



Air conditioners for IT Cooling

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## INSTALLATION, USE AND MAINTENANCE MANUAL

Italian is the original language.

The other languages versions are translation of the original.

English

To ensure safe and correct use, carefully read this manual and make sure to understand all the contained indications and information.

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**Before carrying out any operation on the machine, you must carefully read this manual and make sure you understand all the instructions and information given.**

**Keep this manual in a known and easily accessible place to refer to as necessary during the entire life-span of the unit.**

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# 1 GENERAL PROVISIONS

## 1.1 General information and safety

### 1.1.1 Scope of the manual

This manual, which is an integral part of the machine (\*), was prepared by the Manufacturer to provide the necessary information to all those who are authorised to interact with it during its life span: Buyers, System Designers, Carriers, Handling Operators, Installers, Expert Operators, Specialist Technicians and Users.

(\*) in the interest of clarity, this term is used as defined in the Machinery Directive.

As well as adopting a code of good practice, the recipients of the manual must read the information with care and apply it scrupulously. Taking a little time to read this information can help avoid risks to the health and safety of persons as well as prevent financial losses.

The information was written by the Manufacturer in the manufacturer's native language (Italian) and is referred to as the "ORIGINAL INSTRUCTIONS". The information is valid even if the machine in your possession is not exactly the same as the one referred to.

Keep this manual in a known and easily accessible place to refer to as necessary.

The Manufacturer reserves the right to modify the product without prior notice.

A number of symbols are used to highlight some parts of the text that are of particular importance. These are described below.

*(1) in the interest of clarity, this term is used as defined in the Machinery Directive.*

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## 2 SYMBOLS

**DANGER:**

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING:**

Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**ATTENTION:**

Attention indicates a potentially hazardous situation which, if not avoided, could cause minor or moderate damage.

**PROHIBITION:**

Prohibition to perform certain movements or activities.

**OBLIGATION:**

This indicates mandatory actions and behaviours to ensure product reliability and safety.

**INFORMATION:**

Indicates technical information of particular importance which should not be neglected.

**NOTICE:**

This is used to address practices not connected with possible physical injury.

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## 3 GLOSSARY AND TERMINOLOGY

There are some recurring terms in the manual which are described below in more detail.

**Manufacturer:** this is the company that has designed and built the machine in line with current laws, implementing all the good construction rules, and paying attention to the health and safety of people interacting with the machine.

**Buyer:** the person responsible for making the purchase who must supervise the organisation and assignment of duties to ensure that everything is done in compliance with the applicable laws.

**Owner:** Legal representative of the company, a body, or a natural person who owns the plant where the machine is installed and is responsible for checking compliance with all the safety rules in this manual and the national regulations in force.

**Designer:** a competent specialist person duly appointed and authorised to draw up a project that takes into account all the legislative and regulatory aspects and code of good practice that apply to the system as a whole. In any case, as well as comply with the instructions provided by the machine Manufacturer, the designer must consider all the safety aspects for all those persons who will have to interact with the system during its expected life span.

**Installer:** specialist competent person duly appointed and authorised to set up the machine or system according to the project specifications and the recommendations of the machine Manufacturer and in compliance with the laws on safety at work.

**User:** person authorised to manage use of the machine in compliance with the "instructions for use" and the laws in force concerning safety at work.

**Carriers:** the persons who take the machine to the destination in a suitable means of transport. They must stow and position the machine in a suitable way to ensure that it cannot move suddenly during transfer. When using devices for loading and unloading, they must observe the instructions that can be found on the machine to ensure their own safety and that of those people with whom they interact in the process.

**Handling operators:** those who duly set up the machine and implement all the applicable measures so that it can be handled in a safe and correct manner. They are also those persons who, upon receipt of the machine, move it to the place of installation according to the instructions which can be found on the machine. All the above employees must have adequate skills and observe the instructions to ensure their own safety and that of those people with whom they interact in the process.

**Maintenance person:** the person authorised by the owner to carry out on the machine all the adjustment and check activities expressly indicated in this manual, and which must be strictly followed. His/her work will only be limited to what is clearly allowed.

**Expert operator:** person appointed and authorised by the User or the Buyer to use the machine and carry out the routine maintenance according to the instructions provided by the Manufacturer. In the event of failures not considered in this manual, the expert operator must request the assistance of a specialist technician.

**Specialist technician:** the person authorised directly by MEHITS to carry out all operations of ordinary and extraordinary maintenance. He/she will also carry out all regulations, checks, repairs and replacement of parts that should become necessary during the life of the unit itself. Outside Italy and those countries where the Manufacturer is not directly present, the Agent is personally responsible for acquiring a suitable number of Technicians, proportional to the area and the business.

**Routine maintenance:** all the operations that help to ensure the good performance and efficiency of the machine. These operations are planned by the Manufacturer who defines the skills required and the procedures to be implemented.

**Extraordinary maintenance:** all the operations that help to ensure the good performance and efficiency of the machine. These operations, which are not foreseeable, are not planned by the Manufacturer and must only be carried out by the specialist technician.

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## 3.1 Attached documentation

The following documents are delivered with the unit:

- **Installation, use and maintenance manual:** it contains the list of operations to carry out.
- **Wiring diagram:** it is specific to the machine in question. It is useful for the persons who will have to carry out work on the electrical system, as it shows the various components and connections.
- **Dimensional and lifting drawings.**
- **Instructions for the installation of accessories:** describes the procedures for their installation on the machine.
- **EC declaration of conformity:** indicates that the machines comply with current European directives.

The instructions are also available in an alternative format on the website <https://www.melcohit.com/EN/download/>

### 3.1.1 General safety rules

The manufacturer, during design and construction, has paid particular attention to aspects that may pose a risk to the safety and health of people interacting with the machine. The manufacturer has complied with the applicable laws as well as the code of good manufacturing practice. The purpose of this manual is to encourage users to take all due care and thereby avoid any risks. In any case, prudence is required at all times. Safety is also the responsibility of all operators who interact with the machine.

Carefully read the instructions in this manual and those applied directly on the machine, and respect those concerning safety in particular.

An overall project that envisages implementation of this machine in a system must take into account the code of good practice as well as the legislative and regulatory aspects. Particular attention must be paid to all the recommendations and technological information provided by the manufacturer. Do not tamper with, avoid, remove or bypass the safety devices installed on the machine. Failure to observe this requirement could result in serious risks to the health and safety of the persons involved.

The personnel who carry out any kind of work during the entire life span of the machine must have precise technical knowledge, special skills and recognised experience in the specific sector. The personnel must also possess and use/wear all the personal protective equipment (PPE) required by law. Non-fulfilment of these requirements could endanger people's health and safety.

Keep the area around the machine in a good state in order to avoid risks to the health and safety of persons during normal use and maintenance of the machine.

Some processes may require the assistance of one or more helpers. In which case, these helpers must be duly trained and informed of the type of work to be carried out in order to avoid risks to their health and safety.

Move the machine observing the information shown on the packaging and the instructions on use provided by the manufacturer.

When handling, if the circumstances demand it, request the assistance of one or more helpers who can give directions.

The personnel who carry out loading, unloading and handling of the equipment must have recognised skills and experience in the specific sector and must have absolute command of the lifting equipment to be used.

During installation, observe the clearances indicated by the manufacturer and take into account all the work activities carried out in the vicinity. Installation must also be carried out in compliance with the laws in force on safety at work.

The machine must be installed and connected in accordance with the manufacturer's instructions. The person in charge must also take into account all regulatory and legislative requirements, carrying out all installation and connection operations in a workmanlike manner.

After installation and before commissioning the machine, he must perform a general check to make sure that these requirements have been met.

Check that any means of transport to be used for transfer of the machine are suitable for the purpose, and that the machine is loaded and unloaded with care to ensure the safety of the operator and of any other persons who are directly involved. Before transfer, make sure that the machine and its components are duly anchored to the vehicle and do not exceed the maximum permitted dimensions for transport on the vehicle. Apply any necessary signs.

The operator must have read and understood the information on use of the machine, and have suitable skills and experience for carrying out the work in hand.

Put the machine only to the uses foreseen by the manufacturer. Improper use of the machine may pose risks to the health and safety of the persons and cause financial losses.

The machine has been designed and constructed to meet all the operating conditions indicated by the manufacturer. Tampering with any of the devices to change the performance can expose the persons to health and safety risks and cause financial losses.



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Only use the machine with the safety devices properly installed and in perfect working order. Failure to observe this requirement could result in serious risks to the health and safety of the persons involved.

Keep the machine in perfect working order and perform the routine maintenance recommended by the manufacturer. Good maintenance can help to ensure the best possible performance, a long useful life and constant compliance with the safety requirements.

Before maintenance and adjustments, activate all the applicable safety devices and provide the personnel and any other people in the vicinity with all necessary information. In particular, cordon off the area and prevent access to all the devices that could, if activated, inadvertently cause danger and pose risks to health and safety.

Maintenance and adjustments must be carried out by authorised persons who must implement all the necessary safety measures according to the procedures set down by the manufacturer.

All maintenance operations that require specific technical expertise or skills must only be carried out by qualified personnel with recognised experience in the field.

In the case of maintenance in areas that are awkward or dangerous to access, implement appropriate measures to ensure the safety of oneself and of other people, in compliance with the laws in force on safety at work.

Replace excessively worn parts. All the above can help to ensure the good working order of the machine and the required level of safety.

This appliance must not be used by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they are supervised or given instructions. Children must be supervised to make sure they do not play with the appliance.

For an appliance intended to be permanently connected to the water supply and not connected by a set of pipes, this shall be indicated in the chapter "Hydraulic connections".



**WARNING:**

During regular maintenance activities or in the event of a fault only use original components.

### 3.1.2 Precautions against residual risks

#### Prevention of residual mechanical risks

- install the machine according to the instructions of this manual;
- regularly carry out all the maintenance operations foreseen in this manual;
- wear protective equipment (gloves, eye protection, hard hat, etc.) suited to the work in hand; do not wear clothes or accessories that can get caught or sucked in by flows of air, tie back long hair before entering the machine
- the fins on heat exchangers and the edges of metal components and panels can cause cuts;
- do not remove the guards from mobile components while the machine is operating
- before restarting the machine, make sure that the guards protecting moving components are correctly installed;
- fans, motors and belt drives might be running: before accessing these, always wait for them to stop and take appropriate measures to prevent them from starting up
- the surfaces of the machine and pipes can get very hot or cold and cause the risk of scalding;
- do not exceed the maximum admissible pressure (PS) of the water circuit of the machine as indicated;
- before removing parts on the pressurised water circuits, close the section of the piping concerned and drain the fluid gradually to stabilise the pressure at the atmospheric level;

#### Prevention of residual electrical risks

- disconnect the machine from the mains using the main switch before opening the electrical panel;
- check that the machine has been grounded correctly before starting it;
- Install the machine in a suitable place; if intended for indoor use, it may be installed outside, provided that it is protected from weather conditions;
- do not use cables with inadequate sections nor extension cable connections, even for very short periods or emergencies;
- for machines with power correction capacitors, wait 3 minutes after removing the electric power supply before accessing the inside of the electrical panel.

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### **Prevention of environmental risks**

- The machine contains substances and components that are dangerous for the environment, such as ethylene or propylene glycol.
- The units may only be serviced and disposed of by qualified technicians.

### **Prevention of other residual risks**

- the machine contains pressurised water or glycol solutions: the pressurised equipment must not be touched, except during maintenance, which must be entrusted to qualified and authorised personnel;
- connect the utilities to the machine following the indications set out in this manual and in the symbols on the panels of the machine itself;
- the water circuit contains harmful substances. Do not drink from the hydraulic circuit and make sure the material contained in it does not touch your skin, eyes or clothing.
- in order to avoid an environmental risk, make sure that any leaking fluid is collected in suitable devices in accordance with local regulations
- if a part needs to be dismantled, make sure that it is correctly re-assembled before starting the unit;
- when the rules in force require the installation of fire-fighting systems near the machine, check that these are suitable for extinguishing fires on electrical equipment and on hydraulic circuits containing glycol, as specified on the safety data sheets of these fluids (for example, a CO2 fire extinguisher);
- keep all the safety devices in good working order and check them periodically according to the regulations in force;
- do not store inflammable liquids near the unit
- only carry out brazing or welding activities on clean and empty pipes;
- do not use naked flames near the machine;
- the machinery must be installed in structures protected against atmospheric discharge according to the applicable laws and technical standards
- do not bend or hit pipes containing pressurised fluids
- it is not permitted to walk or rest other objects on the machines
- the user is responsible for overall evaluation of the risk of fire in the place of installation (for example, calculation of the fire load)
- during transport, always secure the unit to the bed of the vehicle to prevent it from moving about and overturning
- the machine must be transported according to the regulations in force taking into account the characteristics of the fluids in the machine and the description of these on the safety data sheet
- inappropriate transport can cause damage to the machine. Before start-up, the machine must be checked for leaks and repaired accordingly
- unless arranged otherwise with the Manufacturer, the machine be installed in environments where there is no risk of explosion (SAFE AREA).

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### 3.1.3 List of machine internal symbols



Internal moving components



Equipment under voltage



Earth connection

### 3.1.4 Procedure for requesting support

For support, please contact one of the authorised centres (Italy) or our branches/distributors (outside Italy). When requesting technical support concerning the machine, cite the data on the identification plate, and the serial number in particular, and describe the conditions of access and the area around the machine.

In your request, indicate the approximate hours of use and the fault detected. In case of alarm, indicate the alarm message number.

## 3.2 Machine identification

### 3.2.1 Designation

The alphanumerical code of the model of the machine, which is given on the identification plate, represents precise technical specifications which are indicated in the figure.

**MEDR-TF-SL-A 015**

**MEDR Dry Cooler**

**TF Coil type**  
TF = Tube & fin exchanger

**B Acoustic preparation**  
[ ] = Standard  
SL = Low Noise

**A Fan electric motor**  
A = with AC electric motors  
E = with EC electric motors

**015 Model code** corresponding to the rated power (kW)



### 3.5 Description of the main components

Heat sink for IT Cooling with axial fans with horizontal or vertical air flow. Air flow from coil to fan.

The design solution allows a high degree of application flexibility. There are 2 series with 9 models each.

Between the internal unit and the heat sink, the hydraulic connection and the electrical connection of the fan speed control proportional signal and the alarms are required.

The machines in this series are designed and built for use in technological air conditioning systems.

The machines are not suitable for ducting the intake and discharge of air.

On request, it is possible to have:

- The support feet kit, to transform the machine into a machine with vertical air flow;
- The Finguard protective treatment for tube and fin coils.

In order to ensure maximum performance and guarantee the safety of people, the product and the environment, before installation it will be necessary to complete a full design of the system within which the machine will be installed, assessing all the predicted and foreseeable critical points during its life, from installation to dismantling.

The machines essentially consist of a heat exchange section and one or more fans.

They work by cooling the fluid of the hydraulic circuit.

The outdoor air is channelled through the coil by the fans, to help cool the fluid.

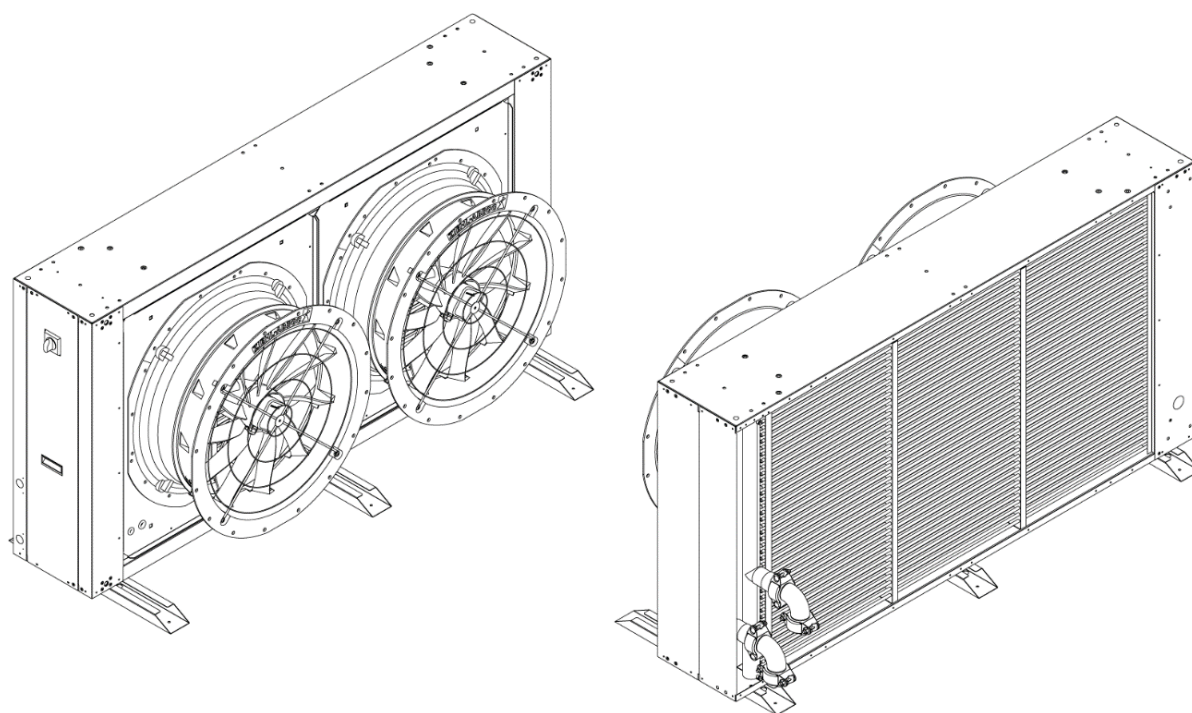
The heat extracted from the coil is released into the ambient air.

The remote heat sink is connected to the main machine by hydraulic pipes.

For further machine characteristics and technical data, please refer to the Data Book.

Front view

Rear view



### 3.5.1 Electrical panel

The power supply is independent of the internal unit.

The electrical panel is installed on the machine and is fitted with a line disconnector.

In accordance with the standard EN 60204-1, the handle of the circuit breaker must be easy to access and at a height of between 0.6 and 1.9 metres above the floor. The position of the machine in the place of installation must be considered, because if the unit is placed on a raised platform the height of the circuit breaker might no longer be in compliance with the standard. In which case the installer must arrange for a walkway or a similar solution that can allow operators to access the safety device with ease.

### 3.5.2 Hydraulic circuit

The hydraulic circuit comprises a Cu-Al tube and fin heat exchange coil. The hydraulic connections can be either grooved or threaded, depending on the size of the unit. Please refer to the Data Book for the sizes of the connections, which depend on the size of the machine.

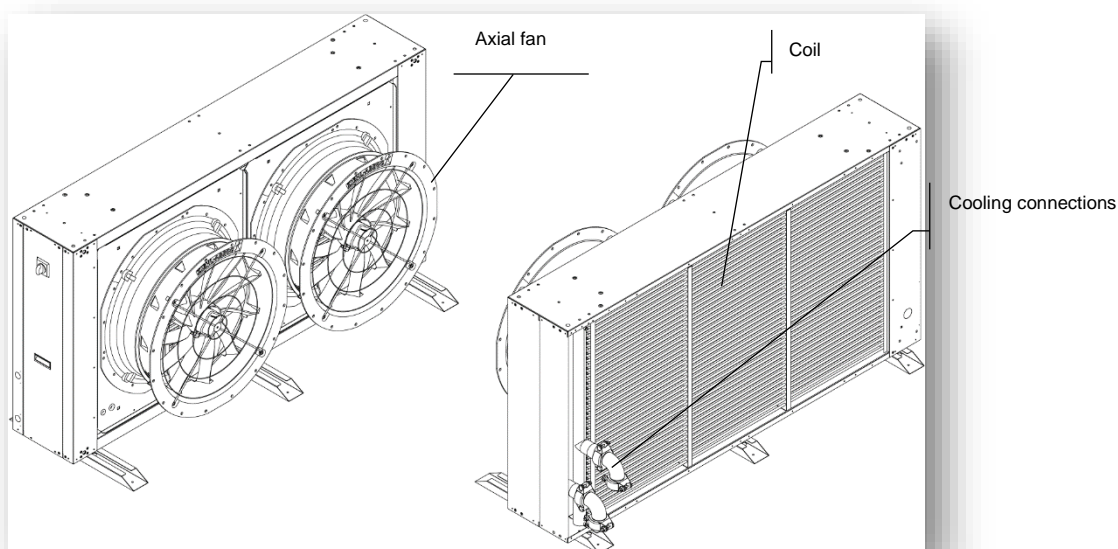
### 3.5.3 Ventilating section

The unit is equipped with axial fans and protective grilles on the air supply. Units can have 1, 2, 3 fans, or 4, 6 fans. Both AC and EC fans are available.

### 3.5.4 Structure

The all-aluminium structure is particularly suitable for outdoor installation.

The machines are fully assembled in the factory, supplied with control equipment in order to reduce installation time and costs.

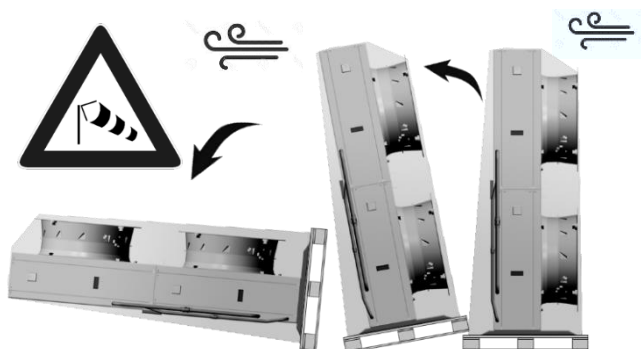


## 4 TRANSPORT, STORAGE AND INSTALLATION

### 4.1 Transport and moving

#### 4.1.1 Storage

Place in a protected environment, where there is no wind or condensation. Secure the machine in place so that there is no risk of overturning.



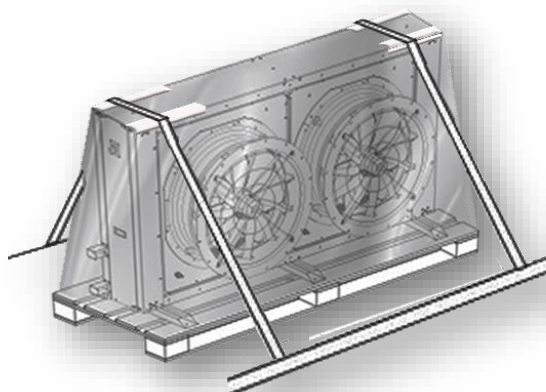
#### 4.1.2 Transport

For road transport, it is advisable to use a low loader truck with tarpaulin, or use tarpaulin to protect the units against bad weather. Use straps with a ratchet system to secure the unit for the purpose of transport.



#### **INFORMATION:**

To avoid damage to the panels, it is recommended to secure the machine as shown in the figure. The belts must be tensioned with care. Make sure that the belts don't press against the mouthpiece of the fans. For more information, contact the Shipping Office of the Manufacturer.



#### 4.1.3 Discharge

Lift and move the machine as indicated on the packaging and/or directly on the machine.

It is advisable NOT TO REMOVE the shrink wrap protection during the unloading, handling and positioning operations.

**OBLIGATION:**

All the unloading, handling and positioning operations must be carried out using appropriate means and by experience personnel, trained and authorised for such activities.  
Keep the machine on the pallet for unloading and handling operations.

#### 4.1.4 Receipt and inspection

Upon receipt, verify the integrity of the machine and check it against the order:

- Check the number of packages against the transport document. If incorrect, notify the carrier and the Manufacturer.
- Perform a visual inspection of the packaging.

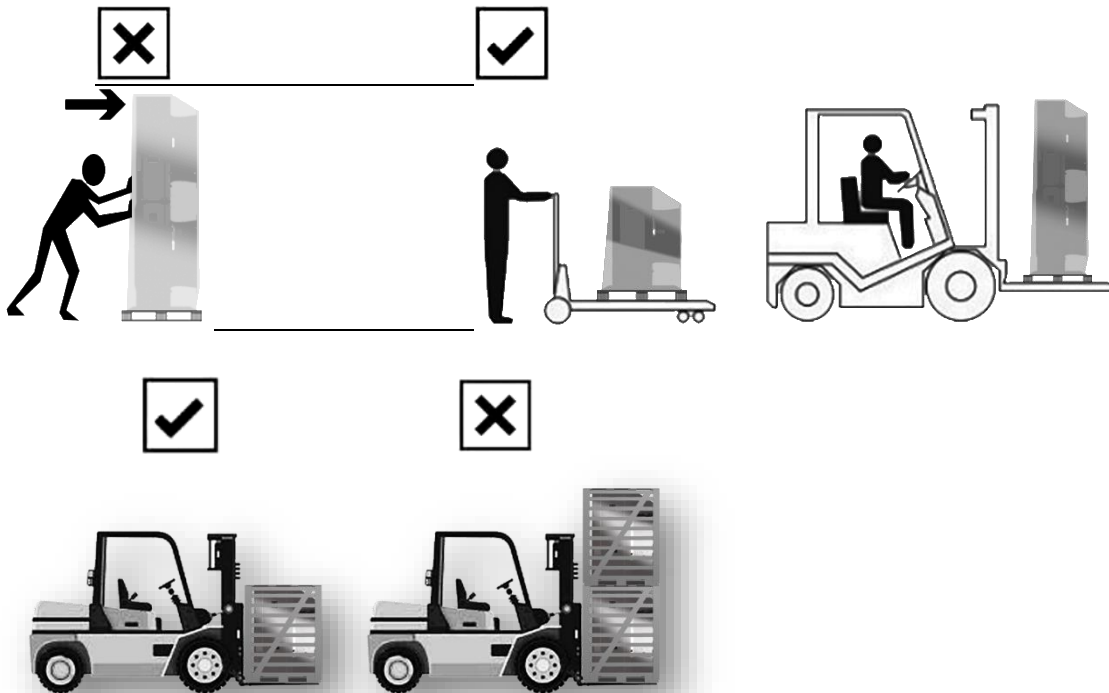
**INFORMATION:**

If any of the packages are damaged or missing, contact the Sales Office of the manufacturer and the freight forwarder, to agree the next plan of action.

For more information, contact the Shipping Office of the Manufacturer.

If the machine is not installed immediately after receipt, it should be stored in a protected environment as indicated in the "storage" and "storage temperature" sections.

#### 4.1.5 Handling





## 4.2 Disassembly of the machine panels

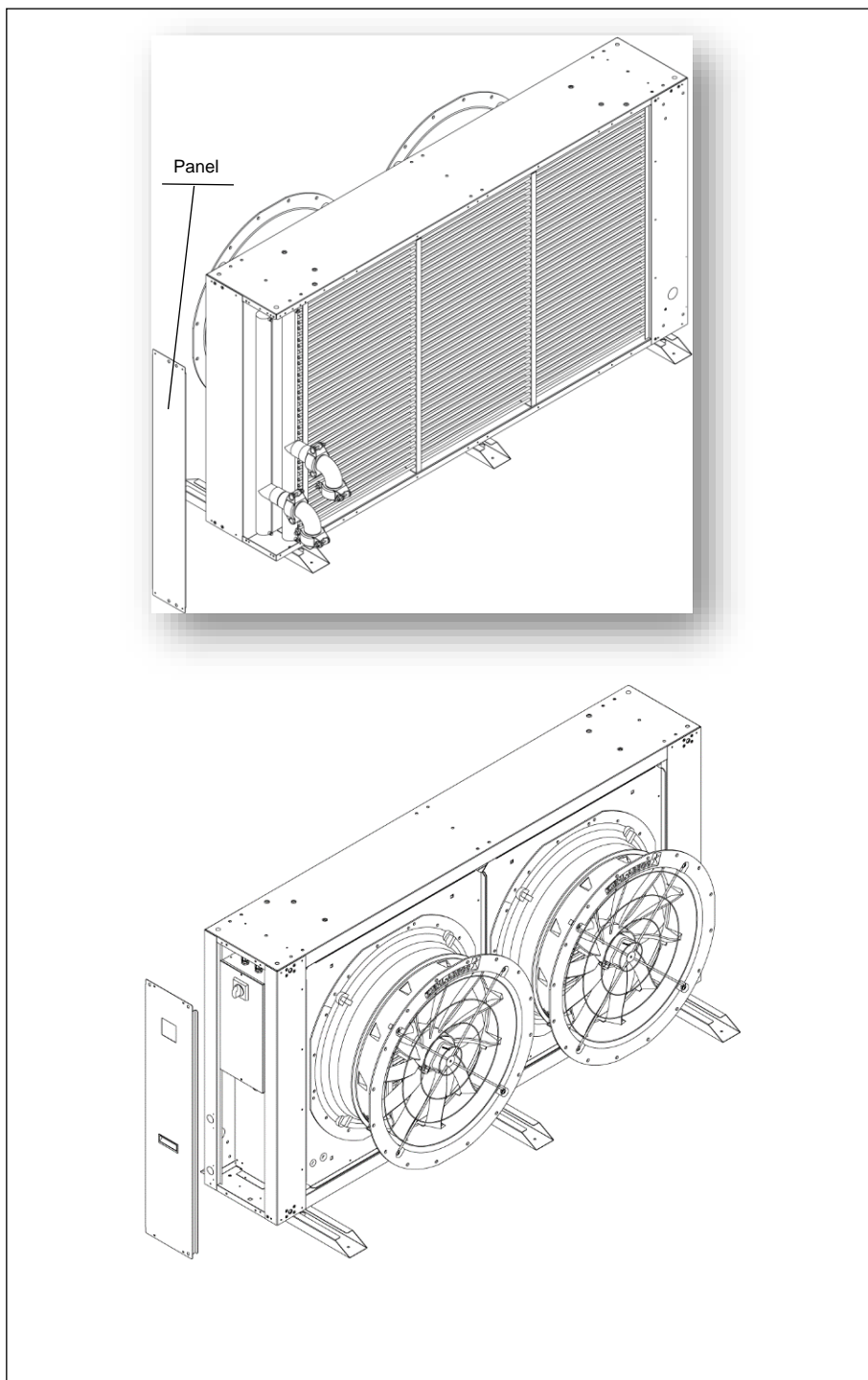


### **DANGER:**

The machine panelling is made of heavy aluminium sheet. All the assembly and disassembly operations must be carried out using suitable means and by experienced individuals, trained and authorised for these types of operations.

### **Machine panels**

The side panels can be removed. The panels are screwed onto the machine.



## 4.3 Installation

### 4.3.1 Installation of the standard machine

**OBLIGATION:**

All the phases of installation must be covered in the general project.

Before starting the installation activities, in addition to defining the technical requirements, the person authorised to perform the work must, if necessary, implement a "safety plan" to safeguard the safety of the people directly involved, and strictly implement the safety rules and, in particular, the laws that apply to mobile construction sites.

Before installing the machine, be sure that:

- the area is perfectly flat and can ensure long-term stability;
- the floor of the building on which the machine is to be installed is of adequate capacity;
- the machine is easily accessible to all people who must interact with it during its expected useful life.
- it must be possible to perform all maintenance and replacement operations (routine and extraordinary) easily and without risks to people and in compliance with the laws in force concerning safety at work.
- the spaces are adequate to ensure appropriate air flow for correct machine operation and ventilation.
- the minimum space requirements for operation and inspection indicated in this manual are ensured.
- air intake and delivery are never hindered or obstructed, even partially.
- if people and vehicles are expected to transit in the vicinity, suitable fencing must be erected, in compliance with existing regulations and ensuring at least the minimum required clearance around the machine for carrying out any intervention that may be required on the same.

The machine must be installed indoors, in a non-aggressive atmosphere.

**OBLIGATION:**

The unit must be installed in an area where access is only permitted to OPERATORS, MAINTENANCE PERSONNEL and TECHNICIANS. If this is not possible, it must be enclosed in a perimeter fence positioned at least two metres from the external surfaces of the machine itself.

The staff of the INSTALLER or any other visitors must always be accompanied by an OPERATOR. Under no circumstances, must unauthorised personnel be left alone in contact with the machine.

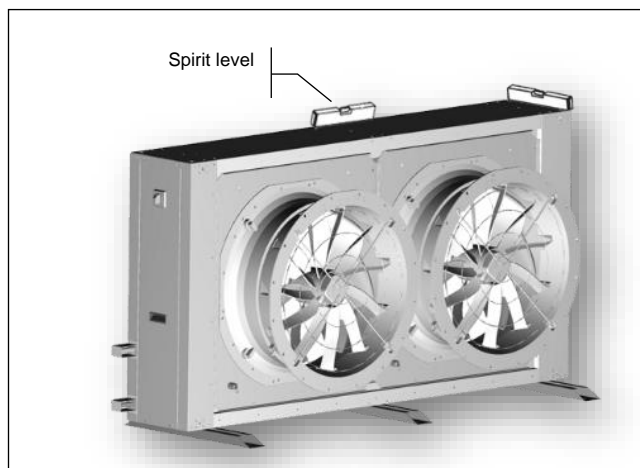
The MAINTENANCE MAN must limit him/herself to the controls of the machine only; the only panel that can be opened by him/her is the one that accesses the control module - no other must be touched.

The INSTALLER may only connect the machine to the system.

Access the machine using the relative personal protective equipment and only after having read and understood the documents and instructions, which must always be kept close at hand.

### 4.3.2 Machine positioning

The machine is placed directly on the ground. Once the machine has been positioned, it must be checked that it is level in the four positions indicated in the figure.



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### 4.3.3 Fixing the machines to the ground

The machines must be fixed to the ground or to the support structure. The support feet are provided with holes for fixing as shown in the figure. Fixing systems are not supplied.

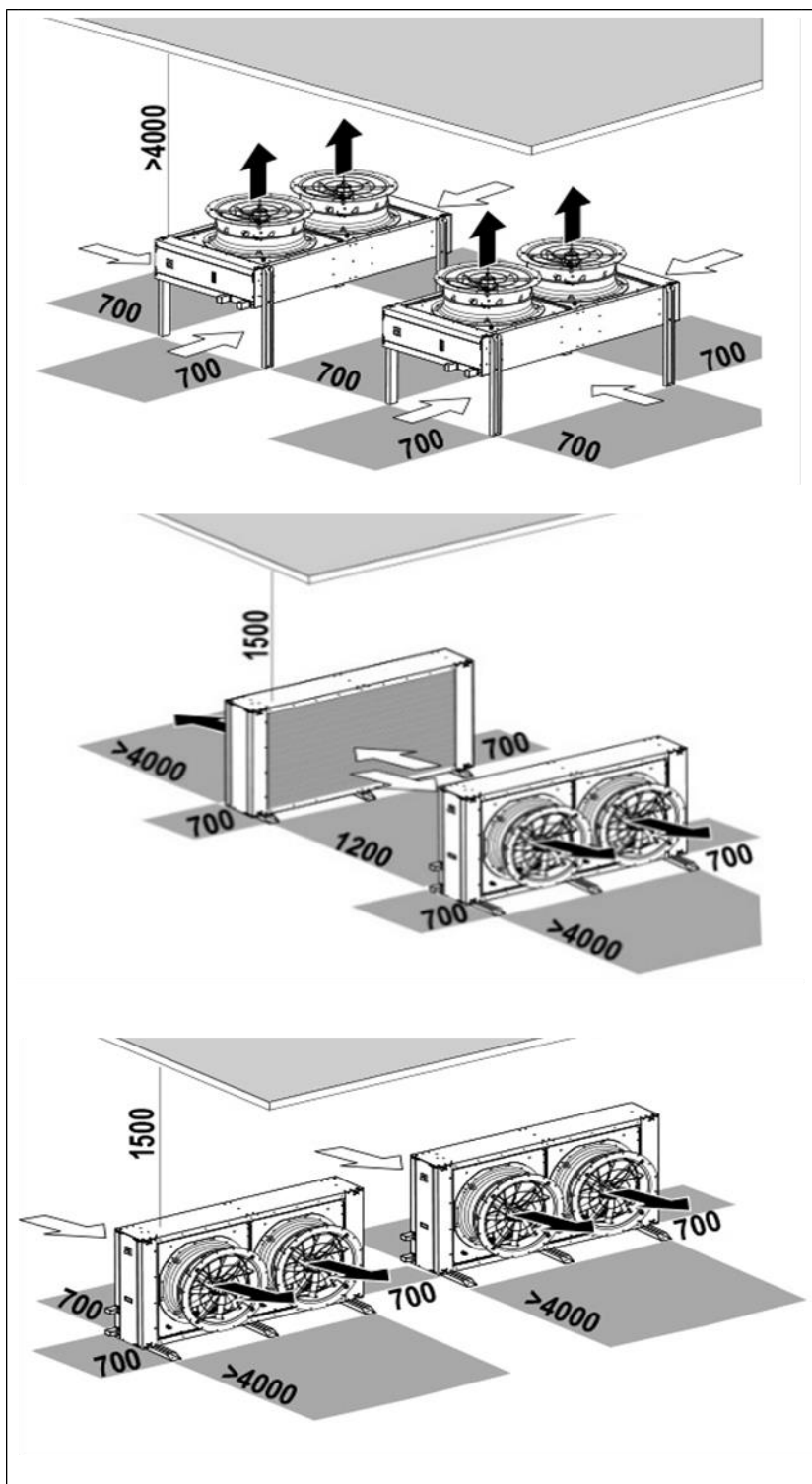


#### 4.3.4 Installation clearances

**OBLIGATION:**

For a correct installation of the machine, it is necessary to ensure a free area around the same, as shown in the figure. This allows correct air circulation and ease of access to the components of the machine for the purpose of normal inspection and maintenance operations.

If several machines are installed side-by-side, provide a space between the machines as shown in the figure:

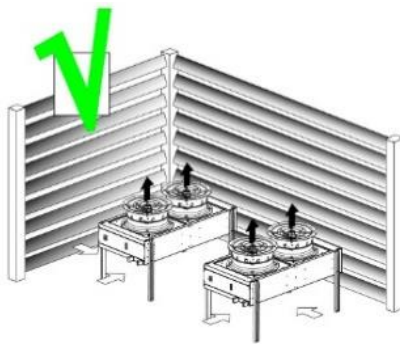


#### 4.3.5 Installation and position of any obstacles

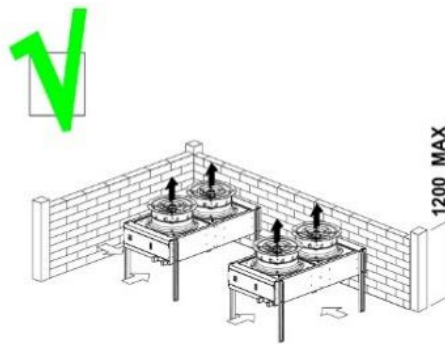


##### **OBLIGATION:**

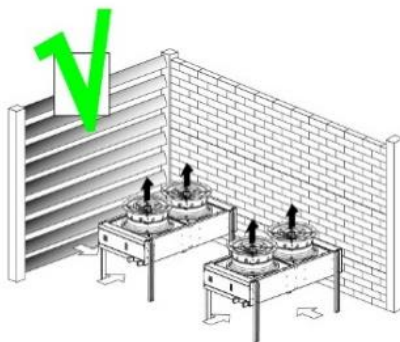
The air expelled from the machine must be easily dispersed into the environment. Avoid the presence of obstacles that may cause the expelled air to recirculate. Structures around the installation perimeter must ensure the free movement of air such as: finned barriers, finned barriers with sound-proofed passages. There are no height limits for finned barriers. Masonry barriers must not exceed a height of 1200 mm.



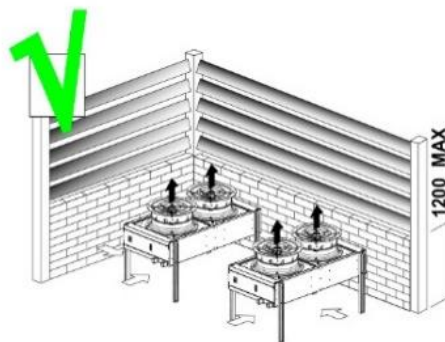
Perimeter structure with finned barriers. No height limit.



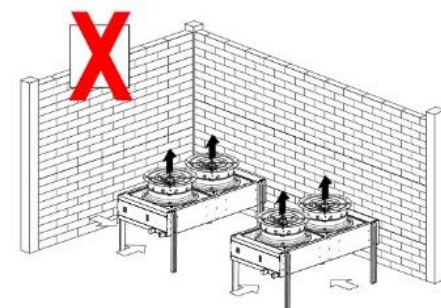
Masonry perimeter structure with a height limit of 1200 mm.



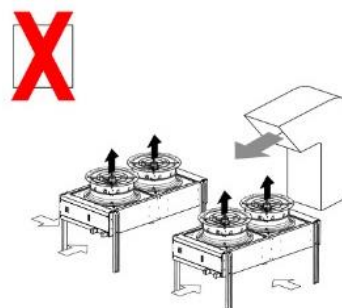
A very high masonry structure is allowed, but at least one very wide finned barrier must be present



Masonry perimeter structure with a height limit of 1200 mm. The finned barrier can protrude over the masonry.



**IT IS FORBIDDEN TO SURROUND THE INSTALLATION WITH A MASONRY BARRIER WITH A HEIGHT OF MORE THAN 1200 MM.**



**AVOID INSTALLING THE MACHINE IN THE DISCHARGE AIR FLOW OF ANY EXTRACTORS.**

#### 4.3.6 Installation in places with heavy snowfall

Snow can accumulate around and above the machine and low outside temperatures can freeze the snow in blocks of ice that block the fan grille or the coil.

This condition may cause a malfunction or breakage of the machine.

Check and keep the machine clear of snow.

#### 4.3.7 Installation in places with strong winds for AC fans

Installation in areas sheltered from the wind is necessary in order to prevent dominant winds and possible air recirculation from interfering with fan operation and condensation control. For this reason, where strong winds are possible and for installations with horizontal air flow, it is suggested to place the condensers in a partial barrier to limit direct winds on the fans. These recommendations are not necessary with EC fans.

**If it is not possible to install the condenser in an area protected from the wind, it is recommended to install it with vertical air flow.**

Machines with horizontal air flow.

Strong winds (above 50 km/h) generate very high forces on the machine structure. It is therefore necessary to counteract these forces with anchorages suitable for the support structures (refer to the technical manual).

### 4.4 Machine hydraulic connections



#### **OBLIGATION:**

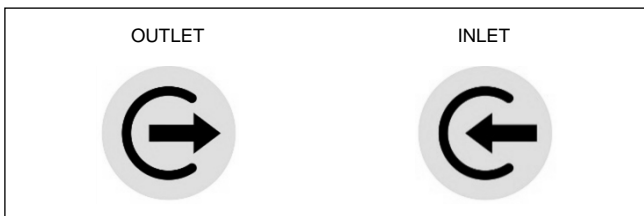
The execution of the hydraulic connection must be carried out by qualified personnel.

All the works, the choice of the components and the materials used must comply with the "Good Practices", according to the regulations in force in the different countries, taking into account the intended operating conditions and uses of the equipment.

The hydraulic connection to the water exchangers must be defined during the design stage.

Refer to the dimensional drawing of the machine for the spacing of the connections.

The in and out directions are highlighted by circular plates:



#### 4.4.1 Hydraulic connection to finned coils

The water inlet and outlet pipes can be identified by the labels applied directly on the machine.

During the design phase, envisage the installation of the following components on the inlet water line.

**RUa - Shut-off valves:** for shutting off the supply of water to the machine during maintenance.

**AV - Anti-vibration:** to isolate the vibrations that can be transmitted from the system.

**M - Pressure gauge** (with stopcock): indicates the water pressure in the inlet line.

**T - Thermometer:** indicates the water temperature in the inlet line.

**SA - Air vent:** to eliminate air in the inlet line.

**SC - Drain valve:** to drain water out of the system. To be used also for connecting an external pump for chemical washing.

**MF - Mains filter:** (with RU tap system for filter cleaning): to trap impurities inside the system (with particle filtration degree not less than 140 mesh = 105 microns).

Assemble the following components on the water outlet line.

**RUa - Shut-off valves:** for shutting off the supply of water to the machine during maintenance.

**AV - Anti-vibration:** to isolate the vibrations that can be transmitted from the system.

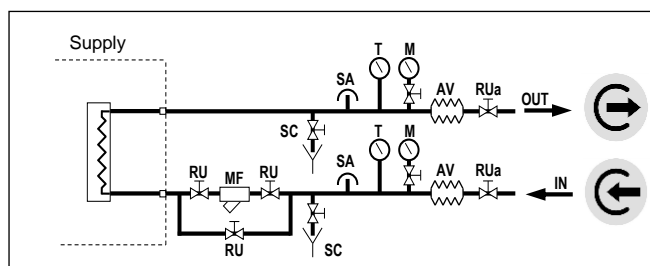
**M - Pressure gauge** (with stopcock): indicates the water pressure in the inlet line.

**T - Thermometer:** indicates the water temperature in the outlet line.

**SA - Air vent:** to eliminate air in the outlet line.

**SC - Drain valve:** to drain water out of the system. To be used also for connecting an external pump for chemical washing.

Install an expansion vessel with a safety valve in the hydraulic circuit. The hydraulic circuit must be sized according to the applicable laws in force.



#### OBLIGATION:

Maximum operating pressure 10 bar, including the hydrostatic head – PN 10.

#### 4.4.1.1 Hydraulic connections

| MODEL                        |        | 014   | 026   | 034 | 061 | 070   |
|------------------------------|--------|-------|-------|-----|-----|-------|
| <b>HYDRAULIC CONNECTIONS</b> |        |       |       |     |     |       |
| Inlet / Outlet               | Inches | 1+1/4 | 1+1/2 | 2   | -   | -     |
| Inlet / Outlet (1)           | Inches | -     | -     | -   | 2   | 2+1/2 |

| MODEL                        |             | 082   | 122       | 140   | 165   |
|------------------------------|-------------|-------|-----------|-------|-------|
| <b>HYDRAULIC CONNECTIONS</b> |             |       |           |       |       |
| Inlet / Outlet               | Inches      | -     | -         | -     | -     |
| Inlet / Outlet (1)           | Inches / DN | 2+1/2 | 2+1/2 (*) | 3 (*) | 3 (*) |

(1) Grooved connection

(\*) Referring to the manifold

#### 4.4.2 Installation technical notes

- The connection pipes must be suitably supported so that they do not weigh down on the machine.
- Avoid rigid connections between the machine and the pipes, and install vibration dampers.
- For temperatures values, minimum and maximum water flow rates and the volumes of water in the heat exchanger water circuit, refer to the Data Book.
- Any heating elements installed to prevent the pipes from freezing must be kept away from devices, sensors and materials that the heating elements could damage or cause to malfunction (for example, temperature sensors, plastic components and power cables).
- The carrier fluid in the water circuits must be prevented from flowing in the reverse direction as this can damage the pumps or cause by-passes, affecting the flow and temperature of the system.
- Install suitable devices to ensure the correct fluid flow rate even with one or more machines switched off, so as to avoid exceeding the flow rate limits indicated in the tables available in the machine Data Book.



#### 4.4.3 Cleaning and filling the hydraulic circuits

**OBLIGATION:**

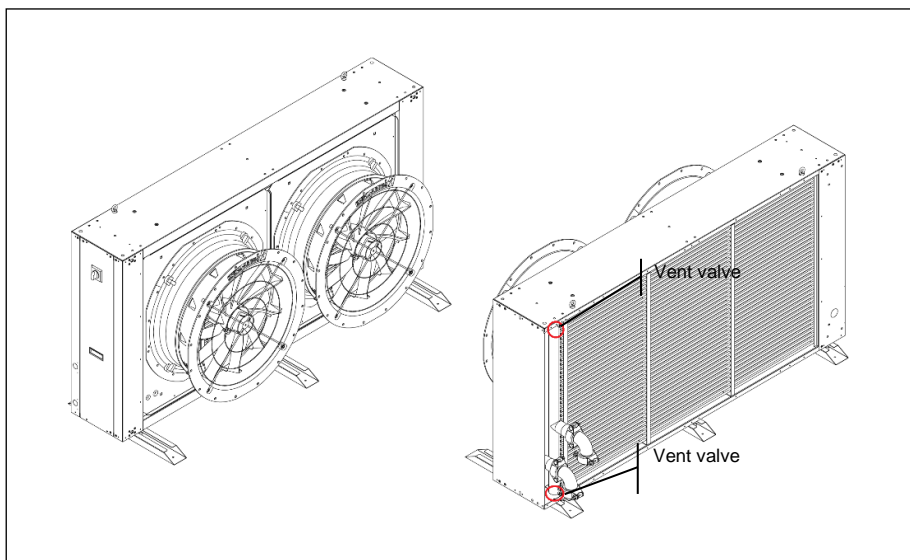
Wash the pipes of the hydraulic circuits to remove any processing residues and other dirt inside. This operation must be performed to avoid damaging the parts of the machine.

After washing, check the hydraulic circuits for any leaks. To do this, load the circuits at a pressure higher than atmospheric pressure and check that there are no pressure leaks over time.

**INFORMATION:**

The thermal insulation of the pipes outside the machine is the responsibility of the installer and must only be completed after ascertaining that there are no leaks.

If other products are expected, in addition to mixtures of water and ethylene or propylene glycol, contact the manufacturer's technical office. The position of the vent valves is shown in the figure below.





#### 4.4.4 Water quality

**OBLIGATION:**

The values shown in the table must be guaranteed during the entire life cycle of the machine.

| Ref. | Description                                 | Symbol   | Range values |
|------|---|--|--------------|
| 1    | Hydrogen ions                               | pH   | 7.5 - 9      |
| 2    | Presence of calcium (Ca) and magnesium (Mg) | Hardness   | 4 ÷ 8.5 °D   |
| 3    | Chloride ions                               | Cl <sup>-</sup>  | < 150 ppm    |
| 4    | Iron ions                                   | Fe <sup>3+</sup>   | < 0.5 ppm    |
| 5    | Manganese ions                              | Mn <sup>2+</sup>   | < 0.05 ppm   |
| 6    | Carbon dioxide                              | CO <sub>2</sub>  | < 10 ppm     |
| 7    | Hydrogen sulphide                           | H <sub>2</sub> S   | < 50 ppb     |
| 8    | Oxygen                                      | O <sub>2</sub>   | < 0.1 ppm    |
| 9    | Chlorine                                    | Cl <sub>2</sub>  | < 0.5 ppm    |
| 10   | Ammonia NH <sub>3</sub>                     | NH <sub>3</sub>  | < 0.5 ppm    |
| 11   | Ratio between carbonates and sulphates      | HCO <sub>3</sub> <sup>-</sup> /SO <sub>4</sub> <sup>2-</sup> | > 1          |
| 12   | Sulphate ions                               | SO <sub>4</sub> <sup>2-</sup>                                | < 100 ppm    |
| 13   | Phosphate ions                              | PO <sub>4</sub> <sup>3-</sup>                                | < 2.0 ppm    |

where: 1/1.78°D = 1°Fr with 1°Fr = 10 gr CaCO<sub>3</sub> / m<sup>3</sup>

ppm = parts for millions

ppb = parts per billion

**Explanatory notes:**

- ref. 1: Concentrations of hydrogen ions greater than those indicated implies a high risk of deposits, whereas concentrations of hydrogen ions lower than those indicated implies a high risk of corrosion;
- ref. 2: The hardness measures the amount of Ca and Mg carbonate dissolved in the water with a temperature lower than 100°C (temporary hardness). A high hardness implies a high risk of deposits;
- ref. 3: Concentrations of chloride ions higher than those indicated causes corrosion;
- ref. 4 - 5 - 8: the presence of iron and manganese ions and oxygen leads to corrosion;
- ref. 6 - 7: carbon dioxide and hydrogen sulphide are impurities that promote corrosion;
- ref. 9: In water from the waterworks it is a value of between 0.2 and 0.3 ppm. High values cause corrosion;
- ref. 10: The presence of ammonia reinforces the oxidising power of oxygen
- ref. 11: Below the value shown in the table, there is a risk of corrosion due to the trigger of galvanic currents between copper and other less noble metals.
- ref. 12: the presence of sulphate ions leads to corrosion;
- ref. 13: the presence of phosphate ions leads to corrosion.

Checks should be carried out on a regular basis, taking samples at various points of the hydraulic system.

During the first year of operation, it is recommended to perform checks every 4 months. Checks can then be performed once every six months as from the second year of operation.

**OBLIGATION:**

Parameter values outside the indicated ranges may lead to the formation of deposits and scale, and/or encourage the occurrence of corrosive phenomena inside the system. In case of service fluids other than water (e.g. ethylene or propylene glycol), it is advisable to always use special inhibitors that offer thermal stability within the operating temperature ranges and protection against corrosion phenomena.

It is absolutely essential that, in the presence of dirty and/or aggressive water, an intermediate heat exchanger is placed upstream of the heat exchangers.

#### 4.4.5 Anti-freeze solutions

- Protect the water circuit with an anti-freeze mixture when the ambient temperature may fall below freezing, or when the operating temperature of the carrier fluid is below 5°C.

If the use of products other than mixtures of water and ethylene or propylene glycol is envisaged, contact the manufacturer's technical office to check compatibility with the components of the machine.

## 4.5 Electrical connections

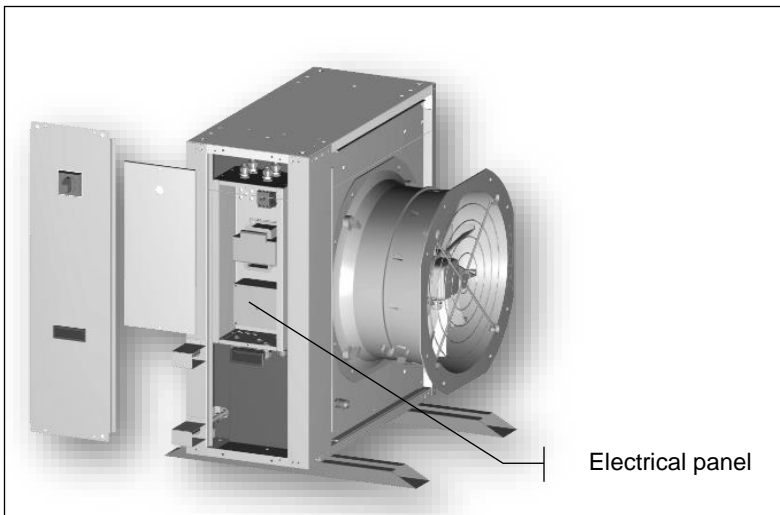
The electrical connections of the machine must be defined during the system design.

**DANGER:**

The electrical connections must only be designed and completed by personnel with precise technical competence or particular skills in the field of activity.  
Before proceeding, personnel must disconnect all power supply sources, making sure that no one may inadvertently re-connect them.

The specifications of the mains power supply must comply with IEC 60204-1 and the local regulations in force and be sufficient for the absorption requirements of the machine indicated in the wiring diagram and on the data plate.

- The machine must be connected to a single-phase or three-phase power supply depending on the model (type TT). Should the installation of a circuit breaker be envisaged in the electrical system, it must be type A or B.
- For the electrical connection, open the panels covering the electrical panel.

**OBLIGATION:**

The power supply line must be equipped with a main switch to protect the machine from overload or short circuit, if the machine is not powered by the internal unit.

The power supply must never be disconnected, except during maintenance operations, to ensure the operation of the fans.

### 4.5.1 Electrical data

Refer to the wiring diagram, the data plate on the machine and the Data Book.

### 4.5.2 Electric power supply connection

The standard power supply of the unit is independent of the internal unit.

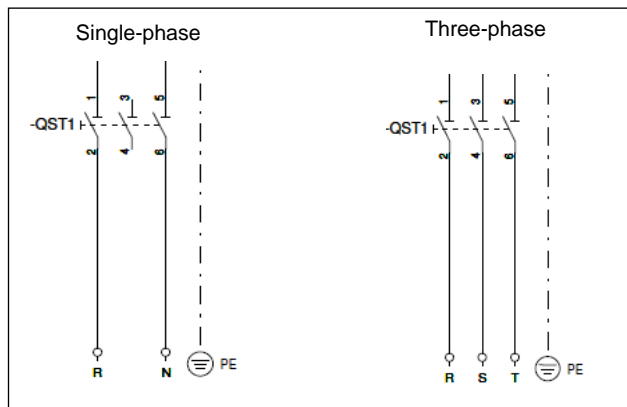
The power supply line must be equipped with all the protections and controls required by current regulations.

Use a conductor with protective sheath. The cable section depends on the maximum absorbed current of the machine (A) as shown in the dedicated wiring diagram.

For the entry of the power cables in the machine use the holes provided by the Manufacturer.

Do not touch hot or sharp surfaces.

Connect the power cable to the terminal board and to the ground terminal.



POWER SUPPLY

### 4.5.3 Electrical panel

The electrical panel is located inside the condenser structure. To access it, the side panel must be removed. The electric power panel is suitable for outdoor installation and complies with EN60204-1 standards.

The electric power panel includes:

- Degree of protection IP44 - degree of protection of the electric power panel inserted in the machine structure and not referring only to the panel.
- General isolating switch with door safety lock.
- Terminal board for electrical connections:
  - power supply - the power supply is independent of the internal unit.
  - 0-10Vdc signal for fan rotation speed control - to be connected to the internal unit.
  - alarm signal of the fans and, if present, of the FMC electronic board - to be connected to the internal unit.

#### VERSION WITH AC ELECTRIC MOTORS - MEDR-A series

FMC electronic board for fan rotation speed control. In case of power failure and malfunction, the board sends a digital alarm signal to the internal unit (refer to the wiring diagrams).

The system for regulating the supply voltage of the fans is managed by the FMC electronic board.

#### VERSION WITH EC ELECTRIC MOTORS - MEDR-E series

Direct control of the fan rotation speed by 0-10 Vdc signal.

Models with 4/6 fans:

There are two electric power panels, each with the above equipment. The panels are already interconnected, but only one of them performs the main panel action. The power supply and the control and alarm signals must be connected in this panel.

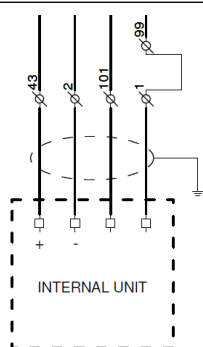
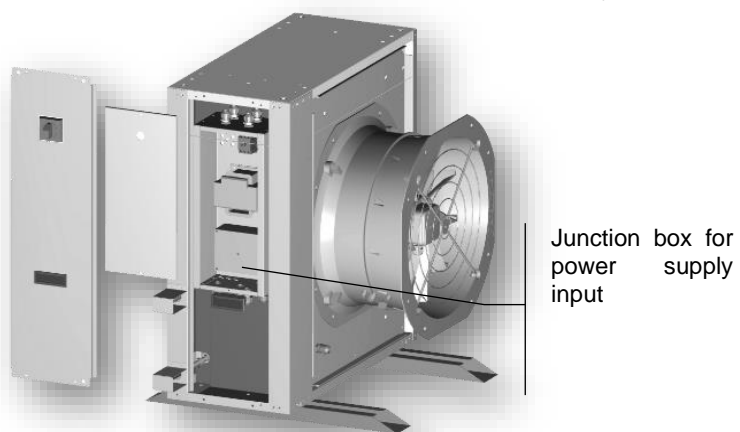
### 4.5.4 Auxiliary electric connections

The auxiliary connections can be found in the terminal board contained in the electrical panel of the main machine. Connections required:

- 0-10Vdc signal for condensation control;
- Fan thermal alarm;

For the connection of the auxiliaries use shielded cable 4 x 0.75 mm<sup>2</sup> with a maximum length of 120 m.

Remove the panels to access the power supply box



SIGNAL

43 – 2 → 0-10V signal

101 – 1 → alarm relay

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## 4.6 Optional installation

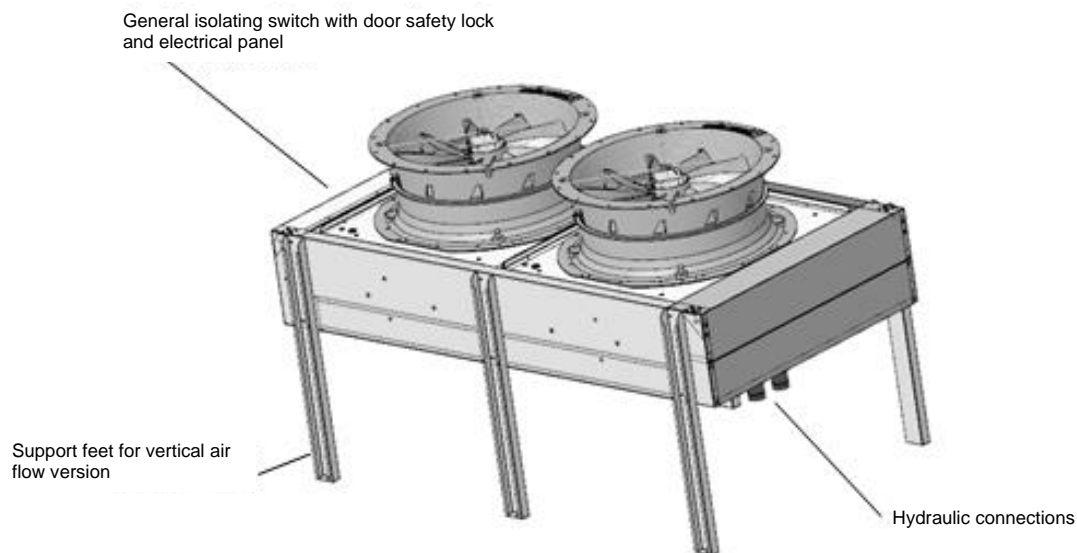
### 4.6.1 Vertical air flow

The accessory is only available for machines equipped with 1/2/3 fans.

The units can be supplied with support feet to obtain a vertical airflow. The support feet are supplied in assembly kits together with the necessary hardware. The installation of the feet is the responsibility of the installer. Always fix the unit to the floor as envisaged for the basic version.

The vertical airflow version is recommended for installation in windy areas.

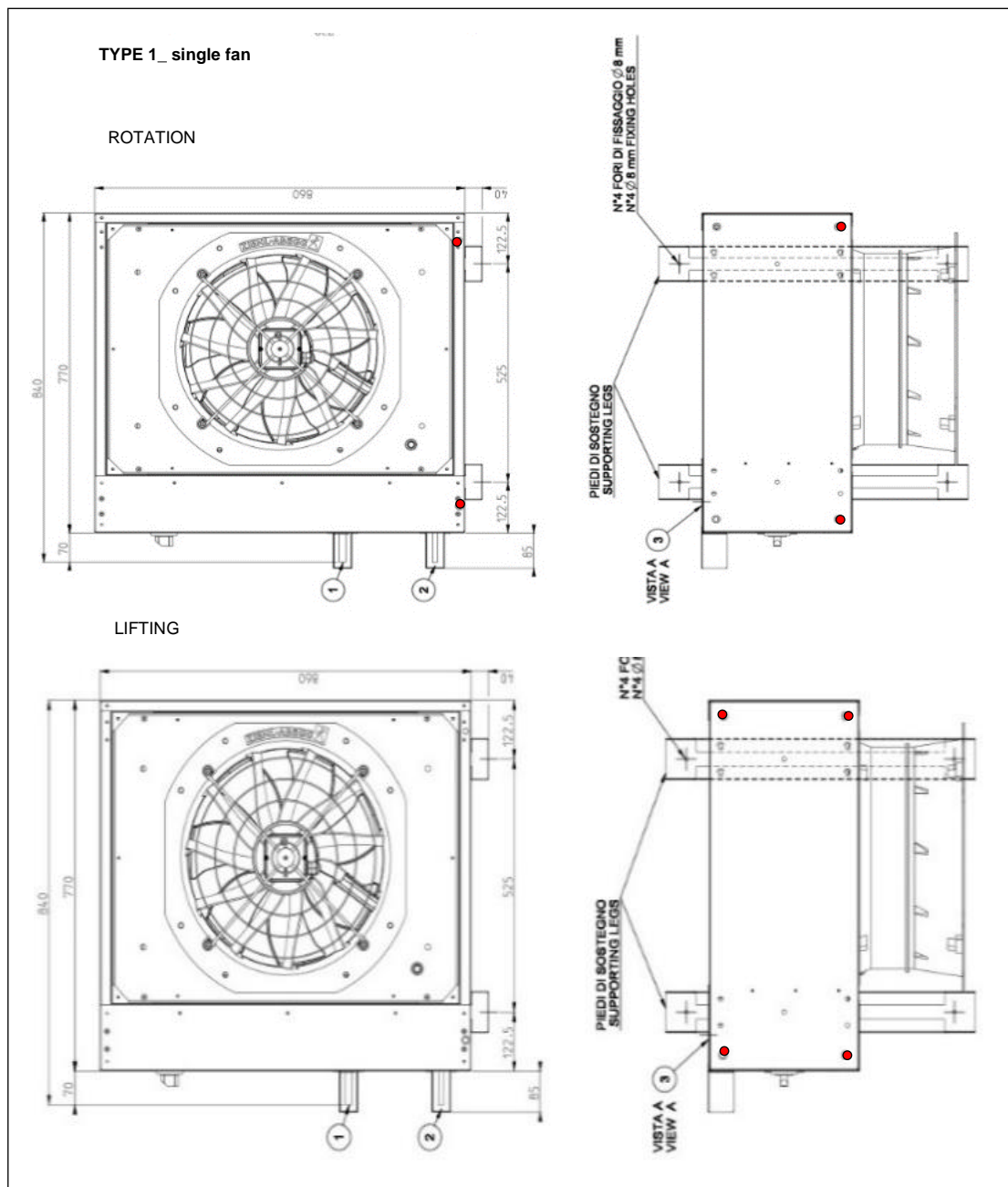
The vertical airflow version is not suitable for installations in seismic areas.



#### 4.6.2 Hooks for lifting and rotation

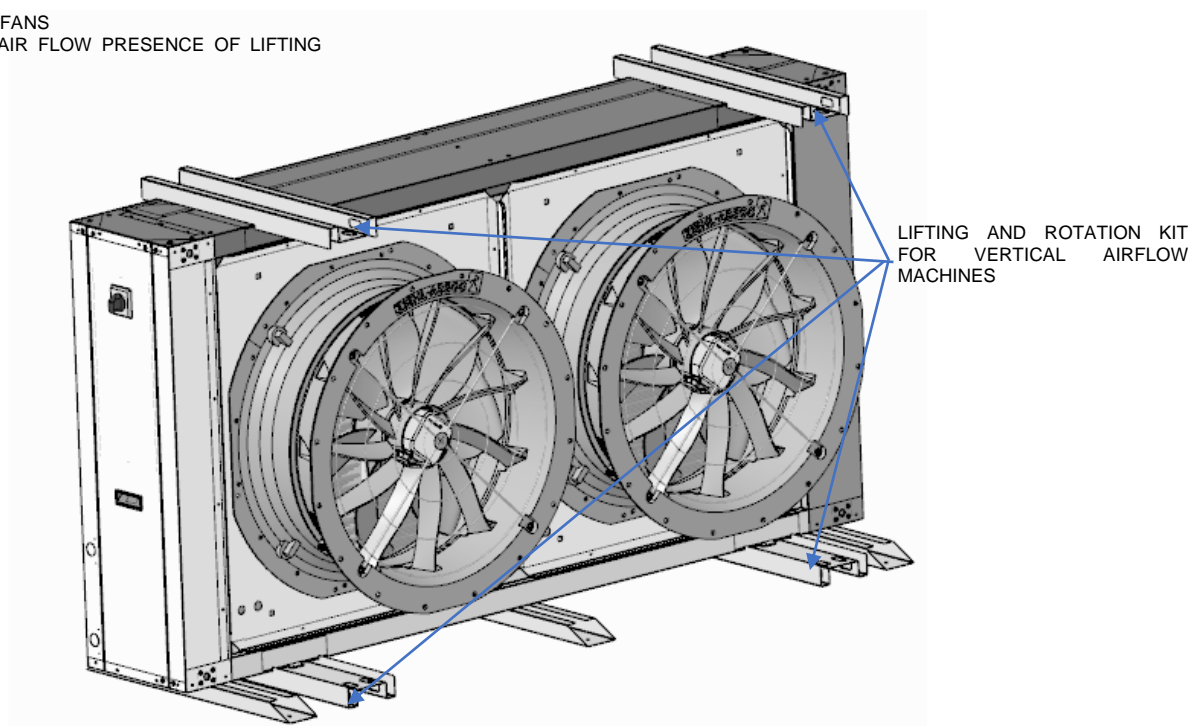
The types of supports for lifting and rotating the machine can be of 3 types, depending on the size and number of fans of the machine itself.

The machines are equipped with lifting devices.

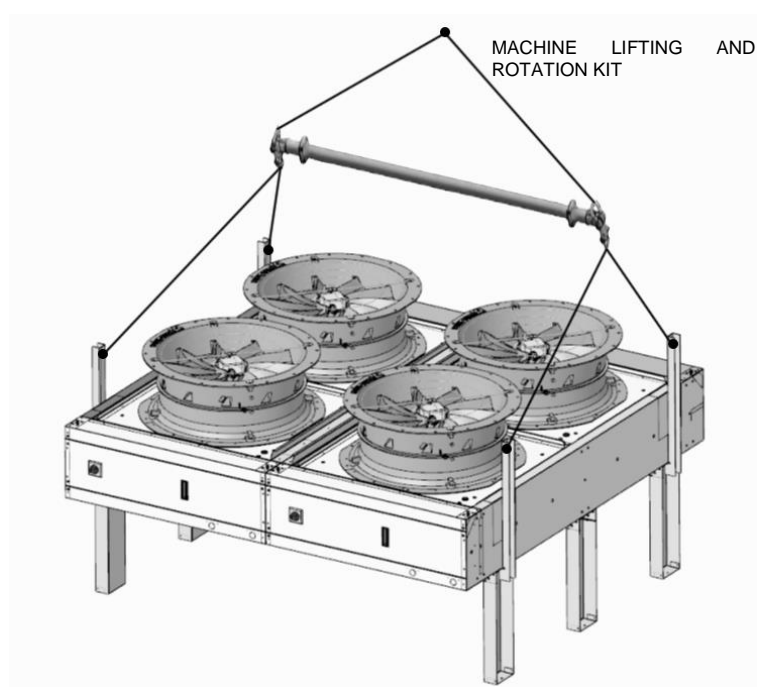


### TYPE 2\_ 2/3 fan

UNIT WITH 2/3 FANS  
HORIZONTAL AIR FLOW PRESENCE OF LIFTING  
EYEBOLTS

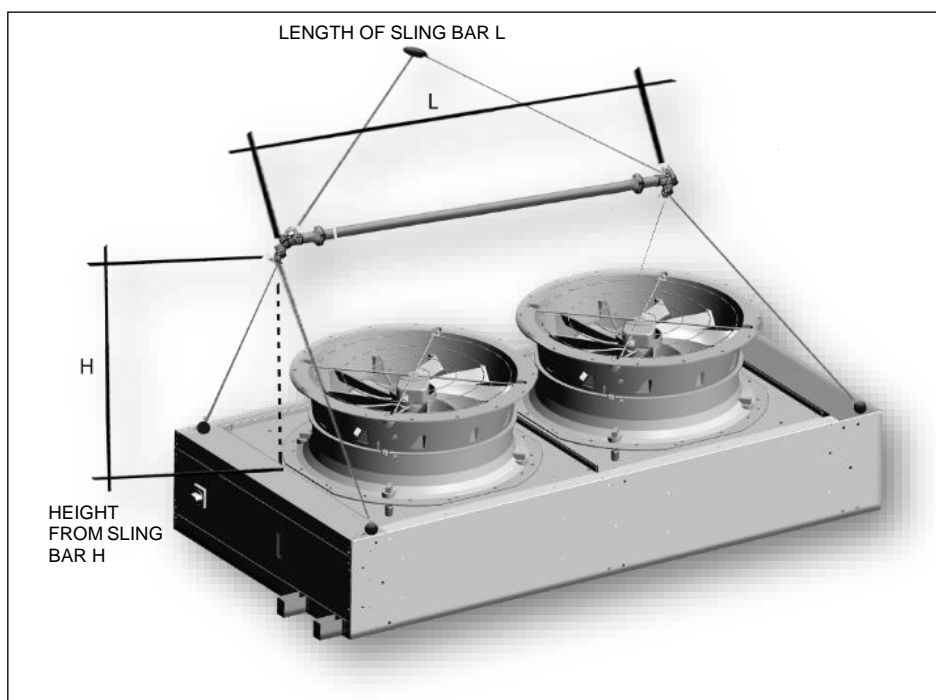


### TYPE 3 \_Double mobile



#### **OBLIGATION:**

All the unloading, handling and positioning operations must be carried out using appropriate means and by experience personnel, trained and authorised for such activities.  
Keep the machine on the pallet for unloading and handling operations.



**OBLIGATION:**

The sling bar length 'L' must never be less than the length of the machine. Ensure that the distance 'H' between the machine and the sling bar is greater than 1.1 metres.



**OBLIGATION:**

- Carefully carry out all handling operations to avoid damaging the coil and fans.
- Large machines are equipped with eyebolts to facilitate lifting.
- The version with vertical air flow is subject to all the regulations and instructions contained in this manual. In particular, the protection of the condenser from snow.

## 5 PRE-COMMISSIONING

### 5.1 Before starting the unit

Before contacting the Specialist Engineer, who will execute the first commissioning running test, the Installer must carefully check that the installation complies with the requirements and specifications set-out during the design stage, making sure that:

- that the electrical connection is correct, and that it guarantees compliance with the current Electromagnetic Compatibility Directive.
- the hydraulic connection to the exchangers is correctly terminated;
- the hydraulic system is loaded with pressurised liquid;
- the pumping systems are working;
- all shut-off valves are open.



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## 6 START

### 6.1 Machine start-up

Commissioning must be carried out by a specialist Engineer, in the presence of the Installer and an experienced Operator. The specialist Engineer will test the equipment, carrying out checks, calibrations and commissioning according to the applicable procedures falling under their responsibility.

The experience Operator must address questions to the specialist Engineer in order to acquire the necessary information to be able to carry out the control and operation activities that will fall under their responsibility.

After the first few days of operation, check the mesh filters of the hydraulic circuits and clean as necessary.

Before start-up, ensure the following:

- Check maintenance clearances and safety distances;
- Measure the absorption of the fans by comparing the value with the indications in the Data Book;
- Check the **power supply voltage**. Check that the mains voltage does not exceed +/- 10% of the machine nominal value;
- Check the **direction of rotation of the three-phase motors**. Check the direction of rotation of the three-phase motors. If it is wrong, reverse two phases on the general door locking switch;
- Check the **unbalancing between the phases**. Check that the unbalancing between the phases does not exceed 2%. Otherwise, contact the electricity distribution company to solve the problem.

## 7 METHOD OF USE

### 7.1 Provisions and warnings for use

The day-to-day use of the equipment does not require the presence of the operator, who must only intervene to carry out regular checks, in case of emergency, or in case of planned starts and stops. If these activities are carried out consistently and correctly, good long-term performance of the machine and the equipment will result.



#### INFORMATION:

Failure to comply with the procedures can cause bad operation of the machine and the system as a whole, resulting in early deterioration.

The machine runs automatically and is controlled by the main machine.

### 7.2 Emergency stop

Considering that there are no directly accessible moving parts in the machine, there is no need to install an emergency stop device. In any case, if installed this device would not reduce the risk as the emergency stop would be identical to the normal stop using the main switch.

### 7.3 Prolonged shutdowns of the machine

In case of extended machine inactivity (e.g. seasonal shutdown), the specialist Engineer must:

- carry out a leak test on the system;
- opening of the line circuit breaker;
- close the shut-off valves;

### 7.4 Start-up after extended machine inactivity

Before starting the machine, carry out all the maintenance activities. The specialist Engineer must also carry out adequate checks, calibrations and the start-up procedure.

## 8 FIRST DIAGNOSTICS

### 8.1 Troubleshooting ...

List of actions to be taken in case of machine fault.

| Fault                           | Cause     | Solution   | Intervention level |
|---------------------------------|-----------|--|--------------------|
| Poor / lack of heat dissipation | Fan       | Check the power supply to the fan                            | Service            |
|                                 |           | Check the incoming drive signal from the internal unit       | Service            |
|                                 |           | Check that the fan rotates freely                            | User               |
|                                 | exchanger | Check the air channel for any obstructions                   | User               |
|                                 |           | Check that the exchanger is clean                            | Service            |
|                                 |           | Check that the inside of the exchanger is clean (water side) | Service            |
|                                 |           | Check the exchanger for fluid leaks                          | User               |
|                                 | Plant     | Check the opening of the valves                              | Service            |
|                                 |           | Check the hydraulic circuit for any obstructions             | Service            |
|                                 |           | Check the operation of the fluid circulation pumps           | Service            |
|                                 |           | Check the hydraulic circuit for leaks                        | Service            |

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## 9 MAINTENANCE

### 9.1 Maintenance instructions

**OBLIGATION:**

Both regular and extraordinary maintenance activities must be carried out by **AUTHORISED TRAINED INDIVIDUALS** equipped with all the necessary personal protective equipment. The machine site of installation must meet all the safety requirements. The procedures set by the Manufacturer must be followed.

Before any kind of maintenance is carried out the following measures must be observed:

- isolate the machine from the mains using the yellow/red disconnecter on the machine electrical panel;
- place a sign saying, "Do not operate - maintenance in progress" on the disconnecting switch open;
- use appropriate personal protective equipment (for example: helmet, insulating gloves, protective goggles, safety shoes, etc.);
- use tools that are in good condition and be sure to be familiar with the instructions before putting them into practice.

Whenever measurements must be taken or checks performed with the machine running, it is necessary to:

- make sure that any remote control systems are disconnected. Keep in mind, however, that the PLC on board of the main machine controls their functions and can activate and deactivate the components, creating dangerous situations (such as for example powering fans and their mechanical drive systems);
- work on the open electrical panel for as short a time as possible;
- close the electrical panel as soon as the single measurement or check has been performed.

Furthermore, the following precautions must always be taken:

- during venting operations, protect against possible fluid leaks at dangerous temperatures and / or pressures;
- when replacing electronic boards, always use suitable equipment (extractor, antistatic bracelet, etc.);
- if replacing a fan or other heavy component, make sure that the lifting equipment is suitable for the weight;
- do not access the fan compartment without first isolating the machine using the main switch on the panel and displaying a "Maintenance - do not switch on" sign;
- always use only original spare parts purchased directly from the Manufacturer or from official dealers;
- before closing and restarting the machine, make sure to remove all tools or foreign bodies.

The list of scheduled maintenance operations is shown in the next paragraph of this manual.

For each intervention, both of ordinary and extraordinary maintenance, a special form must be issued and kept by the user.

If a Scheduled Ordinary Maintenance notebook is available on the machine, all the operations carried out must also be recorded on the same.

### 9.2 Scheduled maintenance

Carry out all the scheduled maintenance activities at the indicated intervals.

**INFORMATION:**

Failure to carry out regular maintenance will make the warranty null and void and relieve the manufacturer of all safety related responsibilities.

The scheduled maintenance activity intervals are indicated in the tables on the following pages.

### 9.3 Table of general maintenance jobs

|                       | WORK TO BE CARRIED OUT  | WORK INTERVALS |  |   |
|-----------------------|---|----------------|--|---|
|                       |   | Every day      | Beginning of season<br>Every 500 hours every<br>2 months | Beginning of season<br>every 1000 hours every<br>3 months |
| Expert<br>Operator    | Check any alarms.   | ●              |  |   |
|                       | Visually check for liquid leaks   | ●              |  |   |
|                       | Checking the outlet water temperature   |                | ●  |   |
| Specialist technician | Check the hydraulic circuit filters   |                | ●  |   |
|                       | Clean the coil  |                |  | 1 a year  |
|                       | Check the operation of exchanger and/or pipe anti-freeze resistances (where fitted) |                |  | ●   |
|                       | Check of electric connection tightness  |                |  | ●   |
|                       | Check for worn or damaged cables and replace as necessary                           |                |  | ●   |
|                       | Check the noise level of the fan bearings   |                |  | ●   |
|                       | Check the torque of bolts, moving components and components subjected to vibration  |                |  | ●   |
|                       | Check for any leaks on the hydraulic circuit.                                       |                |  | ●   |

| Specialist technician | Checking the operating parameters of the hydraulic circuits. In each circuit check the following |           |  |   |
|-----------------------|--|-----------|--|---|
|                       | WORK TO BE CARRIED OUT   | Every day | Beginning of season<br>Every 500 hours every 2<br>months | Beginning of season<br>every 1000 hours every<br>3 months |
|                       | The calibration and correct functioning of the flow switch (if present)                          |           |  | ●   |
|                       | Water flow control and exchanger cleaning status. See next chapter                               |           |  | ●   |
|                       | Water quality control for condensation with well water or tower water                            |           |  | ●   |
|                       | Control of the concentration of glycol solution (if present)                                     |           |  | ●   |

The frequency of the operations described in the table above should be considered indicative. In fact, it may undergo variations according to the method of use of the machine and the system in which the latter is required to operate.

### 9.4 Cleaning the finned coils

The accumulation of dirt on the exchange coils causes the malfunction of the machine. This can lead to a reduction in the flow rate of the air going through the heat exchanger, with an increase in fan consumption, or a decrease in cooling capacity.



#### INFORMATION:

Cleaning activities must be increased during the periods of higher formation of dirt (e.g.: in the period when leaves or flowers fall from trees).



#### OBLIGATION:

Do not use high pressure cleaners to clean the coil as excessive pressure can cause irreparable damage. Damage caused by cleaning with unsuitable chemical substances or excessive water pressure is not covered by the guarantee.

**DANGER:**

The aluminium fins are thin and sharp. Make sure to always wear appropriate PPE to avoid cuts and abrasions. Protect the eyes and face against the spraying of water and dirt during the cleaning process. Wear waterproof shoes or boots and clothes that cover all the body.

**INFORMATION:**

In the case of machines installed in aggressive atmosphere where there is a high degree of dirt, cleaning of the coil must be included in routine maintenance. This type of installation should in any case be cleaned on a regular basis, removing all dust and particles that settle on the coil as soon as possible and following the instructions below.

#### 9.4.1 Cu-AL "tube and fin" coils

As a minimum requirement, the coils must be inspected and cleaned on an annual basis after initial commissioning. The frequency of inspections should be increased in the case of aggressive weather conditions or a high degree of dirt. Follow the instructions below on how to clean the coils properly:

- **Remove all traces of dirt on the surface.** Remove any deposits like leaves, fibres, etc. using a vacuum cleaner (or, if necessary, a brush or other soft accessory, making sure not to scratch and damage the metal parts). If using compressed air, always keep the flow of air perpendicular to the surface of the coil to avoid bending the aluminium fins. Be careful not to bend the fins with the nozzle of the compressed air gun.
- **Rinse.** Rinse with water. It is possible to use chemical substances (special detergents for finned coils). Rinse by letting water flow through each passage in the fins until they are perfectly clean. Always aim the jet of water perpendicularly to the surface of the coil in order to avoid bending the aluminium fins. Avoid hitting the coil with the hose. It is advisable to put a thumb on the end of the hose to adjust the pressure of the jet of water, rather than use nozzles that could knock against the coil and damage it.

#### 9.4.2 Treated Cu-Al "tube and fin" coils

There are various types of surface treatment for protecting Cu-Al coils. The general rules are given below. It is advisable, in any case, to always refer to the specific documentation provided by the supplier, with whom we recommend setting up a maintenance contract with guarantee.

As a minimum requirement, the coils must be inspected and cleaned on an six-monthly basis after initial commissioning. In coastal and/or industrial areas, inspections and cleaning should be carried out on a quarterly or monthly basis, depending on the characteristics of the place and the degree of pollution.

**Routine maintenance.**

- **Remove all traces of dirt on the surface.** Remove any deposits like leaves, fibres, etc. using a vacuum cleaner (or, if necessary, a brush or other soft accessory, making sure not to scratch and damage the metal parts). If using compressed air, always keep the flow of air perpendicular to the surface of the coil to avoid bending the aluminium fins. Be careful not to scratch the coil with the nozzle of the compressed air gun.
- **Rinse.** Use a low pressure jet of hot or cold water (refer to the instructions of the coating manufacturer) to rinse the coil, then wash it with water mixed with the cleaning agent specified by the coating manufacturer, and rinse again.
- **Inspection.** After washing, always inspect the coil to check the coating for any signs of damage, deterioration and corrosion phenomena. Notify the qualified applicator immediately of any signs of damage, deterioration or corrosion on the coil. The following detergent has been approved for use on coated coils to remove mould, dust, soot, traces of grease, fluff and other particles, providing that it is used in compliance with the manufacturer's instructions on mixing and cleaning:

Detergent for coated Cu-Al "tube & fin" coils. **Product:** Blygold

**Retailer:** Coil Clean Blygold

### Supplementary maintenance.

The salient feature of the coating is the fact that it can be reapplied. Solid particles (like sand) can enter from the side of the coil where air flows in, and erode the corrosion protection exposing the metal. Should this happen, the surface coating must be reapplied. Reapplication should be carried out by qualified personnel. The coating can be reapplied several times during the useful life of the coil. Normally, good routine maintenance reduces the need for supplementary maintenance.

## 9.5 Extraordinary maintenance

If repairs are needed, contact a Service Centre authorized by the manufacturer.



#### **INFORMATION:**

Failure to comply with the above will make the warranty null and void and relieve the manufacturer of all safety related responsibilities.



#### **OBLIGATION:**

Only use original spare parts (see the list of “recommended spare parts”).

## 10 DISPOSAL OF THE MACHINE

Contact a Service Centre authorised by the Manufacturer to arrange for disposal of the machine.



#### **OBLIGATION:**

When components are replaced, or when the entire machine is removed from the installation at the end of its useful life, the following requirements must be observed to minimise impact on the environment:

- the refrigerant gas must all be collected by specialist personnel with the necessary certification and delivered to the collection centres;
- the lubrication oil in the compressors and cooling circuit must be collected and delivered to the collection centres;
- the structure, the electrical and electronic equipment and the components must be sorted according to category and material and delivered to the collection centres;
- if the water circuit contains mixtures with antifreeze, these must be collected and delivered to the collection centres;

- Observe the domestic laws in force.



#### **OBLIGATION:**

The machine contains electrical and electronic parts that may contain substances that are harmful for the environment and human health, and which therefore cannot be disposed of with normal municipal waste. The machine cannot be disposed of with mixed municipal waste.

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The machine is identified with the following symbol:



to indicate that it must be disposed of by separating the various materials.

The customer has an important role in ensuring reutilisation, recycling and other forms of recovery of the machine.

The machine is classed as PROFESSIONAL by WEEE Directive 2012/19/EU. Upon dismantling, it must be treated as waste by the user, who may ask the reseller to collect it, or take it to authorised waste collection centres.

Italy only:

MEHITS is part of the RIDOMUS consortium for the disposal of WEEE waste at the end of its life. At the end of the useful life, the owner of products classed as waste may contact the distributor, so that they can be collected free of charge by the consortium of which MEHITS is part.

**mitsubishi** **ELECTRIC HYDRONICS & IT COOLING SYSTEMS S.p.A.**

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