **Pumps:** If any pump fails due to a manufacturing defect within 12 months from the date of original shipment Blue-Airco will replace or repair the part without charge. The service labor will be covered as well provided the conditions specified in the following chapter are fulfilled. Pumps damaged that have been submerged or run dry are not covered by warranty.

- **After market:** For replacement parts and components the warranty duration is 90 days, the labor is not cover.

7.3. WARRANTY CONDITIONS:

In case of defective products, the intervention must be prior authorized by the Customer Service; therefore, the client shall write by email to info@blue-airco.com requiring the intervention. All the parts delivered bear a data plate reporting model and serial number, it is recommended therefore to attach pictures of parts and data plate to the email. A copy of the bill of sale of the equipment or a copy of the bill of sale showing the first date of boat possession by the owner can be required as a proof of the startup date of the equipment.

The owner shall provide the Customer Service with all the information related to the failure.

The intervention must be carried out by a local service authorized by Blue-Airco Srl. In case there is no authorized service dealer in that particular area, Blue-Airco will authorize the use of a local service company and will assist in any way possible.

Where labor is included for a particular product covered under this Limited Warranty, Blue-Airco is not responsible for additional labor charges associated with the removal, reinstallation, or replacement of any equipment or furnishings beyond the particular covered product. This Blue-Airco Limited Warranty allows up to 1 hour time for the Servicing Dealer's travel. Any additional travel time is the owner's sole responsibility. The labor eventually necessary to remove other parts and equipment to access to the faulty unit in order to start repairing, will be at owner's charge.

Any unit or replacement part installed due to a warranty failure carries the remainder of the original warranty. Warranty coverage does not start over from the repair/replacement date.

If the intervention onboard is required but the problem is due to improper installation and use, or any cause independent from the supplied equipment, the cost of intervention will be at owner's charge. The installation of the products is not covered by the Blue-Airco warranty, because the manufacturer has no control or authority over the selection, location, application, or installation of these components.

The responsibility of the owner of the equipment includes the following:

- To run the equipment according to the manufacturer's instructions.
- To provide an easy access for service.
- To check and reset circuit breakers and disconnect the electric power before calling for service.
- To keep the units clean and free of dirt, to keep the air filters and the drain pan clean.
- To keep the condenser coil free of sediment and scale.
- To keep clean the seawater circuit.
- To pay the charges incurred when any of the above has not been done.
- To pay for repair or replacement of any material or part, other than those provided by Blue-Airco.
- To check any protective device on the circuit board and replace if required.
- To ensure that the unit is correctly connected to the ground and the bonding system.

This warranty does not cover:

- Failures and damages resulting from improper or faulty installation, abuse, misuse of the equipment, installation that does not comply with the manufacturer instructions or otherwise,

installation that does not comply with boat standards ABYC;
- Dockage fees, tendering, or special arrangements required when the boat is not moored or docked in a serviceable location.
- Damages caused by natural disasters, flooding, fire, submerge, water leakage.
- Transport: product damage as a result of improper return packaging or other freight damage.
- Negligent servicing.
- Wrong electrical and hydraulic connections.
- Power supply not in according to manufacturer's specifications.
- Coil damaged due to water frosting, failures due to improper winterization.
- Corrosion, electrolysis and galvanism, stray current, seawater erosion.
- Water damage, including but not limited to all components of the unit and the pump.
- Additional labor charges associated with the removal, reinstallation, or replacement of any equipment or furnishings beyond the particular covered product.
- Pumps with cracked heads or pumps that have been run dry, or have been submerged.
- PCB and display with water damage.
- Environmental and/or recovery fees.
- Damages occurring as a result of normal wear or aging.
- Replacement of refrigerant with substitute without the manufacturer preauthorization.
- Welding and Nitrogen Fees.
- Any additional costs or charges not expressly mentioned in this warranty.

8.0 DISPOSAL AND REFRIGERANT FLUID RECOVERY

- Disposal of the appliance, its components and packaging materials shall be carried out in accordance with the local laws and regulations applicable to the different categories of waste and recycling.
- Refrigerant and compressor oil must be recovered and handled only by authorized and qualified personnel or companies, in accordance with applicable regulations. Do not release refrigerant into the atmosphere.
- For information regarding disposal, refrigerant recovery or other environmental requirements, please contact Blue-Airco Customer Care at info@blue-airco.com.

The unit falls within the scope of **Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE)**, Annex III, Category 1, **"Temperature exchange equipment,"** which expressly includes air-conditioning equipment.
Accordingly, pursuant to Article 14(4) of the Directive, the appliance must bear the **crossed-out wheeled bin symbol** (Annex IX), indicating the requirement for separate collection at the end of its service life and the prohibition of disposal with unsorted household waste.
It is therefore recommended to include the following explanatory text on the product rating plate and/or in this manual, next to the symbol:
"This product must not be disposed of with household waste. At the end of its service life, it must be delivered to an authorized collection facility for the recycling of electrical and electronic equipment, or returned to the distributor when purchasing equivalent equipment, in accordance with the procedures established by the national legislation implementing Directive 2012/19/EU."

9.0 POLICY UPDATES

Blue-Airco Srl reserves the right to revise, update, or modify this documentation at any time without prior notice. Customers are encouraged to consult the latest available documentation or contact Customer Service for clarification