

CKN-XHE2i

7.1-14.2

MANUAL

FOR INSTALLATION,
USE AND MAINTENANCE



M06K40A18-08 06-23

R-410A

Dear Customer,

We congratulate you on choosing these product

Clivet has been working for years to offer systems able to assure the maximum comfort for a long time with highly-reliable, efficient, high-quality and safe solutions. The target of the company is to offer advanced systems, that assure the best comfort and reduce energy consumption as well as the installation and maintenance costs for the entire life-cycle of the system.

With this manual, we want to give you information that are useful for all phases: from reception, installation and use to disposal - so that such an advanced system can provide the best performances during installation and use.

Best regards and have a good read.

CLIVET Spa

The data contained in this manual is not binding and may be changed by the manufacturer without prior notice. Reproduction, even partial, is FORBIDDEN. © Clivet S.p.A. - Feltre (BL) - Italia

INDEX

Safety considerations	4
Configurations	7
Reception	8
Selecting the installation site	11
Water connections	17
Aeraulic connections	20
Electrical connections	21
Start-up	27
Control	35
Maintenance	50
Decommissioning	59
Residual risks	60
Technical information	62

Manual

The manual provides correct unit installation, use and maintenance.

It is advisable to read it carefully so you will save time during operations.

Follow the written indications so you will not cause damages to things and injuries people.

Preliminaries

Only qualified personnel can operate on the unit, as required by the regulation in force.

Risk situations

The unit has been designed and created to prevent injuries to people.

During designing it is not possible to plane and operate on all risk situation.

Read carefully "Residual risk" section where all situation which may cause damages to things and injuries to people are reported.

Installation, starting, maintenance and repair required specific knowledge; if they are carried out by inexperienced personnel, they may cause damages to things and injuries people.

Intended use

Use the unit only:

- civil air-conditioning
- keep to the limits foreseen in the technical schedule and in this manual

The manufacturer accepts no responsibility if the equipment is used for any purpose other than the intended use.

Installation

Outdoor installation

The positioning, hydraulic system, refrigerating, electrics and the ducting of the air must be determined by the system designer in accordance with local regulations in force.

Follow local safety regulations.

Verify that the electrical line characteristics are in compliance with data quotes on the unit serial number label.

Maintenance

Plan periodic inspection and maintenance in order to avoid or reduce repairing costs.

Turn the unit off before any operation.



Pay particular attention to:

⇒ warnings / prohibitions / danger indicating particularly important operations or information, operations that cannot be done, which compromise the functionality of the unit or which may cause damage to things or persons.

Modification

All unit modifications will end the warranty coverage and the manufacturer responsibility.

Breakdown/Malfunction

Disable the unit immediately in case of breakdown or malfunction.

Contact a certified service agent.

Use original spares parts only.

Using the unit in case of breakdown or malfunction:

- voids the warranty
- it may compromise the safety of the unit
- it may increase time and repair costs

User training

The installer has to train the user on:

- start-up/shutdown
- set points change
- standby mode
- maintenance
- what to do / what not to do in case of breakdown.

Data update

Continual product improvements may imply manual data changes.

Visit manufacturer web site for updated data.

Indications for the User

Keep this manual with the wiring diagram in an accessible place for the operator.

Note the unit data label so you can provide them to the assistance centre in case of intervention (see “Unit identification” section).

Provide a unit notebook that allows any interventions carried out on the unit to be noted and tracked making it easier to suitably note the various interventions and aids the search for any breakdowns.

In case of breakdown or malfunction

- Immediately deactivate the unit
- Contact a service centre authorized by the manufacturer

The installer must train the user, particularly on:

- Start-up/shutdown
- Set points change
- Standby mode
- Maintenance
- What to do / what not to do in case of breakdown

Unit identification

The serial number label is positioned on the unit and allows to identify all the unit features.

The matriculation plate shows the indications foreseen by the standards, in particular:

- unit type
- serial number (12 characters)
- year of manufacture
- wiring diagram number
- electrical data
- type of refrigerant
- refrigerant charge
- manufacturer logo and address

The matriculation plate must never be removed.

It contains fluorinated greenhouse gases.

Serial number

It identifies uniquely each unit.

Must be quoted when ordering spare parts.

Refrigerant

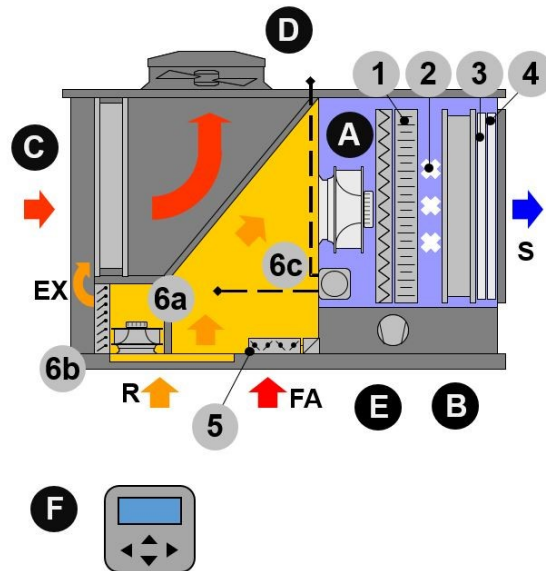
It contains fluorinated greenhouse gases

Type of refrigerant: R410A

Assistance request

Note data from the serial number label and write them in the chart on side, so you will find them easily when needed.

Series
Size
Serial number
Year of manufacture
Number of electrical wiring diagram



R. Air return

S. Treated air supply

FA. Outdoor air

EX. Exhaust

A. A. Supply fan and air filter

Electronic control, which returns the air to the setting after having taken it in, strained it with G4 efficiency and treated it

B. Internal exchanger

Thermal energy releases (cool or heat) the inlet air

C. External exchanger

It exchanges energy (heating or cooling) with the outdoor air

D. External fan

Axial type with electronically controlled brushless motor based on the condensing temperature, it allows effective heat exchange with the air source.

E. Direct expansion circuit

It produces cooling energy (or heating energy on reversible models) to be introduced in the served area

F. User interface

Easy to use, allows automatic control sensors on-board.

MAIN OPTIONS

1. High-efficiency filtration

Second filtration stage available with F7, F9 or electronic filter.

2. Electric / hot water heating

It integrates and/or replaces the direct expansion circuit operation

3. Hot gas post-heating

It recovers condensation energy in the summer humidity control

4. Humidification

Immersed electrodes steam type

5. Fresh air Shutter

(CBK/CCK configuration)

It allows to introduce renewed air in the served area. The fresh air damper is manual in the CB construction configuration (optional on off motorized) and modulating motorised version in the CC construction configuration. It is not present in the CA constructive configuration (100% recirculation).

MODEL WITH EXTRACTION AND EXHAUST (configuration CCK)

6a. Extraction and exhaust fan

Electronically controlled, it extracts the unhealthy air from the served area and it exhausts it outside after the thermodynamic energy recovery. It allows automatic FREE-COOLING operating.

6b. Overpressure damper

It prevents the air inlet in the environment from the extraction/exhaust section with fan stopped

6c. Ambient pressure controller

It calibrates the fresh air damper opening and to balance the ambient pressure

Filters nomenclature according to EN ISO 16890

1° filtering stage - standard	G4	ISO 16890 Coarse 60%
2° filtering stage - option	F7	ISO 16890 ePM1 55%
2° filtering stage - option	F9	ISO 16890 ePM1 80%
2° filtering stage - option	FES (electronic filters)	ISO 16890 ePM1 90%

Safety

Operate in compliance with safety regulations in force.

For detailed information (dimensions, weight, technical characteristics etc.) please refer to the TECHNICAL INFORMATION section.

Use single protection devices: gloves, glasses etc.

Reception

You have to check before accepting the delivery:

- That the unit hasn't been damaged during transport
- That the materials delivered correspond with that indicated on the transport document comparing the data with the identification label positioned on the packaging.

In case of damage or anomaly:

- write down on the transport document the damage you found and quote this sentence: "Conditional acceptance clear evidence of deficiencies/damages during transport"
- contact by fax and registered mail with advice of receipt to supplier and the carrier.

NOTE

⇒ Any disputes must be made within 8 days from the date of the delivery. Complaints after this period are invalid.

Storage

Respect the indications on the outside of the pack.

In particular:

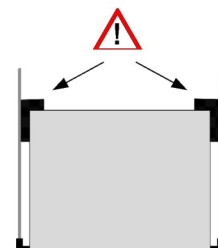
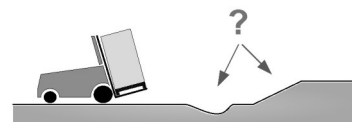
⇒ minimum ambient temperature -15°C
(possible components damages)

⇒ maximum ambient temperature $+49^{\circ}\text{C}$
(possible safety valve opening)

⇒ maximum relative humidity 95%
(possible damages to electrical components)

NOTE

⇒ The unit may not be tilted more than 15° during transport.



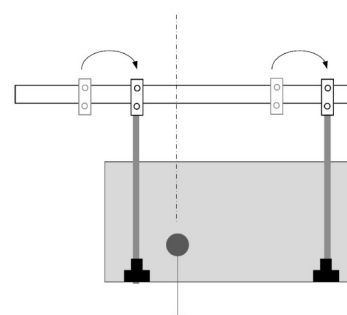
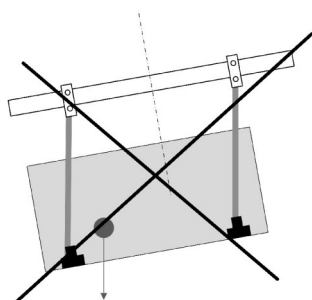
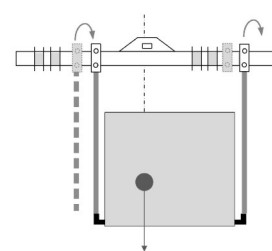
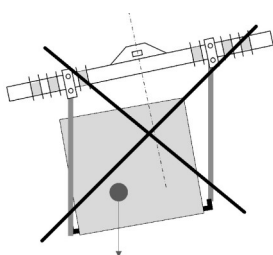
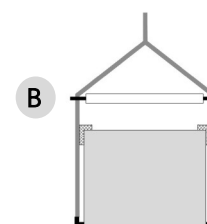
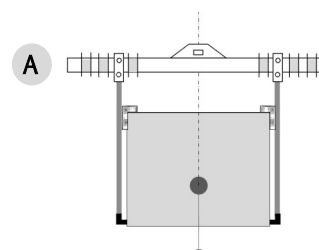
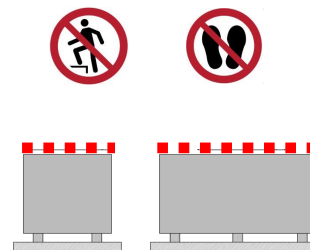
Handling

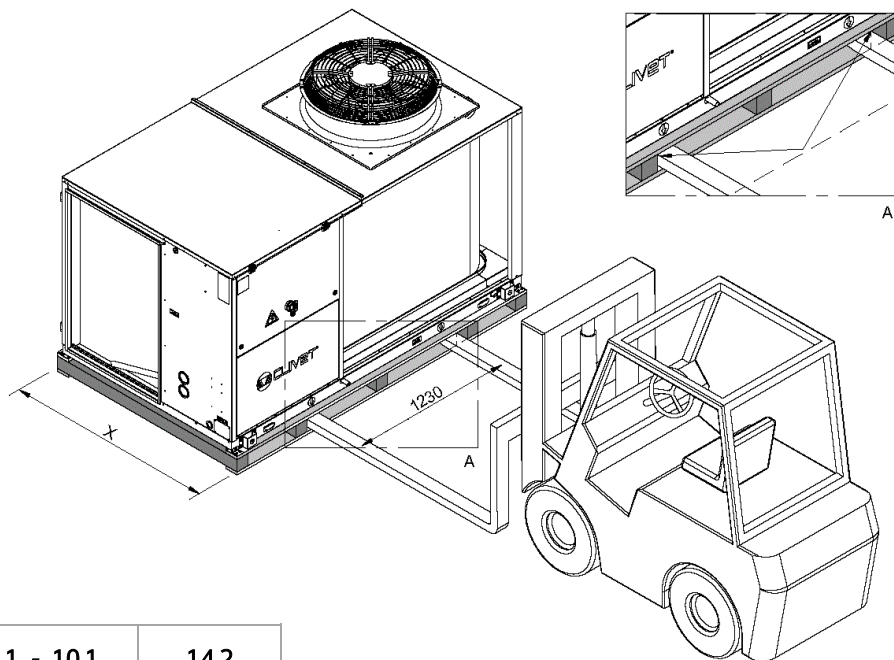
Caution

⇒ Check that all handling equipment complies with local safety regulations (cran, forklifts, ropes, hooks, etc.).

⇒ Provide personnel with personal protective equipment suitable for the situation, such as helmet, gloves, accident-prevention shoes, etc.

- Observe all safety procedures in order to guarantee the safety of the personnel present and the of material.
- Verify unit weight and handling equipment lifting capacity.
- Identify critical points during handling (disconnected routes, flights, steps, doors).
- Suitably protect the unit to prevent damage.
- Lifting with balance (A)
- Lifting with spacer bar (B)
- Align the barycenter to the lifting point
- Gradually bring the lifting belts under tension, making sure they are positioned correctly.
- Before starting the handling, make sure that the unit is stable.



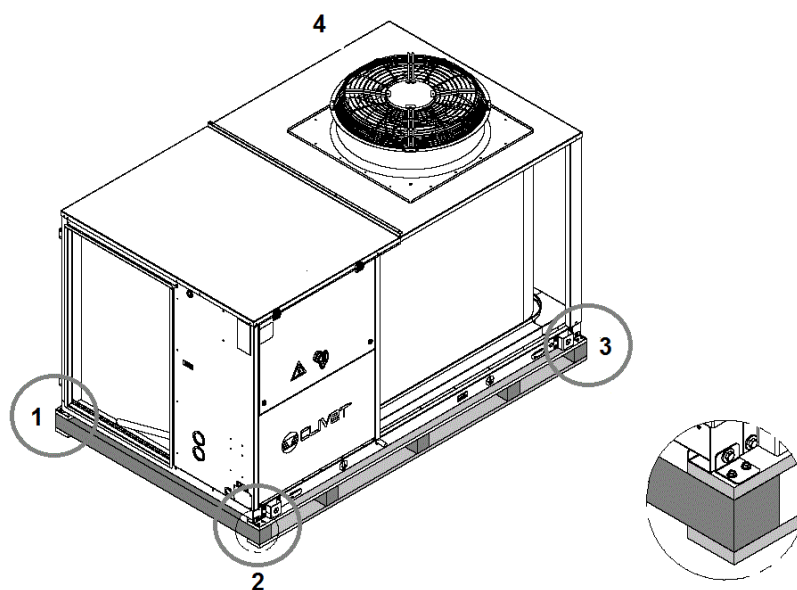


Size	7.1 - 10.1	14.2
X	1160	1600

Removal of packaging

Be careful not to damage the unit.

Recycle and dispose of the packaging material in compliance with local regulations.



Positioning

⇒ Installation must be in accordance with local regulations. If they do not exist, follow EN378.

During positioning consider these elements:

- customer approval
- unit weight and bearing point capacity
- safe accessible position
- functional spaces
- spaces for the air intake/exhaust
- electrical connections
- max. distance allowed by the electrical connections
- water connections

Functional spaces

Functional spaces are designed to:

- guarantee good unit operation
- carry out maintenance operations
- protect authorized operators and exposed people

⇒ Respect all functional spaces indicated in the TECHNICAL INFORMATION section.

Positioning

Units are designed to be installed:

- EXTERNAL
- in fixed positions

⇒ Put the unit in a position where any leaking gas cannot enter buildings or stagnate in closed areas. In the latter case, observe the rules for machinery rooms (ventilation, leak detection, etc.).

Installation standards:

- install the unit raised from the ground
- bearing points aligned and leveled
- discharged condensation water must not cause harm/danger to people and property
- the accumulation of snow must not cause clogging of the coils
- avoid installations in places subject to flooding

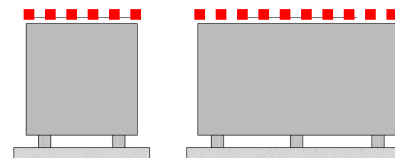
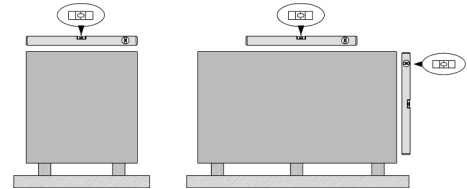
Limit vibration transmission:

- use anti-vibration devices or neoprene strips on the unit support points
- install flexible joints on the hydraulic and aeraulic connections

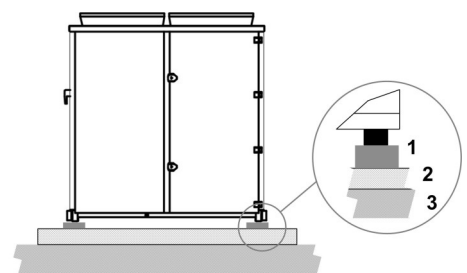
Protect the unit with suitable fence in order to avoid access to unauthorised personnel (children, vandals, etc.)

A correct circulation of the air is mandatory to guarantee the good unit operating..

The unit must be level.

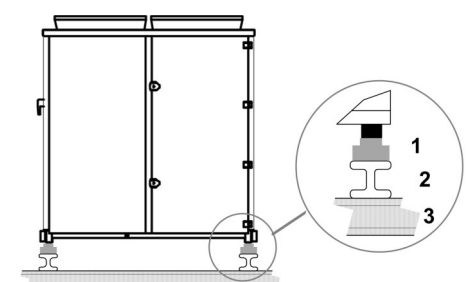


Concrete floor



- 1 2 cm thick neoprene strips
- 2 concrete floor
- 3 floor

Steel structure



- 1 anti-vibration devices
- 2 steel structure
- 3 steel structure

Avoid therefore:

- obstacles to the airflow
- exchange difficulties
- leaves or other foreign bodies that can obstruct the exchange batteries
- winds that hinder or favour the airflow
- heat or pollution sources close to the unit (chimneys, extractors etc)
- stratification (cold air that stagnates at the bottom)
- recirculation (expelled air that is sucked in again)
- positioning below the level of the threshold, close to very high walls, attics or in angles that could give rise to stratification or recirculation phenomena.

Ignoring the previous indications could:

- energy efficiency decrease
- alarm lockout due to HIGH PRESSURE (in summer) or LOW PRESSURE (in winter)

Pressure relief valve gas side

The installer is responsible for evaluating the opportunity of installing drain pipes in compliance with the local regulations in force (EN 378).

If ducted, the valves must be sized according to EN13136 .

Only if electronic filter is present

The most common contaminants for which the filter is designed, are:

- air pollution by PM10, PM 2,5 and PM1

Contaminants that can be filtered:

- dry smokes
- powder (up to 0,3 microns)
- smoke electrostatically charged

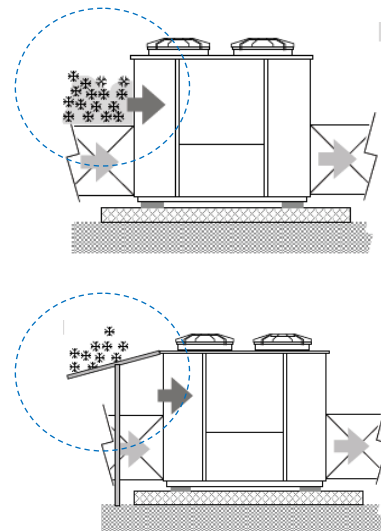
Contaminants that can NOT be filtered:

- ⇒ *water vapors also in low concentration*
- ⇒ *oil vapors*
- ⇒ *large amounts of dust*
- ⇒ *metal shavings, iron filing dusts and waste generally*
- ⇒ *Gas*

Absolutely to avoid:

- ⇒ *metal dusts also fine*
- ⇒ *fumes produced by combustion of organic and not materials (wood, coal, gasoline, etc.)*

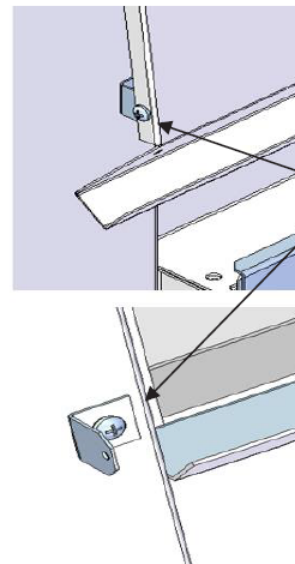
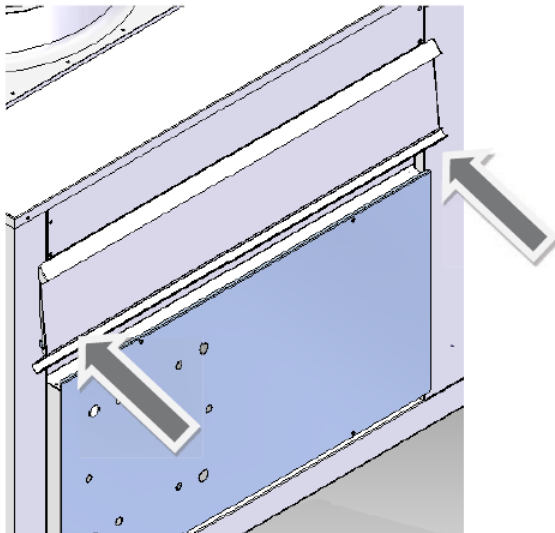
Avoid snow accumulating



External air hood CBK, CCK configurations

1 - APRIRE CUFFIA ARIA ESTERNA – All'interno ci sono le finiture DX e SX, rete AE + viti di fissaggio

1 – OPEN THE EXTERNAL AIR HOOD – Inside there are right and left parts, grid EA + fixing screws

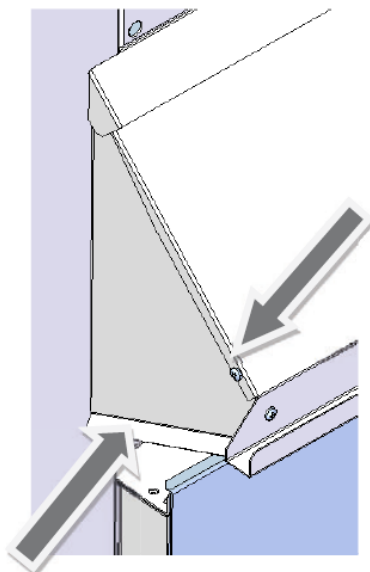


Togliere viti e
staffa di fissaggio
Remove screws
and
mounting bracket

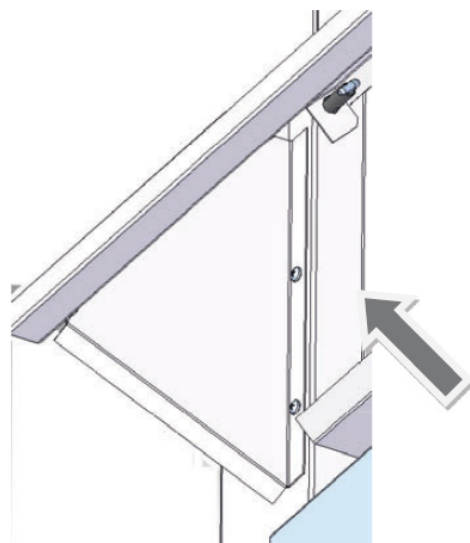
2 - FISSARE LE FINITURE DX E SX - Esternamente e internamente, sugli appositi fori con le viti in dotazione.

2 – FIX RIGHT and LEFT PARTS - With screws supplied, on the appropriate holes internal and external side.

FISSAGGI ESTERNI - EXTERNAL FIXING



FISSAGGI INTERNI - INTERNAL FIXING

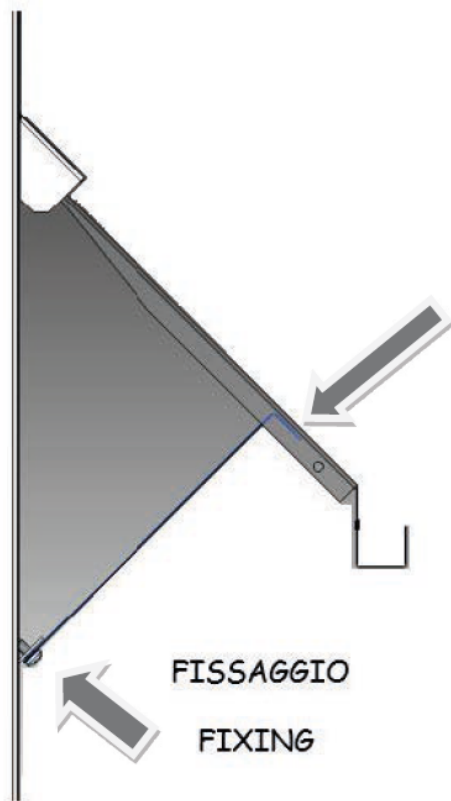


Le pieghe in basso devono andare verso l'esterno della cuffia !

The folds on the bottom must be installed on the external side of the air hood !

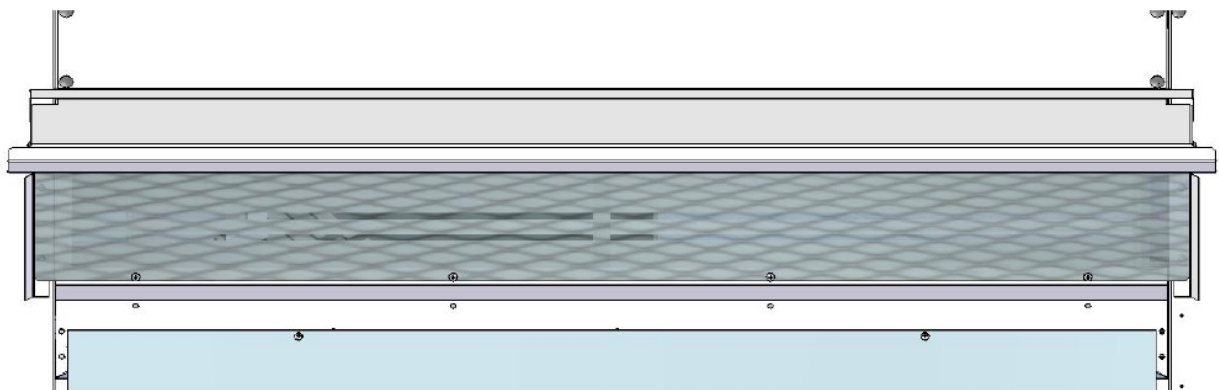
3 - FISSARE LA RETE ARIA ESTERNA (AE)- Sugli appositi fori con le viti in dotazione.

3 – FIX GRID EXTERNAL AIR (EA)- With screws supplied, on the appropriate holes.



La piega deve andare verso l'esterno della cuffia

The fold must be installed on the external side of the air hood



Gas heating module

Option

Burner with low pollutant emissions (NO_x below 80 mg/kWh), in line with Class 5 of the EN 676 European standard is supplied with a gas increase control for methane or LPG.

The heating module with burner includes:

- hot air generator powered with methane
- kit for transformation of power with liquefied petroleum gas (LPG)
- kit of steel chimney for exhaust fumes
- all the control and safety devices

⇒ The component requires gas supply (gas connections to be made by the Customer).

⇒ The location of the unit and the fume drain mode must comply with laws and standards in force in the Country of use.

⇒ The Customer may choose the flue chimney.

⇒ The Customer is responsible for mounting the chimney kit during installation.

⇒ Based on the specific installation requirements, the length of the chimney can be increased with suitable joints and fittings (not supplied by Clivet).

Gas connection

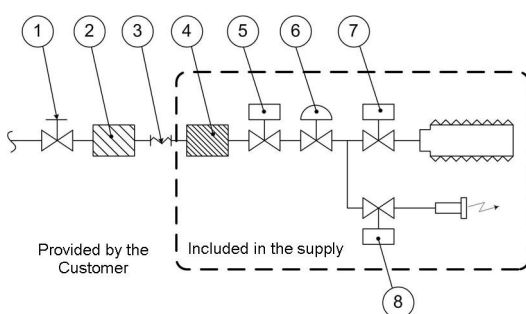
- Read the gas heating module manual.
- Connection must be carried out by qualified personnel.
- use certified components and comply with the local standards in force
- install on the gas connection: tap, large section filter and anti-vibration joint
- check the supply pressure is correct and stable, in particular where more uses are inserted on the same line.

System maintenance booklet

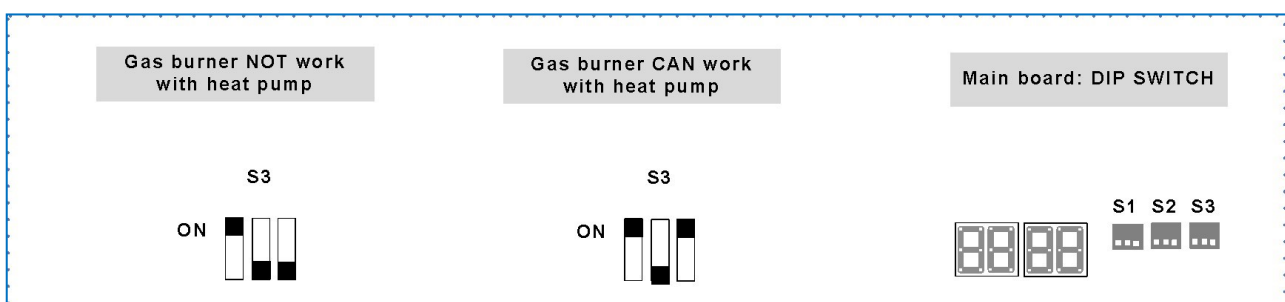
- It must be kept in the place of installation of the unit
- It must be filled-in upon commissioning
- It must be updated with the results of the periodical checks, of the routine and extraordinary maintenance interventions.

Interventions

For start-up, ordinary and extraordinary maintenance of the gas module, contact the local technical assistance of the manufacturer of the gas module.

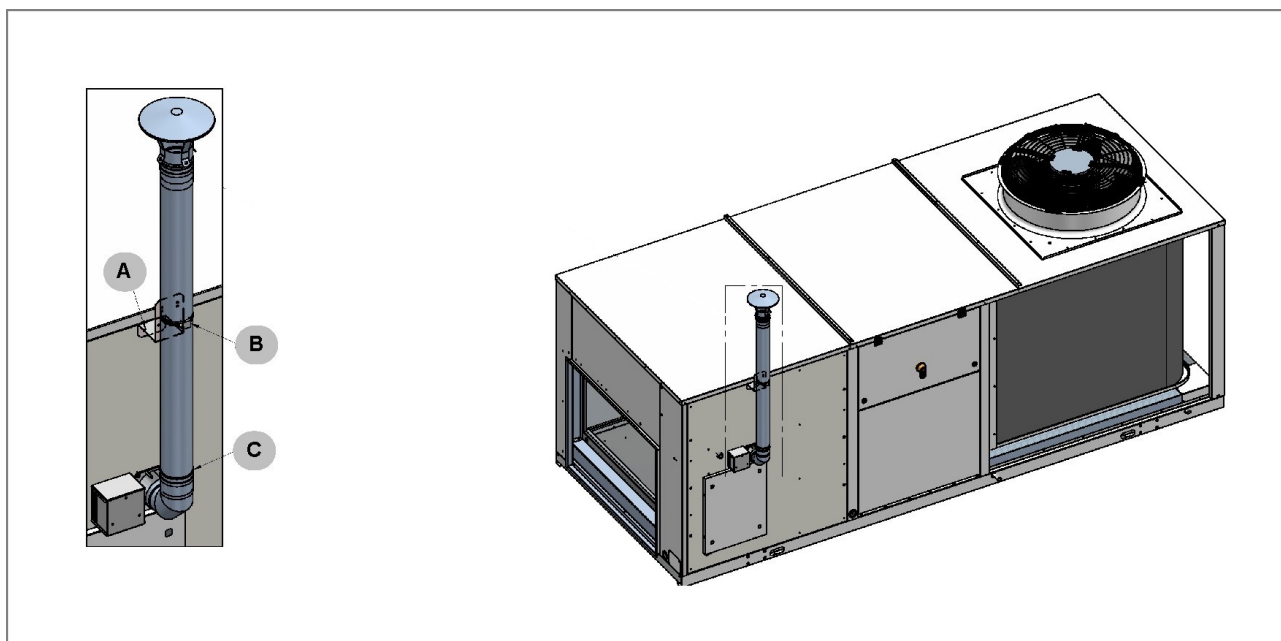


1. gas shut-off valve
2. Gas filter (large section)
3. Anti-vibration joint
4. Gas filter (small section)
5. Safet gas solenoid valve
6. Pressure stabiliser
7. Main gas burner solenoid valve
8. Pilot burner gas solenoid valve



4 - SELECTING THE INSTALLATION SITE

- A. Fissare con viti la staffa di sostegno del camino al pannello frontale del modulo gas
 - B. Fissare tramite fascetta le prolunghe alla staffa di sostegno del camino
 - C. Fissare i componenti del camino (curve, prolunghe e terminali) tramite le relative giunzioni
- A. Screw the chimney support bracket to the front panel of the gas module with screws
 - B. Fix the extensions to the support bracket of the chimney using a clamp
 - C. Fix the components of the chimney (curves, extensions and terminals) through the relative gaskets



Gas use features

		35kW		44kW		65kW		82kW	
NOx class	Val			5					
		min	max	min	max	min	max	min	max
Nominal heating capacity	kW	7,6	34,8	8,50	42,0	12,4	65,0	16,4	82,0
Efficiency Hi (P.C.I.)	%	107,0	96,3	105,9	96,2	108,1	96,8	108,4	97,6
Efficiency Hs (P.C.S.)	%	96,4	86,8	95,4	86,7	97,4	87,2	97,6	87,9
Max produced condensation	l/h	0,9		1,1		2,1		3,3	
Carbon monoxide CO (0% di O ₂)	ppm	<5		<5		<5		<5	
Nitrogen oxide - NOx (0% di O ₂)		41 mg / kWh 23 ppm		35 mg / kWh 20 ppm		40 mg / kWh 23 ppm		34 mg / kWh 19 ppm	
Available flue pressure	Pa	90		90		120		120	
Gas connection diameter	GAS	UNI ISO 228/1 - G 3/4"		UNI ISO 228/1 - G 3/4"		UNI ISO 228/1 - G 3/4"		UNI ISO 228/1 - G 3/4"	
Exhaust pipe diameter	mm	80		80		80		80	
Seasonal space heating energy efficiency [EU Reg./2281/2016] [η _s , h]	%	92,1		90,8		93,2		93,2	
Emission efficiency [EU Reg./2281/2016] [η _{sflow}]	%	97,3		97,0		97,4		97,1	
Power supply pressure (for gas G20)	mbar			20 [min 17-max 25]					
Gas consumption @15°C - 1013 mbar (for G20 gas)	m3/h	0,8	3,69	0,9	4,44	1,31	6,88	1,74	8,68

Condensate drain

The condensate must be disposed in order to avoid damages to people and things.

- Unit discharge fitting: the connection must not transmit mechanical stresses and must be performed taking care not to damage the unit discharge fitting.
- Provide a siphon that, eliminating the negative pressure caused by the fan, prevents the air intake from the discharge duct.
- The connection between the attachment and the siphon must be hermetically sealed (A)
- The piping must have adequate slope to allow out flow.
- Anchor the ducting with an adequate number of supports.. Otherwise are generated duct failures and air locks that prevent the runoff.
- Insulate the duct and the siphon to avoid the condensate drippings.
- Connect the condensate discharge to a sewerage drainage network.
- DO NOT use white water or drainage networks to avoid the aspiration of odours in the case of evaporation of water contained in the siphon.
- Check at the end of the work, the regular condensate runoff pouring some water in the tray.

Siphon height calculation

$$T = 2P$$

$$S = T/2$$

P is the pressure determined by the fan in correspondence of the condensate collection bowl (approx. 1 mm = 9.81 Pa)

Example :

$$P = 300 \text{ Pa} = 30 \text{ mm}$$

$$T = 2P = 60 \text{ mm}$$

$$S = T/2 = 30 \text{ mm}$$

Condensation in winter operation

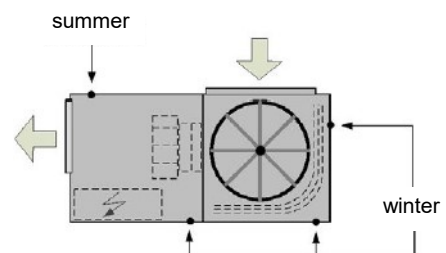
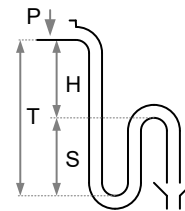
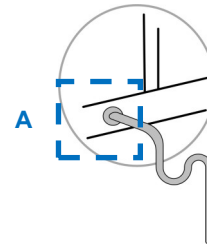
When a heat pump is running it produces a considerable amount of water due to the defrosting cycles of the external coil.

The condensate must be disposed in order to avoid damages to people and things.

Risk of freezing

Prevent the risk of freeze if the unit, drain or plumbing connections can be subject to temperatures close to 0°C.

- isolate the piping
- protect the piping with heating cables laid underneath the insulation



Immersed electrode humidifier

Option

Connexion humidificateur: 1" F

Supply water

The humidifier must be supplied with mains water having the following features:

- pressure between 0.1 and 0.8 Mpa (1 – 8 bar)
- temperature between 1 and 40°C

Do not use:

- water treated with softeners: it can corrode the electrodes and form foam with possible faults/malfunctionings
- pit, industrial or potentially polluted (chemically or bacteriologically) water
- disinfectants or anti-corrosive substances mixed with water, as potentially irritating

Supplying the humidifier with water treated with reverse osmosis filtering system gives the following advantages:

- reduces limescale deposits
- reduces energy consumptions
- reduces maintenance costs
- increases humidifier duration

Check that the filter guarantees a water flow rate higher than the flow rate of the installed humidifier.

Limit values for the supply water

Respect the limits indicated in the table

No relation can be demonstrated between water hardness and conductivity.

Limit values for the supply water		conductivity		medium-low		medium-high	
				min	max	min	max
Hydrogen ions	pH			7	8,5	7	8,5
Specific conductivity at 20°C	µS/cm			125	500	300	1250
Total dissolved solids	TDS	mg/l		(1)	(1)	(1)	(1)
Dry residue at 180°C	R ₁₈₀	mg/l		(1)	(1)	(1)	(1)
Total hardness	TH	mg/l CaCO ₃		50 ⁽²⁾	250	100 ⁽²⁾	400
Temporary hardness		mg/l CaCO ₃		30 ⁽³⁾	150	60 ⁽³⁾	300
Iron + Manganese		mg/l Fe+Mn		0	0,2	0	0,2
Chlorides		ppm Cl		0	20	0	30
Silica		mg/l SiO ₂		0	20	0	20
Residual chlorine		mg/l Cl ⁻		0	0,2	0	0,2
Calcium sulphate		mg/l CaSO ₄		0	60	0	100
Metallic impurities		mg/l		0	0	0	0
Solvents, diluents, soaps, lubricants		mg/l		0	0	0	0

(1) Values depending on specific conductivity; in general:

$$TDS \cong 0,93 * \sigma_{20}; R_{180} \cong 0,65 * \sigma_{20}$$

(2) not lower than 200% of the chloride content in mg/l of Cl⁻

(3) not lower than 300% of the chloride content in mg/l of Cl⁻

Drainage water

It can reach a temperature of 100°C.

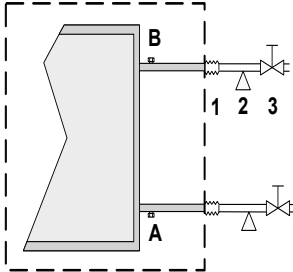
It contains the same substances of the supply water but in higher concentration.

As it is not toxic, it can be disposed of with white waters.

Heating coil

Option

Max. operating pressure = 10 bar



A drain valve

B vent valve

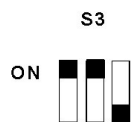
Provided by the costumer:

1 anti-vibration devices

2 piping supports

3 Shut-off valves

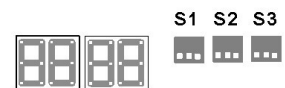
Water coil NOT work with
heat pump



Water coil CAN work with
heat pump



Main board: DIP SWITCH



AERAULIC CONNECTIONS

The dimensioning and correct execution of the aeraulic connections are fundamental to guarantee good unit operation and adequate level of silence in the room.

When designing and manufacturing the ducting, consider LOAD LOSSES, AIR FLOW AND SPEED that must be consistent with the unit features.

Particularly consider that load losses higher than the unit useful prevalence, lead to reduction in flow rate, with consequent unit blocks.

- the weight of the channels must not burden on the connection flanges
- place anti-vibration joints between channels and unit
- connection to the flanges and between the various sections of the channels must guarantee air seal, avoiding dispersions penalising the overall efficiency of the system
- limit the load losses by optimising the path, the type and number of bends and junctions
- use wide bends evaluating the opportunity of equipping them with deflectors (in particular with high air speed or bends with reduced radius)

Treated air channelling

The internal surface of the channel must be smooth, enable its washing and must not contaminate the air.

Thermally isolate the channels and the flanges to avoid energy losses and forming of condensation.

DIFFUSERS INLETS GRILLES

A correct diffusion of the air in the room is determining for the level of comfort.

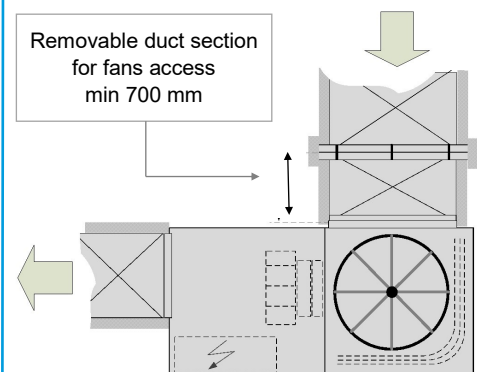
When choosing and positioning the grilles, inlets and diffusers, avoid:

- excessive air speed
- forming of stagnant and stratification areas
- cold air delivery in room
- forming of localised currents (also due to uneven distribution of air)
- excessive room temperature variations, vertically and horizontally
- short circuits of the supply air towards the return air

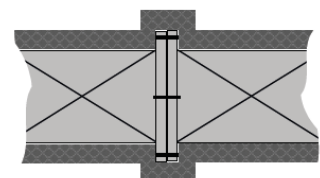
For sound comfort, consider that:

- the air diffusers must be chosen verifying the sound power generated at nominal flow rate conditions
- the cut-off to diffusers must be carried out with flexible elements
- the return grilles must be widely dimensioned

Isolate the channels



Isolate the flanges



The characteristics of the electrical lines must be determined by specialized personnel able to design electrical installations; moreover, the lines must be in conformity with regulations in force.

The protection devices of the unit power line must be able to stop the presumed short circuit current, whose value must be determined in function of system features.

The power cables and the protection cable section must be defined in accordance with the characteristics of the protections adopted.

All electrical operations should be performed by trained personnel having the necessary requirements by the regulations in force and being informed about the risks relevant to these activities.

Operate in compliance with safety regulations in force.

Electrical data

The serial number label reports the unit specific electrical data, included any electrical accessories.

The electrical data indicated in the technical bulletin and in the manual refer to the standard unit, accessories excluded.

Refer to the electrical data report on the serial number label:

- Tensione
- F.L.A.: full load ampere, absorbed current at maximum admitted conditions
- F.L.I.: full load input, full load power input at max. admissible condition
- Electrical wiring diagram Nr

Connections

refer to the unit electrical diagram (the number of the diagram is shown on the serial number label).

verify that the network has characteristics conforming to the data shown on the serial number label.

Before starting work, verify that the sectioning device at the start of the unit power line is open, blocked and equipped with cartel warning.

Primarily you have to realize the earthing connection.

Shelter the cables using adequate measure fairleads.

Before power the unit, make sure that all the protections that were removed during the electrical connection work have been restored.

Power supply network requirements

- 1 The short circuit capacity of the line must be less than 15 kA
- 2 The units can only be connected to TN, TT distribution systems
- 3 Voltage 400-3-50 +/-10%
- 4 Phase unbalance < 2%
- 5 Harmonic distortion less than 12% (THDv<12%)
- 6 Voltage interruptions lasting no longer than 3ms and with at least 1 s between each one
- 7 Voltage dips not exceeding 20% of the RMS value, lasting no longer than a single period (50Hz) and with at least 1 s between each dip.
- 8 Earth cable as specified in the table:

Cross-section of the line conductors (mm ²)	Minimum cross-section of the protective conductor (PE) (mm ²)
$S \leq 16$	S
$16 < S \leq 35$	16
$S > 35$	S/2

Signals / data lines

Do not overpass the maximum power allowed, which varies, according to the type of signal.

Lay the cables far from power cables or cables having a different tension and that are able to emit electromagnetic disturbances.

Do not lay the cable near devices which can generate electromagnetic interferences.

Do not lay the cables parallel to other cables; cable crossings are possible, only if laid at 90°.

Connect the screen to the ground, only if there aren't disturbances.

Guarantee the continuity of the screen during the entire extension of the cable.

Respect impedance, capacity and attenuation indications.

Power input

Fix the cables: if vacated may be subject to tearing.

The cable must not touch the compressor and the refrigerant piping (they reach high temperatures).

Remote ambient air temperature probe.

HT1,1

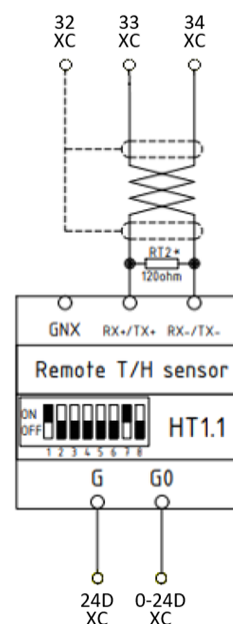
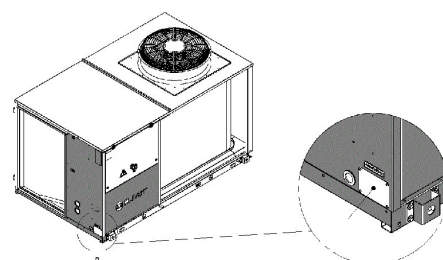
Option

Allows adjustment of the unit with a temperature probe located at a suitable point of the room to detect the conditions at rest.

This solution can be used as an alternative either to the probes in the user interface and be located in a technical room other than the room to be air conditioned, or to the probes on the return line of the unit.

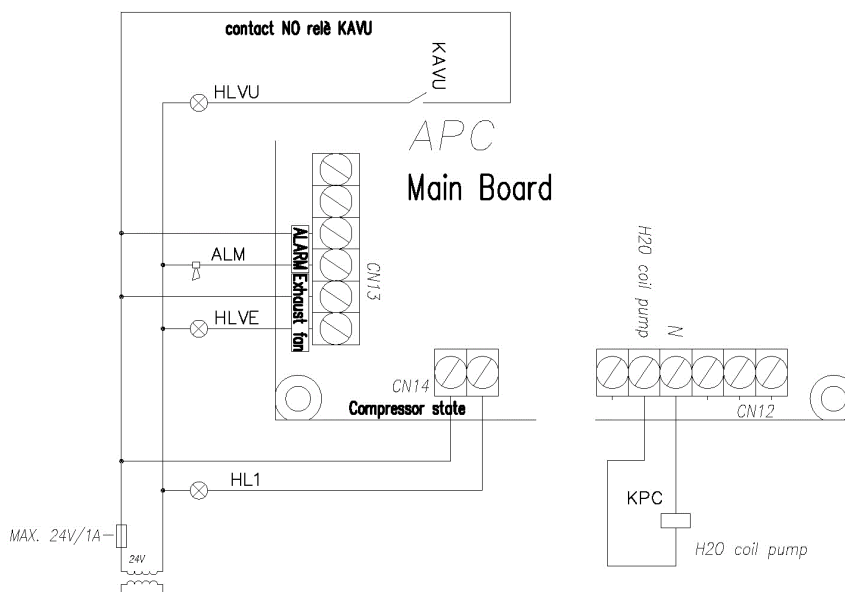
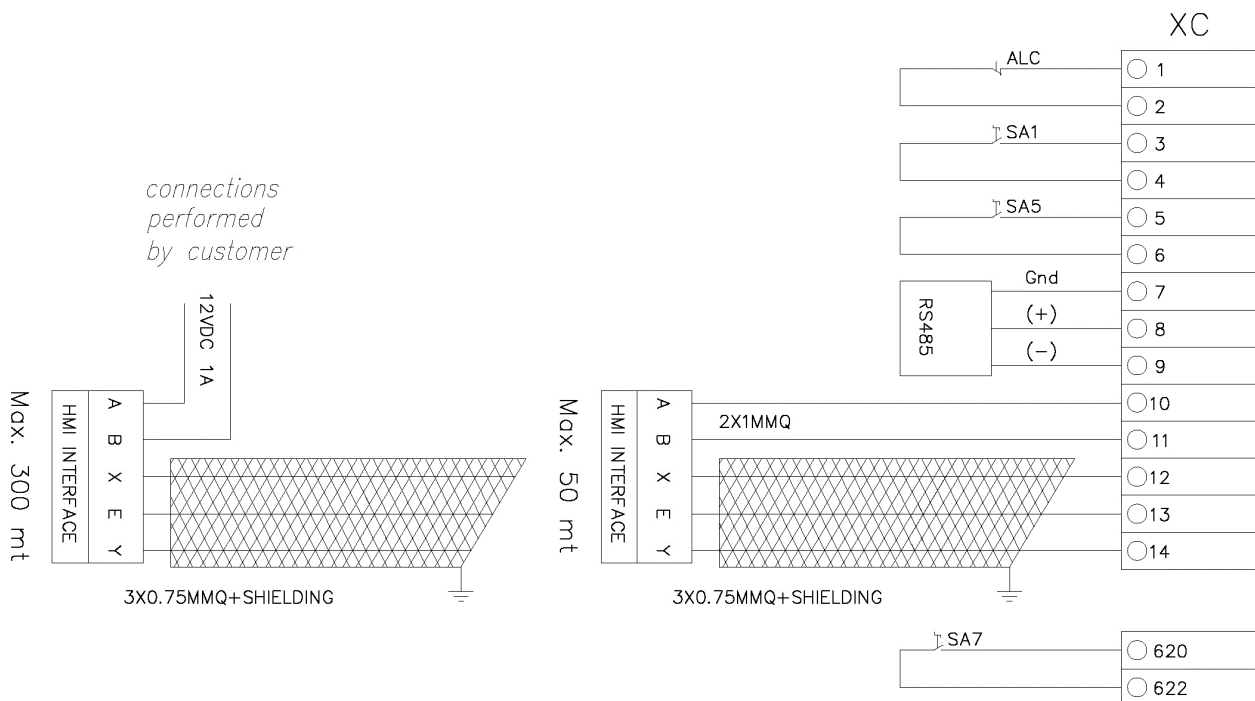
The probe can be located a maximum of 200 m away from the unit (cables not included in supply).

Option provided separately, electrical connection to be performed by the customer (recommended cables: for power supply at 24V PUR/PVC 2x0,75mm², fire resistant and with double insulation, to be laid separately from other signal/power cables, and shielded and twisted 485 serial cable)



Connections performed by costumer

ALC	contatto pulito da impianto di segnalazione allarme antincendio free contact from signalling system of fire alarm contact libre de installation de signalisation alarme d'incendie Schließerkontakt aus der Signalisierungsanlage der Feuerschutzalarm contacto libre de instalación de señalización alarma antincendio	SA5	selettore remoto "estate/inverno" remote winter/summer selector sélecteur déporté "été/hiver" Fernwahlschalter "Winter/Sommer" selector remoto "verano/invierno"
HLVU	lampada segnalazione stato ventilatore di mandata indicating light of the supply fan status lampe de signalisation de l'état ventilateur de refoulement Signallampe des Zustandes des Druckventilators lámpara indicadora estado ventilador de impulsión	SA7	selettore abilitazione allo scarico manuale umidificatore enabling selector to the humidifier manual discharge sélecteur validation à la décharge manuelle humidificateur Freigabewähler auf den manuellen Ablauf des Befeuchters selector habilitación a la descarga manual humidificador
ALM	segnalazione blocco cumulativo cumulative fault signal signalisation alarme Sammelstörungsmeldung señalización bloqueo cumulativo	KPC	comando pompa/circolatore della batteria integrativa pump/circulating pump control of the integration coil commande pompe/pompe de circulation de la batterie supplémentaire Pumpe/Zirkulationspumpe-Steuerung der Zusatzbatterie mando bomba/bomba de circulación de la batería complementaria
SA1	selettore on/off remoto remote on/off selector sélecteur ON/OFF déporté Fernwahlschalter Ein/Aus selector on/off remoto	HLVE	lampada segnalazione stato ventilatore d'estrazione Exhaust fan status warning light *
HL1	lampada di segnalazione stato compressore compressor status signal lamp lampe de signalisation état compresseur Signallampe Verdichterzustand lámpara de señalización estado compresor		



ON-OFF remote





MENU > Assistance setting* >

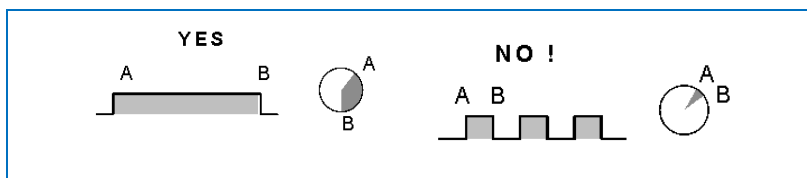
Operation parameter > P05 EnONOFF

*Assistance setting: accesso al menu protetto da password

Do not perform short On Off cycles

Do not use the remote On Off with thermoregulation function.

1.05 EnOnOff	ON / OFF from:	
= 0	digital input SA1	Unit ON  Unit OFF 
= 1	controller	
= 2	BMS	



Wall mounted control.

Before proceeding, make sure you have:

Name	Nr.	
Wired Controller	1	KJRH-120H/BMCO-E
Cross round head wood mounting screw	3	For Mounting on the Wall
Cross round head mounting screw	2	For Mounting on the Electrical Switch Box
Plastic bolt	2	This accessory is used when install the centralized control inside the electric cabinet
Plastic expansion pipe	3	For mounting on the Wall

Installation

Do not install the unit in a place with much oil, steam, sulfide gas.

Otherwise, the product may deform and fail.

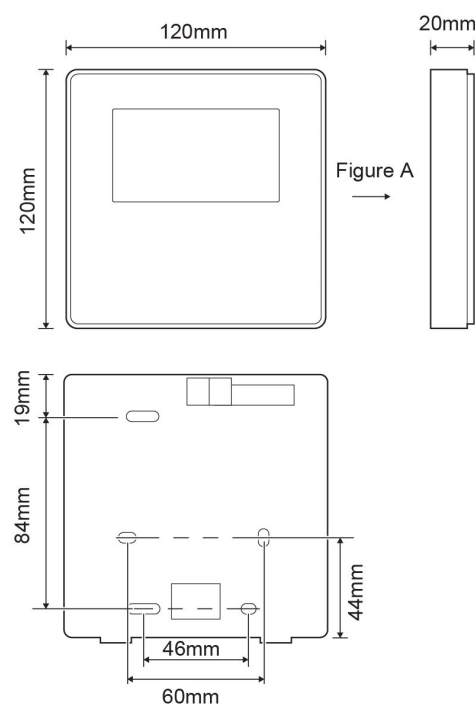
Check that all the components listed below are present.

Circuit of Wired Remote Controller is low voltage circuit. Never connect it with a standard 220V/380V circuit or put it into a same Wiring Tube with the circuit.

The shielded cable must be connected stable to the ground, or transmission may fail.

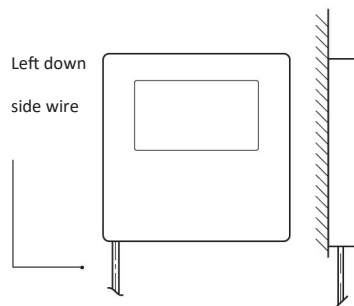
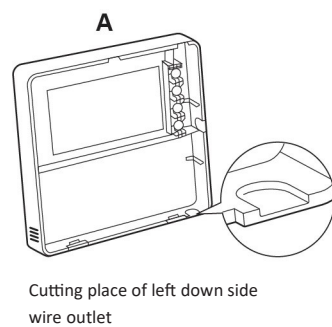
Do not attempt to extend the shielded cable by cutting, if it is necessary, use Terminal Connection Block to connect.

After finishing connection, do not use Megger to have the insulation check for the signal wire

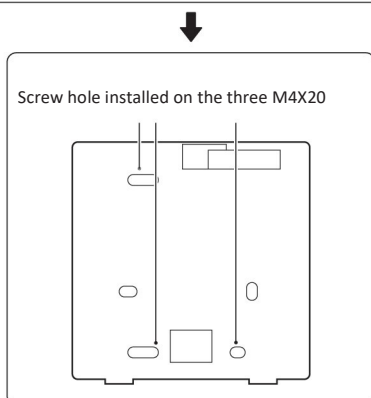
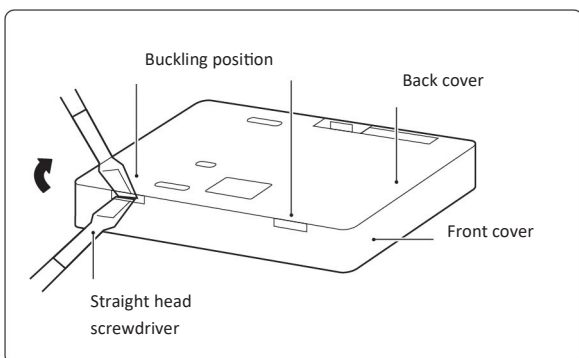


Back cover installation

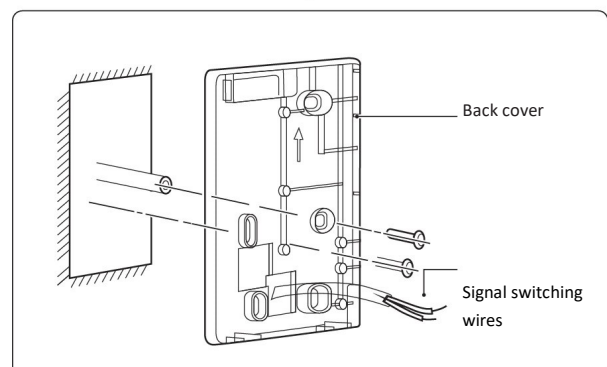
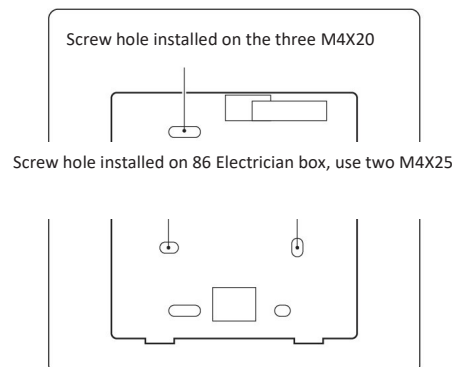
- 1) Use straight head screwdriver to insert in the buckling position in the bottom of wired controller, and spin the screwdriver to take down the back cover. (Pay attention to spinning direction, otherwise will damage the back cover!)
- 2) Use three M4X20 screws to directly install the back cover on the wall.
- 3) Use two M4X25 screws to install the back cover on the 86 electrician box, and use one M4X20 screws for fixing on the wall.
- 4) Adjust the length of two plastic screw bars in the accessory to be standard length from the electrical box screw bar to the wall. Make sure while installing the screw bar to the wall, making it as flat as the wall.
- 5) Use cross head screws to fix the wired controller bottom cover in the wall through the screw bar. Make sure the wired controller bottom cover is on the same level after installation, and then install the wired controller back to the bottom cover.
- 6) Over fastening the screw will lead to deformation of back cover.



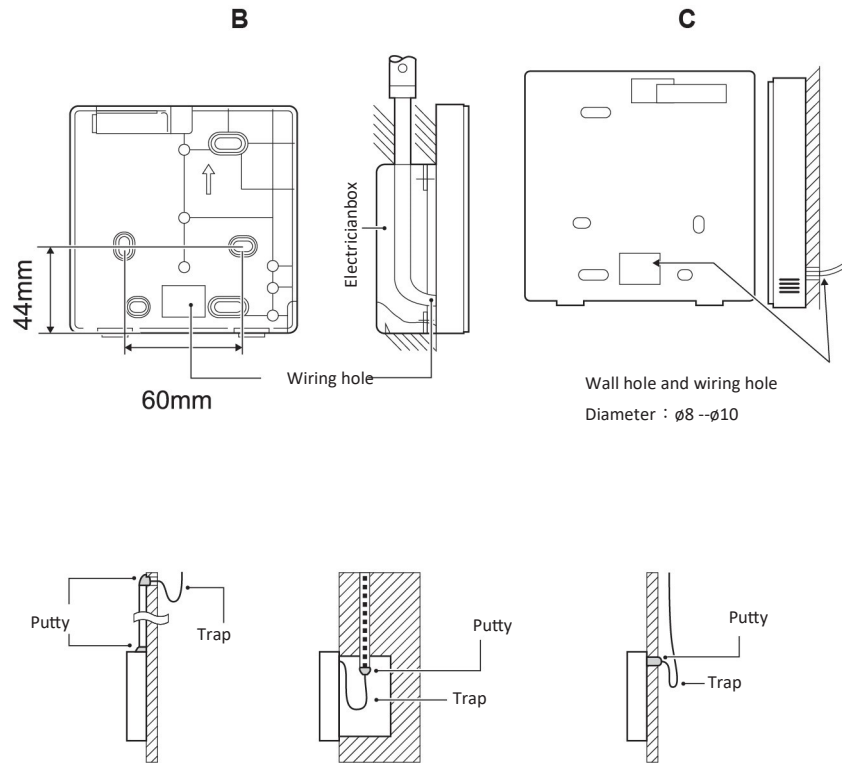
Wall installation



Installation in electrical box 86

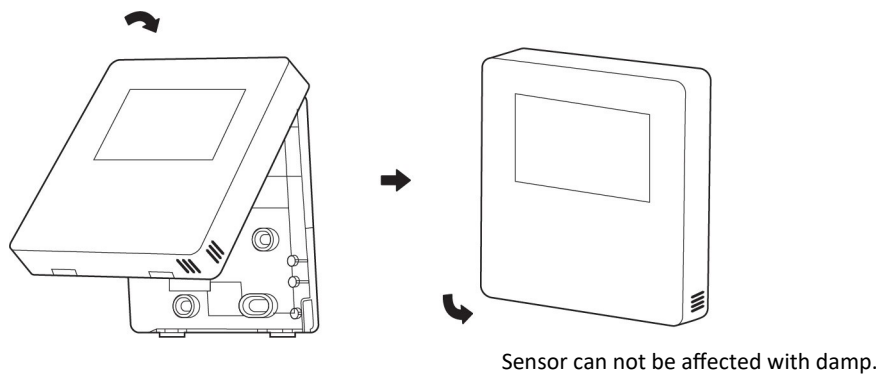


Avoid the water enter into the wired remote controller, use trap and putty to seal the connectors of wires during wiring installation.

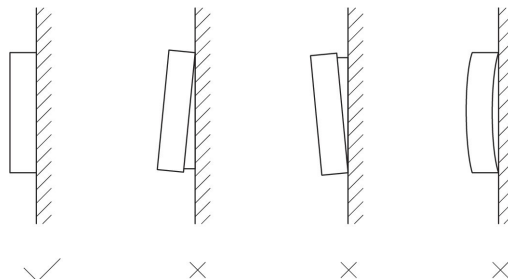


Front cover installation

After adjusting the front cover and then buckle the front cover; avoid clamping the communication switching wire



Correct install the back cover and firmly buckle the front cover and back cover, otherwise will make the front cover drop off.



START-UP

The indicated operations must be carried out by qualified technicians and specifically trained on the product.

Upon request, the after-sales assistance centres execute start-up.

The electric, hydraulic connections and the other work of the system are the responsibility of the installer.

Agree the start-up date with the after-sales assistance centre with sufficient advance

Before starting any check, verify that :

- the unit is perfectly installed and in compliance with that reported in this manual
- the electric power supply line of the unit is isolated at start-up
- the isolation device of the line is open, blocked and equipped with relative signal.
- make sure no tension is present

⇒ *After turning off the power, wait at least 5 minutes before accessing to the electrical panel or any other electrical component.*

⇒ *Before accessing check with a multimeter that there are no residual stresses.*

UV-C lamps

Option

Caution

⇒ *Direct radiation device: causes eye irritation and skin rashes.*

⇒ *Any maintenance operation must be carried out with the lamps off.*

Preliminary checks

For details refer to the various chapters in the manual.

Unit OFF power supply

- 1 safe access
- 2 functional spaces
- 3 air flow: correct return and supply (no bypass, no stratification)
- 4 integrity of structure
- 5 fans turn freely
- 6 unit on anti-vibration devices
- 7 condensate drain
- 8 air filters present and clean
- 9 completed aeraulic system
- 10 cooling circuit visual control
- 11 earth connection
- 12 power supply features
- 13 electric connections by customer



Preliminary checks

For details refer to the various chapters in the manual.

unit ON power supply

- 1 compressor carter heaters ON from at least 8 hours
- 2 vacuum voltage measurement
- 3 phases sequence control
- 4 shut-off valve refrigerant circuit open (if present)
- 5 unit ON
- 6 load voltage measurement and absorptions
- 7 liquid sight glass check (no bubbles)
- 8 fans operation check
- 9 check air flow on outer coil (no by-pass, no stratification)
- 10 treated air flow rate measurement
- 11 static pressure relief in return
- 12 supply, return and outdoor air temperature measurement
- 13 subcooling and overheating measurement
- 14 no anomalous vibrations check
- 15 set-point personalization
- 16 climatic curve personalization
- 17 scheduling personalization
- 18 fire alarm configuration *
- 19 complete and available unit documentation

* only if present

Cooling circuit

- 1 Visually check the cooling circuit: any oil stains can be symptom of leaks (caused by, for example, transport, handling or other).
- 2 Check the cooling circuit is pressurised: use the machine pressure gauges, if present, or service pressure gauges.
- 3 Check all service sockets are closed with relative plugs; their absence may determine coolant leaks
- 4 Shut-off valve refrigerant circuit open (if present)

Water circuit

Only with humidifier options - Hot water coil

- 1 Before realizing the unit connection make sure that the hydraulic system has been cleaned up and the cleaning water has been drained.
- 2 Check that the water circuit has been filled and pressurized.
- 3 Check that the shut-off valves in the circuit are in the "OPEN" position.
- 4 Check that there isn't air in the circuit, if required, evacuate it using the air bleed valve placed in the system high points.
- 5 When using antifreeze solutions, make sure the glycol percentage is suitable for the type of use envisaged.

NOTE

⇒ *Neglecting the washing will lead to several filter cleaning interventions and at worst cases can cause damages to the exchangers and the other parts.*

Electric Circuit

Verify that the unit is connected to the ground plant.

Check the conductors are tightened as: the vibrations caused by handling and transport might cause these to come loose.

Connect the unit by closing the sectioning device, but leave it on OFF.

Check the voltage and line frequency values which must be within the limits: 400/3/50 +/- 10%

Check and adjust the phase balance as necessary: it must be lower than 2%

NOTE

⇒ Working outside of these limits can cause irreversible damages and voids the warranty.

Compressor crankcase heaters

Power the compressor oil heating resistors for at least 8 hours before starting the compressor itself:

- upon unit commissioning
 - after every prolonged stop period with unit not powered
- 1 Power the resistors by closing the unit isolator.
 - 2 Check electric absorption of the resistors to be sure they are working.
 - 3 Execute start only if the temperature of the compressor casing on the lower side is at least 10°C higher than the outdoor temperature.
 - 4 Do not start the compressor with carter oil not in temperatureTensioni

Voltages

Check that the air and water temperatures are within in the operating limits.

Start-up the unit.

With unit operating in stable conditions, check:

- Voltage
- Total absorption of the unit
- Absorption of the single electric loads

Scroll compressor

The Scroll compressors have only one rotation direction.

In the event it is reversed, the compressor is not immediately damaged, but increases its noise and jeopardises pumping.

After a few minutes, the compressor blocks due to intervention of the thermal protection.

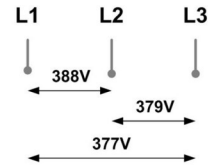
In this case, disconnect power supply and invert 2 phases on the machine power supply.

Avoid the compressor working for a long time with contrary rotation: more than 2-3 of these anomalous start-ups can damage it.

To ensure the rotation direction is correct, measure the condensation and suction pressure.

The pressures must significantly differ: upon start-up, the suction pressure decreases whereas the condensation one, increases.

The phase monitor optional, controlling the phases sequence, can also eventually be installed subsequently.



$$1) \quad \frac{388 + 379 + 377}{3} = 381 \text{ (A)}$$

$$2) \quad \text{MAX} - A = 388 - 381 = 7$$

$$3) \quad S = \frac{7}{A} \times 100 = 1,83 \text{ OK}$$

Remote controls

Check that the remote controls (ON-OFF etc) are connected and, if necessary, enabled with the respective parameters as indicated in the “electrical connections” section.

Check that probes and optional components are connected and enabled with the respective parameters (“electrical connections” section and following pages).

Delivery air flow management

Standard mode

The **fan rotation speed** remains constant in all heat load conditions and operation modes.

Constant air flow

Option

The delivery air flow rate stays constant during variations in the thermal load and head losses of the unit and system.

The ventilation remains active even when the setpoint is fulfilled.

Variable airflow

Option

The air flow supply varies depending on the heat load, up to a minimum value compatible with the distribution system and the chosen air diffusion.

The ventilation remains active even when the setpoint is fulfilled.

Air flow setting

Standard mode

The real unit flow is according to the aeraulic system features.

Before checking, make sure that the system has been completed in all its parts (shunts, dampers, grilles, diffusers etc.).

Check the doors and windows of the serviced room are closed.

The unit must be calibrated while full recirculation has been running for at least 30 minutes.

The unit is in full recirculation during the first 60 minutes of operation.

Set the fan's percentage of operation:

FanSpeedOutMand

"Follow me" function

Allows you to set the probe on which the thermoregulation is based.

0 = return probe installed in the unit

1 = room thermostat

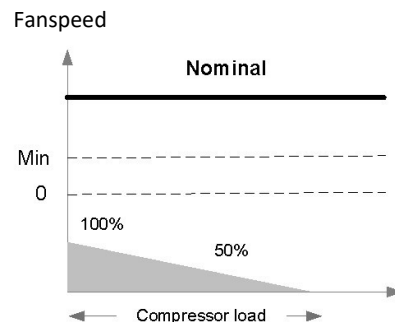
Default di fabbrica = 0

Factory default

Settable only via HMI and from technical assistance.

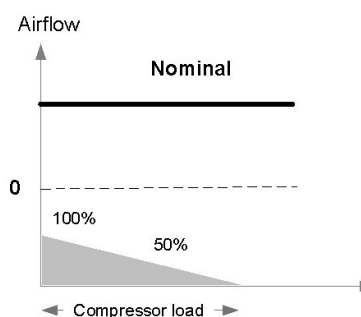
Standard mode

Nominal = FanSpeedOutMand



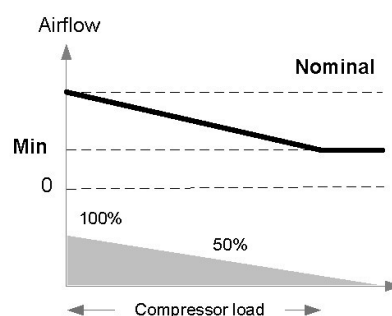
Constant airflow

Nominal = QSetMand



Variable airflow

Nominal = QSetMandV



Follow me

1. OPERATION PARAMETER	
1.19 BandPr	2 °C
1.20 ReturnCool	2 °C
1.21 ReturnHeat	2 °C
1.22 FollowMe	0
⚙️ ADJUST	8 1 / 4

Eco Mode

The air flow supply remains constant at varied heat loads and is shutdown when setpoint is fulfilled.

To further increase the energy savings in this condition, it is also possible to set less demanding operation setpoints for the unit in respect to the standard mode.

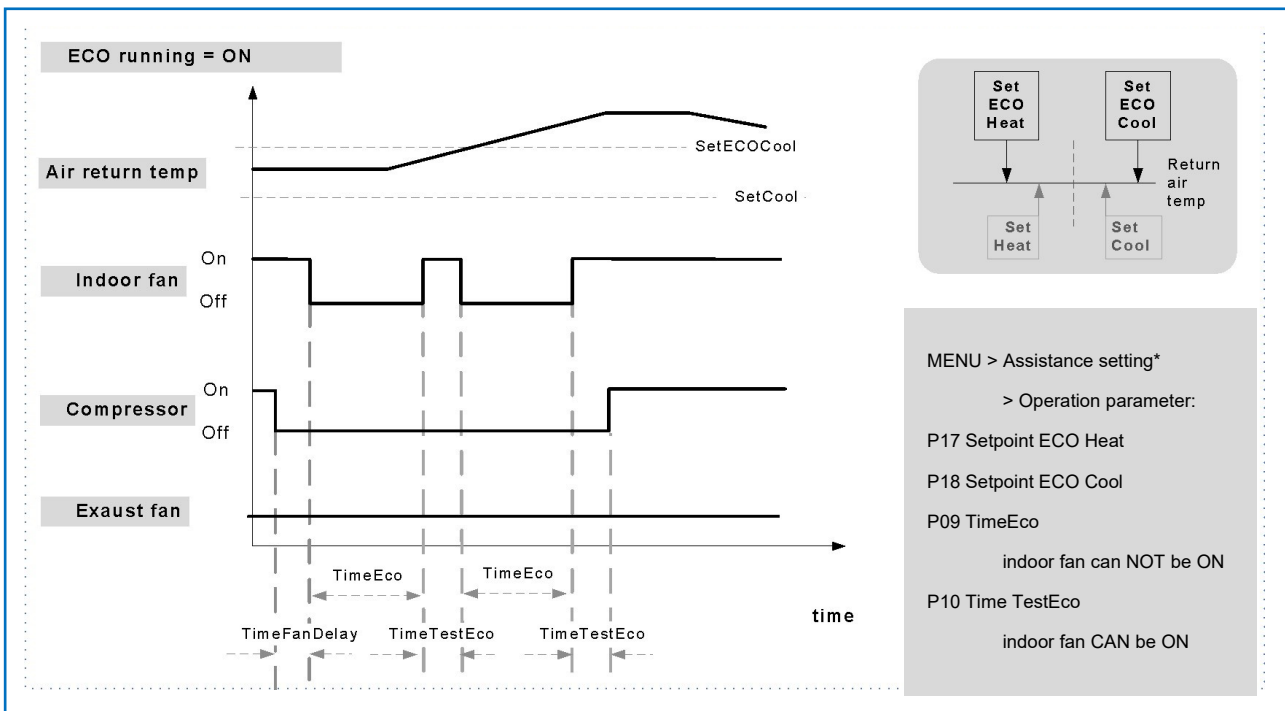
This function is indicated for the thermal maintenance of the served area in case it is temporarily not used, which can for example occur at night.

In ECO mode, the fresh air is not managed.

The ECO mode can be activated:

- Manually: P04 Enable EcoMode = 1
- Automatically by means supervision system

Example in cooling mode:

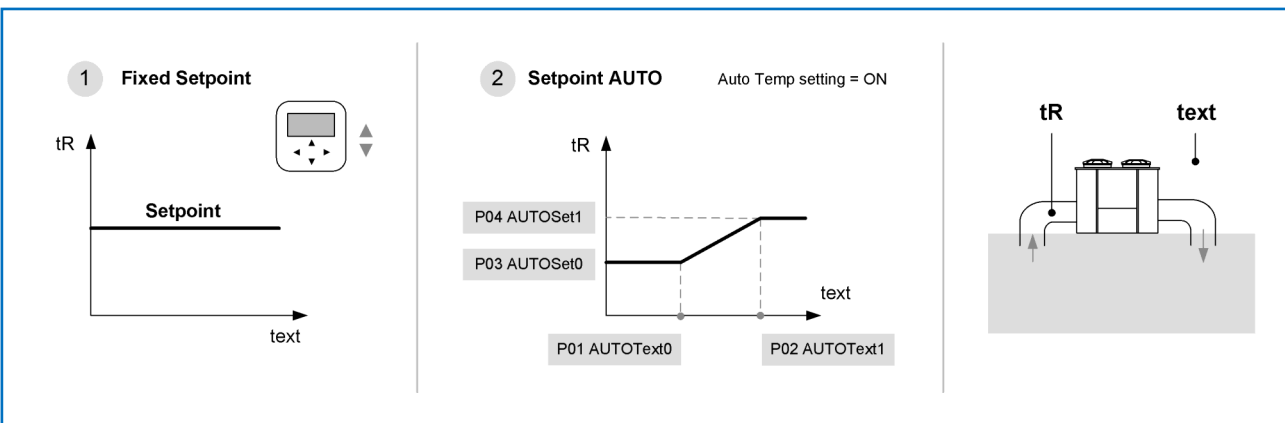


*Assistance setting: access to password-protected menu

Operating mode

The set point can be fixed (1) or variable depending on the outdoor temperature (2).

Menu: Autotemp setting



The HEAT / COOL mode can be modified:

- manually through the SA5 contact, from the keypad or through the BMS
- automatically depending on the return temperature

To choose, set P06 EnMode.

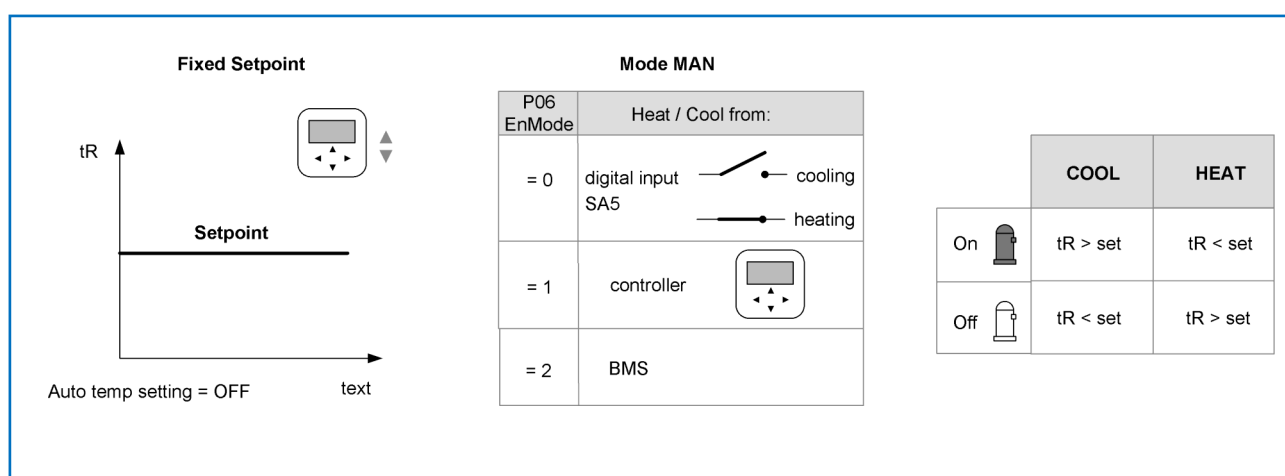
Menu > assistance setting* > operation parameter >

*Assistance setting: access to password-protected menu

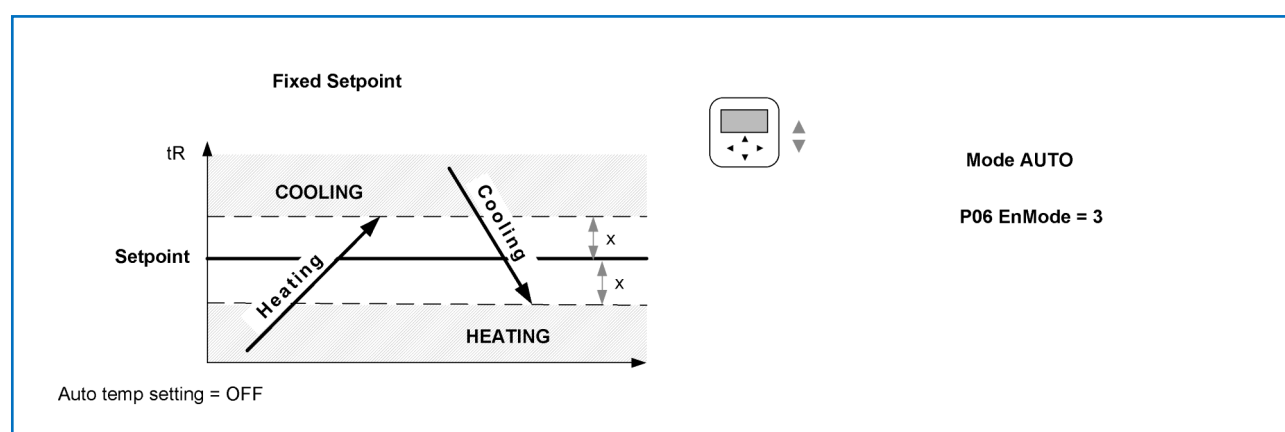
You can choose between 4 types of operation::

P06 EnMode	
0	digital input SA5
1	keypad not available if EnOnOff = 0 o 2
2	BMS
3	auto not available if EcoMode is enabled

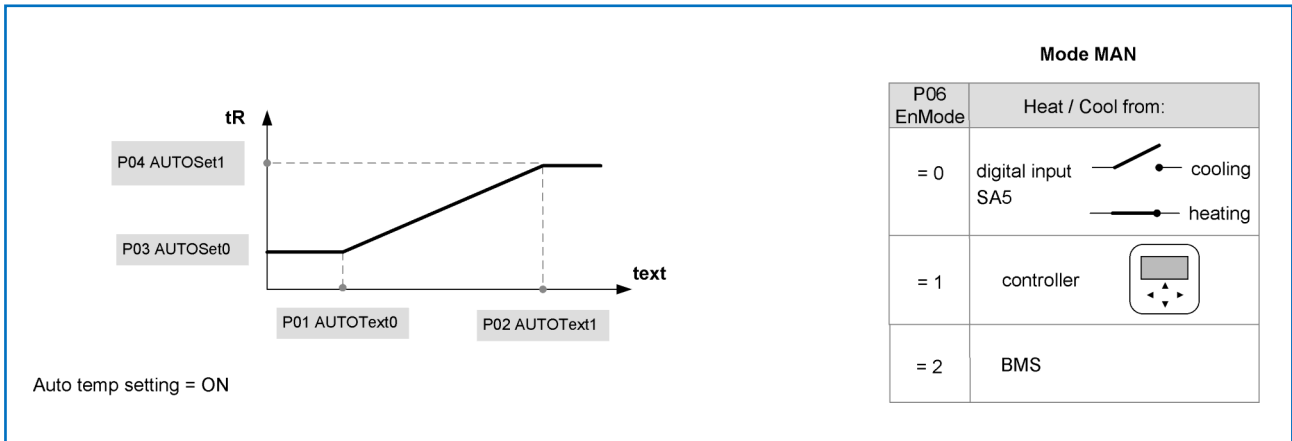
Fixed set point - Manual mode



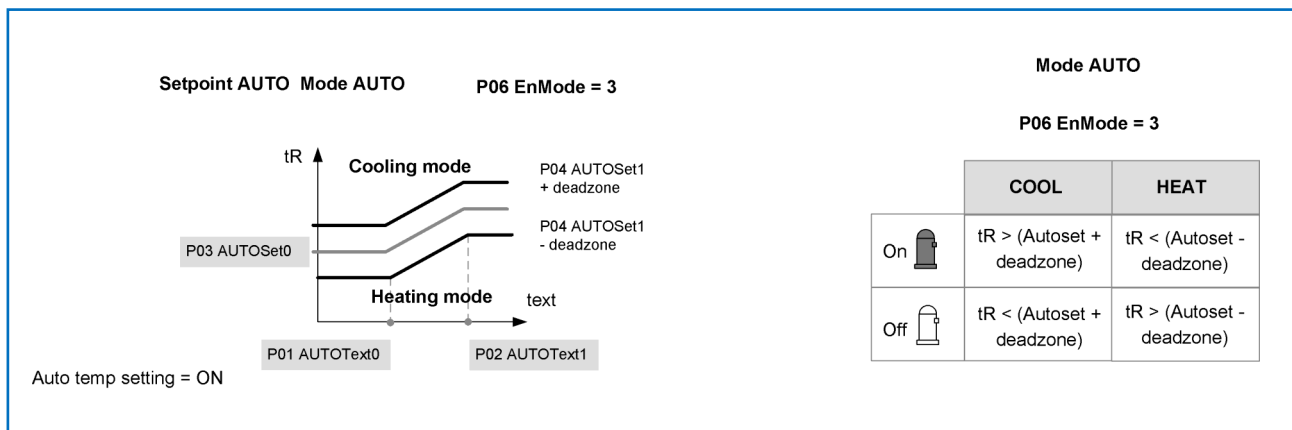
Fixed set point - Automatic mode



Variable set point - Manual mode



Automatic set point - Automatic mode



Fire alarm: configuration

It is possible to configure the unit behaviour in presence of alarm signal.

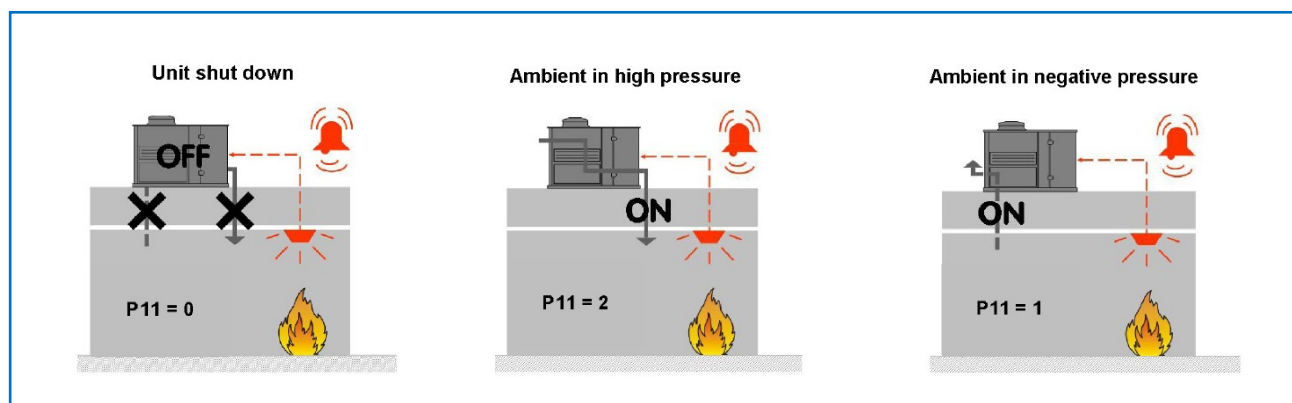
Par 11 TypeFireMode

MENU > Assistance setting* > operation parameter > P11 TypeFireMode

*Assistance setting: access to password-protected menu

⇒ The unit cannot be used as smoke extractor.

⇒ Any fire detection devices built-in the unit must be considered as an auxiliary safety system, and, accordingly, must not be a replacement for any fire detection devices in the room.



Room pressure calibration

CCK configuration

- 1 check the doors and windows of the serviced room are closed
 - 2 calibration must be carried out with unit all in recirculation
 - 3 view the status on the display: Pf2 RETURN AIR PRE
 - 4 wait for the pressure value to stabilise and take note of the value
 - 5 to keep the room at neutral pressure, memorise the value of the read pressure in p06 SetPAmb
 - 6 to maintain the room in overpressure, memorise a lower value respect to that detected
 - 7 to maintain the room in depression, memorise a higher value
- MENU > Assistance setting * > Operation parameter >

P06 SetPAmb

*Assistance setting: access to password-protected menu

Start-up report

Identifying the operating objective conditions is useful to control the unit over time.

With unit at steady state, i.e. in stable and close-to-work conditions, identify the following data:

- total voltages and absorptions with unit at full load
- absorptions of the different electric loads (compressors, fans, pumps etc)
- temperatures and flows of the different fluids (water, air) both in input and in output from the unit
- temperature and pressures on the characteristic points of the refrigerating circuit (compressor discharge, liquid, intake)

The measurements must be kept and made available during maintenance interventions.

2014/68/UE PED directive

DIRECTIVE 2014/68/UE PED gives instructions for installers, users and maintenance technicians as well.

Refer to local regulations; briefly and as an example, see the following:

Compulsory verification of the first installation:

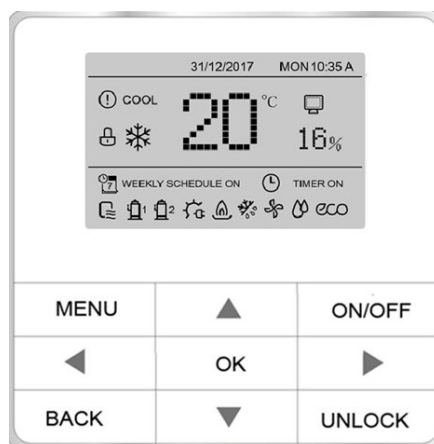
- only for units assembled on the installer's building site (for ex. Condensing circuit + direct expansion unit)

Certification of setting in service:

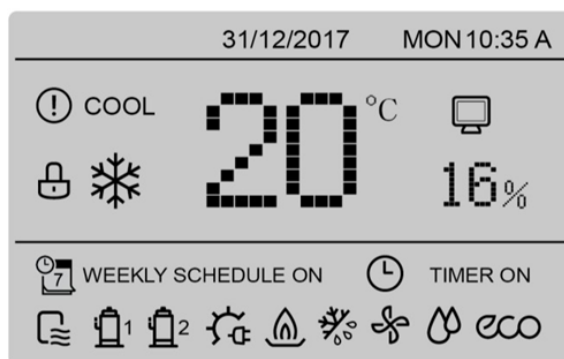
- for all the units

Periodical verifications:

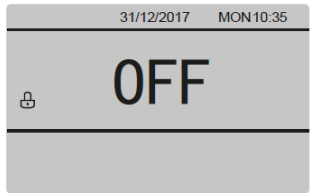
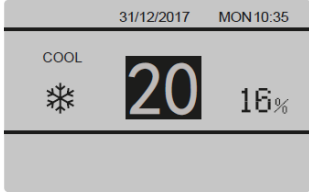
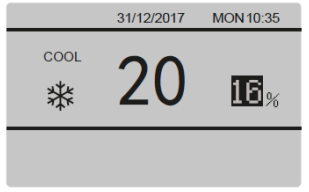
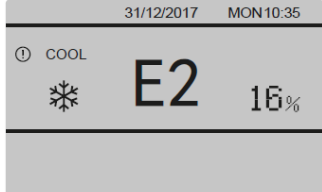
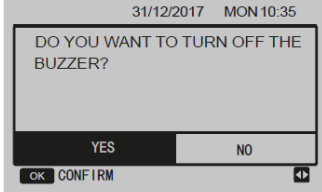
- to be executed with the frequency indicated by the Manufacturer (see the "maintenance inspections" paragraph)



MENU	To access the various menus of the HOME page.
▲, ▼, ◀ ▶	▲ up, ▼ down, ◀ left, ▶ right To shift the cursor, modify the selection or modify the set value. The parameter can be rapidly modified by pressing it extendedly..
OK	To confirm an operation
ON/OFF	To set the ON / OFF function
BACK	To return to the previous level. Press to exit the current page and return to the previous page. Press extendedly to return to the home page directly.
UNLOCK	To lock/unlock.



	Mode: indicates, respectively, heat, cool and auto
OFF	Controller deactivated (off)
	Remotely controlled controller Appears when the unit is set from the keypad for being controlled from a remote terminal or a remote switch.
20	Return air temperature. 16: value of the return air humidity (indicator on only when humidity check is enabled) Generally, this area displays the actual temperature of the return air and the relative humidity of the return air; when the set value is modified, it displays the modified temperature and the relative humidity.
	Unit status: indicator on when the unit is running.
	Compressor: indicator on when the compressor is running.
	Auxiliary electric heater: indicator on when the auxiliary electric heater or H2O coil is running.
	Gas module: indicator on when the gas module is running.
	Defrosting: indicator on when the unit is defrosting the outdoor coil
	Internal fan: indicator on when the internal fan is running.
	Humidifier: indicator on when the humidifier is running.
eco	Eco running: indicator on when the ECO function is set to ON
	Timer: indicator on when a valid timer has been set (weekly schedule).
	Alarm: indicator on when a fault occurs or a protection device intervenes.
	Lock: indicator on when the controller's keypad is locked.

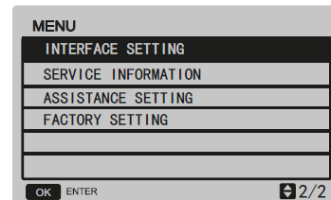
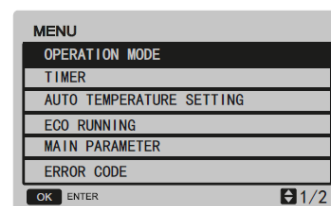
<p>Lock/unlock</p> <p>To lock/unlock the screen, press UNLOCK for 3 sec.</p> <p>Switch-on/off</p> <p>To switch it on/off, press ON/OFF.</p>	
<p>Temperature/humidity adjustment</p> <p>Press ◀ ▶ to adjust the temperature</p> <p>Press ▲ ▼ to select</p> <p>Press ◀ ▶ to adjust the temperature (if the sensor is enabled)</p> <p>Press OK to confirm</p> <p>If no operations are made for more than 10 sec, the system automatically memorises the settings and returns to the home page</p>	 
<p>Alarms</p> <p>If an alarm intervenes, the “!” symbol flashes and the error code appears.</p> <p>The beeper sounds 3 times for 180 sec.</p> <p>Press OK: the buzzer can be silenced. Select using ◀ ▶ and press OK.</p> <p style="text-align: center;">Caution</p> <p>⇒ Before resetting an alarm identify and remove its cause.</p> <p>⇒ Repeated resets can cause irreversible damage.</p>	 

Settings menu

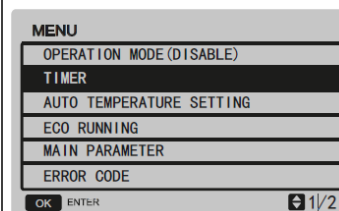
Press ▲ ▼ to select each menu option.

Press OK to access the corresponding sub-menu

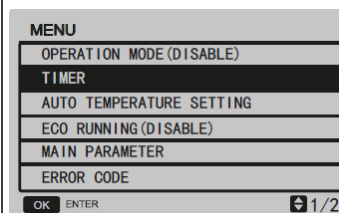
Press BACK to return to the home page .



If ENMode=0 or =2 (in the ASSISTANCE menu), the mode operation is disabled



If ENMode=3 (in the ASSISTANCE menu), the mode and eco mode operations are disabled

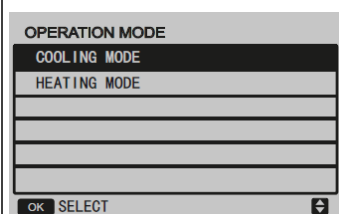
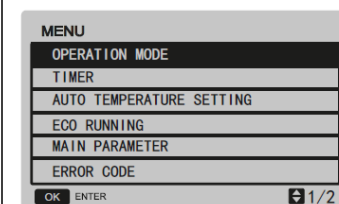


Operating mode

Choose the mode with

▲ ▼. Confirm with OK.

After 10 sec, without any operation, the mode is memorised automatically

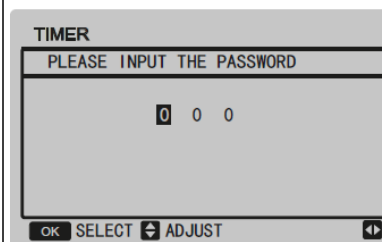
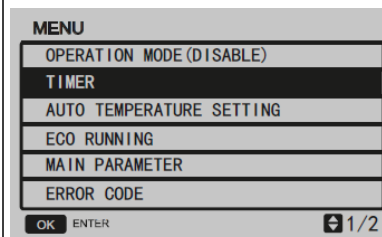


Timer

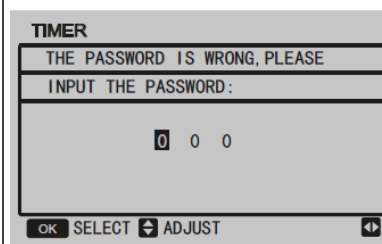
Select TIMER using ◀ ▶ and press OK.

Press ◀ ▶ to select the value of the password Press ▲ ▼ to enter the value of the password.

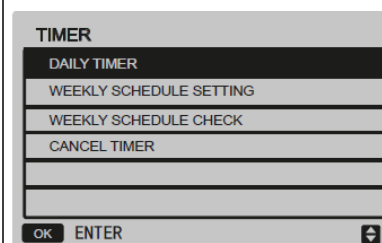
The password is **123** and cannot be modified.



If the password is incorrect, the display will appear as follows:



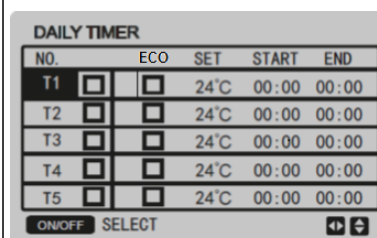
After entering the correct password, the display will appear as follows:



Daily timer

Select DAILY TIMER using ▲ ▼ and press OK .

If the Start time of the time band is earlier than the current time set and displayed on the HMI, the action requested in that band will be performed in the next cycle (the next day).



Press ▲ ▼ to choose timer T1 - T5.

Press ON/OFF to enable/disable the selected timer.

Press ▲ ▼ to select each option to be set

Press ▲ ▼ to adjust the temperature and start/end time parameters.

Press OK to confirm the setting and return to the previous page, or press BACK to delete the setting and return to the previous page .

DAILY TIMER

NO.	ECO	SET	START	END
T1	<input type="checkbox"/>	<input type="checkbox"/> 24°C	00:00	00:00
T2	<input type="checkbox"/>	<input type="checkbox"/> 24°C	00:00	00:00
T3	<input type="checkbox"/>	<input type="checkbox"/> 24°C	00:00	00:00
T4	<input type="checkbox"/>	<input type="checkbox"/> 24°C	00:00	00:00
T5	<input type="checkbox"/>	<input type="checkbox"/> 24°C	00:00	00:00

ON/OFF SELECT

Weekly timer

Select DAILY TIMER using ▲ ▼ and press OK

TIMER

DAILY TIMER

WEEKLY SCHEDULE SETTING

WEEKLY SCHEDULE CHECK

CANCEL TIMER

OK ENTER

Press ◀ ▶ ▲ ▼ to select the days.

Press ON/OFF to confirm/delete the selected days

After the selection, press OK to view the next page

WEEKLY SCHEDULE SET

CHOOSE THE SETTING DAYS

MON ☐ TUE ☐ WED ☐ THU ☐

FRI ☐ SAT ☐ SUN ☐

ON/OFF CHOOSE

Press ▲ ▼ to choose timer T1 - T5.

Press ON/OFF to enable/disable the selected timer.

Press ON/OFF to enable/disable ECO function

Press ▲ ▼ to select each option to be set

Press ▲ ▼ to adjust the temperature and start/end time parameters.

Press OK to confirm the setting and return to the previous page,

or press BACK to delete the setting and return to the previous page.

WEEKLY SCHEDULE SET

NO.	ECO	SET	START	END
T1	<input type="checkbox"/>	<input type="checkbox"/> 24°C	00:00	00:00
T2	<input type="checkbox"/>	<input type="checkbox"/> 24°C	00:00	00:00
T3	<input type="checkbox"/>	<input type="checkbox"/> 24°C	00:00	00:00
T4	<input type="checkbox"/>	<input type="checkbox"/> 24°C	00:00	00:00
T5	<input type="checkbox"/>	<input type="checkbox"/> 24°C	00:00	00:00

ON/OFF SELECT

Verification of the weekly schedule

Select WEEKLY SCHEDULE CHECK in the TIMER menu

The WEEKLY CHECK allows for viewing, but not modifying, the weekly schedule.

Press ▲ ▼ to shift from one day of the week to another.

WEEKLY SCHEDULE

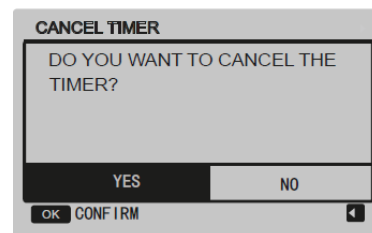
DAY	NO.	ECO TEMP.	START	END
MON	T1	<input type="checkbox"/> 24°C	00:00	00:00
	T2	<input type="checkbox"/> 24°C	00:00	00:00
	T3	<input type="checkbox"/> 24°C	00:00	00:00
	T3	<input type="checkbox"/> 24°C	00:00	00:00
	T3	<input type="checkbox"/> 24°C	00:00	00:00

Verification of the weekly schedule

Select CANCEL TIMER in the TIMER menu

Press ◀ ▶ to select YES.

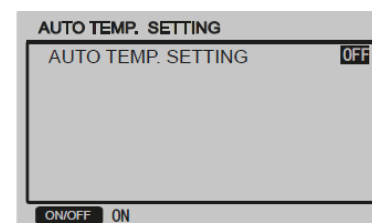
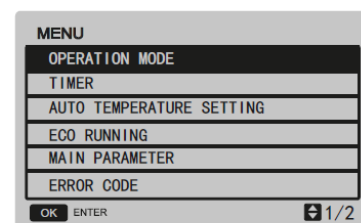
Press OK to cancel all the settings of the daily and weekly timers.



AUTOMATIC TEMPERATURE

Press ON/OFF to enable/disable the function.

Press OK to confirm or BACK to cancel the operation and return to the previous page .

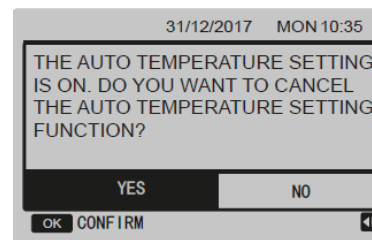


When AUTO TEMP. SETTING = ON, manual adjustment of the temperature is disabled.

Shown to the side is the page that appears when the user attempts to modify the temperature manually.

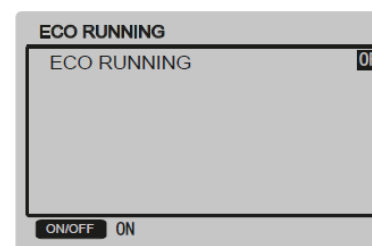
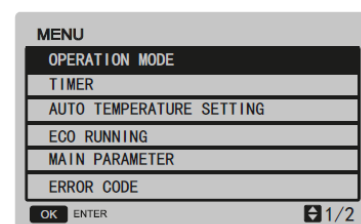
Press ◀ ▶ to select YES.

Press OK to disable the AUTO TEMP. function and return to the previous page



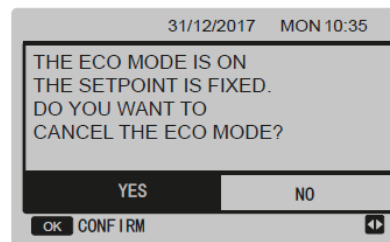
ECO RUNNING

When ECO RUNNING is set to ON, the unit operates in the energy saving mode..



When ECO RUNNING is set to ON, the set point cannot be modified from the HOME page; if the user attempts to modify it, the following page appears:

If YES is selected, the ECO RUNNING function is disabled; if NO is selected, ECO RUNNING is still active .



MAIN PARAMETERS

Press ▲ ▼ to select the parameter.

Press ◀ ▶ to set the value.

Press OK to confirm the value or press BACK to cancel it and return to the previous page.

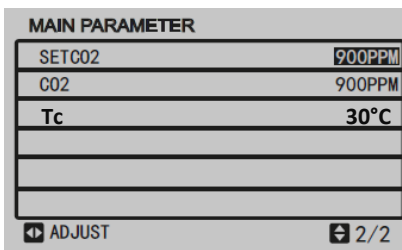
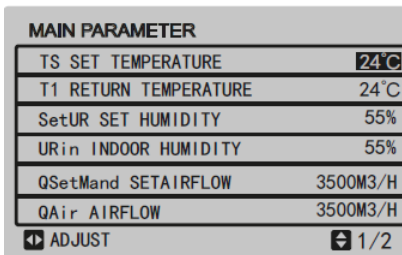
If EnURCool = 0 and EnURHeat = 0 are set on the controller, SetUR is disabled; SetUR and URin are displayed as "--".

If EnDiffMand = 0 is set on the controller, QSetMand is disabled; QSetMand and QAir are displayed as "--".

If EnProbe = 0 is set on the controller, SetCO2 is disabled; SetCO2 and VOC are displayed as "--".

If the sensor does not work, the current value is displayed as "--".

Tc = Unit supply temperature



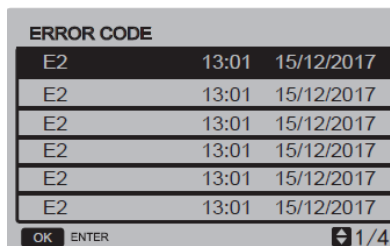
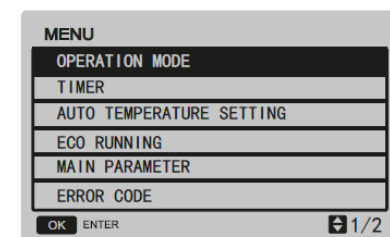
ALARM LOG

Press ▲ ▼ to select ERROR CODE.

The time of the error code is that at which the corresponding protection device intervenes or the error occurs.

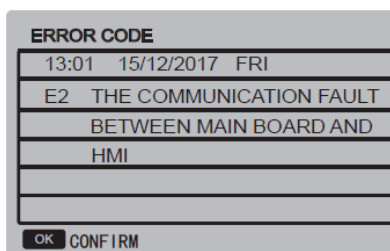
Press ▲ ▼ to skip to the log pages.

Up to maximum 24 errors can be displayed (when 25 faults occur or protection devices intervene, the error that occurs first will be cancelled)



Select an error code and press OK to access the page with the details.

If an error occurs, the same page appears



Code	Description
E0	Main board EPROM fault
E1	Main board phase error
E2	Communication error between the main board and the keypad/controller
E3	T2 probe fault
E4	Tw probe fault
E5	T3 probe fault
E6	T1 probe fault
E7	T4 probe fault
E8	Power phase protection fault
E9	Compressor type error
Eb	T2B probe fault
Ed	Tp probe fault
EP	Fire alarm
EU	Room fan alarm
H0	IPM module communication error
H1	Low-voltage protection
H4	10 interventions of the protection module in 120 minutes
H9	Outdoor fan fault
HE	EXV disconnection alarm
F8	Expulsion fan
F9	TF probe fault
C0	Heating elements high temperature alarm
C1	Humidifier alarm
C3	Filter alarm
C4	Electric filter alarm
C6	URin probe fault
C7	URout probe fault
C8	Pf1 probe fault
C9	Pf2 probe fault
CA	CO2 probe fault
P0	High discharge temperature or high-pressure protection
P1	Low pressure
P4	High current
P6	L0-L9 module fault
P7	T3 high-temperature protection in cool mode
P9	DC fan outdoor DC protection
Pb	Water coil anti-frost protection
PL	TF high-temperature alarm

KEYPAD SETTINGS

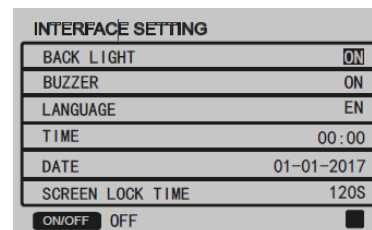
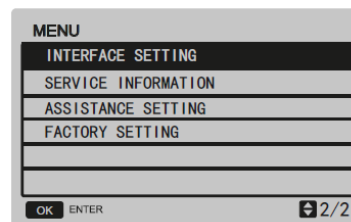
Select INTERFACE SETTING

To shift the cursor, press ▲ ▼;

select ON or OFF

To adjust the value, press ◀ ▶.

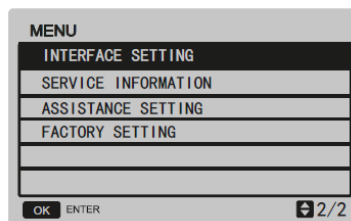
To select the language, press ▲ ▼.



SERVICE INFORMATION

Select SERVICE INFORMATION

To shift the cursor, press ▲ ▼



SERVICE INFORMATION	
OPERATION MODE	OFF
COMPRESSOR 1.1 CURRENT	0A
COMPRESSOR 1.1 FREQUENCY	0HZ
COMPRESSOR 2.1 CURRENT	0A
COMPRESSOR 2.1 FREQUENCY	0HZ
COMP. RUN TIME	0HOUR
1/6	

SERVICE INFORMATION	
COMP. START TIMES	0
EXV OPENNING	0P
OUTDOOR FAN SPEED	0r/min
INDOOR FAN OUTPUT	0%
INDOOR AIR FLOW	0M3/H
EXHAUST FAN OUTPUT	0%
2/6	

SERVICE INFORMATION	
DAMPER OUTPUT	0%
AUX. HEATER	OFF
AUX. HERTER OUTPUT	0%
HUMIDIFYER OUTPUT	0%
T1 INDOOR TEMP.	0°C
T2 INDOOR COIL TEMP	0°C
3/6	

SERVICE INFORMATION	
T3 OUTDOOR COIL TEMP.	0°C
T4 OUTDOOR TEMP.	0°C
T2B INDOOR COIL_0 TEMP	0°C
TP1 TEMP.	0°C
TP2 TEMP.	0°C
TF1 TEMP.	0°C
4/6	

SERVICE INFORMATION	
TF2 TEMP.	0°C
TW WATER COIL TEMP.	0°C
Pf1 INDOOR FAN PRE.	0Pa
Pf2 RETURN AIR PRE.	0Pa
URin IN_HUMID.	0%
URout OUT_HUMID.	0%
5/6	

SERVICE INFORMATION		
HMI SOFTWARE	01-12-17	V19
MAIN SOFTWARE	25-10-17	V09
6/6		

MODBUS

Summary

The communication protocol is between the wired controller and the unit, adopt Modbus RTU, wired controller is Master, Unit is Slave.

Enabling

Menu > Assistance setting > password > operation parameter :

05 EnOnOff = 2

06 EnMode = 2

Communication spec:RS-485:

Protocol :ModbusRTU: 9600,8,N,1

Baud rate : 9600bps

Data bits:8 Data bits

Parity bit: None Parity

Stop bit: 1 stop bit

Modbus Communication specs CANNOT be changed

Function code

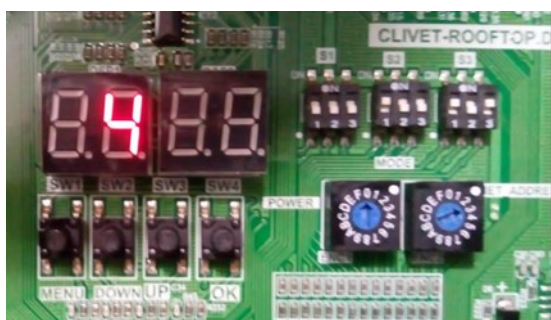
Unit address is setted by the encoder called "NET ADRESS".

The unit address is corresponding with Encoder setting+1 (eg, if it is setted to 0, the corresponding unit address is 1).

The unit address is shown in the main board in the display called "DSP1".

The default encoder setting is 0. The default address is 1

It should power on the unit after set the dipswitch



Function Code	
03	Read Holding Registers
06	Write Single Register
16	Write Multiple Registers

Error code		
Exception Code)		
01	Illegal function code	Unsupported function code.
02	illegal data address	The address that is sent when query or set, undefined in the online controller.
03	illegal data value	The parameters set are illegal, beyond the reasonable range or not the valid parameter for current state of the wired controller.

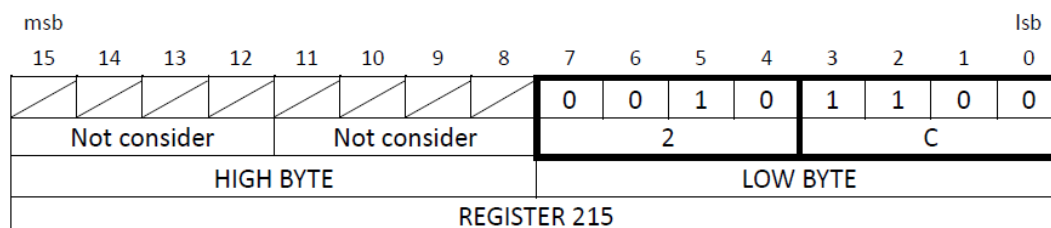
Customer's BMS registers		
Register number	Register content	Note
0	Mode setting	8=OFF; 1=Cooling mode; 2=Heating mode
1	Temperature setpoint	16°C -- 28°C
2	R.H.% setpoint	0% -- 100%
3	Constant airflow setpoint	set [m3/h]
4	Enable Auto Temperature	0=OFF; 1=ON
5	Enable ECO Mode	0=OFF; 1=ON
6	Air quality setpoint	set [ppm]
7	FollowMe function setpoint	Actual temperature (-25.0~70.0), unit 0.1 degree Celsius

Status		
Register number	Register content	Note
200	Host address	-
201	PCB switches setting	-
202	Encoder setting	7 = size 7.1; 11 = size 10.1; 18 = size 14.2
203	Operation mode	8=OFF; 0=Stanby; 1=Cooling mode; 2=Heating mode
204	HMI visualization	1 = ON
		0 = OFF
		BIT0 = Unit running
		BIT1 = Compressor 1 running
		BIT2 = Compressor 2 running
		BIT3 = Electric air heater
		BIT4 = Gas Burner or Water coil
		BIT5 = Defrost Logo
		BIT6 = Indoor fan state
		BIT7 = Humidifier state
		BIT8 = ECO running
		BIT9 = Fault state
205	Current compressor	Current [A] Compressor A
206	Current compressor	Current [A] Compressor B
207	Frequency compressor	Frequency [Hz] Compressor A
208	Frequency compressor	Frequency [Hz] Compressor B
209	EXV step	step
210	Outdoor fan speed	RPM
211	Supply fan output	%
212	Airflow	2000~2000 m ³ /h
213	Exhaust fan output	%
214	Damper output	%
215	Fault code	See below
216	Ai setpoint	0 ~ 65535 m ³ /h
217	T1- Return air temperature	-25 °C ~ 70 °C
218	Tc - Unit supply temperature	-25 °C ~ 70 °C
219	T2 - Internal half coil temperature	-25 °C ~ 70 °C
220	T3 - Outlet temperature of external	-25 °C ~ 70 °C
221	T4 - Outdoor temperature	-25 °C ~ 70 °C
222	TP1 - Discharge temperature C1	-25 °C ~ 70 °C

Status		
Register number	Register content	Note
223	TP2 - Discharge temperature C2 (Only size 14.2)	-25 °C ~ 70 °C
224	TF1 - Inverter module 1 temperature	0 °C ~ 140 °C
225	TF2 - Inverter module 2 temperature (Only size 14.2)	0 °C ~ 140 °C
226	T2B - Internal battery piping temperature (inlet if heating mode, outlet if cooling mode)	-25 °C ~ 70 °C
227	Tw - Hot water coil temperature	-25 °C ~ 70 °C
228	Pfin - Supply fan differential pressure	0 Pa ~ 2000 Pa
229	Pfout - Differential pressure area external air – return air	0 Pa ~ 2000 Pa
230	URin - Indoor humidity (return air side of the unit)	0% ~ 100%
231	URout - Outdoor humidity	0% ~ 100%
232	CO2 concentration	0 ppm ~ 2000 ppm
233	Exhaust fan output	%
234	Auxiliary heating source output	%
235	Humidifier output	%
236	Factory test mode output	step

In BMS reading, register 215 displays one of the following "Fault codes" in hexadecimal format (hex), considering only the LOW BYTE.

Consider only the last two alphanumeric digits of the code.



Fault code	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF	AH	AL	AP	AU
LOW BYTE [Hex]	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	10	11	12	13	14
Fault code	B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF	BH	BL	BP	BU
LOW BYTE [Hex]	15	16	17	18	19	1A	1B	1C	1D	1E	1F	20	21	22	23	24	25	26	27	28
Fault code	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF	CH	CL	CP	CU
LOW BYTE [Hex]	29	2A	2B	2C	2D	2E	2F	30	31	32	33	34	35	36	37	38	39	3A	3B	3C
Fault code	E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF	EH	EL	EP	EU
LOW BYTE [Hex]	3D	3E	3F	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F	50
Fault code	F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF	FH	FL	FP	FU
LOW BYTE [Hex]	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F	60	61	62	63	64
Fault code	H0	H1	H2	H3	H4	H5	H6	H7	H8	H9	HA	HB	HC	HD	HE	HF	HH	HL	HP	HU
LOW BYTE [Hex]	65	66	67	68	69	6A	6B	6C	6D	6E	6F	70	71	72	73	74	75	76	77	78
Fault code	L0	L1	L2	L3	L4	L5	L6	L7	L8	L9	LA	LB	LC	LD	LE	LF	LH	LL	LP	LU
LOW BYTE [Hex]	79	7A	7B	7C	7D	7E	7F	80	81	82	83	84	85	86	87	88	89	8A	8B	8C
Fault code	J0	J1	J2	J3	J4	J5	J6	J7	J8	J9	JA	JB	JC	JD	JE	JF	JH	JL	JP	JU
LOW BYTE [Hex]	8D	8E	8F	90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F	A0
Fault code	N0	N1	N2	N3	N4	N5	N6	N7	N8	N9	NA	NB	NC	ND	NE	NF	NH	NL	NP	NU
LOW BYTE [Hex]	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF	B0	B1	B2	B3	B4
Fault code	P0	P1	P2	P3	P4	P5	P6	P7	P8	P9	PA	PB	PC	PD	PE	PF	PH	PL	PP	PU
LOW BYTE [Hex]	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF	C0	C1	C2	C3	C4	C5	C6	C7	C8
Fault code	R0	R1	R2	R3	R4	R5	R6	R7	R8	R9	RA	RB	RC	RD	RE	RF	RH	RL	RP	RU
LOW BYTE [Hex]	C9	CA	CB	CC	CD	CE	CF	D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC
Fault code	T0	T1	T2	T3	T4	T5	T6	T7	T8	T9	TA	TB	TC	TD	TE	TF	TH	TL	TP	TU
LOW BYTE [Hex]	DD	DE	DF	E0	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF	F0
Fault code	U0	U1	U2	U3	U4	U5	U6	U7	U8	U9	UA	UB	UC	UD	UE	UF	UH	UL	UP	UU
LOW BYTE [Hex]	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF					

MAINTENANCE

Safety

Operate in compliance with safety regulations in force.

Use single protection devices: gloves, glasses etc.

Generality

Maintenance must be carried out authorised after-sales assistance centres or by specialised personnel.

Maintenance allows:

- maintaining the unit efficient
- reduce deterioration speed to which each equipment is subject in time
- collect information and data to understand the efficiency state of the unit and prevent possible faults

WARNING

- ⇒ *Before checking, please verify the following:*
- ⇒ *the electrical power supply line should be isolated at the beginning*
- ⇒ *the line isolator device is open, locked and equipped with the suitable warning sign*
- ⇒ *make sure no tension is present*
- ⇒ *After switching the power off, wait at least 5 minutes before accessing to the electrical panel or any other electrical component.*
- ⇒ *Before accessing check with a multimeter that there are no residual stresses.*

Frequency of interventions

Perform an inspection every 6 months.

However, frequency depends on the type of use.

Plan inspections at close intervals in the event of:

- frequent use (continuous or very intermittent use, near the operating limits, etc)
- critical use (service necessary)

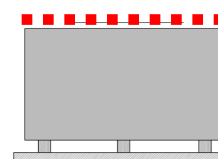
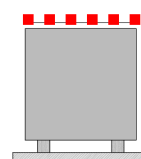
Unit booklet

It's advisable to create a unit booklet to take notes of the unit interventions.

In this way it will be easier to adequately note the various interventions and aid any troubleshooting.

Report on the booklet:

- date
- intervention description
- carried out measures etc.



Recommended periodical checks sheet

	intervention frequency (months)	1	6	12
1	presence corrosion			X
2	panel fixing			X
3	fans fixing		X	
4	coil cleaning		X	
5	bowl cleaning + sanitisation		X	
6	outflow test		X	
7	air filters cleaning/inspection	X		
8	air flow rate measurement			X
9	channelling: anti-vibration devices and fastenings check			X
10	power supply cable isolation and fastening check			X
11	earth cable check			X
12	electric control board cleaning			X
13	power remote controls state			X
14	clamps closure, cables isolation integrity			X
15	phases unbalancing and power supply voltage (vacuum and loaded)		X	
16	absorption of the individual electric loads		X	
17	compressors carter heaters test		X	
18	leaks control *			*
19	cooling circuit work parameters detection		X	
20	Safety valve *			*
21	protective equipment test: safety valves, pressure switches, thermostats, flow meters, etc.		X	
22	protective equipment test: setpoint, climatic compensations, power slicing, air flow rate variations		X	
23	control devices test: alarms signal, thermometers, probes, pressure gauges, etc.		X	
24	electrical heaters check - option			X
25	water coil check - option			X

NOTE

⇒ **Refer to the local regulations. Companies and technicians performing installation, maintenance/repair, leak control and recovery operations must be CERTIFIED as set out by the local regulations.*

Structure

Check the state of the parts constituting the structure.

Treat those parts of the unit subject to oxidation, with paints act at eliminating or reducing the oxidation phenomena.

Check fastening of the unit external panelling.

Bad fastening give rise to anomalous noises and vibrations.

Outdoor air coil

Accidental contact with the exchanger flaps can cause injuries from cut: use protective gloves.

The coil must allow maximum thermal exchange, therefore, the surface must be clear from dirt and scaling.

Clean the air inlet side.

Use a soft brush or aspirator or pressurised air jet or high-pressure water jet machine.

Keep the direction parallel to the flow of the flaps to avoid damages.

Check the aluminium flaps have not been damaged or folded, on the contrary contact an authorised after-sales assistance centre to "comb" the coil for excellent air flow.

Keep the direction parallel to the flow of the flaps to avoid damages.

Indoor air coil

Accidental contact with the exchanger flaps can cause injuries from cut: use protective gloves.

The finned surfaces of the cooling coils and, in particular, the condense collection bowls constitute places where microorganisms and moulds greatly flourish. It is very important to foresee periodical cleaning with suitable detergents and, eventually, disinfect with sanitising products.

Condensation collection basin

Dirt or scale can give rise to clogging.

Also, microorganisms and mould can flourish in the bowl. It is very important to foresee periodical cleaning with suitable detergents and, eventually, disinfect with sanitising products.

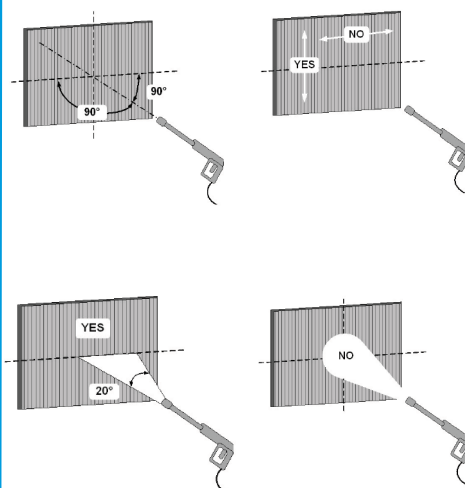
Once cleaning is completed, pour water inside the bowl to check the regular outflow.

Compressor crankcase heaters

Check :

- closing
- operation

The operation of the crankcase heaters is managed by the rooftop regulator according to the external air and discharge temperatures. Refer to an authorized technical assistance center.



G4 (ISO 16890 Coarse 60%) Folded air filters

It is very important for the air treatment coil to offer maximum thermal exchange: the unit must always work with clean and installed filters. Cleaning and replacement of filters are very important from an hygienic-sanitary point of view.

Operation with clogged filters leads to a reduction in the air flow rate with malfunctionings and block, up to possible breaks in the unit.

The frequency with which the filters must be checked depends on the quality of the outdoor air, the unit operation hours, the dustiness and crowding of rooms.

Frequency can indicatively vary from WEEKLY to MONTHLY. It is advised to start with frequent checks, subsequently adjusting frequency to degree of detected dirt.

- 1 Remove the closing panels
- 2 Delicately remove the filter avoiding dirtying the area below
- 3 Wash the filtering jacket in warm water with common detergent
- 4 Accurately rinse in running water avoiding spilling in the room
- 5 Dry the filter
- 6 Insert it back in its seat
- 7 Remount the closing panels

Old filters, washing wastewater and residues must be disposed of according to the current standards.

F7 (ISO 16890 ePM1 55%)/F9 (ISO 16890 ePM1 80%) filters

Option

The pocket filters are not renewable, once dirty they must be replaced

- 1 aprire il open the access panel
- 2 delicately remove the filter avoiding dirtying the area below
- 3 insert the new filters, with the pockets vertically
- 4 close the panel
- 5 dispose of the old filters sending them to specialised recycling or collection centres (keep to the standards in force)

Electric heaters

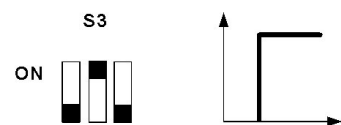
Option

Check:

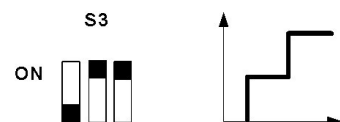
- cleaning state
- fastening
- presence of corrosion

Electric heaters

1 step electric heater



2 step electric heater



Main board: DIP SWITCH



FES (ISO 16890 ePM1 90%) Electronic filters

Option

The electronic adjustment is integrated in the filter; maintenance can be carried out without removing it.

Materials necessary for maintenance

- 1 Acid detergent B01212 (code CLIVET C6460316);
- 2 Plastic or steel tank (750x750x310 mm) with settling bottom
- 3 Protective gloves and goggles;
- 4 Graduated jug;
- 5 Pump for manual or pneumatic spraying.

Do not use aluminum tanks or galvanized.

Maximum water temperature for washing the filters: 45 ° C

Maximum air temperature for drying the filters: 60 ° C

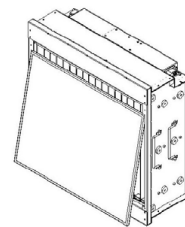
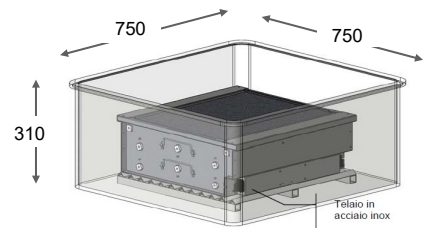
Foresee a stainless steel frame that keeps the filters lifted from the tank base to have a settling bottom for the muds.

Remove the pre-filter by lifting it of about 1 cm and remove it as shown in figure.

- 1 Position the filter to be washed on a support to facilitate work.
- 2 Prepare a tank with a solution of B01212 detergent and water at 1÷20.
- 3 Immerse the filter in this solution
- 4 Ensure the solution covers the entire filter
- 5 Immerse it for about 5-7 minutes. A slight chemical reaction is noticed within 2÷3 minutes with the development of foam indicating the occurred elimination of residues.
- 6 Rinse the filter with a jet of water or using a low-pressure water jet machine.
A poor rinse may not completely remove the detergent, which over time can attack both the filter cell and the surfaces on which it is placed.
- 7 Leave the electrostatic cells to dry in a hot room or directly in the sun for a few hours.
Keep the cells lifted from the ground using two metal or wooden laths.
It is recommended to dry the filter cell in an open or dry place. Closed and / or humid places can prevent the filter from completely drying
The entire cell must dry completely before restoring the electrical connections on the machine.
Make sure the filter cell electrical connectors are completely dry before making the connections.
A connector that is still wet / damp can cause irreversible damage to the entire filter cell.
- 8 Check the ionisation wires before remounting the filter.

The cleaner can be used to clean about 20 filters.

Can be recovered and placed in plastic containers closed; the air oxidizes the cleaner and reduces its effectiveness



Ionisation wires

The impurities can determine oxidation or scaling on the wires, which can be removed using a cloth soaked in alcohol or an abrasive scourer with very fine grain.

Due to the high voltage powering them, the ionisation wires are subject to wear.

To foresee a yearly replacement OF ALL WIRES avoids unexpected breaks.

In case of break:

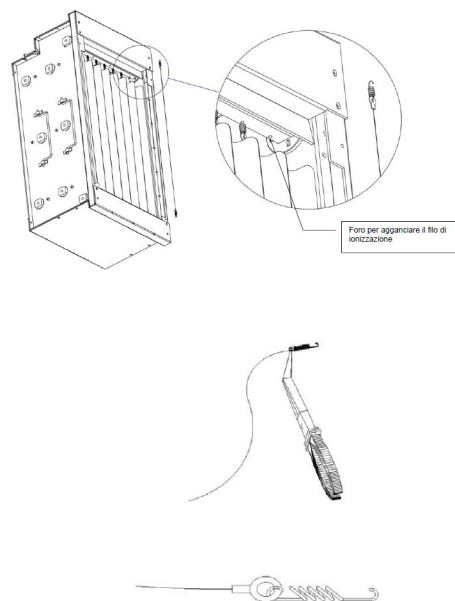
- 1 remove all wire pieces present in the cell and remove the springs stretching the wire;
- 2 hook the spring to the wire eyelet;
- 3 grip the ionisation wire with curved beaks pliers;
- 4 hook the top of the spring with the open eyelet to the wire stretcher rod of the electrostatic cell;
- 5 keeping the ionisation wire stretched, with the other hand hook it to the other wire stretching rod, always by means of the curved beaks pliers.
- 6 replace all other wires, even those apparently intact, as they are potentially in an advanced state of wear

Immerged electrodes humidifier

Option

Do not use solvents or detergents to clean the plastic components.

For descaling use a vinegar or acetic acid solution at 20%, subsequently rinsing with water



Periodical checks

15 days	Cylinder: not over 300 hours of work checking operation, general state, no leaks
90 days	Cylinder: not over 1000 hours of work checking operation, general state, no leaks, any replacement
1 year	Cylinder: not over 2500 hours of work (disposable cylinders) Load solenoid valve replacement: disconnect electric power supply, dismantle valve, clean the drain solenoid valve filter: disconnect electric power supply, remove reel and dismantle valve body and any impurity and rinse the power supply bowl, piping: check they are free and without impurities
5 years	Cylinder: not over 10000 hours of work (inspectional cylinders) replacement

Humidifier cylinder drainage

Cylinder must be drained in these situations:

- cleaning of the cylinder
- emptying of the cylinder to avoid ice forming
- replacement of the cylinder

The manual drainage is carried out by means of selector SA7: see ELECTRIC CONNECTIONS chapter.

Replacement of the cylinder

To remove the cylinder:

- completely drain the water
- interrupt power supply voltage of humidifier by means of the unit isolator
- remove the vapour pipe from the cylinder
- disconnect the electric connections of the electrodes and remove the pins from the high level electrodes
- loosen the ring nut to remove the pipe unions and the filter (when filter is outside the cylinder)
- lift the cylinder to remove it

Before mounting it:

- the filter body does not require replacing, wash it with water and remount it on the new cylinder, using the new gasket provided with the latter
- check the seal gasket between the cylinder and the drain unit
- remount the cylinder repeating the operations in reverse order

UV-C lamps

Option

Caution

⇒ *Direct radiation device: causes eye irritation and skin rashes.*

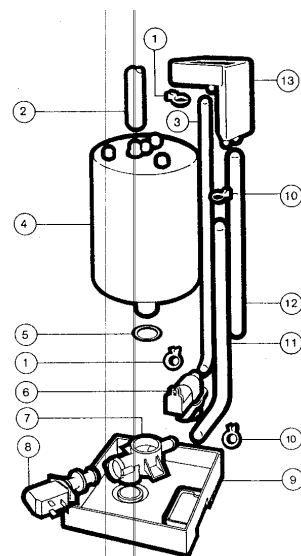
⇒ *Any maintenance operation must be carried out with the lamps off...*

⇒ *Do not touch the glass part with hands.*

The UV-C lamps are on when the supply fans are running..

Clean with cloth and alcohol to remove dust.

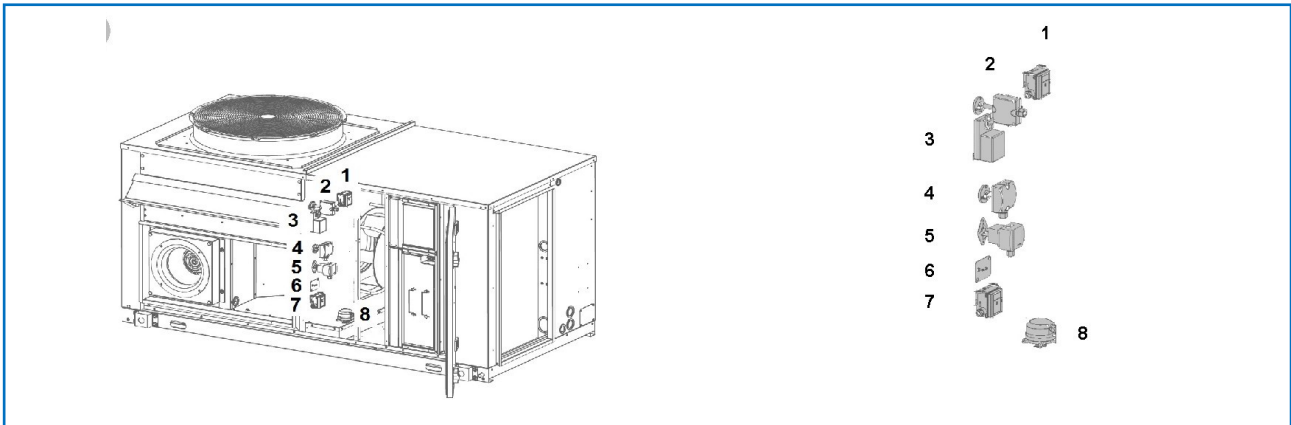
Replace the lamp after 9,000 hours of operation.



- 1 pipe fixing spring
- 2 vapour pipe
- 3 load pipe
- 4 vapour cylinder
- 5 seal O-rings
- 6 load valve
- 7 valves support
- 8 drain valve
- 9 bottom tank
- 10 pipe fixing spring
- 11 load pipe
- 12 too full pipe
- 13 fill tank



Access to the components - Probes and trasducers

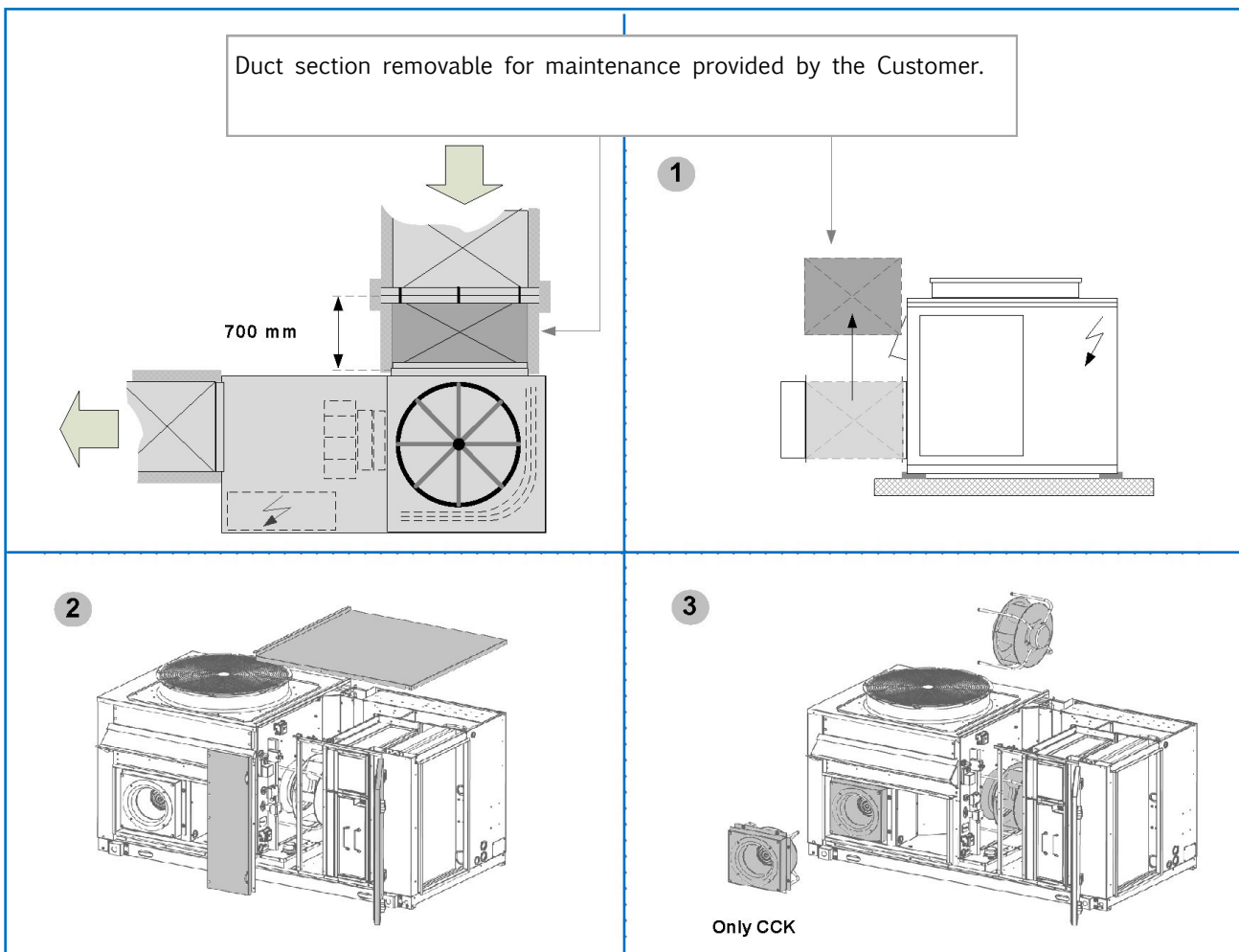


1. Outdoor / return air pressure transducers
2. Outdoor air humidity probe
3. Outdoor air shutter actuator
4. Return humidity probe
5. Return air quality probe

6. Return temperature probe
7. Delivery pressure transducer
8. Filter differential pressure switch

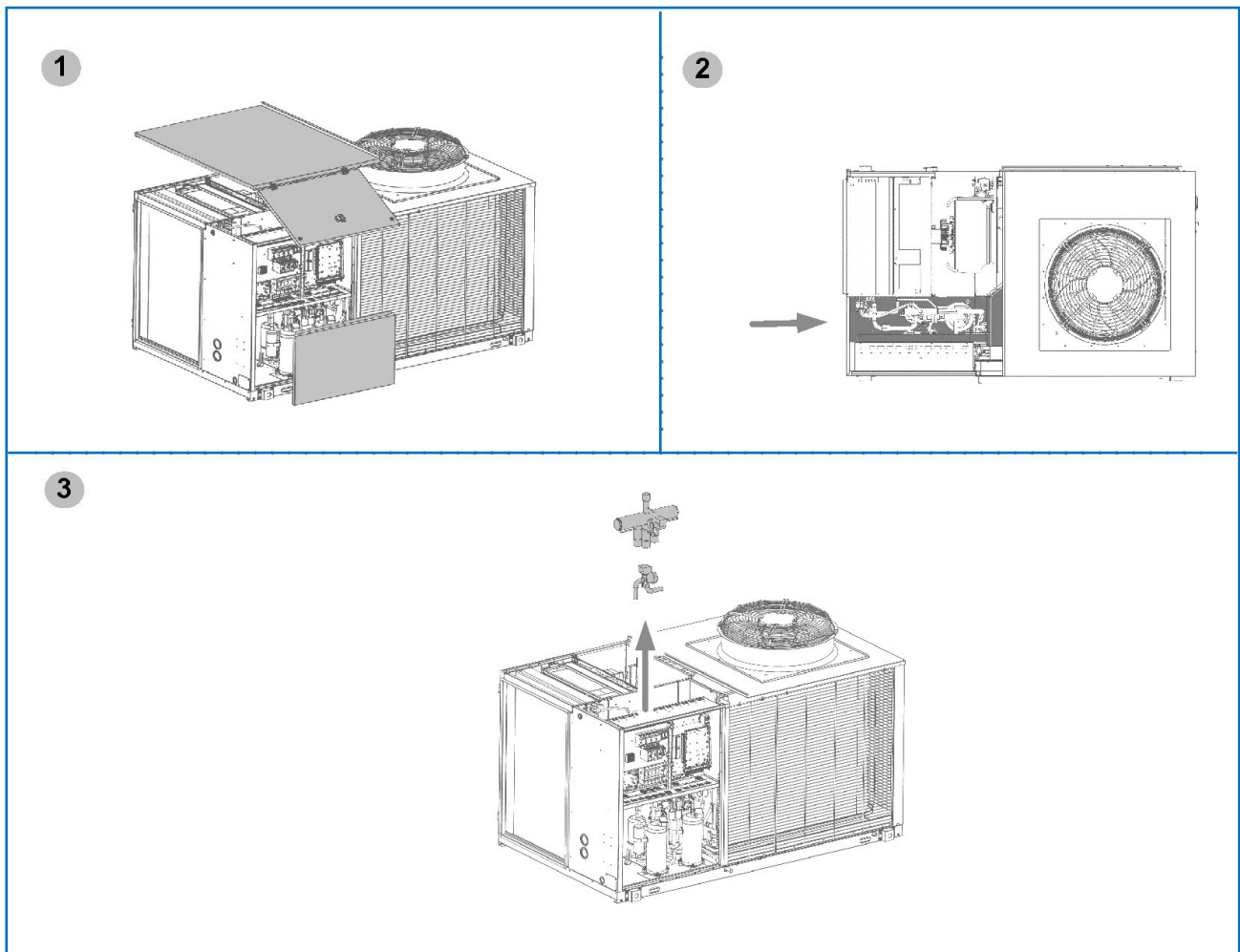
Some components are optional and may not be present on the machine

Access to the components - Fans



Access to the components - Valves

Only size 14.2



Standby mode

If a long period of inactivity is foreseen:

- turn off the power
- avoid the risk of frost (empty the system or add glycol)

Turn off the power to avoid electrical risks or damages by lightning strikes

With lower temperatures keep heaters turned on in of the electrical panel (option).

It's recommended that the re-start after the stopping period is performed by a qualified technician, especially after seasonal stops or seasonal switching.

When restarting, refer to what is indicated in the "start-up" section.

Schedule technical assistance in advance to avoid hitches and to guarantee that the system can be used when required.

Disconnection

WARNING

⇒ Before performing any operation, read the warnings found in the Maintenance chapter.

Avoid leak or spills into the environment.

Before disconnecting the unit, the following must be recovered, if present:

- refrigerant gas
- Anti-freeze solutions in the hydraulic circuit

Awaiting decommissioning and disposal, the unit can also be stored outdoors, as bad weather and rapid changes in temperature do not harm the environment provided that the electric, cooling and hydraulic circuits of the unit are intact and closed.

WEEE INFORMATION

The manufacturer is registered on the EEE National Register, in compliance with implementation of Directive 2012/19/EU and relevant national regulations on waste electrical and electronic equipment.

This Directive requires electrical and electronic equipment to be disposed of properly.

Equipment bearing the crossed-out wheelie bin mark must be disposed of separately at the end of its life cycle to prevent damage to human health and to the environment.

Electrical and electronic equipment must be disposed of together with all of its parts.

To dispose of "household" electrical and electronic equipment, the manufacturer recommends you contact an authorised dealer or an authorised ecological area.

"Professional" electrical and electronic equipment must be disposed of by authorised personnel through established waste disposal authorities around the country.

In this regard, here is the definition of household WEEE and professional WEEE:

WEEE from private households: WEEE originating from private households and WEEE which comes from commercial, industrial, institutional and other sources which, because of its nature and quantity, is similar to that from private households. Subject to the nature and quantity, where the waste from EEE was likely to have been by both a private household and users of other than private households, it will be classed as private household WEEE;

Professional WEEE: all WEEE which comes from users other than private households.

This equipment may contain:

refrigerant gas, the entire contents of which must be recovered in suitable containers by specialised personnel with the necessary qualifications;

- lubrication oil contained in compressors and in the cooling circuit to be collected;
- mixtures with antifreeze in the water circuit, the contents of which are to be collected;
- mechanical and electrical parts to be separated and disposed of as authorised.

When machine components to be replaced for maintenance purposes are removed or when the entire unit reaches the end of its life and needs to be removed from the installation, waste should be separated by its nature and disposed of by authorised personnel at existing collection centres.



General

In this section the most common situations are indicated, as these cannot be controlled by the manufacturer and could be a source of risk situations for people or things.

Danger zone

This is an area in which only an authorised operator may work.

The danger zone is the area inside the unit which is accessible only with the deliberate removal of protections or parts thereof.

Handling

The handling operations, if implemented without all of the protection necessary and without due caution, may cause the drop or the tipping of the unit with the consequent damage, even serious, to persons, things or the unit itself.

Handle the unit following the instructions provided in the present manual re-garding the packaging and in compliance with the local regulations in force.

Should the refrigerant leak please refer to the refrigerant "Safety sheet".

Installation

The incorrect installation of the unit could cause water leaks, condensate accumulation, leaking of the refrigerant, electric shock, poor operation or damage to the unit itself.

Check that the installation has been implemented by qualified technical personnel only and that the instructions contained in the present manual and the local regulations in force have been adhered to.

The installation of the unit in a place where even infrequent leaks of inflammable gas and the accumulation of this gas in the area surrounding the area occur could cause explosions or fires.

Carefully check the positioning of the unit.

The installation of the unit in a place unsuited to support its weight and/or guarantee adequate anchorage may result in consequent damage to things, people or the unit itself.

Carefully check the positioning and the anchoring of the unit.

Easy access to the unit by children, unauthorised persons or animals may be the source of accidents, some serious.

Install the unit in areas which are only accessible to authorised person and/or provide protection against intrusion into the danger zone.

General risks

Smell of burning, smoke or other signals of serious anomalies may indicate a situation which could cause damage to people, things or the unit itself.

Electrically isolate the unit (yellow-red isolator).

Contact the authorised service centre to identify and resolve the problem at the source of the anomaly.

Accidental contact with exchange batteries, compressors, air delivery tubes or other components may cause injuries and/or burns.

Always wear suitable clothing including protective gloves to work inside the danger zone.

Maintenance and repair operations carried out by non-qualified personnel may cause damage to persons, things or the unit itself.

Always contact the qualified assistance centre.

Failing to close the unit panels or failure to check the correct tightening of all of the panelling fixing screws may cause damage to persons, things or the unit itself.

Periodically check that all of the panels are correctly closed and fixed. If there is a fire the temperature of the refrigerant could reach values that increase the pressure to beyond the safety valve with the consequent possible projection of the refrigerant itself or explosion of the circuit parts that remain isolated by the closure of the tap.

Do not remain in the vicinity of the safety valve and never leave the refrigerating system taps closed.

Electric parts

An incomplete attachment line to the electric network or with incorrectly sized cables and/or unsuitable protective devices can cause electric shocks, intoxication, damage to the unit or fires.

Carry out all of the work on the electric system referring to the electric layout and the present manual ensuring the use of a system thereto dedicated.

An incorrect fixing of the electric components cover may lead to the entry of dust, water etc inside and may consequently electric shocks, damage to the unit or fires.

Always fix the unit cover properly.

When the metallic mass of the unit is under voltage and is not correctly connected to the earthing system it may be as source of electric shock and electrocution.

Always pay particular attention to the implementation of the earthing system connections.

Contact with parts under voltage accessible inside the unit after the removal of the guards can cause electric shocks, burns and electrocution.

Open and padlock the general isolator prior to removing the guards and signal work in progress with the appropriate sign.

Contact with parts that could be under voltage due to the start up of the unit may cause electric shocks, burns and electrocution.

When voltage is necessary for the circuit open the isolator on the attachment line of the unit itself, padlock it and display the appropriate warning sign.

Moving parts

Contact with the transmissions or with the fan aspiration can cause injuries.

Prior to entering the inside of the unit open the isolator situated on the connection line of the unit itself, padlock and display the appropriate warning sign.

Contact with the fans can cause injury.

Prior to removing the protective grill or the fans, open the isolator on the attachment line of the unit itself, padlock it and display the appropriate warning sign.

Refrigerant

The intervention of the safety valve and the consequent expulsion of the gas refrigerant may cause injuries and intoxication.

Always wear suitable clothing including protective gloves and eyeglasses for operations inside the danger zone.

Should the refrigerant leak please refer to the refrigerant "Safety sheet".

Contact between open flames or heat sources with the refrigerant or the heating of the gas circuit under pressure (e.g. during welding operations) may cause explosions or fires.

Do not place any heat source inside the danger zone.

The maintenance or repair interventions which include welding must be carried out with the system off.

Hydraulic parts

Defects in tubing, the attachments or the removal parts may cause a leak or water projection with the consequent damages to people, things or shortcircuit the unit.

General technical data

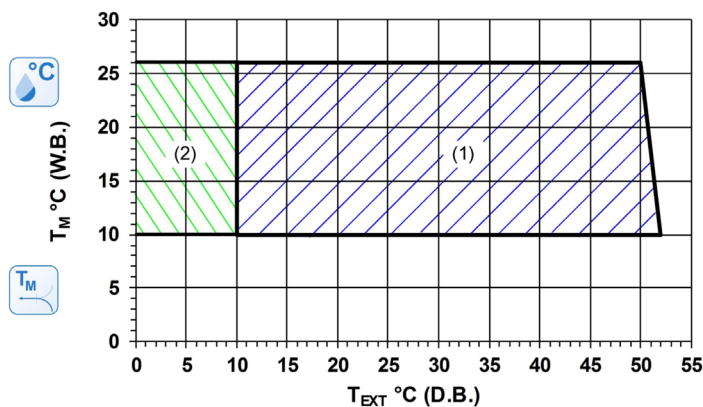
SIZE		7.1	10.1	14.2
Cooling				
Cooling capacity	1 kW	20,6	30,4	45,7
Sensible capacity	1 kW	16,5	24,6	35,9
Compressor power input	1 kW	5,27	8,28	11,5
EER	1	3,91	3,67	3,97
Cooling capacity (EN 14511:2018)	10 kW	19,0	28,4	42,1
EER (EN 14511:2018)	10	3,08	2,88	2,97
SEER	11	4,58	4,37	4,48
η_{sc}	11 %	180,2	171,9	176,2
Eurovent seasonal efficiency class		B	B	B
Heating				
Heating capacity	2 kW	20,9	29,8	43,8
Compressor power input	2 kW	5,08	7,24	9,89
COP	2	4,11	4,12	4,43
Heating capacity (EN 14511:2018)	12 kW	20,5	29,1	43,1
COP (EN 14511:2018)	12	3,26	3,25	3,28
SCOP	11	3,22	3,20	3,27
η_{sh}	11 %	125,8	125,0	127,8
Eurovent seasonal efficiency class		B	B	B
Compressor				
Type of compressors	3	Rot	Scroll	Rot
No. of compressors	Nr	1	1	2
Std Capacity control steps	Nr	20-100%	20-100%	20-100%
Refrigerant charge (C1)	4 kg	7,0	10,0	13,0
Refrigeration circuits	Nr	1	1	1
Air Handling Section Fans (Supply)				
Type of supply fan	5	RAD	RAD	RAD
Number of supply fans	Nr	1	1	1
Fan diameter	mm	450	500	560
Type of motor	6	EC Brushless	EC Brushless	EC Brushless
Supply airflow	l/s	1111	1667	2500
Supply airflow	m³/h	4000	6000	9000
Installed unit power	kW	1,0	2,6	2,9
Max. static pressure supply fan	7 Pa	380	680	510
Fans (Exhaust)				
Type of exhaust fan	5	RAD	RAD	RAD
Number of exhaust fans	8 Nr	1	1	1
Fan diameter	8 mm	355	355	450
Type of motor	6	EC Brushless	EC Brushless	EC Brushless
Installed unit power	8 kW	0,9	0,9	1,0
External Section Fans				
Type of fans	9	AX	AX	AX
Number of fans	Nr	1	1	1
Fan diameter	mm	750	750	780
Type of motor	6	EC Brushless	EC Brushless	EC Brushless
Standard airflow	l/s	2361	3500	5833
Installed unit power	kW	0,65	0,75	1,5
Connections				
Condensate drain	mm	20	20	20
Power supply				
Standard power supply	V	400/3~/50+N	400/3~/50+N	400/3~/50+N

The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 2016/2281, also known as Ecodesign Lot21. Contains fluorinated greenhouse gases (GWP 2087,5)

Performance data are referred to operation with 30% of fresh air intake and same amount of air exhaust. (configuration CCK)

- Ambient air at 27°C/19°C W.B.. external exchanger entering air temperature 35°C. EER referred only to compressors
- Ambient air 20°C D.B. Outdoor air 7°C D.B./6°C W.B.. COP referred only to compressors
- ROT = rotary compressor; SCROLL = scroll compressor
- Indicative values for standard units with possible +/-10% variation. The actual data are indicated on the label of the unit
- RAD = radial fan
- EC Electronic switching motor
- Net outside static pressure to win the outlet and intake onboard pressure drops
- Configuration for fresh air supply with exhaust and extraction
- AX = axial fan
- Capacity in total recirculation according to EN 14511-2018, indoor air temperature 27°C D.B./19°C W.B.; outdoor temperature 35°C. EER according to EN 14511-2018
- Data calculated in accordance with EN 14825: 2018
- Capacity in total recirculation according to EN 14511-2018, indoor air temperature 20°C; outdoor temperature 7°C D.B./6°C W.B.. COP according to EN 14511-2018

Operating range (Cooling)



The limits are meant as an indication and they have been calculated by considering:

- general and non specific sizes,
- standard airflow,
- non-critical positioning of the unit and correct operating and maintenance of the unit,
- operating at full load

To verify the operation field of the operating units with percentages of external air, always calculate the T_m mixing temperature at the internal heat exchanger input.

T_m = Internal exchanger entering air temperature
temperature measured with wet bulb (W.B.=WET BULB)

TEXT = Inlet air temperature in the external exchanger
dry bulb measured temperature (D.B.=DRY BULB)

Within the operating range, the unit can operate at a part load to maximize the energy efficiency

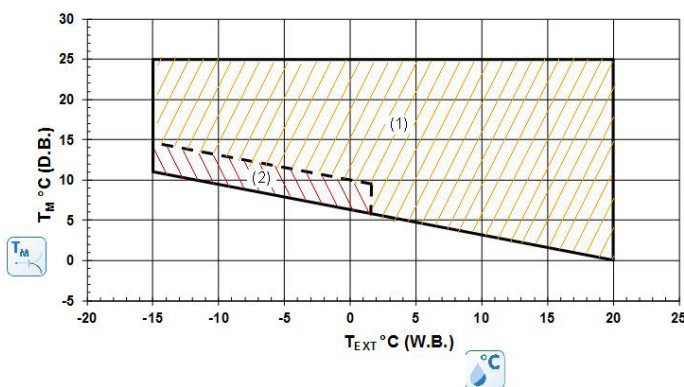
1. Standard operating range
2. Operation field of the unit in FRE-

WET BULB TEMPERATURE - EXAMPLE

25°C W.B. { 40°C D.B. / 30% R.H.
35°C D.B. / 45% R.H.
30°C D.B. / 67% R.H.



Operating range (Heating)



The limits are meant as an indication and they have been calculated by considering:

- general and non specific sizes,
- standard airflow,
- non-critical positioning of the unit and correct operating and maintenance of the unit,
- operating at full load

To verify the operation field of the operating units with percentages of external air, always calculate the T_m mixing temperature at the internal heat exchanger input.

T_m = Internal exchanger entering air temperature
temperature measured with dry bulb (D.B.=DRY BULB)

Text = entering internal exchanger air temperature,
temperature measured with wet bulb (W.B.=WET BULB)

Within the operating range, the unit can operate at a part load to maximize the energy efficiency

1. Standard operating range
2. Range in which the unit operation is allowed only for a limited period (max 1 hour)

In extended operating mode, in heat pump operation with an outdoor air temperature of less than 6°C, the unit performs defrosts by reversing the cycle, so as to eliminate the ice that forms on the surfaces of the outside exchanger; in addition, in the event of negative temperatures, the water resulting from the defrosts must be drained so as to avoid the accumulation of ice near the base of the unit. Make sure that this does not constitute a danger for people or things.

With an outdoor air temperature between -10°C and -20°C install the following options:

- Two-rows hot water coil
- Combustion module
- Electrical panel anti-freeze protection

Sound levels

Size	Sound power level (dB)								Sound power level	Sound pressure level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000		
7.1	69	73	76	77	77	75	70	74	82	65
10.1	77	75	77	79	79	77	71	75	84	66
14.2	73	78	79	82	81	79	74	78	86	68

The sound levels are referred to unit operating at full load in nominal conditions. The sound pressure level is referred at a distance of 1 m. from the ducted unit surface operating in free field conditions. External static pressure 50 Pa.

(standard UNI EN ISO 9614-2)

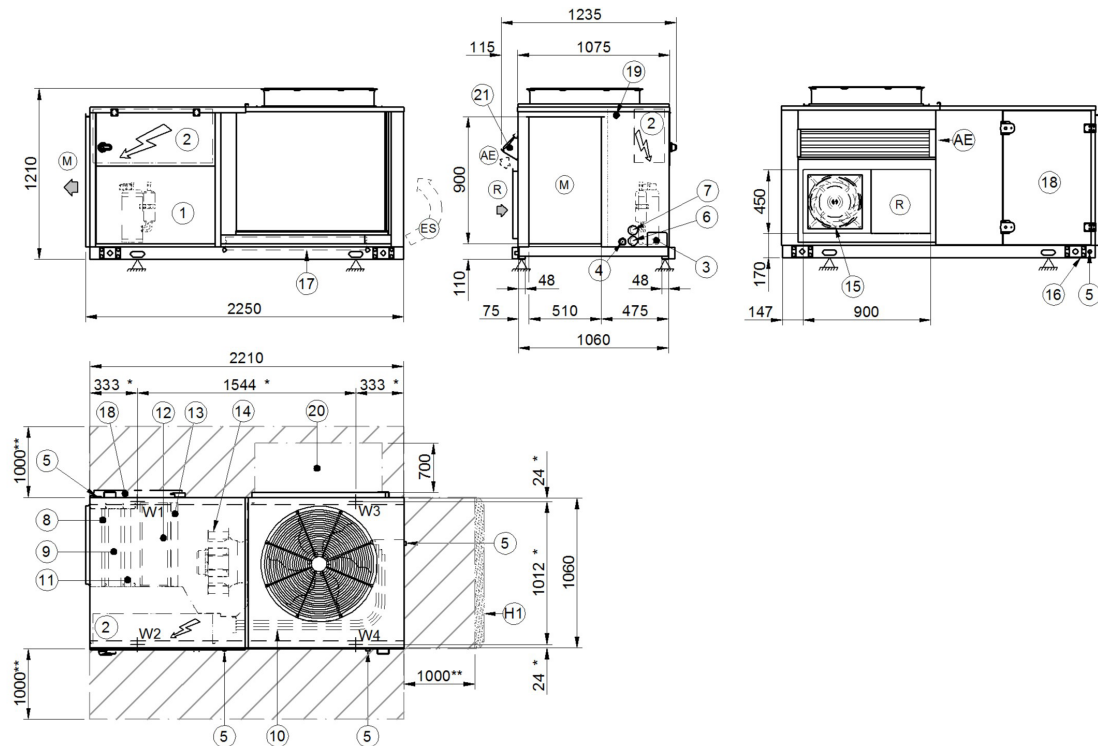
Measures are according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification, which provides for a tolerance of 2 dB(A) on the sound power level, which is the only acoustic data to be considered binding.

Please note that when the unit is installed in conditions different from nominal test conditions (e.g. near walls or obstacles in general), the sound levels may undergo substantial variations

Dimensional drawings

Size 7.1 - Version CAK/CBK/CCK

DAA6K0001_7.1_0_REV00
Data/Date 06/11/2017



1. Compressor compartment
 2. Electrical panel
 3. Power input
 4. Humidifier connections
 5. Condensate drain
 6. H₂O heating coil output Φ 3/4"
 7. H₂O heating coil input Φ 3/4"
 8. Re-heating coil (optional)
 9. Internal exchanger
 10. External exchanger
 11. H₂O heating coil (optional) or heating elements (optional)
 12. F7/F9 / electronic filters (optional)
 13. G4 air filters (standard)
 14. Electric fan (supply-return)
 15. Exhaust electric fan (version CCK only)
 16. Lifting brackets (removable)
 17. Over pressure damper exhaust (version CCK only)
 18. Access for inspection coil, filters, heating elements
 19. Access for inspection of the bleed valve (hot water coil)
 20. Duct section removable for maintenance provided by the customer
 21. Fresh air intake cap (only version CBK-CCK)
- (R) Air return
(M) Air supply
(AE) Fresh air intake
(ES) Air exhaust (only version CCK)
(H1) Wall with same height as unit on a maximum of three side
(**) Minimum suggested clearance
(*) Vibration mounts position

Weight distribution of full re-circulation (CAK) / Recirculation and renewal air (CBK) configuration

Size		7.1
W1 Supporting Point	kg	98
W2 Supporting Point	kg	122
W3 Supporting Point	kg	96
W4 Supporting Point	kg	100
Shipping weight	kg	452

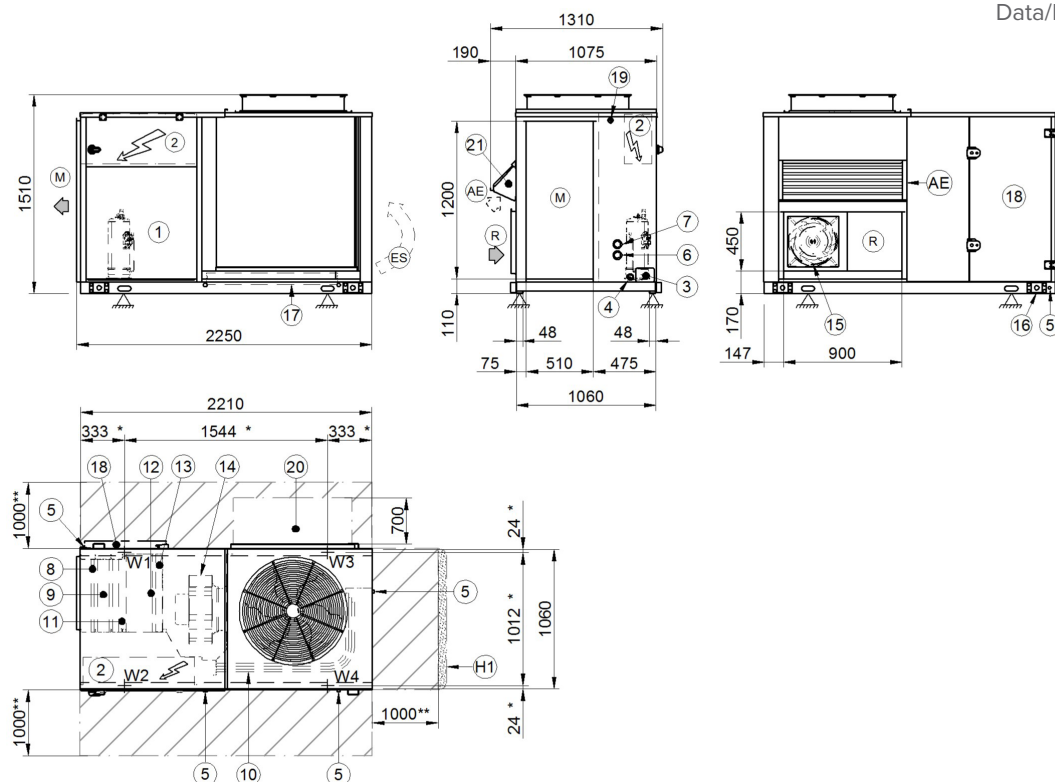
Weight distribution of full re-circulation, renewal air and exhaust (CCK) configuration

Size		7.1
W1 Supporting Point	kg	102
W2 Supporting Point	kg	126
W3 Supporting Point	kg	101
W4 Supporting Point	kg	105
Shipping weight	kg	470

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Size 10.1 - Version CAK/CBK/CCK

DAA6K0002_10.1_O_REV00
Data/Date 06/11/2017



1. Compressor compartment
 2. Electrical panel
 3. Power input
 4. Humidifier connections
 5. Condensate drain
 6. H₂O heating coil output Φ 1"
 7. H₂O heating coil input Φ 1"
 8. Re-heating coil (optional)
 9. Internal exchanger
 10. External exchanger
 11. H₂O heating coil (optional) or heating elements (optional)
 12. F7/F9 / electronic filters (optional)
 13. G4 air filters (standard)
 14. Electric fan (supply-return)
 15. Exhaust electric fan (version CCK only)
 16. Lifting brackets (removable)
 17. Over pressure damper exhaust (version CCK only)
 18. Access for inspection coil, filters, heating elements
 19. Access for inspection of the bleed valve (hot water coil)
 20. Duct section removable for maintenance provided by the customer
 21. Fresh air intake cap (only version CBK-CCK)
- (R) Air return
(M) Air supply
(AE) Fresh air intake
(ES) Air exhaust (only version CCK)
(H1) Wall with same height as unit on a maximum of three side
(**) Minimum suggested clearance
(*) Vibration mounts position

Weight distribution of full re-circulation (CAK) / Recirculation and renewal air (CBK) configuration

Size		10.1
W1 Supporting Point	kg	132
W2 Supporting Point	kg	107
W3 Supporting Point	kg	131
W4 Supporting Point	kg	126
Shipping weight	kg	532

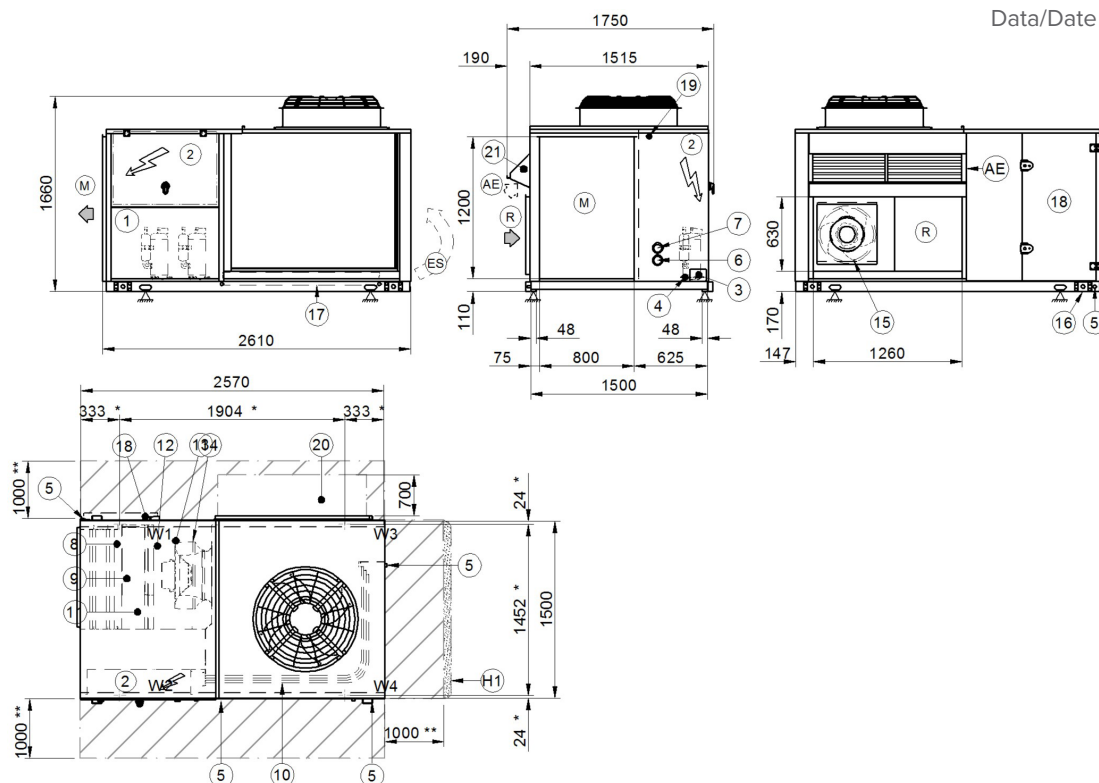
Weight distribution of full re-circulation, renewal air and exhaust (CCK) configuration

Size		10.1
W1 Supporting Point	kg	138
W2 Supporting Point	kg	113
W3 Supporting Point	kg	137
W4 Supporting Point	kg	132
Shipping weight	kg	556

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Size 14.2 - Version CAK/CBK/CCK

DAA6K0003_14.2_0_REV00
Data/Date 06/11/2017



- | | |
|---|---|
| 1. Compressor compartment | 15. Exhaust electric fan (version CCK only) |
| 2. Electrical panel | 16. Lifting brackets (removable) |
| 3. Power input | 17. Over pressure damper exhaust (version CCK only) |
| 4. Humidifier connections | 18. Access for inspection coil, filters, heating elements |
| 5. Condensate drain | 19. Access for inspection of the bleed valve (hot water coil) |
| 6. H ₂ O heating coil output Φ 1" 1/4 | 20. Duct section removable for maintenance provided by the customer |
| 7. H ₂ O heating coil input Φ 1" 1/4 | 21. Fresh air intake cap (only version CBK-CCK) |
| 8. Re-heating coil (optional) | |
| 9. Internal exchanger | (R) Air return |
| 10. External exchanger | (M) Air supply |
| 11. H ₂ O heating coil (optional) or heating elements (optional) | (AE) Fresh air intake |
| 12. F7/F9 / electronic filters (optional) | (ES) Air exhaust (only version CCK) |
| 13. G4 air filters (standard) | (H1) Wall with same height as unit on a maximum of three side |
| 14. Electric fan (supply-return) | (**) Minimum suggested clearance |
| | (*) Vibration mounts position |

Weight distribution of full re-circulation (CAK) / Recirculation and renewal air (CBK) configuration

Size		14.2
W1 Supporting Point	kg	175
W2 Supporting Point	kg	127
W3 Supporting Point	kg	171
W4 Supporting Point	kg	162
Shipping weight	kg	685

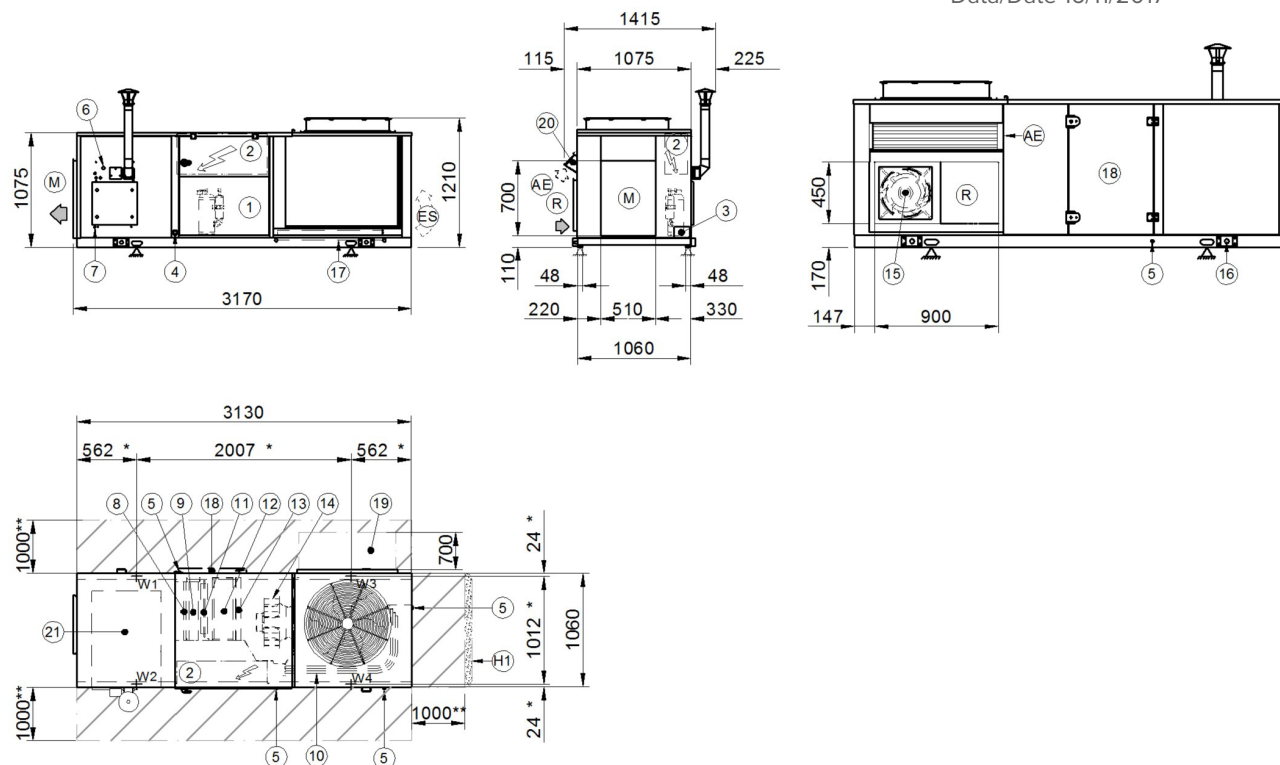
Weight distribution of full re-circulation, renewal air and exhaust (CCK) configuration

Size		14.2
W1 Supporting Point	kg	183
W2 Supporting Point	kg	137
W3 Supporting Point	kg	180
W4 Supporting Point	kg	170
Shipping weight	kg	720

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Size 7.1 - Version CAK/CBK/CCK - Gas heating module 35/53 kW

DAA6K0004_7.1_GC01_GD13_0 REV00
Data/Date 16/11/2017



1. Compressor compartment
2. Electrical panel
3. Power input
4. Humidifier connections
5. Condensate drain
6. Gas connection (UNI ISO 228/1 - G 3/4")
7. Condensate drain (only for condensation gas heating module)
8. Re-heating coil (optional)
9. Internal exchanger
10. External exchanger
11. Resistenze elettriche (optional)
12. F7/F9 / electronic filters (optional)
13. G4 air filters (standard)
14. Electric fan (supply-return)

15. Exhaust electric fan (version CCK only)
16. Lifting brackets (removable)
17. Over pressure damper exhaust (version CCK only)
18. Access for inspection coil, filters, heating elements
19. Duct section removable for maintenance provided by the customer
20. Fresh air intake cap (only version CBK-CCK)
21. Gas module

- (R) Air return
(M) Air supply
(AE) Fresh air intake
(ES) Air exhaust (only version CCK)
(H1) Wall with same height as unit on a maximum of three side
(**) Minimum suggested clearance
(*) Vibration mounts position

Weight distribution of full re-circulation (CAK) / Recirculation and renewal air (CBK) configuration

Size		7.1
W1 Supporting Point	kg	136
W2 Supporting Point	kg	167
W3 Supporting Point	kg	141
W4 Supporting Point	kg	145
Shipping weight	kg	625

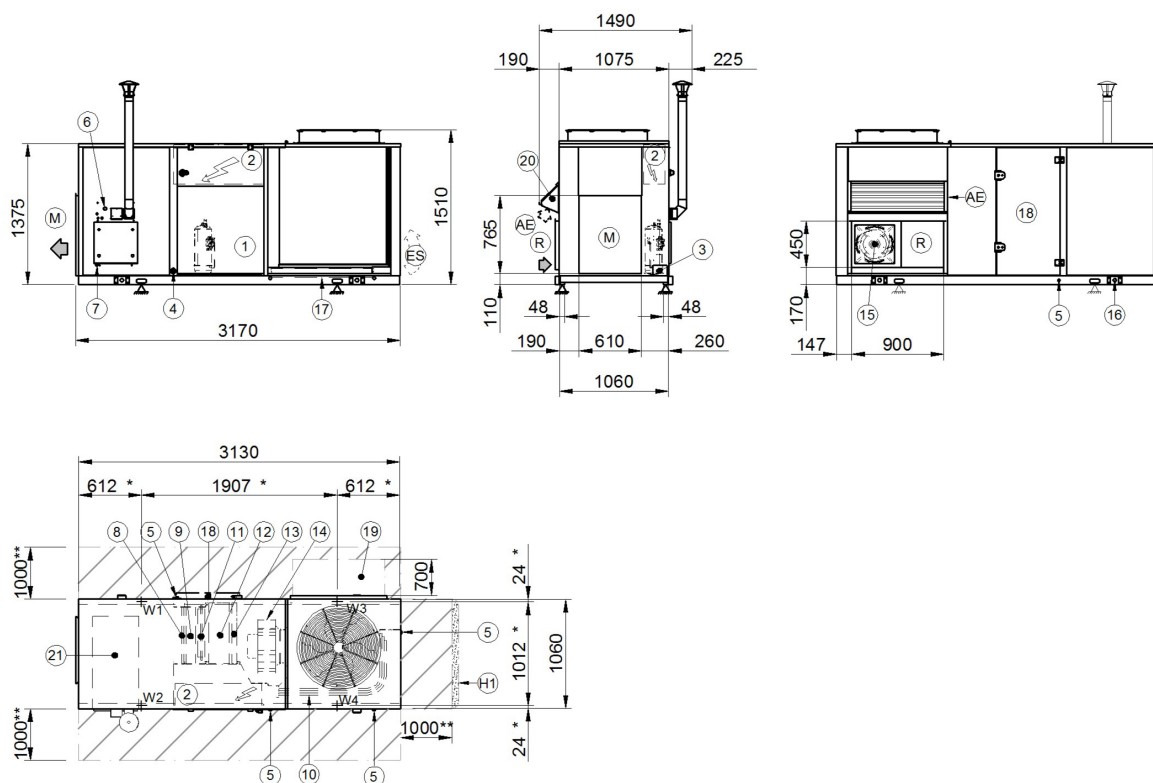
Weight distribution of full re-circulation, renewal air and exhaust (CCK) configuration

Size		7.1
W1 Supporting Point	kg	140
W2 Supporting Point	kg	172
W3 Supporting Point	kg	145
W4 Supporting Point	kg	150
Shipping weight	kg	643

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Size 10.1 - Version CAK/CBK/CCK - Gas heating module 35/53 kW

DAA6K0005_10.1_GC01_GD13_0 REV00
Data/Date 06/11/2017



1. Compressor compartment
 2. Electrical panel
 3. Power input
 4. Humidifier connections
 5. Condensate drain
 6. Gas connection (UNI ISO 228/1 - G 3/4")
 7. Condensate drain (only for condensation gas heating module)
 8. Re-heating coil (optional)
 9. Internal exchanger
 10. External exchanger
 11. Resistenze elettriche (optional)
 12. F7/F9 / electronic filters (optional)
 13. G4 air filters (standard)
 14. Electric fan (supply-return)
 15. Exhaust electric fan (version CCK only)
 16. Lifting brackets (removable)
 17. Over pressure damper exhaust (version CCK only)
 18. Access for inspection coil, filters, heating elements
 19. Duct section removable for maintenance provided by the customer
 20. Fresh air intake cap (only version CBK-CCK)
 21. Gas module
- (R) Air return
(M) Air supply
(AE) Fresh air intake
(ES) Air exhaust (only version CCK)
(H1) Wall with same height as unit on a maximum of three side
(**) Minimum suggested clearance
(*) Vibration mounts position

Weight distribution of full re-circulation (CAK) / Recirculation and renewal air (CBK) configuration

Size		10.1
W1 Supporting Point	kg	180
W2 Supporting Point	kg	148
W3 Supporting Point	kg	173
W4 Supporting Point	kg	168
Shipping weight	kg	705

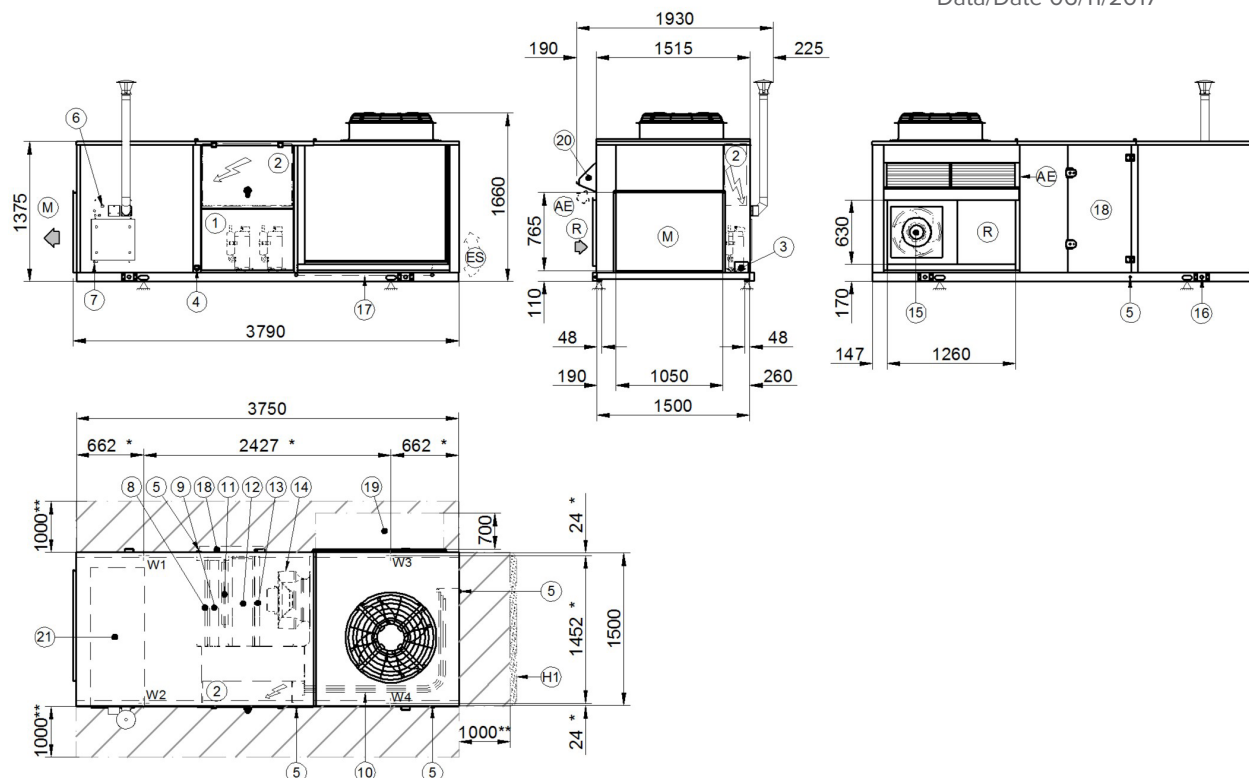
Weight distribution of full re-circulation, renewal air and exhaust (CCK) configuration)

Size		10.1
W1 Supporting Point	kg	186
W2 Supporting Point	kg	154
W3 Supporting Point	kg	179
W4 Supporting Point	kg	174
Shipping weight	kg	729

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Size 14.2 - Version CAK/CBK/CCK - Gas heating module 35/100 kW

DAA6K0006_14.2_GC01_GD15_0 REV00
Data/Date 06/11/2017



1. Compressor compartment
2. Electrical panel
3. Power input
4. Humidifier connections
5. Condensate drain
6. Gas connection (UNI ISO 228/1 - G 3/4")
7. Condensate drain (only for condensation gas heating module)
8. Re-heating coil (optional)
9. Internal exchanger
10. External exchanger
11. Resistenze elettriche (optional)
12. F7/F9 / electronic filters (optional)
13. G4 air filters (standard)
14. Electric fan (supply-return)

15. Exhaust electric fan (version CCK only)
16. Lifting brackets (removable)
17. Over pressure damper exhaust (version CCK only)
18. Access for inspection coil, filters, heating elements
19. Duct section removable for maintenance provided by the customer
20. Fresh air intake cap (only version CBK-CCK)
21. Gas module

- (R) Air return
(M) Air supply
(AE) Fresh air intake
(ES) Air exhaust (only version CCK)
(H1) Wall with same height as unit on a maximum of three side
(**) Minimum suggested clearance
(*) Vibration mounts position

Weight distribution of full re-circulation (CAK) / Recirculation and renewal air (CBK) configuration

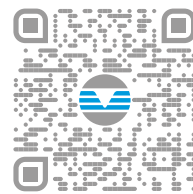
Size		14.2
W1 Supporting Point	kg	249
W2 Supporting Point	kg	191
W3 Supporting Point	kg	235
W4 Supporting Point	kg	226
Shipping weight	kg	951

Weight distribution of full re-circulation, renewal air and exhaust (CCK) configuration

Size		14.2
W1 Supporting Point	kg	258
W2 Supporting Point	kg	200
W3 Supporting Point	kg	243
W4 Supporting Point	kg	235
Shipping weight	kg	986

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

FOR OVER 30 YEARS WE HAVE BEEN OFFERING
SOLUTIONS TO ENSURE SUSTAINABLE
COMFORT AND THE WELL-BEING OF PEOPLE
AND THE ENVIRONMENT



vendita e assistenza

Info & Contacts: www.clivet.com



MideaGroup
humanizing technology