

# INSTALLATION & OPERATION MANUAL

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## FAN COIL UNITS

MODELS:  
(R410A)

KFHC12H0EN1	KFHE12H0EN1
KFHC20H0EN1	KFHE20H0EN1
KFHC25H0EN1	KFHE25H0EN1
KFHC30H0EN1	KFHE30H0EN1
KFHC38H0EN1	KFHE38H0EN1
KFHC48H0EN1	KFHE48H0EN1
KFHC57H0EN1	KFHE57H0EN1
KFHC65H0EN1	KFHE65H0EN1
KFHC78H0EN1	KFHE78H0EN1

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## 1. PRECAUTIONS

- Be sure to be in conformity with the local, national and international laws and regulations.
- Read "PRECAUTIONS" carefully before installation.
- The following precautions include important safety items. Observe them and never forget.
- Keep this manual in a handy place for future reference.
- Before out from factory, FAN COIL UNIT (AIR UNITS) has passed Fan Coil Overpressure Resistant Test, Statically and Dynamically Balanced Adjustment, Noise Test, Air (cool) Volume Test, Electric Property Test, Outline Quality Detection.

The safety precautions listed here are divided into two categories. In either case, important safety information is listed which must be read carefully.



### WARNING

Failure to observe a warning may result in death.



### CAUTION

Failure to observe a caution may result in injury or damage to the equipment.

After completing the installation, make sure that the unit operates properly during the start-up operation. Please instruct the customer on how to operate the unit and keep it maintained.



### WARNING

**Be sure only trained and qualified service personnel to install, repair or service the equipment.**

Improper installation, repair, and maintenance may result in electric shocks, short-circuit, leaks, fire or other damage to the equipment.

**Install according to this installation instructions strictly.** If installation is defective, it will cause water leakage, electrical shock and fire.

**When installing the unit in a small room, take measures against to keep refrigerant concentration from exceeding allowable safety limits in the event of refrigerant leakage.** Contact the place of purchase for more information. Excessive refrigerant in a closed ambient can lead to oxygen deficiency.

**Use the attached accessories parts and specified parts for installation.**

otherwise, it will cause the set to fall, water leakage, electrical shock and fire.

**The appliance must be installed 2.3m above floor.**

**The appliance shall not be installed in the laundry.**

**Before obtaining access to terminals, all supply circuits must be disconnected.**

**The appliance must be positioned so that the plug is accessible.**

**The enclosure of the appliance shall be marked by word, or by symbols, with the direction of the fluid flow.**

**For electrical work, follow the local national wiring standard, regulation and this installation instructions. An independent circuit and single outlet must be used.**

If electrical circuit capacity is not enough or defect in electrical work, it will cause electrical shock fire.

**Use the specified cable and connect tightly and clamp the cable so that no external force will be acted on the terminal.**

If connection or fixing is not perfect, it will cause heat-up or fire at the connection.

**Wiring routing must be properly arranged so that control board cover is fixed properly.**

If control board cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electrical shock.

**If the supply cord is damaged, it must be replaced by the manufacture or its service agent or a similarly qualified person in order to avoid a hazard.**

**An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.**

**When carrying out piping connection, take care not to let air substances go into refrigeration cycle.**

Otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration cycle.

**Do not modify the length of the power supply cord or use of extension cord, and do not share the single outlet with other electrical appliances.**

Otherwise, it will cause fire or electrical shock.

**If the water leaks during installation, ventilate the area immediately.**

**After completing the installation work, check that the water does not leak.**

The cool water in the unit is not lower than 3°C, hot water is not higher than 65°C. Water in the unit must clean, air quality must meet to the standard of PH=6.5~7.5.



## CAUTION

### Ground the air conditioner.

Do not connect the ground wire to gas or water pipes, lightning rod or a telephone ground wire. Incomplete grounding may result in electric shocks.

### Be sure to install an earth leakage breaker.

Failure to install an earth leakage breaker may result in electric shocks.

### Connect the outdoor unit wires, then connect the indoor unit wires.

You are not allowed to connect the air conditioner with the power source until wiring and piping the air conditioner is done.

### While following the instructions in this installation manual, install drain piping in order to ensure proper drainage and insulate piping in order to prevent condensation.

Improper drain piping may result in water leakage and property damage.

### Install the indoor and outdoor units, power supply wiring and connecting wires at least 1 meter away from televisions or radios in order to prevent image interference or noise.

Depending on the radio waves, a distance of 1 meter may not be sufficient enough to eliminate the noise.

**This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.**



**DISPOSAL:** Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary.

### Don't install the air conditioner in the following locations:

- There is petrolatum existing.
- There is salty air surrounding (near the coast).
- There is caustic gas (the sulfide, for example) existing in the air (near a hot spring).
- The Volt vibrates violently (in the factories).
- In buses or cabinets.
- In kitchen where it is full of oil gas.
- There is strong electromagnetic wave existing.
- There are inflammable materials or gas.
- There is acid or alkaline liquid evaporating.
- Other special conditions.

## 2. USER

### 2.1 Machine description

The fan-coil unit for the treatment of air in indoor environments, available in versions with casing, versions for building-in.

#### 2.1.1 Standard conditions of use

The fan-coil unit is intended for the treatment of air (summer and winter climatisation) inside buildings used for domestic or similar purposes. The unit is not designed for installation in rooms used for laundry purposes.



## CAUTION

### DANGER!

The machines are designed for indoor installation for use in domestic or similar environments.

### DANGER!

Do not introduce objects through the air intake or delivery grilles.

### IMPORTANT!

The unit will function correctly only if the instructions for use are scrupulously followed, if the specified clearances are complied with during installation and if the operating restrictions indicated in this manual are strictly adhered to.

### IMPORTANT!

If clearance distances are not maintained at installation, it could cause maintenance difficulties and reduction in performance.

#### 2.1.2 Construction features

1. Connections for standard coil;
2. Fixing slots;
3. Defrosting tray;
4. Condensate discharge;
5. Air filter;
6. Blower;
7. Coils;

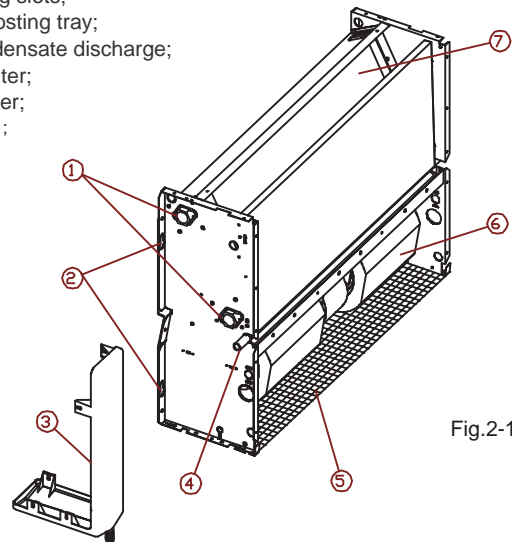


Fig.2-1

### 2.1.3 Versions with casing

- Supply voltage 220-240V~ 1ph 50Hz;
- Finned coil type heat-exchanger consisting of copper tubes and aluminium fins,with connections on the left reversible to fit on the right.
- Three-speed centrifugal blower with aluminium blades statically and dynamically babanded. Diretly-coupled motor equipped with internal thermal protection and condenser permanently in circuit.
- Casing in pre-painted galvanised steel sheet,clad in a protective film of PVC,complete with the-rmoacoustic insulation,grilles in heat-resistant ABS polymer with fixed vanes.
- Condensation collection tray with natural drainage,complete with anti-condensation insulation.
- Mesh filter in regenerable polypropylene.

#### ■ VERSION I KFHC

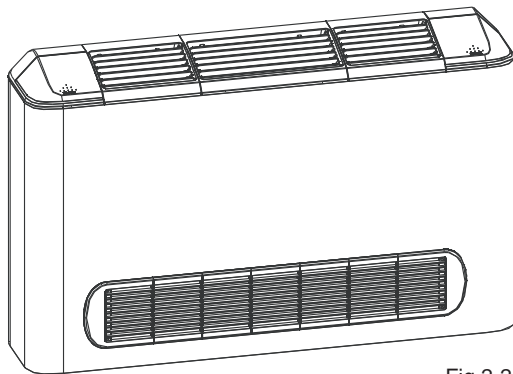


Fig.2-2

#### ■ VERSION II

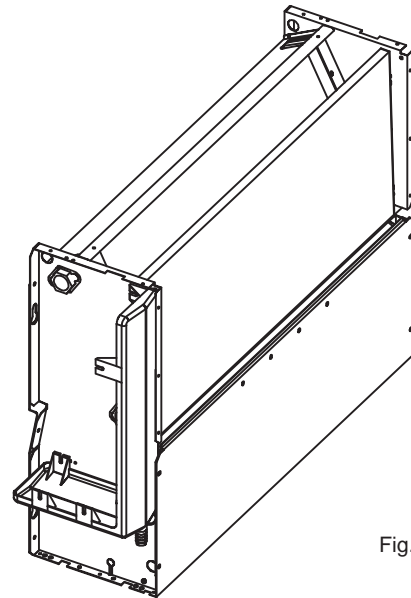


Fig.2-4

### 2.1.4 Built-in version II KFHE

- Supply voltage 220-240V~ 1ph 50Hz;
- Finned coil type heat-exchanger consisting of copper tubes and aluminium fins,with connections on the left reversible to fit on the right.
- Three-speed centrifugal blower with aluminium blades statically and dynamically babanded.
- Diretly-coupled motor equipped with internal thermal protection and condenser permanently in circuit.
- Structure in galvanised sheet steel..
- Condensation collection tray with natural drainage,complete with anti-condensation insulation.
- Mesh filter in regenerable polypropylene.

### 2.1.5 Restrictions on use



#### CAUTION

##### IMPORTANT!

The machine has been designed and built solely and exclusively to function as a ceiling-mounted air-handling terminal,supplied through ducting or panelling;any other use is expressly prohibited.

Installation of the machine in an explosive environment is also forbidden.

### 2.1.6 OPERATION RANGE

Use the system in the following temperature for safe and effective operation.

Temperature Mode	Outdoor temperature	Room temperature	water inlet temperature
Cooling operation	0°C~43°C	17°C~32°C	3°C~20°C
Heating operating (cooling only type without)	-15°C~24°C	0°C~30°C	30°C~65°C



#### NOTE

- 1 If air conditioner is used outside the above conditions, it may cause the unit to function abnormally.
- 2 The phenomenon is normal that the surface of air conditioning may condense water when the relative larger humidity in room, please close the door and window.
- 3 Optimum performance will be achieved within these operating temperature range.
- 4 Water system operating pressuer: Max: 1.6MPa, Min: 0.15MPa.

2.1.7 Information about further risks and unavoidable hazards



**CAUTION**

**IMPORTANT!**

Pay the utmost attention to the signs and symbols located on the appliance.

If any risks remain in spite of the provisions adopted, or if there are any potential or hidden risks, there are indicated by adhesive labels attached to the machine.



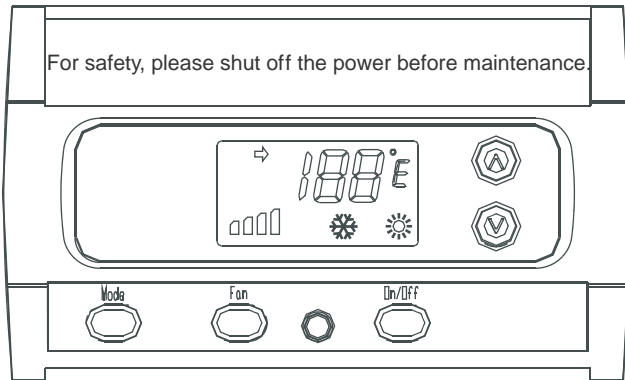
**CAUTION**

**IMPORTANT!**

Only use original spare parts and accessories. The company shall not be held liable for damage caused by tampering or work carried out by unauthorised personnel or malfunctions caused by the use of non-original spare parts or accessories.

**IMPORTANT!**

In the case of a water supply with a particularly high content of hard water salts, it is advisable to fit a water softener.



Cooling



Heating

Fig.2-5

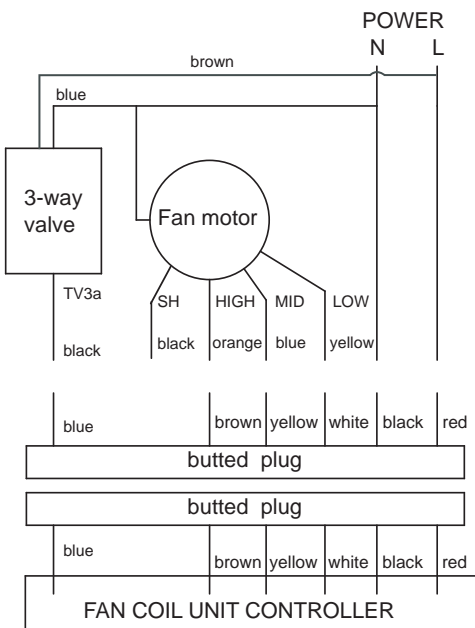
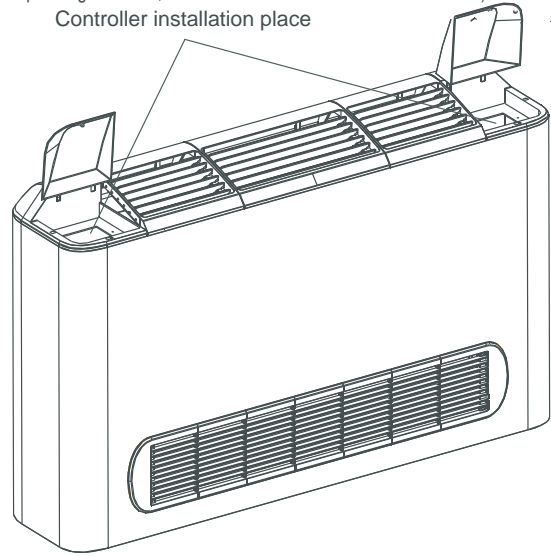


Fig.2-6

**INSTALLATION PLACE INSTRUCTION**

(For suspending mounted, it is not allow to install the cabinet at here.)  
Controller installation place



According to the users' need, controller can be installed in left side, right side or wall-fixed. The details of installation methods according to the installation manual for controller.

Fig.2-7

**The following operations can be carried out using the control panels:**

- Start/stop the unit.
- Select between the three blower speeds.
- Thermostat adjustment and maintenance of the desired ambient temperature.
- Switching between operating modes: cooling and heating.
- Constant ventilation control.
- Specific instructions for use are supplied with the controllers themselves.

**2.1.8 Prolonged shutdown**



**CAUTION**

**IMPORTANT!**

If the unit is not used during the winter period, the water contained in the system may freeze.

If the machine is going to be out of use for long periods of time, it is necessary to disconnect the unit from the mains by opening the main switch (which is required to be fitted by the installer).

If the unit is not used during the winter period, the water contained in undertaken in good time.

Alternatively, a suitable quantity of anti-freeze should be mixed with the water.

### 2.1.9 Startup after prolonged shutdown

Before starting up the unit again:

- Clean or change the airfilters:
- Clean the heat-exchanger.
- Clean the condensation collector tray drain tube or make sure it is clear.
- Bleed any air from the water system.
- It is advisable to run the unit at maximum speed for several hours.

## 2.2 Cleaning the unit



### CAUTION

#### DANGER!

Always switch off the electric power before beginning cleaning or maintenance operations. Do not spill water on the unit.

In versions with casing, it is possible to clean the outside of the unit. For cleaning, use a soft cloth dampened with water and alcohol. Do not use hot water, solvents or abrasives, or corrosive substances.

### 2.2.1 Cleaning the air filter

- To ensure correct air intake, the air filter must be cleaned at least once a month, or more frequently if the unit is being used in very dusty environments. The filter must always be removed from the unit for cleaning.
- The filter is housed in the lower part of the unit in versions II and III which take in air from below or from the rear.
- To remove the filter in versions II and III proceed as following indicated.

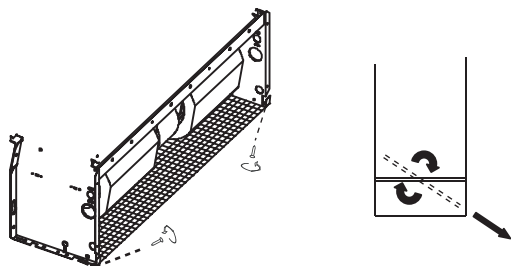


Fig.2-8

While it is housed in the front cowl in version I, which take in air from the front.

To remove the filter in version I, proceed as following indicated.

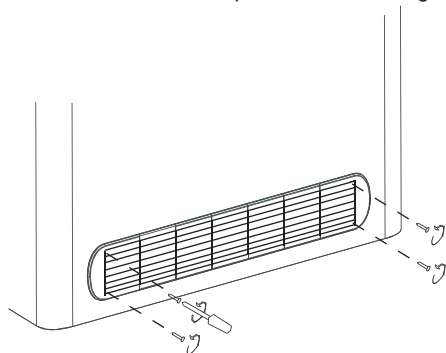


Fig.2-9

The air filter must be cleaned by blowing it out with compressed air or washing it in water. Before refitting the filter, make sure it is clean and completely dry. If the filter is damaged, it must be replaced with a genuine corresponding filter.

## 2.3 Warnings and suggestions

Always avoid obstructing the flow of air, or using the unit as a surface to lean on. The use of water or aerosol sprays in proximity to the unit can cause electric shocks and malfunctions.

## 3. INSTALLATION AND MAINTENANCE

### 3.1 TRANSPORT AND HANDLING

#### ■ PACKAGING AND COMPONENTS



### CAUTION

#### DANGER!

DO NOT OPEN OR TAMPER WITH THE PACKAGING BEFORE INSTALLATION.

The units should only be moved and lifted by specialised personnel trained in these operations.

Check on arrival that the unit has not been damaged during transport and that it is complete with all its parts.

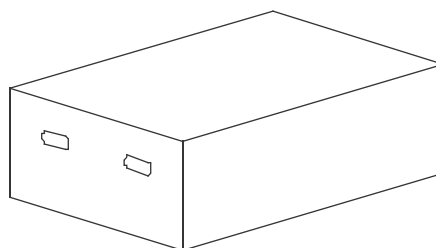


Fig.3-1

To remove the packaging, follow these instructions:

- 1 Check for visible damage
- 2 Open the packaging.
- 3 Check that the packet containing the manual for use and maintenance is inside!
- 4 Dispose of the packaging material in accordance with current legislation, at the appropriate waste reception or recycling site.



#### PRESERVE THE ENVIRONMENT!

Dispose of the packaging materials in compliance with the national or local legislation in force in your country.



### CAUTION

#### DANGER!

Do not leave the packaging within reach of children.

#### ■ HANDLING INSTRUCTIONS



## CAUTION

### DANGER!

Movement of the unit should be performed with care, in order to avoid damage to the external structure and to the internal mechanical and electrical components.

Also make sure that there are no obstacles or people along the route, to avoid the danger of collisions or crushing and to prevent the lifting or handling device from turning over.

All the operations listed below must be carried out in accordance with current health and safety regulations, both as regards the equipment used and as regards the procedure followed. Before commencing moving operations, check that the lifting apparatus has the required capacity for the unit in question.

The units may be moved or lifted either by hand or by means of a suitable trolley. If the weight of the unit is more than 30 kg, moving units need to be moved at the same time, it is advisable to put the machines in a container and lift them by means of a crane or something similar.

### STORAGE CONDITIONS

Units in their packaging may be stacked not more than four high, and must be kept under cover.

### CLEARANCES AND POSITIONING

## CAUTION

### IMPORTANT!

Incorrect positioning or installation of the unit may amplify noise levels and vibrations generated during operation.

The units may be mounted vertically, provided that the correct clearances for positioning are maintained.

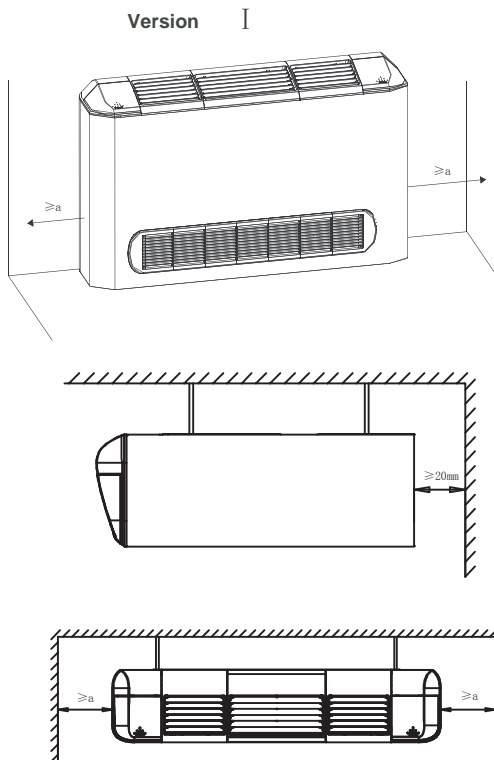


Fig.3-2

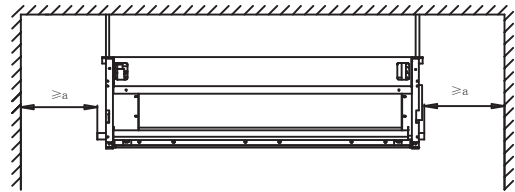
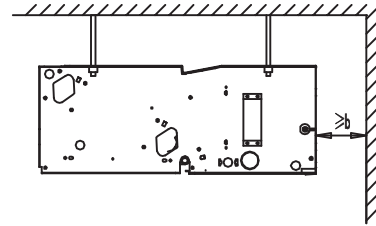
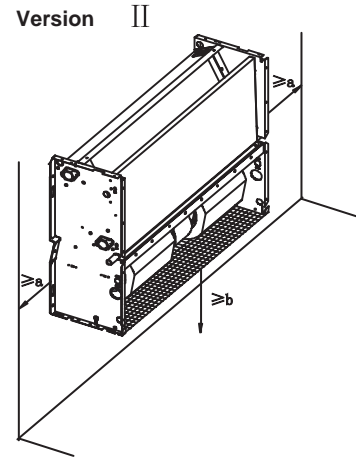


Fig.3-4

Table.3-1

Version	I	II
a mm	150	200
b mm	—	80

### 3.2 INSTALLATION



#### CAUTION

**DANGER!**

Installation must only be carried out by qualified technicians, trained to work with air-conditioning and refrigeration systems. Incorrect installation could lead to unit malfunctioning and a consequent deterioration in performance.

**DANGER!**

The unit must be installed according to national or local rules in force at the time of installation.

**For installation, follow the instructions set out below:**

Remove the external casing (in versions I), unscrewing the screws which secure it to the structure, as following indicated.

- Mark out the fixing points on the wall or ceiling, either by marking through the drillings in the unit itself, or by referring to the measurements given in "7 DIMENSIONS". Maintain a gentle fall in the condensation drainage pipe, to ensure that water escapes properly.

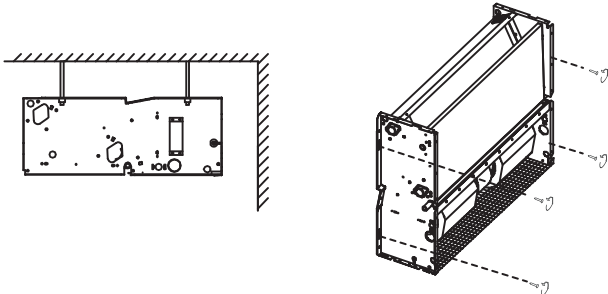


Fig.3-6

### 3.2.1 HYDRAULIC CONNECTIONS

- Connection to the system



#### CAUTION

**IMPORTANT!**

It is most important that the hydraulic connections are made with great care by specialised fitters.

Connect the unit to the water system by means of the fittings which are marked Flow and Return.

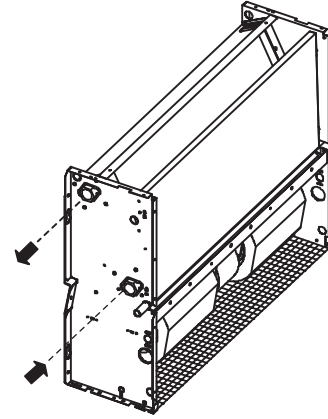


Fig.3-7

All the water coils, including the optional extras, are equipped with air bleed-valves next to the upper union, and with water drain valves next to the lower union.

All the valves can be opened and closed with screwdrivers or allenkeys.



#### CAUTION

**IMPORTANT!**

The water coils can be partially drained through the drain valves. To drain them completely, they should be blown out with an air-jet.

**When installation is complete, it is necessary to :**

- Bleed the air contained in the circuit.
- Lag the connection pipes and any valves fitted with anticondensation material 10 mm thick or install the auxiliary drain.
- Pour water into the condensation collector tray and check that the liquid drains properly, following it right through to the exit of the drain tube. If it does not, check the fall and look for possible blockages.

- **Setting up the condensate drainage system**

The condensation drainage system must be set up with an adequate fall, to ensure that the water escapes properly.

Following are directions for setting up a proper condensation drainage system.



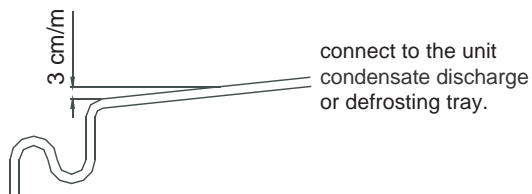


Fig.3-8

■ **Creation of the trap**

The condensation drainage system must be fitted with a suitable trap to prevent seepage of odours. Following are directions for setting up the trap.

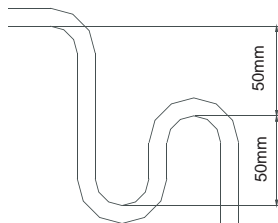


Fig.3-9

Always provide a drainplug at the bottom of the trap, and arrange it so that it can be quickly dismantled



**CAUTION**

**IMPORTANT!**

Position the drain-tube so that it does not put strain on the drainage connector on the unit.

■ **How to turn the coil round, from fittings on the left (standard) to fittings on the right.**

The unit is supplied as standard with connections to the coil on the left. It is possible however to turn the coil round, so that the connections are on the right.

The operation of turning the principal and supplementary coils round can be carried out with the unit in situ, but it is preferable to do it before installation, with the unit on solid ground.

**Procedure to reverse the coil:**

- 1 Remove the casing (on versions I);
- 2 Remove the screws on both sides which hold the coil to the structure of the unit;
- 3 Turn the coil round in the direction indicated in Fig;
- 4 Re-fit the coil mounting screws;
- 5 Re-fit the casing (on versions I)

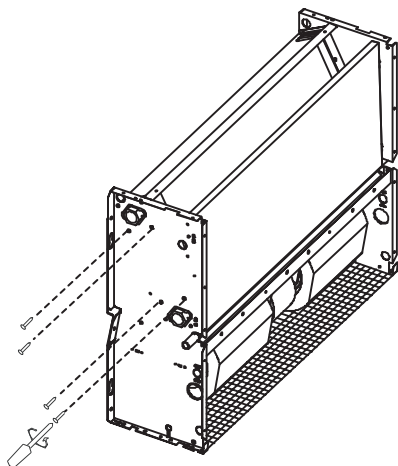


Fig.3-10

■ **Antifrost protection.**



**CAUTION**

**IMPORTANT!**

When the unit is out of service, remember to arrange in good time for the entire water content in the circuit to be drained down.

**IMPORTANT!**

Mixing the water with glycol modifies the performance of the unit.

Pay attention to the safety instructions regarding ethylene glycol which are printed on the container.

If the unit is not used during the winter period, the water contained in the system may freeze.

Draining the water circuit needs to be undertaken in good time. However, if the operation of draining the system is felt to be too laborious, a suitable quantity of antifreeze may be mixed with the water instead.

**3.2.2 ELECTRICAL CONNECTIONS.**



**CAUTION**

**IMPORTANT!**

Electrical connection of the unit must be carried out by qualified personnel in compliance with the regulations in effect in the country where the unit is installed. The company shall not be held liable for damage to persons or property caused by incorrect electrical connection.

an all-pole disconnection device which has at least 3mm separation distance in all pole and a residual current device (RCD) with the rating of above 10mA shall be incorporated in the fixed wiring according to the national rule.

The appliance shall be installed in accordance with national wiring regulations.

**DANGER!**

Always install a general automatic switch in a protected area near the appliance with an adequate capacity characteristic delayed curve with sufficient breaking power. There should be a minimum distance of 3mm between the contacts. Earth connection is compulsory by law to ensure user safety while the machine is in use.

■ **Table 5-2**

AIR FLOW(m <sup>3</sup> /h)		255~1530
POWER	PHASE	1-phase
	FREQUENCY AND VOLT	220-240V~ 50Hz
CIRCUIT BREAKER/FUSE(A)		15/15

## ■ WIRING

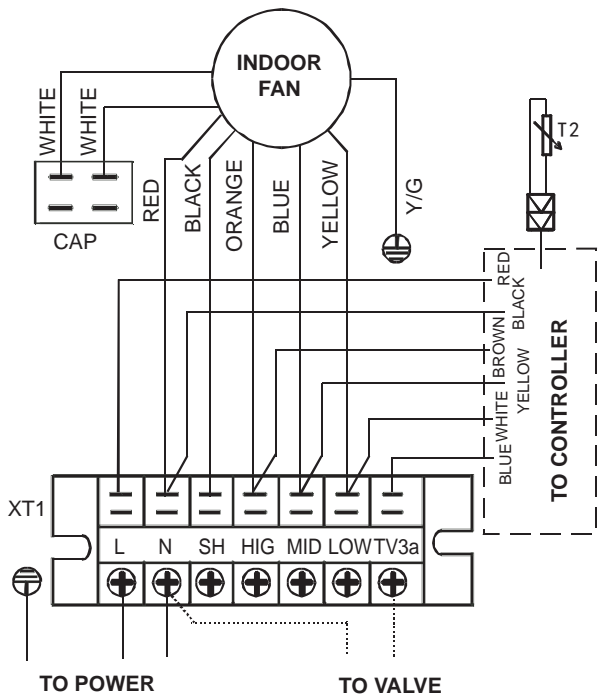


Fig.3-11

- Check that the voltage and the frequency of the electrical supply correspond to 220-240V single phase at 50Hz; that the available power is sufficient for the running the equipment; and that the supply cables are of adequate section for the maximum current which will be required.
- Make sure that the electrical supply system complies with current national safety regulations.
- Electrical connections must be made in accordance with the wiring diagrams supplied with the machine. For connection to the electrical supply network, use double-insulated flexible cable, twin pole + earth, section 1.5mm<sup>2</sup>, type H05RN-F.
- Pass the supply cable through the slot beside the air filter. Use the cable clamp provided on the inner side of the panel to secure the supply cable and the connecting cables, and strip only the length of cable needed to go into the connector block. In the event that the unit is mounted on a metal surface, earth connections must be made in compliance with local regulations. If the optional extra electric heating element is fitted, a separate power supply must be provided. Use double-insulated flexible cable, twin pole + earth, section 2.5mm<sup>2</sup>, type H05RN-F.

### ■ The installation of room and pipe temperature sensors

- Inside temperature controller ( Fig.3-12)
  1. Install the room temperature sensor.
    - 1) Dismount casing from equipment.
    - 2) Fixing install the room temperature sensor (length: 600mm) at air return orifice by cable clips and lead the sensor wire through out the wire hole. (showed as the Fig.3-12)
    - 3) Fix the room temperature sensor cable and connect it to temperature controller.

2. Install the pipe temperature sensor
  - 1) Connect the pipe temperature sensor to the Temperature Controller (Note: Pipe temperature sensor be connected to the black wire of Temperature controller, while Room temperature sensor be connected to white wire of temperature controller. )
  - 2) Mount up the casing.

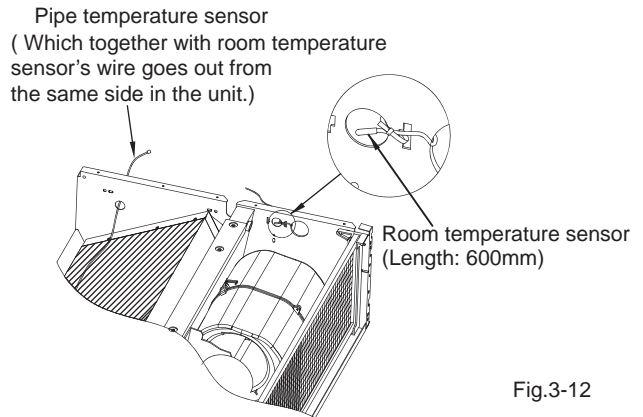


Fig.3-12

### ● Outside temperature controller ( Fig.3-13)

1. Install the room temperature sensor
  - 1) Connect the room temperature sensor (length: 150mm) to the wire of temperature controller directly (Note: Pipe temperature sensor be connected to the black wire of Temperature controller, while Room temperature sensor be connected to white wire of temperature controller. )
2. Install the pipe temperature sensor
  - 1) Dismount casing from equipment.
  - 2) Lead the pipe temperature sensor's wire through out from indoor unit and connecting to temperature controller via a long connecting wire.
  - 3) Mount up the casing.

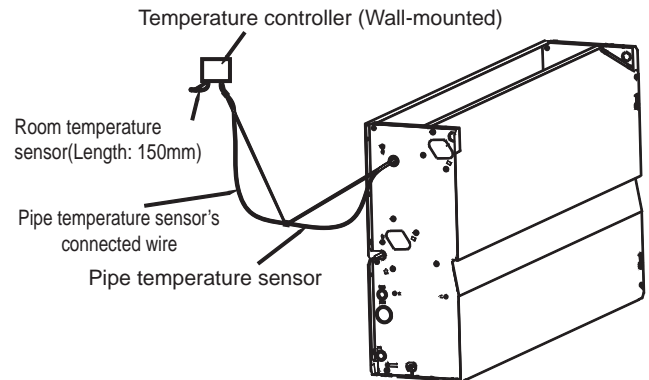


Fig.3-13

## 3.2.3 STARTUP INSTRUCTIONS



### CAUTION

#### IMPORTANT!

Machine commissioning or the first start up must be carried out by skilled personnel qualified to work on this type of product.

#### DANGER!

Before starting up, make sure that the installation and electrical connections have been carried out in accordance with the instructions in this manual. Also make sure that there are no unauthorised persons in the vicinity of the machine during these operations.

■ **Pipeline system has been vacuumed before initial start the equipment (see Fig.3-14)**

- 1 Remove the connecting pipe's side cover panel by cross screwdriver.
- 2 Remove the bolts that showed at the figure by slotted screw driver. Start up the pump to circulate the pipeline water and vacuum air from the system until there have water flow out from bolt holes, and then tighten the bolts the system.
- 3 Shutdown the sestem that showed at the figure by slotted screwed and replace the side cover panel.

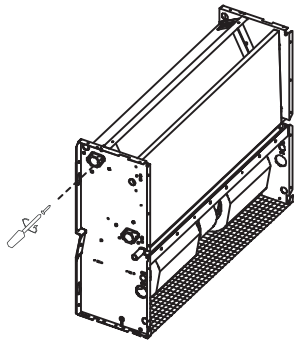


Fig.3-14

■ **PRELIMINARY CHECKS BEFORE STARTUP**

**Before starting up the unit,make sure that:**

- the unit is positioned correctly;
- the flow and return pipes of the water system are correctly connected;
- the pipes are clean and free of air;
- the unit falls correctly towards the drainage outlet and the trap;
- the heat-exchangers are clean;
- the electrical connections are correct;
- the screws holding the cables are well tightened;
- the supply voltage is as required;
- the power consumption of the blower is correct and does not exceed the maximum permitted.

**3.2.4 MAINTENANCE**



**CAUTION**

**DANGER!**

Maintenance work must only be carried out by qualified technicians authorised to work on air-conditioning and refrigeration systems. Use suitable work gloves.

Do not introduce pointed objects through the air intake grilles.

Disconnect the power supply before cleaning and maintenance. Use dry cloth to clean the unit.

Always disconnect the unit from the mains power supply at the main isolator switch before carrying out maintenance work or checks. Make sure that no one accidentally supplies power to the machine, lock the main switch in the Off position.

■ **SCHEDULED MAINTENANCE**

● **Once a month**

Check the state of cleanliness of the air filters. The air filters are made of fibre and are washable in water. The state of cleanliness of the filters must be checked regularly at the start of the operating season and on a monthly basis.

● **Every six months**

Check the state of cleanliness of the heat-exchanger and the condensation drain-tube. With the unit switched off, remove the casing of the machine and check the state of the heat-exchanger and the condensation drain-tube. If necessary:

- 1 remove any foreign bodies from the finned surface which may obstruct air flow;
- 2 clean off the dust with a jet of compressed air; wash and brush, gently, with water;
- 3 dry with a jet of compressed air;
- 4 check that there are no obstructions in the condensation drain tube which could prevent the normal flow of water.

Check for the presence of air in the water system.

- 1 remove the casing of the machine (on units I );
- 2 start the system and run for a few minutes;
- 3 stop the system;
- 4 slacken the bleed screw on the inlet manifold and bleed the air.
- 5 Repeat the operation several times until no more air comes out of the system.

● **At the end of the season**

**Drain the water system(for all heat exchangers).**

To avoid the risk of rupture due to freezing, it is advisable to drain the water from the system at the end of every season.

● **Electrical Circuit**

The following operations are recommended for the maintenance of the electrical circuit:

- 1 check the unit 's power absorption using a clip-on ammeter and compare the reading with the values shown on the documentation;
- 2 inspect and, if necessary, tighten the electrical contacts and terminals.

■ **NON-SCHEDULED MAINTENANCE**

● **Replacement of the blower assembly**

In the case of burnout of the blower electric motor, it is necessary to replace the entire blower assembly.

**Procedure for removal of the blower:**

- 1 Remove the casing (on units I )
- 2 Disconnect the electrical supply cable from the blower;
- 3 Remove the screws on both sides which hold the blower to the structure of the unit;
- 4 Take out the blower.

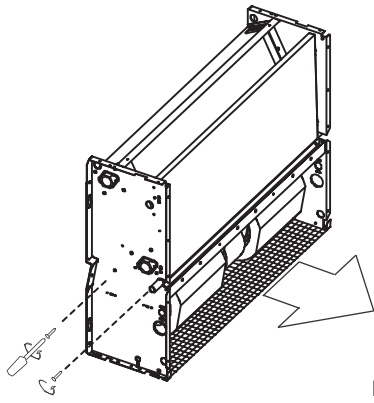


Fig.3-15

- 5 Procedure for refitting the blower is a reversal of the above.

● **Replacement of the heat-exchanger coil**

**Procedure for removal of the heat-exchanger:**

- 1 Remove the casing(on units I );
- 2 Isolate the flow and return water pipes;
- 3 Disconnect the coil from the water system;
- 4 Remove the screws on both sides which hold the coil to the structure of the unit;
- 5 Take out the heat-exchanger coil.

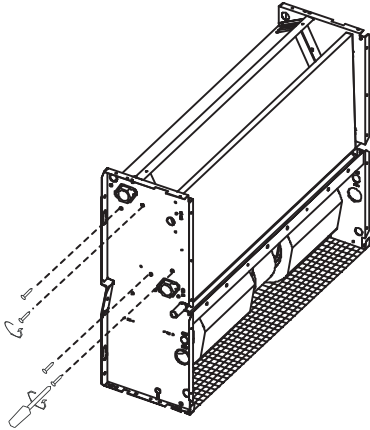


Fig.3-16

- 6 Procedure for refitting the heat-exchanger is a reversal of the above.

● **DISMANTLING THE UNIT AND DISPOSAL OF HARMFUL SUBSTANCES**

	<p><b>PRESERVE THE ENVIRONMENT!</b></p> <p>We care about protecting the environment. When the unit is dismantled it is important to adhere scrupulously to the following procedures.</p>
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The unit should only be dismantled by a firm authorized for the disposal of scrap machinery.

The unit as a whole is composed of materials considered as secondary raw materials and the following conditions must be observed:

- 1 If the system has antifreeze as an additive, it must not be just dumped, because it causes pollution. It should be collected and suitably disposed of.
- 2 The electronic components (electrolytic condensers) should be considered special waste, and as such they should be delivered to a firm authorised to collect them.
- 3 The expanded polyurethane rubber insulation on the pipes and the expanded polyethylene mesh, the expanded polyurethane and sound-absorbent spong lining the bodywork must be removed and processed as urban refuse.

## 4. DIMENSIONS

### 4.1 VERSION I KFHC

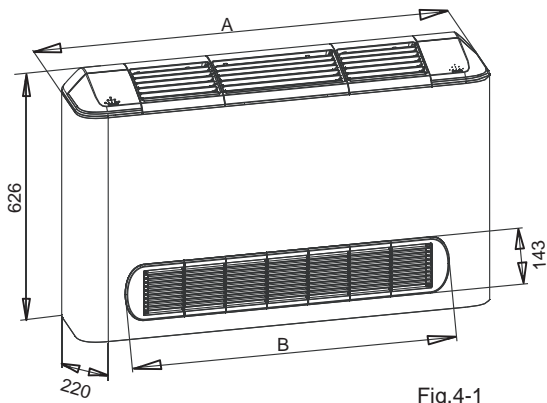


Fig.4-1

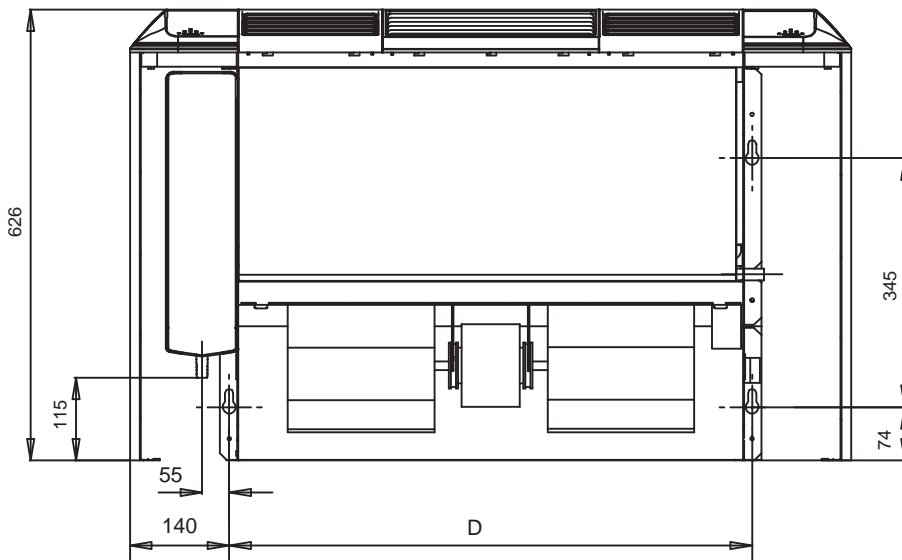


Fig.4-3

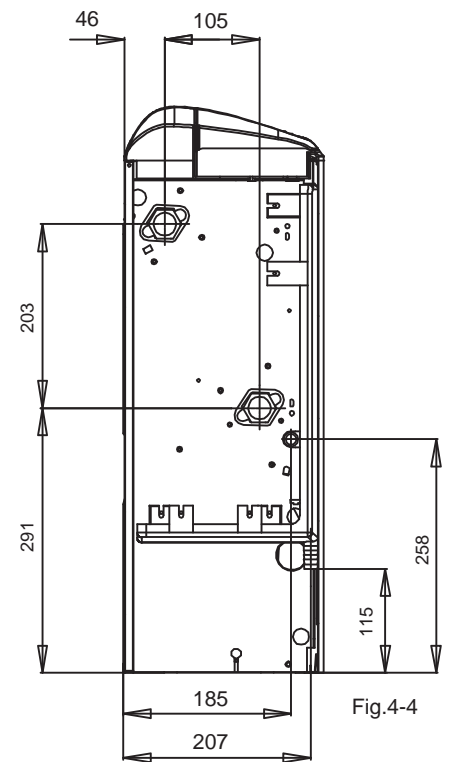


Fig.4-4

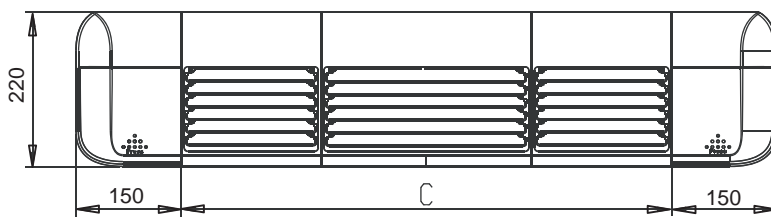


Fig.4-5

Table.4-1

VERSION I	12	20	25	30	38	48	57	65	78
A(mm)	800	800	1000	1000	1200	1200	1500	1500	1500
B(mm)	584	584	784	784	984	984	1284	1284	1284
C(mm)	500	500	700	700	900	900	1200	1200	1200
D(mm)	526	526	726	726	926	926	1226	1226	1226

## 4.2 VERSION II KFHE

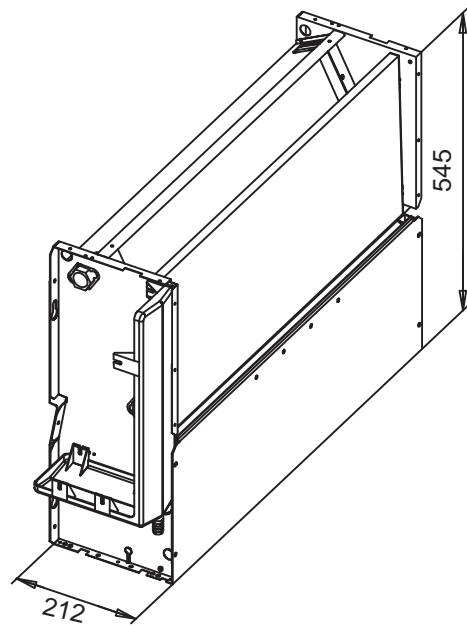


Fig.4-6

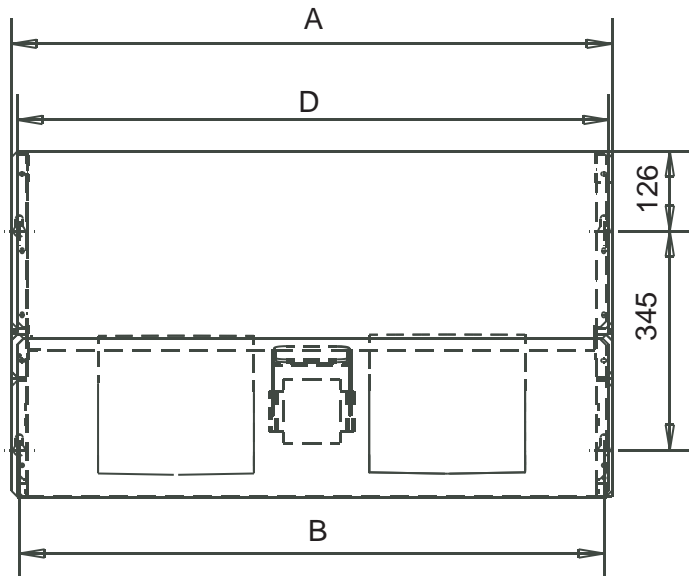


Fig.4-7

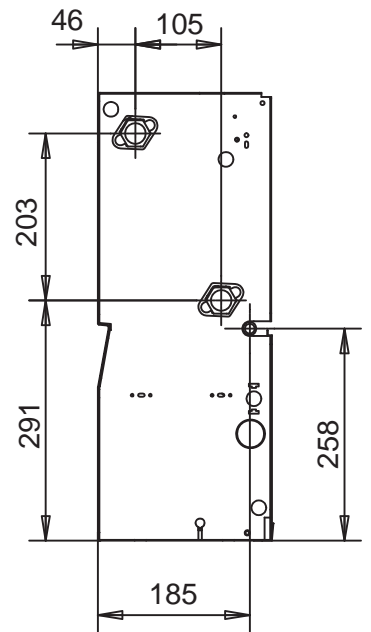


Fig.4-8

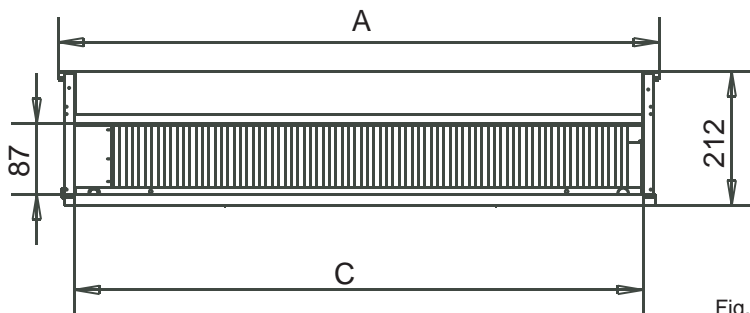


Fig.4-9

Table.4-2

VERSION III	12	20	25	30	38	48	57	65	78
A(mm)	550	550	750	750	950	950	1250	1250	1250
B(mm)	526	526	726	726	926	926	1226	1226	1226
C(mm)	500	500	700	700	900	900	1200	1200	1200
D(mm)	532	532	732	732	932	932	1232	1232	1232

## 5. SPECIFICATION

### VERSION I、 II

Table.5-1

MODEL		12	20	25	30	38	48	57	65	78
Cooling capacity(W)(*)		1150	1870	2530	3270	3970	4850	5640	6520	7850
Water flow rate(L/h)(*)		197	323	435	562	683	835	969	1122	1349
Water side pressure drops(kPa)(*)		18.3	10.1	14.2	9.5	10.3	24.6	11.4	9.5	12.1
Heating capacity(W)(**)		1520	2530	3490	4580	5640	6980	8230	9580	11690
Water flow rate(L/H)(**)		222	364	492	631	774	899	1071	1343	1589
Water side pressure drops(kPa)(**)		16.5	9.3	13.5	8.6	9.5	20.8	10.1	9.5	11.7
Air volume (m <sup>3</sup> /h)		255	425	510	680	765	850	1020	1360	1530
Sound pressure (dB(A))(***)		32	35	37	39	41	43	44	46	48
Rated input (W)	I	27	29	40	46	35	49	63	88	137
	II	29	30	44	44	36	51	64	95	143
Rated current (A)	I	0.12	0.14	0.19	0.2	0.15	0.22	0.27	0.38	0.61
	II	0.13	0.15	0.19	0.19	0.157	0.23	0.28	0.41	0.64
Weight I (kg)		22.5	22.5	26	26	32.5	32.5	39	39	39
Weight II (kg)		17	17	20	20	25	25	32	32	32
Blowers (n°)		1	1	2	2	2	2	3	3	3
Height of feet (mm)		80	80	80	80	80	80	80	80	80
Standard coil connections		3/4G(M)								
Condensation drain pipe connection		φ 16mm								
Power supply		220-240V~ 1ph 50Hz								

(\*) In the following conditions: ambient temperature 27°C D.B.; 19°C W.B.; temperature of inlet water 7°C with  $\Delta t$ 5°C; at high speed.

(\*\*) In the following conditions: ambient temperature 20°C; temperature of inlet water 70°C with  $\Delta t$ 10°C; at high speed.

(\*\*\*) Sound pressure level in dB(A) refers to a measurement taken at a distance of 1 m from the point of exit of the air, with the outlet open.