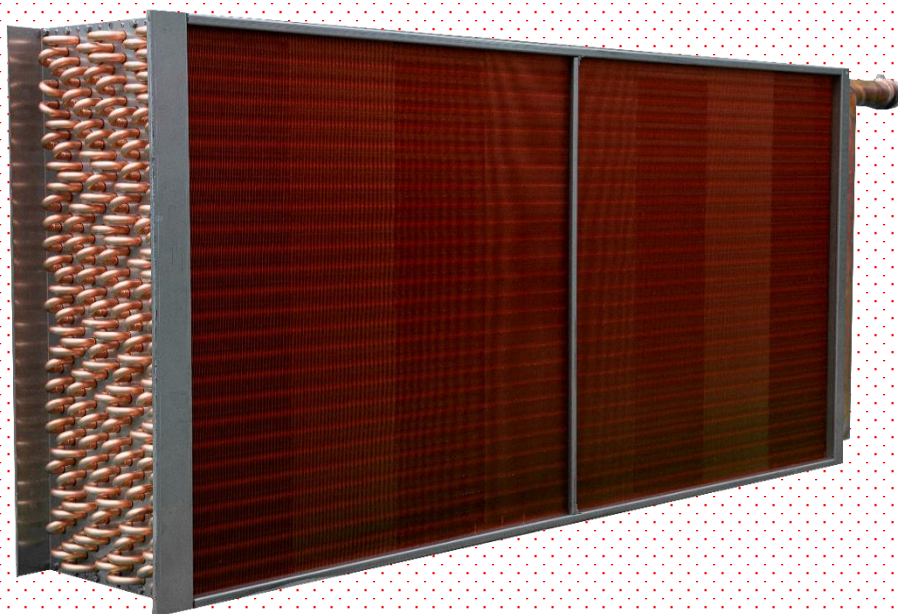


MAINTENANCE MANUAL

MANUALE D'USO E MANUTENZIONE



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INTRODUCTION

This use and maintenance manual indicates the main operations required to use and maintain the supplied units as well as possible. This manual will define the most important points paying particular attention to what can cause problems to persons, things and environment. It is anyway advisable to have the equipment operated by qualified personnel trained for the task to be carried out. This manual includes important indications to follow, but certainly it isn't exhaustive. Therefore, it'll be the user's concern to complete the manual indications with proper procedures in order to achieve a correct use of the equipment.



1. EQUIPMENT DESCRIPTION

The coil comprises the following items:

- Main body and tube side,
- Connections

This coil is shown in detail in the attached construction drawing.

The equipment has been inspected and suitable certificate (declaration of compliance) has been issued.

The installer is required to install a safety pressure relief device within the circuit up-stream of the plant.

This type of equipment must be used solely for the type of heat exchanger indicated on the machine plate.

2. TECHNICAL SPECIFICATION

All the most important coil data in keeping with current legislation is shown on the data plate attached to the coil itself.

All this data is also shown on the attached construction drawing.

The equipment weight and dimensions are shown in the attached manufacturer's construction drawing or on the necessary transportation packaging (where contractually applicable).

3. SAFETY RULES

All hazardous components must be labelled with a warning sign (Recommendation to be adopted for the plant by user).

The signs must never be removed and if necessary damaged ones must be replaced.

The most common risk for these coils is in relation to:

- Hot surfaces
- Sharp edges of the finned packs of the coils.

The above-mentioned risks must always be clearly labelled with the following warning signs.



SUPERFICIE CALDE

Operators must wear safety shoes, gloves, hard hat, safety goggles and their overalls must have hermetically sealed sleeves.

Avoid loose clothing, watches, necklaces, bracelets and any other item of clothing that could be caught up.

Long hair cannot be left to hang loose but must be kept tied back.

All operations must be carried out in safe conditions, and must never be at variance with all of the process and system safety regulations.

Prior to any work being carried out on any equipment accessory, the instructions provided in this manual must always be read.

Do not touch surfaces containing process liquids. They can reach high temperatures which can be hazardous as regards burning or scalding.

Prior to carrying out maintenance, ensure that all the equipment is kept separate from all heat and/or electrical energy sources.

During use, avoid touching any part of the equipment, keep clear of the equipment and neither lean nor sit on the outer casing or any other part of the equipment.

Do not leave any type of object on the casing or on the surfaces of the equipment.

Do not leave or place containers containing any kind of liquids on the equipment.

During overhaul and/or maintenance of the equipment, a sign with the following text should be displayed "Machinery out of service due to maintenance operations".

Ensure that all guards are correctly reassembled once maintenance operations have been concluded.

Ensure that the fitted component is functioning properly after maintenance, and always use only genuine spare parts.

The equipment has not been designed to operate in extreme environmental conditions (different from design ones) nor during earthquakes.

4. PACKAGING

Units are supplied with a packing suitable for transport to avoid damages. Any accidental damages due to incorrect transport and handling can't be imputed to manufacturer.

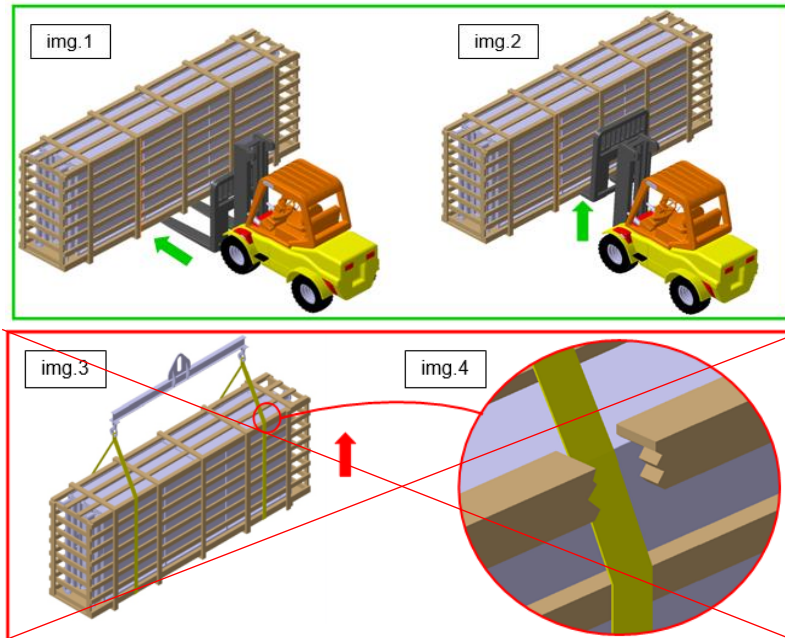
5. HANDLING

The following instructions get used to:

- Define the handling criteria;
- Define the lifting criteria;
- Ensure that the materials are complete.

6. LOADING AND UNLOADING

The wooden cage must be loaded and unloaded using a pneumatic forklift (img.1 and img.2). Using straps during lifting may cause structural damage to the wooden cage with potential repercussions on the heat exchangers (img.3 and img.4)



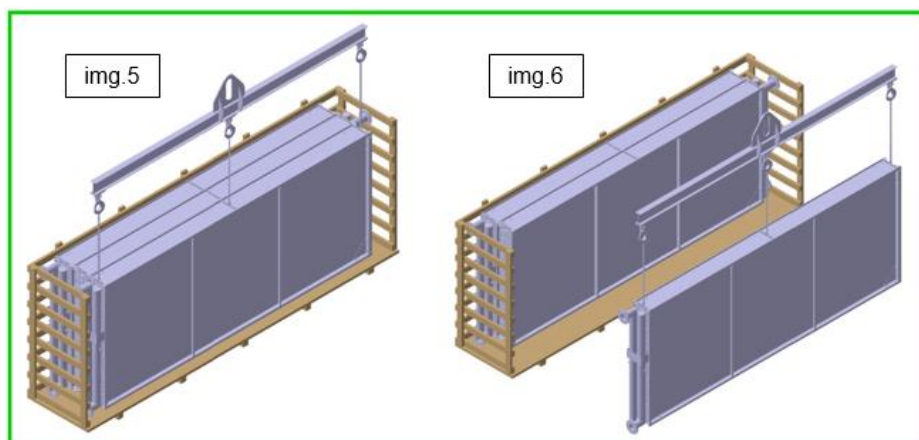
The shipment is removed from the truck in the following way (for shipments where a forklift truck or crane is necessary):

- Ensure that the crane operator and/or the truck driver lift the unit securely. Always consider the weight of the coil with regard to crane, forklift, etc.
- Remove the packing and verify that no damage, previously hidden, has occurred. Here can be added that slightly dented fins normally can be repaired easily. You can, as habitual costumer, have advantage of buying a fin straighten tool, which is a useful tool for your fitter.
- Dented or slightly damaged tubes are only to be repaired by a qualifier fitter. If the damage of the tubes cannot be repaired by your fitter contact your local representative about returning the shipment to the factory.
- Be aware that you according to insurance procedures only have 1 working week to forward your damage complaint, if the damage has not been marked in the consignment note.

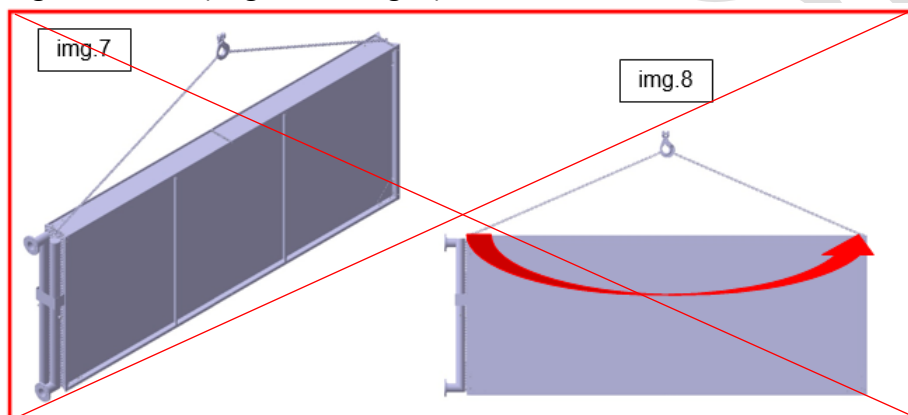
7. HANDLING REQUIREMENTS

a. Remove the heat exchanger

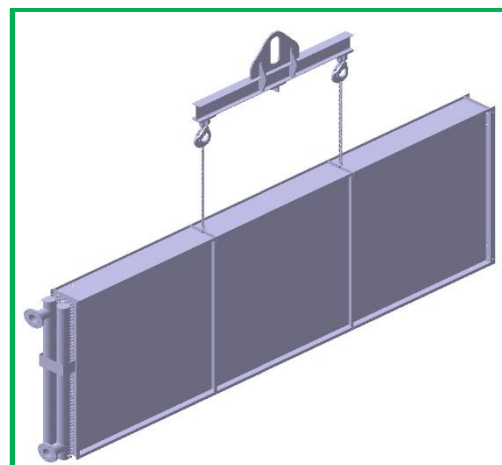
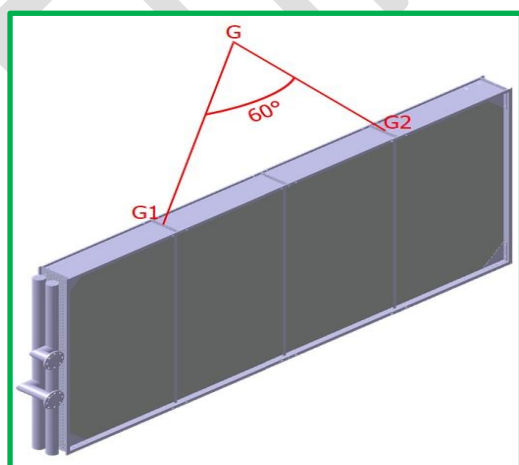
It is preferable to use a spreader beam to remove the heat exchangers from the wooden cage (img. 5 and img. 6). Using this type of equipment minimises stresses that may damage the heat exchangers.



Due to the length of the heat exchangers, if a single, central anchoring point is used this may cause the heat exchangers to bend (img. 7 and img. 8).

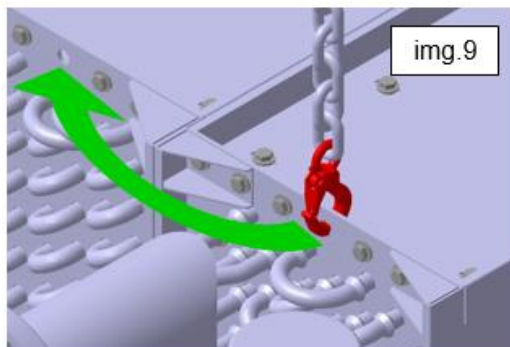


Alternatively, where there was the possibility, use the intermediate docking points, as shown in the images below.



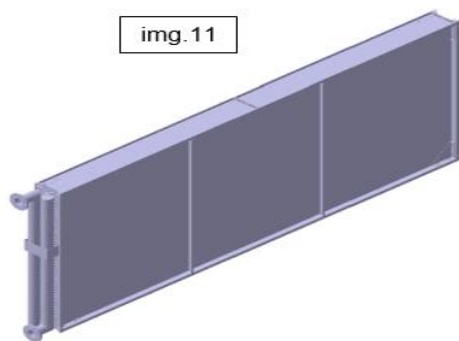
b. Lifting points

The Ø14 holes found on the top of the heat exchanger can be used as attachment points for this type of handling (img. 9 and img. 10).

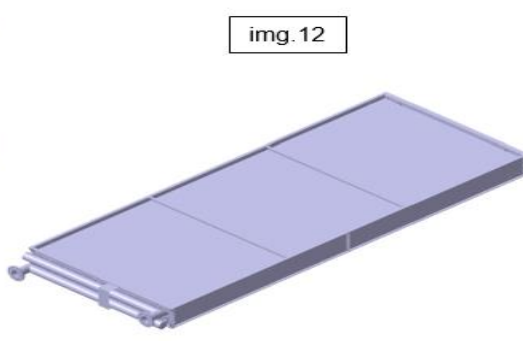


c. Vertical and horizontal operation

Vertical or horizontal operation refers to the positioning of the heat exchanger, as shown in the images below (img.11 and img.12).



Vertical Operation



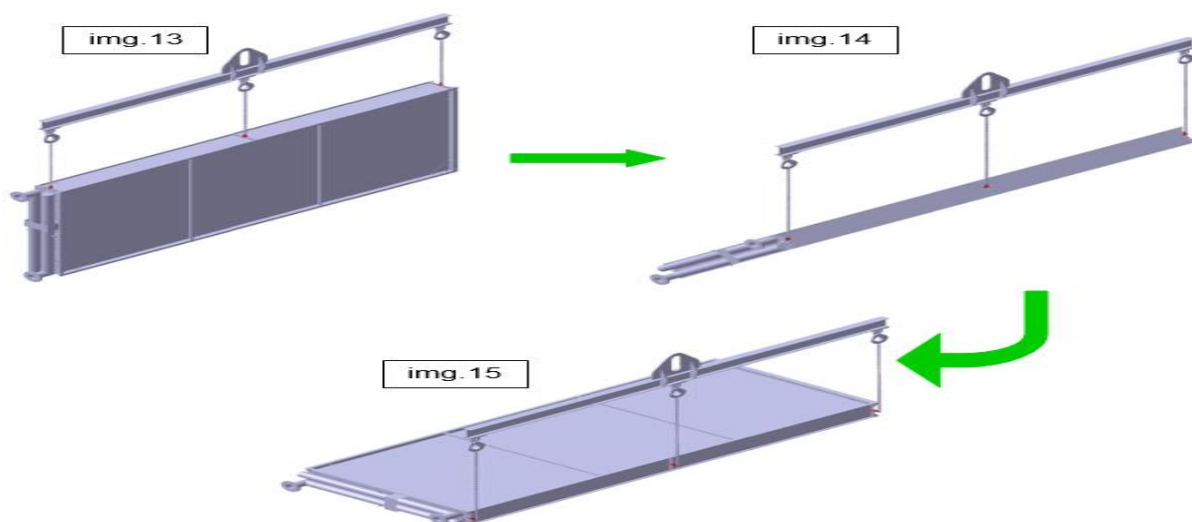
Horizontal Operation

d. Vertical operation handling

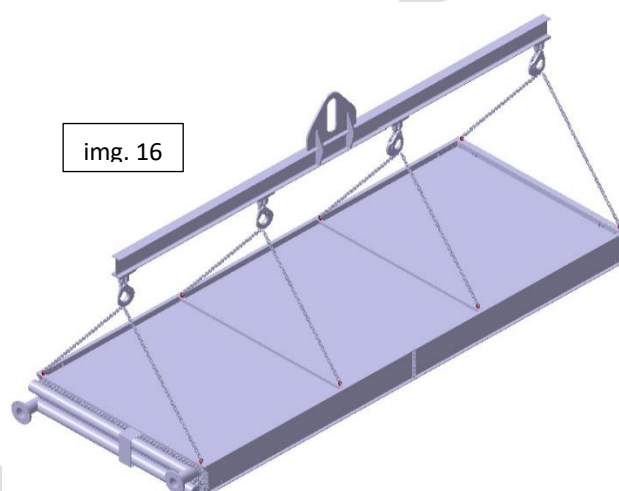
If the heat exchangers are in a vertical operating position, please refer to preceding paragraphs for information regarding handling and attachment points.

e. Horizontal operation handling

If, on the other hand, the heat exchangers are in a horizontal operating position, they must be lifted in two steps, as follows. Still using the spreader beam, tilt the heat exchanger until it rests on the floor (img. 13, img. 14 and img. 15).

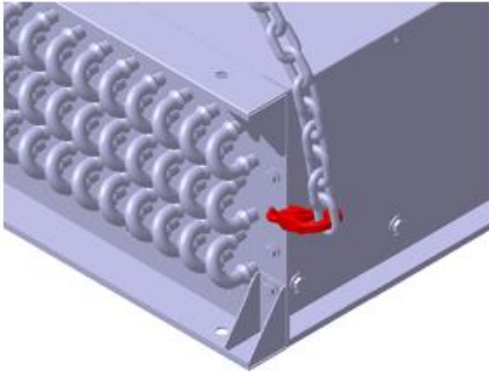


Once the heat exchanger is resting on the floor, move it as shown in img. 16



f. Attachment points for horizontal operation

For this type of movement, attach eyebolts to the holes found on the front of the heat exchanger (img. 17 and img. 18).



img.17



img.18

g. Failure to comply with requirements

Should it become apparent that damage of any kind has resulted from failure to comply with any of the above requirements (unless previously discussed and agreed), Eurotec s.r.l. reserves the right to deduct all costs incurred in managing and resolving this failure from the relevant party.

8. DELIVERY

This equipment is not hazardous for authorised operators provided it is used according to the instructions supplied by Eurotec srl contained in this manual and that all the envisaged safety accessories are kept in an operational condition. The equipment is fully identified using its badge number. For any information required and in any exchange with the manufacturer, the badge number must always be communicated.

Upon delivery of the equipment ensure that:

- The supply package corresponds to the order specification, by checking the delivery note and the attached documentation.
- The packaging is in good condition and immediately inform Eurotec srl should there be any damage or lost items (even as regards documentation).

Again, it should be borne in mind that all drawings and any document delivered with the equipment are the property of Eurotec srl which owns all rights and these cannot be divulged to a third party (unless agreed).

9. TRANSPORT

Transport shall be carried out by qualified and trained personnel with means insured according to the effective laws.

The units loading and unloading shall be carried out by qualified and trained personnel with means of suitable capacity as well as volume by taking all necessary precautions. The personnel charged with this task shall implement all accident prevention prescriptions to avoid any accidents and/or damages (refer to local standards).

10. STORAGE

If units are not installed immediately after their arrival at their destination, they shall be stored indoors and protected from atmospheric agents, collisions, tampering.

11. INSTALLATION

The installer will place the heat exchanger coil according to the rules of a workmanlike manner complying with the temperature and pressure data indicated in the technical data sheets of our EUROTEC COILSxx and any nameplate and/or indications agreed when ordering. For handling, the installer must use the suitable holes or any eye bolts obtained on the coil frame. The weight of the coil is shown on the relevant technical sheet. Otherwise, please ask for it. The treated air must be distributed perfectly evenly over the exchanging surface. Special attention must be paid to prevent the accidental leakage of the fluid circulating inside the tubes (hot water, superheated water, refrigerants etc.) that may cause harm to persons, property and environment. Make sure that the heat exchange coils are levelled, both for vertical installation (horizontal air flow), and for horizontal installation (vertical air flow) and tilted. This is to prevent the formation of air pockets during the operation or fluids retention in case of emptying. In the case of tilted assembly never exceed the inclination recommended in the design. Connect the input connectors to the output ones according to the diagram agreed or arranged on the machine and/or system. We recommend providing the installation of feeding and discharge gate valves, essential for maintenance and repair. Make connections related to feeds and discharges so as to allow removal of the heat exchange coils without hindrance.

Avoid too tightened and rigid connections or in any case not suitable to neutralize any possible presence of dilations. To move the heat exchanger during the installation, use the provided holes and eyebolts on the frame.

12. AIR VENT

We recommend to fill the water coils from the bottom, so as to completely eliminate the air. In any case, the installer must pay close attention to this operation, the presence of air may in fact give rise to many problems including corrosion and reduction of heat capacity. The coils for steam

condensation must be equipped with air eliminator or with arresters featuring eliminators (thermostatic traps with float air vent).

13. MAINTENANCE

Check to every 3 months that there are no obstructions on the heat exchange fins due to the presence of foreign bodies (in principle at least once a year). In case of obstructions provide by air blow. Any limited irregular folds not exceeding the finned pack to 15 ° shall not affect the thermal performance of the machine. In case of accumulation of dirt, grease, etc. It should be changed to appropriate bathrooms degreasing / descaling of all the battery as long as non-corrosive to the materials that make up the same. In case of damaged parts, comb the coil with a special tool using the appropriate spacing of the comb for fins.



14. REPAIRS AND DANGER OF FROST

All maintenance and repair should be performed at plant shutdown, a cold battery and subject to any applicable safety standards. Repair of pipes that make up the finned pack must be carried out to plant shutdown, a cold battery and without pressure in the pipes. The heat exchanger must be carefully emptied from the circulating fluid inside through the appropriate vents placed on the same attacks or connections.

In case of outdoor installation or facility in winter stop, the battery must be carefully defended from the danger of working fluid frost inside, using antifreeze systems or with careful draining and elimination of retention by capillarity by blowing compressed air. Failure to follow the above can result in breakage of the package finned tubes even if made of iron or stainless steel. In case the battery is equipped with crankcase seal on the tube plates and it is necessary to perform a repair in its interior, and 'can remove it by breaking the welding points or by acting on the fixing screws.

15. WARRANTY

The warranty regulations in force, for transactions between companies (B2B), is 12 months from delivery date. A warranty activation request must be made within 15 days from the date of discovery of the defect. All forms of warranty is void if:

1. you do not install a safety valve in accordance with Directive 2014/68/UE;
2. you do not install an expansion vessel complying with EU Directive 2014/68/UE and suitable for the capacity and temperatures of the system;
3. design temperatures and pressures are not complied to;
4. the standards to carry out a workmanlike manner installation are not complied to;
5. just one of the product components is tampered with/or damaged without the authorisation of Eurotec s.r.l.;
6. if demineralized water has been used as exchanged fluid

16. USE

The user must use appropriate thermodynamic check, in order to find temperature variations on the shall surface, due to inefficiency or breaking of the inner refractory. The use of units shall keep to the following prescriptions. As already reported in the introduction, the following directions have to be considered as an indication.

Any operations shall be compulsorily carried out by personnel properly trained by the user. Use conditions refer to the design data. These conditions have to be considered as limit conditions never to be exceeded in any case.

17. INNER FLUID

The materials of units have been chosen according to the fluids used during their operation. Any changes of fluids shall be submitted for the designer's and/or manufacturer's approval.

Chemical H₂O parameters regarding the water "in/out" of the heat exchangers.
Allowable quantity - parts per million

✓ Ammonia	None
✓ Bacteria	Bacteriolog safe
✓ Calcium	< 800 ppm
✓ Chlorides	< 5 ppm
✓ Dissolved solids	50 - 150 ppm
✓ Iron	3 ppm
✓ Nitrates	< 10 ppm
✓ Nitrogen compounds	None
✓ Oxidising salts or acids	None
✓ pH level	6 - 8.5
✓ Silica as SiO ₂	< 150 ppm
✓ Sulphides	< 1 ppm
✓ Sulphur Dioxide	< 50 ppm

18. DECOMMISSIONING

Once the equipment has reached the end of its lifecycle, when the unit and/or a part of it has to be dismantled, the Competent Authority must be notified, and special attention must be given to the heat exchange fluid contained in the tubing. This will have to be disposed of according to the instructions provided in the relative safety data sheets, and in any case in accordance with the laws currently in force in the country where the equipment has been installed. Do not throw the packaging and any other piece of equipment in the environment.

19. SCHEME "TYPE" INSTALLATION WATER COIL

