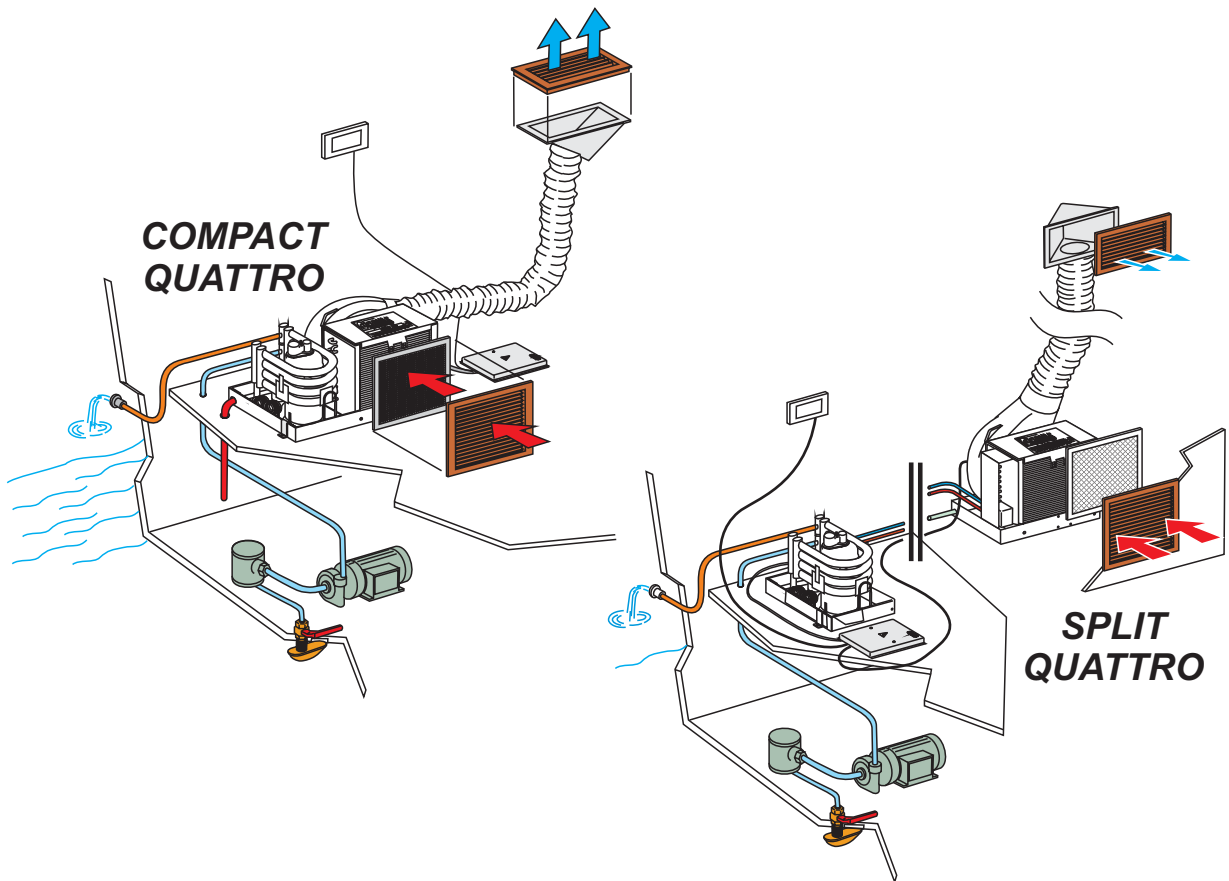




**AIR-CONDITIONERS**  
*COMPACT end SPLIT QUATTRO models*

INSTALLATION MANUAL  
USE & SCHEMATICS



Cod. A52040 19/03/08



COMPANY  
WITH QUALITY SYSTEM  
CERTIFIED BY DNV  
= ISO 9001/2000 =

**veco** S.p.A.



Via Cantore, 6/8 - 20034 Giussano (MI) ITALY  
Tel. +39 0362.35321 - fax +39 0362.852995  
E-mail: info@veco.net

**AIR-CONDITIONERS**

COMPACT and SPLIT QUATTRO models

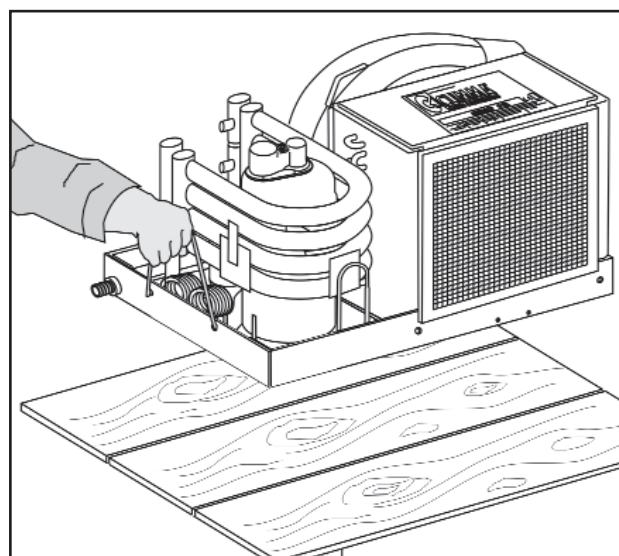
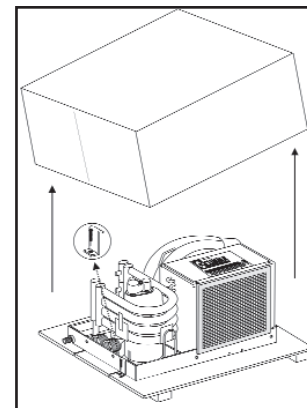
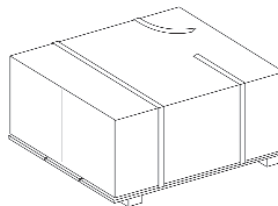
**1.1 - CRATING**

The CLIMMA air-conditioning unit is fastened to a wood plane and crated. Pay attention at opening.

Unhook the unit, unscrewing the provided clamps. Keep them to fasten the unit on the boat.

Raise the unit using the rope handles provided for this purpose. Don't raise it getting hold of fans and pipes, that can suffer damage.

On the unit there is a label that describes its technical specifications.

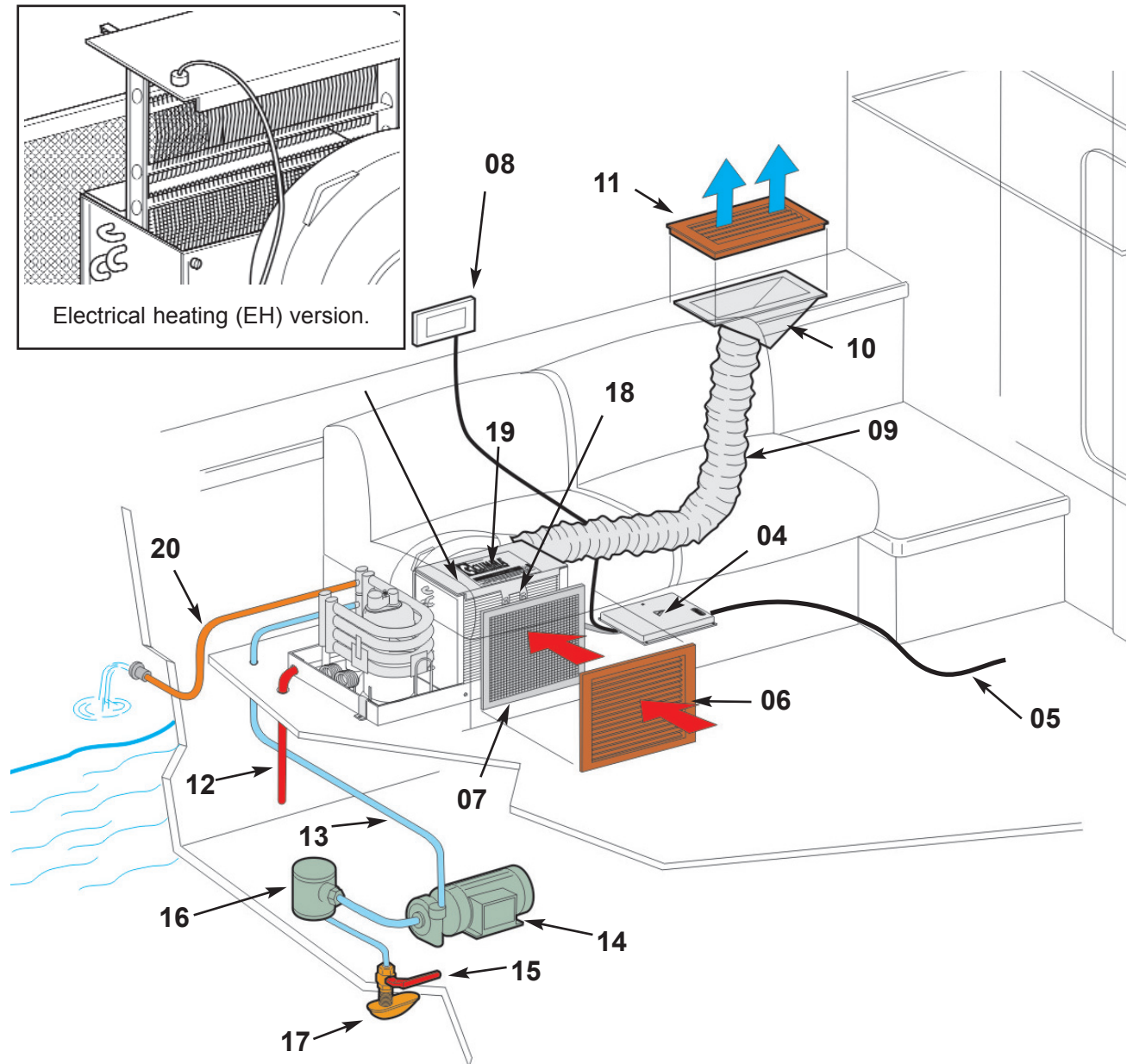
**NOTE**

Check that the technical specifications, the electrical supply, etc.... on the label correspond to the technical specifications of the boat.

made by VECCO - Giussano - Italy		<b>CLIMMA</b> <sup>®</sup>		MARINE AIR CONDITIONING				
<b>COMPACT 12 EH QUATTRO</b>								
MAIN POWER	NOMINAL CAPACITY	HEATER CONSUMPTION	COMPRESSOR RATED CONSUMPTION	FAN CONSUMPTION (MAX SPEED)		REFRIGERANT KIND / CHARGE	COOLING WATER	
230/1/50	12'000 Btu/h	5.6A/1300W	3.3 A	737 W	0,8 A	180 W	R407C / 350 g	13 l/min

EXAMPLE OF LABEL

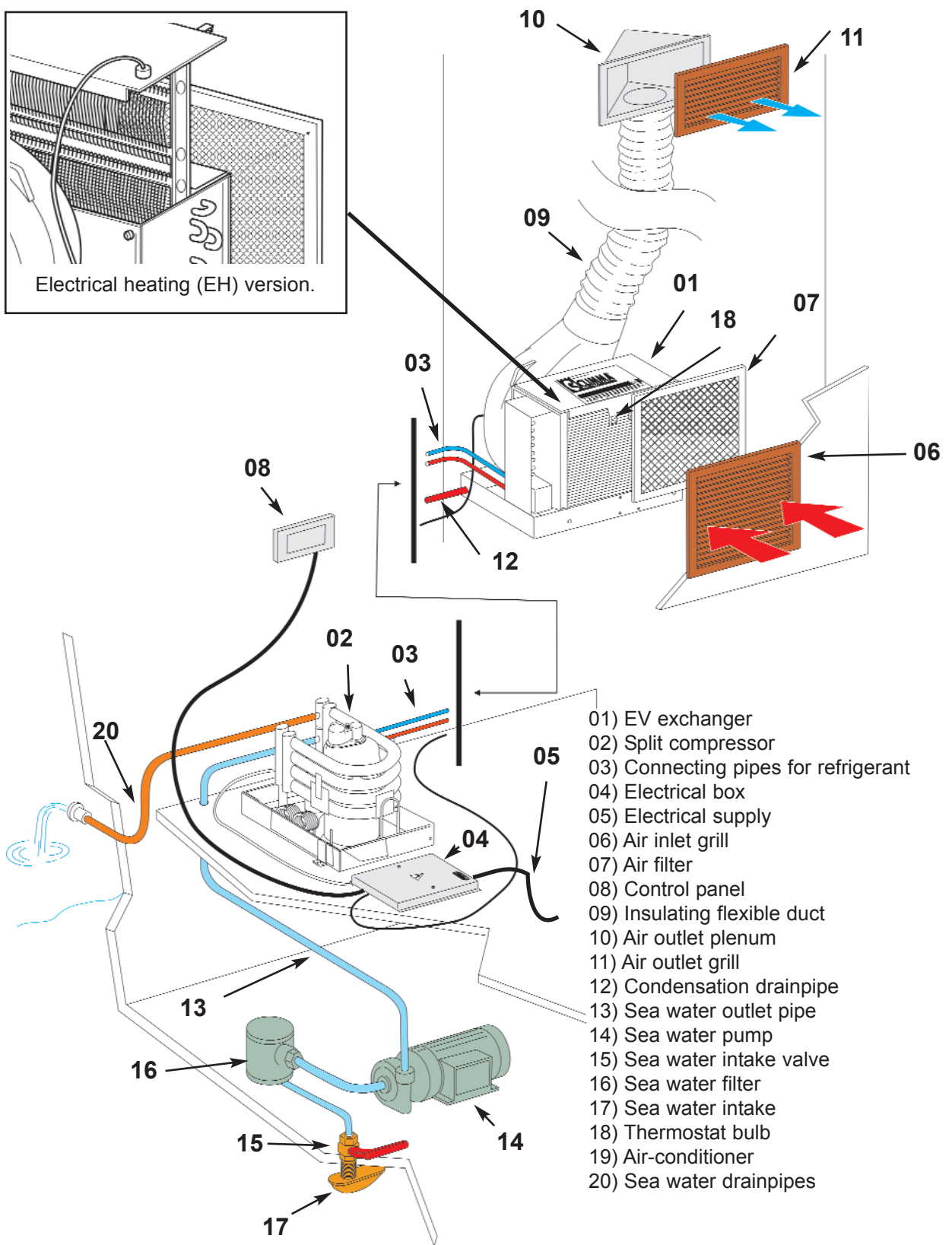
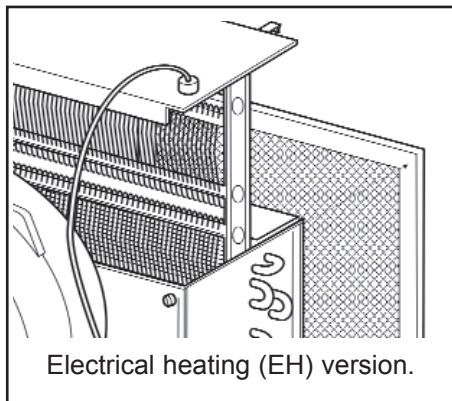
**2.1 Installation diagram of the Compact air-conditioner**



Electrical heating (EH) version.

- |                              |                            |
|------------------------------|----------------------------|
| 04) Electrical box           | 14) Sea water pump         |
| 05) Electrical supply        | 15) Sea water intake valve |
| 06) Air inlet grill          | 16) Sea water filter       |
| 07) Air filter               | 17) Sea water intake       |
| 08) Remote control panel     | 18) Thermostat bulb        |
| 09) Insulating flexible duct | 19) Air-conditioner        |
| 10) Air outlet plenum        | 20) Sea water drainpipes   |
| 11) Air outlet grill         |                            |
| 12) Condensation drainpipe   |                            |
| 13) Sea water inlet pipe     |                            |

**2.2 Installation diagram of the Split air-conditioner with EV**

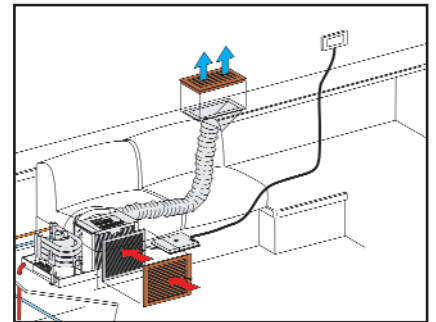


- 01) EV exchanger
- 02) Split compressor
- 03) Connecting pipes for refrigerant
- 04) Electrical box
- 05) Electrical supply
- 06) Air inlet grill
- 07) Air filter
- 08) Control panel
- 09) Insulating flexible duct
- 10) Air outlet plenum
- 11) Air outlet grill
- 12) Condensation drainpipe
- 13) Sea water outlet pipe
- 14) Sea water pump
- 15) Sea water intake valve
- 16) Sea water filter
- 17) Sea water intake
- 18) Thermostat bulb
- 19) Air-conditioner
- 20) Sea water drainpipes

**3 INSTALLATION OF THE COMPONENTS****3.1 - FUNCTIONING OF THE AIR-CONDITIONERS**

During the cooling cycle, the refrigerant circuit takes the ambient air away and to make it over the sea water (**CO models**).

It is possible to select the functioning cycle, the desired temperature and the fan speed from a remote control panel that can be installed in the air-conditioned room. For the specific distances, refer to the directions of the remote control panel (page 149).



Version with standard mechanical panel

**3.2 - ARRANGEMENT - General notes**

Choosing the unit position, it is necessary to consider the following elements:

- 1 - the accessibility to the air filter for the cleaning;
- 2 - the necessary space for the fastening of the provided clamps (figure 1.8 - page 8);
- 3 - the connection of the condensation drainpipes (figure 2.8 - page 8);
- 4 - since the fan rotates, it is necessary to choose the best position to connect it to the air duct. Then, block the fan in the chosen position;
- 5 - the passing of the sea water circuit pipes;
- 6 - the passing of the electrical connection wires and the easy access to the electrical box.

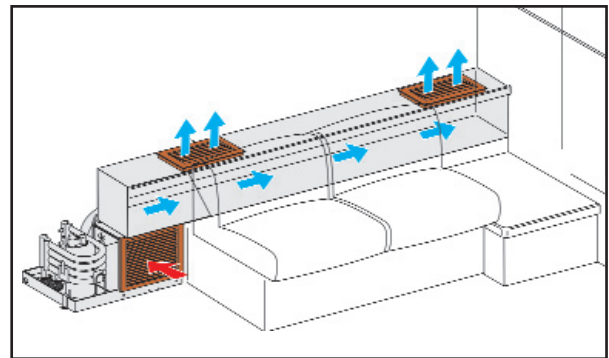
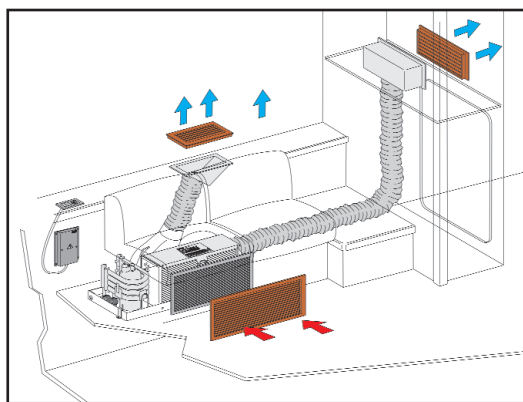
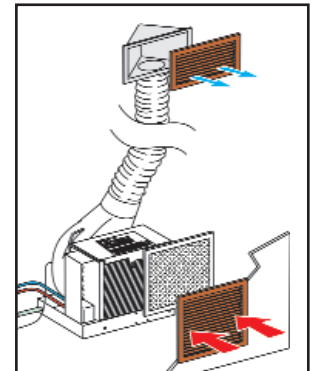
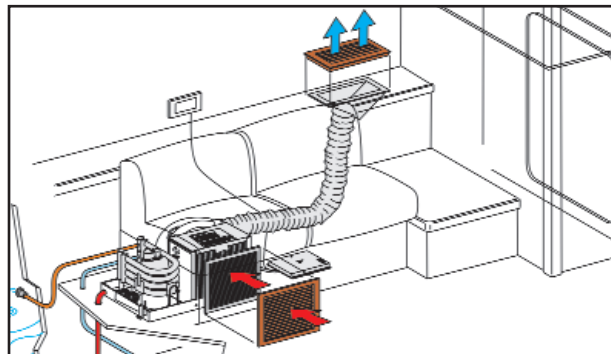
Position the pipe-tightening clamps of the water system so that once arranged the unit, it is possible to tighten the screws. Instead of the clamps we suggest to use all stainless steel components.



**3 INSTALLATION OF THE COMPONENTS**

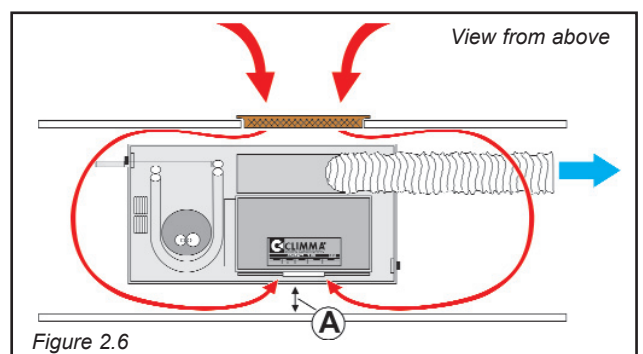
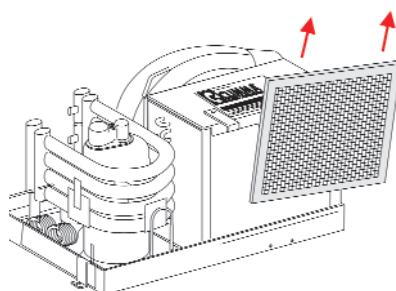
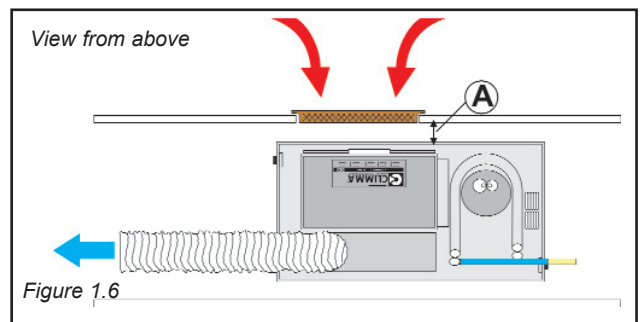
**3.3 - PLACING**

A.- The unit has been designed to take the ambient air directly away. It must be installed in a room that must be conditioned.



B.- The conditioned air (from the fan) must be piped towards one or more grills through flexible pipes or through isolated ducts of suitable section in the boat structure.

C - The exchanger system takes away the ambient air. The side with the filter mustn't be in line with the aspiration grill, as in the picture 1.6. It can have also a different position (see the picture 2.6). The second solution is the best one thanks to the best sound isolation of the system.

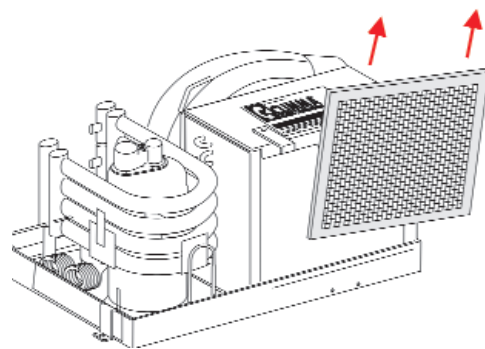
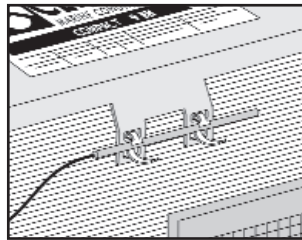
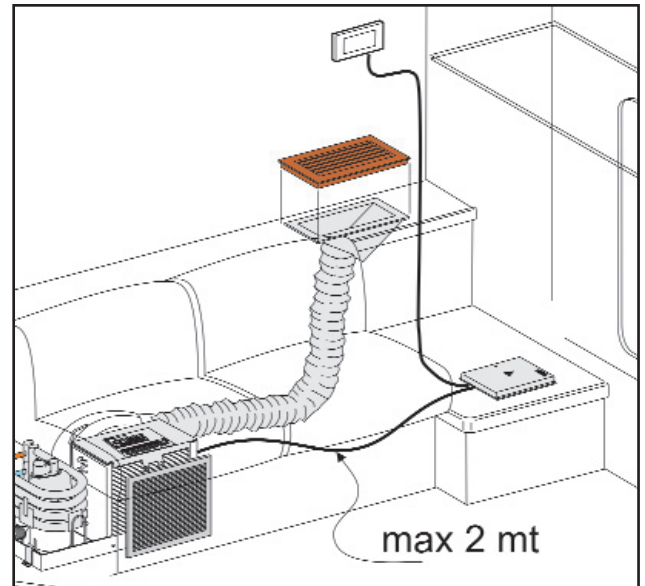


**3 INSTALLATION OF THE COMPONENTS**

E.- The air-conditioner is connected to the electrical box through cables of different length. So there must be an accessible space (next to the compressor unit for SPLIT models) to install the electrical box.

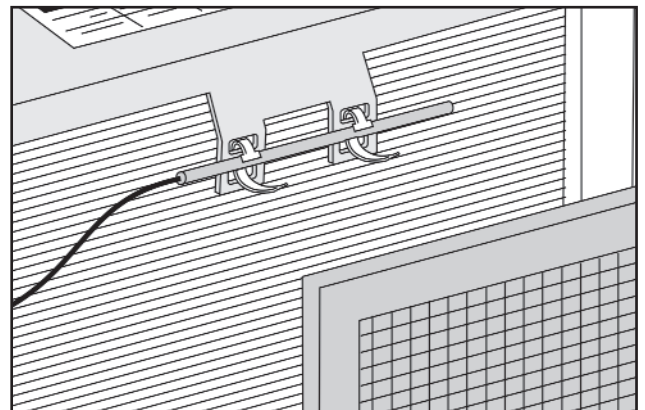
F.- The thermostat bulb and the aspiration filter must be mounted on the air-refrigerating gas exchanger. This side must be accessible for the filter maintenance.

G.- The maximum distance between the control panel and the electrical box is 3 m both for the thermostat capillary and for the connection cable.

**3.4 - THERMOSTAT BULB**

The thermostat bulb must be fastened to the air exchanger by means of special latches.

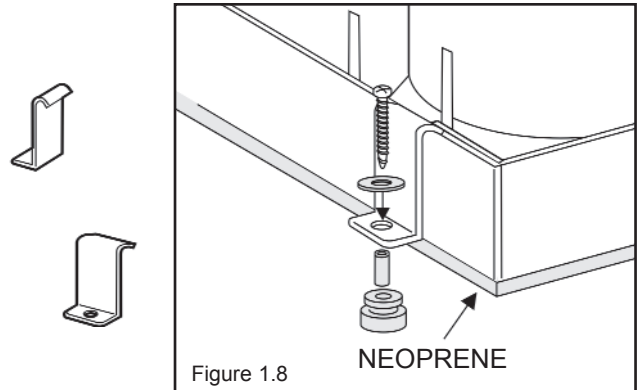
The bulb must keep separated from the exchanger because it must be influenced only by the sucked up air, but not by the refrigerating circuit. Sometimes you can install the bulb not directly on the exchanger but in the room, so that it is sensitive to the ambient temperature. To fasten the bulb to the wall, you can use the special plaque.



**3 INSTALLATION OF THE COMPONENTS**

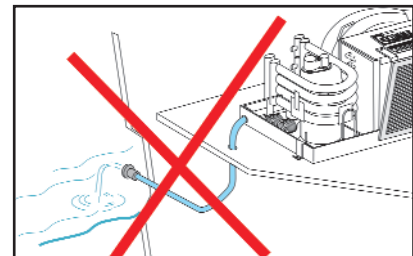
**3.5 - FASTENING**

The fastening must be executed as indicated.

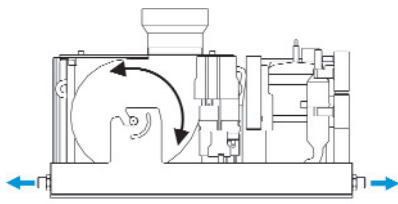


**3.6 - CONDENSATION OUTLET**

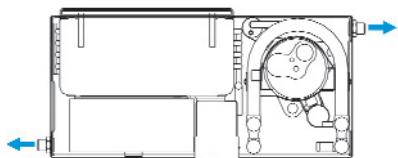
The air-conditioning determines the separation of the condensation water due to the humidity of the conditioned air. This condensation must be discharged in the bilge or in a special tank and then by means of a self-priming pump in the sea.



The direct bulkhead outlet is not the best solution: in fact, it can suck up unpleasant smells due to the exhaust emissions of its own or of other engines. **Make reference to the safety regulations of the different countries**

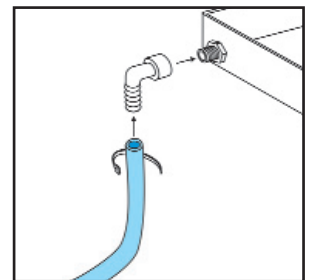


Dis 2.8

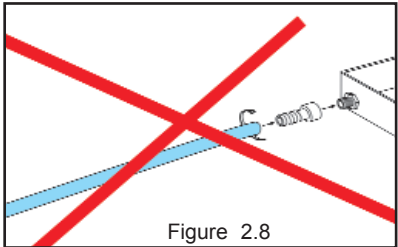
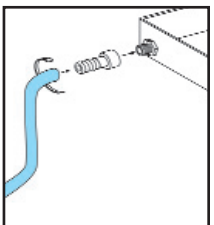


Each unit is endowed with two outlets, as you can see in the picture above.

The water condensation outlet pipe must be linked to the rubber-holders of 19 mm on the condensation collection basin.



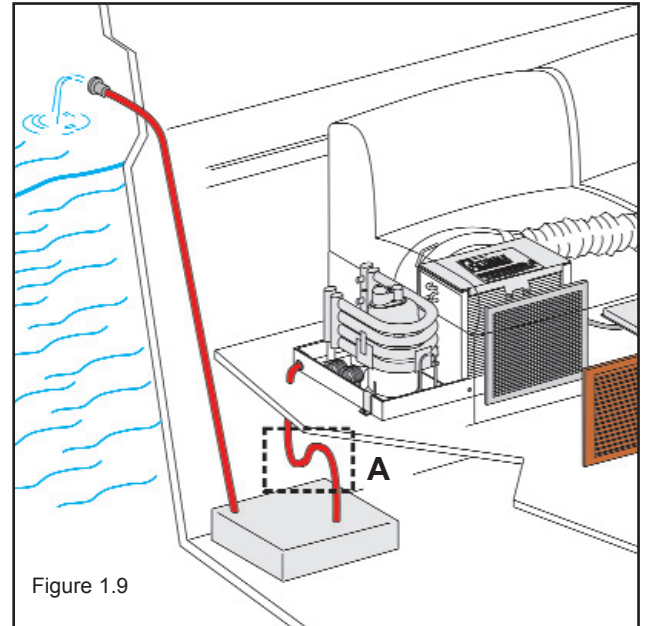
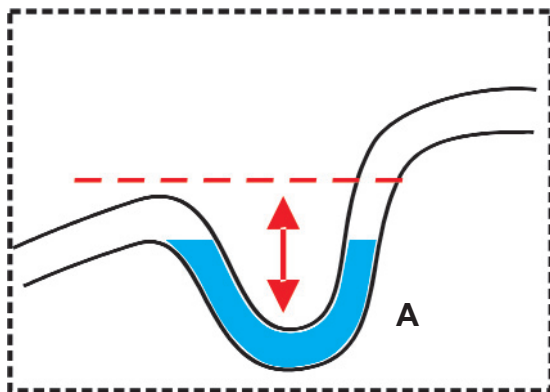
If the condensation discharge pipe for exigencies of installation must be long, it is better to use the special "L" connection. You must avoid such an installation as you can see in the picture 1.8 because the condensation water can stop and flow back to the collection basin because of the boat rocking.

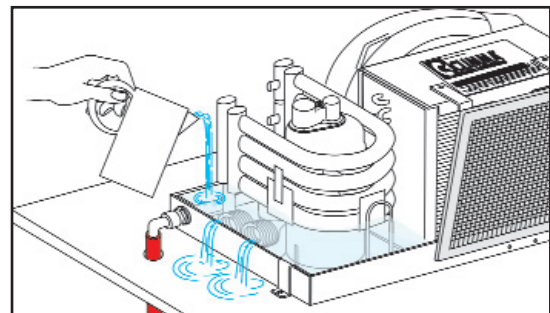
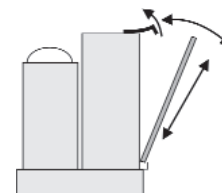
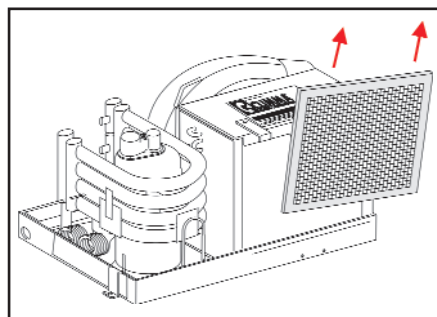
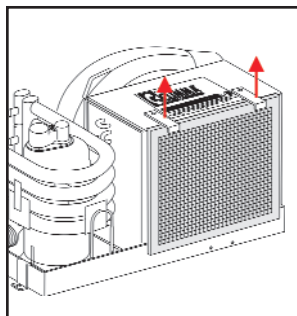


**3 INSTALLATION OF THE COMPONENTS****3.7 - CONDENSATION OUTLET**

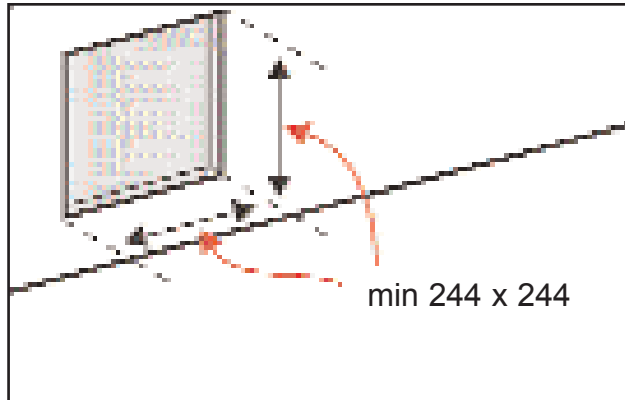
Since during the operating the air-conditioner sucks up and causes a light vacuum in the room, the condensation outlet pipe can suck up from the pilge or the special tank unpleasant smells that can spread in the cabin. To avoid this possibility, it is possible to create a siphon (A) as you can see in the picture 1.9 to stop the air.



To check the actual efficiency of the condensation outlet, pour some water in the basin.

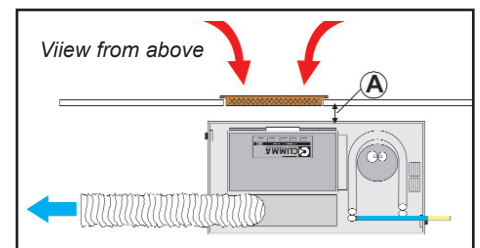
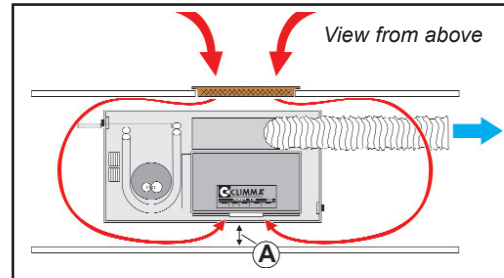
**3.8 - AIR FILTER**

The air-conditioner sucks up the ambient air through an air-refrigerating gas exchanger endowed with many aluminium tongues. They would soon become obstructed because of powder and filth. That's why you can mount the air filter directly on the exchanger (as you can see in the picture). The filter must be easily taken off to clean or replace it.

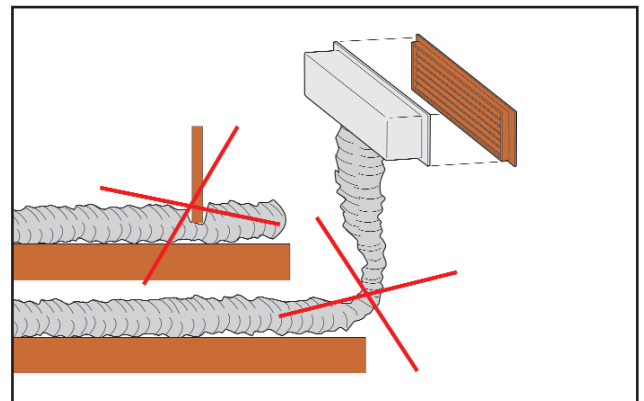
**3 INSTALLATION OF THE COMPONENTS****3.9- AIR CIRCULATION SYSTEM** (see examples on page 12)**3.9.A - Sucking up**

The ambient air is sucked up through one or more grills of suitable dimensions. The minimum dimensions are 244x244.

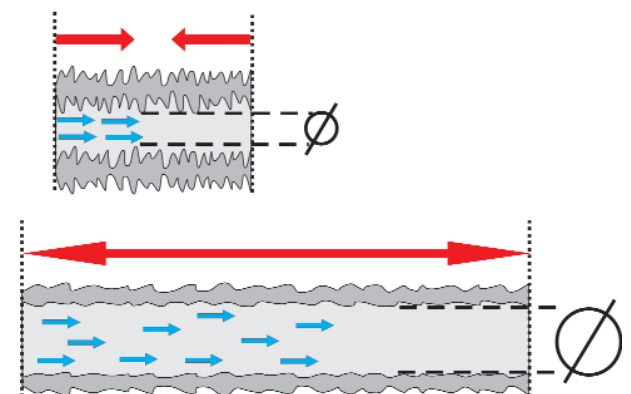
(To canalize the air flow back, call the technical assistance).

**3.10.B - Air circulation**

The efficiency of the installation depends on the air volume. So it is important to avoid narrow passages in the air circulation system, keeping the original diameter dimensions and using short pipes.

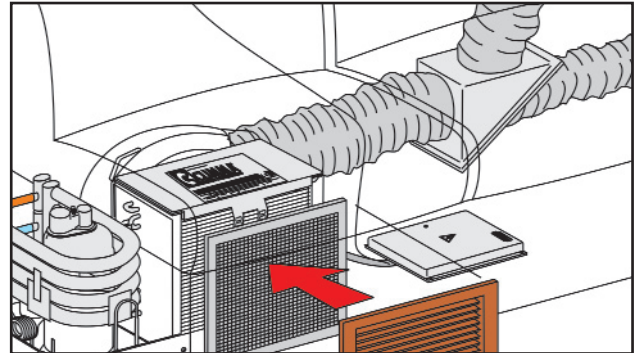
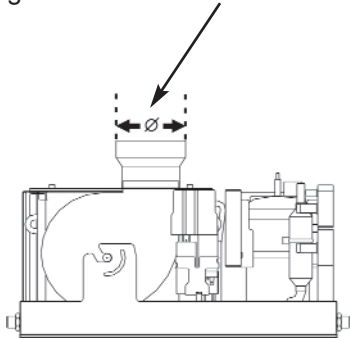
**3.11.B - Air ducts**

The isolated ducts must not be bent so that the air can circulate currently. Cut out the unuseful lenght.

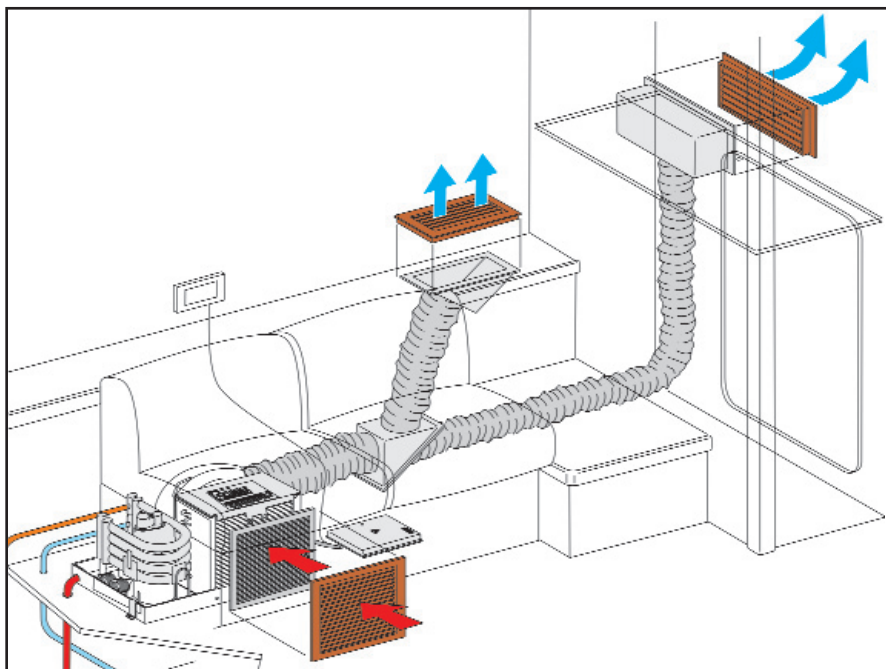
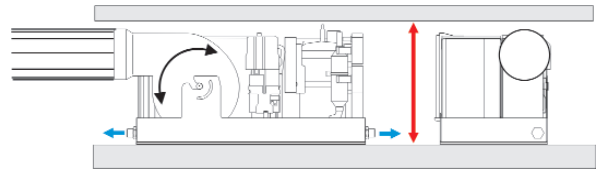


**3 INSTALLATION OF THE COMPONENTS****3.12.C - COMPACT - SPLIT QUATTRO**

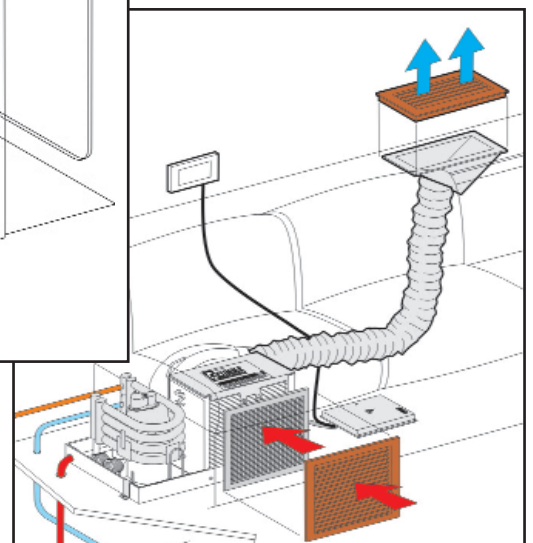
The fan must be linked by means of a duct to the air distribution system, that can be constituted of one or more grills and corresponding plenums. The main duct diameter must not be inferior to the diameter of the fan fittings.



The fan can be turned of 90° in case of installation of limited height.



*Example of a Compact installation:  
a plenum for air-conditioning two  
cabins.*



**3 INSTALLATION OF THE COMPONENTS**

**AIR DISTRIBUTION LAYOUT  
EXEMPLE DE DISTRIBUTION D'AIR  
ESEMPI DI DISTRIBUZIONE ARIA**

**ONE OUTLET - UNE SORTIE SEULEMENT - UNA SOLA USCITA**

Btu/h	2	L1	A
4000-5000	100	3	300x112
6000-9000	100	3	300x112
10000-13000	125	3	400x112
14000-17000	150	3	400x172

**TWO OUTLET - DEUX SORTIES - DUE USCITE**

Btu/h	2	L1	A	4	L2	B
4000-5000	100	3	200x76	3	75	200x76
6000-9000	100	3	300x112	3	75	200x76
10000-13000	125	3	400x76	3	75	200x76
14000-17000	150	3	400x112	3	100	300x112

- 1 = Air-conditioning unit - Unité de climatisation - Unità condizionatore
- 2 = Main air duct - Gaine d'air principal - Condotta d'aria principale
- 3 = Air splitter plenum - Plenum distribution air - Plenum di divisione aria
- 4 = Secondary air duct - Gaine d'aire secondaire - Condotta aria secondaria
- 5 = Air plenum - Plenum grille - Plenum per griglia
- 6 = Air plenum - Plenum grille - Plenum per griglia
- A = Main air delivery grill - Grille distribution principale - Griglia di mandata aria principale
- B = Secondary air delivery grill - Grille distribution secondaire - Griglia di mandata aria secondaria

**DUCT SPECIFICATIONS - SPECIFICATION DU GAINE - SPECIFICHE DELLA CONDOTTA**

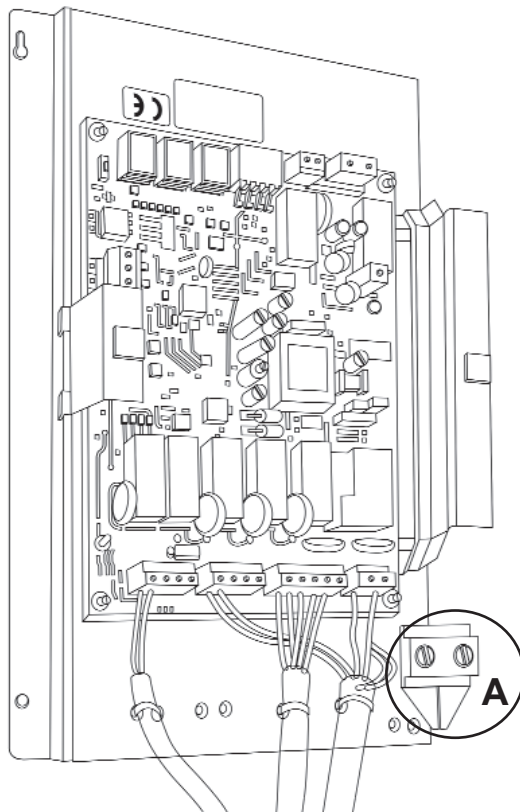
1 = SUGGESTED - CONSEILLE - SUGGERITO  
 2 = ACCEPTED - ACCEPTE - ACCETTATO  
 3 = WRONG - DECONSEILLE - SCONSIGLIATO

C331 05/96

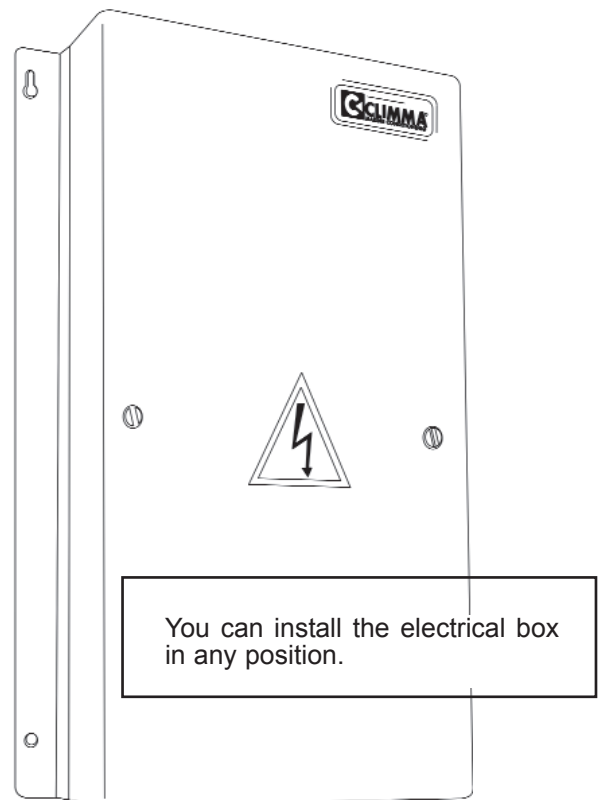
**3 INSTALLATION OF THE COMPONENTS****3.13 - ELECTRICAL BOX**

It contains the following electrical connections:

- to the grid;
- to the compressor-fan-checks group;
- to the control panel;
- to the sea water electrical pump;
- to the external temperature probe.

**3.13.A - PLACING**

You must install the electrical box near the air-conditioning unit, to which it is connected by means of a 2 m cable. It must be easily accessible for the maintenance or repair. Fasten the inlet cables with the suitable terminal (**A**).



You must fasten the electrical box on the wall by means of four screws, using the holes provided in the base.



**3 INSTALLATION OF THE COMPONENTS****3.14- MECHANICAL CONTROL PANEL**

By means of the control panel, you can set and control the following functions:

**3.14.A - PLACING**

You must choose the correct position to connect the panel to the board by means of a 3 m cable (included) and to install the thermostat bulb on the unit exchanger. If necessary, you can install the bulb not directly on the exchanger but in the room, choosing the right position to control the temperature. To fasten the bulb on the wall, you can use the suitable plaque.

**3.14.B.- INTERCHANGEABLE PLAQUE**

The standard plaque (included) is black.

**3.14.C - FASTENING**

The panel has been designed for a casing fastening. You must drill into it as indicated on the right.

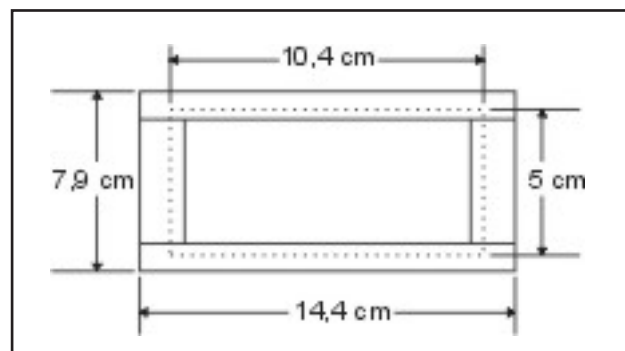
A.-Switching on and off  
 SUMMER AIR-CONDITIONING : push the “COOL” button with the ice star.

WINTER HEATING : push the “HEAT” button with the orange sun.

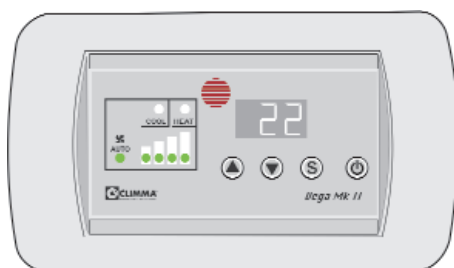
To switch off, put the switch in the central position.

B.- Setting-regulation of the temperature by means of the thermostat (TEMP). The thermostat has got a 3 m capillary with a bulb. The bulb must perceive the sucked up air (it must not come into contact with the exchanger tongues; it is in fact the battery where the refrigerant spreads: the tongues cool down, so that if the bulb comes into contact with them, it will perceive a temperature value that is lower than the ambient temperature).

C.- Regulation of the fan speed: by means of the button with the fan it is possible to regulate the four fan speeds. Push the button to select the fan speed: upwards arrow means speed increase and downwards arrow means speed decrease. Switching on the fan for the first time, it will run in MED speed. Then it will run according to the last selected speed.



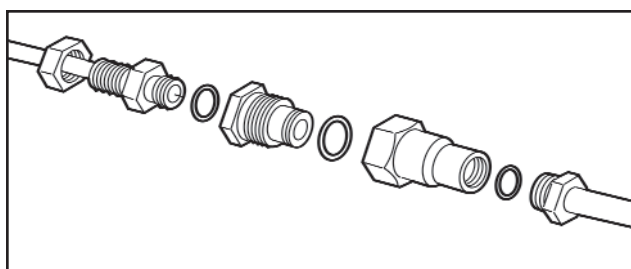
**IMPORTANT NOTE** : In the panel there is only low voltage. After having installed it, the back must not be accessible. An optional protection cover (code: M69330) is available. If the panel back is accessible because it may suffer damages.

**3.15- DIGITAL CONTROL PANEL VEGA MKII**

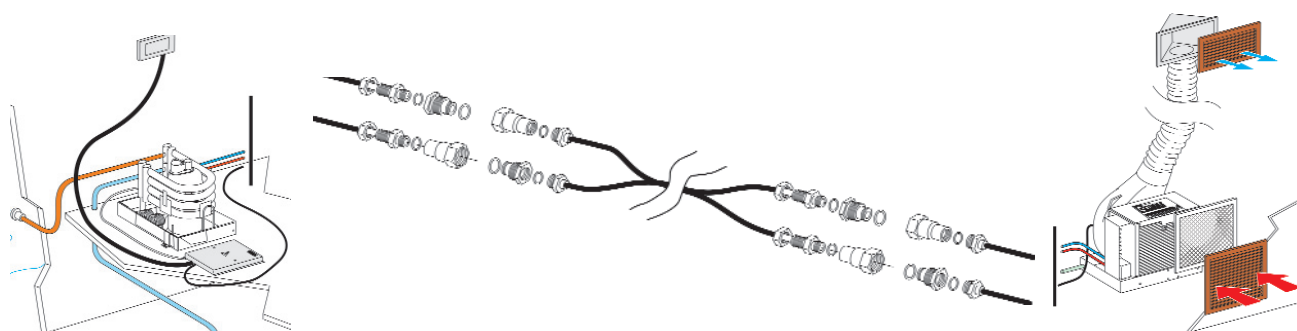
For the technical specifications and for the installation directions, make reference to the manual **VEGA MKII** (code: **A52000**).

**3.INSTALLATION OF THE COMPONENTS****3.16- PRE-CHARGED GAS PIPES WITH RAPID COUPLINGS (only for SPLIT models)**

SPLIT QUATTRO air-conditioners are composed by the compressor unit and by the evaporator. SPLIT 4 QUATTRO and SPLIT 8 QUATTRO are pre-charged with R134A and endowed with rapid couplings. The refrigerant gas circulates between them through pre-charged copper pipes with rapid couplings for the connection. The standard pipe connected to the evaporator is 70 cm long. It is possible to separate two units by means of extension leads of different length. During the connection, observe the directions of labels on two sides: "Compressor side" and "Evaporator side" according to the following outlet. Handle pipes carefully to avoid breakages due to incorrect use. The least bending radius is 50 mm.



LUGHEZZA METRI	CODICE PROLUNGA
2	M60160A
3	M60160B
4	M60160D
5	M60160E
6	M60160F

**3.17 - CONNECTING PIPES**

Except SPLIT 4 QUATTRO and SPLIT 8 QUATTRO models, all other models of SPLIT QUATTRO range are not pre-charged. The connection between two units is a "FLARE" type connection. So only qualified personnel must carry out the discharge and the charge of the system.

It's not VECO S.p.a. but the installer to provide the material for this operation.

The flare must be perfect (without any burr or imperfection).  
The length of the flare walls must be the same.

**OUTLET AND INLET PIPES SECTIONS**

For the section of outlet and inlet pipes, it is necessary to follow carefully the directions on each SPLIT QUATTRO unit.

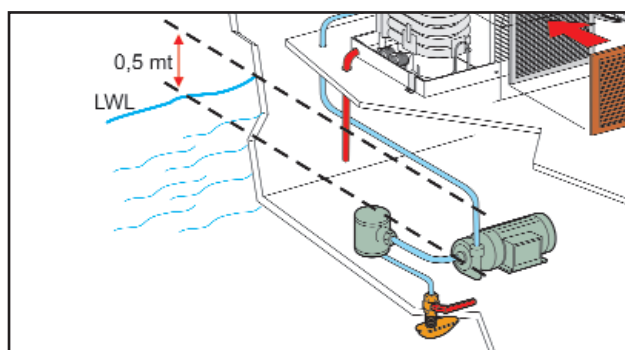
**4 SEA WATER CIRCUIT**

**4.1 - SEA WATER ELECTRICAL PUMP**

Thanks to the sea water electrical pump the water volume indicated in the exchanger can circulate. The electrical pump must be noiseless. It must work continually and it must be produced with marine building materials.

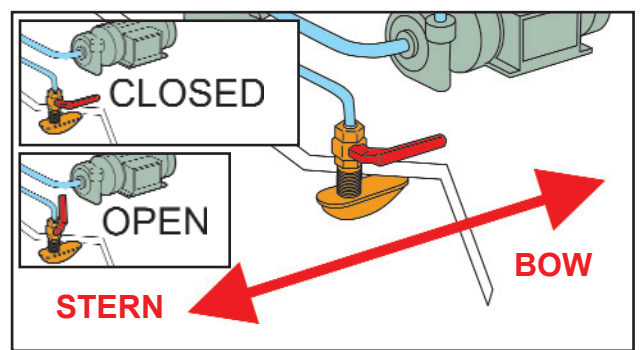
**4.2 - PLACING**

**4.2 - A**



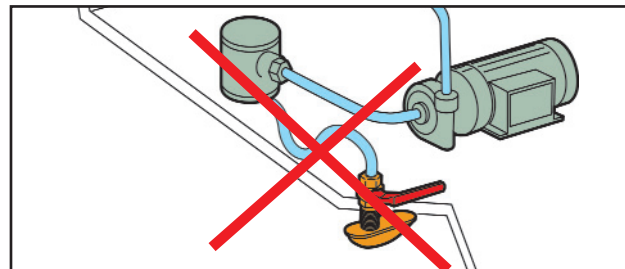
Install the electrical pump horizontally. Its vertical outlet opening must be upwards and at least 50 cm below the water line.

**4.2 - B**



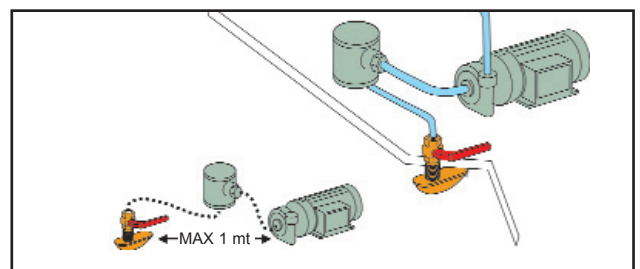
Sea water blade intake towards the bow.

**4.2 - C**



The filter and the connection to the electrical pump must be linked without any siphon (vertically from the sea water intake to the electrical pump intake).

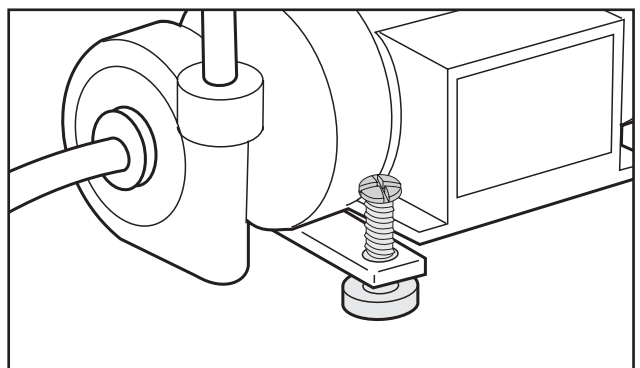
**4.2 - D**



The section of the intake pump must be as short as possible (less than 1 m for an efficient circuit).

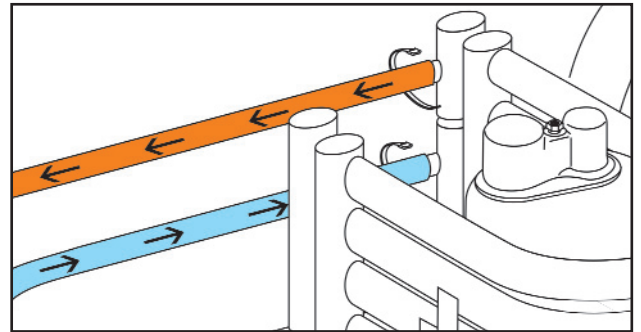
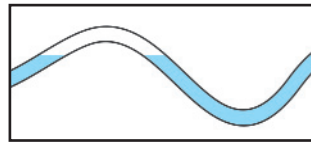
**4.3 - FASTENING**

Fasten the electrical pump by means of the suitable screws using the holes provided in the base. The flexible installation (with anti-vibrating system) makes the electrical pump even more noiseless.



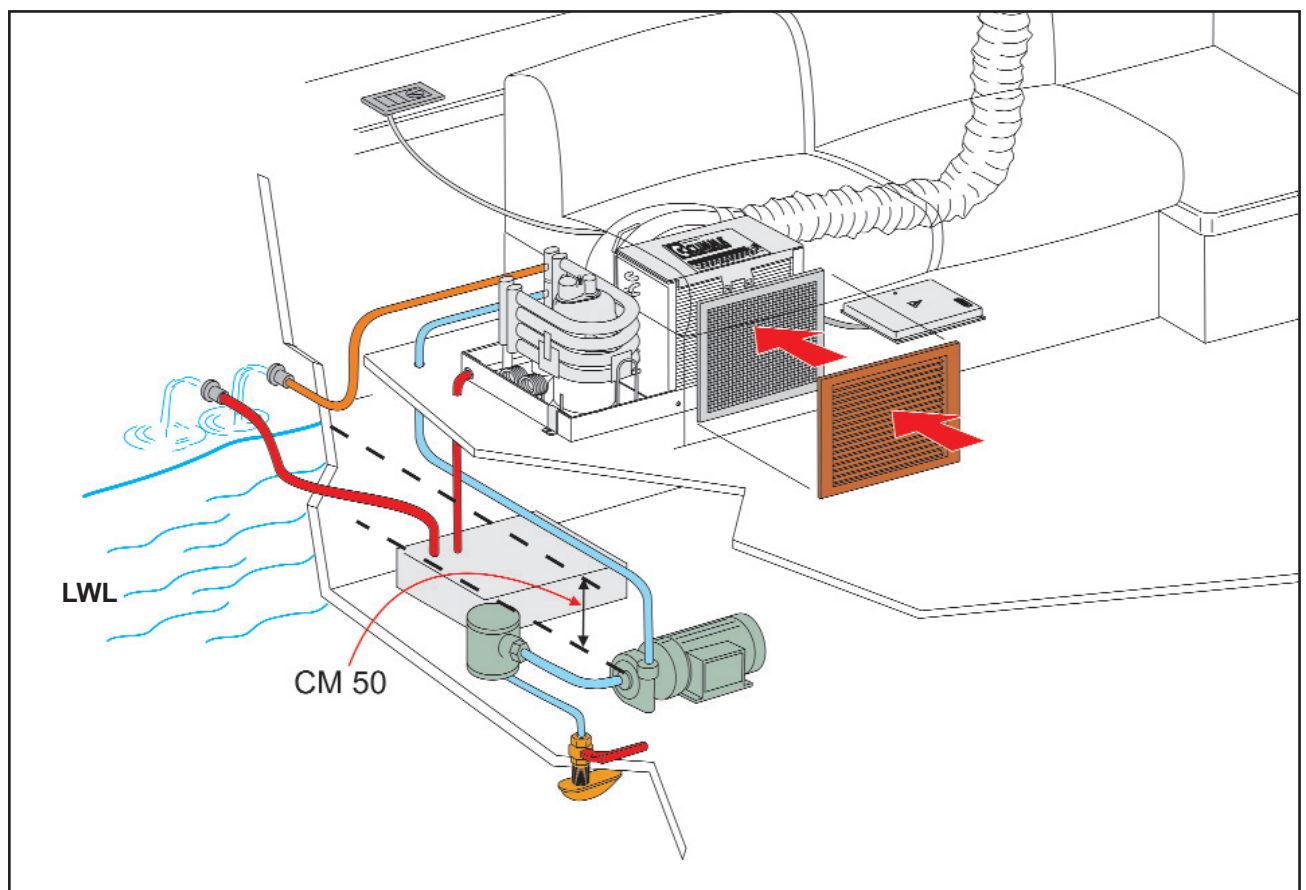
**4 SEA WATER CIRCUIT****4.4- SEA WATER CIRCUIT**

The circuit follows a vertical line from the sea water intake to the unit exchanger. Then it can follow both a vertical or an horizontal direction.



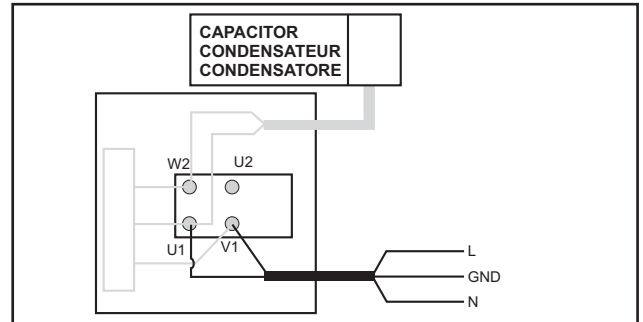
Anyway it is better not to create any siphon, because some air bubbles coming from the sea water intake during the sailing may remain in the circuit.

The water jet of the discharge must not disturb either the guests of the boat where it is installed or the ones of the other boats.

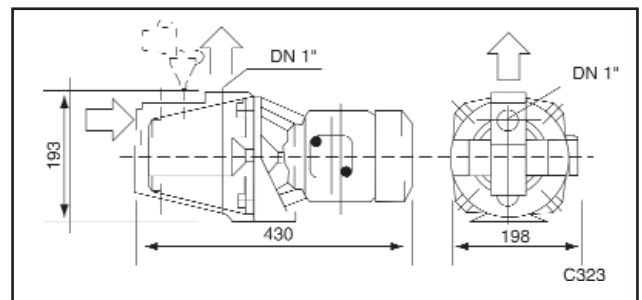


**4 SEA WATER CIRCUIT****4.5 - ELECTRICAL CONNECTIONS**

All electrical pumps are single-phase pumps. So they need a connection to the neutral wire, to the phase and to the grounding. Check always that the voltage on the label corresponds to the voltage available on board. Execute the connection according to the diagram on the terminal board cover. Follow the sequence of the phases for the pump connection. Check that the rotation direction corresponds to the instructions of the pump.

**4.6 - SELF-PRIMING ELECTRICAL PUMP**

If it is not possible to follow the directions at 3.2, it is necessary to install a self-priming electrical pump following the same instructions for the connection of a centrifugal pump. Before starting it, it is necessary to fill the electrical pump tank to make it self-priming.





# WARNING

## **AVOID THE RISK OF THE ELECTROCUTION !!!**

Only the qualified staff can execute the troubleshooting and the repair.

Keep isolated from the ground during the execution of the electrical operations, wearing dry clothes, rubber shoes, rubber carpets, etc.... Don't check wires under voltage if none can bring help.

## **IMPORTANT NOTE**

To avoid possible electrical shocks, that can cause harm or death to people, execute the grounding of the air-conditioning system, as indicated:

- 1- Use a suitable electrical cable with ground wire section and isolation to give the charge from the switch on the control board of the boat to the electrical box of the system. The ground wire must be correctly connected to the ground terminal of the panel.
- 2- Check that the ground connection between the electrical box and the air-conditioner hasn't suffer any damage during the transport.
- 3- Check that the connection of the water pump to the suitable terminal of the electrical box includes also the ground connection.
- 4- Check the ground continuity before switching off the air-conditioner.

**5 ELECTRICAL CIRCUIT****5.1 - ELECTRICAL BOX**

The COMPACT & SPLIT QUATTRO air-conditioners are available in the CO configuration (Cooling Only).

**5.2 - SUPPLY**

Check that the available supply corresponds to the label on the unit, on the box and on the electrical pump.

A bipolar switch with suitable fuses supplies the connection board of every unit.

The supply cables must be proportionated to the charge. The supply must be connected to the terminal board, for which section wires up to 4 mm are suitable. Fasten the cable using the suitable clamps.

**5 ELECTRICAL CIRCUIT**

**5 - FUNCTIONS OF THE BOARD**

**5.1 - ADJUSTABLE DELAY**

FUNCTIONS OF THE BOARD / CAPTION			
		Paragraph	Page
1	ADJUSTABLE DELAY	5.1	21
2	BOARD SETTING	5.2	22
3	POWER FUSE	5.3	23
4	FUNCTIONING WARNING LIGHTS	5.4	24
5	SELECTOR FOR MULTIPLE INSTALLATIONS	5.5	25

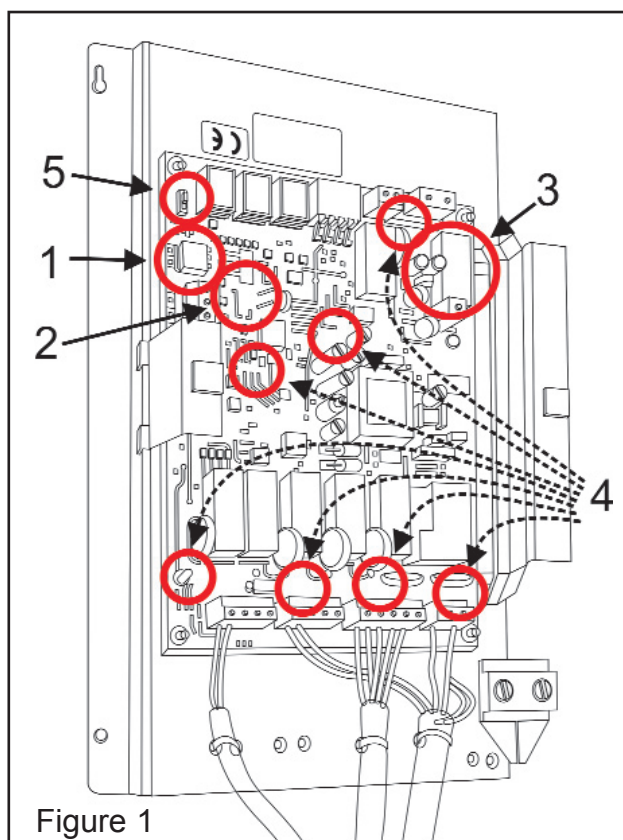
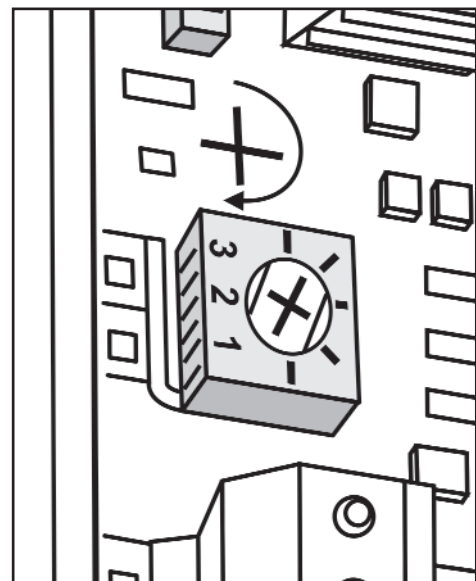


Figure 1

When more groups are connected to the same grid and are supplied simultaneously, it is necessary to activate the delay function: you must turn its device clockwise as indicated in the figure.

You can regulate the delay from 2 to 12 seconds.



Detail of the delay device (detail 1 of the figure 1).

**NOTE :** It is necessary to differentiate the switching on delays of different air-conditioners at least of 4 seconds one from another.

**5 ELECTRICAL CIRCUIT**

**5 - FUNCTIONS OF THE BOARD**

**5.2 - BOARD SETTING**

FUNCTIONS OF THE BOARD / CAPTION			
		Paragraph	Page
1	ADJUSTABLE DELAY	5.1	21
2	BOARD SETTING	5.2	22
3	POWER FUSE	5.3	23
4	FUNCTIONING WARNING LIGHTS	5.4	24
5	SELECTOR FOR MULTIPLE INSTALLATIONS	5.5	25

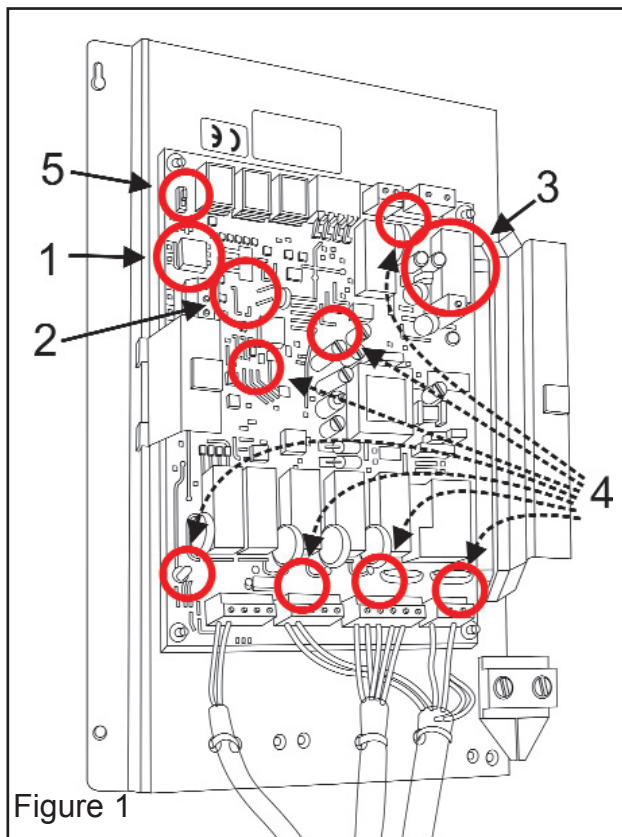
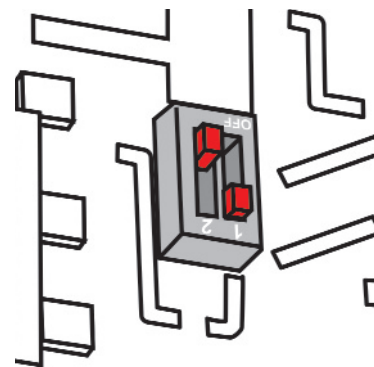


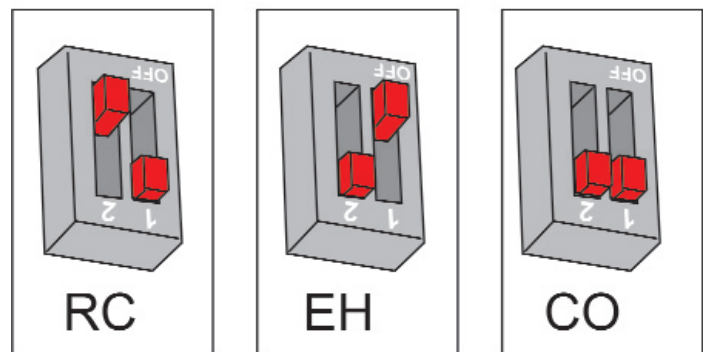
Figure 1



Detail of the setting device (detail 2 of the figure 1).

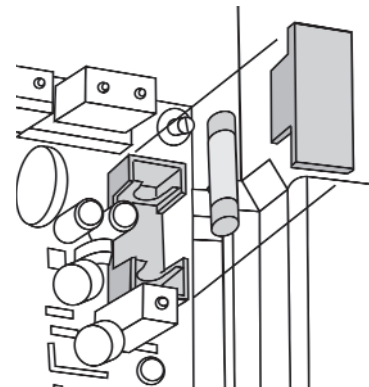
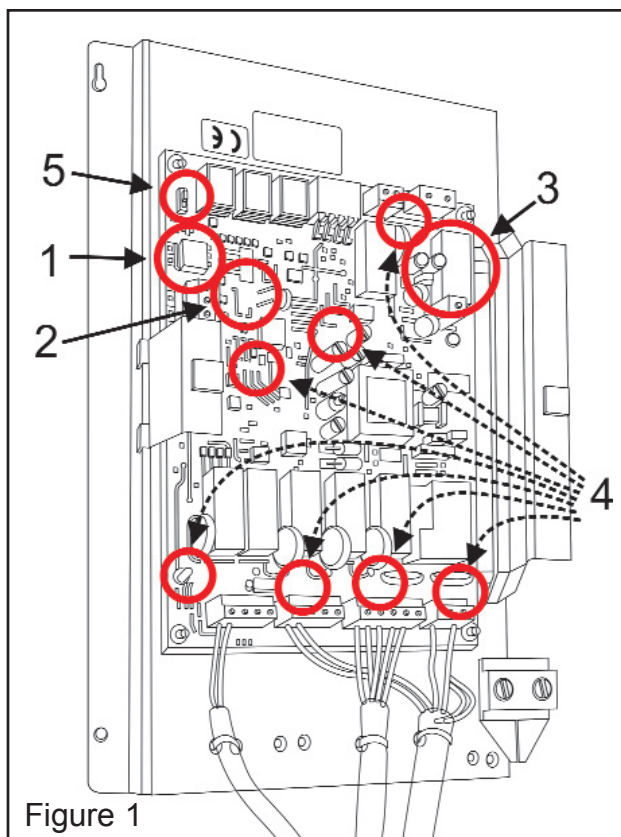
**DIP SWITCH**

The board connected to the group has already been set. Set only replacement material or when you exchange boards and groups.



**5 ELECTRICAL CIRCUIT****5 - FUNCTIONS OF THE BOARD****5.3 - POWER FUSE**

FUNCTIONS OF THE BOARD / CAPTION			
		Paragraph	Page
1	ADJUSTABLE DELAY	5.1	21
2	BOARD SETTING	5.2	22
3	POWER FUSE	5.3	23
4	FUNCTIONING WARNING LIGHTS	5.4	24
5	SELECTOR FOR MULTIPLE INSTALLATIONS	5.5	25



Detail of the power fuse and of its casing (detail 3 of the figure 1).

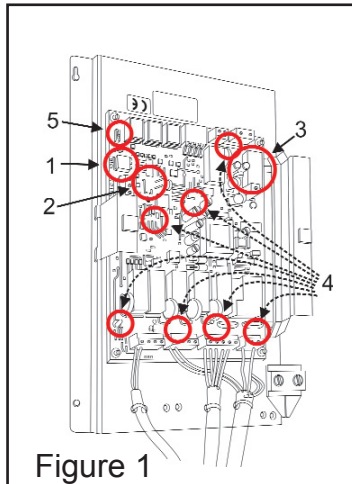
A power fuse is included in the board. For the value, make reference to the value.



**5 ELECTRICAL CIRCUIT**

**5 - FUNCTIONS OF THE BOARD**

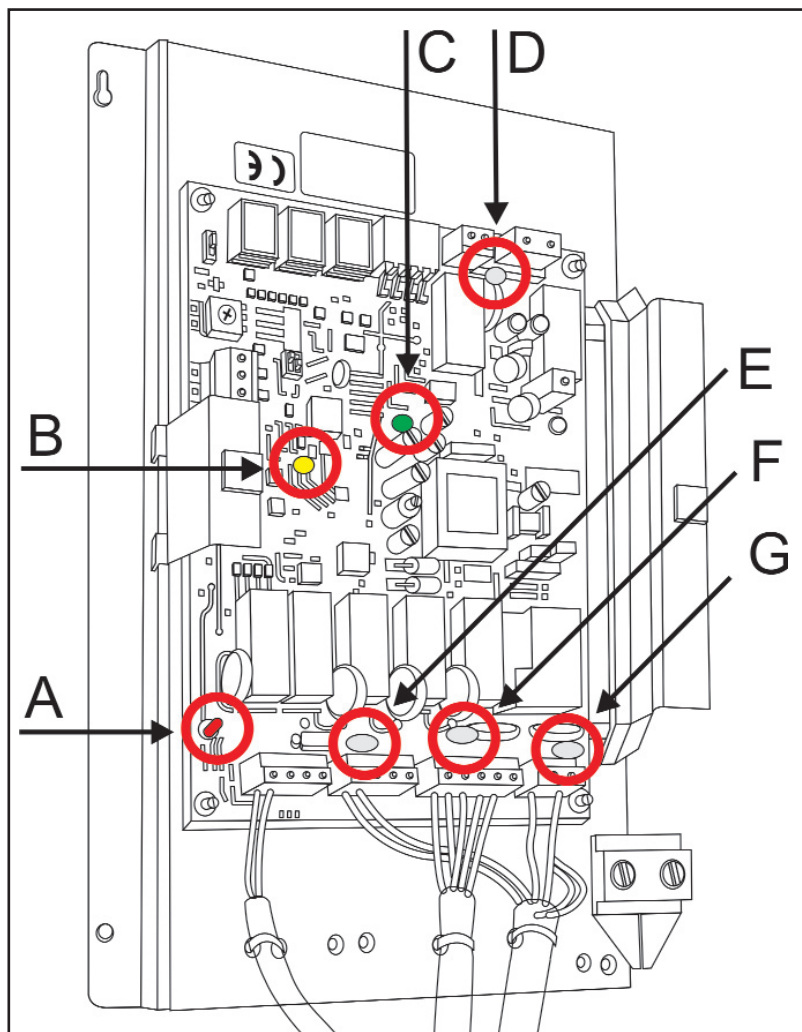
**5.4 - FUNCTIONING WARNING LIGHTS**



FUNCTIONS OF THE BOARD / CAPTION			Paragraph	Page
1	ADJUSTABLE DELAY		5.1	21
2	BOARD SETTING		5.2	22
3	POWER FUSE		5.3	23
4	FUNCTIONING WARNING LIGHTS		5.4	24
5	SELECTOR FOR MULTIPLE INSTALLATIONS		5.5	25

Figure 1

On the board there are some functioning warning lights. The following outline shows their functions.



- A** HP LED

---

- B** LED ON WHEN POWERBOARD SET MASTER

---

- C** POWER ON LED

---

- D** ALARM POMP

---

- E** IN-USE LIGHT RC - CO

---

- F** IN-USE LIGHT FAN

---

- G** IN-USE LIGHT COMPRESSOR

*The figure shows the position of the functioning warning lights (detail 4 of the figure 1).*

**5 ELECTRICAL CIRCUIT**

**5 - FUNCTIONS OF THE BOARD**

**5.5 - SELECTOR FOR MULTIPLE INSTALLATIONS**

FUNCTIONS OF THE BOARD / CAPTION			
		Paragraph	Page
1	ADJUSTABLE DELAY	5.1	21
2	BOARD SETTING	5.2	22
3	POWER FUSE	5.3	23
4	FUNCTIONING WARNING LIGHTS	5.4	24
5	SELECTOR FOR MULTIPLE INSTALLATION	5.5	25

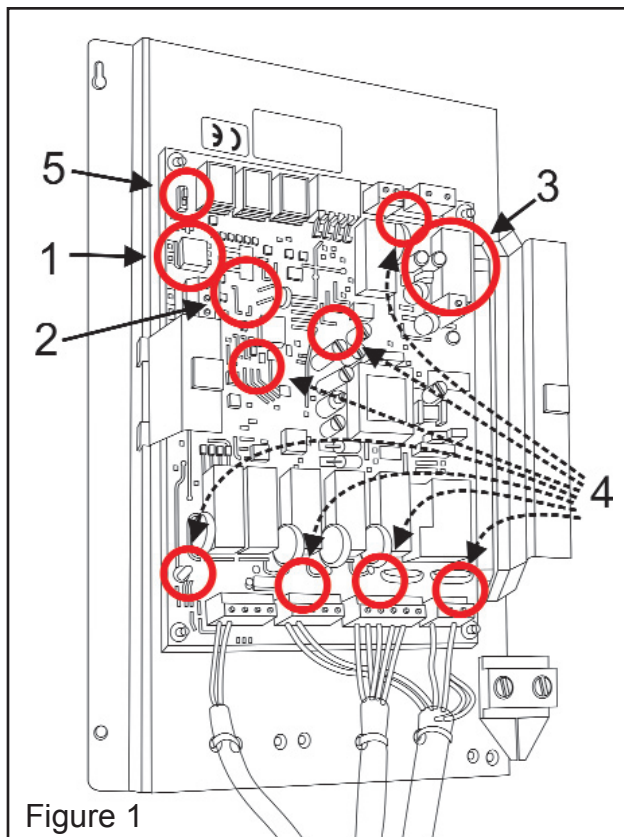
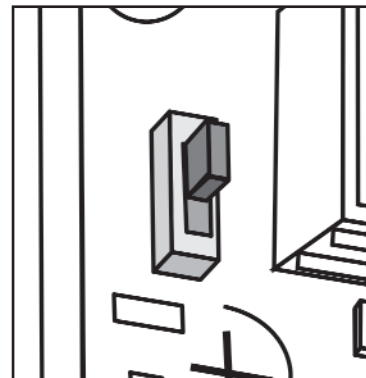


Figure 1

It is possible to connect two or more systems to the same control panel. In this case it is necessary to act on the selector (5) as indicated in the following out-line.

**ATTENTION**

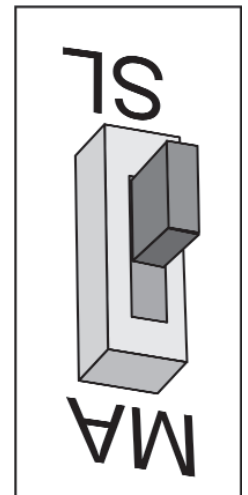
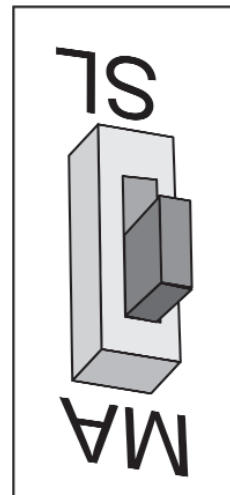
INCORRECT SETTING PREVENTS COMPACT AND SPLIT UNITS TO WORK BECAUSE OF A PROTECTION (SEE "TROUBLESHOOTING").

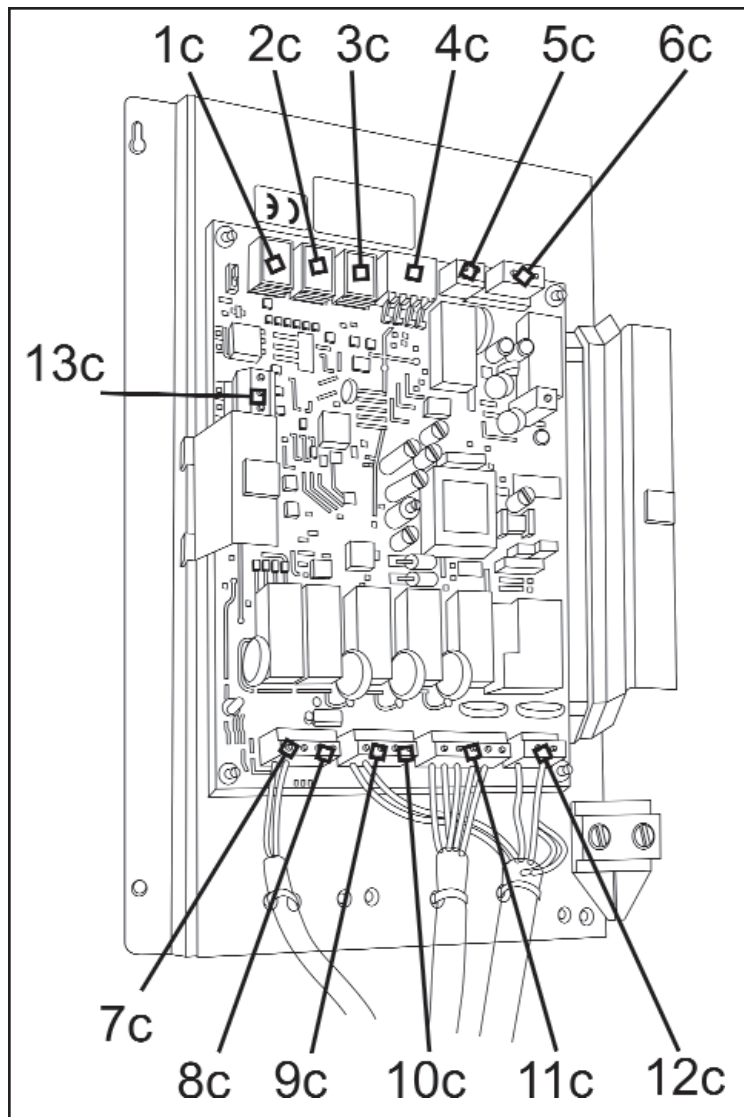


The figure shows the selector (detail 5 of the figure 1).

Set **MASTER (MA)**  
when remote panel is conncted to the powerboard (default).

Set **SLAVE (SL)**  
when powerboard is in multiboard configuration but remote panel is not connected.



**5 ELECTRICAL CIRCUIT****5.6 - CONNECTIONS TO THE BOARD****5.6.1 - CONNECTIONS**

- 1c** ROOM PROBE  
-OPTIONAL-
- 2c** BRIDGE
- 3c** DIGITAL PANEL
- 4c** MECHANICAL PANEL
- 5c** PUMP
- 6c** MAIN SUPPLY
- 7c** HP PRESSURE  
SWITCH
- 8c** SENSOR NTC  
-OPTIONAL-
- 9c** REV. VALVE OR 1ST.  
HEATER
- 10c** 2ND. HEATER
- 11c** FAN
- 12c** COMPRESSOR
- 13c** CONNECTION FOR  
RS485

**5 ELECTRICAL CIRCUIT**

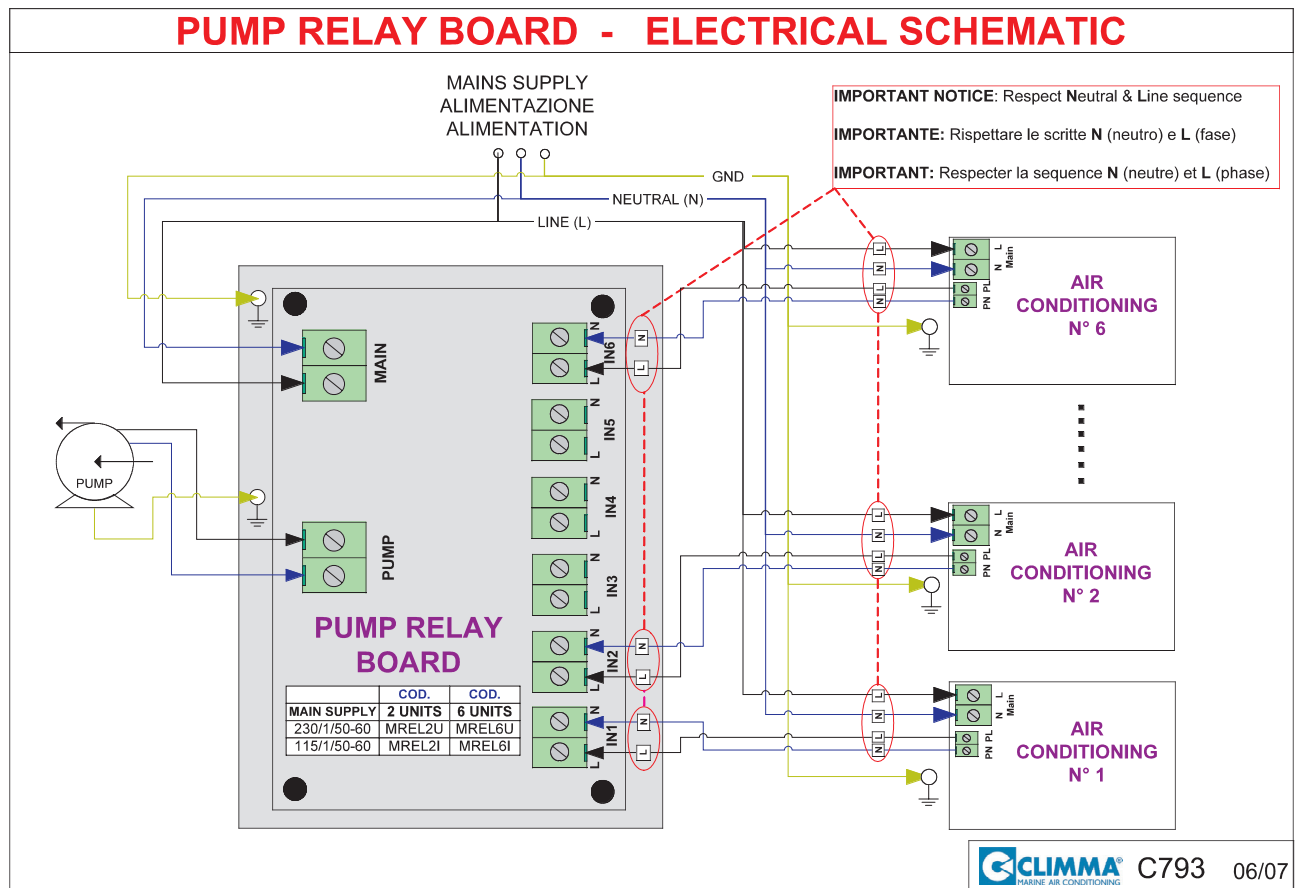
**5.7 - MULTIPLE INSTALLATION**

The CABIN air-conditioner fits perfectly in multiple installations. These are the features of a multiple installation:

- more systems are supplied by the same sea water electrical pump;
- the compressor of each system must start with a certain delay.

**5.8 - CONNECTION TO THE PUMP FOR MULTIPLE INSTALLATIONS**

It is available the relay box for the pump as optional. Each air-conditioner is connected to the relay box. The supply of the pump and of the air-conditioners must not be the same. The first one must be protected by an independent fuse. The pump must be supplied by all relays connected to each box.



**6 GOOD FUNCTIONING CHECK****6.1.- CHECK OF THE SEA WATER ELECTRICAL PUMP**

- 1.- Put the thermostat knob on "24" (clockwise).
- 2.- Push the "COOL" button.
- 3.- Check that the electrical pump turns regularly and that the water flow is regular and corresponding to the specifications of the installation. The fan runs at the selected speed.

**6.2.- CHECK OF THE COOLING CYCLE**

Air-conditioner as indicated in 6.1:

- 1.- Turn slowly the thermostat (TEMP) anticlockwise towards "18" until the compressor starts running.
- 2.- Check that after few seconds the air coming from the distribution plate cools down perceptibly. If the air-conditioner runs for some time, it is possible to check the functioning of the thermostat and the condensation outlet system. If it is damp, the exchanger will get wet and start drop forming the condensation, that must drain outboard.

**6.3.A- CHECK OF THE HEATING CYCLE (CYCLE REVERSAL)**

Air-conditioner off. Put the thermostat on "24". Put the "FAN" knob on "MAX" and push the "HEAT" button. Check that after few seconds the air coming out from the distribution plate warms up. If the air-conditioner runs for some time, it is possible to check the functioning of the thermostat.

**6.3.B- CHECK OF THE HEATING CYCLE ( ELECTRICAL HEATING)**

Air-conditioner off. Put the thermostat on "24"; put the "FAN" knob on "MIN" and push the "HEAT" button. Check that after few seconds the air coming out from the distribution plate warms up. If the air-conditioner runs for some time, it is possible to check the functioning of the air-conditioner. NOTE: Because of the electrical heating the compressor and the sea water pump don't work. The air coming out will be warmer if the fan speed is the lowest.

**6.4.- CHECK OF THE SEA WATER CIRCUIT**

During the running, it is very important to check the tightness of all the fittings below the water line. Check the flow at the outlet or by a liter-counter.

**6.5.- CHECK OF THE ELECTRICAL PUMP ABSORPTION**

Since technical specifications of cooling circuits are always different, it is necessary to check that the electrical pump runs by its parameters. During the functioning, measure the electrical pump absorption by means of an ammeter. The absorption must not exceed the value on the label of the electrical pump. In this case, switch off the air-conditioner and check the circuit (see 3.7).

**6.6.- CHECK AND CALIBRATION OF THE AIR CIRCUIT DISTRIBUTION**

It is very important to measure and regulate the conditioned air volume. On this depends the efficiency of the system during its running in sailing. It is not necessary to switch on the compressor, but only the fan group. It is possible to execute this operation even in shipyard supplying the air-conditioner by means of the ground voltage. To obtain the hole capacity of the system, you must measure the conditioned air volume on the inlet grill of the system by means of an ammeter.

**See the following page - 7.6.1**



**6 GOOD FUNCTIONING CHECK****6.6 - MEASURING OF THE AIR VOLUME**

Follow these instructions:

- 1.- Measure the net surface in sqmt of the inlet grill without the frame.
- 2.- Measure the air speed on different points of the grill.
- 3.- Add up the different speed values and divide them by the number of measurements to obtain the air speed average (in mt/s or mt/m according to the measuring instrument).

4.- Thanks to one of the following formulas it is possible to draw the air volume in the system:

$$Q = S \times V \times 3600$$

$$Q = S \times V \times 60$$

Where:

Q = cmt/h of conditioned air

S = surface in sq mt of the grill without the frame

V = air speed in mt/s or mt/m

3600 = for the speed in mt/s

60 = for the speed in mt/m

From these formulas it is possible to draw the following ones:

$$S = \frac{Q}{V \times 3600} \quad S = \frac{Q}{V \times 60}$$

$$V = \frac{Q}{S \times 3600} \quad V = \frac{Q}{S \times 60}$$

Compare the volume in cu mt/h with the value indicated in the table of technical specifications. If the air volume is lower of 15/20% than values in the table (but not more than 15/20%), the value can be considered normal. The measurement on the outlet grill can be useful for the balancing if there are more outlet grills for a comparison with the air volume of the outlet grill. To air-condition two or more cabins, it is necessary to calculate the air volume to introduce. To obtain this value, divide the air volume obtained from the previous measurement by all air-conditioned cu mt (ratio between conditioned air and conditioned volume). Multiply this value by volumes of each cabin to obtain a rough value of the conditioned air to introduce.

Example:

Volume aria trattata in mc/h VT	700
Volume condizionato dinette mc VC	25
Volume condizionato cabina mc VC	15
Totale mc. VC	40
Rapporto VT/VC	17,5
Mc aria dinette = 25x17,5	438
Mc aria cabina = 15x17,5	263
Totale mc/h	700

**7/8/9 USE DIRECTIONS****7.1 - FUNCTIONING OF THE COMPACT & SPLIT QUATTRO AIR-CONDITIONERS**

During the cooling cycle, the refrigerant circuit takes the ambient air away and to make it over the sea water (**CO models**).

It is possible to select the functioning cycle, the desired temperature and the fan speed from a remote control panel that can be installed in the air-conditioned room. For the specific distances, refer to the directions of the remote control panel (page 149).

**7.2 - MECHANICAL CONTROL PANEL**

By means of the control panel, you can set and control the following functions:

A.-Switching on and off

SUMMER AIR-CONDITIONING : push the "COOL" button with the ice star.

WINTER HEATING : push the "HEAT" button with the orange sun.

To switch off, put the switch in the central position.

B.- Setting-regulation of the temperature by means of the thermostat (TEMP). The thermostat has got a 3 m capillary with a bulb. The bulb must perceive the sucked up air (it must not come into contact with the exchanger tongues; it is in fact the battery where the refrigerant spreads: the tongues cool down, so that if the bulb comes into contact with them, it will perceive a temperature value that is lower than the ambient temperature).

C.- Regulation of the fan speed: by means of the button with the fan it is possible to regulate the four fan speeds. Push the button to select the fan speed: upwards arrow means speed increase and downwards arrow means speed decrease. Switching on the fan for the first time, it will run in MED speed. Then it will run according to the last selected speed.

**7.3.- SUMMER FUNCTIONING (COOLING) BY MEANS OF THE MECHANICAL CONTROL PANEL**

Switch on the system, pushing the "COOL" button. Turn the thermostat knob towards "-" anticlockwise, until the compressor starts running. Pushing the "Fan" button regulate the fan speed until the desired speed "MIN-MED-MAX-EXTRA-MAX". When in the cabin there is the chosen temperature, turn the thermostat knob towards "+" clockwise until the compressor stops running. After having switched off the compressor, the fan makes the air circulate without cooling it down until the compressor starts running again.

**7.4. - WINTER FUNCTIONING BY MEANS OF THE MECHANICAL CONTROL PANEL (HEATING BY MEANS OF THE ELECTRICAL RESISTANCE - EH MODEL)**

Switch on the system, selecting "HEAT". Turn the thermostat knob towards "+". After few seconds the warm air will come out. Select the desired fan speed. Let the air-conditioner run until in the room there is the ideal temperature. Then turn the thermostat knob towards "-" anticlockwise until the resistance stops. As indicated in 2.1, switching off the resistance, the air-conditioner makes the air circulate without warming it up. In case of fan breakdown or obstruction of the air outlet, an internal safety device switches off the resistance to avoid the overheating. To reset the normal functioning, switch off the system pushing the "COOL-OFF-HEAT" button, solve the problem causing the block, wait for some minutes and switch on again the air-conditioner. In systems with electrical heating, during the functioning in "Heat" mode, the compressor and the pump don't run.

**7.5. - WINTER FUNCTIONING BY MEANS OF THE MECHANICAL CONTROL PANEL (HEATING BY MEANS OF THE REVERSAL CYCLE - RC MODEL)**

Switch on the system selecting "HEAT". Turn the thermostat knob towards "+" until the compressor starts running. Select the fan speed. When in the cabin there is the desired temperature, turn the thermostat knob towards "-" anticlockwise until the compressor stops. As indicated in 2.2, switching off the compressor, the air-conditioner makes the ambient air circulate without warming it up. If the sea water temperature is above 18° C, the high pressure safety device will snap. Switch off the system and then switch it on again and select a higher fan speed value.

**8 - IMPORTANT NOTES****8.1 - INSTALLATION IN THE ENGINE COMPARTMENT (only for SPLIT models)**

The air-conditioner use can cause the going off of sparks (switches, relays, etc...) To avoid the risk of explosions, it is necessary to start the smoke-exhauster 10 minutes before switching on the air-conditioning system and they must suck up the smoke as long as the air-conditioner runs.

**8.2 - TROUBLESHOOTING**

Only the qualified staff can execute the troubleshooting respecting the safety regulations.

**8.3 - MULTIPLE INSTALLATION**

It is necessary to space out the switching on delays of the air-conditioners at least of 5 seconds one from another.

**9 - MAINTENANCE**

For an efficient functioning of the air-conditioner, follow these advices about checks and maintenance. Intervention times can change according to the installation place, the pollution and the installation use.

- " Clean the sea water filter every week.
- " Clean the air filter every month.
- " Clean the condensation outlet pipe every four months.
- " Clean the condensation collection tray every year.
- " Clean the water intake every year (operation to be executed in shipyard).
- " Change the batteries (only for Vega MK II with remote control device) every year.

These operations must be executed only after having switched off the air-conditioner and only by the qualified staff.

Don't check the electrical circuit if none can bring help in case of accident.

- " Check hydraulic connections every year.
- " Consult also "Installation Manual".

**9.1 - CONDENSATION WATER AND ITS OUTLET**

During the cooling cycle air-conditioners produce much condensation water, above all when it is damp. Check periodically that there are no leaks or obstructions on the condensation outlet and that the condensation water drains regularly. Pour in the condensation tray some water and check that it flows currently. If the condensation water drains to the bilge, it is better to let it flow towards a limited space and let it drain continually to avoid stagnation that can cause unpleasant smells.

**9.2 - AIR FILTER**

The filter on the exchanger air outlet must be periodically cleaned and/or substituted. This filter avoids the obstruction of the air-conditioner exchanger. The maintenance frequency depends on the running hours number and above all on the air pollution. We suggest to clean the filter every month. An obstructed air filter can cause a decrease of the system efficiency in cooling mode (COOL). In the heating cycle (RC models) in system with reversal cycle, it can block the system because of the high pressure; in EH models with electrical resistance it can block the system because of the intervention of an internal safety device.

**7/8/9 USE DIRECTIONS****9.3 - SEA WATER FILTER (for the COMPACT models there is a water circuit)**

The water filter on the intake of the cooling water electrical pump must be periodically cleaned. Thanks to this filter the pump and the cooling circuit work correctly. The maintenance frequency depends on the running hours number of the system and above all on the water pollution. We suggest to check the sea water filter every week. To check that there are no obstructions, check the pump outboard discharge (N). If there is a lack of circulating water in the cooling cycle, the efficiency of the system decreases and the air-conditioner may get stuck. In the heating cycle, in RC models it can decrease the system efficiency.

**9.4 - COLD**

If you don't use the boat and the temperature is below 0° C, you must drain the water in the condenser, in the electrical pump, in the filter and in the connection pipes. You must:

- close the sea water intake;
- take off the pipe of the water intake on the condenser (between the electrical pump and the air-conditioner) to drain the condenser water;
- clean the filter and drain the water in the filter and in the electrical pump.

**10 TROUBLESHOOTING AND REPAIR****10.1 - IDENTIFICATION OF THE PRODUCT**

Each product is identified by means of a label. Make reference to the description, to the code, to the series number if you must eventually call the Assistance Centre.

**10.2 - TROUBLESHOOTING**

Before calling an Assistance Centre, check the system. The following problems are the most common ones and you can solve them. If the system doesn't work, even after having checked it, call the nearest CLIMMA Assistance Centre. Call the Veco Service: +39.0362.35321 or consult the WEB page: [www.climma.it](http://www.climma.it)

**10.3 - THE UNIT DOESN'T WORK**

Is the automatic switch snapped?

*Reset the switch on the main board.*

Is the supply voltage too low?

*Check the voltage value between "L" and "N" of the "MAIN POWER" terminal on board.)*

**10.4 - THE FAN DOESN'T TURN**

Is the air-conditioner switched on?

*Switch on the unit by means of the control panel.*

Is the fuse burned?

*After the necessary checks, replace the F1 fuse with another one with the same dimensions and charge.*

**10.5 - THE COOLING IS NOT SUFFICIENT - CO, RC, EH VERSIONS**

Have you selected the correct operational mode?

*Select on the panel the cooling mode (COOL) or AUTO (only for the digital model).*

Have you correctly regulated the thermostat?

*Regulate the temperature on lower values.*

Is the fan speed too low?

*Increase the fan speed or select the AUTO mode for the digital version.*

Is the air circulation insufficient?

*Check that there are no obstructions on the outlet or inlet grills and that the filter is cleaned.*

Is the air filter dirty?

*Clean or replace it.*

Has the compressor been running only for short periods?

*The high pressure switch device is snapped. Check the water circulation, the filter and the sea water pump.*

Doesn't the compressor run?

*The high pressure switch device is snapped more than three times. Check the sea water circuit, switch off and then switch on again the system by means of the panel. If this happens again, call the Assistance Service.*

**10.6 - THE HEATING IS NOT SUFFICIENT - EH VERSION**

Have you selected the correct operational mode?

*Select on the panel the heating mode (HEAT) or AUTO (only for the digital model).*

Have you correctly regulated the thermostat?

*Regulate the temperature on higher values.*

Is the fan speed too high?

*Decrease the fan speed or select the AUTO mode for the digital version.*

Is the air circulation insufficient?

*Check that there are no obstructions on the outlet and inlet grills and that the air filter is cleaned.*

Is the air filter dirty?

*Clean or replace it.*

Has the heating been working only for few minutes?

*The resistance protection device is snapped. Check the air circulation, the fan speed and the air filter. If this happens again, call the Assistance Service.*

**10.7 - THE HEATING IS NOT SUFFICIENT - RC VERSION**

Have you selected the correct operational mode?

*Select on the control panel the heating mode (HEAT) or AUTO (only for the digital model).*

Have you correctly regulated the thermostat?

*Regulate the temperature on higher values.*

Is the fan speed too high?

*Decrease the fan speed or select the AUTO mode for the digital version.*

Is the air circulation insufficient?

*Check that there are no obstructions on the outlet and inlet grills and that the air filter is cleaned.*

Has the compressor been running only for short periods?

*The high pressure switch device is snapped. Check the air circulation and that there are no obstructions on the openings and on the inlet grill and that the filter is cleaned.*

Is the air filter dirty?

*Clean or replace the filter.*

Doesn't the compressor run?

*The high pressure switch device is snapped more than three times. Check the air circulation. Switch off and then switch on again the system by means of the panel. If this happens again, call the Assistance Service.*

**10.8 - THE SEA WATER PUMP DOESN'T WORK**

Is the fuse burned?

*After the necessary checks, replace the F1 fuse with another one with the same dimensions and charge.*

Is the high pressure switch device snapped?

*Check the cooling circuit and clean the filter on the sea water intake. If this happens again, call the Assistance Service.*

**TABLE**

**UNITS WITH REFRIGERANT R407C**  
**SPLIT 10 / SPLIT 12 / SPLIT 16 / SPLIT 17 SLIM / SPLIT 24 SLIM.**

The connection for refrigerant pipes, must be made by a qualified engineer.

PIPE DIAMETER		
UNIT CAPACITY	SUCTION	LIQUID
10'000 Btu/h	10 mm – 3/8"	6 mm – 1/4"
12'000 Btu/h	10 mm – 3/8"	6 mm – 1/4"
16'000 Btu/h	12 mm – 1/2"	6 mm – 1/4"
17'000 Btu/h	12 mm – 1/2"	6 mm – 1/4"
24'000 Btu/h	12 mm – 1/2"	10 mm – 3/8"

COPPER PIPE Ø - code	INSULATING PIPE Thick - Ø - code
6 mm - A040745	6 x 10 A040787
10 mm - A040726	
12 mm - A040707	6 x 12 A040763

The connections between compressor unit and evaporator must be made by the installer. The compressor unit and the evaporator are pressurized with dry air and nitrogen, NOT refrigerant.

Refrigerant grade copper pipe must be used for the connecting lines. Do NOT use standard plumbing copper pipe.

The connections are made by flare connections (45° angle).

Insulate each pipe individually.

-Maximum distance between compressor unit and evaporator = 15 m.

-Maximum height difference between compressor unit and evaporator = 5 m.