

ESC • SCP • SCP-M

INSTALLATION AND USER MANUAL



SELF-CONTAINED & SPLIT SYSTEMS

Fixed speed (on/off) compressors.

Reverse-cycle cooling and heating · 230 V 50–60 Hz.

ESC 08 · ESC 10 · ESC 13 · ESC 16 · ESC 24

SCP 13 · SCP 16 · SCP 24

SCP-M 16 · SCP-M 24

VERSION 4.4 · OCTOBER 2026 · EN



About this manual

Thank you for choosing MBC Marine

This manual covers the installation, commissioning, operation, maintenance and troubleshooting of MBC Marine **ESC** self-contained and **SCP** split marine air conditioning units (230 V, single phase). Keep it on board, close to the unit, for the whole life of the system.

WHO SHOULD READ WHAT

Reader	Read these parts
Boat owner / user OWNER	Part 1 Safety · Part 9 Operation · Part 10 Maintenance · Part 11.2 First checks
Installer INSTALLER	All parts, especially Parts 3–8. Hand this manual to the owner after commissioning.
Service technician TECHNICIAN	Parts 7, 9.5, 10.2 and 11. Refrigerant work requires certification (Part 1.5).

Section headings carry the same coloured tags, so each reader can find the parts relevant to them at a glance.

SAFETY SIGNS USED IN THIS MANUAL



WARNING

A hazardous situation which, if not avoided, **could result in death or serious injury.**



CAUTION

A hazardous situation which, if not avoided, **could result in minor or moderate injury.**



NOTICE

Information about **damage to the unit or the boat**, or loss of performance or warranty. No personal injury risk.



NOTE

Useful information and tips for correct installation and operation.

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PART 1

Safety



WARNING

Read this part completely before installing, operating or servicing the unit. Ignoring these instructions may result in death, serious injury, fire or damage to the boat.

1.1 Intended use OWNER INSTALLER

The unit is designed exclusively for cooling, heating and ventilating the interior of boats, using seawater as the heat source and heat sink. Any other use is considered improper. Use the unit only within the operating limits in Part 2.5 and according to this manual.

1.2 Qualified personnel INSTALLER

Installation, electrical connection and commissioning must be carried out only by qualified personnel familiar with marine electrical and plumbing practice and with the applicable regulations. Work on the refrigerant circuit is reserved for technicians certified for flammable (A2L) refrigerants. A professional installation according to this manual is a condition of the warranty.

1.3 Electrical safety OWNER INSTALLER



WARNING – ELECTRIC SHOCK

Parts of the unit carry **230 V AC**. Before opening the electrical box or the unit, switch off the power at the main switchboard or the shore power source and secure it against being switched on again. Contact with live parts can be fatal.

- Earth (ground) the unit correctly. The yellow-green conductor must only ever be used as protective earth.
- Protect the unit with its own circuit breaker and a 30 mA residual current device (RCD).
- Do not operate the unit with the electrical box cover removed.

1.4 Fire, fuel and exhaust gases **OWNER**

INSTALLER



WARNING

Do **not** install the unit in the engine room, in the bilge, or in any compartment containing petrol engines, fuel tanks, LPG/CNG cylinders, regulators, valves, fuel lines or fittings. The unit must not be able to draw carbon monoxide, exhaust gases or other toxic vapours into the cabin.

During installation and maintenance wear safety glasses and work gloves, and keep a fire extinguisher close to the work area.

1.5 Refrigerant R32 (mildly flammable) **OWNER**

TECHNICIAN



WARNING – FLAMMABLE REFRIGERANT

The unit contains **R32** refrigerant (safety class A2L, mildly flammable).

- Do not pierce, cut, drill or burn any part of the refrigerant circuit.
- Keep ignition sources (open flames, operating gas appliances, electric heaters, sparks) away from the unit.
- If you notice a refrigerant leak (oily residue, hissing, ERROR 5): switch the unit off, ventilate the cabin, avoid ignition sources and call a qualified technician.
- Only certified technicians may open the refrigerant circuit. Brazing is allowed only after the refrigerant has been recovered and the circuit has been purged with nitrogen.

1.6 Limitation of liability **OWNER** **INSTALLER**

MBC Marine assumes no liability for damage resulting from:

- incorrect installation or connection;
- mechanical impact or overvoltage;
- modification of the product without written permission from MBC Marine;
- use outside the intended purpose or the specified operating limits.

PART 2

Product overview

2.1 Models covered

OWNER

INSTALLER

Series	Type	Models
ESC	Self-contained unit: compressor, condenser, evaporator and blower on one base tray	ESC 08 · ESC 10 · ESC 13 · ESC 16 · ESC 24
SCP	Split unit: condensing unit with separate evaporator	SCP 13 · SCP 16 · SCP 24
SCP-M	Multi split: one condensing unit with two evaporators and one display	SCP-M 16 (2 × 8 000 Btu/h) SCP-M 24 (2 × 12 000 Btu/h) SCP-M 24 (8 000 + 16 000 Btu/h)

2.2 Package contents

INSTALLER

Before starting, check that the shipping box and the unit are undamaged. **Do not install a damaged product.** The package contains:

Qty	Item	Purpose
1	Air conditioning unit	–
1	Display (control panel)	User control
1	LAN data cable, 5 m	Display ↔ control board
1	Room temperature sensor, 5 m cable	Connects to the AII (white) socket
4	L-shaped mounting brackets	Securing the unit
2	Y-branch joints	SCP-M only: pipe split

If any item is missing or damaged, do not start the installation; contact your distributor or MBC Marine.



ESC self-contained unit



ESC unit with electrical box



SCP condensing unit



SCP evaporator unit

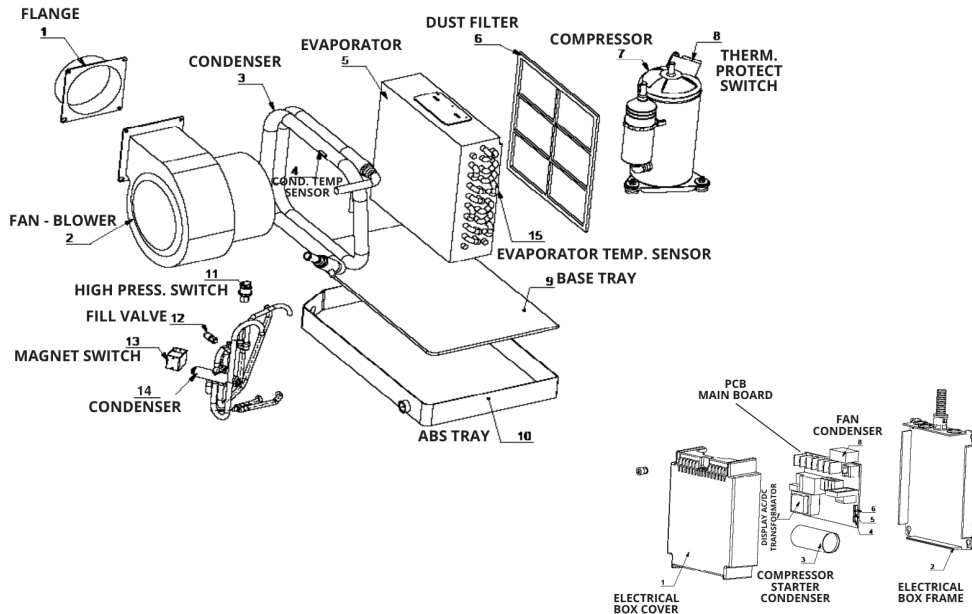


SCP-M: condensing unit with two evaporators

2.3 Main components

INSTALLER

TECHNICIAN



ESC unit – exploded view. 1 Flange · 2 Blower · 3 Condenser · 4 Condenser temperature sensor · 5 Evaporator · 6 Dust (air) filter · 7 Compressor · 8 Compressor thermal protector · 9 Base tray · 10 ABS tray · 11 High-pressure switch · 12 Service (fill) valve · 13 Magnetic switch (4-way valve coil) · 14 Condenser · 15 Evaporator temperature sensor · Electrical box: PCB main board, fan and compressor capacitors, cover and frame.

2.4 How the system works OWNER INSTALLER

The unit relies on the balance of three circuits. A fault in any of them reduces performance or triggers a protective shutdown:

- 1 **Seawater circuit** – carries heat away from (cooling) or to (heating) the condenser. Without proper water flow the compressor overheats.
- 2 **Air circuit** – circulates cabin air through the evaporator. Insufficient airflow can freeze the evaporator (cooling) or overheat it (heating).
- 3 **Electrical system** – power supply, control, communication and safety circuits. Faults can damage the electronics or prevent the unit from starting.

In **COOL** mode the unit moves heat from the cabin into the seawater. In **HEAT** mode the 4-way valve reverses the cycle and the unit extracts heat from the seawater and releases it into the cabin (reverse-cycle heating).

2.5 Operating limits OWNER INSTALLER

The limits refer to the seawater temperature at the unit's seawater inlet, assuming correct installation, continuous

water flow, free air circulation and a clean filter.

Mode	Seawater temperature at inlet
COOL	below 32 °C
HEAT	7 – 18 °C

- **Cooling:** do not operate at seawater temperatures of 32 °C or above. High seawater temperature or low water flow reduces performance even below this limit and can cause a protective shutdown.
- **Heating:** use HEAT mode only between 7 °C and 18 °C seawater temperature. Below 7 °C there is not enough heat in the water; above 18 °C heating is rarely needed and the fixed-speed compressor cannot reduce its output for very small heating demands.



NOTICE

Operation outside these limits may reduce performance, cause protective shutdowns (e.g. ERROR 8, 9, 10) and is excluded from warranty.

PART 3

Planning the installation

3.1 Before you start INSTALLER

No two boats are the same. Do not copy the installation of another boat: the correct set-up depends on the specific vessel. Most problems reported in the field are not caused by the unit but by installation faults such as wrong tilt, poor ventilation, a clogged filter or undersized ducting.



NOTICE

Start the installation only when every component location complies with the applicable regulations. Plan enough free space for installation and later maintenance.

3.2 Choosing the location INSTALLER

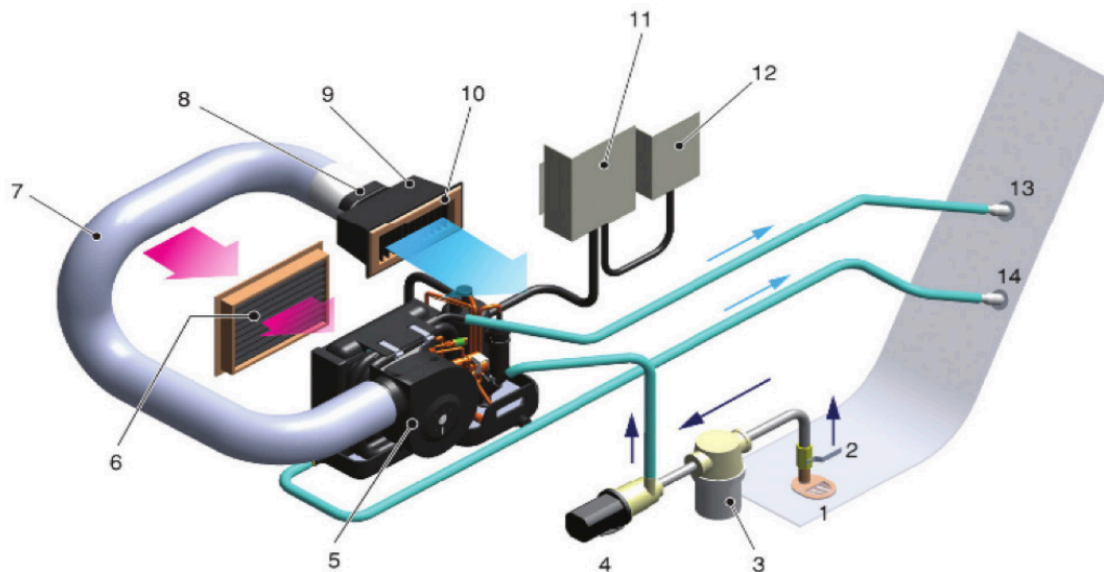
REQUIREMENTS

- Dry, well-ventilated enclosed space, protected from heat sources and exhaust gases.
- Stable, level, horizontal base, at least **60 mm** free space on all sides for airflow.
- Return air grille and air filter easily accessible for cleaning.
- Compressor side placed as far as possible from the return air opening, to reduce noise.
- Room for the electrical box on a dry, well-ventilated surface within cable reach.
- Possible condensate drain route to the bilge (see 4.2).

AVOID

- Engine room, machinery spaces, bilge (see 1.4).
- Directly next to ventilation ducts.
- Wet or damp floor areas.
- Paths of exhaust fumes or carbon monoxide.
- Tight, closed furniture compartments that are difficult to open.

3.3 Typical installation **INSTALLER**



- | | | | |
|---------------------------------|--------------------------|-----------------------------|---------------------------------|
| 1. Scoop-type thru-hull fitting | 5. Air conditioning unit | 9. Transition box | 13. Seawater outlet (overboard) |
| 2. Ball valve (seacock) | 6. Return air grille | 10. Supply air grille | 14. Condensate drain outlet |
| 3. Seawater strainer | 7. Flexible duct | 11. Display (control panel) | |
| 4. Seawater pump | 8. Duct ring | 12. Soft starter (optional) | |

PART 4

Mounting the unit

4.1 Mounting **INSTALLER**

- 1 Place the unit on a stable, horizontal surface with at least 60 mm clearance on all sides.
- 2 Tilt the unit **1–2 cm towards the condensate drain** so that the drain pan empties completely.
- 3 Secure the unit along the edge of the tray with the 4 brackets supplied. Tighten firmly but not excessively, so that the vibration dampers keep working.
- 4 Mount the electrical box on a dry, well-ventilated surface.

4.2 Condensate drain **INSTALLER**

In COOL mode the unit produces condensate, collected in the drain pan. Route the drain hose with a continuous fall to the bilge, ideally close to the automatic bilge pump. Where direct drainage is not possible, collect the condensate and pump it out with a dedicated drain pump.



NOTICE

- Do not connect the drain pump outlet to the discharge line of any other system.
- Never route the drain to an area where water cannot be collected or pumped out.

Drain test: after installation pour 2–3 litres of water into the drain pan and check that it drains freely, without backflow or leaks.

4.3 Display (control panel) **INSTALLER**

Install the display (type CD-3) on an easily accessible wall, above the mid-height of the cabin, protected from heat and light. Do not install it:

- in direct sunlight or near heat-producing appliances;
- on partition walls with heat accumulating behind them;
- directly above or below supply or return air grilles.

Connect the display to the control board with the 5 m LAN cable supplied.

4.4 Room temperature sensor **INSTALLER**

The display has a built-in sensor, but for accurate cabin temperature control **always install the supplied room temperature sensor** (5 m cable). Place it in the return air stream, away from supply air and heat sources. Connect it to the **AI1 (white)** socket on the control board.

4.5 Refrigerant piping (SCP and SCP-M)

INSTALLER

TECHNICIAN



WARNING – FLAMMABLE REFRIGERANT

R32 is mildly flammable. Refrigerant piping must be installed only by a qualified refrigeration technician, with good ventilation and no ignition sources nearby.

Connect the evaporator to the condensing unit with two insulated copper pipes, sized to the service valves of the condensing unit (SCP 16 and SCP 24: **gas 12.7 mm (1/2")**, **liquid 6.35 mm (1/4")**; see Part 12). Maximum pipe length **10 m**, maximum height difference **2 m**. Mount the evaporator with the same care as the unit (4.1) and slightly tilted towards its condensate drain.

Refrigerant charge: the condensing unit is factory charged for a pipe length of up to **4 m**. For every additional metre add **20 g of R32** (example: 7 m pipe length = 3 m extra = 60 g). Charge liquid R32 after evacuation and write the total charge on the unit label.

SCP-M: one gas pipe and one liquid pipe run from the condensing unit; split each of them to the two evaporators with the two **Y-branch joints** supplied. Install the Y-branches horizontal or vertical, never tilted. Count the pipe length to both evaporators.

- 1 Route the pipes as short as possible. Bend with a pipe bender (radius min. $3.5 \times$ pipe diameter); never kink a pipe. Keep pipe ends sealed until connected.
- 2 Insulate the gas and liquid pipes **separately** along their full length with closed-cell insulation (min. 9 mm wall). Seal all insulation joints.
- 3 Cut with a pipe cutter, deburr with the pipe end facing down, slide on the flare nut and make a 45° flare with a flare tool suitable for R32.
- 4 Align the flare with the connection and tighten the flare nut by hand first, then with a torque wrench and a backup spanner: **14–18 Nm** for 6.35 mm (1/4"), **34–42 Nm** for 9.52 mm (3/8"), **49–61 Nm** for 12.7 mm (1/2"). Overtightening cracks the flare; never reuse a flare that has been tightened before.
- 5 **Pressure test** the pipes and the evaporator with **dry nitrogen** (never oxygen or compressed air), with the service valves of the condensing unit closed. The pressure must not drop for at least 30 minutes. Check every flare with leak detection spray.
- 6 **Evacuate** the pipes and the evaporator with a vacuum pump to **500 microns (67 Pa) or lower**. Close the manifold and wait 15 minutes: the vacuum must not rise above 1 000 microns.
- 7 Open the service valves of the condensing unit fully (liquid valve first, then gas valve). Refit and tighten the valve caps, and check all joints for leaks.

PART 5

Air system

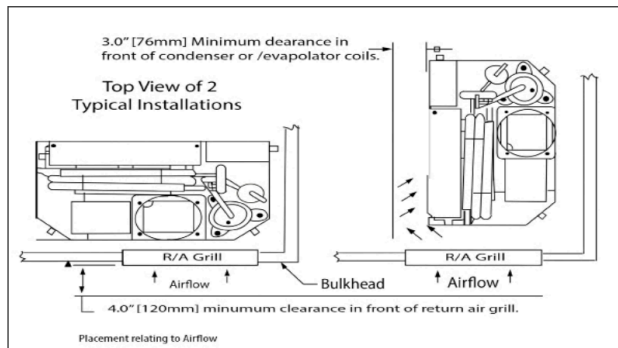


NOTICE

Insufficient airflow is the most common cause of malfunction. Even a 30–40 % airflow loss can cause performance problems and error codes (ERROR 4 in heating, ERROR 9 in cooling).

5.1 Return air INSTALLER

The unit draws cabin air in through the return grille, passes it over the evaporator and blows it out through the supply side. Size the return grille at least as large as the value in table 5.4. A grille that is too small restricts airflow and may freeze the evaporator (ERROR 9) or overload the compressor.



Return air: keep the minimum clearance in front of the evaporator coil.



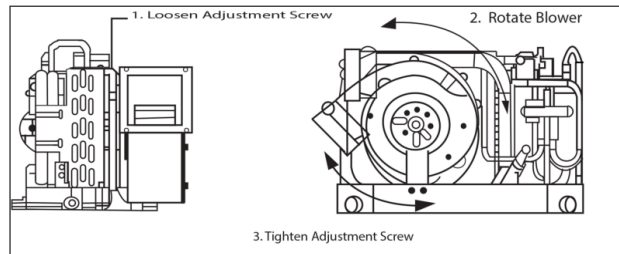
NOTICE

The unit does not need to be installed directly against the return air grille. Maintain a minimum **60 mm (2.4")** clearance around the unit to ensure adequate airflow.

5.2 Blower orientation INSTALLER

Before installation, turn the blower outlet to the position that gives the most direct route to the supply duct. Loosen

the fixing screw, rotate the blower horizontally or vertically, then tighten the screw firmly.



1 Loosen the adjustment screw · 2 Rotate the blower · 3 Tighten the screw.

✗ INCORRECT INSTALLATION
Shown: Obstacles of improper ducting and airflow space

- ✗ Uninsulated or unsuitable ducting**
The supply duct must always be thermal and acoustic insulated and suitable for the unit's output capacity.
- ✗ Duct diameter reduced**
The duct diameter must not be reduced below the manufacturer's specifications (e.g. a 150 mm outlet must not be reduced to 100 mm).
- ✗ Severely restricted airflow**
This system is highly sensitive to reduced airflow. Even a 30-40% loss can cause performance issues and trigger error codes.
- ✗ Excessive length and sharp bends**
The total duct length should not exceed 4 meters. Avoid 90° or sharp bends, as they can reduce airflow by up to 25%.
- ✗ Poor mechanical installation**
Ducts are created, compressed and routed incorrectly. They must be installed tightly and without chisels, and must not be squeezed by furniture or structural components.

⚠ WARNING!
The air conditioner must not be directed towards the air intake as short-circuiting can lead to a loss of performance.

Possible consequences:

- Reduced cooling/heating performance
- Frequent shutdowns and error codes
- Component damage
- Shorter lifespan of the unit



Incorrect installation: uninsulated duct, reduced diameter, restricted airflow, excessive length and sharp bends, creased and compressed duct. Possible consequences: reduced cooling and heating performance, frequent shutdowns and error codes, component damage, shorter service life.

5.3 Supply air and ducting INSTALLER

- Use thermally and acoustically insulated duct of the diameter given in table 5.4. Never reduce the duct diameter (e.g. a 150 mm outlet must not be reduced to 100 mm).
- Keep the total duct length **below 4 m**. Avoid 90° and sharp bends: each can reduce airflow by up to 25 %.
- Install ducts taut, without kinks or creases, and make sure furniture cannot compress them later.
- Install supply grilles as high as possible in the cabin, because cold air sinks.
- Do not point the supply louvres towards the return grille: this short-circuits the air and reduces performance.
- Avoid undersized grilles, closed louvres or narrow branches.

5.4 Air system sizing per model INSTALLER

	ESC 08	ESC 10	ESC 13	ESC 16	ESC 24
Supply duct diameter (mm)	125	125	125	150	200
Min. return air grille (cm ²)	300	450	450	510	720
Min. supply air grille (cm ²)	750	800	800	1030	1400
Airflow high / medium / low (m ³ /h)	420 / 350 / 280	500 / 405 / 350	580 / 495 / 410	730 / 610 / 520	1200 / 1080 / 900
Max. total duct length	4 m	4 m	4 m	4 m	4 m

Grille areas are free (open) areas. With several supply grilles, the sum of their free areas must reach the value in the table.

SCP and SCP-M evaporators: use the duct diameter of the evaporator outlet (SCP-M evaporators: see Part 12).

INSTALLING THE AIR DUCT

Unimpeded airflow is essential for the system to reach its rated performance. Always use air duct of the correct size and quality, with thermal and acoustic insulation, designed for air conditioning. Protect the duct from damage during installation and lay it as straight as possible, with as few branches and bends as possible.

Damaged or clogged ducts restrict airflow and reduce performance. If a duct is damaged during installation or later use, repair or replace it.

PART 6

Seawater system

The seawater circuit removes heat from the condenser (cooling) or supplies heat to it (heating). Insufficient flow leads to compressor overheating, error codes (ERROR 8, ERROR 10) and shutdown. The circuit must be unobstructed, continuous and free of air.

6.1 Component order INSTALLER

- 1 Scoop-type thru-hull fitting
- 2 Ball valve (seacock), directly on the fitting
- 3 Seawater strainer
- 4 Seawater pump
- 5 Condenser inlet of the unit
- 6 Condenser outlet → overboard fitting



NOTICE

Do not share the seawater circuit with other systems (e.g. toilet or engine cooling). This causes flow problems and error codes.

6.2 Seawater intake INSTALLER

Fit the scoop-type intake on the lower part of the hull, preferably near the keel, facing forward. The deeper the

intake, the cooler the water, which matters in warm climates. Mount the ball valve directly on the intake.



WARNING

The seawater circuit must be closable during malfunction or maintenance. Operating without a ball valve (seacock) is a flooding hazard and may endanger life.

6.3 Pump and strainer INSTALLER

- Install the pump (magnetic drive, centrifugal) and the strainer **30-50 cm below the waterline**, so that they fill by gravity. A centrifugal pump cannot self-prime.
- Orient the pump head so that the outlet points upwards (see figure 6.7).
- Install the strainer where it is easy to open and inspect. Its transparent bowl must be intact.
- All suction-side components (thru-hull, valve, strainer, pump) must be airtight.
- **Pump size:** the pump must deliver at least the required seawater flow of the unit (Part 12: 10-30 l/min) against the losses of the actual installation: hose length, fittings, strainer and height difference. Use one pump per unit.



NOTICE

Never operate the system without a strainer: debris destroys the pump and can lead to complete system failure. MBC Marine is not responsible for failures caused by an incorrectly installed or operated seawater pump.

6.4 Hoses INSTALLER

- Use only spiral-reinforced, pressure-resistant hose that does not collapse when bent.
- Route the hose with a **continuous rise** from the pump to the condenser inlet: no loops, high points or sharp bends where air can be trapped.
- **Hose inner diameter:** at least the size of the condenser connection, **5/8" (16 mm)**, on the whole circuit. Keep the hoses as short as possible.
- Double-clamp all hose connections. Seal threads with marine-grade sealant (e.g. Loctite 55 or Sika 291i).

6.5 Seawater outlet INSTALLER

Install the overboard outlet **above the waterline, at most 150 mm above it**, so the flow can be checked visually. Keep it at least **150 cm** from the intake, so the system does not draw in its own warm discharge water.

6.6 Galvanic protection and bonding

INSTALLER

Connect all metal parts in contact with seawater (intake fitting, pump, unit base tray) to the boat's bonding system. Install a zinc or aluminium sacrificial anode upstream of the pump to protect the condenser and pump from electrolytic corrosion.



NOTICE

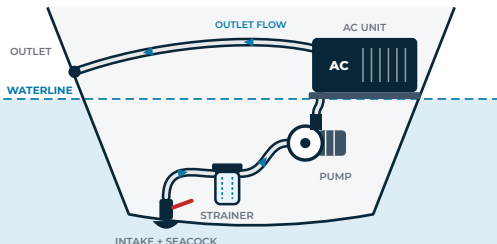
MBC Marine assumes no liability for damage caused by electrolysis or corrosion if no sacrificial anode or bonding is installed. Galvanic corrosion of the condenser is excluded from warranty.

6.7 Correct and incorrect seawater installation INSTALLER



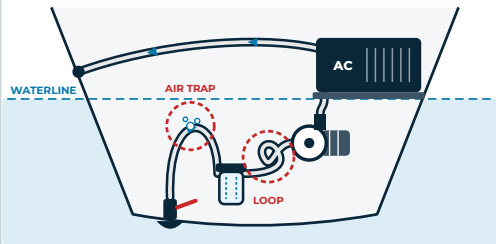
CORRECT

Steady rise from intake to unit, then down to the outlet. Pump and strainer below waterline.



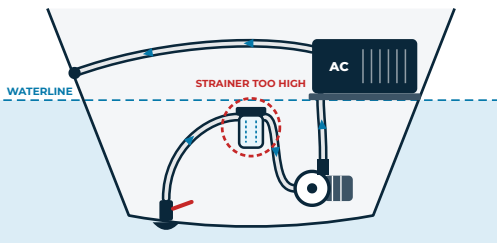
INCORRECT

Loops, kinks or high points in the hose trap air and stop the flow.



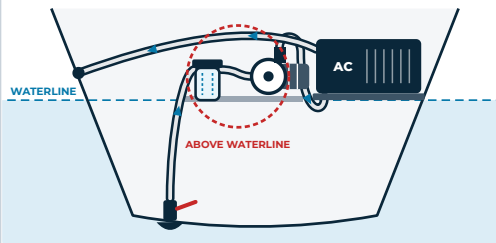
INCORRECT

The strainer must not be higher than the pump. Keep it low and close to it.



INCORRECT

Pump and strainer above the waterline: the pump cannot fill and runs dry.



PUMP HEAD ORIENTATION



Outlet pointing up
Air escapes, pump primes



Outlet sideways
Air stays in the pump



Outlet pointing down
Air stays in the pump

Correct: steady rise from inlet to unit, then down to the outlet; strainer and pump below the waterline; hoses double-clamped. Incorrect: loops or high points that trap air, strainer above the pump, pump or strainer above the waterline.

6.8 Seawater system checklist INSTALLER

- ☐ All connections and threads sealed with marine-grade sealant; hoses double-clamped.
- ☐ Ball valve fully operable and easily accessible.
- ☐ Strainer accessible, clean, bowl intact.
- ☐ Pump and strainer 30–50 cm below the waterline; pump outlet pointing up.
- ☐ Suction side airtight; hose rising continuously to the unit.
- ☐ Outlet above the waterline (max. 150 mm), at least 150 cm from the intake.
- ☐ All wetted metal parts bonded; sacrificial anode installed.
- ☐ Before first start: no leaks, clean strainer, sufficient water flow at the outlet.



NOTE

If you do not have sufficient training to install the seawater system, consult a qualified boat technician.

6.9 Checking the seawater flow INSTALLER

TECHNICIAN

Check the flow at commissioning and whenever ERROR 6, 8, 10 or 12 appears. Use either method with the unit running in COOL mode:

- **Volume method:** collect the water from the overboard outlet in a measuring container and time it. Flow (l/min) = litres × 60 ÷ seconds. Example: 10 litres in 30 seconds = 20 l/min.
- **Temperature method:** after 10–15 minutes of operation, measure the water temperature at the seawater intake (or strainer) and at the overboard outlet. At the required flow the outlet is about **4–5 °C warmer** than the intake. A difference above 8 °C means the flow is roughly half of the required value or less.

Compare the result with the required flow of the model in Part 12. If it is too low, check the strainer, the intake, the pump (air lock) and the hose routing.

PART 7

Electrical installation



WARNING – ELECTRIC SHOCK

Disconnect all power before working on the electrical installation. Only qualified electricians may connect the unit.



NOTICE

Undersized wiring or loose connections cause overheating and contact failures and can damage the control board or the compressor.

7.1 Electrical requirements INSTALLER

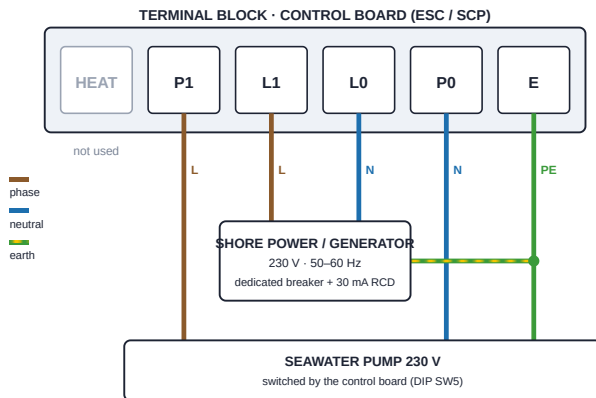
- Supply: **230 V, 1 phase, 50/60 Hz**. Current draw per model: see Part 12.
- Cable cross-section: **min. 3 × 1.5 mm²**, up to 3 × 2.5 mm² depending on model and cable length.
- A dedicated circuit breaker for the unit only (minimum rating per model: see Part 12), plus a 30 mA RCD.
- Protective earth is mandatory. Use the yellow-green conductor only as earth, never as neutral.
- Fit ferrules on all stranded cable ends connected to the terminal block.

7.2 Terminal block (ESC and SCP) INSTALLER

Terminal	Function
HEAT	Not used – leave unconnected (the units have no electric heater)
P1	Seawater pump – PHASE output
L1	Shore power – PHASE input
L0	Shore power – NEUTRAL input
P0	Seawater pump – NEUTRAL output
E	EARTH – shore power and pump (mandatory)

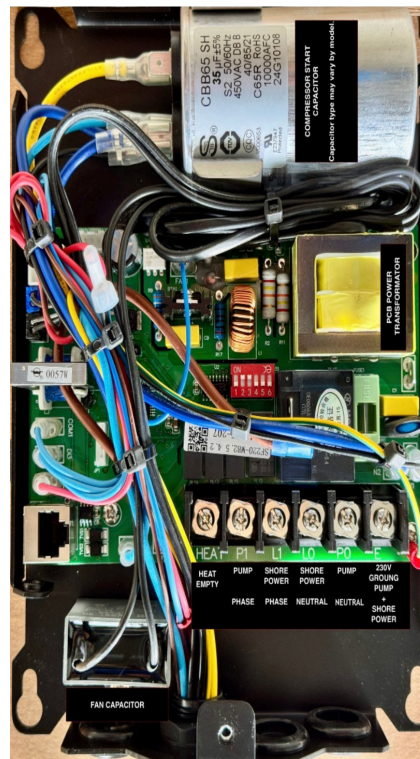
The seawater pump is powered and switched by the control board through P1/P0 (230 V). Its behaviour is set by DIP switch SW5 (see 7.8).

7.3 Field wiring diagram INSTALLER TECHNICIAN



Field wiring of the terminal block (ESC and SCP). The SCP evaporator fan connection is shown in 7.5.

ESC electrical box



Terminals from left: HEAT (empty) · P1 pump phase · L1 shore phase · L0 shore neutral · P0 pump neutral · E earth

24

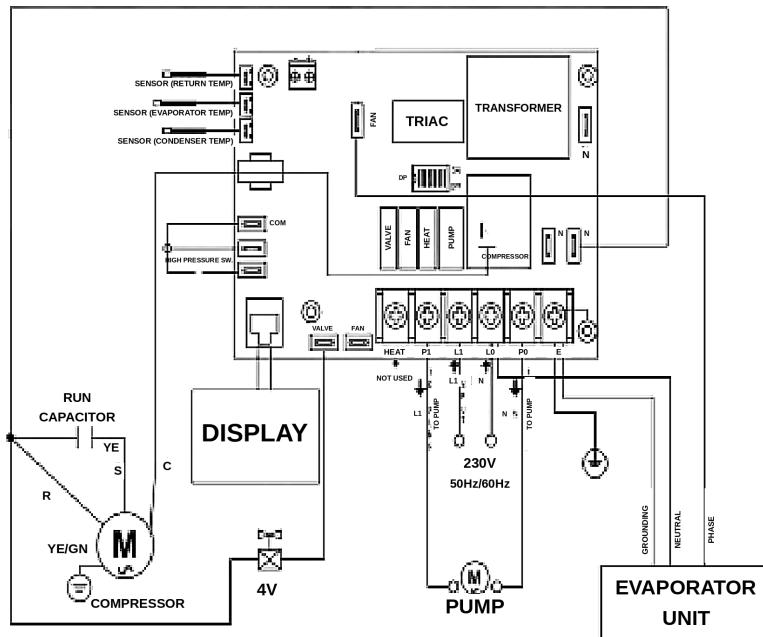


7.4 Display, sensors and connectors

INSTALLER **TECHNICIAN**

Connector on control board	Connects to
LAN socket (RJ45)	Display, via 5 m LAN cable
All – white	Room / return air temperature sensor
Blue	Evaporator temperature sensor (factory fitted)
Black	Condenser temperature sensor (factory fitted)
COM1, DI3	Internal connections (factory fitted) – check if ERROR 11 appears

MBC MARINE SCP SPLIT SYSTEM ELECTRICAL WIRING SCHEME



SCP split system factory wiring diagram. Supply 230 V 50–60 Hz; HEAT terminal not used; evaporator connection: see 7.5.

7.5 SCP split unit wiring INSTALLER

Disconnect the power supply, then connect the evaporator fan wires to the control board in the SCP electrical box:

Evaporator wire	Terminal
Phase (brown)	FAN
Neutral (blue)	L0
Earth (yellow-green)	E

The control board switches the evaporator fan automatically when the system starts.



SCP electrical box with evaporator phase connection

7.6 SCP-M multi split (2 evaporators) INSTALLER

Available combinations: **SCP-M 16** (16 000 Btu/h condensing unit + 2 × 8 000 Btu/h evaporators), **SCP-M 24** (24 000 Btu/h + 2 × 12 000 Btu/h) and **SCP-M 24 (8 + 16)** (24 000 Btu/h + 8 000 Btu/h and 16 000 Btu/h evaporators). Technical data: Part 12.

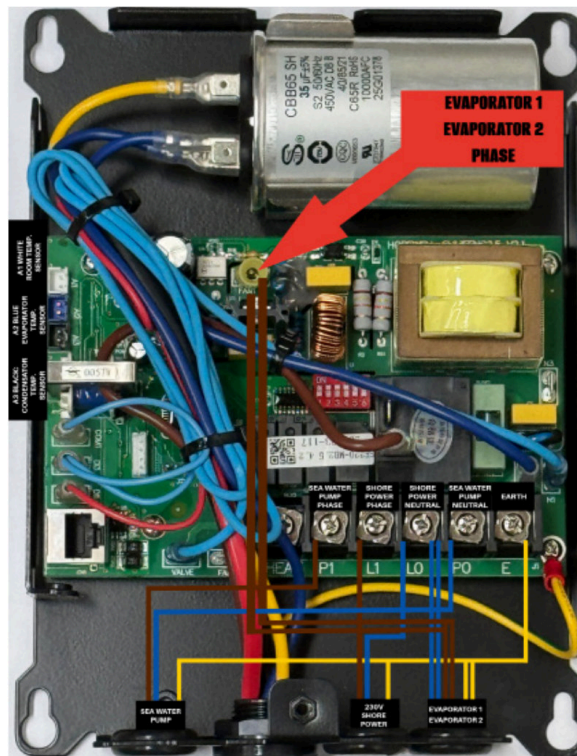
Connect the second evaporator **in parallel** with the first: both share the same terminals on the control board.

Evaporator 1 and 2 wire	Terminal
Phase (brown)	FAN
Neutral (blue)	L0
Earth (yellow-green)	E



NOTE

The SCP-M system uses **one** display. Both evaporator fans always run together.

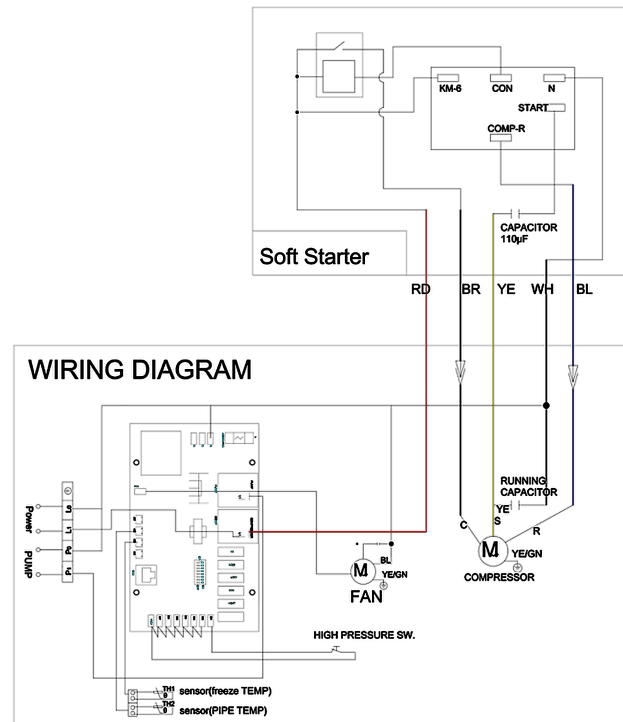


SCP-M: evaporator 1 and 2 phase on the FAN terminal

7.7 Soft starter (optional) INSTALLER

A soft starter reduces the inrush current when the compressor starts. It lowers the risk of tripping breakers and extends component life. It is recommended when:

- the unit is powered by a generator;
- shore power in the marina is weak (voltage below 200 V at start-up);
- the installation is sensitive to current surges (small fuses, long or thin cables).



Soft starter wiring diagram (MBC soft starter)

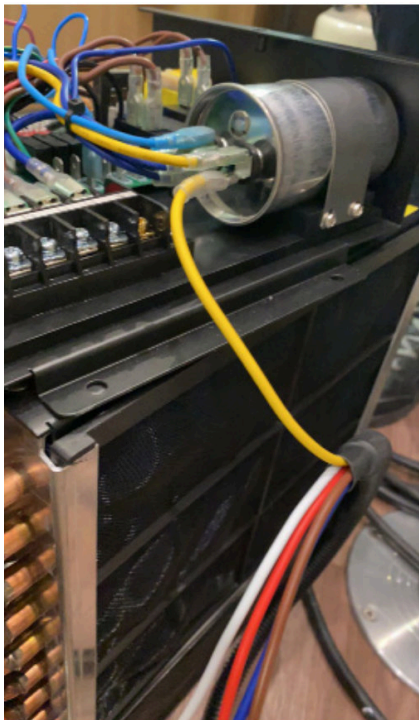


Photo 1

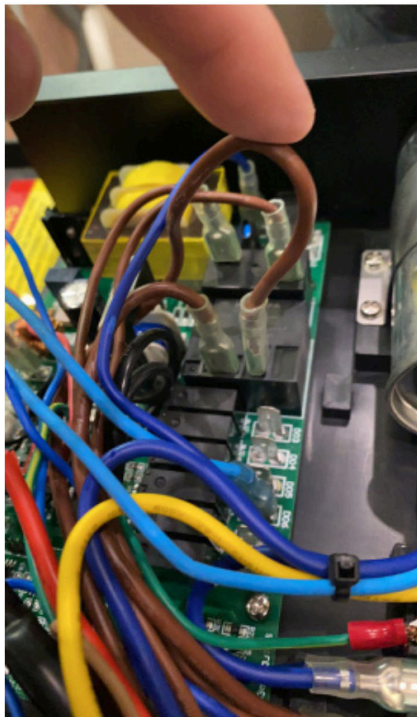


Photo 2

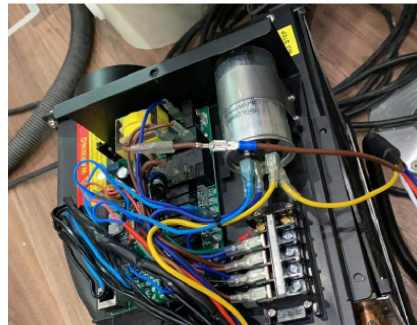


Photo 3



Photo 4

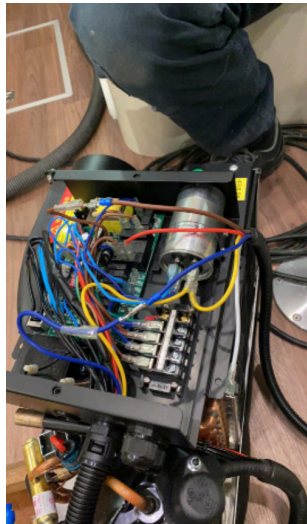


Photo 5



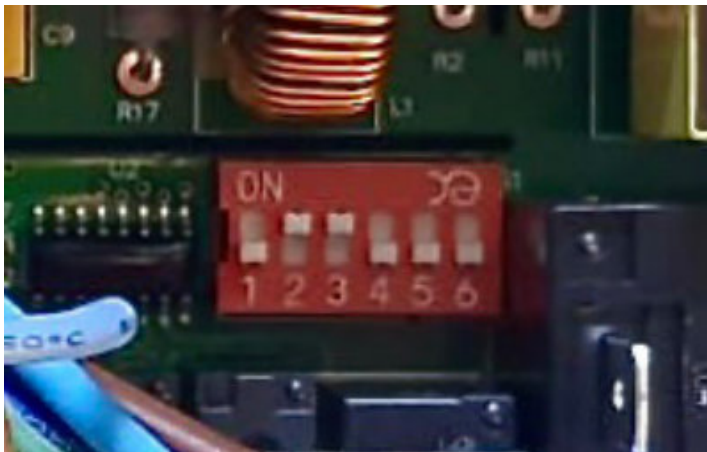
Photo 6



Photo 7

Soft starter installation reference photos 1-7. Follow the wiring diagram above and the instructions supplied with the soft starter.

7.8 DIP switch settings INSTALLER TECHNICIAN



DIP switch block SW1–SW6 on the control board



NOTICE

Change DIP switches only with the power switched off, and only if you understand the effect. Incorrect settings may cause malfunction or reduced performance.

Switch	OFF	ON
SW3 – after power failure	Unit stays off	Restores last operating state
SW4 – evaporator & condenser sensors	Sensors active	Sensor functions disabled
SW5 – seawater pump	Runs with the compressor	Runs continuously after start
SW6 – ventilation mode	Available	Not available

SW1	SW2	Operating mode
OFF	ON	Cooling and heating (factory setting)
ON	ON	Cooling only
OFF	OFF	Not used (no electric heater)
ON	OFF	Not used (no electric heater)

Factory setting	SW1	SW2	SW3	SW4	SW5	SW6
ESC	OFF	ON	ON	OFF	OFF	OFF
SCP	OFF	ON	ON	ON	OFF	OFF

7.9 Electrical checklist **INSTALLER**

- ☐ Supply voltage 230 V and stable; cable cross-sections correct.
- ☐ Shore power phase on L1, neutral on L0.
- ☐ Pump phase on P1, neutral on P0.
- ☐ Earth of shore power and pump connected to E.
- ☐ All terminals tight, ferrules fitted, no damaged insulation.
- ☐ Dedicated circuit breaker and 30 mA RCD installed.
- ☐ Electrical box in a dry, well-ventilated place, cover closed.
- ☐ Display connected with the LAN cable and communicating.
- ☐ Room temperature sensor connected to A11 (white).
- ☐ DIP switches at the correct setting for the installation.

PART 8

Commissioning (first start-up)

8.1 Before switching on **INSTALLER**

- ☐ Seawater, air, drain and electrical checklists (6.8, 7.9) completed.
- ☐ Air filter fitted; all grilles open and unobstructed.
- ☐ Seacock open; strainer clean and filled with water.
- ☐ No tools or packaging left inside the unit or the electrical box; covers closed.

8.2 First start **INSTALLER**

- 1 Open the seacock. Make sure the pump and hoses are filled with water and free of air (gravity filling).
- 2 Switch on the circuit breaker. The display shows the start screen; tap it to open the main screen.
- 3 Select **COOL** mode (or HEAT, depending on the seawater temperature) and a set temperature well below (or above) the cabin temperature.
- 4 Within a short time check a steady water flow from the overboard outlet. If there is no flow, switch off immediately and vent the pump. Check the flow rate (6.9).
- 5 Check airflow at every supply grille at all fan speeds.
- 6 After 10–15 minutes of operation check that the supply air is clearly cooler (or warmer) than the return air, and that no error code is shown. The status screen (9.4) shows the return air and evaporator temperatures.
- 7 Check all water connections and the drain for leaks; perform the drain test (4.2).

8.3 Handover to the owner **INSTALLER**

- ☐ Explain basic operation (Part 9), the operating limits (2.5) and the owner maintenance tasks (10.1).
- ☐ Show the seacock, the strainer, the air filter and the circuit breaker.
- ☐ Hand over this manual and register the product at **www.mbc-marine.com** (2-year warranty for registered units installed by an MBC partner, see Part 13).

PART 9

Operation

9.1 Control panel OWNER

The display is a touch screen. After power-on it shows the MBC Marine start (sleep) screen: **tap the screen** to open the main screen. The main screen shows the room temperature and gives access to all everyday functions.

Button	Function
ON/OFF	Switches the unit on or off
MODE	Selects the operating mode: Cool / Heat / Fan
▲ ▼	Raises / lowers the set temperature; the set value is shown while you press
FAN	Cycles through the fan speeds
MENU	Opens the status screens and settings
ALARM	Shows active alarms and error codes

DISPLAY OVERVIEW

The main display provides quick access to all primary functions and operating information.



Main screen of the CD-3 display. Available modes depend on the model and the DIP switch settings.

9.2 Everyday use **OWNER**

- 1 Make sure the seacock is open and the circuit breaker is on.
- 2 Tap the screen, then press ϕ to switch the unit on.
- 3 Press MODE to select COOL, HEAT or FAN (ventilation only).
- 4 Set the desired temperature with $\blacktriangle$ / $\blacktriangledown$.
- 5 Press FAN to choose the fan speed.



NOTICE

Wait at least 5 seconds before switching between COOL and HEAT, so that the refrigerant pressures can equalise.

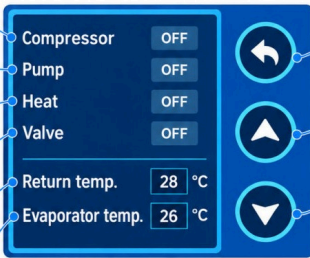
9.3 Tips for comfort and efficiency **OWNER**

- Keep hatches, windows and doors closed while cooling or heating.
- Choose a moderate set temperature. In heating, do not force the unit with an unnecessarily high set point.
- Use a higher fan speed in hot, humid conditions; this also prevents evaporator icing.
- Keep the return and supply grilles free; do not cover them with cushions or curtains.
- Clean the air filter regularly (Part 10).
- After a power failure the unit restarts in its last state or stays off, depending on DIP switch SW3.

9.4 Status screens OWNER TECHNICIAN

SYSTEM STATUS SCREEN

This screen provides real-time information about the system status and key operating parameters.



Compressor Status
Shows whether the compressor is running.

Seawater Pump Status
Indicates the status of the seawater pump.

Electric Heater
Shows the status of the electric heater.

3-Way Valve Status
Indicates the position of the 3-way valve.

Return Air Temperature
Temperature of the air returning from the cabin.

Evaporator Temperature
Temperature at the evaporator coil.

Compressor OFF

Pump OFF

Heat OFF

Valve OFF

Return temp. 28 °C

Evaporator temp. 26 °C

Refresh / Back
Returns to the previous screen.

Scroll Up
Navigate to the previous item.

Scroll Down
Navigate to the next item.

PARAMETER	EXPLANATION
 COMPRESSOR	Indicates the current operational status of the compressor. OFF: The compressor is not running; no active cooling or heating is taking place. ON: The compressor is running, and the refrigerant is circulating in the system.
 PUMP	Indicates seawater pump status. OFF: No seawater flow – system cannot cool or heat. ON: Seawater is circulating. Note: Continuous pump operation is required for safe performance.
 HEAT	This function applies only to units equipped with electric heating. Electric heating is not available on VSC models.
 VALVE	Indicates the status of the 3-way valve. OFF in cooling mode, ON in heating mode.
 RETURN TEMP.	Temperature of air returning from the cabin.
 EVAPORATOR TEMP.	Temperature at the evaporator coil, approximately equal to the air temperature of the fan air.



NOTE

The values shown are for reference only and may vary depending on operating conditions.

System status screen

SYSTEM PARAMETERS SCREEN

This screen displays additional operating values and system configuration options.



Condenser Temperature
Displays the condenser temperature.

Compressor Current
Displays the real-time compressor current draw.

Temperature Format
Selects between °C and °F.

Control Fan
Controls whether fan operation follows the compressor status.

Condenser temp. 27 °C

Comp. current 0.0 A

Temp. format °C °F

Control Fan OFF

Refresh / Back
Returns to the previous screen.

Scroll Up
Navigate to the previous item.

Scroll Down
Navigate to the next item.

Settings
Opens the selected setting.

PARAMETER	EXPLANATION
 CONDENSER TEMP.	Temperature measured at the condenser.
 COMP. CURRENT	Real-time compressor current draw.
 TEMP. FORMAT	Select between °C and °F display.
 CONTROL FAN	Determines whether fan operation follows the compressor status automatically. OFF: The fan runs continuously, regardless of whether the compressor is active. ON: The fan only runs when the compressor is operating, allowing quieter and more energy-efficient operation.



NOTE

Displayed values may vary depending on system operation and environmental conditions.

System parameters screen

9.5 Technician settings (PIN protected) TECHNICIAN



NOTICE

The parameter menu is intended for qualified service personnel only. Incorrect settings can impair operation and protective functions. The PIN code is provided by MBC Marine to authorised partners.

1 PARAMETER SELECTION MENU

Use this menu to access parameter settings and adjust screen brightness.



PARAMETER	EXPLANATION
 PRAM. SETTINGS	Technician-only menu, protected by PIN code.
 BRIGHT ADJ.	Adjusts screen brightness.

i NOTE: This menu is intended for qualified service personnel only. Improper changes may affect system performance.

Parameter selection: Param Setting (PIN) and Bright Adj. (display brightness)

2 PIN ENTRY SCREEN

Enter the correct PIN code to access the technician settings menu.



KEY	FUNCTION
0 - 9	Enter PIN code.
.	Decimal point (if required).
-	Delete last entry.
DEL	Clear entire entry.
OK	Confirm PIN code and enter the settings menu.

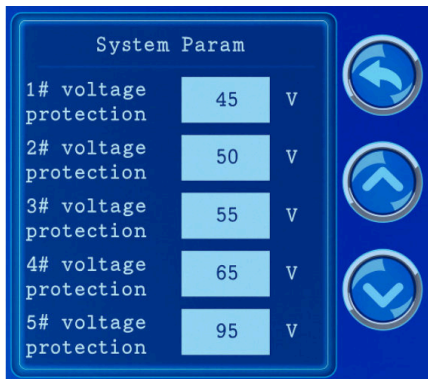


IMPORTANT WARNING:

The PIN-protected menu provides access to fine settings and advanced configuration options of the unit.

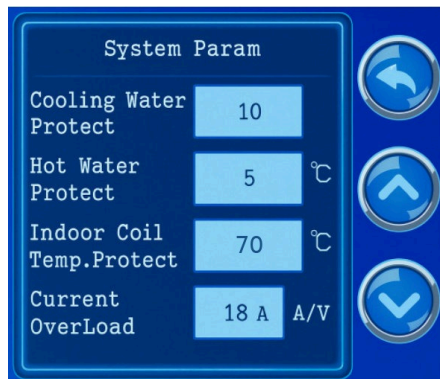
We recommend that only qualified personnel make adjustments to factory settings, as improper changes may affect system performance.

PIN entry screen



Fan speed levels 1#–5# (factory settings)

Each of the 5 fan speed levels can be set between 35 V and 99 V (fan motor voltage). Adjusting them may be useful to reduce air noise in small, quiet cabins or to adapt to special duct layouts. Do not reduce airflow below what the air system needs (Part 5).



Protection parameters screen

Parameter	Function
Cooling Water Protect	Lower seawater temperature limit in cooling mode; below it the compressor stops.
Hot Water Protect	Lowest permitted seawater temperature in heating mode; protects the condenser from freezing.
Indoor Coil Temp. Protect	Evaporator temperature limit in heating mode (ERROR 4); factory setting 70 °C, adjustable 50–70 °C.
Current OverLoad	Compressor current limit (ERROR 12).

PART 10

Maintenance and lay-up


WARNING

Switch off the unit and the circuit breaker before any maintenance. Close the seacock before opening the strainer.

10.1 Owner maintenance **OWNER**

When	Task
Before each trip / weekly in season	Check that water flows steadily from the overboard outlet while the unit runs.
Weekly in season	Inspect the strainer; clean the basket if debris is visible.
Monthly in season	Remove and rinse the air (dust) filter with fresh water; let it dry before refitting.
Monthly	Check that grilles are free and the condensate drains (no water around the unit).
Always	Never run the unit without the air filter or with the seacock closed.

10.2 Annual service by a technician

TECHNICIAN

- Clean or descale the condenser (seawater side) with a suitable marine descaler; flush thoroughly with fresh water.
- Inspect and, if worn, replace the sacrificial anode; check the bonding connections.
- Check pump, hoses, clamps and seacock for wear and leaks.
- Clean the drain pan and drain line; check the evaporator coil for dirt.
- Tighten electrical terminals; check insulation and the RCD.
- Check operating values on the status screens and the refrigerant circuit for leaks (certified technician only).

10.3 Lay-up and winterization **OWNER**

TECHNICIAN

In salt water, remove seawater from the system for longer stops. In winter, protect the system against frost; frost damage is excluded from warranty.

- 1 Switch off the unit and the circuit breaker.
- 2 Close the seacock.
- 3 Drain the seawater circuit (strainer, pump, hoses, condenser), or flush it with fresh water and fill it with a non-toxic, environmentally friendly antifreeze suitable for marine systems, following local regulations.
- 4 Clean the strainer and the air filter.
- 5 Leave the seacock closed and label it.

10.4 Recommissioning OWNER INSTALLER

Refill and vent the seawater circuit, check all hoses and clamps for leaks, open the seacock and follow the first-start steps in 8.2.

PART 11

Troubleshooting

11.1 How faults are shown **OWNER**

The control system protects the unit by shutting it down when it detects a fault, and shows an error code on the display (ALARM). Some faults are temporary and clear automatically; others need a technician. Codes 7, 13 and 14 are not used on ESC, SCP and SCP-M units.



WARNING

Owners: only carry out the checks marked for owners. Do not open the electrical box or the refrigerant circuit. Work marked **Technician** must be done by qualified personnel.

11.2 First checks for owners **OWNER**

Symptom	Check
Unit does not start, display dark	Circuit breaker and RCD on? Shore power or generator available?
Runs, but no cooling / heating	Correct mode and set temperature? Seacock open? Water flowing from the outlet? Strainer clean? Seawater within limits (2.5)?
Weak airflow	Air filter clean? Grilles open and unobstructed? Fan speed too low?
Water around the unit	Drain hose blocked or kinked? Unit still tilted towards the drain?
Error code on the display	Note the code, see table 11.3. If it persists, call a technician.

11.3 Error code overview

OWNER

TECHNICIAN

Code	Error	Typical cause	Unit reaction	Recovery / action
1	Room temperature sensor	Sensor or cable (All, white) open or faulty	System stops	Restarts automatically when the sensor is OK
2	Evaporator temperature sensor	Sensor or cable (blue) open or faulty	System stops	Restarts automatically when the sensor is OK
3	Condenser temperature sensor	Sensor or cable (black) open or faulty	System stops	Restarts automatically when the sensor is OK
4	Evaporator overheat (heating)	Insufficient airflow in HEAT mode	Compressor stops	Restarts automatically after cooling down; check air system
5	Refrigerant leak	Leak in the refrigerant circuit	System stops	Do not use the unit – call a technician
6	Compressor overheat	Low seawater flow, low refrigerant charge, dirty condenser	Compressor stops	Check seawater flow; technician checks charge
8	High refrigerant pressure	Low seawater flow (cooling) or low airflow (heating)	Compressor stops	Check seawater flow and airflow
9	Evaporator icing (defrost)	Low airflow, cold seawater, low refrigerant charge	Compressor stops, defrost	Restarts automatically after defrost
10	Seawater temperature protection	Interrupted seawater flow; seawater $\geq 32^{\circ}\text{C}$ (cool) or $< 7^{\circ}\text{C}$ (heat)	Compressor stops	Check continuous seawater flow; respect limits
11	Incorrect connection	Loose COM1 / DI3 connector, faulty LAN cable	–	Check connectors and LAN cable
12	Compressor overcurrent	Low voltage, low seawater flow, thin cables	Compressor stops	Check voltage, connections, fuse; soft starter
15	Communication failure	LAN cable, display or control board	–	Replace LAN cable, display or board

11.4 Error code details **TECHNICIAN**

1 Room temperature sensor

The room temperature sensor on the **white** All socket is disconnected or faulty.

POSSIBLE CAUSES

- Connector loose or not plugged in
- Damaged cable
- Faulty sensor

TECHNICIAN **TECHNICIAN**

- Check that the white connector is firmly seated in the white socket.
- Inspect the cable for damage.
- Replace the sensor with a compatible MBC sensor if faulty.

2 Evaporator temperature sensor

The evaporator sensor on the **blue** socket reads an open circuit (infinite resistance) or an implausible value.

POSSIBLE CAUSES

- Broken wire
- Connector not properly seated on the control board
- Faulty sensor

TECHNICIAN **TECHNICIAN**

- Inspect the wiring and connector.
- Replace the sensor with a compatible one if damaged.

3 Condenser temperature sensor

The condenser sensor on the **black** socket (fitted at the bottom of the condenser) is disconnected or faulty.

POSSIBLE CAUSES

- Broken wire
- Connector not properly seated
- Faulty sensor

TECHNICIAN **TECHNICIAN**

- Check the black connector and wiring.
- Replace the sensor if faulty.

4 Evaporator overheat protection (HEAT mode)

In HEAT mode the evaporator (indoor coil) temperature has reached the "Indoor Coil Temp. Protect" limit (factory setting 70 °C, adjustable 50–70 °C). The compressor stops and restarts automatically after the coil has cooled down. Occasional occurrence (once every 20–30 minutes) is not critical.

POSSIBLE CAUSES

- Restricted airflow: dirty filter, closed or undersized grilles
- Ducts too long (over 4 m), kinked or reduced in diameter

WHAT THE OWNER CAN DO

- Clean the air filter; open all grilles; select a higher fan speed.

TECHNICIAN TECHNICIAN

- Check grille sizes and ducting against table 5.4 and correct as needed.

5 Refrigerant leak

A pressure loss due to a refrigerant leak has been detected. Oil traces in the base tray may indicate a severe leak.

POSSIBLE CAUSES

- Leak in pipes, joints or components of the refrigerant circuit

WHAT THE OWNER CAN DO

- Switch the unit off, ventilate the cabin, keep ignition sources away (R32 is flammable) and call a technician. Do not use the unit.

TECHNICIAN TECHNICIAN

- Locate the leak with a pressure test using dry nitrogen and a leak detector.
- Recover refrigerant before any brazing; repair; repeat the nitrogen pressure test.
- Evacuate and recharge with the specified type and amount of R32 (nameplate).

6 Compressor overheat

The compressor's internal thermal protector has opened because of excessive temperature or overload.

POSSIBLE CAUSES

- Insufficient or no seawater flow

- Dirty or scaled condenser (salt, algae, debris)
- Low refrigerant charge
- Operation outside the limits or overloaded installation

WHAT THE OWNER CAN DO

- Check that water flows from the outlet; clean the strainer; open the seacock.

TECHNICIAN TECHNICIAN

- Check pump, hoses and condenser; descale if needed.
- Measure refrigerant pressures; if low, leak-test and recharge.
- If the error persists with correct seawater flow and refrigerant charge, contact MBC Marine service.

8 High refrigerant pressure

The high-pressure switch has opened because condensing pressure is too high. The compressor stops.

POSSIBLE CAUSES

- COOL mode: seawater flow low or stopped (air-locked pump, clogged strainer, blocked intake or hose)
- HEAT mode: airflow too low (ducts over 4 m, undersized grilles, dirty filter)

WHAT THE OWNER CAN DO

- Check water flow at the outlet and clean the strainer; clean the air filter and open the grilles.

TECHNICIAN TECHNICIAN

- Vent the pump, check intake and hoses.

- Check the air system against table 5.4.
- If the error persists with correct seawater flow and airflow, contact MBC Marine service.

9 Evaporator icing – defrost

The evaporator has started to ice up. The compressor stops and defrosting runs; the unit restarts automatically within a few minutes.

POSSIBLE CAUSES

- Low airflow: low fan speed, dirty filter, restricted return air, undersized supply grilles
- Cold seawater (approx. 13–16 °C) combined with a warm cabin, typically early in the season
- Low refrigerant charge, if the error also occurs in hot summer conditions

WHAT THE OWNER CAN DO

- Clean the filter, open all grilles, choose a higher fan speed.

TECHNICIAN TECHNICIAN

- Check the air system; check refrigerant charge if the fault persists in warm conditions.

10 Seawater temperature protection

The unit does **not** measure seawater flow directly; it monitors the condenser temperature. ERROR 10 stops the compressor when the seawater side is outside the operating limits: **32 °C or above in COOL mode**, or **below 7 °C in HEAT mode** (see 2.5).

POSSIBLE CAUSES

- **Interrupted seawater flow** (most common): the water left in the condenser heats up from the refrigerant, and the system detects this as an incorrect seawater temperature.
- Seawater temperature outside the operating limits: 32 °C or above (cooling), below 7 °C (heating)
- Temporary reading during a mode change; usually clears after restart

WHAT THE OWNER CAN DO

- **Check that the seawater flow is continuous** (steady stream from the outlet while running); seacock open, strainer clean. Then restart the unit.

TECHNICIAN TECHNICIAN

- Check the pump for air locks and the intake, hoses and condenser for blockages; check the condenser sensor (black).

11 Incorrect connection

Faulty connection between the control board and its connectors.

POSSIBLE CAUSES

- COM1 or DI3 connector not properly attached
- Damaged LAN cable

TECHNICIAN TECHNICIAN

- Check that COM1 and DI3 are firmly seated.
- Inspect and replace the LAN cable if needed.

- Restart the system to clear the error.

12 Compressor overcurrent

The compressor current exceeds the "Current OverLoad" limit.

POSSIBLE CAUSES

- Insufficient seawater flow
- Low refrigerant charge
- Low shore power voltage (common in busy marinas)
- Loose connections, undersized cables
- Dirty condenser

WHAT THE OWNER CAN DO

- Check seawater flow and strainer. Try another power source.

TECHNICIAN TECHNICIAN

- Measure the supply voltage at start-up; below 200 V use an MBC soft starter or another source.
- Check terminals, cable cross-sections and fuses.

15 Communication failure

No communication between the control board and the display.

POSSIBLE CAUSES

- Damaged or loose LAN cable
- Faulty display
- Faulty control board

TECHNICIAN TECHNICIAN

- Replace the LAN cable.
- Replace the display.
- Replace the control board if the fault persists.

11.5 Faults without an error code TECHNICIAN

Symptom	Possible cause	Check / remedy
Weak cooling, no error code	Dirty filter or evaporator; low fan speed; undersized or leaking ducts; supply air mixing with return air; seawater close to 32 °C; low refrigerant charge	Clean filter; check the air system against 5.4; measure the air temperature difference across the evaporator (typically 8–12 °C in COOL mode); check the refrigerant pressures
Weak heating or no HEAT mode	Seawater too cold (below approx. 10 °C capacity drops, below 7 °C ERROR 10); low airflow; DIP SW1/SW2 set to cooling only	Check seawater temperature and airflow; check SW1/SW2 (7.8)
Compressor starts and stops often (short cycling)	Room sensor in the supply air stream or near a heat source; supply air blowing back into the return grille; unit oversized for the cabin	Relocate the room sensor into the return air stream (4.4); separate supply and return grilles
Fan runs, compressor does not start	Set temperature already reached; low supply voltage at start-up; faulty run capacitor or compressor wiring	Check set temperature and mode; measure voltage at start-up (min. 200 V); check capacitor and connections; consider a soft starter (7.7)
SCP: compressor runs, evaporator fan does not	Evaporator fan wiring (FAN, L0, E); faulty fan capacitor or motor	Check wiring against 7.5; check fan capacitor and motor
Seawater pump does not run	P1/P0 wiring; pump breaker; SW5 setting; air lock in the pump	Check wiring (7.2) and SW5 (7.8); vent the pump
No water from the overboard outlet	Seacock closed; strainer clogged; air lock; blocked intake (fouling, plastic bag)	Open seacock; clean strainer; vent the pump; clear the intake
Noise or vibration	Mounting brackets overtightened; dampers missing; unit or pipes touching the hull; air in the seawater pump; duct resonance	Check mounting (4.1); isolate pipes and hoses from the hull; vent the pump; fix loose ducts
Water around the unit or dripping grilles	Drain blocked or not falling; unit not tilted to the drain; uninsulated supply ducts sweating	Perform the drain test (4.2); check tilt; insulate ducts
Musty smell	Dirty filter, drain pan or evaporator	Clean filter and drain pan; clean the evaporator coil

11.6 Reference values for technicians TECHNICIAN

All three temperature sensors (room, evaporator, condenser) are **NTC thermistors**: their resistance falls as the temperature rises. Disconnect the sensor from the control board and measure its resistance; compare it with a new MBC sensor at the same temperature. An open circuit (infinite) or a short circuit (0 Ω) means a faulty sensor or cable.

Check	Typical value
Supply voltage at compressor start	min. 200 V
Running current	see Part 12 (cooling / heating, per model)
Seawater flow	see Part 12 (10–30 l/min per model); measuring: 6.9
Seawater temperature rise, COOL mode	about 4–5 °C at the required flow
Air temperature drop across the evaporator, COOL mode	typically 8–12 °C
Seawater operating limits	COOL below 32 °C · HEAT above 7 °C
Evaporator overheat limit, HEAT mode	70 °C (factory setting)
Pipe length (SCP, SCP-M)	max. 10 m · max. 2 m height difference
Additional R32 charge (SCP, SCP-M)	20 g per metre above 4 m

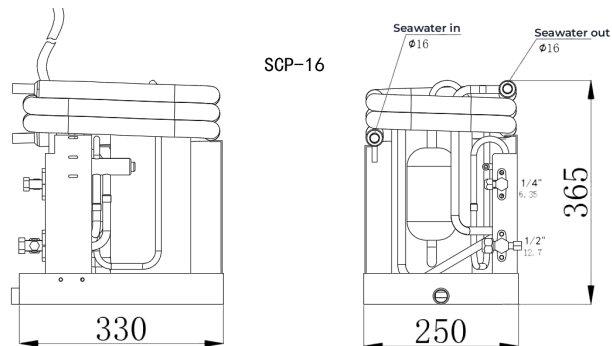
PART 12

Technical data

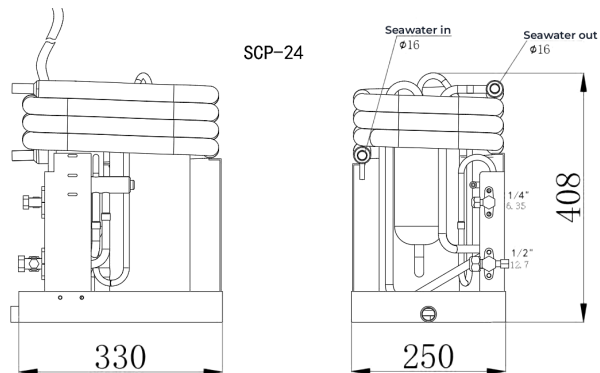
ESC units		ESC 08	ESC 10	ESC 13	ESC 16	ESC 24
Cooling capacity	Btu/h	8 000	10 000	13 000	16 000	24 000
	kW	2.34	2.93	3.81	4.69	7.03
Heating capacity	Btu/h	8 700	11 000	13 800	17 600	26 400
	kW	2.55	3.22	4.04	5.16	7.74
Power supply		230 V / 1 ph / 50–60 Hz				
Power input	Cooling, kW	0.74	0.78	1.01	1.17	1.75
	Heating, kW	0.86	1.05	1.28	1.56	2.20
Running current	Cooling, A	3.3	3.5	4.2	5.1	7.9
	Heating, A	3.7	4.0	5.2	6.5	9.9
Airflow	High / Med / Low, m ³ /h	420/350/280	500/405/350	580/495/410	730/610/520	1200/1080/900
Refrigerant		R32				
Required seawater flow	l/min	10	12	16	20	30
Circuit breaker (min.)	A	10	10	12	12	16
Dimensions H × W × D	mm	320×420×255	322×500×305	350×500×305	360×510×320	430×690×449
Supply duct diameter	mm	125	125	125	150	200
Return air grille (min.)	cm ²	300	450	450	510	720
Supply air grille (min.)	cm ²	750	800	800	1 030	1 400
Condensate drain		DN20	DN20	DN20	DN20	DN20
Seawater connection		5/8"	5/8"	5/8"	5/8"	5/8"
Weight	kg	20	25.5	26.5	29.5	58

SCP 13 / 16 / 24: same data as ESC 13 / 16 / 24, except the condensing unit dimensions (see next page).

SCP condensing unit dimensions and connections



SCP 16 condensing unit: 330 × 250 mm, height 365 mm



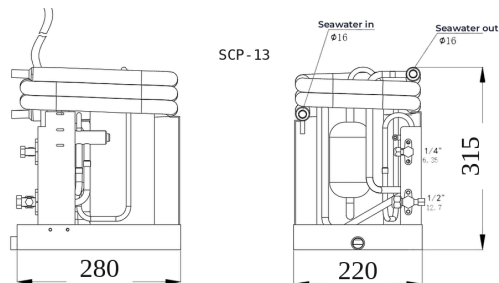
SCP 24 condensing unit: 330 × 250 mm, height 408 mm

Connection	SCP 16	SCP 24
Seawater inlet (lower) / outlet (upper)	Ø16 mm	Ø16 mm
Refrigerant liquid service valve	1/4" (6.35 mm) flare	1/4" (6.35 mm) flare
Refrigerant gas service valve	1/2" (12.7 mm) flare	1/2" (12.7 mm) flare
Pipe length / height difference	max. 10 m / 2 m	max. 10 m / 2 m
Factory charge covers	4 m (add 20 g R32 per extra metre)	4 m (add 20 g R32 per extra metre)

SCP and SCP-M evaporator dimensions

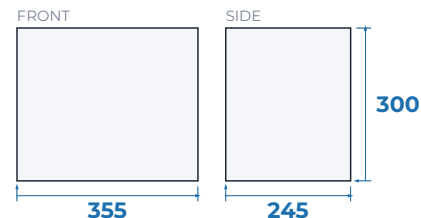
Evaporator	Used in	H × W × D (mm)
SCP 10 evaporator	SCP 10	300 × 355 × 245
SCP 13 evaporator	SCP 13	300 × 355 × 245
SCP 16 evaporator	SCP 16	355 × 400 × 320
SCP 24 evaporator	SCP 24	430 × 560 × 370
8 000 Btu/h evaporator	SCP-M 16 (2×), SCP-M 24 (8 + 16)	290 × 300 × 240
12 000 Btu/h evaporator	SCP-M 24 (2×)	300 × 355 × 245
16 000 Btu/h evaporator	SCP-M 24 (8 + 16)	355 × 500 × 345

SCP 13 dimensions



SCP 13 condensing unit: 280 × 220 mm, height 315 mm

SCP 13 evaporator



SCP 13 evaporator: 355 × 245 mm, height 300 mm

SCP-M multi split units

SCP-M units		SCP-M 16	SCP-M 24	SCP-M 24 (8 + 16)
Condensing unit		as SCP 16 / ESC 16	as SCP 24 / ESC 24	as SCP 24 / ESC 24
Cooling / heating capacity	Btu/h	16 000 / 17 600	24 000 / 26 400	24 000 / 26 400
Evaporators	Btu/h	2 × 8 000	2 × 12 000	1 × 8 000 + 1 × 16 000
Evaporator dimensions H × W × D	mm	290×300×240	300×355×245	290×300×240 / 355×500×345
Evaporator weight	kg	8 each	12 each	8 / 14
Evaporator power input	W	200 each	300 each	200 / 300
Supply duct diameter (min.)	mm	100 each	125 each	100 / 150
Refrigerant connections gas / liquid	mm	12.7 / 9.52	12.7 / 9.52	12.7 / 9.52
Condensate drain		DN20	DN20	DN20

One display controls both evaporators; both evaporator fans always run together (see 7.6).

PART 13

Warranty

13.1 Limited warranty OWNER

MBC Marine provides a limited warranty for its marine air conditioning systems against defects in materials and workmanship, for the original end user, within the warranty period. If a verified defect is found during the warranty period, MBC Marine may, at its sole discretion, repair or replace the defective component(s) or refund the purchase price in part or in full. In the case of a refund, the contract is considered terminated and no further claims can be made.

13.2 Warranty period OWNER

Product status	Warranty
Registered and installed by an official MBC partner	2 years, full warranty
Not registered, or not installed by an MBC partner	1 year: first 6 months parts and labour, last 6 months parts only

The warranty starts on the date of purchase, the date of installation or, for OEM installations, the date the vessel is delivered to the end user, but never later than 3 years after the manufacturing date. The manufacturing date can be verified from the serial number through MBC Marine customer service.

13.3 Product registration OWNER

Register your product at www.mbc-marine.com to benefit from the full warranty. For unregistered products, a valid proof of purchase is required for any warranty claim.



NOTICE

Improper earthing, incorrect connection to the seawater or electrical system, or installation not according to this manual voids the warranty.

13.4 Exclusions **OWNER**

- Normal wear and tear (e.g. filters, fuses).
- Labour costs for removal or reinstallation of the system.
- Damage during transport or improper storage.
- Galvanic corrosion of the condenser tubes due to missing or inadequate galvanic protection.
- Installation not following the official MBC Marine guidelines.
- Corrosion, improper maintenance, misuse or external damage.
- Unauthorised modifications, non-genuine parts or repairs by unauthorised personnel.
- Water damage to electrical components such as control boards or displays.
- Frost damage due to insufficient winterization.
- Use of unauthorised refrigerants.
- Damage caused by insufficient or unstable power supply (under- or overvoltage, spikes, surges, incorrect frequency, generator instability).
- Failures caused by restricted airflow (undersized ducts, blocked grilles, dirty filters, improper installation).
- Products with removed, altered or illegible serial number labels.
- Failures from operation outside the specified limits or contrary to this manual.
- Indirect, incidental or consequential damages (including travel costs, lost time, financial loss or personal injury).

13.5 Final provisions **OWNER**

MBC Marine reserves the right to amend this warranty policy at any time without prior notice, in particular to comply with national or EU legislation. Statutory rights of consumers remain unaffected.

PART 14

Legal disclaimer

MBC Marine has prepared this manual based on the most current information available. It cannot cover every possible situation; please contact our experts for specific questions or unusual requirements. While every precaution has been taken to ensure accuracy, MBC Marine is not liable for errors or omissions, nor for damage arising from the use of the product or of the information in this manual.

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MBC Marine Ltd. · Petőfi Sándor u. 39/A · 2049 Diósd · Hungary · www.mbc-marine.com

EU Declaration of Conformity: see the following page.

EU Declaration of Conformity

Manufacturer	MBC Marine Ltd. Petőfi Sándor u. 39/A, 2049 Diósd, Hungary
Product	Marine air conditioning units with fixed speed (on/off) compressor, reverse cycle cooling and heating
Models	ESC self-contained: ESC 08, ESC 10, ESC 13, ESC 16, ESC 24 SCP split: SCP 13, SCP 16, SCP 24 SCP-M multi split: SCP-M 16, SCP-M 24, SCP-M 24 (8 + 16)
Supply / refrigerant	230 V 1~ 50–60 Hz · R32

This declaration of conformity is issued under the sole responsibility of the manufacturer. The products described above are in conformity with the relevant Union harmonisation legislation:

- **2014/35/EU** Low Voltage Directive
- **2014/30/EU** Electromagnetic Compatibility Directive
- **2011/65/EU** and **(EU) 2015/863** RoHS Directive
- **2014/53/EU** Radio Equipment Directive (units with the optional Wi-Fi controller)

Harmonised standards and technical specifications applied:

Standard	Title
EN 60335-1	Household and similar electrical appliances – Safety – General requirements
EN 60335-2-40	Particular requirements for electrical heat pumps, air conditioners and dehumidifiers
EN 55014-1 / -2	Electromagnetic compatibility – Emission / Immunity
EN 61000-3-2	Limits for harmonic current emissions (≤ 16 A per phase)
EN 61000-3-3	Voltage fluctuations and flicker (≤ 16 A per phase)
EN 300 328 · EN 301 489-1 / -17	Wi-Fi radio and radio EMC (optional Wi-Fi controller)
EN IEC 63000	Technical documentation for the assessment with respect to the restriction of hazardous substances

Conformity applies when the product is installed and operated according to this manual.

Budapest, 15.10.2025
Place and date of issue

Roland Várnai, CEO
Name and function


Signature



Notes

Notes



MBC Marine Ltd.

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