

ORIGINAL
MANUAL



INSTALLATION, USER & MAINTENANCE MANUAL

Cross-flow heat recovery

KRE-500DX1

KRE-1000DX1

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WE DECLARE UNDER OUR SOLE RESPONSIBILITY THAT THE MACHINE

DICHIARIAMO SOTTO LA NOSTRA SOLA RESPONSABILITÀ CHE LA MACCHINA
 WIR ERKLÄREN EIGENVERANTWORTLICH, DASS DIE MASCHINE
 NOUS DÉCLARONS SOUS NOTRE SEULE RESPONSABILITÉ QUE LA MACHINE
 EL FABRICANTE DECLARA BAJO SU EXCLUSIVA RESPONSABILIDAD QUE LA MÁQUINA

CATEGORY	Energy recovery unit
CATEGORIA	Unità di recupero calore
KATEGORIE	Wärmerückgewinnungsgerät
CATEGORIE	Unité de récupération chaleur
CATEGORIA	Unité de récupération chaleur

TYPE / TIPO / TYP / TYPE / TIPO

HRV-DX-2-XMi D500 - HRV-DX-2-XMi D1000















- **COMPLIES WITH THE FOLLOWING EC DIRECTIVES, INCLUDING THE MOST RECENT AMENDMENTS, AND THE RELEVANT NATIONAL HARMONISATION LEGISLATION CURRENTLY IN FORCE:**
- RISULTA IN CONFORMITÀ CON QUANTO PREVISTO DALLE SEGUENTI DIRETTIVE CE, COMPRESSE LE ULTIME MODIFICHE, E CON LA RELATIVA LEGISLAZIONE NAZIONALE DI RECEPIMENTO:
- DEN IN DEN FOLGENDEN EG-RICHTLINIEN VORGESEHENEN VORSCHRIFTEN, EINSCHLIEßLICH DER LETZTEN ÄNDERUNGEN, SOWIE DEN ANGEWANDTEN LANDESGESETZEN ENTSPRICHT:
- EST CONFORME AUX DIRECTIVES CE SUIVANTES, Y COMPRIS LES DERNIÈRES MODIFICATIONS, ET À LA LÉGISLATION NATIONALE D'ACCUEIL CORRESPONDANTE:
- ES CONFORME A LAS SIGUIENTES DIRECTIVAS CE, INCLUIDAS LAS ÚLTIMAS MODIFICACIONES, Y A LA RELATIVA LEGISLACIÓN NACIONAL DE RECEPCIÓN:

- 2006/42/EC** **Machinery directive**
 Direttiva macchine
 Maschinenrichtlinie
 Directive sur les machines
 Directiva máquinas
- 2014/30/UE** **Electromagnetic compatibility**
 Compatibilità elettromagnetica
 Elektromagnetische Verträglichkeit
 Compatibilité électromagnétique
 Compatibilidad electromagnética
- 2011/65/UE** **RoHs**
- 2009/125/CE** **Ecodesign**
 Progettazione ecocompatibile
 Ecodesign
 Éco-conception
 Ecodiseño






-Responsible to constitute the technical file is the company n°. IT03074850235 and registered at the Chamber of Commerce of Verona Italy
 -Responsabile a costituire il fascicolo tecnico è la società n°. IT03074850235 registrata presso la Camera di Commercio di Verona Italia
 -Verantwortliche für die technischen Unterlagen zusammenstellen n°. IT03074850235 ist das Unternehmen bei der Handelskammer von Verona Italien registriert
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 -Encargado de elaborar el expediente técnico es la empresa n°. IT03074850235 registrada en la Cámara de Comercio de Verona Italia

SANT JUST DESVERN, 06/11/2020 NAME / NOME / VORNAME / PRÉNOM / NOMBRE
 SURNAME / COGNOME / ZUNAME / NOM / APELLIDOS **EDUARDO ROMANO**
 COMPANY POSITION / POSIZIONE / BETRIEBSPOSITION / FONCTION / CAI BUSINESS UNIT MANAGER HVAC & ENERGY

GENERAL WARNINGS

	This manual is an integral part of the apparatus and then it must be preserved with care and it ALWAYS must accompany the machine, even in the case of cession to another owner or user or in the case of a transfer on another system. In the case of its damage or losing, ask another copy to the distributor Company.
	The repairs or the maintenance must be carried out by expert and qualified staff as it is expected in this handbook. Don't modify or tamper with the machine because it can create dangerous situations and the distributor Company does not answer to possible damages.
	Check the perfect integrity of all machine components. Check that in the packing all the accessories for the installation and the relevant documentation, are included. In the case of not conformity turn to seller company.
	The installation of the machine must be carried out by qualified Company according to the law March, 5th 1990 n° 46 which, at the end of the work, must give to the owner, the declaration of conformity of installation workmanlike, that is in compliance with the regulations in force and with the indications of this handbook.
	The distributor Company does not answer to possible damages to people, animals or things, due to wrong installation, regulations and maintenance or due to illegitimate use.
<p>Remember that in the use of products that use electrical energy and water, some fundamental rules of security must be observed. In particular:</p>	
	Children and handicapped people without assistance must not use the machine.
	Don't touch the machine if you are barefoot and if you are wet.
	Do not proceed with cleaning or maintenance operations, before switching off the electric power supply.
	Do not modify security or adjustment devices without permission and indications of the Manufacturer Company.
	Do not pull, remove, twist electrical cables coming out from machine, even if these is disconnected from power supply network.
	Do not walk up, sit down and/or place any objects on the machine.
	Do not spurt water directly on the machine.
	Do not open access doors of the machine, without positioning general switch of the system on "off" .
	Do not scatter, leave close by children packing material because it could be dangerous.




SYMBOLS USED

	WARNING
	DANGER
	DANGER OF ELECTRICAL SHOCK
	QUALIFIED STAFF ONLY
	PROHIBITION

IDENTIFICATION OF THE UNIT

(A)

	(B)
Modello Model	(C)
Matricola Serial Number	(D)
Tensione/Fasi/Frequenza Voltage/Phase/Frequency	(E)
Corrente Max Assorbita Max input current	(F)
Codice Code	(G)
Data di produzione Manufacturing date	(H)
Grado IP IP grade	(I)

(M) **Made in China**
(L)

A	<i>Manufacturer's mark</i>
B	<i>Manufacturer's address</i>
C	<i>Model</i>
D	<i>Serial number</i>
E	<i>Voltage; number of phases; frequency</i>
F	<i>Maximum absorbed current [A]</i>
G	<i>Code</i>
H	<i>Manufacturing date</i>
I	<i>IP Grade</i>
L	<i>CE mark</i>
M	<i>Barcode</i>



IMPORTANT NOTES

THE HEAT RECOVERY UNITS OF KRE DX SERIES ARE ONLY SUITABLE FOR INTERNAL INSTALLATION

The heat recovery unit is a machine designed and built exclusively to change air in the civil environments, incompatible with toxic and inflammable gases. Therefore it cannot be used in those environments where the air is mixed and/or altered by other gaseous composites and/or solid particles.

The use of the same for different purposes from those envisioned, not conform to that described in this manual, will make any direct and/or indirect liability of the Manufacturer automatically become null and void.

SECTION 1 - GENERAL CHARACTERISTICS

1.1 Presentation of the manual

This manual describes the rules for the transportation, the installation, the use and the maintenance of the heat recovery. The user will find everything that is normally useful to know for a correct and safe installation of the **KRE DX** unit.

The non-observance of what is described in this handbook and an inadequate installation of the **KRE DX** unit may cause the cancellation of the guarantee that the Manufacturer/Distributor Company grants on the same one. The Manufacturer/distributor Company, moreover, does not answer to possible direct and/or indirect damages due to wrong installation carried out by inexperienced and/or non-authorized staff. At the moment of the purchase, check that the machine is integral and complete. Claims will have to be produced within 8 days from the reception of the goods.

1.2 General characteristics

- Galvanized steel self-supporting panels, internally and externally insulated
- Counterflow air-to-air heat recovery device, made of plane sheets of special paper with special sealing to keep airflows separate and only permeable to water vapor. **Total heat exchange** with temperature efficiency up to 76% and enthalpy efficiency up to 67%, also at high level during summer season
- ISO 16890 Coarse 50% + ePM2.5 95% (F9 EN779) efficiency class filters on fresh air, Coarse 50% (G3 EN779) filter on return air intake. All filters are made with synthetic cleanable media.
- Removable side panel to access filters and heat recovery in the event of scheduled maintenance
- Motorised heat recovery by-pass device automatically controlled by unit control to use fresh air free-cooling when convenient
- **Low consumption**, high efficiency & low noise direct driven fans with **EC motors**
- **Supply section complete with DX coil** (R410A) fitted with solenoid control valve, freon filter, contact temperature sensors on liquid and gas line, NTC sensors upstream and downstream airflow
- **Integrated sanitization system BIOX-DX®**, switched on at fans running, able to do an efficient antibacterial treatment, ensuring a perfect healthiness of supplied air
- Built-in electric box equipped with PCB to control internal fan speed and to interconnect outdoor/indoor units
- Duct connection by circular plastic collars
- PRE-DX-500 electric pre-heating module (available as an accessory) for temperatures below -5 °C.

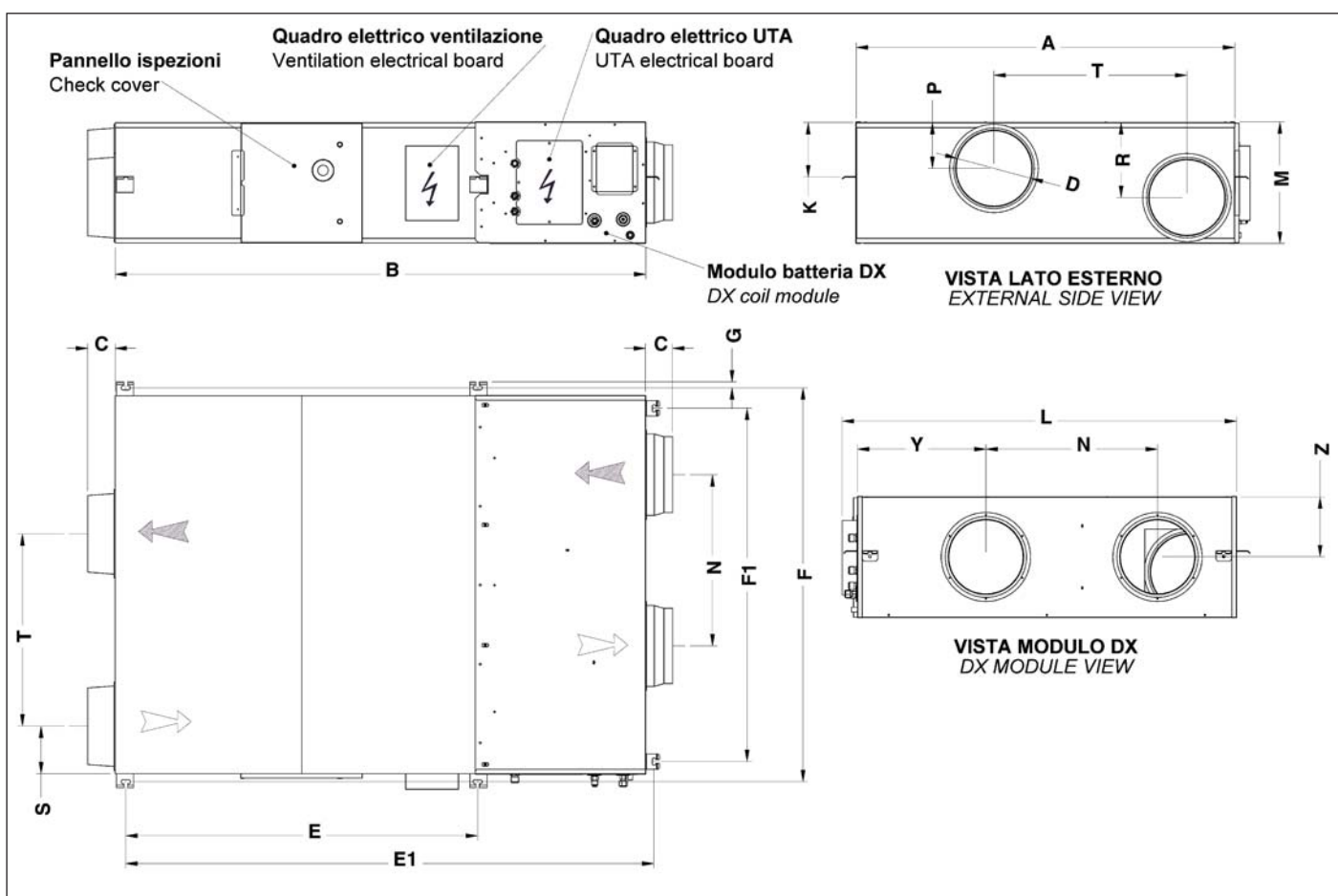
1.3 KRE DX series technical data

MODEL	KRE-	500DX1	1000DX1
Nominal air flow	m ³ /h	500	1000
Nominal external static pressure	Pa	90	115
Electrical power supply	V/ph/Hz	220 - 240 / 1 / 50	
Total full load amperage	A	0.6	2.1
WORKING LIMITS			
Limit working temperature	°C / %	- 15 ...+ 40°C / 10 ... 95 %	
FANS			
Motor typology		EC	EC
Number of speeds		3	3
Fan control (1)		Man	Man
Internal specific fan power of ventilation components - SFP int (5)	W/(m ³ /s)	547	881
Total nominal power input	kW	0.15	0.39
Sound pressure level (2)	dB(A)	39	43
HEAT EXCHANGER			
Winter thermal effic. (3)	%	76.0%	76.0%
Winter enthalpy effic. (3)	%	67.0%	62.0%
Summer thermal effic. (4)	%	76.0%	76.0%
Summer enthalpy effic. (4)	%	63.0%	60.0%
Dry thermal efficiency (5)	%	76.0%	76.0%
DX COIL			
Heating capacity (6)	kW	2,5 (2,7)	5,2 (6,7)
Approximate supply air temperature at (6) condition	°C	28,0 (27,3)	28,5 (27,8)
Approximate supply air humidity at (6) condition	%	16 (15)	15 (14)
Total cooling capacity (7)	kW	3.0	5.8
Sensible cooling capacity	kW	2.1	4.1
Approximate supply air temperature at (7) condition	°C	15.9	16.2
Approximate supply air humidity at (7) condition	%	90	89

- (1) Man = Manual by selector switch or control panel;
- (2) Sound pressure level calculated at 1 m far from service side of casing, with ducted supply, exhaust, return and fresh air, at nominal conditions return-fresh air intake/service side, at nominal conditions.
- (3) Outside air at -5° 80% RH; room air at 20°C 50% RH
- (4) Outside air at 32° 50% RH; room air at 26°C 50% RH
- (5) Refer to EU 1253/2014 regulation: at nominal pressure; air conditions refer to EN 308 standard
- (6) Air inlet condition: 13°C DB, RH 40% (11°C DB, RH 45%); condensing temp. 40°C
- (7) Air inlet condition: 28,5°C DB, RH 50%; evaporating temp. 7°C

1.4 Dimensions and weights KRE DX

Model	Dimension [mm]																			Weight net / gross [Kg]	Packing dimensions [mm]	Packaging overlap
	A	B	C	D	E	E1	F	F1	G	L	T	K	M	N	P	R	S	Y	Z			
KRE-500DX1	904	1450	107	200	825	1445	960	830	19	955	500	135	270	350	135	135	202	350	135	90 - 98	1750x1120x420	6
KRE-1000DX1	1216	1750	85	250	1130	1750	1273	1140	19	1290	621	171	388	550	146	241	151	415	195	105 - 120	2080x1460x540	5



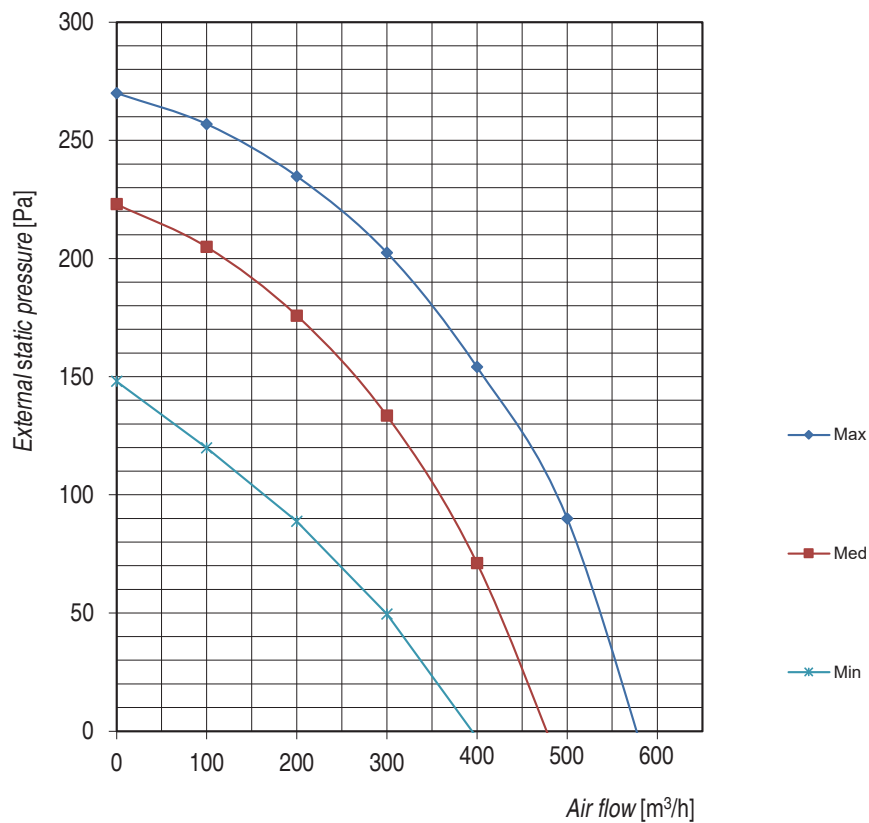
ACCESSORIES

- Electric pre-heater module - **PRE-DX**

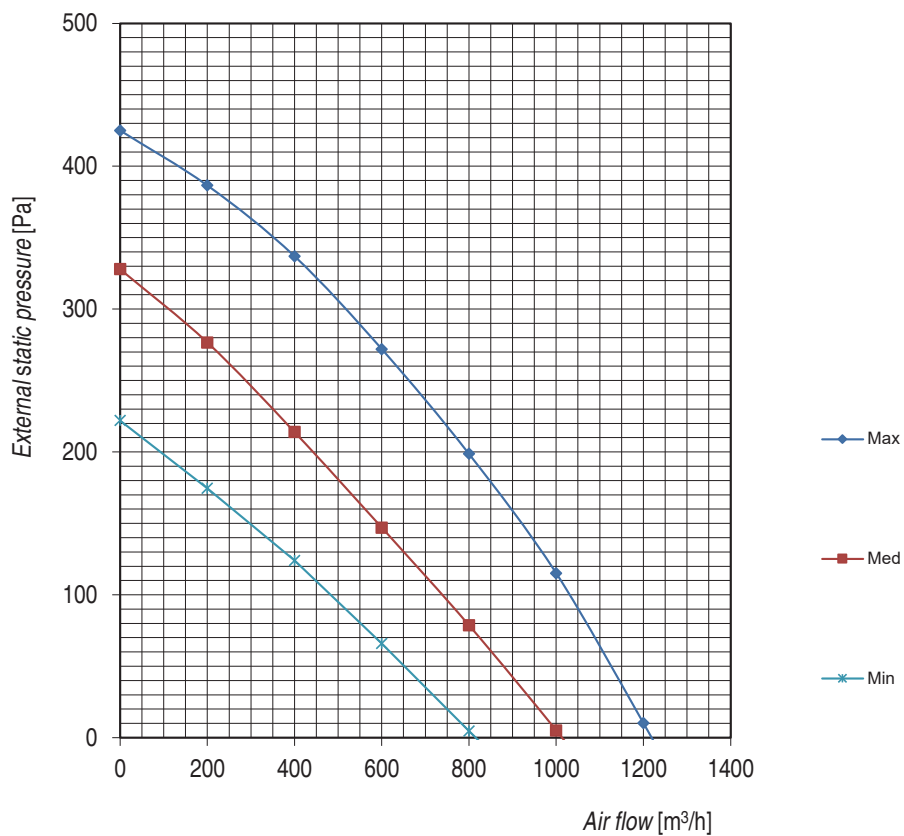
Finned pipe coil with safety thermostats enclosed between galvanized steel plates with duct round adapters downstream and upstream, to be placed externally, connected to the suction of fresh air stream.

1.5 Characteristic curves

KRE-500DX1



KRE-1000DX1



1.6 Sound power levels

KRE-500DX1	Sound power levels L_w at center band frequencies									Total L_w
	Hz	63	125	250	500	1000	2000	4000	8000	
Supply duct	dB(A)	32.8	37.9	54.9	55.5	54.2	52.2	44.0	33.9	60.5
Exhaust duct	dB(A)	32.8	46.9	54.2	55.6	55.0	52.2	44.0	33.9	60.7
Outside the casing	dB(A)	27.8	33.1	42.8	41.3	40.0	37.4	12.7	9.0	47.0

Noise at nominal working point

KRE-1000DX1	Sound power levels L_w at center band frequencies									Total L_w
	Hz	63	125	250	500	1000	2000	4000	8000	
Supply duct	dB(A)	46.4	52.9	60.1	59.3	59.0	59.0	52.5	47.9	66.0
Exhaust duct	dB(A)	45.8	52.5	57.0	58.1	56.6	57.2	52.0	47.9	64.1
Outside the casing	dB(A)	41.1	41.4	44.8	44.3	43.0	43.2	20.3	17.9	51.0

Noise at nominal working point

SECTION 2 - TRANSPORT



2.1 Packing

- The regenerators and their accessories are inserted in cardboard boxes that will have to remain integral until the moment of the assembly.
- The components that, due to technical requirements, are not assembled, are supplied packed in a suitable covering and fixed to the inside or outside of the unit.

2.2 Handling and transport

- For the handling, in function of the weight, use adequate means in conformity to the directive 89/391/EEC and successive modifications.
- The weight of every single machine is shown on the attached technical data sheet.
- Avoid rotations without control.
- Take utmost care during loading operations: all the machines must be loaded and stored in the truck interposing opportune spacers to safeguard all protruding parts like water couplings, handles, hinges.

2.3 Control upon reception

Upon reception of the goods, please carry out a control of all the parts, verifying that the transport has not caused damages. All damages must be communicated to the carrier, putting a reserve clause on the delivery note and specifying the type of damage.

2.4 Storage

In case of long term storage, keep the machines protected from dust and from all sources of vibrations and heat.

The manufacturer company declines every responsibility for damages due to uncorrect unloading or not sufficient protection against atmospheric agents.



3.1 Definitions

CUSTOMER - The customer is the person, the agency or the company, that has acquired or rented the unit and that uses it for the conceived purpose.

USER / OPERATOR - The operator or user is the physical person who has been authorised from the customer to operate with the machine

SPECIALISTIC STAFF - Intended are all those physical persons who have achieved a specific training, are therefore in a position to recognize the dangers deriving from the use of this machine and are able to avoid them.

3.2 Safety Standards

The Manufacturer/Distributor Company declines whichever responsibility for the non observance of the emergency and prevention norms described below.

It declines furthermore responsibility for damages caused by an improper use of the unit and/or by modifications carried out without authorization.

- The installation must be carried out by expert and qualified staff.
- During installation operations, use suitable accident-prevention clothing, as an example: glasses, gloves, etc as indicated by the 686/89/EEC and successive norms.
- During installation, operate in absolute safety, in clean surrounding and free from impediments.
- Respect the laws in force in the Country in which the unit is installed, concerning the use and the disposal of the packings and the products used for cleaning and maintaining the machine and follow the manufacturer instructions of such products.
- Before putting the unit in function, check the perfect integrity and safety of all components and of the entire system.
- Avoid at all cost to touch the parts in motion or to interfere with the same ones.
- Do not proceed with cleaning or maintenance operations, before switching off the electric power supply.
- The maintenance and the substitution of damaged or worn out parts of the unit must be carried out by qualified staff only and following the indications contained in this handbook.
- Spare parts must correspond to the requirements defined by the Manufacturer Company.
- In case of dismantling of the unit, follow the relevant antipollution norms.

N.B. When using the unit, the installer and the user must take into account and place remedy to all the other types of risk connected with the sistem. As an example risks deriving from entry of foreign bodies, or risks deriving from the conveying of dangerous gases that are inflammable or toxic at high temperature.

3.3 Preliminary operations

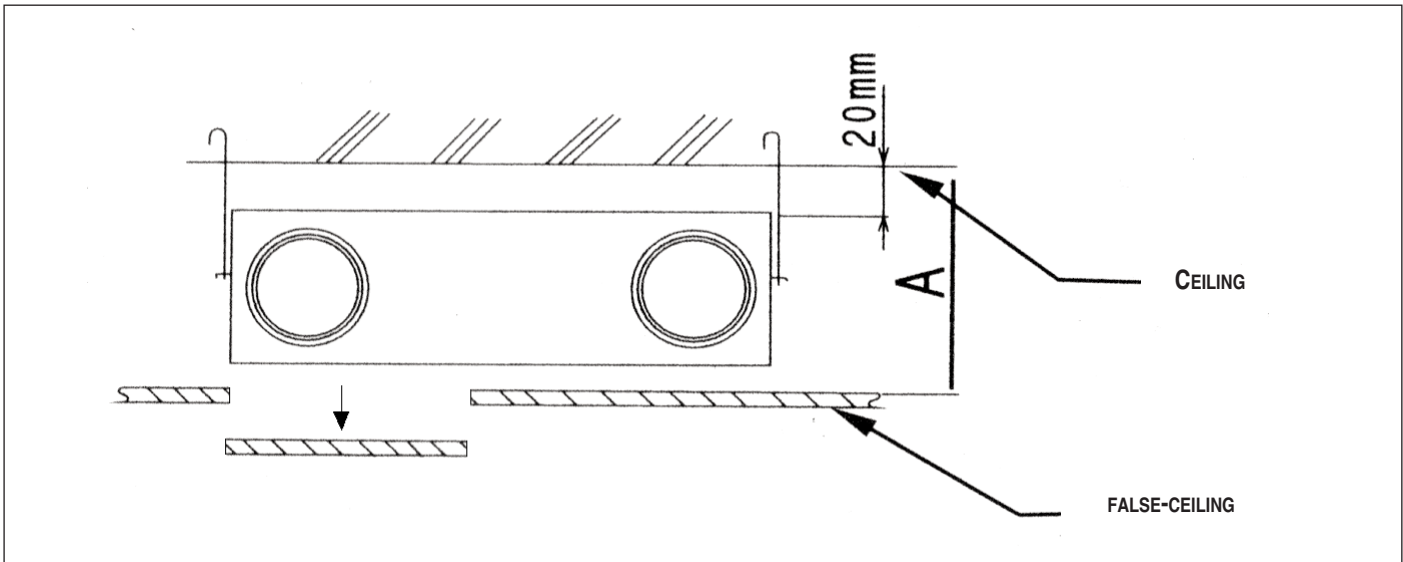


- Check the perfect integrity of all components.
- Check that in the packing all the accessories for the installation and the relevant documentation, are included.
- Transport the packed section as close as possible to the installation place.
- Do not put tools or weights over the packed unit.

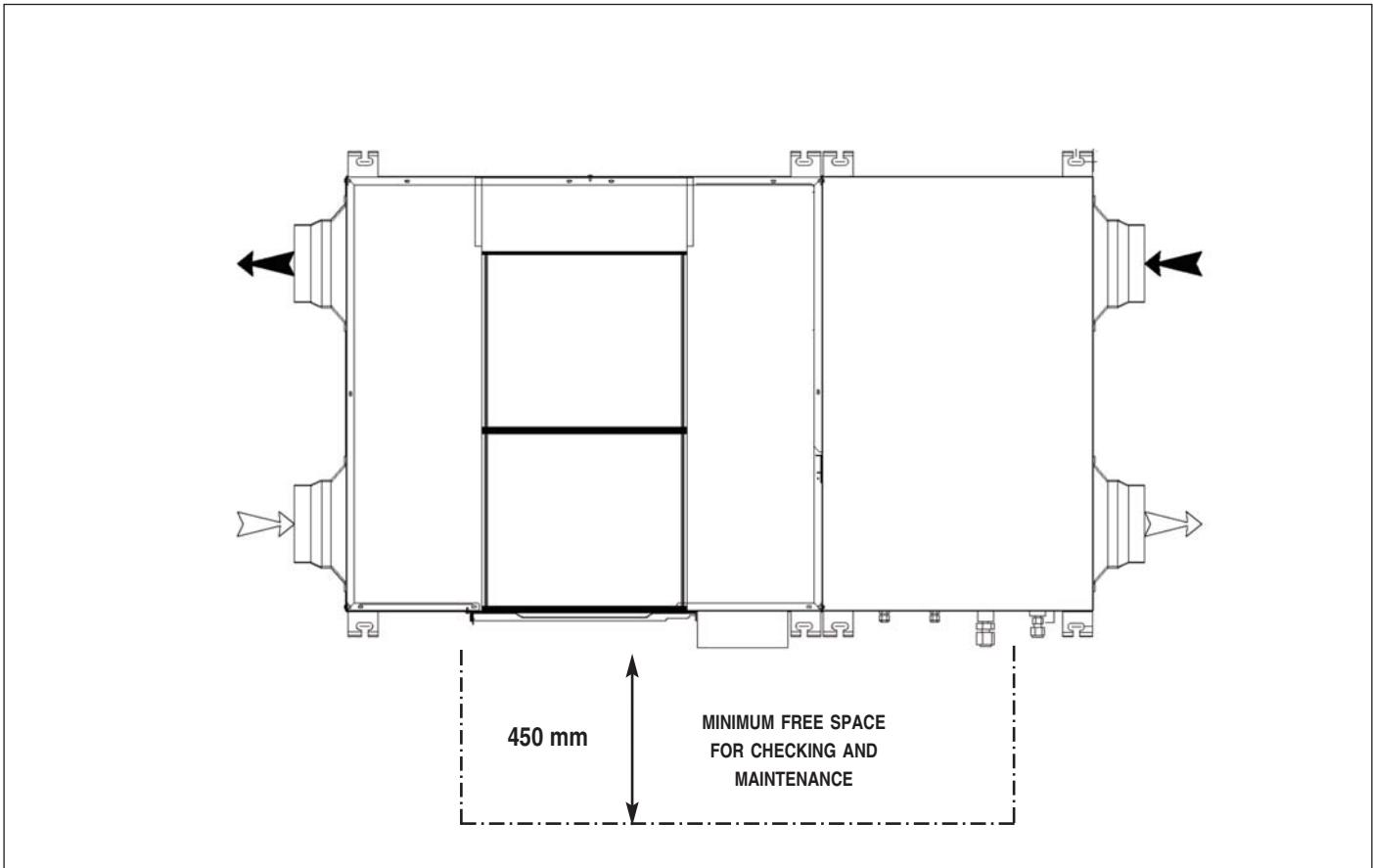
3.4 Choice of the installation place



- Place the unit on a solid structure that shall not causes vibrations and that is solid enough to support the weight of the machine.
- Do not place the unit in rooms where inflammable gases, acids or aggressive and corrosive substances may be present. These could damage the different components in an irreparable way.
- Foresee a minimum free space as shown on the following figures, to make possible the carrying of scheduled and not scheduled maintenance; in order to do maintenance to BIOX-DX system, allow accessibility from lower side around supply section with DX coil.



Modello KRE DX	KRE-500DX1	KRE-1000DX1
A (mm)	450	450

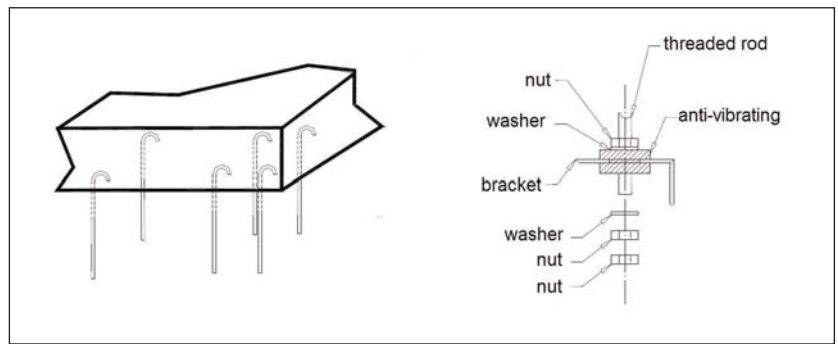


3.5 Positioning of the unit



In the continuation are illustrated some sequences of the assembly:

1. Carry out the drilling on the ceiling and fix six M8 threaded rods as shown in the figure.
2. Position the unit on the six threaded rods (eight brackets available).
3. Block the unit by locking the bolts.

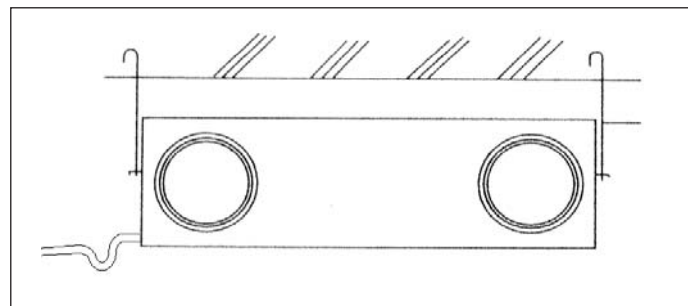


3.6 Drain tray connection



Close to supply air duct connection, a drain tray outlet (1/4" hose pipe) shall be connected for discharge of condensed water during cooling mode.

It is strongly suggested to install a water trap close to the unit in order to avoid odors coming inside and to get a slope on discharge pipeline.

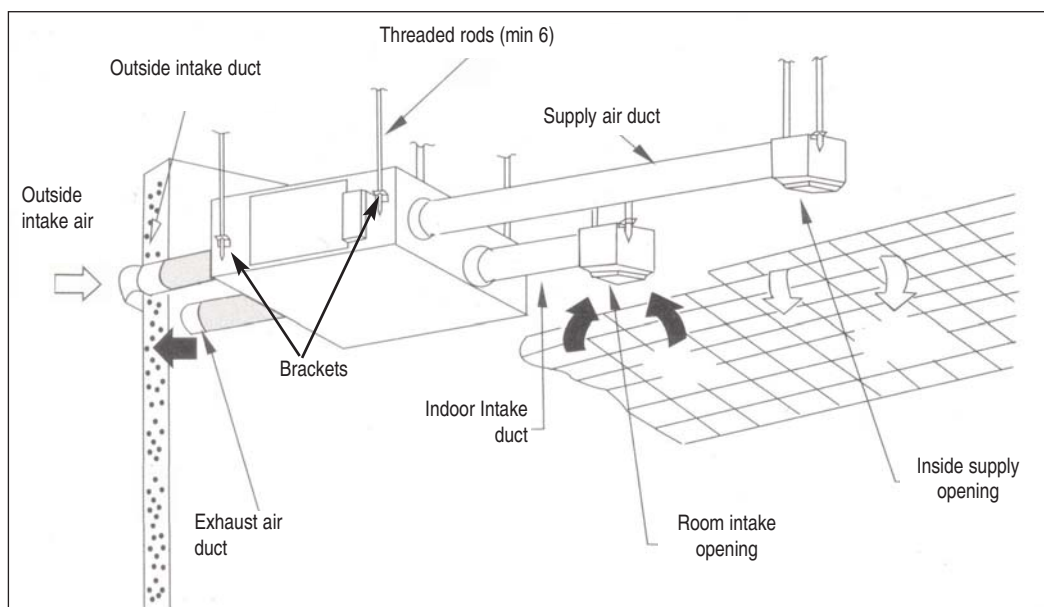


3.7 Connection to the ducts



IMPORTANT: IT IS PROHIBITED TO START UP THE UNIT, IF THE FANS OUTLETS ARE NOT CANALIZED OR PROTECT WITH AN ACCIDENT-PREVENTION NET AS PER UNI 9219 AND SUCCESSIVE NORMS.

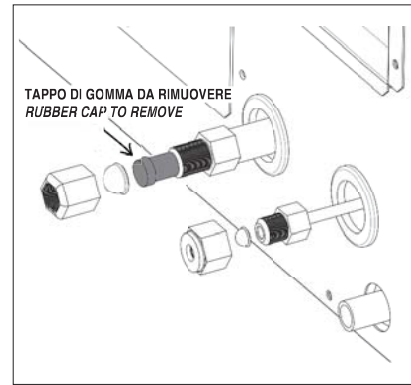
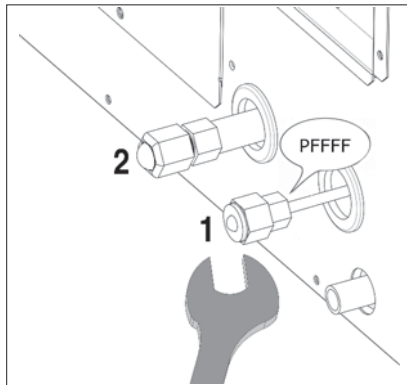
- The ducts must be dimensioned in function of the system and of the air flow characteristics of the unit ventilators. A wrong calculation of the ducts may cause loss of power or the possible activation of devices fitted on the unit.
- Severe bending, several bending and diameter reductions of the ducts should be avoided to minimize the pressure loss.
- In order to prevent the formation of condense and to reduce the noise level it is advised to use insulated ducts.
- If rigid ducts are used, to avoid the transmission of possible vibrations of the machine in the atmosphere, it is advised to interpose an anti-vibrating joint between the air outlets and the ducts. The electrical continuity between duct and machine must however be guaranteed through a earth cable.
- The distance between indoor inlet port and indoor intake port should be as far as possible
- In order to prevent the penetrations of rains, the ducts connecting the unit with the outside should be protected by grilles. Moreover the ducts should be a little tilted



3.8 Connecting the refrigerant pipes



The unit is supplied with plugged direct expansion coil: to ensure its tightness during storage and transport, inside it is loaded nitrogen gas at a higher pressure than atmospheric.

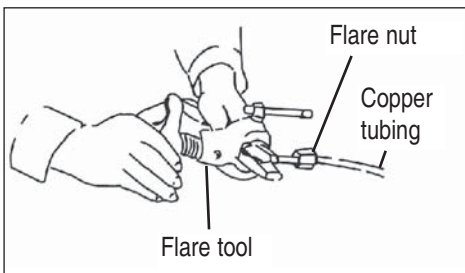
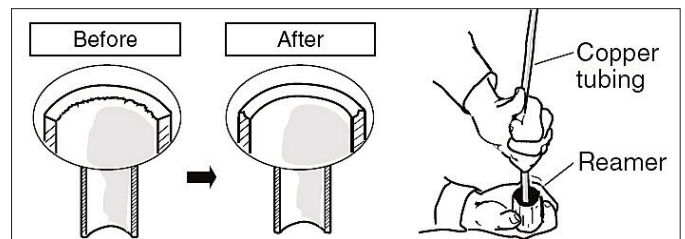


1) First loosen the FLARE 1/4 "union (1) and carry out the leak test, checking that a clear noise is heard due to the outflow of pressurized nitrogen coming out of the pipe.

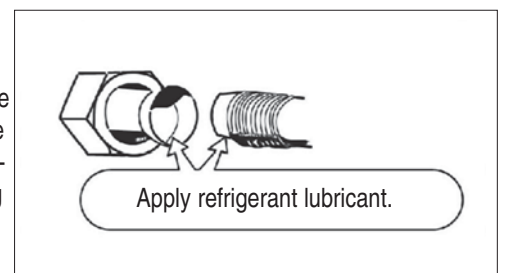
2) Loosen the 1/2 "FLARE pipe union (2) and remove the rubber cap

3) Prepare the pipes to be connected following the procedure:

- Cut the copper tube to the required length with a tube cutter. It is recommended to cut approx. 30 – 50 cm longer than the tubing length you estimate.



- Remove burrs at each end of the copper tubing with a tube reamer or file. This process is important and should be done carefully to make a good flare. Be sure to keep any contaminants (moisture, dirt, metal filings, etc.) from entering the tubing.



- Remove the flare nut from the unit and be sure to mount it on the copper tube.

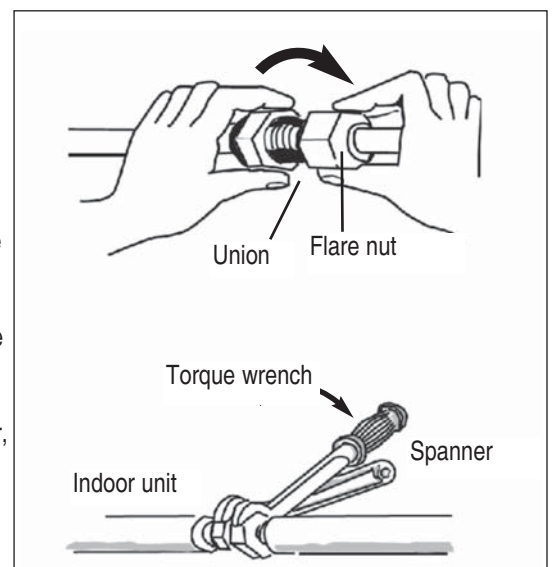
- Make a flare at the end of the copper tube with a flare tool. A good flare should have the following characteristics:
 - inside surface is glossy and smooth
 - edge is smooth
 - tapered sides are of uniform length

- Apply a sealing cap or water-proof tape to prevent dust or water from entering the tubes before they are used.

- Be sure to apply refrigerant lubricant (ether oil) to the inside of the flare nut before making piping connections. This is effective for reducing gas leaks.

- For proper connection, align the union tube and flare tube straight with each other, then screw on the flare nut lightly at first to obtain a smooth match.

- Adjust the shape of the liquid tube using a tube bender at the installation site and connect it to the liquid tubing side valve using a flare.



3.8 Connecting therefrigerant pipes



CAUTIONS DURING BRAZING

Replace air inside the tube with nitrogen gas to prevent copper oxide film from forming during the brazing process. (Oxygen, carbon dioxide and Freon are not acceptable.)

- Do not allow the tubing to get too hot during brazing. The nitrogen gas inside the tubing may overheat, causing refrigerant system valves to become damaged. Therefore allow the tubing to cool when brazing.
- Use a reducing valve for the nitrogen cylinder.
- Do not use agents intended to prevent the formation of oxide film. These agents adversely affect the refrigerant and refrigerant oil, and may cause damage or malfunctions.

TIGHTENING

In the table below are shown the pipes diameter for each unit

Unit	KRE-500DX1	KRE-1000DX1
Gas Pipe	ø 12,7 mm	
Liquid Pipe	ø 6,35 mm	

ø Tube	Tightening torque	Tube thickness
ø 6,35 (1/4")	14 - 18 N*m	0,8 mm
ø 12,7 (1/2")	49 - 55 N*m	0,8 mm

For the flare nuts at tubing connections, be sure to use the flare nuts that were supplied with the unit, or else flare nuts for R410A. The refrigerant tubing that is used must be of the correct wall thickness as shown in the table below.

Because the pressure is approximately 1.6 times higher than conventional refrigerant pressure, the use of ordinary flare nuts or thin-walled tubes may result in tube rupture, injury, or asphyxiation caused by refrigerant leakage.

In order to prevent damage to the flare caused by overtightening of the flare nuts, use the table above as a guide when tightening.

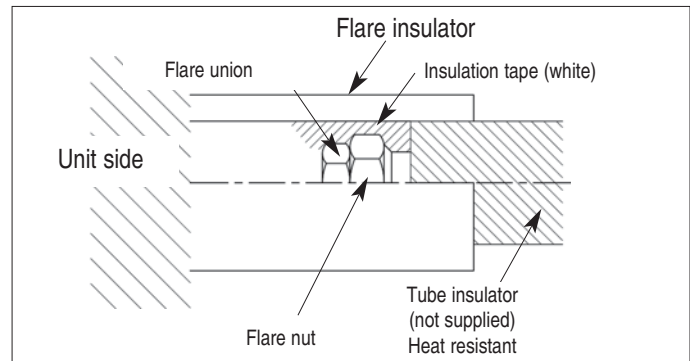
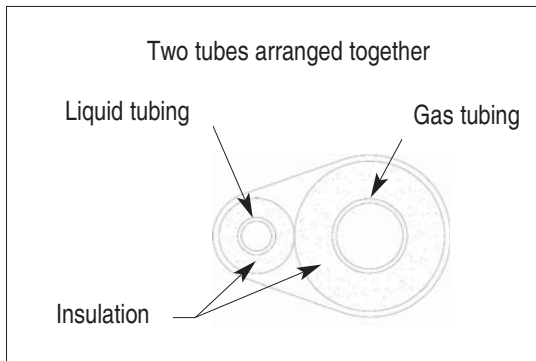
When tightening the flare nut on the liquid tube, use an adjustable wrench with a nominal handle length of 200 mm.

INSULATING THE REFRIGERANT TUBING

Thermal insulation must be applied to all units tubing, including distribution joint (field supply). For gas tubing, the insulation material must be heat resistant to 120°C or above. For other tubing, it must be heat resistant to 80°C or above.

Insulation material thickness must be 10 mm or greater.

If the conditions inside the ceiling exceed DB 30°C and RH 70%, increase the thickness of the gas tubing insulation material by 1 step.



3.9 Connecting PRE-DX

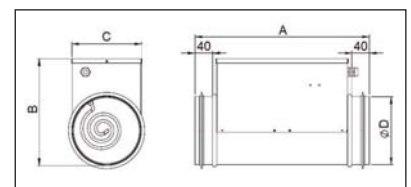


- The electric heater shall be connected to the suction of fresh air stream, both upstream and downstream to a duct of the same nominal diameter; the duct must be fully inserted on the heater sleeve up to the stop, so that it fits the airtight gasket.
- It is suggested to mount the heater as close as possible to the unit to which it is connected. **For PRE-DX heater the ambient temperature must be from -25°C to +30°C; degree of protection IP40.**
- The heater can be installed both horizontally and vertically; in case of horizontal electric heater, the electric box must be placed according to one of the positions.
- The heater must be adequately supported, so that unit connections are free from any stress.
- The heater must not be insulated.

For BE heater, the supply air temperature must be lower than 50°C and the air speed must be higher than 2 m/s. Make sure that the heater is turned ON only when the fan is switched on. The fan must continue to run at least 30 seconds after the heater has been turned off.

- Connections and cables that are used for them have to be supplied by the installer.
- For power supply of the electric heater use a 3-wire cable (line, neutral, ground), sized for the specific current of the selected model. First, pass along the free ends of the three cables from the inside of electrical board to the outside, through the glands on the basic unit.

Modello / Model	PRE-DX	Ampere	Dt nom	Stadi / Stages	V / ph / Hz	Ø	A	B	C	Peso / Weight
	Pt pre									kW
KRE-500DX1	1.5	6.5	9.0	1	230 / 1 / 50	200	400	289	200	4.6
KRE-1000DX1	2.5	10.9	9.0	1	230 / 1 / 50	250	400	342	260	4.8





Before beginning whichever operation make sure that the voltage supply is cut off.



- The electrical connections to the control cabinets must be carried out by specialized staff, following the supplied wiring diagrams.
- Make sure that the voltage and the frequency specified on the nameplate correspond to those of the power supply line.
- For the main supply of the regenerator is not allowed to use adapters, multiple sockets and/or cable extensions.

Carry out the connection with cables of a section which is adapted to the engaged power and in the respect of the local norms. Their dimension must however allow to realize a voltage drop of less than 3% during the starting phase.

- The installer must foresee the installation of the cut-off switch and of everything that is necessary for the protection of the electrical components, as close as possible to the unit.
- Connect the unit to an effective earth, using the appropriate screw fitted on the unit.

4.1 Electric board's layout - DX Module

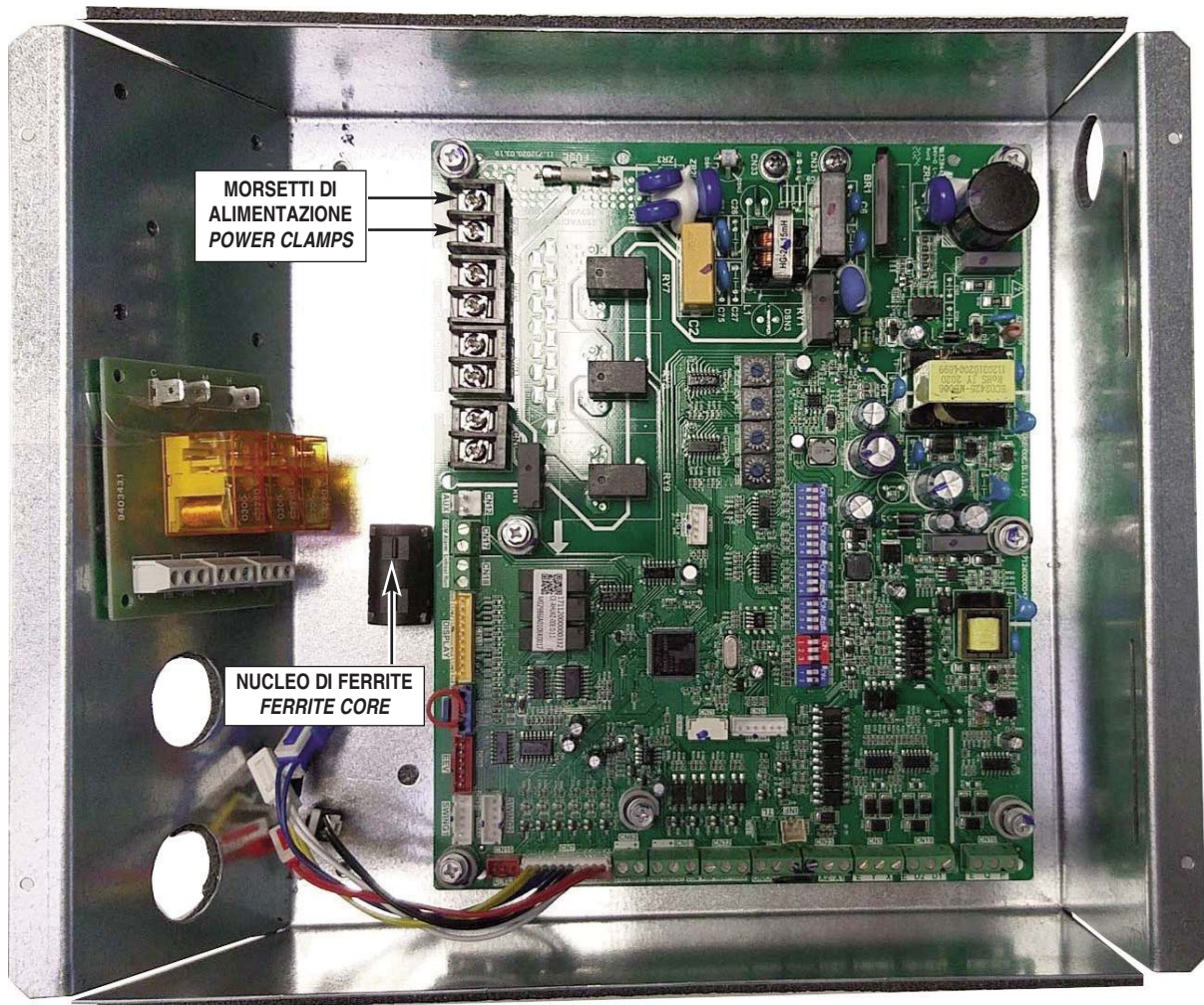
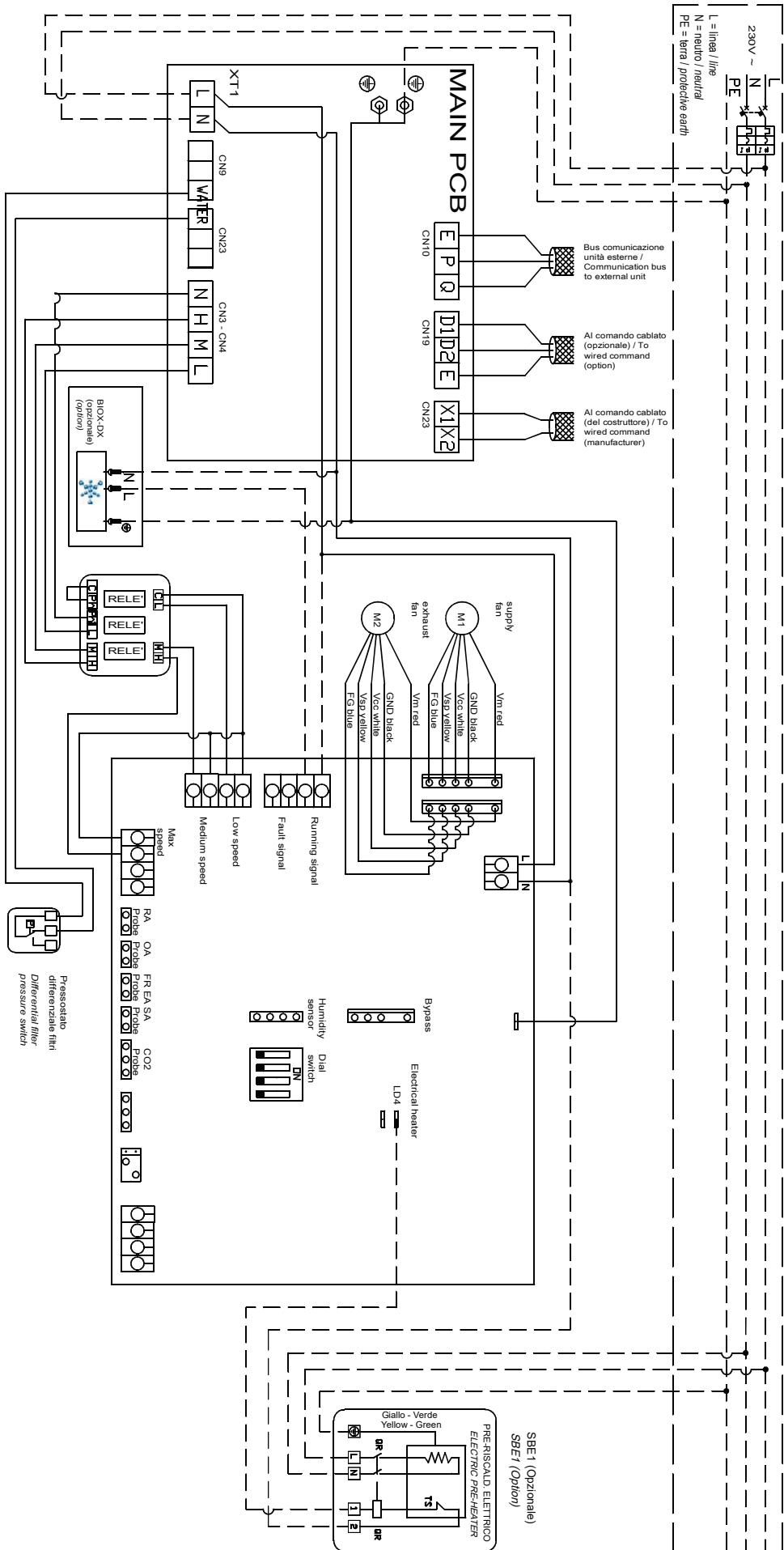


fig.4.1



4.3 Temperature sensor Installation



There are five temperature sensors (T1, TA, T2A, T2, and T2B) and five extension wires in the accessories, as shown in Figure 4.3a.

Temperatur sensor

Extension wire

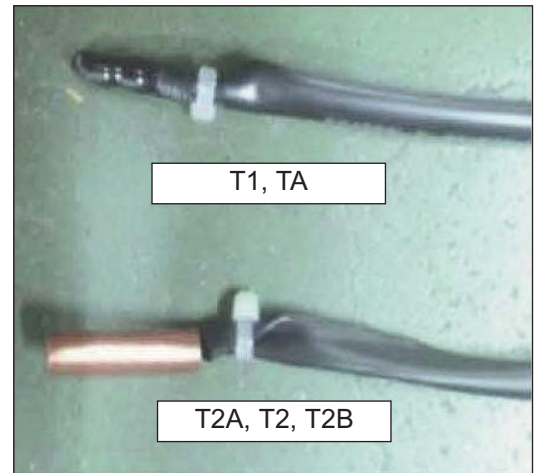
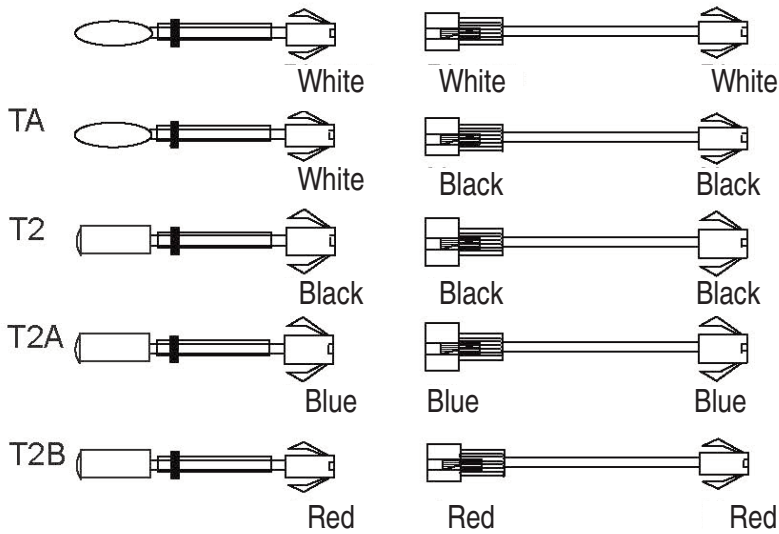


fig.4.3a

Mounting location for temperature sensors:

T1: is an AHU inlet air temperature sensor; it should be installed at the air inlet of the AHU.

T2A: is an AHU evaporator inlet temperature sensor; it should be installed at the inlet pipe of the evaporator.

T2: is an AHU evaporator intermediate temperature sensor; it should be installed at the intermediate pipe of the evaporator.

T2B: is an AHU evaporator outlet sensor; it should be installed at the outlet pipe of the evaporator.

TA: is an outlet air temperature sensor and therefore does not need to be installed if outlet air temperature control is not selected.

Mounting location of T2A, T2, and T2B tube temperature sensors

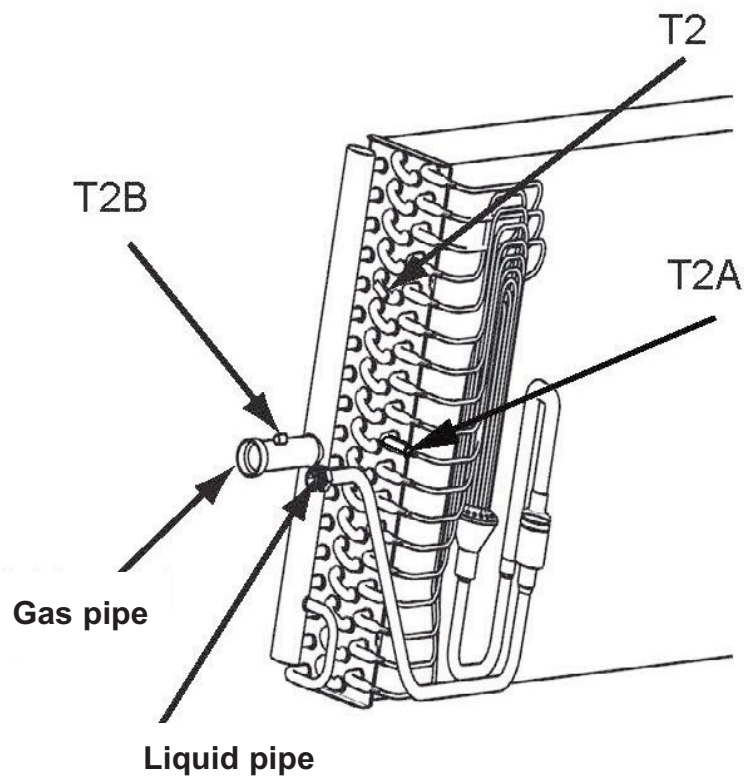


fig.4.3b

4.3 Wiring connection



4.4.1 Access to electrical panel

- Remove the fixing screws of electrical panel (FIG 4.4a)
- Rotate the electrical panel and extract on the left (FIG 4.4b)

fig.4.4a

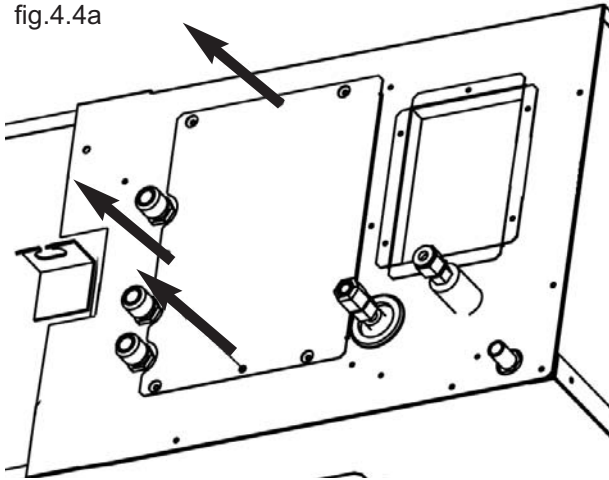
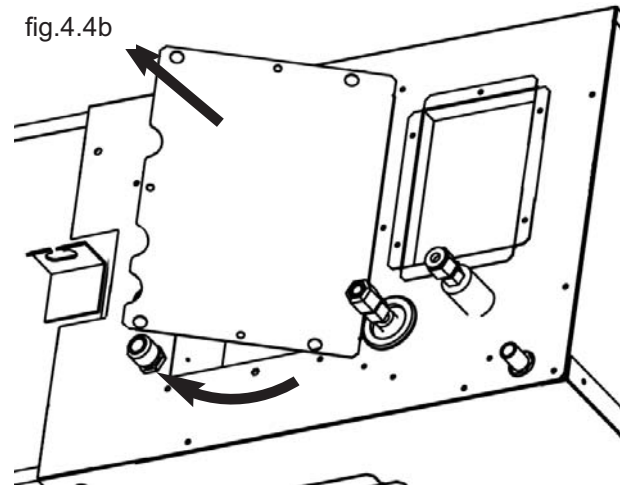


fig.4.4b



4.4.2 Insertion of the electrical supply line and signals for accessories

- Screw down the cable glands placed outside the QE: insert the cable into the cable gland cover, then into the cable gland, towards the inside of the compartment, taking care to pass it through the already prepared ferrite core. Ref. fig. 4.1 page 45.



5.1 Application control

Refer to the specific manuals "AHU AHU Control box" and "Wired Controller" supplied with the unit; below are explained the main instructions.

Set the PCB code of the indoor unit electric control box by different usage. After setting, be sure to turn off the total power switch and then switch on.

The setting function can not be carried out if not to turn off the total power switch and then switch on (SW4-2, ENC1).

5.2 System address and network address setting

- 1) After first powered on, please set the system address by remote controller or wired controller, the address range is 0-63, the indoor unit addresses of the same system can not be repeated.
- 2) Display as the table.5-2, when there are different ENC1, the address setting will be different;

Each independent control box needs to be set an address, this address is an actual address; when the capacity code ENC1 is selected to be E-4, this indoor unit independent control box will produce virtual address(es) with corresponding quantity based on the set actual address, and if an address has been an actual address or virtual address, then this address can not be the actual address or virtual address of other indoor unit in the same system;

For example, if there are two independent control boxes in the same system, one of the capacity code is E, the setting actual address is 5, then according to the table.7-2 this control box will produce one virtual address as 6, and then the actual address and the virtual address of the other independent control box can not be any one of 5, 6; The actual address and the virtual address should less than or equal to 63.

- 3) The indoor unit quantity detected by outdoor unit will be the sum of the actual address quantity and the virtual address quantity, e.g. when the capacity code of independent control box is E, the setting actual address is 5, then it will produce virtual address 6, and then the indoor unit quantity detected by outdoor unit will be 2.
- 4) The outdoor unit can not use auto addressing for to set the address for the indoor unit without address; only the indoor unit has address then can the outdoor unit to be set auto addressing;
- 5) When the independent control box system connects to the indoor unit centralized controller, the actual address and the virtual address will be displayed on the centralized controller, e.g. when the capacity code of independent control box is E, the setting actual address is 5, then the actual address 5 and virtual address 6, will be displayed on the centralized controller, that is to say, it equals to two indoor units, and the states of four indoor units will be kept in the same;
- 6) The network address is the same as the indoor unit address, no need to setting separately.

Table 5-1 Capacities of SW4-2 and ENC1

SW4-2 ON	ENC1	Capacity (hp)	Capacity (KW)	
1234	0	0,8 hp	2,2	KAHU-90.4
	1	1,0 hp	2,8	
	2	1,2 hp	3,6	
	3	1,7 hp	4,5	
	4	2,0 hp	5,6	
	5	2,5 hp	7,1	
	6	3,0 hp	8,0	
	7	3,2 hp	9,0	
	8	3,6 hp	10,0	
	9	4,0 hp	11,2	
0	A	4,5 hp	12,0	KAHU-200.4
	B	5,0 hp	14,0	
	C	6,0 hp	16,0	
	D	6,5 hp	18,0	
	E	7,0 hp	20,0	
	F	8,0 hp	22,4	
	0	10,0 hp	28,0	
1	1	12,0 hp	33,5	
	2	14,0 hp	40,0	
	3	16,0 hp	45,0	
	4	20,0 hp	56,0	

- Function specification:
SW4-2, ENC1 - Cooling capacity setting, set the cooling capacity of this machine (Table. 5-1).

DipSW factory settings:

- SW1: 0000 (leaving the differential for thermo-off in cooling by default at 0 ° C)
- SW2: 0000
- SW3: 0001 (compensation in heating 2 ° C, the only dipSW to actually move)
- SW4: 0000
- SW9: 000
- SW10: 00 (identifies UTA kit size)

Capacity settings:

- KRE-500DX1 (3 kW in cooling) -> 1HP -> SW4-2=0, ENC1=1
- KRE-1000DX1 (5,8 kW in cooling) -> 2HP -> SW4-2=0, ENC1=4

Table. 5-2

SW4-2	ENC1	Corresponding Virtual Addresses					Qty of Occupied Addresses
0	0-D	No virtual address					1
0	E-F	Actual address +1	/	/	/	/	2
0	0-1	Actual address +1	/	/	/	/	2
0	2-4	Actual address +1	Actual address +2	Actual address +3	/	/	4

5.3 - Checks before start up

Before starting the unit check the following:

- Anchorage of the unit to the ceiling.
- Connection of the air ducts.
- Connection of the earth cable.
- Fixing of all the electric terminals



5.4 Module setting indications

0 means DIP switch is dialled to "OFF"
 1 means DIP switch is dialled to "ON"

1) Definitions of each bit of SW1:

<p>ON</p> <p>1234</p> <p>Valid for the master unit only</p>	<p>SW1-1 is 0: shutdown compensation temperature (cooling) is 0°C (factory default) SW1-1 is 1: shutdown compensation temperature (cooling) is 2°C (outlet air temperature control is invalid)</p>
<p>ON</p> <p>1234</p> <p>Valid for the master unit only</p>	<p>SW1-2 is 0: AHU control box provides three fan speeds (factory default) SW1-2 is 1: only one fan speed</p>
<p>ON</p> <p>1234</p> <p>Valid for the master unit only</p>	<p>SW1-3 and SW1-4 are 00: the number of slave AHU control boxes connected in parallel is 0 (factory default); valid for the master unit</p>
<p>ON</p> <p>1234</p> <p>Valid for the master unit only</p>	<p>SW1-3 and SW1-4 are 01: the number of slave AHU control boxes connected in parallel is 1</p>
<p>ON</p> <p>1234</p> <p>Valid for the master unit only</p>	<p>SW1-3 and SW1-4 are 10: the number of slave AHU control boxes connected in parallel is 2</p>
<p>ON</p> <p>1234</p> <p>Valid for the master unit only</p>	<p>SW1-3 and SW1-4 are 11: the number of slave AHU control boxes connected in parallel is 3</p>

2) Definitions of each bit of SW2:

<p>ON</p> <p>1234</p>	<p>SW2-1 is 0: automatic addressing (factory default) SW2-1 is 1: clearing AHU control box address</p>
<p>ON</p> <p>1234</p>	<p>SW2-2 is 0: no self-check (factory default) SW2-2 is 1: self-check</p>
<p>ON</p> <p>1234</p>	<p>SW2-3 and SW2-4 are 00: master AHU control box</p>
<p>ON</p> <p>1234</p>	<p>SW2-3 and SW2-4 are 01: slave AHU control box 1</p>
<p>ON</p> <p>1234</p>	<p>SW2-3 and SW2-4 are 10: slave AHU control box 2</p>
<p>ON</p> <p>1234</p>	<p>SW2-3 and SW2-4 are 11: slave AHU control box 3</p>

SECTION 5 - SETTINGS MODULE



3) Definitions of each bit of SW3:

	Return Air Temperature Control (SW4-1 is 0)	Outlet Air Temperature Control (SW4-1 is 1)
<p>ON</p> <p>Valid for the master unit only</p>	SW3-1 and SW3-2 are 00: anti-cold air temperature value in heating mode is 15°C (factory default)	SW3-1 and SW3-2 are 00: anti-cold air temperature value in heating mode is 14°C
<p>ON</p> <p>Valid for the master unit only</p>	SW3-1 and SW3-2 are 01: anti-cold air temperature value in heating mode is 20°C	SW3-1 and SW3-2 are 01: anti-cold air temperature value in heating mode is 12°C
<p>ON</p> <p>Valid for the master unit only</p>	SW3-1 and SW3-2 are 10: anti-cold air temperature value in heating mode is 24°C	SW3-1 and SW3-2 are 10: anti-cold air temperature value in heating mode is 16°C
<p>ON</p> <p>Valid for the master unit only</p>	SW3-1 and SW3-2 are 11: anti-cold air temperature value in heating mode is 26°C	SW3-1 and SW3-2 are 11: anti-cold air temperature value in heating mode is 18°C
<p>ON</p> <p>Valid for the master unit only</p>	SW3-3 and SW3-4 are 00: temperature compensation in heating mode is 6°C (factory default)	SW3-3 and SW3-4 are 00: Outlet air temperature control is invalid
<p>ON</p> <p>Valid for the master unit only</p>	SW3-3 and SW3-4 are 01: temperature compensation in heating mode is 2°C	SW3-3 and SW3-4 are 01: Outlet air temperature control is invalid
<p>ON</p> <p>Valid for the master unit only</p>	SW3-3 and SW3-4 are 10: temperature compensation in heating mode is 4°C	SW3-3 and SW3-4 are 10: Outlet air temperature control is invalid
<p>ON</p> <p>Valid for the master unit only</p>	SW3-3 and SW3-4 are 11: temperature compensation in heating mode is 0°C(Follow Me function)	SW3-3 and SW3-4 are 11: No temperature compensation for outlet air temperature control by default

4) Definitions of each bit of SW4:

<p>ON</p> <p>Valid for the master unit only</p>	SW4-1 is 0: return air temperature control (factory default) SW4-1 is 1: outlet air temperature control	<p>ON</p> <p>Valid for the master unit only</p>	SW4-2 indicates high bit (ON indicates + 16)
<p>ON</p> <p>Valid for the master unit only</p>	SW4-3 and SW4-4 are 00: factory controller mode (factory default)	<p>ON</p> <p>Valid for the master unit only</p>	SW4-3 and SW4-4 are 01: capacity output mode of a third party controller
<p>ON</p> <p>Valid for the master unit only</p>	SW4-3 and SW4-4 are 10: set temperature control mode of a third party controller	<p>ON</p> <p>Valid for the master unit only</p>	SW4-3 and SW4-4 are 11: set temperature control mode of a third party controller (reserved)



5) Definitions of each bit of SW9:

 ON Valid for the master unit only	SW9-1 is 0: 2-digit digital display panel (factory default) SW9-2 is 1: 3-digit digital display panel
 ON Valid for the master unit only	SW9-2 is 0: One or more AHU control boxes are connected in parallel to one AHU; one coil is connected to multiple control boxes; (shielding faults from the slave unit's temperature sensors T1, T2, T2A, TA and T2B) (factory default) SW9-2 is 1: Multiple AHU control boxes are connected in parallel. In the event of multiple coils, one coil is connected to one control box; (shielding faults from the slave unit's temperature sensor T1,TA)
 ON Valid for the master unit only	SW9-3 is 0: no swing control (factory default) SW9-3 is 1: swing control

6) Definitions of each bit of SW10:

 ON 12	00: KAHU-90.4 model
 ON 12	01: KAHU-200.4 model
 ON 12	10: KAHU-360.4 model
 ON 12	11: KAHU-560.4 model

7) Definitions of J1:

 J1	Without jumper; no short circuit indicates a power failure memory function (factory default)
 J1	With jumper, short circuit indicates no power failure memory function



5.5 Error Codes and Query

Priority	Definition	Displayed content
1	Rcfrigerant leak error	A1
2	Emergency shut down	A0
3	No address is set	FE (only displayed on the display board)
4	IDU address code repeated → F7+repeated address, displayed alternately every 1s	F7+repeated address
5	Mode conflict error	E0
6	Communication error between IDU and ODU	E1
7	T1 sensor error	E2
8	T2 sensor error	E3
9	T2B sensor error	E4
10	T2A sensor error	E5
11	IDU fan error	E6 (reserved)
12	EEPROM error	E7
13	TA sensor error	E8 (the error is not reported when return air temperature control is applied)
14	Communication error with the wired controller, or no address is setted	E9 (only for wired controller)
15	Error of electronic expansion valve coils	Eb (restore after power on again)
17	ODU error	Ed
18	Water level alarm error	EE
19	Low temperature alarm	H2
20	High temperature alarm	H3
21	The number of detected AHU control boxes and the number of dialing units are inconsistent, or Master-slave communication is not available	H6
22	Capacity DIP switch of the AHU control box is inconsistent with model	H8 (restore after power on again)
23	(ENC2,ENC3,ENC4)incorrect DIP switch for 0-10V fan signal.The DIP switch value ensures ENC2< ENC3< ENC4.	H9 (restore after power on again)
24	Pressure sensor error	P1 (reserved)
25	MS error mode	F8
26	MS self-check error	U4 (restore after power on again)
27	Slave unit error	Hb



Query

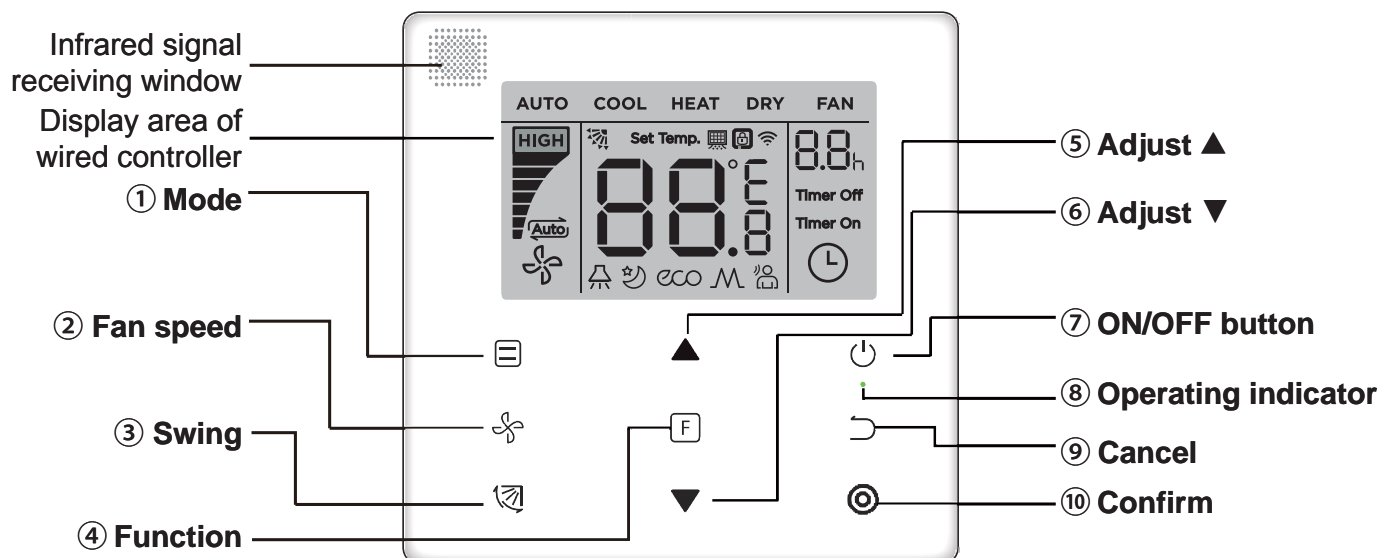
Wired controller query

No.	No. Parameter displayed on the wired controller during control box check
1	Control box communication address
2	Capacity (HP) of control box
3	Control box network address (the same as the communication address)
4	Set temperature Ts
5	Room temperature T1
6	Actual T2 AHU temperature
7	Actual T2A AHU temperature
8	Actual T2B AHU temperature
9	TA temperature
10	Compressor discharge temperature (show high discharge temperature)
11	Target superheat degree (reserved)
12	EEV position/8
13	Software version No.
14	Error Code



WIRED REMOTE CONTROLLER OUTLOOK

KCT-03 SRPS (A)



Button	Functions
1. Mode	To set the operating mode: → Cool → Heat → Dry → Fan
2. Fan speed	To set the fan speed.
3. Swing	To set the swing function.
4. Function	To switch to functions that can be set in the current mode.
5. Adjust upwards	To adjust temperature setting and timing (for timer) upwards.
6. Adjust downwards	To adjust temperature setting and timing (for timer) downwards.
7. ON/OFF	To turn on/off the unit
8. Operating indicator	To indicate the ON/OFF state of the indoor unit.
9. Cancel	To turn off the timer/IDU LED display/silent/ECO/auxiliary heater function ¹ ; to cancel the timer.
10. Confirm	To turn on the timer/IDU LED display/silent/ECO/auxiliary heater function ¹ ; to confirm the timer.



3. Icons in the Display

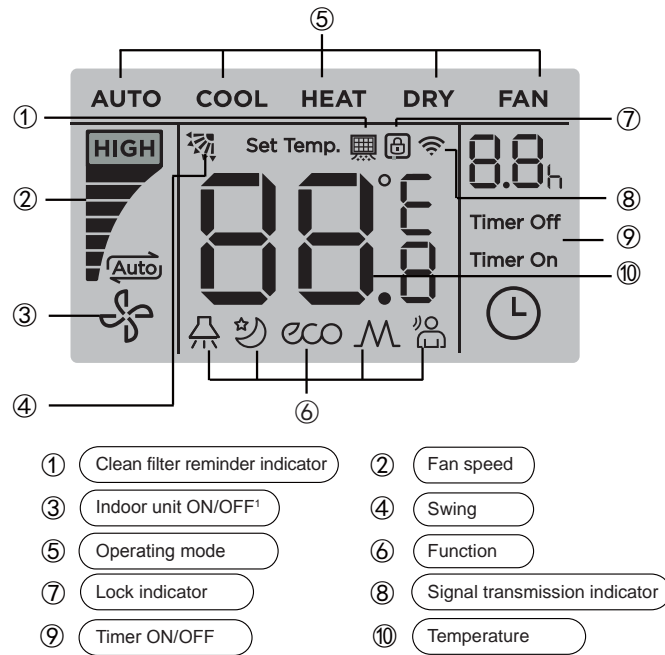


Figure 5.1

Note1: When the indoor unit is on, the icon "  " spins; when the indoor unit is off, the icon "  " does not spin.

4. Operation Guide

4-1 ON/OFF Setting

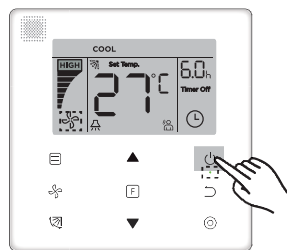








Figure 6.1

- 1) Press  (ON/OFF) button, and the Operating Indicator "  " on the wired controller will light up, while the ON/OFF icon "  " of the indoor unit on the display will spin to indicate that the indoor unit has started running. (see Figure 6.1)
- 2) Press  (ON/OFF) button again, and the Operating Indicator "  " on the wired controller will turn off, and the display icon "  " will stop spinning as the indoor unit stops running.

4-2 Mode Setting

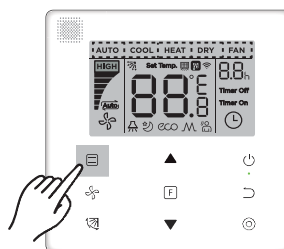



Figure 6.2

Press  (Mode) button. Each time press this button, the operating mode will change in turn as shown in Figure 6.3.

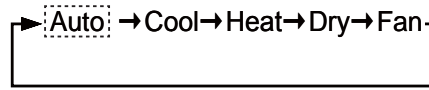


Figure 6.3

In the "Auto", "Cool", "Dry", or "Heat" mode, press ▲ and ▼ buttons to adjust to the setting temperature. (see Figure 6.4)

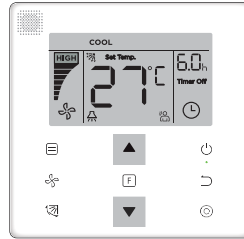


Figure 6.4

Note:

- The "Auto" mode is not available for all air conditioner models.
- Temperature setting is not available in the "Fan" mode.
- "Dry" mode and "Auto" mode is not available for FAPU .

4-3 Fan Speed Setting

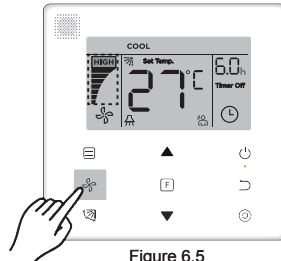


Figure 6.5

In the "Cool", "Heat" or "Fan" mode, press (Fan speed) button to set the operating fan speed (see Figure 6.5).

If the wired controller is configured with seven fan speeds, press (Fan speed) button to set the fan speed in turn as shown in Figure 6.6.

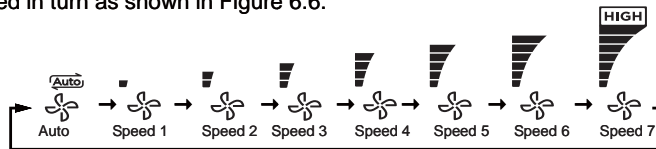


Figure 6.6

If the wired controller is configured with three fan speeds, press (Fan speed) button to set the fan speed in turn as shown in Figure 6.7.

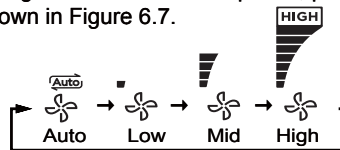


Figure 6.7

Note:

- In the "Auto" and "Dry" modes, the fan speed is set to "Auto", and will not change even press (Fan speed) button.
- The default fan speed is 7 fan speeds, please refer to "Field Setting" to adjust the default fan speed.

NOTE: For other functions and details, see the installation and use manual of the KCT-03 SRPS (A) wired controller supplied.

SECTION 7 - ORDINARY MAINTENANCE



7.1 Warning

BEFORE UNDERTAKING WHICHEVER MAINTENANCE OPERATION MAKE SURE THAT THE MACHINE IS SWITCH OFF AND THAT IT CAN NOT BE ACCIDENTALLY CONNECTED TO THE POWER. IT IS THEREFORE NECESSARY TO CUT OFF THE ELECTRIC SUPPLY DURING ALL MAINTENANCE OPERATIONS.

- It is a duty of the user to carry out all the maintenance operations on the regenerator.
- Only assigned and previously trained and qualified personnel can carry out maintenance operations.
- If the unit must be disassembled, protect hands with gloves.

7.2 Monthly checks



7.2.1 Checking and cleaning of heat exchangers and filters

<p>Release the 2 screws of the inspection panel with the proper handle.</p>	
<p>Take the hexagonal heat exchangers out through the proper handles</p>	
<p>Remove the 2 filter by making them scroll on the slides</p>	
<p>CLEANING OF THE HEAT EXCHANGERS Remove with the vacuum cleaner the dust that can be present inside the heat exchangers and verify that there are no foreign objects.</p> <p>ATTENTION: you must not wash the heat exchangers. If they are excessively dirty or damaged, they have to be replaced.</p>	
<p>WASHING OF THE FILTERS</p> <p>Remove the dust on the filters using a vacuum cleaner.</p> <p>If the filters are excessively dirty, you can wash them with water and a neutral detergent at a temperature lower than 60°.</p> <p>Make the filters dry completely before installing them again in the unit. Do not use fire to dry the filters. Do not use fire to dry the filters.</p>	
<p>After cleaning, repeat the operation sequence in reverse order. Always remember to install filters and heat recovery exchanger before starting the unit.</p>	

7.3 Yearly checks

- Verification of the whole electrical installation and in particular the tightening of the cable connections.
- Verification of the tightening of all bolts, nuts, flanges and water connections that could be loose because of vibrations.



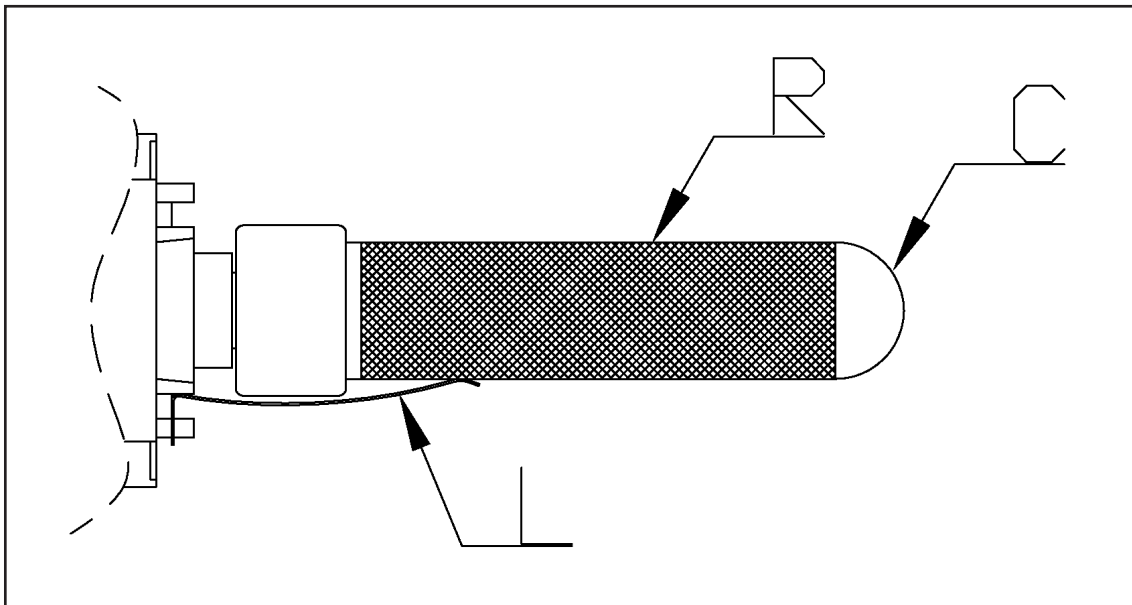
7.3.1 BIOX-DX purifying system check

Once a year at least or when a drop in purifying efficiency is felt cleaning of capacitor shall be done.



In order to service BIOX-DX system, following instructions shall be carried out :

- Switch off the whole unit (main power supply off)
- Unscrew the 4 fixing screws of BIOX-DX system, operating from the lower side of the unit close to supply air duct connection
- Drop off the module (accomodating its fall) until the quartz capacitor is fully out of the unit
- Unlock the electric connector
- After laying the module on a flat surface, unscrew carefully the quartz capacitor (C)
- Remove the external net (R); if it should be difficult, rotate it lightly around the capacitor
- Clean the capacitor with a wet cloth.
- Wash the net with a jet of hot water and dry thoroughly with a dry cloth
- If the pipe is damaged, it shall be replaced with a new one
- As soon as a whitish layer is over the metal grille inside the pipe, capacitor shall be replaced. Usual time for replacement is 18-24 months
- Fit the net on the pipe and over the internal grille.
- Check that tab (L) is in contact with the metal net and push it against the glass of the capacitor (C)
- Clean the equipment all around outside
- Screw softly the capacitor in its seat
- Insert the module across the lower hole and lock the electric connector
- Screw the fixing screws
- Check if the system is working. Now a light noise might be audible.



SECTION 8 - BREAKDOWN DIAGNOSTIC



SYMPTOMS	POSSIBLE CAUSE
Fans not running	No power supply. The switches of the thermostat are not in the right position of working. There are foreign bodies that block the rotors. Electrical connections are released.
Poor cooling / heating performance	Too low airflow. Insufficient refrigerant fill (check refrigerant circuit). Compressor off (check outdoor condenser unit).
Excessive air flow	Pressure drop of the system are overvalued.
Insufficient air flow	Pressure drop of the system are underestimated. Cloggings in the air ducts. Rotation speed too low: verify on the terminal board of the motor that the connection is correct and that the voltage correspond to that of the nameplate. The rotor turn backwards.
Noise	Excessive air flow. Wear or crack in the pads. Unbalanced fan. Foreign bodies in the case.
Strong vibrations	Unbalanced impeller because of wear or of dust deposit. Sliding of the impeller on the case due to deformations. Cloggings in the air ducts

When the failure cannot be easily solved, you have to disconnect the equipment from electrical power and contact the distributor company or an authorized technical assistance centre, having care of quoting the identification data of the unit that you can find on the correspondent label.

SECTION 9 - DISPOSAL



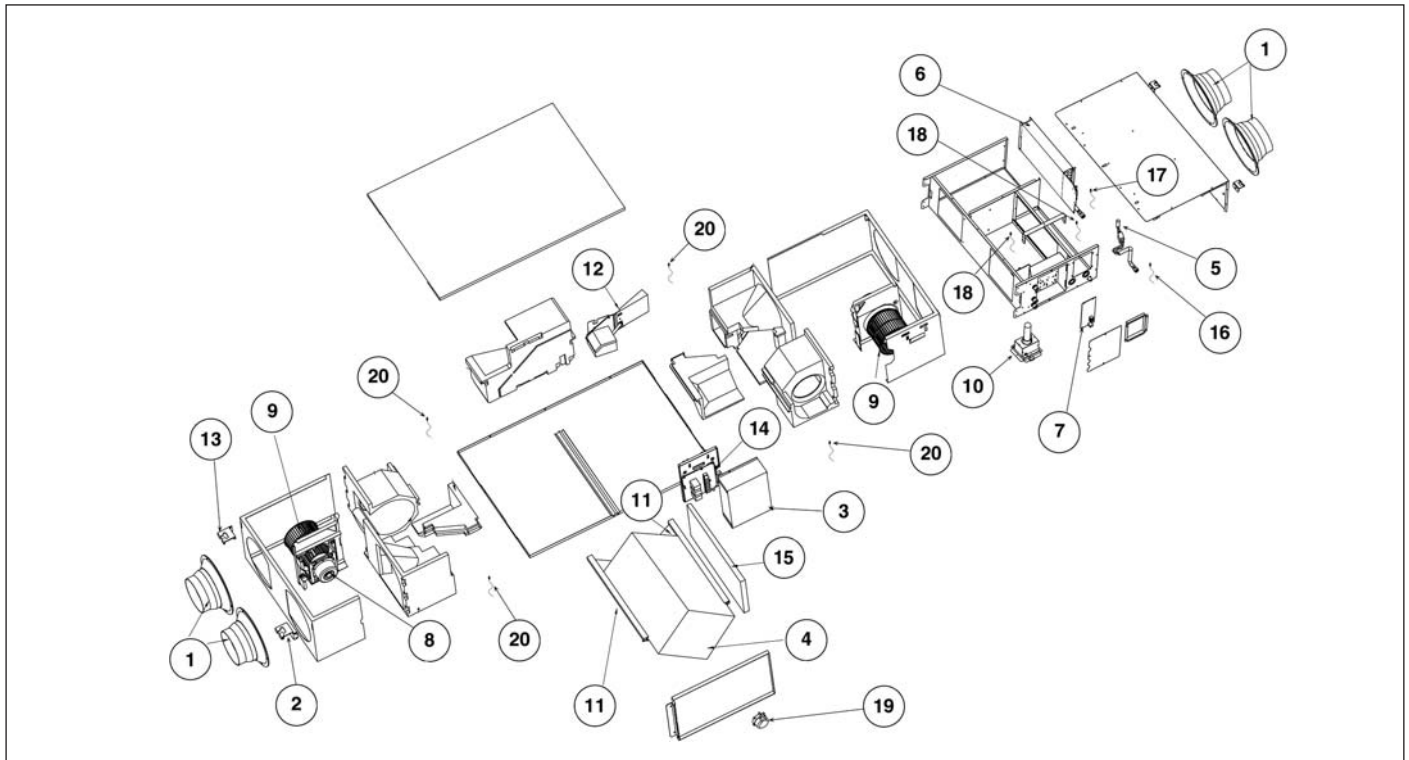
This symbol indicates that this product must not be disposed of with household waste. Dispose of the unit properly according to local laws and regulations.

When the unit reaches the end of its useful life, contact the authorities for information on disposal and recycling possibilities; alternatively, it will be possible to request the free collection of the used equipment from the manufacturer. Separate collection and recycling of the product at the time of disposal will help and conserve natural resources and ensure that the unit is recycled in a manner that protects human health and the environment.

The materials that compose this heat recovery units are:

- Galvanized plate
- Alluminium
- Inox
- Quartz glass
- EPS (expanded polystyrene)
- Polyethylene
- ABS plastic (acrylonitrile butadiene styrene)
- NBR (nitrile butadiene rubber NBR)

SECTION 10 - SPARE PARTS



Spare parts

Model	No.	Parts name	Code	Qty ERV
KRE-500DX1	1	Spigot	MV00BOC0MICH0500	4
	2	Right bracket		2
	3	Electrical box	CP04V00MICROEH00	1
	4	Plate heat exchanger	PR000E000MICH050	2
	5	Electronic expansion valve		1
	6	DX coil	BTAECV0400J02NO0	1
	7	Main electrical board	CT0AHUKZ00D00000	1
	8	Motor (50 Hz/60Hz)	MTE0000MICH0500	2
	9	Impeller	VT000GIRMICH0500	2
	10	BIOX-DX option	AC00MCRBX1C0DX00	1
	11	COARSE 50% Filter	CF0P30MICH050050	2
	12	By-pass	MV00BYP0MICH0000	1
	13	Left bracket		2
	14	PCB	CT00000MICEH0250	1
	15	ePM _{2.5} 95% Filter	CF0M90MICH050480	2
	16	Temp. probe refrigerant inlet (liq.)		1
	17	Temp. probe refrigerant outlet (gas)		1
	18	DX coil air temp. probe		2
	19	ePM _{2.5} Filter pressure switch	CT0AFS930800PF00	1
	20	Heat recovery temp. probe		4
KRE-1000DX1	1	Spigot	MV00BOC0MICH0800	4
	2	Right bracket		2
	3	Electrical box	CP04V00MICROEH00	1
	4	Plate heat exchanger	PR000E000MICH100	2
	5	Electronic expansion valve		1
	6	DX coil	BTAECY0550J03RO0	1
	7	Main electrical board	CT0AHUKZ00D00000	1
	8	Motor (50 Hz/60Hz)	MTE0000MICH1000	2
	9	Impeller	VT000GIRMICH100	2
	10	Bioxigen option	AC00MCRBX1C0DX00	1
	11	COARSE 50% Filter	CF0P30MICH100050	2
	12	By-pass	MV00BYP0MICH0000	1
	13	Left bracket		2
	14	PCB	CT00000MICEH0250	1
	15	ePM _{2.5} 95% Filter	CF0M90MICH100480	2
	16	Temp. probe refrigerant inlet (liq.)		1
	17	Temp. probe refrigerant outlet (gas)		1
	18	DX coil air temp. probe		2
	19	ePM _{2.5} Filter pressure switch	CT0AFS930800PF00	1
	20	Heat recovery temp. probe		4



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