

LENNOX

TM



OPERATION AND MAINTENANCE MANUAL



**CHILLED WATER
PRECISION AIR CONDITIONERS
HCW “DATACOOOL”**

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The manufacturer reserves the right to modify this manual without any notice.



1 - INTRODUCTION

1.1 Manual content

This handbook, written originally in Italian, was completed in compliance with the " Machinery Directive p 1.7.4. and the harmonized standard UNI EN 292/2. It contains all the necessary information for carrying out transportation, installation, start up, operating, adjustments, maintenance and disposal of the Air Conditioning Machines series HCW "Datacool".

In case of doubt about the correct understanding of these instructions, please contact the manufacturer in order to get accurate explanation.

1.2 Safety marks

Following safety marks are employed in this manual to draw attention to all useful information in order to avoid dangerous situation which can be unsafe and harmful for people, can damage equipment and environment besides breaking the machine.



It means operation and behavior not allowed.



It means danger or risk to people, things or environment.



It means an electrical danger.



It means a warning about important functions or useful information.

It is necessary to pay the maximum attention to text paragraphs marked with this symbol.

1.3 Referring standards

The machines of the 'HCW' series are designed and manufactured in compliance with the relevant European Directives and satisfy the essential safety requirements as set out in the Directive 89/392 CE, and further amendments, as also attested by the CE mark, which is found on each unit.

The requirements of these air conditioning machines are certified by the manufacturer, who has signed, attached to this manual, the CE Declaration of Conformity.

1.4 Warranty

The manufacturer warrants the Air Conditioning Machines according to what stated on his general sales terms or according to what else explicitly agreed. The manufacturer warranty is void in cases where the guidance of this manual has not been carefully respected.

The manufacturer liability does not cover any damages to people, animals, properties or environment caused by incorrect installation, maintenance errors or misuse of the machine.

It is considered "misuse" of the machine any use not allowed in this operation and maintenance manual.

1.5 Readers of the Manual

This operation and maintenance manual, included all its attachments, is supplied with the described unit. This manual must be kept by the owner of the unit in a proper place. To this end, a plastic bag has been placed on the rear of the upper cover in order to store the manual together with the machine and have it always available for checking instructions.

In case the manual is lost or deteriorate, a new copy must be requested directly to the manufacturer.

2 - MAIN SAFETY RULES

2.1 Main warnings



It is necessary to pay maximum attention and read carefully this handbook before performing any operation on the unit. Only qualified and trained technicians must perform any operations on the machine.



- Do not touch the machine if with bare feet or with humid or wet parts of the body.
- Do not perform any cleaning operation before the main switch is "OFF" and power line disconnected.
- Do not spread, leave unattended or to the reach of children all package parts (cardboard, plastic bag, staples, etc.), they may be source of dangers.

2.2 Allowed use

The machine has been designed and manufactured for air conditioning of technology centers and therefore it must be used only for this purpose, according to its performing features. All different uses are not allowed and disclaim the manufacturer from any liability for damages caused to environment, people, animals, proprieties, etc.

2.3 Forbidden use

The followings are absolutely forbidden use of the machine:

- other use than that described in paragraph 2.2;
- exposed to rainfall;
- in spaces with high risk of fire or explosion;
- in environment or atmosphere highly corrosive.



Any installation or maintenance operation must be carried out in compliance with local technical standards.

2.4 Dangerous areas

The machine is completely closed by case panels in order to avoid any accidental contact with its dangerous parts.

Only qualified and trained personnel is allowed to remove the covering panels because inside the units there are parts with high risk of electric shock, areas with high temperature and working mechanical components. Moreover, the cooling circuit is charged with pressure gas which must not be released in the atmosphere.

3 - GENERAL DESCRIPTION

3.1 Unit description

The precision air conditioning water cooled units, HCW Datacool series, have been designed for use and installation in technology centers, in data processing centers, in telephone companies and in every building where special thermic and humidity conditions are required.

The machines are suitable for internal installation.

All units undergo a complete operating test.

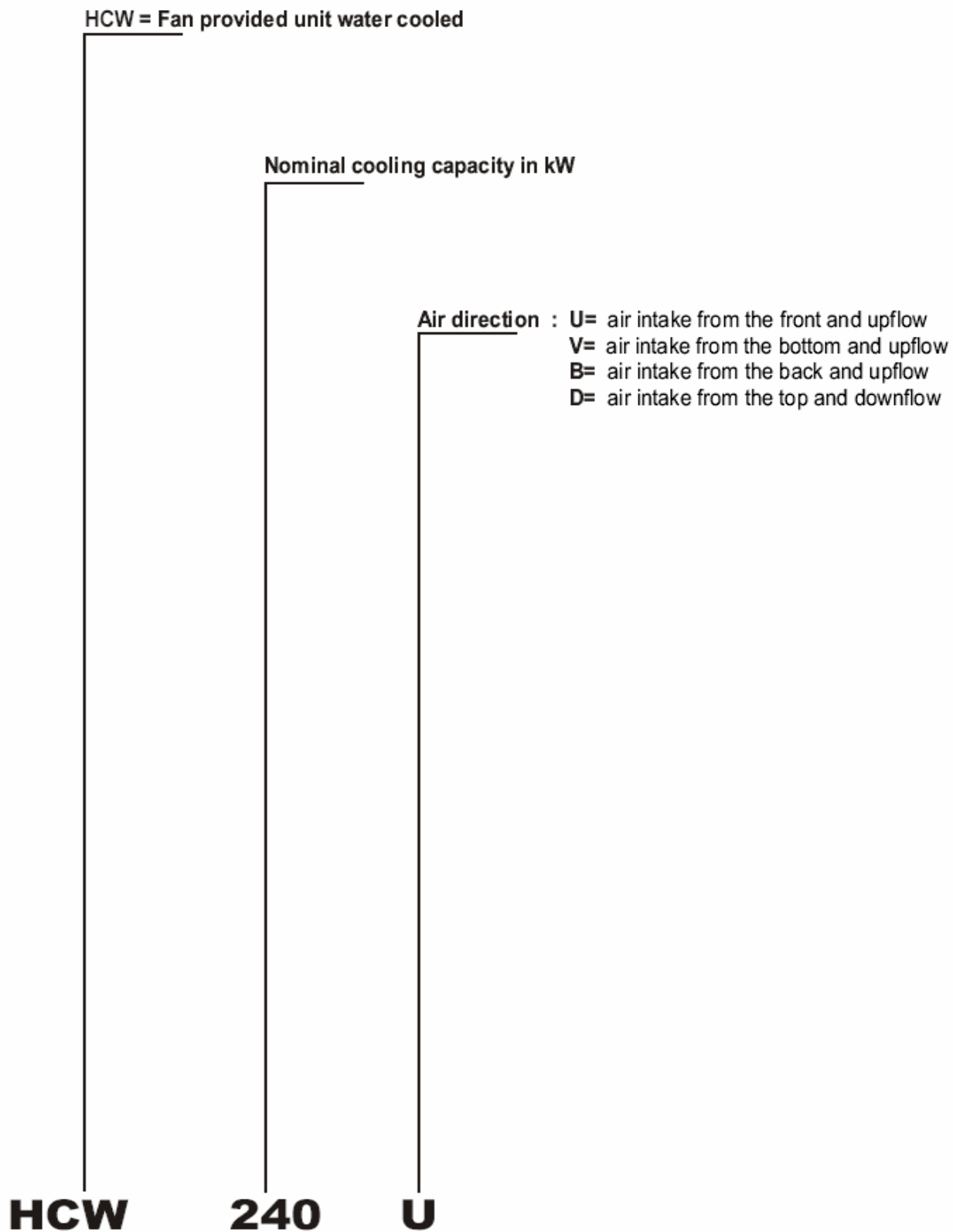
All models are available in different configuration according to air intake and discharge:

- U:** air intake from the front and upflow;
- V:** air intake from the bottom and upflow;
- B:** air intake from the back and upflow;
- D:** air intake from the top and downflow.

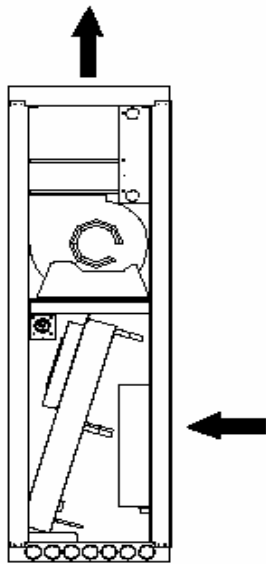
The different unit models of the HCW Datacool series are marked with initials, which interpreting key is shown in the scheme on page 5.



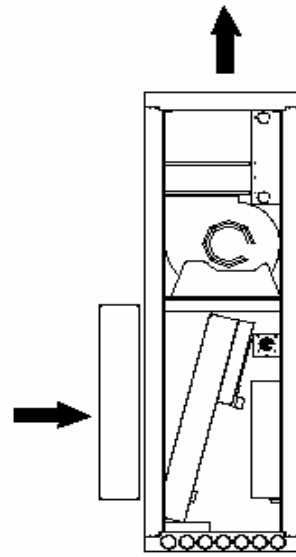
Interpreting key for initials employed to mark the conditioning unit of HCW Datacool series



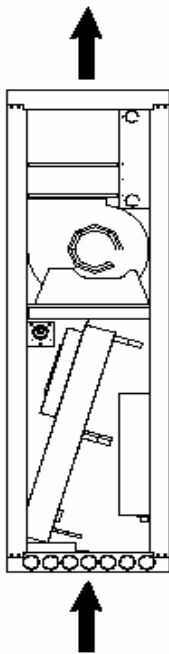
The conditioning units are classified, as shown in the scheme of the previous page, according to the transfer path of the air inside the unit before being discharged into the working space at the desired temperature. Following pictures show the four different configuration, of the air flow system.



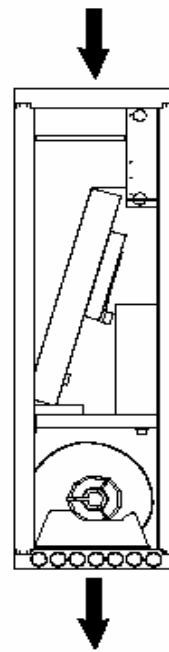
Configuration U: air intake from the front and upflow



Configuration B: air intake from the back and upflow



Configuration V: air intake from the bottom and upflow



Configuration D: air intake from the top and downflow

3.2 Main Components

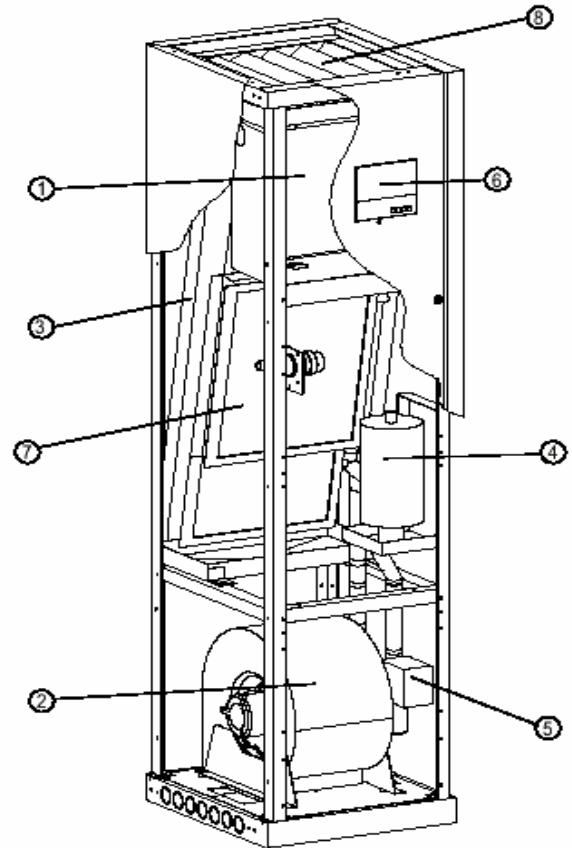
The HCW Datacool units are made of the following main components:

- The supporting structure frame is made of galvanized steel beams covered with epoxy painted steel plate panels. The panels are also provided with internal polyurethane plate covers to reduce noise.
- Centrifugal fans with engine pre -set to a low number of revolutions.
- Cooling coil with refrigerant water.
- Condensate collecting tank.
- Regenerative air filters with efficiency grade F4.
- The electric board, which comply to CE standard, is provided with main disconnecting switch, amperometric and thermal protection, auxiliary low voltage circuit, connector and control by microprocessor.

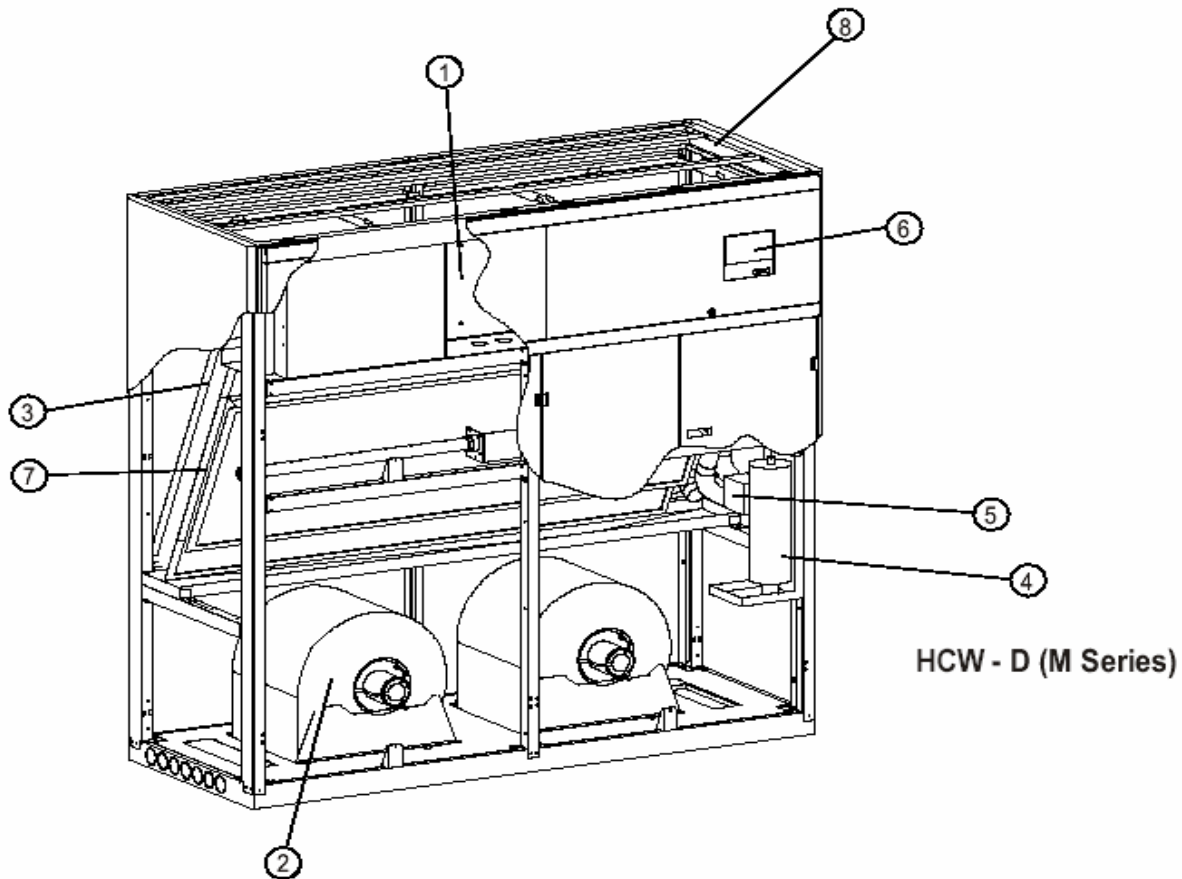
HCW - D (L Series)

Legend

- 1) Electric board
- 2) Fan
- 3) Refrigerant water coil
- 4) Humidifer (optional)
- 5) Three way valve
- 6) Microprocessor display
- 7) Heating coil battery (optional)
- 8) Air filters



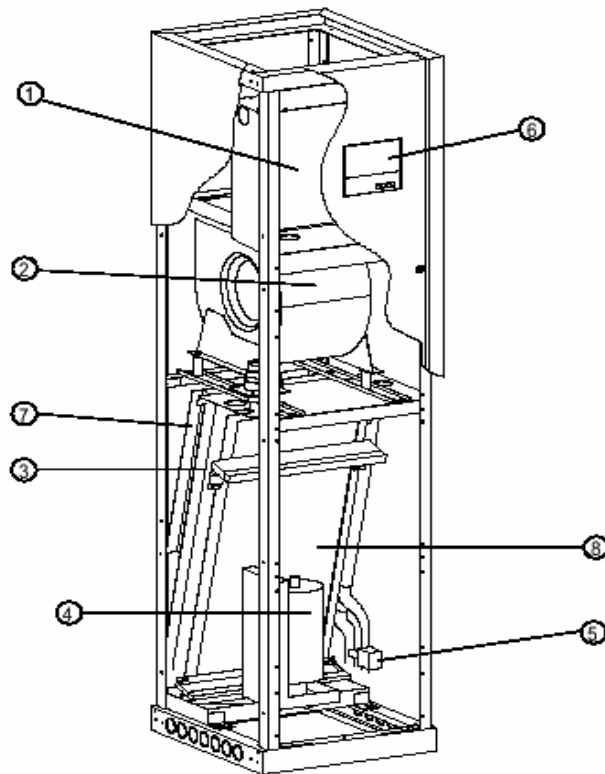
Picture 1



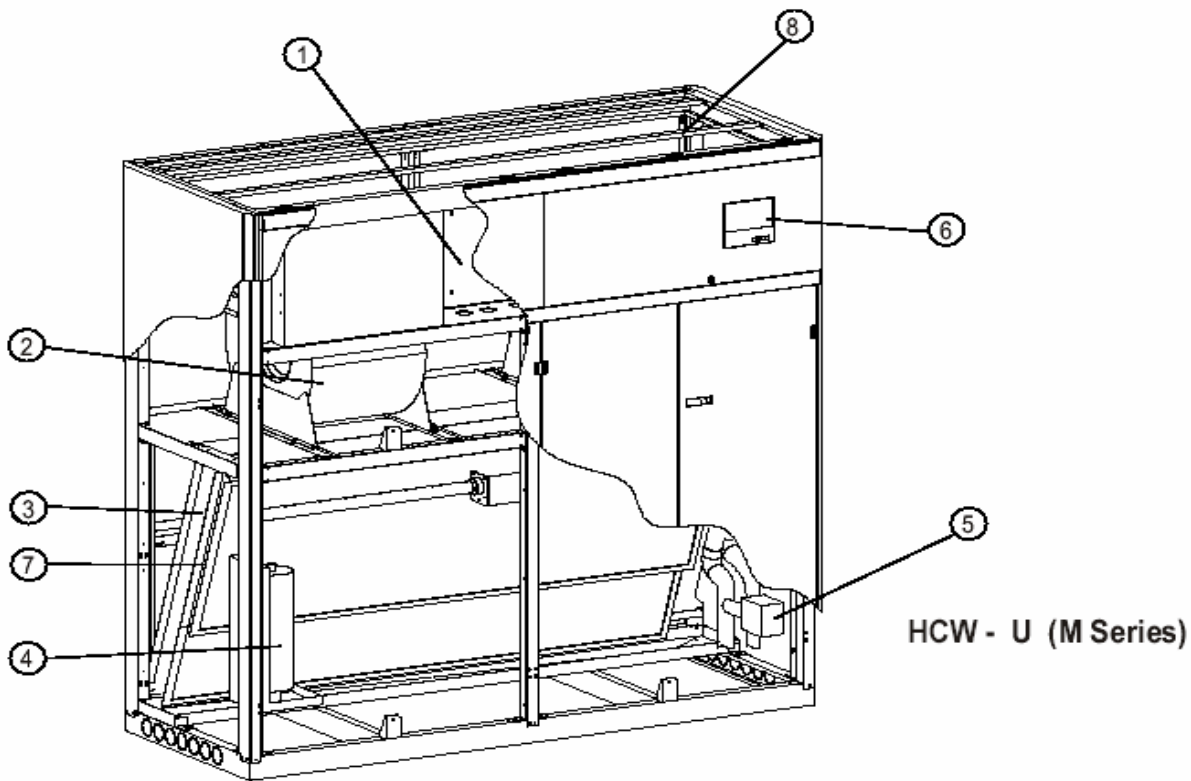
HCW - U (L Series)

Legend

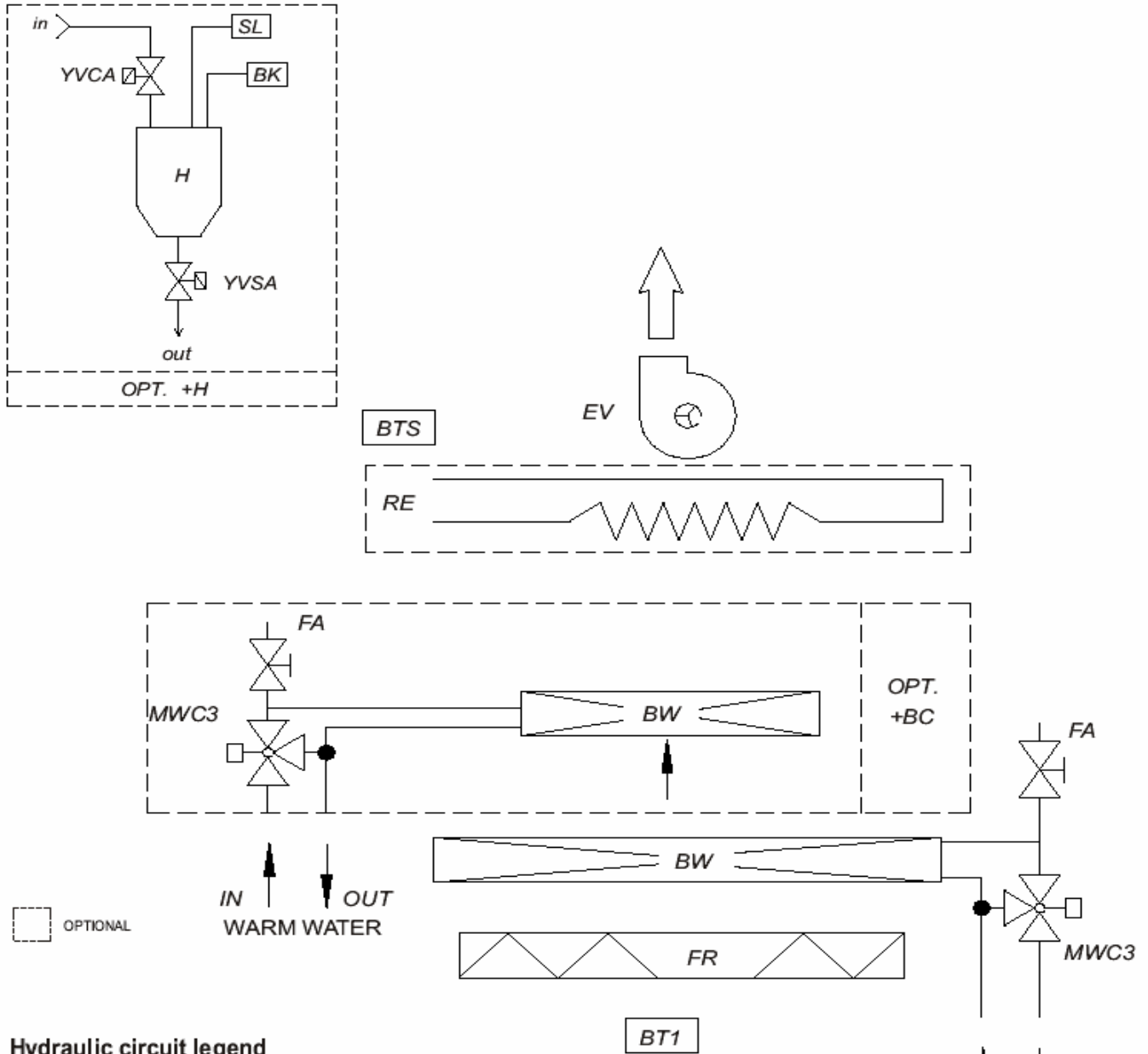
- 1) Electric board
- 2) Fan
- 3) Refrigerant water coil
- 4) Humidifier (optional)
- 5) Three way valve
- 6) Microprocessor display
- 7) Heating coil battery (optional)
- 8) Air filters



Picture 2



3.2.1 Hydraulic circuit



Hydraulic circuit legend

COMPONENTS	
BK	CONDUCTIBILITY PROBE
BTS	SAFETY THERMOSTAT
BT1	REGULATION PROBE
BW	WATER COIL
EV	FAN
FA	RELIEF VALVE
FR	AIR FILTER
H	HUMIDIFIER
MWC3	THREE WAYS VALVE
RE	HEATING ELEMENTS
SL	LEVEL SENSOR
YVCA	HUMIDIFIER INLET VALVE
YVSA	HUMIDIFIER DRAIN VALVE

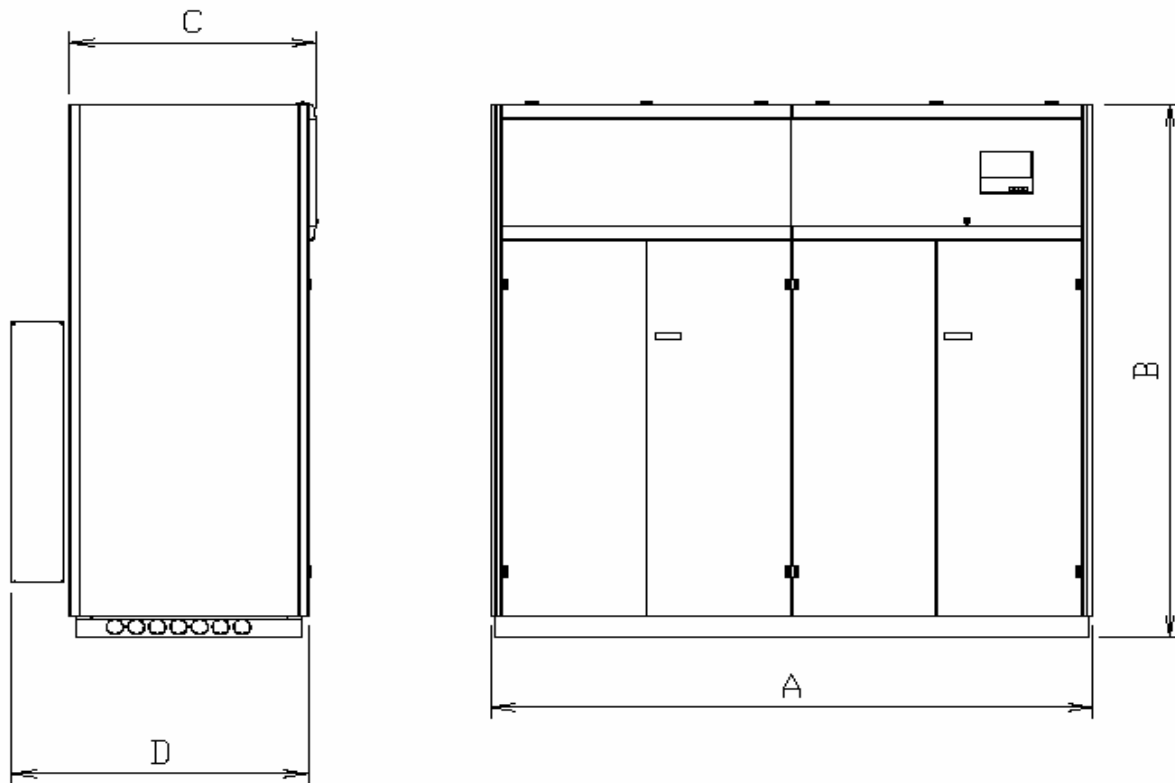


3.3 Specification

The main technical features of the units are shown in the attachments.

3.4 Dimensions

The **table 1** shows the dimensions of the different models of air conditioning machine referring to **Picture 3**.
The **table 2** shows the unit models available for each steel frame series.



Picture 3

TABLE 1

STEEL FRAME SIZE	L1	L2	L3	M1	M2	M3	M4	M5	M6
A	490	640	940	1230	1530	1730	1990	2390	2950
B	1800			1975	1995				
U/V/D version	C	565		665		815			
B version	D	615		815		965			



TABLE 2

STEEL FRAME	L1	L2	L3	M1	M2	M3	M4	M5	M6
MODELS	60 80	120	170	190 240 280	320 380	470	550	640 740	800 870 1000

3.5 Accessories

Each unit can be equipped with a wide range of optional accessories, they can be chosen from the price list of the manufacturer.

AA: Flooding probe, sensitive to the water present on the floor.

AE: Power supply different from the nominal power. Particularly 230V 3-phase for all machine sizes and single phase only for L1. Operating frequency 50/60 Hz.

AF: Clogged filters alarm is made of a differential pressure switch, sensitive to the dirt of the filters, which activates an alarm signal through the control board.

AL: Smoke alarm is made of a sensor, which detects the presence of smoke inside the unit activating an alarm signal through the control board.

AM: Sound attenuator sets on the air supply. These are made of drilled galvanized plates containing noise-absorbing material. They are housed inside the machines or they are installed in the plenum depending on the machine size. These sets are not available for D version.

AR: Sound attenuator sets on the return air inlet. These are made of drilled galvanized plates containing noise-absorbing material. They are housed inside the machines or they are installed in the plenum depending on the machine size. These sets are not available for D version.

B: Base frame made of welded steel tubes. It is available for any machine models, it is height adjustable between 140 and 580 mm.

BC: Warm water coil with 1 row; it is placed after the cooling coil in order to make the post-heating and/or the heating of the treated air. It is regulated by a special three-way mixing solenoid valve controlled by the microprocessor of the machine.

BH: Base frame equipped with a special conveyor which ease the air flow, reducing to the minimum the pressure losses when the air direction is to the front.

BS: Base frame provided with ON/OFF motorized damper for units of the D version. This device prevents air to return inside stand-by units and working units near by.



F5,F6,F7a: High efficiency air filters. They are pleated filters of 50 or 100 mm thickness, depending to the machine version.

F7b, F8, F9: High efficiency air filters. They are rigid pocket filters of 300 mm thickness.

H: Humidifier, immersed electrode type, for steam production. The controller is of the modulating type.

DH: Operation of the dehumidification function through controlled activation of the cooling battery.

IH: Electronic card connected to the microprocessor in order to allow the connection of the machines to the Carel conversion system. In this way the machine can be completely controlled by a remote place. The system communicate in RS485. For connection to other systems of different type it is available the protocol of controlled parameters.

IE: Wooden cage packaging, available on request for critical transportation in order to assure the best protection to the machine.

IB: Serial interface for communication system RS422; this interface needs also option MP.

KC: Kit of efficiency filters F4 as spare filters.

MD: Wired terminal board for remoting the alarms as free contacts.

MG: Microprocessor with graphic display showing state and memory of the main environment features controlled by the machine. It also shows messages written with character other than alphanumeric.

MN: Power supply 400 V 3-phase without neutral.

MP: Oversize microprocessor.

PB: Micropump for extracting condensate created by the machine.

PL: Plenum with grid for frontal air distribution for unit U/V/B.

PR: External air intake, placed on the side of the unit for treated air renewal.

RE: Heating elements made of finned aluminum installed after the cooling coil in order to perform the after-heat and/or the heating of treated air. They are controlled by the microprocessor of the unit.

ST: Hand adjustable damper setting for the treated air.

SL: Main isolator switch with mechanical lock and with external pad lock arrangement.

SV: Over pressure gravity damper for U/V/B units which are provided with duct preventing air return inside stand-by units.


1M,2M,3M,4M,5M: Different available values of external delivery head pressure: for all values and combinations available in relation to machine models and to filtering types, refer to the company's catalogue.



4 - INSTALLATION

4.1 Identification tag

The data for the product identification are permanent marked on the tag (**Picture 4**) attached to the packing and inside the unit near the electrical panel.

MODELLO MODEL MODELE MODELL	<input type="text"/>	GAS REFRIGERANTE TYPE OF REFRIGERANT REFRIGERANT KALTEMITTEL	<input type="text"/>
MATRICOLO SERIAL NUMBER NUMERO DE SERIE STAMM NR	<input type="text"/>	CARICA FREON CHARGE FREON CHARGE DE FREON VOREINFÜLLUNG	kg <input type="text"/>
TENSIONE TENSION VOLTAGE SPANNUNG	V.Ph.Hz <input type="text"/>	PESO NETTO NET WEIGHT POIDS NET NETTOGEWICHT	kg <input type="text"/>
POTENZA MASSIMA ASSORBITA MAX POWER SUPPLY MAX PUISSANCE ABSORBEE LEISTUNGS-AUFNAHME	kW <input type="text"/>	ANNO DI COSTRUZIONE CONSTRUCTION DATE ANNEE DE CONSTRUCTION JAHR VON KONSTRUKTION	<input type="text"/>
POTENZA FRIGORIFERA NOMINALE NOMINAL COOLING CAPACITY PUISSANCE FRIGORIFIQUE NOMINAL NOMINALE KALTLEISTUNG	kW <input type="text"/>		
POTENZA RISCALDAMENTO NOMINAL HEATING CAPACITY PUISSANCE CHAUFFAGE NOMINAL NOMINALE HEIZUNG	kW <input type="text"/>	MADE IN EUROPE	

Picture 4



The correct unit identification, by means of the serial number, is essential for the execution of any operations to carry out on the unit. The serial number must be always advised whenever submitting a request of technical service support.

4.2 Receiving and inspection

It is very important to inspect the packing integrity directly upon delivery. In case the packing is found damaged, it is necessary to carry out an accurate inspection of the machine, then describe the state of the received goods writing directly on the consignment note, which must be also countersigned by the driver. Any claims concerning the delivered goods must be sent by fax or registered letter within 8 days from receiving date. It is advisable to unpack the unit only when installation begins and possibly after the unit has been moved to the location where it must be installed.



It is forbidden to stack units, even if they are packed. In case the machine is stored after receiving, it must not be exposed to weather agents, even if packed.

4.3 Handling

The handling of the unit must be carried out by expert personnel equipped with proper equipment in relation to the weight and dimensions of the machine.

During the handling operation the machine must be always kept upright.



The weight of some models is unbalanced, check the unit stability before starting to handle it.

For any machine moving, what is shown below (**Picture 5**) must be followed.

In case the fork lift is employed, the forks must be spaced out to the maximum allowed by the pallet size.

In case the machine is moved by means of a crane, possible damages caused by cables and belts must be prevented.



Angle α must not be greater than 30° .

Picture 5

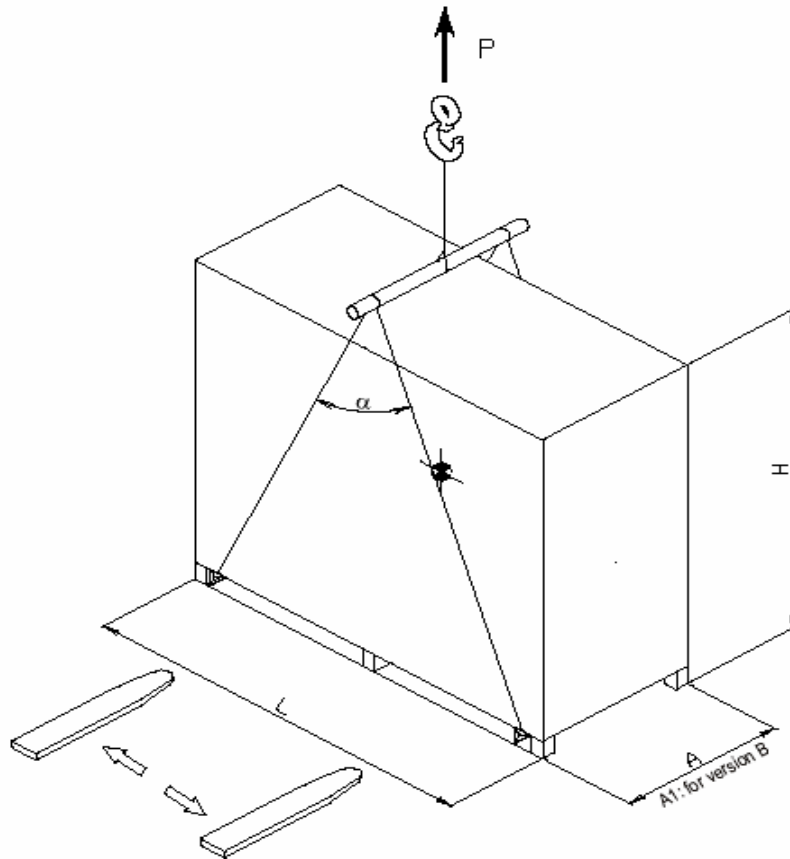


Table 3 shows the overall dimensions of different models packaging included.

The overall dimensions of the units included packing are indicated in the table here below.

TABLE 3

Model	Steel frame	H	L	A	A1
60 – 80	L1	1225	540	610	760
120	L2		690		
170	L3		990		
190 – 240 – 280	M1	2145	1290	710	860
320 – 380	M2		1600		
470	M3		1770	850	1000
550	M4		2030		
640 – 740	M5		2430		
800 – 870 – 1000	M6		3000		

The lifting weight *P* of the unit is the result of the weight as indicated on the data sheet attached to the unit plus the packaging weight as shown in **Table 4** here below.


TABLE 4

Steel frame size	L1	L2	L3	M1	M2	M3	M4	M5	M6
Packing weight (kg)	10	12	15	18	22	24	27	32	40



4.4 Arrangement and placing

The installation of the machine is under the responsibility of the installer, who must supervise the operations. The correct performance of the machine installation must be preceded by a plan drawn up by a qualified professional and the execution must be carried out by skilled and trained technicians. In the following paragraphs there are information and tips to keep in mind when planning the machine installation.

 The unit installation must comply with local existing laws.

Before attempting to install the unit following details must be checked:

- All connections done. The machine needs refrigeration, hydraulic and electric connections and condensate drainage.
- Enough left room around the unit for allowing routine maintenance, as depicted on **Picture 6** by the dashed area in front of the machine. It is also advisable to keep more room on the left and/or right side of the unit for all special maintenance operations, in case option PR is installed or if connections are made on the machine sides.
- If possible, leave lateral free room also for special maintenance operation like heat exchanger replacement and fans replacement.
- The dimensions of these areas are shown in **Picture 6** and in **Table 5** here below.
- The floor where the machine is positioned can bear the total weight of the unit under normal operation.

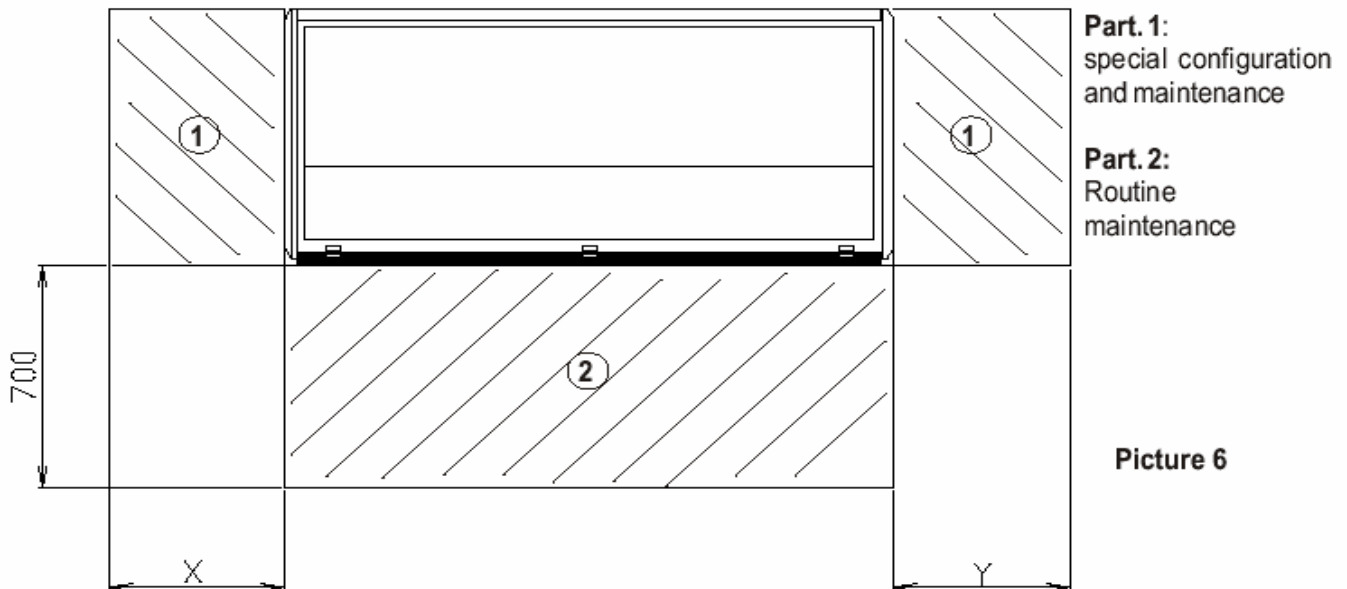


TABLE 5

	500 mm	1000 mm
X	-Left hand connections -Left hand PR option	- Fans replacement M5-M6 U/V/B/D
Y	- Right hand connections - Right hand PR option - B version (filter rescue)	- Fans replacement L1-M4 U/V/B/D



Before starting to move the unit for final positioning, it is necessary to identify the best way to the place, considering dimensions and weight of the machine, the lifting equipment available and any optional accessory dimensions.

All units described in this manual do not need any special foundation, since they can be simply laid on the chosen surface or arranged on a base frame (option) just placing a rubber protective plate underneath.

Make sure the features of the unit, as shown in the data sheet, match those required for the undertaken project.

In case of machine provided with bottom air outlet, the height of the floating floor must be kept into account because it can greatly influence the unit performance.

Check carefully the value of the load losses on the air distribution system, they shall not be higher than the static delivery of the unit in its standard configuration.

Different grades of static delivery head, besides the standard one are available as optional.

The number and the features of the suction and air distribution grills must be controlled in order to check if they fit the unit flow capacity.

As for the installation of accessories supplied apart from the unit, the assembling instruction attached to them must be strictly followed.

4.5 Hydraulic connections

The units are designed to be connected to a distribution system of refrigerated water.

The piping installation must be carried out by a skilled technician.

The piping layout must be planned in order to prevent, if possible, load losses in the circuit.

In any case, the pump for refrigeration water circulation must be able to deliver sufficient flow with necessary head to overcome possible load losses in every realistic operation condition.

The pipes must be adequately supported by brackets and have easy access for installation and inspection.

All materials employed for the construction of the circuit must stand a nominal pressure not lower than a PN 6.

The refrigerated water circuit must be isolated with insulation material made with closed cells and have thermal isolation feature and steam resistance suitable to the operation conditions of the unit.

It is recommended to take all necessary precaution in order to avoid that dirt or foreign matters enter the pipes during the installation phase.

At piping completion and unit installation, a tightness test of the hydraulic circuit must be carry out, in order to detect possible leaks and proceed with their repair before operation startup of the circuit.



Never exceed 6 bar pressure during the tightness test or other leaks search.

The connection of the unit with the refrigerated water circuit must be done employing the proper areas indicated in **Picture 7**.

The diameter of the unit hydraulic connections are listed in **Table 6**.

It is recommended to install a filter on the unit inlet having mesh dimension not larger than 1 mm.

It is advisable to mount ball valves in the water inlet and outlet to facilitate all the installation and maintenance operations to be performed on the circuit.



Install relief valves in the highest point of the circuit or in any place where gaseous air lock can be produced holding back the water flow.

If the unit is going to be operated with an anti-freeze mixture, it is necessary to estimate the consequent variation of the cooling capacity and the load loss of the machine.



Employ only anti-freeze liquid suitable for the material of the components of the unit and of the circuit.

The circuit must be provided with a pressure holding device (for example an automatic fill group, expansion tank) appropriate to the operating temperature and to the circuit dimension.



The circuit project and completion must always comply with local existing regulation.

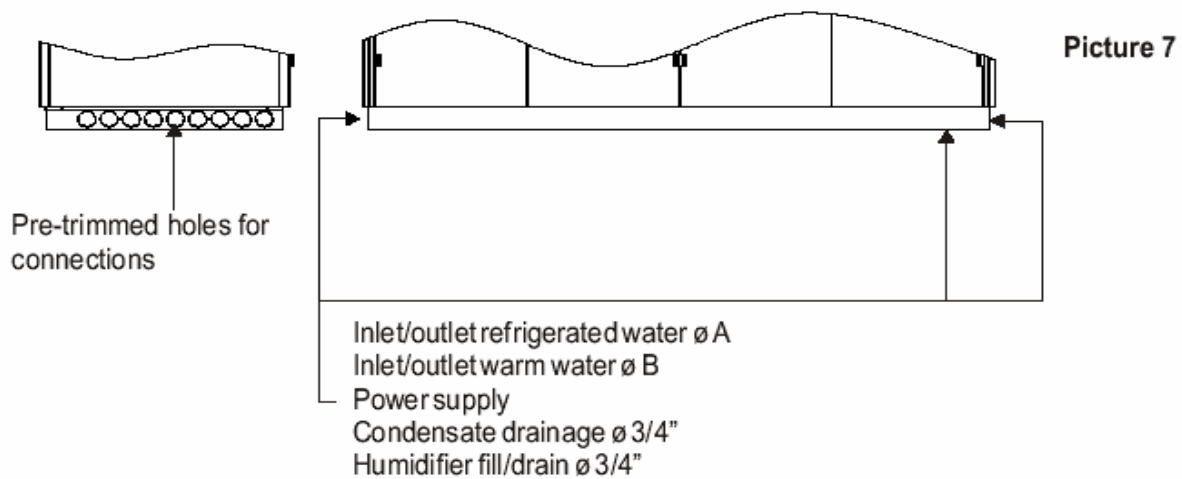


TABLE 6

HCW	IN / OUT refrigerated water	IN / OUT warm water
	Ø A	Ø B
60	3/4"	3/4"
80		
120	1"	
170		
190	1" ¼	
240		
280		
320		
380	1" ½	
470		
550	2"	
640		
740	2" ½	1"
800		
870		
1000		

4.6 Condensate drainage connection

The conditioner is provided with a stainless steel tank collecting the condensate created during the dehumidification phase. The tank is connected to the drainage by means of a flexible pipe with internal diameter of 27 mm. The drainage line must have a slight slope (1%) toward the outlet direction in order to facilitate the condensate outflow.

To guarantee the correct condensate drainage, create a siphon distant 20 mm from the connection point on the drainage line.

4.7 Connection to the humidifier

The humidifier can be supplied on request (Picture 8).

The unit is designed to be fed with water, coming from city water system, and relevant piping equipped with shutoff valve. The unit must be also connected to the drainage line in order to outflow possible condensate and overflow water. Even if the humidifier is provided with a filter, the fed water must be free from impurity larger than 100 micron.

Do not use de-mineralised water (hardness between 15-30°F and conductivity must range between 125 and 1250µSv (cm)). The water system pressure must range between 0.8 and 7 bar.





Picture 8

4.8 Renewal air intake connection

The module Renewal air intake (optional) is installed on the left internal side of the conditioning machine, on demand, on the right side.

The renewal air intake duct is connected to the closest external intake through a coupling of 100 mm diameter, mounted on the left side panel of the unit (Fig. 9a).

The module renewal air intake is equipped with a filter easy removable for cleaning purpose (Fig. 9b).



Picture 9a



Picture 9b

4.9 Electric connections

All electric circuits must be checked for damages, upon delivery. Check if all terminal screws are tight and have not loosened during transportation. Check also carefully if the tension and frequency of the power supply match the same data specified on the machine label.



See first the wiring diagram placed inside the electric panel.

4.9.1 Power supply connection (Picture 10)

The unit can be powered with a 5-pole cable (3pole + N + T). The standard power supply tension is 400V/3ph/50Hz, unit arrangement for special power supply tension can be supplied on request (check identification label and wiring diagram).

Connect the phases and the neutral to the terminals of the main disconnecting switch and the earth wire to its corresponding terminal. Use a power supply cable of adequate cross section and of moderate length to avoid voltage drops.

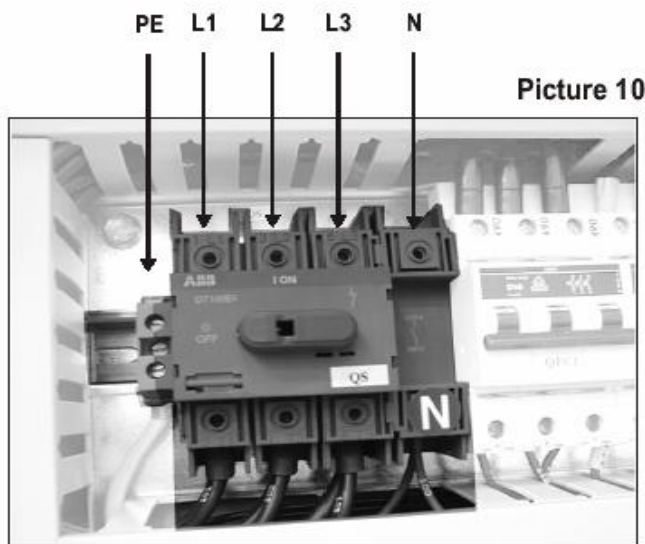
Protect the power supply cable by means of an automatic switch, of acceptable size and features, placed ahead of the unit. The cross section of the power supply cable and the size of the automatic switch can be found on **Table 7**, according to different unit models and configurations.

4.9.2 User's terminal connection

It is also available a terminal (Picture 11) where free contacts are designed for:

- 1 generic alarm state (1);
- 2 machine remote ON/OFF (2).

For the exact correspondence of the terminal numbers see the wire diagram.



Picture 11

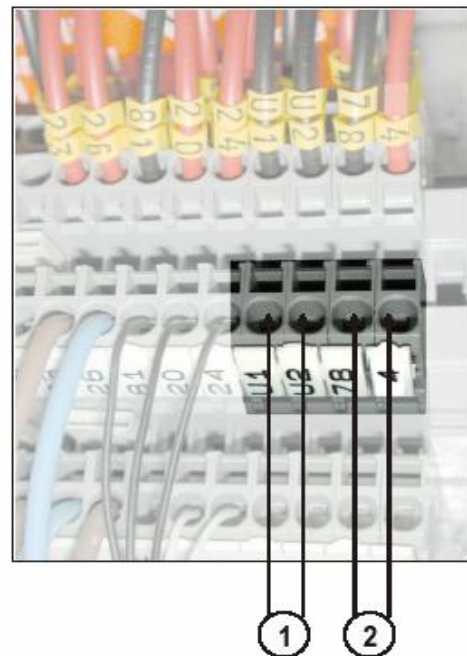


TABLE 7 - Automatic switch size and power cable cross section

Model	STD	H	RE
60 – 80 – 120	16A 4P	25A 4P	25A 4P
170	16A 4P	25A 4P	40A 4P
190 – 240 – 280	16A 4P	32A 4P	50A 4P
320 – 380	20A 4P	32A 4P	63A 4P
470 – 550	20A 4P	50A 4P	80A 4P
640 – 740	25A 4P		100A 4P
800 – 870 – 1000			

Legend:


- STD: standard machine (without humidifier and heating elements)
- H: machine with humidifier (without heating elements)
- RE: machine with heating elements or with heating elements and humidifier

4.10 Hydraulic circuit filling

Once completed the hydraulic circuit and performed the connection to the unit, it is necessary to fill the circuit itself.

Open all relief valves present in the circuit.

Connect the system to a waterworks, possibly in a permanent way, by means of an automatic fill group provided with manometer and non-return valve.

 If the system works with anti-freeze mixture, it is necessary to fill the system with the appropriate quantity of anti-freeze liquid according to the system dimension and to the anti-freeze concentration to get.

Start to fill the system with water.

Check all the relief valves present in the system and close each of them when water, instead of air, starts to go out.


Once all valves are closed, continue to fill the system with water until a pressure between 1,5 and 3,5 bar is reached.

In case filling is done manually, stop the water charge and switch the circulation pumps on, so that possible presence of air inside the system is gathered where relief valves are present.

After two hours of operation, switch the pump off and discharge the air by means of the relief valves.

Fill the system with more water in order to reach the initial value of the pression.

Repeat the operations until the relief valves do not discharge air anymore.

 Make sure the water pressure in the system always ranges between 1,5 and 3,5 bar.



5 - OPERATING

5.1 First start-up


Before starting the unit, the following simple operations must be carried out:


- Hydraulic circuit

Check the hydraulic circuit is completely air free and that the water capacity and temperature are correct.

- Switch on

Perform the operation as described in paragraph 4.9 "Electric connection" and follow these instructions:

 Rotate the main switch to ON position.

 Check if the fans rotation is right, in case the rotation is wrong and the fans are 3-phase, two of the three phase must be inverted in the terminals of the main switch.

Once the unit is started, after a short period needed to the microprocessor for an auto-test, the electric fans of the air conditioning unit will start. Now at this point, all the system components start working according to selected and detected thermal and humidity condition.

Push **OFF** button on the microprocessor keyboard to stop the air conditioning. If the unit must be stopped for more than 24 hours, set the main switch to OFF position.

- Setup

The setup must be performed with the unit working and its status very close to the nominal one.

Check:

- the thermal load present is adequate;
- doors and windows are closed;
- the environment is clean.

- Microprocessor setting

Check that the desired thermal and humidity parameters are set in the microprocessor.

If the preset parameters need to be changed, proceed as described in the microprocessor manual (see attachment).

 Standards units are designed to work with room temperature between 22 e 27 °C (50% relative humidity).

- Steam production setting (unit with humidifier)

Steam production must not exceed 60-70% of max. capacity, this ensures to the humidifier a longer operating life.

In order to set or modify the parameters, see the attached humidifier manual.

TABLE 8: Main electric components (see also wiring diagram attached)

MODELS HCW.U/ HCW.D	STEEL FRAME TYPE	STANDARD FANS		OPTIONAL AA	FUT (10X38)
		KMV	QMV	FUAA	
60 – 80	L1	9A	NO	500mA glass	2A 2P
120	L2	9A	NO	500mA glass	2A 2P
170	L3	9A	NO	500mA glass	2A 2P
190	M1	9A	NO	500mA glass	2A 2P
240	M1	9A	NO	500mA glass	2A 2P
280	M1	9A	NO	500mA glass	2A 2P
320	M2	18A	NO	500mA glass	2A 2P
380	M2	18A	NO	500mA glass	2A 2P
470	M3	18A	NO	500mA glass	2A 2P
550	M4	18A	NO	500mA glass	2A 2P
640	M5	18A	4 – 6,3A	500mA glass	2A 2P
740	M5	18A	4 – 6,3A	500mA glass	2A 2P
800	M6	25A	4 – 6,3A	500mA glass	2A 2P
870	M6	25A	4 – 6,3A	500mA glass	2A 2P
1000	M6	25A	4 – 6,3A	500mA glass	2A 2P

5.2 Fault alarm and display system

The troubleshooting is facilitated by the microprocessor, which activates an alarm and shows on its display the type of fault occurred (see also the microprocessor manual attached).

Since the alarm state is very often generated by an unfitted electric contact, in case the display shows a fault type check for all wiring connections are tighten in the terminals.

In case of fault also refer to the microprocessor manual for checking parameters setting has been done properly.



5.3 Troubleshooting

TROUBLE	POSSIBLE CAUSE	CHECK/ CORRECTIVE ACTION
1) The unit does not work	A) The electric panel is not powered	Check presence of electric tension and main switch in ON position
	B) The auxiliary circuit is not powered	Check fuse FUT
2) The conditioning unit does not start	A) The microprocessor does not start the unit	Check the electric connection to the microprocessor
	B) The external impulse to the microprocessor fails	Check the contact ON/OFF remote is closed
3) Ambient temperature too high (high temperature alarm signal)	A) The unit does not work	See trouble 2
	B) The control system rating is not correct	Check the rating of the control system
	C) The air flow capacity is too low	See trouble 6
	D) Three way valve does not work	See trouble 7
	E) The refrigerated water output is not sufficient	1) Check functioning of the circulation pump 2) Check circulating pump features match the system requirements 3) Check for unexpected load loss in the system 4) Check water filter clean status
	F) The control system does not work	See the attached Microprocessor manual
	G) Thermal load higher than estimated	Check the room thermal load value
4) Ambient temperature too low (low temperature alarm signal)	A) The control system rating is not correct	Check rating of the control system
	B) The heating system do not work (if installed)	See trouble 8
	C) The control system does not work	See the attached Microprocessor manual
	D) Thermal loss higher than estimated	Check thermal loss value
5) Ambient humidity too high (high room humidity alarm)	A) The control system is not properly set	Check control system setting
	B) Latent load higher than estimated	Check room latent load value
	C) The three way valve does not work when in dehumidification phase	See trouble 7
	D) The control system does not work	See the attached Microprocessor manual
6) Low air flow (or absent) (high humidity probe)	A) The fans are not powered	Check the fans electric circuit
	B) Clogged filter (filter alarm activated)	Clean or replace filter
	C) Obstruction in the air duct or excess of load loss in the air duct	Check total load loss and compare with the unit delivery head
	D) Fan thermal protection system is activated	Check fan winding resistance; after reset check tension and electric input
	E) Intake pressure too low	See trouble 12
7) The three ways valve does not work	A) The control system does not work	See the attached Microprocessor manual
	B) The servomotor of the valve does not work	Check electric connections and replace the servomotor, if defective
	C) The valve is mechanically stuck	Try to loose the valve or replace it
8) The heating elements or the heat coil do not work (if installed)	A) The safety thermostat activated	1) The air flow rate is too low, see trouble 6 2) Check the safety thermostat for defect, replace it if so
	B) Fuses activated	Replace damages fuses
	C) The contact maker is not working	Check the contacts and the coil
9) Alarm of one probe	The probe corresponding to the alarm code is defective or disconnected	Check the connection of the probe: in case is defective replace it.

5.4 Routine Maintenance

	Monthly	Quarterly	Annual
Filter cleaning	X		
Condensate tank cleaning		X	
Humidifier's cylinder cleaning		X	
Fan bearings noise level check		X	
Electric connection tightening		X	
Contactors status check		X	
Insulation status of ducting check			X
Water flow check	X		
Electric absorption check		X	
General unit condition check			X
Probe calibration check			X
Set parameter values check		X	
Electric protections operation check		X	
Three way valve operation check			X
Air presence in the hydraulic circuit check	X		



5.5 Spare parts list

UV.	60	80	120	170	190	240	280	320
Temperature probe	MPOST01	MPOST01	MPOST01	MPOST01	MPOST01	MPOST01	MPOST01	MPOST01
Microprocessor	MP00001	MP00001	MP00001	MP00001	MP00001	MP00001	MP00001	MP00001
Fan	VE00001	VE00001	VE00002	VE00003	VE00002	VE00004	VE00004	VE00005
Cold water coil	BWF0001	BWF0002	BWF0003	BWF0004	BWF0005	BWF0006	BWF0007	BWF0008
Three-way valve	VM00001	VM00001	VM00002	VM00003	VM00003	VM00004	VM00004	VM00004
Three-way valve servomotor	MV00001	MV00001	MV00001	MV00001	MV00001	MV00001	MV00001	MV00001
Standard air filter	F400001	F400001	F400002	F400003	F400004	F400004	F400004	F400005

UV.	380	470	550	640	740	800	870	1000
Temperature probe	MPOST01	MPOST01	MPOST01	MPOST01	MPOST01	MPOST01	MPOST01	MPOST01
Microprocessor	MP00001	MP00001	MP00001	MP00001	MP00001	MP00001	MP00001	MP00001
Fan	VE00005	VE00006	VE00007	VE00008	VE00008	VE00008	VE00009	VE00009
Cold water coil	BWF0009	BWF0010	BWF0011	BWF0012	BWF0013	BWF0014	BWF0014	BWF0015
Three-way valve	VM00004	VM00005	VM00005	VM00006	VM00006	VM00006	VM00006	VM00006
Three-way valve servomotor	MV00001	MV00001	MV00001	MV00002	MV00002	MV00002	MV00002	MV00002
Standard air filter	F400005	F400006	F400007	F400008	F400008	F400009	F400009	F400009

5.5.1 Optional spare parts list

UV.	60	80	120	170	190	240	280	320
Steam cylinder	U101001	U101001	U101001	U101001	U101001	U101001	U101001	U101001
Heating elements	R101001	R101001	R101001	R101002	R101003	R101003	R101003	R101003
Warm water coil	BWC0001	BWC0001	BWC0002	BWC0003	BWC0004	BWC0004	BWC0004	BWC0005
Three-way valve	VM00001	VM00007	VM00008	VM00008	VM00001	VM00001	VM00001	VM00001
Filter F5	F500001	F500001	F500002	F500003	F500004	F500004	F500004	F500005
Filter F6	F600001	F600001	F600002	F600003	F600004	F600004	F600004	F600005
Filter F7A	F7A0001	F7A0001	F7A0002	F7A0003	F7A0004	F7A0004	F7A0004	F7A0005
Filter F7B	F7B0001	F7B0001	F7B0002	F7B0003	F7B0004	F7B0004	F7B0004	F7B0005
Filter F9	F900001	F900001	F900002	F900003	F900004	F900004	F900004	F900005
Flooding probe	MPOSA01	MPOSA01	MPOSA01	MPOSA01	MPOSA01	MPOSA01	MPOSA01	MPOSA01
Humidity probe	MPOUT01	MPOUT01	MPOUT01	MPOUT01	MPOUT01	MPOUT01	MPOUT01	MPOUT01
Three-way valve servomotor	MU00001	MU00001	MU00001	MU00001	MU00001	MU00001	MU00001	MU00001

UV.	380	470	550	640	740	800	870	1000
Steam cylinder	U101001	U101002	U101002	U101002	U101002	U101002	U101002	U101002
Heating elements	R101003	R101004	R101004	R101005	R101005	R101005	R101005	R101005
Warm water coil	BWC0005	BWC0006	BWC0007	BWC0008	BWC0008	BWC0009	BWC0009	BWC0009
Three-way valve	VM00001	VM00001	VM00001	VM00002	VM00002	VM00002	VM00002	VM00002
Filter F5	F500005	F500006	F500007	F500008	F500008	F500009	F500009	F500009
Filter F6	F600005	F600006	F600007	F600008	F600008	F600009	F600009	F600009
Filter F7A	F7A0005	F7A0006	F7A0007	F7A0008	F7A0008	F7A0009	F7A0009	F7A0009
Filter F7B	F7B0005	F7B0006	F7B0007	F7B0008	F7B0008	F7B0009	F7B0009	F7B0009
Filter F9	F900005	F900006	F900007	F900008	F900008	F900009	F900009	F900009
Flooding probe	MPOSA01	MPOSA01	MPOSA01	MPOSA01	MPOSA01	MPOSA01	MPOSA01	MPOSA01
Humidity probe	MPOUT01	MPOUT01	MPOUT01	MPOUT01	MPOUT01	MPOUT01	MPOUT01	MPOUT01
Three-way valve servomotor	MU00001	MU00001	MU00001	MU00001	MU00001	MU00001	MU00001	MU00001



6 - DISMANTLING

When the unit has to be dismantled, separate the components by material type and send them to salvage dump for recycling. Only specialized company must perform this activity in compliance with the existing environment local regulation.

The unit works with water, therefore it does not contain any fluid hazardous to persons, properties and environment.



In case the unit had worked with an anti-freeze mixture, it is necessary to collect all the fluid contained in the unit and send it to an authorized collecting centre.



Do not waste, for no reasons, the anti-freeze mixture of the unit in the environment.

DECLARATION EC OF CONFORMITY

The Manufacturer

EMICON A.C. S.P.A.
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47100 Forlì (FC)
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fax. (0039) 0543/411725

DECLARES

that the equipment

Model

Serial Number

suits the followings directives

- 73/23/CEE
- 89/336/CEE
- 98/37/CE

because it has been designed, manufactured and tested according to the following Standards

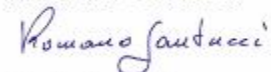
EN 12055
EN 60204-1
EN 60335-1
EN 60335-2-40
EN 60439-1

EN 61000-6-1
EN 61000-6-2
EN 61000-6-3
EN 61000-6-4

EN 292-1
EN 292-2
EN 294
EN 418
EN 563
EN 954-1
ISO 3744
UNI 10615

Forlì, 05/11/2007

Romano Santucci



Technical Manager