CSRN-XHE2   49.4 - 110.4

Direct expansion high efficiency packaged roof top air conditioner for medium crowded areas

Installation use and maintenance manual

CLIVET®

R-410A

Dear Customer,

Congratulations for having chosen this product.

Clivet has been working for years to offer the market systems able to assure maximum and long-lasting wellbeing with high reliability, efficiency, quality and safety.
The company aim is that to offer its customers developed systems that assure the best comfort, reduce energy consumptions and installation and maintenance costs for the entire life-span of the system.

With this manual, we intend giving information useful throughout all phases: from reception, to installation, to use and even disposal, so that such a developed system meets the best installation and use methods.

With kind regards and... good reading!

CLIVET Spa

TABLE OF CONTENTS

The data contained in this manual are not binding and can be changed by the manufacturer without prior notice.

1.1 General warnings

Purpose of the manual

This manual has been realised to enable a correct installation, adjustment and maintenance of the unit.

Manual instructions

It is of fundamental importance that the manual is carefully read.

Pay particular attention to:

PROHIBITIONS

indicate operations that cannot be carried out as they jeopardise the machine operation or can cause personal injuries or damage things.

WARNINGS

indicate potentially dangerous or damaging situations.

INFORMATION

indicate particularly useful information.

The manufacturing company declines every liability for any damages, directly or indirectly, to persons or things, following the non-compliance with these instructions.

Preserving the manual

This manual and the wiring diagram of the unit must be carefully kept and be available to the operator for future consultation.

Systems designing

Installation, electric, hydraulic system, etc., must be defined by enabled designers in accordance with the current standards.

Qualified personnel

The unit must be installed, tested and assisted by qualified personnel having the legal requisites.

Installation

The installation must be carried out in accordance with the local safety standards.

Electric network

Check that the features of the electrical network are conform with the data on the unit matriculation plate, found on the inside of the main electric control board.

Packaging

The packaging material (plastic bags, expanded polystyrene, nails, etc.) must be kept out of the reach of children as it is a potential source of danger and must be correctly recycled in accordance with the local standards in force.

Maintenance

Disconnect the electric power supply to the unit before carrying out any maintenance. The operations must be carried out in accordance with the local safety

standards.

Periodical checks

Carry out periodical checks to identify any loose, damaged or broken parts. The lack in repair

entails the risk of damages to things and personal injuries.

Fault – Malfunctioning

Disconnect the equipment in case of fault or malfunctioning.

Repair

For any repairs, only contact an after-sales technical assistance centre authorised by the manufacturer and request the use of original spare parts. The non-compliance with the above can jeopardise the safety of the equipment.

Modifications

Every liability is declined by the manufacturer with voiding of the warranty in the event of electrical and/or mechanical modifications. Tampering in general, not expressly authorised and not respecting that reported in this manual, void the warranty.

Destination of use

The unit must only be intended to be used for that it was expressly conceived:

CIVIL AIR CONDITIONING

Keep to the limits foreseen in the technical schedule and in this manual.

Any use different to that specified does not entail any kind of commitment or obligation by the manufacturer.

Safety integration principles

The unit is designed and manufactured so as not to expose the personal health and safety to risk.

In this regard, project solutions have been adopted act at eliminating, where possible, the possible causes of risk or significantly reduce the probability of the event-risk. Should it not have been possible to intervene during designing to prevent and/or eliminate the risk, refer to the behavioural prescriptions reported in the residue risks section.

Data update

The continuous improvements made to the product can determine variations to data, even without prior notice by the manufacturer.

User training

The installer must train the user, particularly on:

- Switch-on/off
- Setpoint modification
- Stand-by
- Maintenance
- What to do/not to do in case of fault.

1.2 Machine identification

Matriculation plate

The matriculation plate is found on the unit and indicates all machine features.

The matriculation plate must never be removed.

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

- the type of machine
  range   → **CSRN-XHE2**
  size   → **49.4……..110.4**
- the serial number
  12 characters → **Axxxxxxxxxxx**
- the year of manufacture
- the wiring diagram number
- electrical data
- manufacturer logo and address

Serial number

Unambiguously identifies each machine.

Enables identifying the specific spare parts for the machine.

Intervention requests

From the matriculation plate, take note of the characteristic data on the table so they are easily available if required.

For request of intervention, always give the following data.

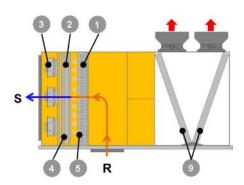|	
Range	
Size	
Serial number	
Year of manufacture	
Wiring diagram	

1.3 Functioning principle of the unit

CAK configuration: single fan section for full recirculation

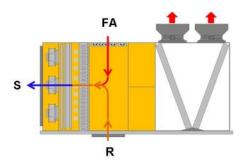For air conditioning applications only, without the need for air renewal.
The supply fan section provides the required supply and return available static pressure.

R. Return air
S. Supply air
1. G4 efficiency filters + H10 equivalent electronic filters
2. Handling exchanger
3. Supply fan section
4. Hot gas reheating exchanger
5. Electric heaters.
9. Thermodynamic recovery on exhaust air

CBK configuration: single fan section for recirculation and fresh air

For applications where you need to keep the room in over-pressure, with the option of controlling a particular fresh air flow.
As for the CAK configuration, the supply fan section provides the supply and return available static pressure.
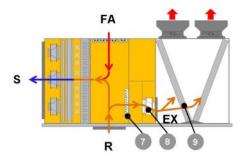

R. Return air
S. Supply air
FA. Fresh air

CCK configuration: double fan section for recirculation, fresh air, exhaust, thermodynamic recovery

For applications with automatic air renewal and free-cooling function control.

In addition to the parts contained in the CBK configuration, the unit is equipped with an exhaust section with thermodynamic energy recovery of the exhaust air.

This air, which is still rich in energy, is mixed with the outdoor air, favouring the temperature conditions on the source side of the exchanger and improving the heating and cooling capacity.
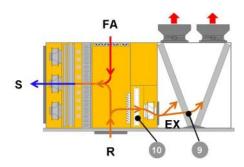
R. Return air
S. Supply air
FA. Fresh air
EX. Exhaust air
7. Exhaust damper
8. Exhaust fan section
9. Thermodynamic recovery on exhaust air

CCKP configuration: double fan section with fresh air and THOR thermodynamic recovery

For applications with automatic air renewal and free-cooling function control.

In addition to the parts contained in the CCK configuration, the unit is equipped with an exhaust section with innovative thermodynamic energy recovery of the exhaust air through a dedicated THOR (THermodynamic Overboost Recovery) exchanger.

The energy contained in the exhaust air is recovered and transferred to handling through the refrigeration circuit.

R. Return air
S. Supply air
FA. Fresh air
EX. Exhaust air
9. Thermodynamic recovery on exhaust air
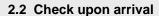10. Thermodynamic recovery exchanger, THOR

2.1 Preliminary information

Work respecting the current safety standards.

For detailed information (dimensions, weights, technical features, etc.) refer to the TECHNICAL INFORMATION chapter.

To perform the operations use the protective equipment: gloves, goggles, etc.

2.2 Check upon arrival

Before accepting delivery, check:

The unit has not been damaged during tran sport. That the delivered material corresponds to that indicated on the transport document, comparing data with the matriculation plate positioned on the pack.
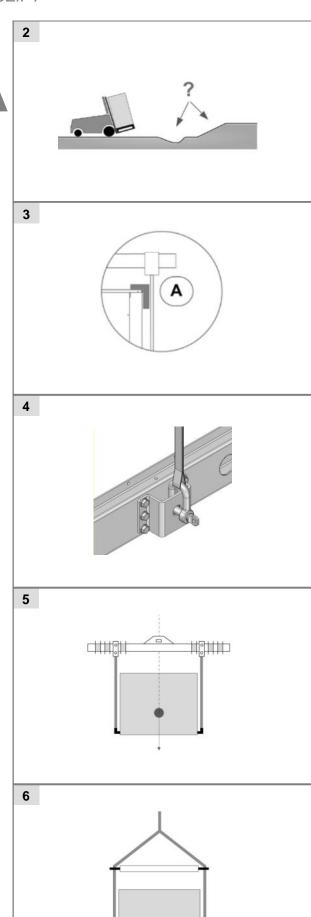
In case of damages or anomalies:

- immediately make a note of the found damage on the transport document and write the wording: "Collection with reserve for evident shortages/damages due to transport".
- notices via fax and with registered letter with acknowledgement receipt to carrier and supplier.

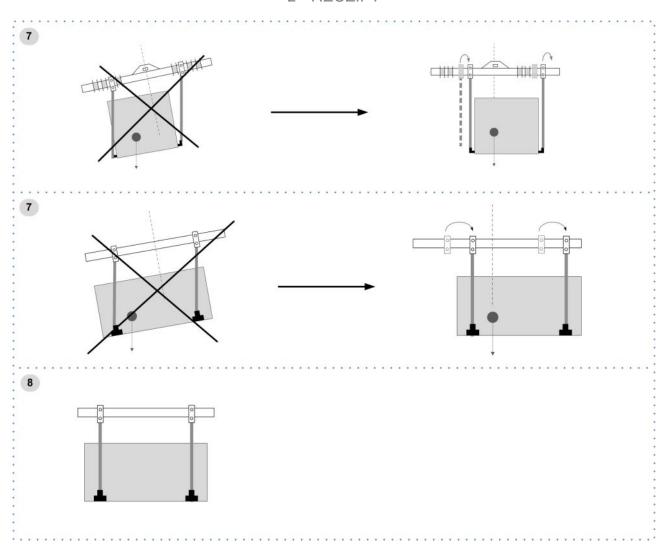The notifications must be made within 8 days from receipt, after this date they will not be accepted.

2.3 Handling

1. Verify unit weight and handling equipment lifting capacity.
2. Identify critical points during handling (disconnected routes, flights, steps, doors).
3. Suitably protect the unit to prevent damage.
4. Lifting brackets (removable)
5. Lifting with balance
6. Lifting with spacer bar
7. Align the barycenter to the lifting point
8. Use all the lifting brackets (see the dimensional section)
9. Gradually bring the lifting belts under tension, making sure they are positioned correctly.
10. Before starting the handling, make sure that the unit is stable.

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2.4 Removal of packaging

Attention not to damage the unit.
Recycle and dispose of the packaging material according to local standards.

2.5 Storage

Respect the indications on the outside of the pack.

ROOF CURB OPTION : SEE PAG 82

3.1 Preliminary information

Work respecting the current safety standards.

For detailed information (dimensions, weights, technical features, etc.) refer to the TECHNICAL INFORMATION chapter.

To perform the operations use the protective equipment: gloves, goggles, etc.

3.2 Functional spaces

The functional spaces have the aim of:

- guarantee good operation of the unit
- allow maintenance operations
- protect the authorised operators and exposed persons.

Respect the functional spaces indicated in the TECHNICAL INFORMATION chapter

Double the functional spaces if more units are aligned.

3.3 Positioning

The units have been designed to be installed :

- OUTDOORS
- in permanent position.

Choose the place of installation depending on the following criteria:

- level of sound emissions admitted by the local standards
- Customer approval
- safely accessible position
- technical spaces requested by the unit
- maximum distance admitted from the electric connections
- support points with adequate capacity for the unit weight
- spaces for air ejection and suction
- disposal of condense water

Prefer places where the unit does not disturb neighbours.
Avoid snow accumulating obstructing the coils
Avoid places that may be subject to floodings
Install the unit lifted from the ground.
Protect the unit with suitable fence in order to avoid access to unauthorised personnel (children, vandals, etc.)
Limit the transmission of vibrations:

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

A correct air circulation on the coil is essential to guarantee the good operation of the machine.
Avoid:

- obstacles to air flow (strong prevailing winds, hedges, fences, etc.)
- difficulty of exchange
- leaves or other bodies that can obstruct the exchange coils
- winds contrasting or favouring the air flow
- heat sources near the unit (chimneys, extractors, etc.)
- sources of dust or pollutants
- stratification (cold air that stagnates at the bottom)
- recirculation (ejected air that is taken back via suction)

- positioning underneath the ground level, near very high walls, underneath roofs or in corners (can give rise to stratification or recirculation phenomena).
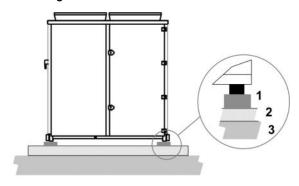
Neglecting the previous indications can lead to:

- worsening of the energy efficiency.
- blocks due to HIGH PRESSURE (in summer) or LOW PRESSURE (in winter).
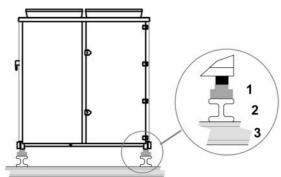
Avoid snow and ice accumulation in front of the external air outlets and of the exhaust air ejection.

Positioning on concrete floor

1 2 cm thick neoprene strips

2 concrete floor

3 floor

Positioning on steel structure

1 anti-vibration devices

2 steel structure

3 steel structure

3.4 ELECTRONIC FILTER - OPTION

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 concentrazione
- 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.)

4.1 Condense drain

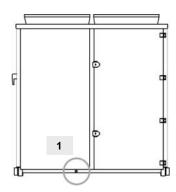The condense must be disposed of in order to avoid damaging things and persons.

- Unit drain coupling: the connection must not transmit mechanical stresses and must be carried out paying attention not to damage the unit drain coupling.

- Foresee a siphon that, by eliminating the depression caused by the fan, prevents suction of air from the drain piping.

- The piping must have adequate slope to allow out flow.

- Anchor the piping with an adequate number of supports.

- On the contrary, cracking in the piping and air pockets obstructing the outflow, are generated.

- Isolate piping and siphon to avoid condense dripping.

- Connect the condense drain to a rain drain network.

- DO NOT use white waters or sewage drains to avoid possible inhaling of odours in case of evaporation of the water contained in the si phon.

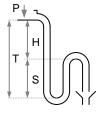- At work end, check the regular outflow of the condense by pouring water in the bowl.

1 - treatment coil condense drain

Siphon height calculation

T = 2P
S = T/2

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

Example :

P = 300 Pa = 30 mm
T = 2P = 60 mm
S = T/2 = 30 mm

4.2 Risk of freezing

Adopt measures to prevent risk of freezing if the unit or relative hydraulic connections can be subject to temperatures near 0°C.

- isolate the piping

- protect the piping with heating cables laid underneath the insulation

4.3 Heater humidifier - Option

The supply water does not require particular treatments.
The water supply capacity must be carefully regulated:

- if excessive, it is possible for the water to flow into the channels or to outflow from the bowl

- if insufficient, the humidifying action will not be present. Install a pressure reducer if the supply pressure is above 3 Bar.

Isolate the drain of the excess water and convey it into a rain drain.

RISK OF FREEZING: foresee anti-freeze resistors

If the drain freezes, the bowl overflows and the water can flow into the room.

The unit is shipped with CLOSED flow regulation/measuring device: to calibrate the water flow, see START-UP section .
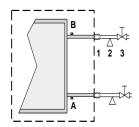
4.4 Heating coil - option

A   drain cock
B   vent valve
Under customer responsibility:
1   anti-vibration devices
2   piping supports
3   Shut-off valves

Max. operating pressure = 19 bar

4.5 Immersed electrodes humidifier - option

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.

Humidifier - size combination table:

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.

Limit values for the supply water with medium-high conductivity in an immersed electrode humidifier

			min	max
Hydrogen ions	pH		7	8,5
Specific conductivity at 20°C		µS/cm	300	1250
Total dissolved solids	TDS	mg/l	[1]	[1]
Dry residue at 180°C	R_{180}	mg/l	[1]	[1]
Total hardness	TH	mg/l $CaCO_3$	100 [2]	400
Temporary hardness		mg/l $CaCO_3$	60 [3]	300
Iron + Manganese		mg/l Fe+Mn	0	0,2
Chlorides		ppm Cl	0	30
Silica		mg/l SIO_2	0	20
Residual chlorine		mg/l Cl^-	0	0,2
Calcium sulphate		mg/l $CaSO_4$	0	100
Metallic impurities		mg/l	0	0
Solvents, diluents, soaps, lubricants		mg/l	0	0

Limit values for the supply water with medium-low conductivity in an immersed electrode Humidifier

			min	max
Hydrogen ions	pH		7	8,5
Specific conductivity at 20°C		µS/cm	125	500
Total dissolved solids	TDS	mg/l	[1]	[1]
Dry residue at 180°C	R_{180}	mg/l	[1]	[1]
Total hardness	TH	mg/l $CaCO_3$	50 [2]	250
Temporary hardness		mg/l $CaCO_3$	30 [3]	150
Iron + Manganese		mg/l Fe+Mn	0	0,2
Chlorides		ppm Cl	0	20
Silica		mg/l SIO_2	0	20
Residual chlorine		mg/l Cl^-	0	0,2
Calcium sulphate		mg/l $CaSO_4$	0	60
Metallic impurities		mg/l	0	0
Solvents, diluents, soaps, lubricants		mg/l	0	0

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

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

(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-

No relation can be demonstrated between water hardness and conductivity.

4.6 Combustion heating modules - option

Preliminary information

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.

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: cock, 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.

OIL 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 oil connection:
  oil filter
- Check the sealed of the oil pipes and filter
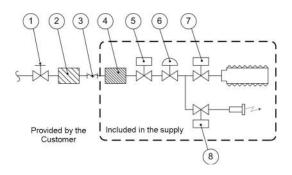
GD - 2-STAGE GAS HEATING MODULE

Burner with low pollutant emissions (NOx below 80 mg/kWh), in line with Class 3 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 with two capacity step control powered with natural gas
- kit for transformation of power with liquefied petroleum gas (LPG)
- kit of steel chimney for exhaust fumes
- all the control and safety devices

1. GAS COCK
2. GAS FILTER (LARGE SECTION)
3. ANTI-VIBRATION JOINT
4. GAS FILTER (SMALL SECTION)
5. SAFET GAS SOLENOID VLAVE
6. PRESSURE STABILISER
7. MAIN GAS BURNER SOLENOID VALVE
8. PILOT BURNER GAS SOLENOID VALVE

Gas use features

Size		74kW		100kW		147kW		200kW		300kW	
Description		min	max	min	max	min	max	min	max	min	max
Nominal heating capacity	kW	60.0	73.5	81.8	100.0	60.0	147.0	81.8	200.0	81.8	300.0
Efficiency Hi (P.C.I.)	%	93.7	91.8	93.9	92.3	93.7	91.8	93.9	92.3	93.9	92.3
Efficiency Hu (P.C.S.)	%	84.1	82.6	84.5	83.1	84.3	82.6	84.5	83.1	84.5	83.1
Available head for the chimney	Pa	140		140		140		120		120	
Gas connection diameter	GAS	UNI ISO 7/1-3/4" M		UNI ISO 7/1-1" M		UNI ISO 7/1-1" M		UNI ISO 7/1-1 1/2" M		UNI ISO 7/1-1 1/2" M	
Fume chimney diameter	mm	80		80		2 x 80		2 x 80		3 x 80	

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 Costumer may choose the flue chimney.
The Costumer 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).
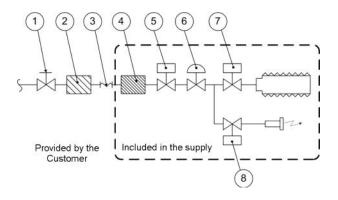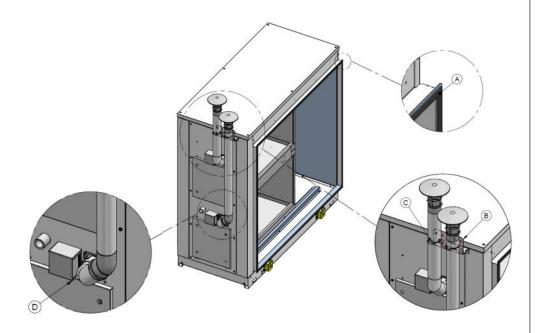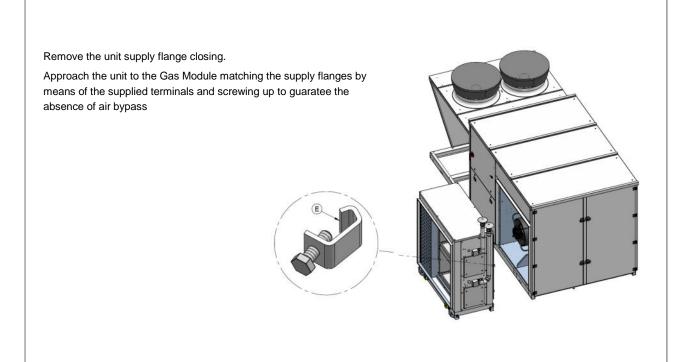
GC - CONDENSING GAS HEATING MODULE AND MODULATING CONTROL

The burner with low polluting emissions (NOx lower than 80mg/kWh) in accordance with Class 3 of European standard EN 676.

The heating module includes:

* hot air generator with condensation and integrated modulating adjustment, powered with methane gas
* kit for transformation of power with liquefied petroleum gas (LPG)
* kit of steel chimney for exhaust fumes
* All the control and safety devices

1. GAS COCK
2. GAS FILTER (LARGE SECTION)
3. ANTI-VIBRATION JOINT
4. GAS FILTER (SMALL SECTION)
5. SAFET GAS SOLENOID VLAVE
6. PRESSURE STABILISER
7. MAIN GAS BURNER SOLENOID VALVE
8. PILOT BURNER GAS SOLENOID VALVE

Gas use features

Size		65kW		82kW		100kW		130kW		164kW		200kW		300kW	
Description		min	max	min	max	min	max	min	max	min	max	min	max	min	max
Nominal heating capacity	kW	12,4	65	16,4	82	21	100	12,4	130	16,4	164	21	200	21	300
Efficiency Hi (P.C.I.)	%	108,1	96,8	108,4	97,6	22,8	97,2	108,1	96,8	108,4	97,6	108,6	97,2	108,6	97,2
Efficiency Hu (P.C.S.)	%	97,4	87,2	97,6	87,9	97,8	87,5	97,4	87,2	108,4	97,6	108,6	97,2	108,6	97,2
Max condensation produced	l/h	2,1		3,3		2,7		4,2		6,6		5,4		8,1	
Carbon monoxide CO (0% of O2)	ppm	<5		<5		<5		<5		<5		<5		<5	
Nitrogen oxides - NOx (0% of O2)		40 mg / kWh 23 ppm		34 mg / kWh 19 ppm		45 mg / kWh 26 ppm		40 mg / kWh 23 ppm		34 mg / kWh 19 ppm		45 mg / kWh 26 ppm		45 mg / kWh 26 ppm	
Available flue pressure	Pa	120		120		120		120		120		120		120	
Gas connection diameter	GAS	UNI ISO 7/1-3/4" M		UNI ISO 7/1-1" M		UNI ISO 7/1-1" M		UNI ISO 7/1-1" M		UNI ISO 7/1-1 1/2" M		UNI ISO 7/1-1 1/2" M		UNI ISO 7/1-1 1/2" M	
Exhaust pipe diameter	mm	80		80		80		2 x 80		2 x 80		2 x 80		3 x 80	

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 Costumer may choose the flue chimney.
The Costumer 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 HEATING MODULE: CONNECTION TO UNIT AND FLUE POSITIONING

A.   Apply the flat adhesive gasket15x5 on the Gas Module flange perimeter to guarantee the absence of air bypass

B.   Fix with screws the flue supporting bracket to the GM frontal panel

C.   Fix the extensions with clamps to the flue supporting bracket

D.   Fix the suction terminals in ambient and the fuel components (curves, extensions, terminals) by the corresponding gaskets

Remove the unit supply flange closing.

Approach the unit to the Gas Module matching the supply flanges by means of the supplied terminals and screwing up to guaratee the absence of air bypass

5.1 Generality

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 channels, 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).
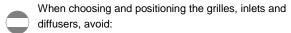
5.2 Treated air channelling

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:
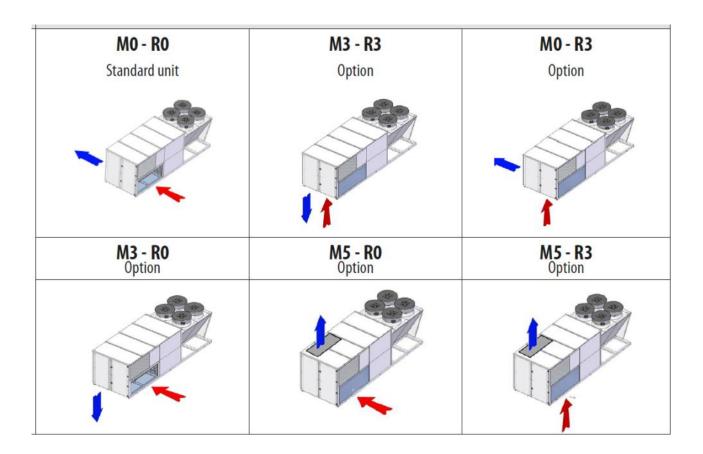
- excessive air speed

- 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.

Options Air supply and return
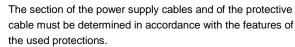
6.1 Preliminary information

The features of the lines must be determined by personnel enabled to the designing of electric systems, complying with the standards in force.

The protective equipment of the unit supply line must be able to shut-off the presumed short circuit current, which value must be determined in accordance with the system features.

The section of the power supply cables and of the protective cable must be determined in accordance with the features of the used protections.

All electrical operations must be carried out by personnel having the legal requisites, trained on the risks related to these operations.

Work respecting the current safety standards.

6.2 Electric data

The matriculation plate shows the electric data specific of the unit, including any electric accessories.

The electric data indicated in the technical schedule and in the manual refer to the standard unit, excluding accessories. Refer to the data reported in the matriculation plate.

| Matriculation plate | | VOLTAGE FLA (A) FLI (kW) |

F.L.A.   Full load ampere
         absorbed current at maximum admitted conditions
F.L.I.   Full load input
         Power absorbed with full load
         (at maximum admitted conditions)

6.3 Connections

Refer to the wiring diagram of the unit (the number of the wiring diagram is indicated in the matriculation plate)

Check the mains have features conform with the data reported on the matriculation plate
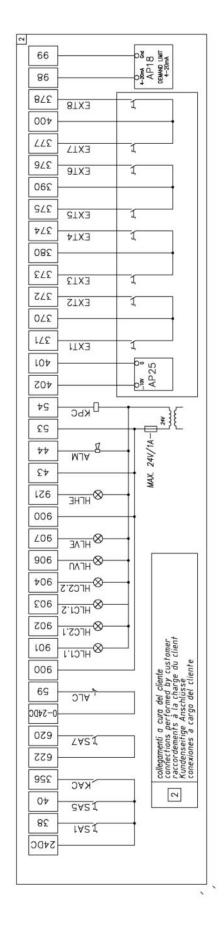
Before starting work, check the isolation device at unit power supply line start is open, blocked and provided with sign

First carry out the earth connection
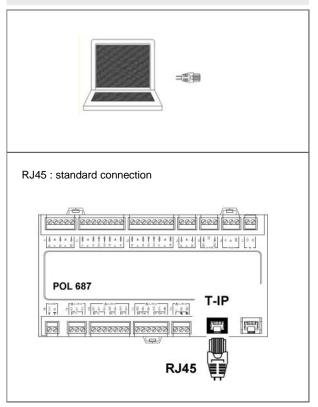
Protect the cables using adequately sized cable glands

Before electrically powering the unit, ensure all protections removed during electric connection are restored.
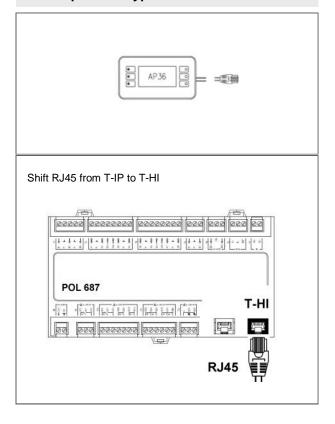
6.4 Data-signal lines

Do not exceed the maximum admitted distance, that varies based on the type of cable and signal.

Lay the cables away from the power lines, with different voltage, or that emit interferences of electromagnetic origin.

Avoid laying the cables near the equipment that can create electromagnetic interferences.

Avoid laying in parallel with other cables, any intersection with other cables is admitted only if at 90°C.

The screen must be connected to earth without interferences.

Guarantee screen continuity for the entire extension of the cable.

Respect the indications on impedance, capacity, attenuation.

6.5 Electric line input

Fix the cables: if left free they may be subject to tears.

The cables must not touch the compressors or cooling piping (they reach high temperatures)

Code	Description
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
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
ALM	segnalazione blocco cumulativo / cumulative fault signal / signalisation alarme / Sammelstörmeldung / señalización bloqueo cumulativo
AP18	demand-limit / demand-limit / demand-limit / demand-limit / demand-limit
SA1	selettore on/off remoto / remote on/off selector / sélecteur ON/OFF déporté / Fernwahlschalter Ein/Aus / selector on/off remoto
HLC1.1..HLC2.2	lampada di segnalazione stato compressore / compressor status signal lamp / lampe de signalisation état compresseur / Signallampe Verdichterzustand / lámpara de señalización estado compresor
SA5	ingresso configurabile / settable input / entrée configurable / konfigurierbares Eingabe / entrada configurable
HLHE	lampada di segnalazione stato funzionamento pompa di calore / warning light of the heat pump operating status / lampe de signalisation état fonctionnement pompe à chaleur / Anzeigelampe Betriebszustand der Wärmepumpe / lámpara indicadora estado funcionamiento bomba de calor
AP25	Modulo estrazione modulante con segnale 0-10V / Modulating extraction module with 0-10V signal / Module d'extraction modulante avec signal 0-10v / Modulierender Auslassmodul mit 0-10V Signal / Módulo extracción modulada con señal 0-10V
EXT1..EXT8	contatto pulito estrattore ambiente / ambient extractor potential-free contact / contact libre extracteur ambiant / potentialfreier Kontakt des Raumabzug / contacto libre extractor ambiente
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
HLF	lampada segnalazione nessun allarme in corso sensore fumo / indicating light of no alarm in progress smoke sensor / lampe de signalisation aucune alarme en cours capteur fumée / Signallampe keinen Alarm im Laufe Rauchsensor / lámpara indicadora ninguna alarma en curso sensor humo
HLE	lampada segnalazione stato ventilatore di ripresa e/o espulsione / indicating light of the return and/or supply fan status / lampe de signalisation état ventilateur d'aspiration et/ou refoulement / Signallampe des Saug und/oder Ablaufventilatorstatus / lámpara indicadora estado ventilador y/o impulsión
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
KAC	modulo controllo remotizzato "on/off" serranda aria esterna / on/off "remote control module" of the fresh air damper / module contrôle à distance" on/off" du rideau air neuf / ernsteuermodul "on/off" der Außenluftklappe / módulo de control a distancia on/off de la compuerta aire exterior
	collegamenti disponibili solo se richiesto opzione / connections available only if option is requested / raccordements disponibles seulement si demandée option / verfügbaren Anschlüsse nur wenn Option angefordert / conexiones disponibles solo si se requiere opción

2 — collegamenti a cura del cliente / connections performed by customer / raccordements à la charge du client / Kundenseitige Anschlüsse / conexiones a cargo del cliente

6.10 P.C. - not supplied

RJ45 : standard connection

6.11 Optional keypad

Shift RJ45 from T-IP to T-HI

P.C. CONNECTION

1   connect P.C. and main module with LAN cable

2   check in the taskbar that the connection is active

3   Open **Control panel** and select **Network and sharing center**

4   Select **Modify board setting**

5   Select **Local area connection (LAN)**

6   Select **Internet protocol version 4 (TPC) IPV4** and enter **Property**

7   Set the IP address **192.168.1.100**

8   Set Subnet mask as **255.255.255.0**

9   confirm (**OK**)

10   Enter **Start** (Windows button).

11   Write the command **cmd** and enter/do it

12   Write and run the command **Ping 192.168.1.42**

13   if will appear dawn an answer string, the connection is ok

14   enter the browser and the address **192.168.1.42**

15   Userid = **WEB**

16   Password = **SBTAdmin!**
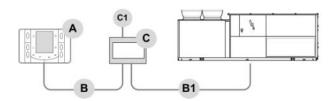
6.12 Remote control with user interface

Distance up to 350 mt

Connections

Distance up to 700 mt

A   user interface

B = B1 KNX bus, max 350 mt
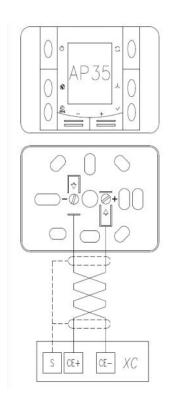
         twisted pair with shield, Ø 0,8 mm

         EIB/KNX cable marking recommended

C   power supply unit N125/11 5WG1 125-1AB11
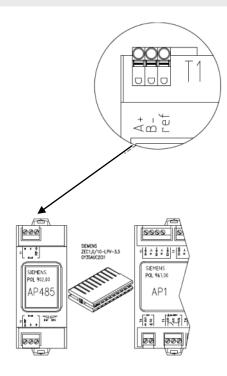
C1   AC 120...230 V, 50...60 Hz

6.13 MODBUS - RS485

LED BSP	communication with AP1 module
green	communication ok
yellow down	software ok but communication with AP1
red	flashing : software error
	fixed : hardware error
LED BUS	communication with MODBUS
green	communication ok
yellow	startup / channel not communicating
red	communication down
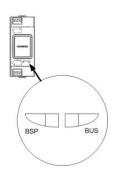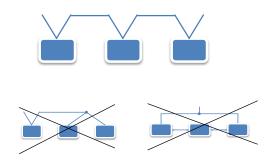
CABLE MODBUS, REQUIREMENTS
Couple of conductors twisted and shielded
Section of conductor $0.22mm^2...0,35mm^2$
Nominal capacity between conductors < 50 pF/m
nominal impedance 120 Ω
Recommended cable BELDEN 3106A
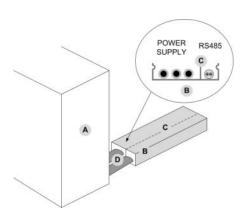
- Every RS485 serial line must be set up using the 'In/Out' bus system. Other types of networks are not allowed, such as Star or Ring networks
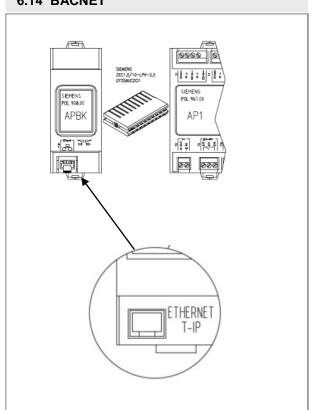
- Every RS485 serial line must be set up using the 'In/Out' bus system. Other types of networks are not allowed, such as Star or Ring networks

- The difference in potential between the earth of the two RS485 devices that the cable shielding needs to be connected to must be lower than 7 V

- Suitable arresters must be set up to protect the serial lines from the effects of the atmospheric discharges

- A 120 ohm resistance must be located on the end of the serial line. Alternatively, when the last serial board is equipped with an internal terminator, it must be enabled using the specific jumper, dip switch or link

- The cable must have insulation features and non-flame propagation in accordance with applicable regulations

- The RS485 serial line must be kept as far away as possible from sources of electromagnetic interference
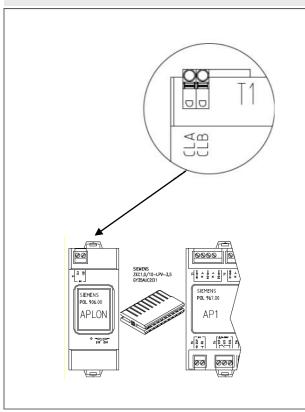
A   unit
B   metal conduit
C   metal septums
D   metal-lined sheath (sleeve)

6.14 BACNET

6.15 LONWORK

LED BSP	communication with AP1 module
green	communication ok
yellow down	software ok but communication with AP1
red	flashing : software error
	fixed : hardware error
LED BUS	**communication with BACNET**
green	ready for communication
yellow	startup
red	BACnet server down
	restart after 3 sec.
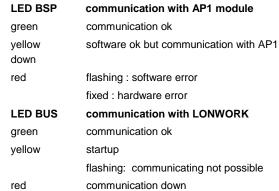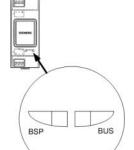
LED BSP	communication with AP1 module
green	communication ok
yellow down	software ok but communication with AP1
red	flashing : software error
	fixed : hardware error
LED BUS	**communication with LONWORK**
green	communication ok
yellow	startup
	flashing: communicating not possible
red	communication down

LONWORK CABLE TYPES

Echelon allows three cable types for channel type TP/FT-10, including the

Category 5 network cable used commonly in building automation and control (TIA

568A Cat-5).

CAT-5 SPECIFICATIONS

Unshielded cable, twisted pair with at least 18 beats per meter:

Cross-sectional area Min. Ø 0.5mm, AWG24, 0.22mm²

Impedance 100 Ω +/- 15 % @ f > 1 MHz

Operating capacity between two wires of a pair < 46 nF/km

Capacity pair to ground, asymmetric. < 3.3 nF/km

DC loop resistance < 168 Ω

Preliminary checks

Checks with machine in OFF, before start-up .
For details refer to the various chapters in the manual.

√ **Unit OFF power supply**
● safe access
● functional spaces
● outdoor coil: free supply and suction
● integrity of structure
● fans turn freely
● unit on anti-vibration devices
● air filters present and clean
● completed aeraulic system
● cooling circuit visual control
● earth connection
● unit powered by fixed network or by electrogen group
● electric connections by customer

Start-up sequence

Machine start-up operations.
For details refer to the various chapters in the manual.

√ **unit ON power supply**
● Powered unit
● compressor carter heaters ON from at least 8 hours
● phases sequence control
● vacuum voltage measurement
● unit ON
● load voltage measurement and absorptions
● fans operation check
● check air flow on outer coil (no by-pass, no stratification)
● treated air flow rate measurement
● supply, return and outdoor air temperature measurement
● subcooling and overheating measurement
● no anomalous vibrations check
● static pressure relief in return
● set date and time
● set-point customisation
● fire alarm configuration *
● heater humidifier calibration *
● available machine documentation

* only if present

7.1 Preliminary information

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

7.2 Preliminary checks

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.

⚠ 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.

7.3 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

7.4 Hydraulic circuit

Only with hot water coil - humidifier options
1. Find out if, before connecting the unit, the hydraulic system has been washed and the washing water drained.
2. Check the hydraulic circuit has been loaded and pressurised.
3. Check the shut-off valves on the circuit are in "OPEN" position.
4. Check there is no air inside the circuit, eventually bleed it through the vent valves in the high points of the system.
5. In case of using solutions to be cooled, check the percentage is suitable for the type of use.

Glycol in weight (%)	10	20	30	40
Freezing temperature (°C)	-3.9	-8.9	-15.6	-23.4
Safety temperature (°C)	-1	-4	-10	-19

7.5 Electric circuit

⚠ Check the unit is connected to the earth system. Check fastening of the conductors: the vibrations caused by handling and transport may cause loosening.

Power the unit by closing the isolation device but leave in OFF.
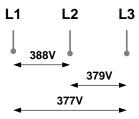
Check the network frequency and voltage values, that are within the limits:

400/3/50 +/- 10%

Check the unbalancing of the phases:

must be below 2% .

Example :

| | L1 | L2 | L3 |

388V
379V
377V

1) $\dfrac{388 + 379 + 377}{3} = 381\ (A)$

2) $MAX - A = 388 - 381 = 7$

3) $S = \dfrac{7}{A} \times 100 = $ **1,83 OK**

⚠ Operation outside the limits can entail irreversible damages.

7.6 Compressor carter resistors

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

Power the resistors by closing the unit isolator.

Check electric absorption of the resistors to be sure they are working.

Execute start only if the temperature of the compressor casing on the lower side is at least 10°C higher than the outdoor temperature.

⊖ Do not start the compressor with carter oil not in temperature.

7.7 Voltages

Check the air and water temperatures are within the operational limits.

Start the unit; refer to the "Adjustment" section for indications on the control system.

With the unit running, meaning in stable conditions and near the work ones, check:

- power supply voltage
- unit overall absorption
- absorption of the individual electric loads.

7.8 Scroll compressors

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.

7.9 Remote consents

Check the remote controls (ON-OFF, etc.) are connected and, if necessary, enabled with relative parameters (ELECTRIC CONNECTIONS sections and following pages)

Check the probes or optional components are connected and enabled with the relative parameters.

7.10 Fan speed

1. The operation allows setting the wanted speed maximum:
   menu SUPPLY VENTILATION
   par 265 SfFanSpeedOut (%)

7.11 Constant air flow rate in supply.

Only PCOSM option

The operation allows setting the wanted flow rate

1. check the doors and windows of the serviced room are closed
2. calibration must be carried out with unit all in recirculation: during the first 20 minutes from start-up, the unit is in full recirculation
3. set the flow rate
   menu *SUPPLY VENTILATION*
   par 261 SfQSet (l/sec)
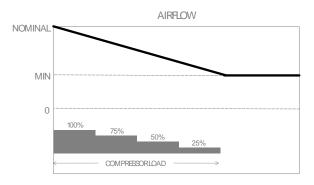
7.12 Variable air flow rate in supply

Only PVAR option

The operation allows to automatically vary the treated air flow rate based on the actual load.

This way the supply temperature "remains constant" both with 1 or 2 active compressors.

1. check the doors and windows of the serviced room are closed
2. calibration must be carried out with unit all in recirculation: during the first 20 minutes from start-up, the unit is in full recirculation
3. set the nominal air flow range
   menu *SUPPLY VENTILATION*
   par 261 SfQSet (m3/h)
4. impostare la portata aria ridotta
   menu *VENTILATION*
   par 294 RfFctRimod
   reduction at xx% of the nominal flow rate

7.13 Room pressure calibration

Only for configuration CCK or CCKP

1. Check the serviced room has doors and windows closed 2
2. Calibration must be carried out with the unit in full recirculation: during the first 20 minutes from start-up, the unit is in full recirculation
3. On display view the state::
   PDiffRipresa_X4:AI-955 value of the return load losses
4. Wait for the pressure value to stabilise and take note of the value
5. To maintain the room in neutral pressure, memorise in
   menu *RECOVERY RENEWAL*,
   par. 334 SetPAmb the detected pressure value

- to maintain the room in overpressure, memorise a higher value respect to that detected
- to maintain the room in depression, memorise a lower value.

7.14 Fire alarm: configuration

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

Menu thermoregulator,P94 TypeFireMode:

> 0 = unit complete stop,
>
> 1 = room in depression,
>
> 2 = room pressurised

In presence of alarm:

- the compressors are switched off
- On-Off remote is disabled
- On-Off from keyboard is disabled

The unit cannot be used as smoke extractor.

complete stop	supply fan	off
	ejection fan *	off
	outdoor air shutter	closed
	overpressure shutter *	closed
room kept in depression (*)	supply fan	off
	ejection fan *	on
	outdoor air shutter	closed
	overpressure shutter *	open
room kept pressurised	supply fan	on
	ejection fan *	off
	outdoor air shutter	open
	overpressure shutter *	closed

* only for configuration CCK or CCKP

7.15 Hot water coil - option

The operation allows to set the start-up ramp of the supply fan

> menu CNF UNIT
>
> > par 31 TypeInt
> >
> > 0 = no
> >
> > 1 / 2 / 3 = electric heaters
> >
> > 4 = Hot water coil
> >
> > 5 = GAS module

Set the outside temperature below which the compressors are disabled and only the hot water coil remains in operation:

menu THERMOREGULATOR

> par 88 LimCompText

7.16 Gas module - option

The operation allows to set the start-up ramp of the supply fan

> menu CNF UNIT
>
> > par 31 TypeInt
> >
> > 0 = no
> >
> > 1 / 2 / 3 = electric heaters
> >
> > 4 = Hot water coil
> >
> > 5 = GAS module

Set the outside temperature below which the compressors are disabled and only the gas module remains in operation:

menu Thermoregulator

> par 88 LimCompText

7.17 Textile channels

Only PCOSM option
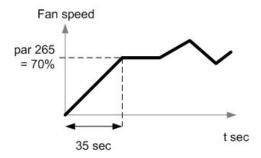
The operation allows to set the start-up ramp of the supply fan

> menu SUPPLY VENTILATION
>
> > par 266 SfRateoStartup

example :

par 266 = 2% / sec
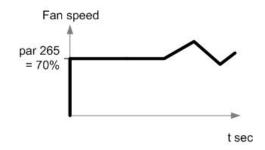
fan speed = 70% in 35 sec.

example:

par 266 = 0% / sec

fan speed = 70% in 0 sec.

7.18 Demand Limit

It allows to temporarily limit the electrical capacity absorbed by the unit according to an ext. signal 0 - 10V.

Higher is the signal and lower the number of available compressors, that is the electrical capacity absorbed.

Enable the function :

par 50 EnDemandLimit =

Set the set Demand Limit:

par 7 SetDL (%)

7.19 Heater humidifier calibration - option

1. Check the water supply pressure is not higher than 3 bar.

2. Open the flow rate measuring device/regulator and adjust it on 50% of the value in the table.

3. Wait 10/15 minutes so the heater soaks and starts.

4. Adjust the water flow rate by choosing whether to give greater importance to comfort or containment of the water consumption with an EXCESSIVE flow rate, it is possible for the water to flow in the channels or overflow from the bowl, with INSUFFICIENT flow rate there is no humidifier action.

5. The heater is correctly wet if a veil of water shows on the external surface (with fan still).

SIZE		49.4	54.4	60.4	70.4
Ta (°C) D.B.	Ta (°C) W.B.	kg/h	kg/h	kg/h	kg/h
30	15,1	150	167	190	213
35	17,6	187	209	238	266
40	19,8	228	254	289	324

SIZE		80.4	90.4	100.4	110.4
Ta (°C) D.B.	Ta (°C) W.B.	kg/h	kg/h	kg/h	kg/h
30	15,1	253	294	323	346
35	17,6	317	367	403	432
40	19,8	385	447	491	526

Ta D.B.= dry bulb entering wet deck air temperature.

Ta W.B.= wet bulb entering wet deck air temperature.

Approximate values of the maximum rate of steam released by the wet deck humidifier to the air to obtain controlled thermal and humidity conditions in supply.

The data refer to a unit with standard air flow-rate in supply.

7.20 Start-up report

To detect the objective operational conditions is useful to control the unit over time.

With the unit running, meaning in stable conditions and near the work ones, detect the following data:

- Overall absorptions and voltages with unit in full load

- Absorptions of the various electric loads (compressors, fans, pumps etc)

- Temperatures and flow rates of the various fluids (water, air) at input and output of the unit

- Temperatures and pressures in the feature points of the cooling circuit (compressor, liquid, suction drain/unload)

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

7.21 LOW SET-UP OUTDOOR TEMPERATURE - OPTION

Option indicated for very cold climates, where the outdoor temperature can be between –10°C and –30°C.

The accessory is also active with unit OFF; the unit must remain powered.
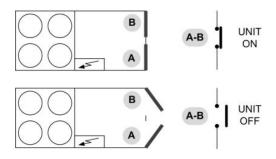
7.22 EC Directive 97/23 PED

From Directive 97/23 EC PED derive the prescriptions for the installers, the users and the maintenance operators of the unit also.

Refer to the local implemented standards; in synthesis and for merely indicative purposes:

- Compulsory check of first system:
  only for units assembled on site by the installer (e.g. condensing + direct expansion unit)

- Declaration of start-up:
  for all units

- Periodical checks:
  to be carried out as frequently as defined by the Manufacturer
  (see MAINTENANCE section) .
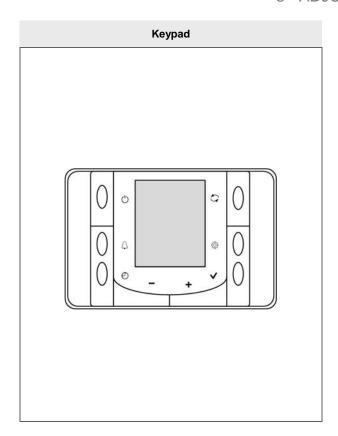
7.23 Closed panels switch

A standard   B Electronic filters option

Keypad

Keys and function	
⏻	change of status: OFF, ON, ECO, FAN
🔔	ALARMS menu access (if available)
🕐	set TIME and DATE set SCHEDULER (prolonged pressure)
−	to browse through the menus to set values
+	to browse through the menus to set values
✓	access to the STATUS menu to confirm your selection
⚙	to access the PARAMETERS menu (password) KEYPAD LOCK menu (password)
🔄	HEAT - COOL mode change CLEAN function (prolonged pressure)

Symbols		
⏻	ON / OFF OFF status. On the top field of the thermostat, the temperature and OFF indication are alternated every 2 seconds. When the status is OFF, changes to the SETPOINT and schedule are blocked.	Humidifier / Dehumidifier mode The Humidifier mode is active If flashing, it means the Dehumidifier mode is active
AUTO	Automatic Mode: The temperature setpoint is in automatic mode. The user cannot change the setpoint value.	Recirculation mode: The machine is in recirculation mode
☾	ECO mode: The machine is in economy mode.	Compressor ON: At least one compressor is active
☀	HEAT mode * : The machine is in heat mode.	
❄	COOL mode: The machine is in cool mode.	Alarm: There is at least one alarm Press the "alarm" key to view it
〰	Defrosting Mode: The machine is defrosting.	Scheduling Mode: The scheduling is active.

Operational modes

MANUAL

The choice between HEATING or COOLING mode is manually carried out from keyboard, room thermostat or remote selector (see ELECTRIC CONNECTIONS chapter).

AUTOMATIC

The choice between HEATING or COOLING mode automatically happens from electronic module depending on the room temperature, detected by the probe in unit return . With temperatures above the cold set, the unit cools the room, with temperatures below the hot set, it heats.

ECO

In this operational mode the minor consumption compared to comfort is privileged:

the ECO-COOL set is higher than the COOLING set

the ECO-HEAT set is lower than the HEATING set

In this mode, the fan periodically activates to verify the room temperature and decide whether to activate or not the available resources to satisfy the set.

It can be activated from keyboard with MODE menu, using the time slots or from supervisor.

FAN

Ventilation only; all the resources devoted to thermoregulation are disabled (compressors, electric heaters, humidifier, etc).

Setpoint

MANUAL TEMPERATURE SETPOINT

The room setpoint can be MANUALLY modified from keyboard at parameter n. 01 ManSet = xx °C .

Starting from this value, the module determines 2 setpoint:

COOLING	=	manset + dead area/2 = xx +1°C
HEATING	=	manset - dead area/2 = xx -1°C
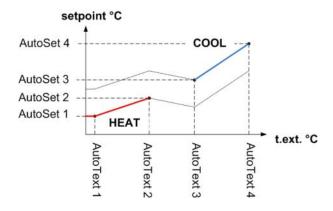
AUTOMATIC TEMPERATURE SETPOINT

The setpoint can also AUTOMATICALLY adjust to the outdoor temperature and some parameters variations (modifiable from after-sales assistance centres)

The choice between MANUAL or AUTOMATIC setpoint happens by modifying the parameter

53 En climatica =

        0   manual operation

        0   automatic operation

HUMIDITY SETPOINT

Only for unit with enthalpy control option.

In heating, the thermoregulator will activate the humidifier by modulating the power in order to humidify the room until reaching the set at parameter 5 SptUrHeat set.

In cooling, the thermoregulator will force compressors operation in order to dehumidify the room until reaching of the set at parameter 4 SptUrCool set.

In parallel, the thermoregulator will activate the post-heating.

SET POINT CO2

Only for units with CO2 / CO2+VOC probe option.

It is possible to manage the air renewal in room based on the CO_2 concentration.

The outdoor air in room relation happens by privileging the thermoregulation requirements, therefore, only if: :

- in HEATING
  the temperature is higher than the set hot - 2 °C

- in COOLING
  the temperature is below the setcold – 2°C

- the outdoor temperature is above 16 °C

8.1 PARAMETERS MENU

press ⚙

⚠ the access by password is reserved to qualified personnel, the parameters changes can cause malfunctions.

16.3 C°
17:00

enter password (0047)

confirm

COD
– – – –

scroll the parameters

enable the parameter change
PO starts flashing

P0
030.0

change the value of the parameter

confirm the new value

P0
032.0

select
to enable the new value and exit

when the time is displayed
it is possible to carry out other operations

ESC

MANUAL SET POINT

To change the *manset* manual temperature Setpoint:
press

The unit:
must be On
En Climate must be = 0

16.3 C°
17:00

keyboard code	Mnemonico	Description
0	**SetUrCool**	Relative humidity setpoint in Cool mode
1	**SetURHeat**	Relative Humidity setpoint in Heat mode
2	**SetEcoCool**	Temperature setpoint in cool economy mode
3	**SetEcoHeat**	Temperature setpoint in heat economy mode
4	**SetCO2**	Air quality setpoint
5	**EnClimatic**	Enables setpoint from climate area
6	**Control priority**	Start-up/mode change controls priority ([0] keyboard [1] BMS)
7	**EnModeAuto**	Enables automatic mode change in relation to the return temperature
8	**EnScheduler**	Enables / disabling scheduler: 0 = disabled, 1 = enabled (P0061 service keypad)

8.2 STATA MENU

Press

16.3 C°
17:00

scroll the statuses

50
011.6

exit

wait for 3 sec

16.3 C°
:

when the time is displayed
it is possible to carry out other
operations

16.3 C°
<u>17:00</u>

Keyboard index	STATUS
0	SupplyTemp._B2:AI-687
1	OutdoorTemp._B3:AI-687
2	RH% Return_X1:AI-955
3	RH% External_X2:AI-955
4	QualityAir_X2:AI-687
5	Nr. active compressors
6	ActVcInt
7	%Cmd ExternalDamper_X7:AO-687
8	PowerHum

Example of status codification:

Supply temperature

Supply temp_B2:AI-687

B2 = electronic module connector code

AI = type of input/output: AI=Analogic input, DI= digital input, AO=analogic output, DO=digital output

687 = electronic module: 687=control unit, 985=compressor, 994=EEV driver,

8.3 DATE AND HOUR

Press	🕐	**16.3 C°** 17:00

HOUR digits start flashing	−	
edit	+	**17**:00
confirm	✓	

MINUTE digits start flashing	−	
edit	+	17:**00**
confirm	✓	

HOUR - MINUTE digits start flashing	−	
choose format 24h / am - pm	+	**17:00**
	✓	

set year, month, day	− + ✓	**16.3 C°** 17:00
main menu	🕐	

8.4 BUTTON LOCK

Press for 4 sec.	⚙	**16.3 C°** 17:00

enter password confirm	− + ✓	**COD** _ _ _ _

example: T0 = "-" key ON = active key see codes-key table		**T0** **ON**

scroll the keys	− +	**T1** **OFF**

select the key (ALL starts flashing) set active-ON / disabled-OFF example: ALL = OFF all keys disabled	✓ − +	**ALL** **OFF**

select to confirm exit	− + ✓	**ESC**

		16.3 C° 17:00

Key-code table			
n. key	key	n. key	key
T0	−	T5	⚙
T1	+	T6	🕐
T2	⏻	T7	✓
T3	↻	ALL	All keys
T4	🔔		

8.5 TO VISUALIZE ALARM IN PROGRESS

⚠ Before resetting an alarm identify and remove its cause.
Repeated resets can cause irreversible damage.

press
only if the ALARM symbol is flashing

🔔

△ **16.3 C°**
17:00

ee   type of alarm (see table)

0   generic alarm (1 circuit1 alarm, etc.)

030   progressive alarm number

ee
0030

→

Type of alarm

Code	Type	Restore
ee	Electric	Automatic
eE	Electric	From Auto to manual*
EE	Electric	Manual
ii	Idraulic	Automatic
iI	Idraulic	From Auto to manual*
II	Idraulic	Manual
ff	Refrigerator	Automatic
fF	Refrigerator	From Auto to manual*
FF	Refrigerator	Manual
aa	Aeraulic	Automatic
aA	Aeraulica	From Auto to manual*
AA	Aeraulica	Manual

press

7   days since the alarm was triggered

17:00 alarm time

✓

007
17:00
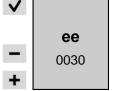
previous menu

scroll the alarms

✓

−

+

ee
0030

* After "n" times the alarm has been triggered, it is necessary to conduct a manual reset.

exit without alarms RESET

🔔

ee
0030

The code of the circuit 2 alarms is **2nn**:
example:

　　　　fF**113**:DI High pressure = circuit **1**
　　　　fF**213**:DI High pressure = circuit **2**

exit with alarms RESET:
scroll and select RES

−

+

✓

RES

8.6 SCHEDULER

⚠ **Enable scheduler (8.1 menu parametres)**

It is possible to set up to 7 schedules (1 for every day of the week)
It is possible to set up to 6 status changes for each day (On, Off, Fan).
In the days not included in the schedule, the unit maintains the most recent status defined in the schedule.
Example:

- Sunday scheduled, 23h unit in OFF mode
- Monday not scheduled (-), the unit remains in - (OFF)

Scheduling example:

Time	Event	1 Monday	2 Tuesday	3 Wedne-sday	4 Thursday	5 Friday	6 Saturday	7 Sunday
05:30	1	- (OFF)	FAN	- (OFF)	FAN	FAN	FAN	- (OFF)
08:00	2	FAN	ON	FAN	ON	ON	ON	FAN
13:00	3	FAN	ON	FAN	ON	ON	ON	FAN
15:00	4	FAN	ON	FAN	ON	ON	ON	FAN
18:00	5	FAN	ON	FAN	ON	ON	ON	FAN
21:00	6	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Scheduling customer:

Time	Event	1 Monday	2 Tuesday	3 Wedne-sday	4 Thursday	5 Friday	6 Saturday	7 Sunday
05:30	1							
08:00	2							
13:00	3							
15:00	4							
18:00	5							
21:00	6							

Sequence of operations:

1. Set weekly scheduling (see table example)
2. define days with the same scheduling
   (ex. days 2 = 4 = 5 = 6)
3. select days 2,4,5,6
4. set event 1 (event time, state Off - On - Fan)
5. set event 2,3, ecc..
6. select days 1,3,7
7. set event 1,2,3, ecc..

The most recent schedule saved overrides the existing one. For instance, if a day is included in two different schedules, the most recent one saved prevails.

Scheduling days 2,4,5,6

Scheduling the 1st day, also the other days of the week are automatically scheduled.

Press 2 sec
(only if the unit is not OFF)

🕐

16.3 C°
17:00

day 1 starts flashing
to go to day 2 press

➕

to schedule day 2 press
(2 stays steady = day 2 scheduled)

✔

2̄

to exclude day 3 press

➕

2 3̄

to schedule day 4 press
(4 starts flashing)

✔

2 4̄

press

➕

to schedule day 5 press
(5 starts flashing)

✔

2 4 5̄

press

➕

to schedule day 6 press
(6 starts flashing)

✔

2 4 5 6̄

press

➕

to exclude day 7 press

➕

2 4 5 6 7̄

to confirm selected days press

➕

‾ ‾ ‾ ‾
2 4 5 6 starts flashing

2̄ 4̄ 5̄ 6̄

press ✔

000
--:--
2 4 5 6

Set event 1
example: Tuesday 05:30 FAN
press
-- starts flashing ✔

000
--:--
2 4 5 6

set
- event time −
+

000
05:--
2 4 5 6

press ✔

set
- eventt minutes −
+

000
05:30
2 4 5 6

press ✔

iset
- desired mode
  0 = null, 1 = OFF, 2 = ECO,
  3 = ON, 4 = Fan −
+

004
05:30
2 4 5 6

press ✔

Press
to set other the events 2,3,4,5,6 +

004
05:30
2 4 5 6

Ripeat from **(Set event 1)**

press 2 times to exit ◷

16.3 C°
17:00

P flashing, active scheduling

P 16.3 C°
17:00
4

Scheduling days 1,3,7

Scheduling the 1st day, also the other days of the week are automatically scheduled.

Press 2 sec
(only if the unit is not OFF) ◷

16.3 C°
17:00

day 1 starts flashing

to schedule day 1 press
(1 stays steady = day 1 scheduled) ✔
to go to day 2 press
(2 starts flashing) +

1̄
1

to exclude day 2 press +

1 2̄

to schedule day 3 press
(3 starts flashing) ✔

1 3̄

press +

1 3̄

to exclude days 4,5,6
press +

1 3 7̄

to schedule day 7 press
(7 starts flashing) ✔

1 3 7

to confirm selected days press +

1̄ 3̄ 7̄

1̄ 3̄ 7̄ starts flashing

press ✔

1 3 7

press ✔

```
000
--:--
1   3      7
```

Set event 1

example: Monday 05:30 FAN

press ✔

 -- starts flashing

```
000
--:--
1   3      7
```

set

- event time

− +

```
000
05:--
1   3      7
```

press ✔

set

- eventt minutes

− +

```
000
05:30
1   3      7
```

press ✔

iset

- desired mode

    0 = null, 1 = OFF, 2 = ECO,
    3 = ON, 4 = Fan

− +

```
001
05:30
1   3      7
```

press ✔

Press

to set other the events 2,3,4,5,6

+

```
001
05:30
1   3      7
```

Ripeat from **(Set event 1)**

press 2 times to exit 🕐

```
16.3 C°
17:00
```

P flashing, active scheduling

```
P  16.3 C°
17:00
4
```
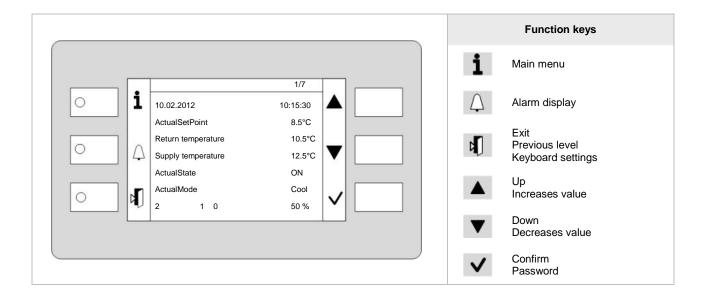
Modify scheduling

Example:

- day 5
- change events 3 and 4
- from ON to OFF

Time	Event	1 Monday	2 Tuesday	3 Wedne-sday	4 Thursday	5 Friday	6 Saturday	7 Sunday
05:30	1	(OFF)	FAN	(OFF)	FAN	**FAN**	FAN	(OFF)
08:00	2	FAN	ON	FAN	ON	**ON**	ON	FAN
13:00	3	FAN	ON	FAN	ON	**OFF**	ON	FAN
15:00	4	FAN	ON	FAN	ON	**OFF**	ON	FAN
18:00	5	FAN	ON	FAN	ON	**ON**	ON	FAN
21:00	6	OFF	OFF	OFF	OFF	**OFF**	OFF	OFF

Press 2 sec 🕐

```
16.3 C°
17:00
```

press

to schedule day 5 press

+

```
5
```

press ✔

(5 stays steady)

press to exclude the other days

+

    _

 5 starts flashing

press ✔

```
_
5
```

press 3 times (= event 3)

+

```
003
13:00
5
```

press 3 times ✔

starts flashing 003 (= ON)

select mode 002 (=OFF) −

```
003
13:00
5
```

confirm ✔

```
002
13:00
5
```

press ✔

002

15:00

5

press 4 times (= event 4) ✚

003

15:00

5

press 3 times
starts flashing 003 (= ON) ✔

003

15:00

select mode 002 (=OFF) ▬ 5

confirm ✔

002

15:00

5

press 2 times to exit 🕐

16.3 C°

17:00

8.7 SERVICE KEYPAD

		Function keys
	i	Main menu
	🔔	Alarm display
	🚪	Exit Previous level Keyboard settings
	▲	Up Increases value
	▼	Down Decreases value
	✓	Confirm Password

Display contents:

	1/7
10.02.2012	10:15:30
ActualSetPoint	8.5°C
Return temperature	10.5°C
Supply temperature	12.5°C
ActualState	ON
ActualMode	Cool
2 1 0	50 %

8.8 DISPLAY MEANING

ActualSetPoint	temperature setting
T.In air	Return temperature
T.Out air	Supply temperature
ActualState	On / off / eco / pmp On
ActualMode	Cool : cooling
	Heat : heating

2	installed compressors
3	**1 - 0** Compressors ON
	example : circuit 1 = **1** compr. On
	circuit 2 = **0** compr. On
50%	required power
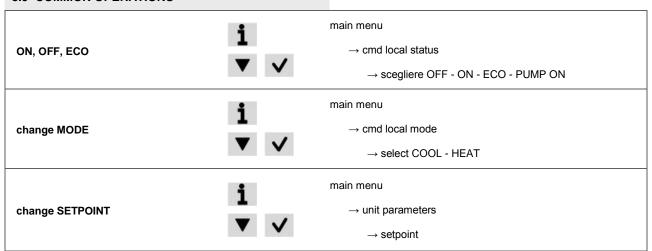
8.9 COMMON OPERATIONS
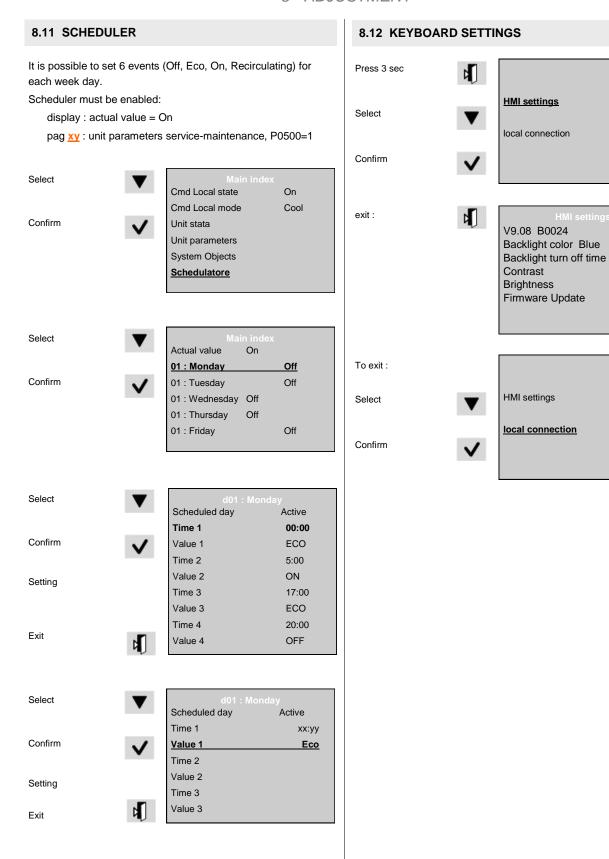
ON, OFF, ECO	**i** ▼ ✓	main menu
		  → cmd local status
		    → scegliere OFF - ON - ECO - PUMP ON

change MODE	**i** ▼ ✓	main menu
		  → cmd local mode
		    → select COOL - HEAT

change SETPOINT	**i** ▼ ✓	main menu
		  → unit parameters
		    → setpoint

8.10 MAIN MENU

Select   **i**

Main index	
Cmd Local state	On
Cmd Local mode	Cool
Unit stata	
Unit parameters	
Scheduler	

Select   ▼

Confirm   ✓

Main index	
Cmd Local state	**On**
Cmd Local mode	Cool
Unit stata	
Unit parameters	
Scheduler	

Cmd Local state	OFF
	ECO
	ON
	Fan
Cmd Local mode	Cool
	Heat
Unit Stata	General
	Central
	Expansion
	Thermoregulator
	Stata C1 Circuit 1 *
	Thermostatic
	Bac
	Lon
Parameters Unit	SetPoint
Scheduler	Scheduler

Unit Stata ⟶ **page 49**

Input, output functioning variables.

See next pages tables

* Circuits number dipend on unit's series .

The menu is repeated for each refrigerant circuit (circuit: circuit1, circuit2,.....;thermostatic: circuit1, circuit2,....)

Setpoint Menu

P0001:	**ManSet**	Manual temperature Setpoint
P0002:	**SetEcoCool**	Temperature setpoint in cool economy mode
P0003:	**SetEcoHeat**	Temperature setpoint in heat economy mode
P0004:	**SetUrCool**	Relative humidity setpoint in Cool mode
P0005:	**SetURHeat**	Relative Humidity setpoint in Heat mode
P0006:	**SetCO2**	Air quality setpoint
P0053:	**EnClimate**	Enables setpoint from climate area
P0054:	**Control priority**	Start-up/mode change controls priority ([0] keyboard [1] BMS)
P0058:	**EnModeAuto**	Enables automatic mode change in relation to the return temperature

8.11 SCHEDULER

It is possible to set 6 events (Off, Eco, On, Recirculating) for each week day.

Scheduler must be enabled:

    display : actual value = On

    pag **xy** : unit parameters service-maintenance, P0500=1

Select ▼

Confirm ✓

Main index	
Cmd Local state	On
Cmd Local mode	Cool
Unit stata	
Unit parameters	
System Objects	
Schedulatore	

Select ▼

Confirm ✓

Main index	
Actual value	On
01 : Monday	**Off**
01 : Tuesday	Off
01 : Wednesday	Off
01 : Thursday	Off
01 : Friday	Off

Select ▼

Confirm ✓

Setting

Exit 🚪

d01 : Monday	
Scheduled day	Active
Time 1	**00:00**
Value 1	ECO
Time 2	5:00
Value 2	ON
Time 3	17:00
Value 3	ECO
Time 4	20:00
Value 4	OFF

Select ▼

Confirm ✓

Setting

Exit 🚪

d01 : Monday	
Scheduled day	Active
Time 1	xx:yy
Value 1	**Eco**
Time 2	
Value 2	
Time 3	
Value 3	

8.12 KEYBOARD SETTINGS

Press 3 sec 🚪

Select ▼

Confirm ✓

HMI settings
HMI settings
local connection

exit : 🚪

HMI settings
V9.08 B0024
Backlight color Blue
Backlight turn off time 0
Contrast 60
Brightness 100
Firmware Update No

To exit :

Select ▼

Confirm ✓

HMI settings
local connection

8.13 TO VISUALIZE ALARM IN PROGRESS

⚠ Before resetting an alarm identify and remove its cause.
Repeated resets can cause irreversible damage.

Press 🔔

alarm log detail
+ eE001 : Monitore fase : Fault

1   Critico (A)

14.02.2012   11.30.10

Press 🔔

alarm list

Reset   Passive 1

+ eE001 : Monitore fase : Fault

Press 🔔

Press ▼

alarm log

Reset   Passivo 10

+ eE001 : Monitore fase : Fault
- EE003 : Guasto P1 Util : Ok
+ EE003 : Guasto P1 Util : Fault

- eE001 : Monitore fase : Fault = active alarm

- - EE003 : Guasto P1 Util : Ok = resetted alarm

RESET ALARM

Press 🔔

alarm log detail
+ eE001 : Monitore fase : Fault

1   Critico (A)

14.02.2012   11.30.10

Press 🔔

alarm list

Reset   Passive 1

+ eE001 : Monitore fase : Fault

Press 🔔

Slide ▼

alarm log
Reset   Passivo 10
+ eE001 : Monitore fase : Fault
- EE003 : Guasto P1 Util : Ok
+ EE003 : Guasto P1 Util : Fault
....

Press 3 sec. ✓

Enter password:
Maintenance
Developer

Confirm ✓

Password

Password

0 - - -

Press 🔔

Select ▼

Confirm ✓

alarm list

Reset   Passive 1

+ eE001 : Monitore fase : Fault

Select ▼

Confirm ✓

Passivo
Attivo

Select 🚪

alarm list

Reset   Passivo 0

Exit:
Press 3 sec. ✓

Select ▼

Confirm ✓

password management

Log off
Cambia PSS user
Cambia PSS service
Cambia PSS manufacturer

ALARM LOG RESET

Press

🔔

```
              alarm log
Reset                    Passivo 10
+ eE001 : Monitore fase : Fault
-  EE003 : Guasto P1 Util  : Ok
+ EE003 : Guasto P1 Util  : Fault
………
```

Press 3 sec.

✔

```
10.02.2012              10:15:30
SetPointAttuale           8.5°C
T.InH2OUtilizzo          10.5°C
T.OutH2OUtilizzo         12.5°C
StatoAttuale                ON
ModoAttuale               Cool
12        1  1             100%
```

Press 3 sec.

✔

Insert password:
Maintenance
Manufacturer

Confirm

✔

```
              Password

              Password
                0 - - -
```

Select

▼

Confirm

✔

```
        password management

Log off
Cambia PSS utente
Cambia PSS service
Cambia PSS costruttore
```

Press

🔔

```
              alarm log
Reset                    Passivo 10
+ eE001 : Monitore fase : Fault
-  EE003 : Guasto P1 Util  : Ok
+ EE003 : Guasto P1 Util  : Fault
………
```

Select

▼

Confirm

✔

```
              Alarm cnf
AlarmSnapshot              0
Lista allarmi :
Ordinamento 1             Ora
Ordinamento 2             Ora
Ordine descrescente    Passive
Storico allarmi :
Reset
```

Select

▼

Confirm

✔

Execute

Select

🚪

```
              Allarmi cnf
AlarmSnapshot              0
Lista allarmi :
Ordinamento 1             Ora
Ordinamento 2             Ora
Ordine descrescente    Passive
Storico allarmi :
Reset
```

8.14 MAIN MENÙ - INSTALLER USE

Press 3 sec. ✓

Password

Password

0 - - -

insert maintenance password

ℹ️

Main index	
Cmd Local state	On
Cmd Local mode	Cool
Unit stata	
Unit parameters	
Scheduler	

Select ▼

Confirm ✓

Main index	
Cmd Local state	On
Cmd Local mode	Cool
Unit stata	
Unit parameters	
System Objects	
Scheduler	

Cmd local state			
Cmd local Mode			
Unit Stata	Circuit stata		
		Circuit 1 stata	
			Circuit 1 I/O stata
			Thermostatic stata
	General stata		
		Central POL687-IO	
		Expansion POL955 - I/O	
		Thermoregulator	
Unit parameters	SetPoint		
	Unit setting		
	circuit setting		
		Circuit C1	
		Thermostatic C1	
	Unit option		
	Thermoregulator		
	Integrations		
	Compressor		
	Correction SH		
	Sourse		
	Ventilation		
		Supply fan	
		Return fan	
	Circuit alarms		
	Defrost		
	Humidity control		
	Recovery renewal		
	Reset usure		
	Sensor settings		
	Serial communication		
System objects	date / hour setting		
	language select		
	Communication		
	Save / load		
	AlarmSanpshot		
	Diagnostica		
	password management		
	time lightening		
	HMI		
	Version		
	sw. info		
	Target		
	DiagobjHandler		
Scheduler	Scheduler *		

8.15 ALLARMS - TAB 1

ID	Description	Reset
AA003	Fire	M
aa004	Dirty filters	A
aa008	Supply air flow	A
eE001	Phase monitor	A/M
EE002	Compartment opening	M
EE005	Electrostatic Filters	A
ee006	POL955 Board Offline	A
eE007	Supply fan protections	A/M
eE009	Return, exhaust fan protections	A/M
EE010	Additions high temp.	M
EE011	Addition heater	M
ee020	POL822 keyboard offline	A
ee027	Return temperature probe	A
ee028	Delivery temperature probe	A
ee029	Outside temperature local probe	A
ee030	Deman Limit input	A
ee031	Relative return humidity probe	A
ee032	Outside relative Humidity probe	A
ee033	Air Quality probe	A
ee035	Supply fan Pdiff. Probe	A
ee036	External fan Pdiff. probe	A
ee037	Return fan Pdiff. probe	A
ee038	Coil antifreeze probe	A
ee039	Supply pressure probe	A
ee040	Signal from humidifier board	A
ee041	Alarm from humidifier board	A
ee042	Alarm from humidifier board	A
ee043	Humidifier board offline	A
ee044	POL925 (1) board offline	A
ee045	POL925 (1) board offline	A
ee046	Ambient pressure probe failure	A
ee101	Circuit 1 module disconnection on ProcessBus	A
ee102	Thermostatic valve driver timeout	A
ee104	Thermostatic valve block	A
EE106	Comp 1 Protec.	M
EE107	Comp 2 Protec.	M
EE108	Comp 3 Protec.	M
EE118	Source Protec.	M
ee122	Discharge temperature C1 probe	A
ee123	Discharge temperature C2 probe	A
ee124	Discharge temperature C3 probe	A
ee125	Source 1 Temp. probe	A
ee126	Source 2 Temp. probe	A
ee127	Suction Temp. probe	A

ALLARMS - TAB 2

ID	Description	Reset
ee128	Discharge Pression probe	A
ee129	Suction Pression probe	A
ee201	circuit 1 module disconnection on ProcessBus	A
ee202	driver 1 module disconnection on ProcessBus	A
ee204	thermostatic valve block	A
EE206	Comp 1 Protec.	M
EE207	Comp 2 Protec.	M
EE208	Comp 3 Protec.	M
EE218	Source Protec.	M
ee222	Discharge temperature C1 probe	A
ee223	Discharge temperature C2 probe	A
ee224	Discharge temperature C3 probe	A
ee225	Source 1 Temp. probe	A
ee226	Source 2 Temp. probe	A
ee227	Suction Temp. probe	A
ee228	Discharge Pression probe	A
ee229	Suction Pression probe	A
ff105	Overheating below minimum limit	A
fF109	DI Low Pressure	A/M
ff110	Cool Low pressure Pre-alarm	A
ff111	Low Heat Pressure pre-alarm	A
fF112	AI Low Pressure	A/M
fF113	DI High Pressure	A/M
ff114	High pressure pre-alarm	A
fF115	AI High Pressure	A/M
ff116	Max. Press. rat. pre-alarm	A
fF117	Min Press. Rat. pre-alarm	A/M
FF119	Max Press. Rat. alarm	M
FF134	Empty circuit alarm	M
FF136	Defrost not manageable due to activated Demand Limit	M
ff205	minimum overheating	A
fF209	DI Low Pressure	A/M
ff210	Cool Low pressure Pre-alarm	A
ff211	Low Heat Pressure pre-alarm	A
fF212	AI Low Pressure	A/M
fF213	DI High Pressure	A/M
ff214	High pressure pre-alarm	A
fF215	AI High Pressure	A/M
ff216	Max. Press. rat. pre-alarm	A
fF217	Min Press. Rat. pre-alarm	A/M
FF219	Max Press. Rat. alarm	M
FF234	Empty circuit alarm	M
FF236	Defrost not manageable due to activated Demand Limit	M
il012	Addition antifreeze	A

ALLARMS - TAB 3

ID	Description	Reset
il120	Source flow	A
Il121	Source frost	M
il220	Source flow	M
Il221	Source frost	M

Type of alarm

A   automatic reset

M   manual reset

A/M rautomatic reset , after N alarm → manual reset

STATA - TAB 1

MENU	ID	Short description	Description
1 Main Page	-	Machine status	Current unit status [0]:Off, [1]:ECO, [2]:ON, [3]:FAN
1 Main Page	-	Machine mode	Current unit mode [0]:COOL, [1]:HEAT
1 Main Page	-	Current setpoint	Current unit setpoint
1 Main Page	-	No. of steps used	Number of compressors currently activated
10 Main Index	-	Clean	Clean control from HMI
3001 Central POL687 - IO	-	IntakeTemp._B1:AI-687	Return temperature detected by the main board's analogue input
3001 Central POL687 - IO	-	OutdoorTemp._B3:AI-687	Outside temperature
3001 Central POL687 - IO	-	SupplyTemp._B2:AI-687	Supply temperature
3001 Central POL687 - IO	-	%Cmd RicicDamper_X1:AO-687	Recirculation damper opening control percentage
3001 Central POL687 - IO	-	QualityAir_X2:AI-687	Air quality value from analogical input
3001 Central POL687 - IO	-	SupplyPDiff_X3:AI-687	Supply fan differential pressure to calculate air flow rate
3001 Central POL687 - IO	-	ExternalPDiff_X4:AI-687	Return external differential pressure to examine pressure drops on the return channel and, if necessary, adjust the external damper
3001 Central POL687 - IO	-	ON-OFFRem_DU1:DI-687	On/off digital input status (open OFF, closed ON)
3001 Central POL687 - IO	-	Heat/CoolRem_DU2:DI-687	Digital input status for mode change (open COOL, closed HEAT)
3001 Central POL687 - IO	-	PhaseControl_D1:DI-687	Phase monitor alarm input status (open ALARM)
3001 Central POL687 - IO	-	Ovl SupplyFan_DL1:DI-687	Supply fan thermal digital input status (open ALARM)
3001 Central POL687 - IO	-	Ovl RipEspFan_DL2:DI-687	Return/exhaust fan thermal digital input status (open ALARM)
3001 Central POL687 - IO	-	Diff. Filters_D2:DI-687	Supply air filters differential input status (open INSUFFICIENT FLOW)
3001 Central POL687 - IO	-	Fire Alarm_X8:DI-687	Fire alarm input status (open ALARM)
3001 Central POL687 - IO	-	%Cmd Supply Fan_X5:AO-687	Modulating supply fan control percentage
3001 Central POL687 - IO	-	%Cmd ExternalDamper_X7:AO-687	External damper opening control percentage
3001 Central POL687 - IO	-	%Cmd EjectionDamper_X6:AO-687	Exhaust damper opening control percentage
3001 Central POL687 - IO	-	Cmd CumAlarm_Q2:DO-687	Alarm cumulative control status
3001 Central POL687 - IO	-	Cmd EjectionDamper_Q5:DO-687	Exhaust damper/fan control status
3001 Central POL687 - IO	-	Cmd Humidifier_Q6:DO-687	Humidifier control status
3001 Central POL687 - IO	-	Cmd SupplyFan_Q3:DO-687	Supply fan control status
3001 Central POL687 - IO	-	Cmd ReturnFan_Q4:DO-687	Return fan control status
3001 Central POL687 - IO	-	Cmd ModeUnit_Q1:DO-687	Unit mode control status (open COOL, closed HEAT)
3001 Central POL687 - IO	-	AntifreezeHeater_Q8	Control status of the antifreeze heaters for source side water exchangers
3002 Expansion POL955 - IO	-	ReturnPDiff_X4:AI-955	Return fan differential pressure to calculate air flow rate
3002 Expansion POL955 - IO	-	Freeze Addition_X3:AI-955	Water coil output temperature for additions' antifreeze function
3002 Expansion POL955 - IO	-	RH% outdoor_X2:AI-955	Outside relative humidity value
3002 Expansion POL955 - IO	-	Supply Pressure_X5:AI-955	Absolute pressure status on supply channel
3002 Expansion POL955 - IO	-	RH% Return_X1:AI-955	Relative return humidity value
3002 Expansion POL955 - IO	-	HT Addition_X6:DI-955	Additions' high temperature alarm input status
3002 Expansion POL955 - IO	-	Ovl Addition_X7:DI-955	Addition protections alarm input status
3002 Expansion POL955 - IO	-	Supply Flux_X8:DI-955	Supply air flow switch status
3002 Expansion POL955 - IO	-	%Cmd Addition_Y2:AO-955	Integration element control percentage
3002 Expansion POL955 - IO	-	%Cmd Return Fan_Y1:AO-955	Return fan control percentage
3002 Expansion POL955 - IO	-	Cmd Addition Pump_Q1:DO-955	Additions' pump control for water coil
3002 Expansion POL955 - IO	-	Cmd Addition 1_Q2:DO-955	Addition 1 control

STATA - TAB 2

MENU	ID	Short description	Description
3002 Expansion POL955 - IO	-	Cmd Addition 2_Q2:DO-955	Addition 2 control
3002 Expansion POL955 - IO	-	Cmd Addition 3_Q2:DO-955	Addition 3 control
3003 Thermoregulator	1	Startup phase	Start-up phase
3003 Thermoregulator	2	Time to end startup	Start-up end timer
3003 Thermoregulator	3	Info to compressor	Information on the compressors
3003 Thermoregulator	4	Info to freecooling/heatingFCHMsg	Freecooling/heating information
3003 Thermoregulator	5	Maximum power available for freecooling/heating	Maximum power available for freecooling
3003 Thermoregulator	6	Info to addition	Information on the additions
3003 Thermoregulator	7	Thermoreg. total request	Thermoreg. total request
3003 Thermoregulator	8	Thermoreg. compressor request	Thermoreg. compressor request
3003 Thermoregulator	9	Thermoreg. freecooling/heating request	Thermoreg. freecooling/heating request
3003 Thermoregulator	10	Thermoreg. addition request	Thermoreg. addition request
3003 Thermoregulator	11	Actual compressor limit for supply T	Power limit of the compressors for supply temp.:
3003 Thermoregulator	12	Actual fch limit for supply T	Freecooling/heating power limit for supply temp.:
3003 Thermoregulator	13	Actual addition limit for supply T	Power limit of the additions for supply temp.:
3003 Thermoregulator	14	Thermo req. compressor	Reg. requested for the compressors
3003 Thermoregulator	15	Thermo req. Fch	Reg. requested for freecooling/heating
3003 Thermoregulator	16	Fch state	Freecooling/heating status
3003 Thermoregulator	17	Actual request for addition	Reg. requested for the additions
3003 Thermoregulator	18	Addition state	Additions' status
3003 Thermoregulator	19	CntDwn start regulation	Countdown to start regulation
3003 Thermoregulator	20	CntDwn stop fan	Countdown to stop fans
3003 Thermoregulator	21	Wait insert step	Minimum waiting time to enable power
3003 Thermoregulator	22	Wait release step	Minimum waiting time to release power
3003 Thermoregulator	23	Enth. outdoor	External air enthalpy
3003 Thermoregulator	24	Enth. Return	Return air enthalpy
3003 Thermoregulator	25	US outdoor	External air specific humidity
3003 Thermoregulator	26	US return	Return air specific humidity
3003 Thermoregulator	27	Renoval available	Renewal availability
3003 Thermoregulator	28	CO2BMS	CO_2 value passed BY BMS
3003 Thermoregulator	29	Modulation external damper for CO2	External damper modulation for CO_2
3003 Thermoregulator	30	Correction external damper for Pdiff	External damper adjustment for diff. pressure
3003 Thermoregulator	31	Power Humidifier	Humidifier power
3003 Thermoregulator	32	Humidifier command	Humidifier control
3003 Thermoregulator	33	H2O valve command	Adiabatic humidifier control
3003 Thermoregulator	34	Power dehumidification	Post-heating power
3003 Thermoregulator	35	Valve postheat state	Post-heating valve status
3003 Thermoregulator	36	CPYCylHr	Cylinder hours CPY humidifier
3003 Thermoregulator	37	CPYHr	Operating hours CPY humidifier
3003 Thermoregulator	38	CPYStage	CPY humidifier operating stage
3003 Thermoregulator	39	CPYStatus	CPY humidifier operating status

STATA - TAB 3

MENU	ID	Short description	Description
3003 Thermoregulator	40	CPYCurrent	CPY humidifier absorbed current
3003 Thermoregulator	41	CPYIstSteam	CPY humidifier output
3003 Thermoregulator	42	Supply Q Air	Supply air flow rate
3003 Thermoregulator	43	Return Q Air	Return air flow rate
3003 Thermoregulator	44	Supply temp. ctrl low power	Supply temperature control activation status for low capacities
3003 Thermoregulator	45	Max mod. damper low power	Maximum renewal for supply limit
3003 Thermoregulator	46	SetActPAmbExt	Current external/return pressure setpoint
3003 Thermoregulator	47	PressRoomExFlow	Status of the ambient pressure detector – ExFlow opt.
3003 Thermoregulator	48	Nr Extractor Run ExFlow	Number of active extractors – ExFlow option
3003 Thermoregulator	49	ExFlow Modulation	External damper modulation associated with ExFlow opt.
3101 Circuit C1 Stata	1100	CMP1 starts	Compressor 1 start-ups
3101 Circuit C1 Stata	1101	CMP2 starts	Compressor 2 start-ups
3101 Circuit C1 Stata	1102	CMP3 starts	Compressor 3 start-ups
3101 Circuit C1 Stata	1104	Source starts	Source motor start-ups
3101 Circuit C1 Stata	1105	Hours Comp.1	Compressor 1 hours
3101 Circuit C1 Stata	1106	Hours Comp.2	Compressor 2 hours
3101 Circuit C1 Stata	1107	Hours Comp.3	Compressor 3 hours
3101 Circuit C1 Stata	1108	HoursScrew	Screw compressor hours
3101 Circuit C1 Stata	1109	HoursSource	Source motor hours
3101 Circuit C1 Stata	1110	Total steps	Total amount of active steps on the circuit
3101 Circuit C1 Stata	1111	Comp.1 status	0=Free 1=Active 2=Timed 3=Not enabled
3101 Circuit C1 Stata	1112	Comp.2 status	0=Free 1=Active 2=Timed 3=Not enabled
3101 Circuit C1 Stata	1113	Comp.3 status	0=Free 1=Active 2=Timed 3=Not enabled
3101 Circuit C1 Stata	1114	Current cap.	Capacity currently employed on the circuit
3101 Circuit C1 Stata	1115	Requested cap.	Capacity requested on the circuit
3101 Circuit C1 Stata	1116	Pressure ratio	Compression ratio status (1+Hp/1+LP)
3101 Circuit C1 Stata	1117	FANPreAlarm	Status of the maximum ventilation pre-alarm in progress 0=Off 1=On
3101 Circuit C1 Stata	1118	Defrost delay	Current value of the countdown towards the cycle inversion due to defrosting. (defrosting starts when the value reaches zero)
3101 Circuit C1 Stata	1119	Defrost status	Indicates the defrosting status 0=DfrOff (Cycle inversion phase for defrosting phase NOT active) 1=DfrON (Cycle inversion phase for defrosting phase ACTIVE)
3101 Circuit C1 Stata	1120	HWErr	0=Off 1=On_Hardware error of the POL94U module that does not preclude the possibility of moving the valve or closing it. Possible causes: anomalous voltage values in the valve motor
3101 Circuit C1 Stata	1121	BlckingHWErr	0=Off 1=On_Hardware error of the POL94U module that prevents the electronic valve from moving. Possible causes: UPS not available, wrong POL94U Bios, HW POL94U Error, Disconnected EEV Motor, calibration error associated with configuration parameters.
3101 Circuit C1 Stata	1122	FailSafeSta	0=Off 1=On_Active block status
3101 Circuit C1 Stata	1123	UPSNotAval	0=Off 1=On_UPS failure
3101 Circuit C1 Stata	1124	CircWarning	Status associated with minor alarm on the circuit
3101 Circuit C1 Stata	1125	CircBlock	Status associated with circuit block alarm
3101 Circuit C1 Stata	1126	ThTempDischarge	Theoretical discharge temperature
3102 Circuit C1 -IO Stata	-	T.DischargeC1_B1:AI-985	Compressor 1 discharge temperature

STATA - TAB 4

MENU	ID	Short description	Description
3102 Circuit C1 -IO Stata	-	T.DischargeC2_B2:AI-985	Compressor 2 discharge temperature
3102 Circuit C1 -IO Stata	-	T.DischargeC3_X2:AI-985	Compressor 3 discharge temperature
3102 Circuit C1 -IO Stata	-	T.Source1_B3:AI-985	Source 1 temperature (for machines with reversible air source on gas = Probe 1 on the source coil. For machines with water source = Source input probe)
3102 Circuit C1 -IO Stata	-	T.Source2_X1:AI-985	Source 2 temperature (for machines with reversible air source on gas = Probe 2 on the source coil. For machines with water source = Source output probe)
3102 Circuit C1 -IO Stata	-	T.Suction_X2:AI-94U	Intake temperature
3102 Circuit C1 -IO Stata	-	DemandLimit_X2:AI-985	Analogue input for demand limit function
3102 Circuit C1 -IO Stata	-	P.Discharge_X3:AI-985	High pressure transducer
3102 Circuit C1 -IO Stata	-	P.Suction_X1:AI-94U	Low pressure transducer
3102 Circuit C1 -IO Stata	-	Ovl Cmp1_D1:DI-985	0=Fault 1=OK Status of the thermal protection contact of compressor 1
3102 Circuit C1 -IO Stata	-	Ovl Cmp2_D2:DI-985	0=Fault 1=OK Status of the thermal protection contact of compressor 2
3102 Circuit C1 -IO Stata	-	Ovl Cmp3_D3:DI-985	0=Fault 1=OK Status of the thermal protection contact of compressor 3
3102 Circuit C1 -IO Stata	-	SourceFlow_X4:DI-985	0=Fault 1=OK Status of the source flow contact (Active only on machines with water source)
3102 Circuit C1 -IO Stata	-	LP_X7:DI-985	0=Fault 1=OK Status of the low-pressure pressure switch contact
3102 Circuit C1 -IO Stata	-	Cmprtmnt opening_DL1:DI-985	0=Fault 1=OK Status of the machine compartments opening contact
3102 Circuit C1 -IO Stata	-	HP_X8:DI-985	0=Fault 1=OK Status of the high-pressure pressure switch contact
3102 Circuit C1 -IO Stata	-	Ovl Source_DL2:DI-985	0=Fault 1=OK Status of the thermal protection contact of the source motors
3102 Circuit C1 -IO Stata	-	ElectFilter_X5:DI-985	0=Fault 1=OK Status of the electrostatic filters' protection contact
3102 Circuit C1 -IO Stata	-	%Cmd Source_X6:AO-985	Percentage value of the status of the control signal of the modulating source motor_X6:AO-985
3102 Circuit C1 -IO Stata	-	Cmd Cmp1_Q2:DO-985	0=Off 1=On_Status of compressor 1 control_Q2:DO-985
3102 Circuit C1 -IO Stata	-	Cmd Cmp2_Q3:DO-985	0=Off 1=On_Status of compressor 2 control_Q3:DO-985
3102 Circuit C1 -IO Stata	-	Cmd Cmp3_Q4:DO-985	0=Off 1=On_Status of compressor 3 control_Q4:DO-985
3102 Circuit C1 -IO Stata	-	Cmd Sorg_Q1:DO-985	0=Off 1=On_Status of source motor control_Q1:DO-985
3102 Circuit C1 -IO Stata	-	Cmd Inj.Cmp1_Q5:DO-985	0=Off 1=On_Status of the compressor 1 liquid injection valve_Q5:DO-985
3102 Circuit C1 -IO Stata	-	Cmd Inj.Cmp2_Q7:DO-985	0=Off 1=On_Status of compressor 2 liquid injection valve_Q7:DO-985
3102 Circuit C1 -IO Stata	-	Cmd Inj.Cmp3_Q8:DO-985	0=Off 1=On_Status of compressor 3 liquid injection valve_Q8:DO-985
3102 Circuit C1 -IO Stata	-	Cmd YV4 vie_Q6:DO-985	0=Off 1=On_Status of control of the cycle inversion valve_Q6:DO-985
3102 Circuit C1 -IO Stata	-	Cmd Digital_DO2:DO-985	0=Off 1=On_Status of button valve control for PWM compressors_DO2:DO-985
3200 Thermostatic C1 Stata	1200	SHSpOp	Operating overheating setpoint net with SH and MET adjustments
3200 Thermostatic C1 Stata	1201	AlCalSuctSprHtP	Current overheating value calculated
3200 Thermostatic C1 Stata	1202	ECVState	0 = Idle 1 = ECVAlarm 2 = FailSafe 3 = Referencing 4 = Positioning 5 = Positioned 6 = ECVWaiting 7 = FastClosing
3200 Thermostatic C1 Stata	1203	EEVSH_Limiter	Maximum valve opening determined by the minimum SH control function
3200 Thermostatic C1 Stata	1204	EEVLET_Limiter	Status of the minimum LET intake temperature control

STATA - TAB 5

MENU	ID	Short description	Description
3200 Thermostatic C1 Stata	1205	EEVMode	0=Idle (motor off) 1=Init (valve initialised when completely closed) 2=Manual (valve controlled in manual mode) 3=Control (the valve conducts adjustments to control SH)
3200 Thermostatic C1 Stata	1206	Prepos	Positioning % required for thermostatics
3200 Thermostatic C1 Stata	1207	ECVSetPos	Opening percentage of the valve when EEVMod = Manual
3200 Thermostatic C1 Stata	1208	ECVMode	0 = Idle 1 = Init 2 = Position 3 = FastClose
3200 Thermostatic C1 Stata	1209	SHPIDOut	% value of the PID output to adjust the valve
3200 Thermostatic C1 Stata	1210	EEVStatus	0 - Closed (Ready) 1 - StartUpPositioning 2 - StartUpPositioned 3 - SuperHeat 4 - Prepositioning 5 - MET 6 - LET 7 - Closing 8 - PumpDown 9 - DangAlarm 10 - PumpDownStartUp 11 - ECVAlarm 12 - MinSHLmtr 13 - WaitValveClose 255 - Warning
3200 Thermostatic C1 Stata	1211	SetPosSteps	Control of the number of steps the valve must reach to adjust overheating
3200 Thermostatic C1 Stata	1212	SetPos%	Opening % control of the valve to adjust overheating
3200 Thermostatic C1 Stata	1213	Pol94xCommOK	0=NotOK 1=OK_Connection status of the POL94U module on processbus
3200 Thermostatic C1 Stata	1214	ActPos%	% value of the current status of the EEV valve
3200 Thermostatic C1 Stata	1215	ActPosSteps	Current number of steps of the EEV valve
3200 Thermostatic C1 Stata	1216	ECVMode	0 = Idle 1 = Init 2 = Position 3 = FastClose.
3200 Thermostatic C1 Stata	1217	ECVState	0 = Idle 1 = ECVAlarm 2 = FailSafe 3 = Referencing 4 = Positioning 5 = Positioned 6 = ECVWaiting 7 = FastClosing
3201 Thermostatic C2 Stata	2200	SHSpOp	Operating overheating setpoint net of SH and MET corrections
3201 Thermostatic C2 Stata	2201	AICalSuctSprHtP	Current overheating value calculated
3201 Thermostatic C2 Stata	2202	ECVState	0 = Idle 1 = ECVAlarm 2 = FailSafe 3 = Referencing 4 = Positioning 5 = Positioned 6 = ECVWaiting 7 = FastClosing
3201 Thermostatic C2 Stata	2203	EEVSH_Limiter	Maximum valve opening determined by the minimum SH control function
3201 Thermostatic C2 Stata	2204	EEVLET_Limiter	Status of the LET minimum intake temperature control
3201 Thermostatic C2 Stata	2205	EEVMode	0=Idle (motor off) 1=Init (valve initialised when fully closed) 2=Manual (valve controlled manually) 3=Control (the valve performs adjustments for the SH control)
3201 Thermostatic C2 Stata	2206	Prepos	Positioning in % requested to the thermostatic valve
3201 Thermostatic C2 Stata	2207	ECVSetPos	Opening percentage of the valve when EEVMod = Manual
3201 Thermostatic C2 Stata	2208	ECVMode	0 = Idle 1 = Init 2 = Position 3 = FastClose
3201 Thermostatic C2 Stata	2209	SHPIDOut	% value of the PID output to adjust the valve
3201 Thermostatic C2 Stata	2210	EEVStatus	0 - Closed (Ready) 1 - StartUpPositioning 2 - StartUpPositioned 3 - SuperHeat 4 - Prepositioning 5 - MET 6 - LET 7 - Closing 8 - PumpDown 9 - DangAlarm 10 - PumpDownStartUp 11 - ECVAlarm 12 - MinSHLmtr 13 - WaitValveClose 255 - Warning
3201 Thermostatic C2 Stata	2211	SetPosSteps	Control associated with the number of steps that the valve needs to reach to adjust overheating
3201 Thermostatic C2 Stata	2212	SetPos%	Opening % control of the valve to adjust overheating
3201 Thermostatic C2 Stata	2213	Pol94xCommOK	0=NotOK 1=OK_Connection status of the POL94U module on processbus
3201 Thermostatic C2 Stata	2214	ActPos%	% value of the current status of the EEV valve
3201 Thermostatic C2 Stata	2215	ActPosSteps	Current number of steps of the EEV valve
3201 Thermostatic C2 Stata	2216	ECVMode	0 = Idle 1 = Init 2 = Position 3 = FastClose.

STATA - TAB 6

MENU	ID	Short description	Description
3201 Thermostatic C2 Stata	2217	ECVState	0 = Idle 1 = ECVAlarm 2 = FailSafe 3 = Referencing 4 = Positioning 5 = Positioned 6 = ECVWaiting 7 = FastClosing
4300 ModBus	750	ModBusBios	Bios version of the ModBus RTU expansion module
4301 BacNet	700	BacnetIPModul	Relative status with the Bacnet module 0=Absent 1 = Present
4301 BacNet	701	BacnetIPState	0=Null 1=Init 2=OK
4301 BacNet	702	BacnetCnf	0=NotOK 1=OK (se Current IP = Set IP, Current MASK = Set MASK, Current DHCP= Set DHCP allora OK)
4301 BacNet	703	BacNetBios	Versione bios del modulo espansione BacNet
4302 LonWorks	800	LonID	Universal identification status of the Lon device
4302 LonWorks	801	LonState	Status of the Lon node
4302 LonWorks	802	LonBios	Versione bios del modulo espansione LonWorks
3004 Expansion POL925 - IO	-	Input 1 X4 - DIPOL687	ExFlow option input 1 status
3004 Expansion POL925 - IO	-	Input 2 DI1 - DIPOL926 (1)	ExFlow option input 2 status
3004 Expansion POL925 - IO	-	Input 3 DI2 - DIPOL926 (1)	ExFlow option input 3 status
3004 Expansion POL925 - IO	-	Input 4 DI3 - DIPOL926 (1)	ExFlow option input 4 status
3004 Expansion POL925 - IO	-	Input 5 DI4 - DIPOL926 (1)	ExFlow option input 5 status
3004 Expansion POL925 - IO	-	Input 6 DI1 - DIPOL926 (2)	ExFlow option input 6 status
3004 Expansion POL925 - IO	-	Input 7 DI2 - DIPOL926 (2)	ExFlow option input 7 status
3004 Expansion POL925 - IO	-	Input 8 DI3 - DIPOL925 (2)	ExFlow option input 8 status
3004 Expansion POL925 - IO	-	Input 9 DI4 - DIPOL925 (2)	ExFlow option input 9 status

Recommended periodical checks sheet

Checks carried out on…………………........by……………………………...………….company…...............……………………………………………….

√	intervention frequency (months)	1	6	12
□	presence corrosion			●
□	panel fixing			●
□	fans fixing		●	
□	coil cleaning		●	
□	bowl cleaning + sanitisation		●	
□	outflow test		●	
□	air filters cleaning/inspection	●		
□	air flow rate measurement			●
□	channelling: anti-vibration devices and fastenings check			●
□	power supply cable isolation and fastening check			●
□	earth cable check			●
□	electric control board cleaning			●
□	power remote controls state			●
□	clamps closure, cables isolation integrity			●
□	phases unbalancing and power supply voltage (vacuum and loaded)		●	
□	absorption of the individual electric loads		●	
□	compressors carter heaters test		●	
□	leaks control *			●
□	cooling circuit work parameters detection		●	
□	protective equipment test: safety valves, pressure switches, thermostats, flow meters, etc.		●	
□	protective equipment test: setpoint, climatic compensations, power slicing, air flow rate variations		●	
□	control devices test: alarms signal, thermometers, probes, pressure gauges, etc.		●	
□	electrical heaters check - option			●
□	water coil check - option			●

Notes/interventions recommended to Owner

*European regulation 303/2008:

Refer to the local implemented standards; in synthesis and for merely indicative purposes, the regulation prescribes the following.

Companies and technicians carrying out installation, maintenance/repair interventions, leaks check and recovery must be CERTIFIED as foreseen by the local standards.

The leaks check must be carried out on a yearly basis

9.1 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

9.2 Frequency of interventions

Frequency of the inspections must be at least six-monthly However, frequency depends on the type of use.

- heavy (continuous or highly intermittent, near to operation limits, etc.)
- critical (essential service).

9.3 Machine schedule

Foresee a machine schedule to keep trace of the interventions made on the unit.

In this way, it will be easier to adequately schedule the various interventions and facilitate any troubleshooting.

On the schedule note:

- date
- type of intervention made
- description of intervention
- measurements taken, etc. .

9.4 Stand-by

If foreseen a long period of inactivity:

- disconnect voltage to avoid electric risks or damages following lightning
- prevent the risk of freezing (empty or glycol the sections of the system exposed to negative temperatures, keep any antifreeze heaters powered)

It is advised that start-up after a period of inactivity be carried out by a qualified technician, in particular after seasonal stops or for seasonal switch-over.

Upon start-up, follow that indicated in the START-UP section.

Plan in advance the technician intervention to prevent misunderstandings and be able to use the system when required

9.5 Voltages

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.

9.6 Structure
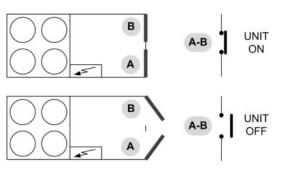
Check the state of the parts constituting the structure.

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.

9.7 Closed panels switch

A standard   B Electronic filters option

9.8 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.
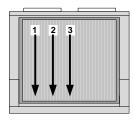
Clean the air inlet side.
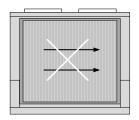
Use a soft brush or aspirator or pressurised air jet or high-pressure water jet machine.

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.

9.9 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.

9.10 Condense collection bowl

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.

9.11 H10 Electronic filters - option

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

(1) Connettore di alimentazione CA (2) Connettore di giunzione OG (3) Connettore terminale CT
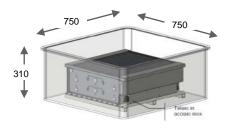
MATERIALS NECESSARY FOR MAINTENANCE

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.

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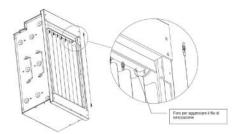
The impurities can determine oxidation or scaling on the wires, which can be removed using a cloth soaked in alcohol or an abrasive scourer with very fine grain.

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.

9.12 F7 filters - option

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

1. 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)

9.13 G4 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

9.14 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.
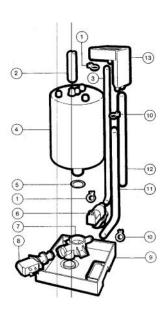
REPLACEMENT OF THE CYLINDER

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

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

9.15 Heater humidifier - option

The duration in time and absence of faults require constant cleaning which periodicity depends on different factors:

concentration of dust in the air, water hardness, type of operation, etc.

When cleaning comply with the following prescriptions: .

1. Close the water shut-off shutter
2. Remove the evaporating heater
3. Remove the casing panel corresponding to the humidifier
4. Remove the water distributor
5. Remove the evaporating heater
6. Was evaporating heater: the evaporating heater can be washed with water against lime deposits, but must be replaced if the deposits are of limescale type
7. Clean the spraying pipe, found on the alveolar distributor, with metal brush and steel points for the small holes
8. Check the water connection pipe is in good conditions, without holes or cuts that may cause water to leak.
9. Wash inside the tank and the various components.
10. Remount the evaporating heaters.
    ATTENTION : The evaporating heaters have a pre-set position to respect the air and water direction , that must be in counter-current.
    The incorrect position jeopardises the good operation and can cause flowing of the water downstream.
11. Upon dehumidifier re-start, check operation again.

9.16 Electrical heaters - option

Check :
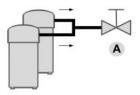
*   cleaning state
*   fastening
*   presence of corrosion

9.17 Compressor crankcase heaters

Periodically check the fixing.

9.18 Compressor supply line shut-off valve

Only if present

A. Supply line shut-off valve

⚠ **CAUTION!**

Do not remove the seal

Remove only if authorized by the manufacturer.

Please contact the maker for informations.

10.1 Disconnection

The disconnection operations must be carried out by qualified technicians.

- Avoid pouring or leaking in room.
- Before disconnecting the unit recover, if present: :
    - the coolant gas
    - solutions to be cooled present inside the hydraulic circuits
- While awaiting dismantling and disposal, the unit can be stored, even outdoor, as bad weather and temperature changes do not cause damaging effects for the environment, as long as the unit has the electric, cooling and hydraulic circuits intact and closed.

10.2 Dismantling

FOR DISMANTLING AND DISPOSING THE UNIT MUST ALWAYS BE DELIVERED TO AUTHORISED CENTRES.

During dismantling, the fan, the motor and the coil, if working, may be recovered by the specialised centres for an eventual reuse.

All materials must be recovered or disposed or in compliance with the relative national standards in force.

For further information on the dismissal of the unit, contact the manufacturing company.

10.3 EC WEEE Directive

The units falling within the standard in question are marked with the symbol at the side.

With a view of respecting the environment, our units are manufactured in accordance with EC Directive on waste electric and electronic equipment (WEEE).

The potential effects on the environment and on personal health, due to the presence of dangerous substances, are reported inside the use and maintenance manual, in the residue risks section.

If necessary, additional information to that listed below can be requested from the manufacturer/distributor/importer, as responsible for the collection/treatment of waste deriving from equipment contemplated by EC - WEEE, and the dealer from where the equipment was purchased or the local services in charge of waste collection.

The EC-WEEE Directive foresees that the disposal and recycling of electric and electronic equipment, indicated therein, are compulsorily managed through appropriate collection, in adequate centres, separate to that used for the disposal of mixed urban waste.

The user must not dispose of the equipment at the end of its life-span, as urban waste, but convey it to appropriate collection centres, as foreseen by the current standards or indicated by the distributor.

Generality

The most common situations, as they cannot be controlled by the manufacturer, that may give rise to risk situations for things or persons are found in this section.

Dangerous area

It is the area in which only an authorised operator can act. The dangerous area is the area inside the unit, accessible only via removal of the cowling or parts of it.

Handling

The handling operations, if carried out without all the necessary safety devices and without the due caution, can cause the falling or overturning of the unit with consequent damages, even serious, to things, persons and the unit itself.

Handle the unit following the instructions on the packaging, in this manual and according to the local standards in force.

In case of coolant gas leak, refer to the coolant "Safety sheet".

Installation

An incorrect installation of the unit can cause water leaks, condense storage coolant leaks, electric shocks, fires, malfunctioning or damages to the unit itself.

Check installation is carried out only by qualified technical personnel and that the instructions in this manual and the local standards in force are complied with.

The unit installation in a place where, even occasionally, the flammable gas leaks and consequent storage of these gases in the area around the unit itself, can cause explosions and fires.

Installation of the unit in an unsuitable place to support the weight and/or guarantee an adequate anchoring, can cause the falling and/or overturning, with consequent damages to things, persons or the unit itself.

Carefully check positioning and anchoring of the unit.

The easy access to the unit by children, unauthorised persons or animals, may give rise to accidents and injuries, even serious.

Install the unit in places accessible only by authorised personnel and/or foresee protections against intrusions in the dangerous area.

General risks

Burnt odour, smoke or other signs of serious anomalies may show the arising of situations that can cause damages to things, persons or the unit itself.

Electrically isolate the unit (yellow-red isolator).

Contact the after-sales authorised assistance centre to identify and resolve the problem at origin of the anomaly.

The accidental contact with exchange coils, compressors, supply piping or other components can cause injuries and/or burns.

Always wear adequate clothing that includes protective gloves for operations inside the dangerous area.

Maintenance and repair operations carried out by unqualified personnel can cause damages to things, persons or the unit itself.

Always contact a qualified after-sales assistance centre.

The lack in closing the unit panels, or lack in checking the correct fastening of all fastening screws of the panelling, can cause damages to things, persons or the unit itself.

Periodically check closing of all panels and their correct fastening.

In the event of fire, the coolant temperature can reach values such to bring the pressure over the safety value, with consequent possible projection of coolant or explosions of the circuit that remain isolated from closure of the cocks.

Do not stand near the safety valve and never leave the cooling system cocks closed.

Electrical part

An incomplete connection line to the electric mains and/or with incorrectly dimensioned cables, and/or with inadequate protective equipment, can cause electric shocks, intoxication, damages to the unit or fires.

Carry out all work on the electric system with reference to the wiring diagram and this manual, assuring use of a dedicated system.

An incorrect fastening of the lid of the electric components can favour entry of dust, water, etc. inside and consequently cause electric shocks, damages to the unit or fires.

Always securely fasten the lid to the unit.

The metal masses of the unit, when powered and not correctly connected to the earth system, can cause electric shocks or death for electrocution.

Carefully execute connection to the earth system.

Contact with the accessible powered parts inside the unit after the removal of guards can cause electric shocks, burns or death for electrocution.

Open and padlock the main isolator before removing the guards and signal the works in progress with relative sign.

Contact with parts that may power due to unit start-up, can cause electric shocks, burns or death for electrocution.

When not necessary.

Moving parts

Contact with the transmissions or suction of the fans can cause injuries.

Before accessing inside the unit, open the isolator on the unit connection line, padlock it and expose appropriate sign.

Contact with the fans can cause injuries.

Before removing the protective grilles or fans, open the isolator on the unit connection line, padlock it and expose relative sign.

Coolant

The intervention of the safety valves and the consequent coolant gas expulsion can cause injuries and intoxication. Always wear adequate clothing and protective goggles for operations inside the dangerous area.

In case of coolant gas leak, refer to the coolant "Safety sheet".

Contact between naked flames or sources of heat with coolant, or the heating of the pressurised gas circuit (e.g. during welding), can cause explosions or fires.

Do not place any source of heat inside the dangerous area.

The maintenance or repair interventions requiring welding must be done with system drained.

Hydraulic part

Defects in the piping, in the connections or in the shut-off parts, can cause water leaks or projections, with consequent damages to things or short circuits of the unit.

STANDARD AIRFLOW

General technical data

Size				49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
Cooling											
Cooling capacity	CAK	1	kW	154.6	164.6	195.0	213.0	245.2	297.3	311.9	333.6
Sensible capacity			kW	116.3	124.3	143.6	164.2	184.2	222.8	234.7	246.0
Compressor power input		1	kW	40.9	45.0	49.9	58.4	64.7	75.7	84.1	94.7
EER		1		3.78	3.66	3.91	3.64	3.79	3.93	3.71	3.52
Cooling capacity	CBK	2	kW	161.2	171.3	202.9	223.2	257.6	310.1	328.2	346.8
Sensible capacity		2	kW	119.4	128.6	148.7	167.3	187.8	229.3	238.0	253.8
Compressor power input		2	kW	41.5	45.5	50.6	59.5	65.5	76.8	85.7	96.2
EER		2		3.88	3.76	4.01	3.75	3.93	4.04	3.83	3.60
Cooling capacity	CCK	3	kW	164.2	175.1	206.0	227.1	262.5	314.7	333.2	353.0
Sensible capacity		3	kW	121.2	130.7	150.2	169.0	190.3	231.9	240.8	256.9
Compressor power input		3	kW	40.2	43.9	49.4	58.1	63.6	74.9	83.5	93.6
EER		3		4.08	3.99	4.17	3.91	4.13	4.20	3.99	3.77
Cooling capacity	CCKP	3	kW	174.9	185.9	220.2	242.1	279.5	336.4	356.0	376.2
Sensible capacity		3	kW	128.7	138.6	160.2	180.3	202.4	247.1	256.5	273.6
Compressor power input		3	kW	41.1	45.1	50.1	59.0	65.1	76.4	85.1	95.3
EER		3		4.26	4.12	4.40	4.10	4.29	4.40	4.18	3.95
Heating											
Heating capacity	CAK	1	kW	161.1	171.9	198.9	220.6	255.1	302.1	323.1	350.0
ompressor power input		1	kW	34.4	36.9	42.5	48.6	55.4	64.8	69.9	79.2
COP		1		4.68	4.66	4.68	4.54	4.60	4.66	4.62	4.42
Heating capacity	CBK	2	kW	163.5	174.3	202.5	223.7	258.9	306.2	327.4	354.5
ompressor power input		2	kW	31.7	33.8	39.0	44.8	51.3	60.1	65.1	72.6
COP		2		5.16	5.16	5.19	4.99	5.05	5.09	5.03	4.88
Heating capacity	CCK	3	kW	167.8	179.3	206.4	228.7	265.4	311.7	333.4	361.9
ompressor power input		3	kW	32.1	34.2	39.4	45.4	51.9	61.1	65.8	73.6
COP		3		5.23	5.24	5.24	5.04	5.11	5.10	5.07	4.92
Heating capacity	CCKP	3	kW	176.3	186.6	218.3	241.2	279.1	330.1	353.0	382.2
ompressor power input		3	kW	32.8	36.5	40.3	46.3	53.0	62.1	67.3	75.0
COP		3	kW	5.38	5.11	5.42	5.21	5.27	5.32	5.25	5.10
THOR recovery efficiency		4	%	91	88	94	93	87	84	84	85
Compressor											
Type of compressors		5		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors			Nr	4	4	4	4	4	4	4	4
Std Capacity control steps			Nr	6	6	4	6	6	6	6	6
Refrigeration circuits			Nr	2	2	2	2	2	2	2	2
Air Handling Section Fans (Supply)											
Type of supply fan		6		RAD	RAD	RAD	RAD	RAD	RAD	RAD	RAD
No. of supply fans			Nr	3	3	4	4	4	6	6	6
Fan diameter			mm	560	560	560	560	560	560	560	560
Supply airflow			m³/h	26000	29000	33000	37000	44000	51000	56000	60000
Supply airflow			l/s	7222	8056	9167	10278	12222	14167	15556	16667
Installed unit power			kW	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90
Max. static pressure supply fan		7	Pa	630	540	660	570	360	620	540	460

Performances in cooling: Indoor air temp. 27°C/19°C W.B. Entering external exchanger air temperature 35°C D.B./24°C W.B. EER referred only to compressors
Performance in Heating: Indoor air temp. 20°C D.B./12°C W.B. entering air to the external exchanger 7°C/6°C W.B. COP referred only to compressors
1. Performance refers to operation at full re-circulation
2. Performance with 30% of outdoor air
3. Performance with 30% of outdoor air including the energy recovery on the exhaust air

4. Energy recovery efficiency determinated on the exhaust air. Indoor temperature 20°C D.B./12°C W.B., outdoor temperature 7°C D.B./6°C W.B.
5. SCROLL = scroll compressor
6. RAD = radial fan electronically controlled
7. Net outside static pressure to win the outlet and intake onboard pressure drops
8. Configuration with double fan section for recirculation, fresh air, exhaust, thermodynamic recovery (CCK) and configuration with double fan section with fresh air and THOR thermodynamic recovery (CCKP)
9. AX = axial fan

Size				49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
Fans (Exhaust) (only CCK, CCKP-THOR configuration)											
Type of fans	6			RAD	RAD	RAD	RAD	RAD	RAD	RAD	RAD
No. of fans	8			2	2	2	2	2	2	2	2
Installed unit power	8	kW		2.60	2.60	2.70	2.70	2.70	2.70	2.70	2.70
External Section Fans											
Type of fans	9			AX	AX	AX	AX	AX	AX	AX	AX
No. of fans			Nr	2	2	4	4	4	6	6	6
Standard airflow			l/s	12500	12500	23333	23333	23333	35000	35000	35000
Single power input			kW	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Connections											
Condensate drain			mm	30	30	30	30	30	30	30	30
Power supply											
Standard power supply			V	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50

Performances in cooling: Indoor air temp. 27°C/19°C W.B. Entering external exchanger air temperature 35°C D.B./24°C W.B. EER referred only to compressors

Performance in Heating: Indoor air temp. 20°C D.B./12°C W.B. entering air to the external exchanger 7°C/6°C W.B. COP referred only to compressors

1. Performance refers to operation at full re-circulation
2. Performance with 30% of outdoor air
3. Performance with 30% of outdoor air including the energy recovery on the exhaust air

4. Energy recovery efficiency determinated on the exhaust air. Indoor temperature 20°C D.B./12°C W.B., outdoor temperature 7°C D.B./6°C W.B.
5. SCROLL = scroll compressor
6. RAD = radial fan electronically controlled
7. Net outside static pressure to win the outlet and intake onboard pressure drops
8. Configuration with double fan section for recirculation, fresh air, exhaust, thermodynamic recovery (CCK) and configuration with double fan section with fresh air and THOR thermodynamic recovery (CCKP)
9. AX = axial fan

Sound levels
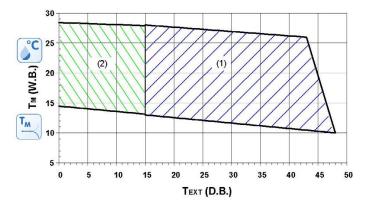
Size	Sound Power [dB] Octave band (Hz)								Sound pressure level [dB(A)]	Sound power level [dB(A)]
	63	125	250	500	1000	2000	4000	8000		
49.4	99	95	98	88	84	75	70	67	72	92
54.4	101	95	95	90	87	78	74	72	72	92
60.4	105	95	95	91	86	80	75	73	72	93
70.4	106	96	95	92	88	83	77	75	73	94
80.4	106	97	96	93	89	82	77	75	74	95
90.4	107	101	100	94	92	85	79	78	76	97
100.4	108	102	101	95	93	86	80	79	77	98
110.4	109	103	102	96	94	87	81	80	78	99

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)

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.

1.

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 outdoor air, always calculate the Tm mixing temperature at the internal heat exchanger input.

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

Text = inlet air temperature in the external exchanger
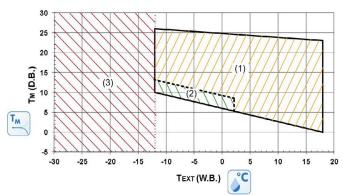dry bulb measured temperature (D.B.=DRY BULB)
1. Standard operating range

2. Operation range of the unit in FREE-COOLING mode or with automatic distribution of the outdoor ventilation

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 outdoor air, always calculate the Tm mixing temperature at the internal heat exchanger input.

Tm = internal exchanger entering air temperature
dry bulb measured temperature (D.B.=DRY BULB)

Text = inlet air temperature in the external exchanger
temperature measured with wet bulb (W.B.=WET BULB)
1. Operation range at full load

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

3. Operation range of the unit equipped with "application for low outdoor temperature" and "hot water coil" or "gas heating module" options. The heat pump circuit is not active.
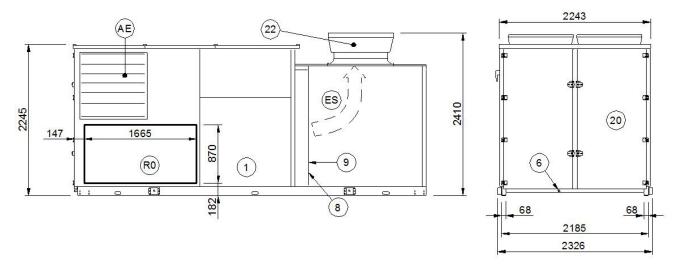
In extended operating mode, in heat pump operation with an outdoor air temperature of less than 6°C, the unit performs defrosts by reversing the cycle, activating one circuit at a time and maintaining the ventilation active to eliminate the ice that forms on the surfaces of the outside exchanger. In 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 –30°C install the following options: hot water coil or gas heating module and outdoor air low temperature configuration

Dimensional drawings

Size 49.4 - 54.4

1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 1" 1/2
9. Water heating coil outlet Ø 1" 1/2
10. Reheat coil (optional)
11. Treatment coil
12. water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters

15. Electric fan (supply - return)
16. Exhaust electric fan (CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)

(R0) Horizontal air return
(R3) Downflow return (optional)
(M0) Horizontal air supply
(M3) Downflow supply (optional)
(M5) Upflow supply(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

Size		49.4			54.4		
Configuration	kg	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP
W1 Supporting point	kg	427	449	468	490	512	531
W2 Supporting point	kg	383	403	420	440	460	477
W3 Supporting point	kg	317	334	348	364	381	395
W4 Supporting point	kg	317	334	348	364	381	395
W5 Supporting point	kg	350	369	384	402	420	436
W6 Supporting point	kg	394	415	432	452	473	490
Operating weight	kg	2189	2304	2400	2512	2628	2724
Shipping weight	kg	2189	2304	2400	2512	2628	2724

The presence of optional accessories may result in a substantial variation of the weights shown in the table.
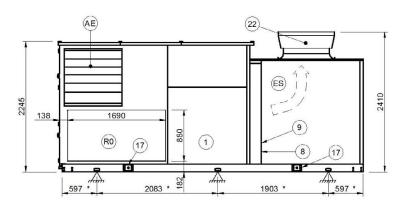
Size 49.4 - 54.4
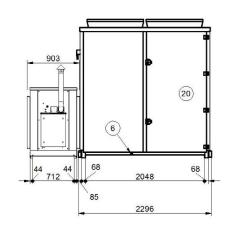
DAA7V49 4_54 4_03
Date: 29/09/2014

Sez A-A

Size 49.4 - 54.4 Combustion module

Single chamber (GC09X 65 kW - GC10X 82 kW - GC11X 100 kW)
(GD14X 74kW - GD15X 100 kW)

1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 1" 1/2
9. Water heating coil outlet Ø 1" 1/2
10. Reheat coil (optional)
11. Treatment coil
12. Water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters

15. Electric fan (supply - return)
16. Exhaust electric fan (CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)
23. Gas module (to be connected to the unit during installation)

(R0) Horizontal air return
(R3) Downflow return (optional)
(M0) Horizontal air supply
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
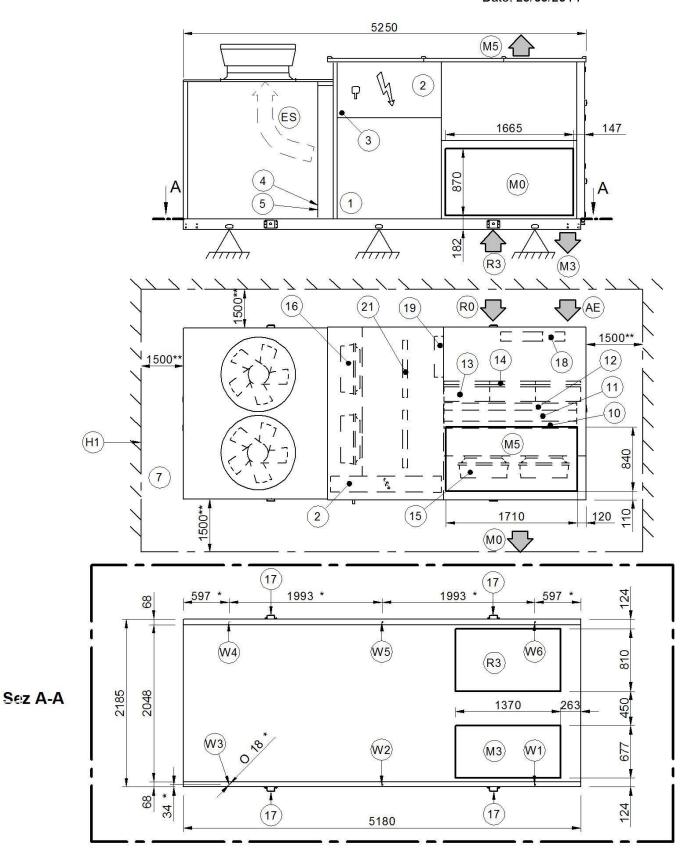(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

Size		49.4			54.4		
Configuration	kg	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP
W1 Supporting point	kg	427	449	468	490	512	531
W2 Supporting point	kg	383	403	420	440	460	477
W3 Supporting point	kg	317	334	348	364	381	395
W4 Supporting point	kg	317	334	348	364	381	395
W5 Supporting point	kg	350	369	384	402	420	436
W6 Supporting point	kg	394	415	432	452	473	490
Operating weight	kg	2189	2304	2400	2512	2628	2724
Shipping weight	kg	2189	2304	2400	2512	2628	2724

GAS MODULE WEIGHT DISTRIBUTION

Size		49.4	54.4
W7 Supporting point	kg	75	75
W8 Supporting point	kg	65	65
W9 Supporting point	kg	65	65
W10 Supporting point	kg	75	75
Operating weight	kg	280	280
Shipping weight	kg	280	280

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

Size 49.4 - 54.4 Combustion module
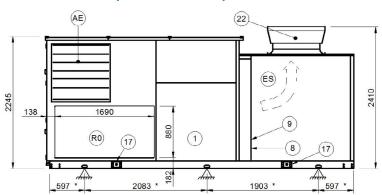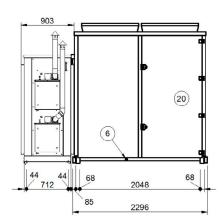
DAA7V49 4_54 4_GC09X_GC11X_00
Date: 04/11/2014

![CLIVET]

Size 49.4 - 54.4 Combustion module

Double chamber (GC12X 130 kW)
(GD16X 147kW)

1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 1" 1/2
9. Water heating coil outlet Ø 1" 1/2
10. Reheat coil (optional)
11. Treatment coil
12. Water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters

15. Electric fan (supply - return)
16. Exhaust electric fan (CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)
23. Gas module (to be connected to the unit during installation)

(R0) Horizontal air return
(R3) Downflow return (optional)
(M0) Horizontal air supply
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

| Size		49.4			54.4		
Configuration	kg	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP
W1 Supporting point	kg	427	449	468	490	512	531
W2 Supporting point	kg	383	403	420	440	460	477
W3 Supporting point	kg	317	334	348	364	381	395
W4 Supporting point	kg	317	334	348	364	381	395
W5 Supporting point	kg	350	369	384	402	420	436
W6 Supporting point	kg	394	415	432	452	473	490
Operating weight	kg	2189	2304	2400	2512	2628	2724
Shipping weight	kg	2189	2304	2400	2512	2628	2724

GAS MODULE WEIGHT DISTRIBUTION

Size		49.4	54.4
W7 Supporting point	kg	100	100
W8 Supporting point	kg	75	75
W9 Supporting point	kg	75	75
W10 Supporting point	kg	100	100
Operating weight	kg	350	350
Shipping weight	kg	350	350

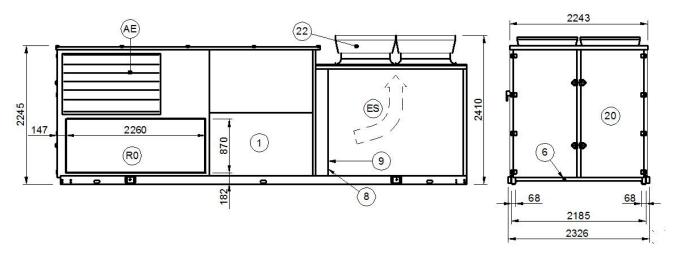The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Size 49.4 - 54.4 Combustion module

DAA7V49 4_54 4_GC12X_00
Date: 04/11/2014

1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 2"
9. Water heating coil outlet Ø 2"
10. Reheat coil (optional)
11. Treatment coil
12. Water heating coil (optional)
13. F7 / Electronic filters (optional)
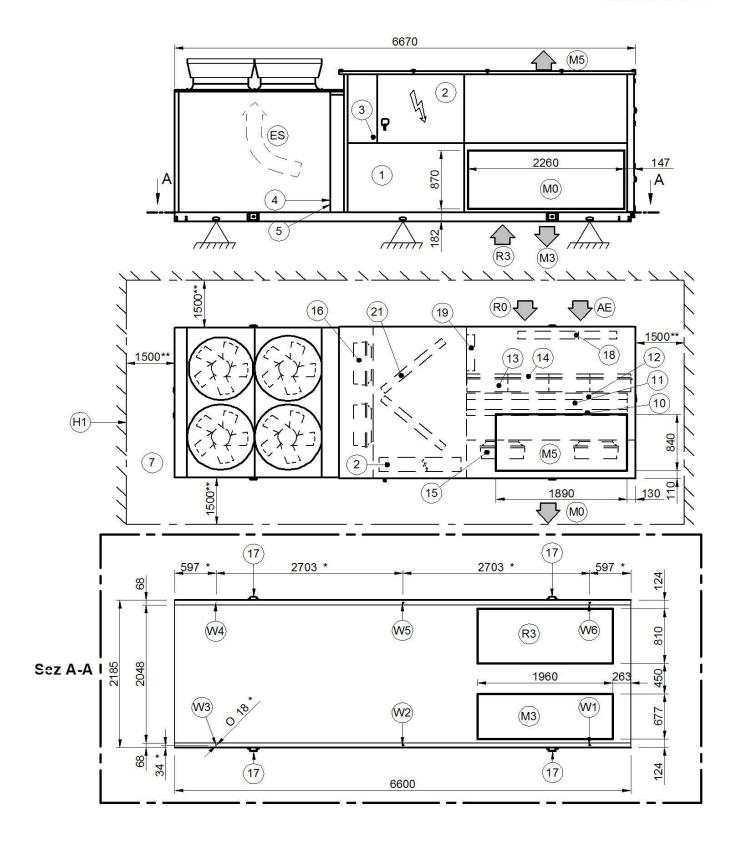14. Standard G4 filters
15. Electric fan (supply - return)

16. Exhaust electric fan (CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)

(R0) Horizontal air return
(R3) Downflow return (optional)
(M0) Horizontal air supply
(M3) Downflow supply (optional)
(M5) Upflow supply
(AE) Outdoor air intake
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

Size		60.4			70.4			80.4		
Configuration	kg	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP
W1 Supporting point	kg	524	554	578	562	591	616	644	674	699
W2 Supporting point	kg	470	497	519	504	530	553	578	605	627
W3 Supporting point	kg	390	412	430	418	440	458	479	501	520
W4 Supporting point	kg	390	412	430	418	440	458	479	501	520
W5 Supporting point	kg	430	454	475	461	485	505	529	553	573
W6 Supporting point	kg	484	511	534	518	546	568	595	622	645
Operating weight	kg	2688	2839	2966	2880	3031	3158	3305	3457	3583
Shipping weight	kg	2688	2839	2966	2880	3031	3158	3305	3457	3583

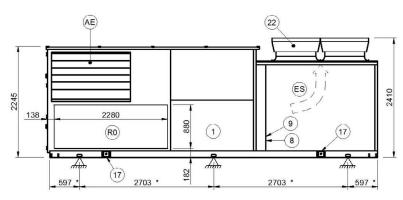The presence of optional accessories may result in a substantial variation of the weights shown in the table.
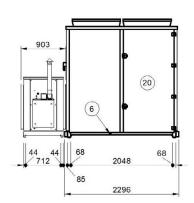
Size 60.4 - 70.4 - 80.4

Sez A-A

Size 60.4 - 70.4 - 80.4 Combustion module

Single chamber (GC10X 82 kW - GC11X 100 kW)
(GD15X 100kW)

1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 2"
9. Water heating coil outlet Ø 2"
10. Reheat coil (optional)
11. Treatment coil
12. Water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters

15. Electric fan (supply - return)
16. Exhaust electric fan (CBK - CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)
23. Gas module (to be connected to the unit during installation)

(R0) Horizontal air return
(R3) Downflow return (optional)
(M0) Horizontal air supply
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

Size		60.4			70.4			80.4		
Configuration	kg	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP
W1 Supporting point	kg	524	554	578	562	591	616	644	674	699
W2 Supporting point	kg	470	497	519	504	530	553	578	605	627
W3 Supporting point	kg	390	412	430	418	440	458	479	501	520
W4 Supporting point	kg	390	412	430	418	440	458	479	501	520
W5 Supporting point	kg	430	454	475	461	485	505	529	553	573
W6 Supporting point	kg	484	511	534	518	546	568	595	622	645
Operating weight	kg	2688	2839	2966	2880	3031	3158	3305	3457	3583
Shipping weight	kg	2688	2839	2966	2880	3031	3158	3305	3457	3583

GAS MODULE WEIGHT DISTRIBUTION

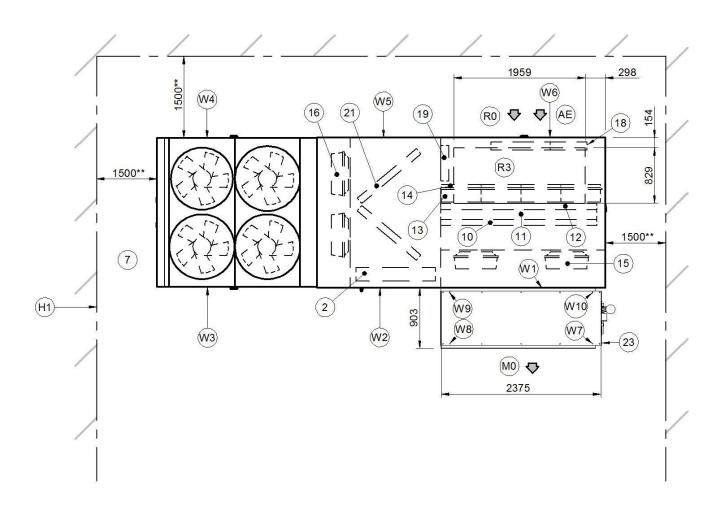| Size		60.4	70.4	80.4
W7 Supporting point	kg	85	85	85
W8 Supporting point	kg	75	75	75
W9 Supporting point	kg	75	75	75
W10 Supporting point	kg	85	85	85
Operating weight	kg	320	320	320
Shipping weight	kg	320	320	320

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

Size 60.4 - 70.4 - 80.4 Combustion module

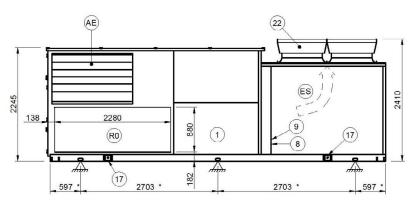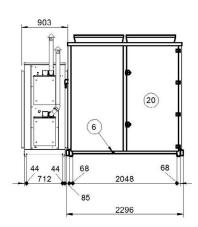**DAA7V60 4_80 4_GC10X_GC11X_00**
Date: 04/11/2014

Size 60.4 - 70.4 - 80.4 Combustion module

Double chamber (GC13X 164 kW - GC06X 200 kW)
(GD16X 147kW - GD17X 200 kW)

1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 2"
9. Water heating coil outlet Ø 2"
10. Reheat coil (optional)
11. Treatment coil
12. Water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters

15. Electric fan (supply - return)
16. Exhaust electric fan (CBK - CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)
23. Gas module (to be connected to the unit during installation)

(R0) Horizontal air return
(R3) Downflow return (optional)
(M0) Horizontal air supply
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

Size		60.4			70.4			80.4		
Configuration	kg	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP
W1 Supporting point	kg	524	554	578	562	591	616	644	674	699
W2 Supporting point	kg	470	497	519	504	530	553	578	605	627
W3 Supporting point	kg	390	412	430	418	440	458	479	501	520
W4 Supporting point	kg	390	412	430	418	440	458	479	501	520
W5 Supporting point	kg	430	454	475	461	485	505	529	553	573
W6 Supporting point	kg	484	511	534	518	546	568	595	622	645
Operating weight	kg	2688	2839	2966	2880	3031	3158	3305	3457	3583
Shipping weight	kg	2688	2839	2966	2880	3031	3158	3305	3457	3583

GAS MODULE WEIGHT DISTRIBUTION

Size		60.4	70.4	80.4
W7 Supporting point	kg	145	145	145
W8 Supporting point	kg	100	100	100
W9 Supporting point	kg	145	145	145
W10 Supporting point	kg	100	100	100
Operating weight	kg	490	490	490
Shipping weight	kg	490	490	490

The presence of optional accessories may result in a substantial variation of the weights shown in the table.
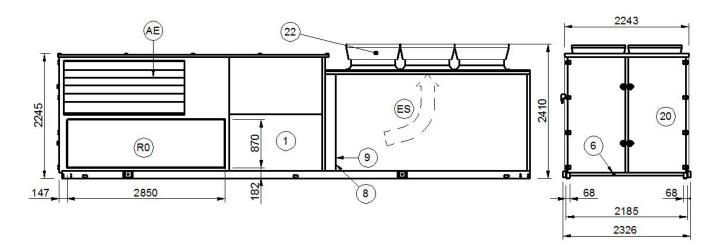
Size 60.4 - 70.4 - 80.4 Combustion module

DAA7V60 4_80 4_GC13X_GC06X_00
Date: 04/11/2014

Size 90.4 - 100.4 - 110.4

1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 2"
9. Water heating coil outlet Ø 2"
10. Reheat coil (optional)
11. Treatment coil
12. Water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters

15. Electric fan (supply - return)
16. Exhaust electric fan (CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)

(R0) Horizontal air return
(R3) Downflow return
(M0) Horizontal air supply
(M3) Downflow supply (optional)
(M5) Upflow supply
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
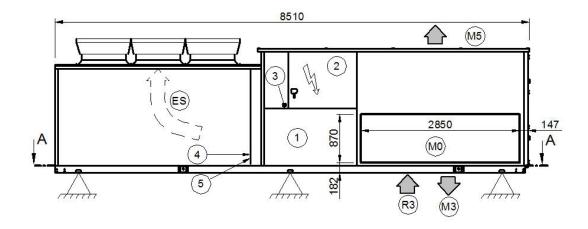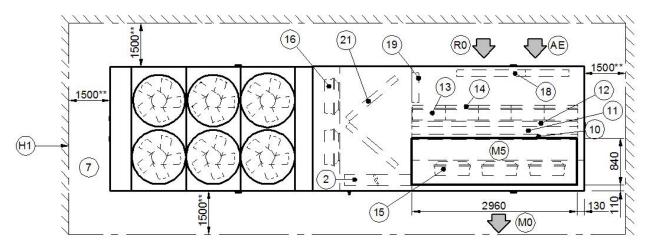(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

Size		90.4			100.4			110.4		
Configuration	kg	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP
W1 Supporting point	kg	669	706	738	717	754	786	822	860	891
W2 Supporting point	kg	600	634	662	643	677	705	738	772	800
W3 Supporting point	kg	497	525	549	533	561	584	611	640	663
W4 Supporting point	kg	497	525	549	533	561	584	611	640	663
W5 Supporting point	kg	549	580	605	588	619	645	675	706	731
W6 Supporting point	kg	617	652	681	661	696	725	759	794	823
Operating weight	kg	3430	3622	3784	3674	3867	4029	4217	4411	4571
Shipping weight	kg	3430	3622	3784	3674	3867	4029	4217	4411	4571

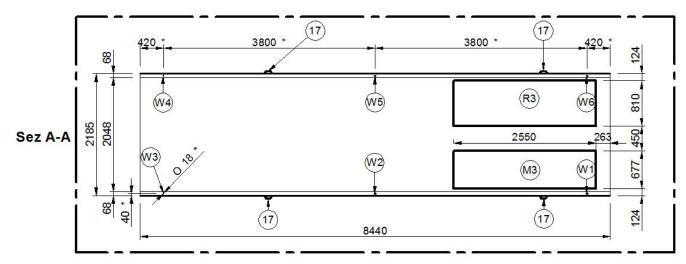The presence of optional accessories may result in a substantial variation of the weights shown in the table.

DAA7V90 4_110 4_03
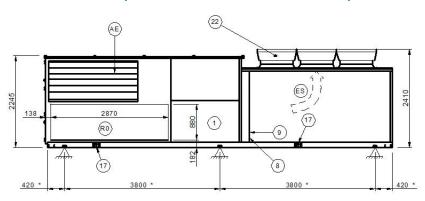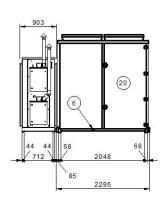Date: 15/04/2016

Sez A-A

Size 90.4 - 100.4 - 110.4 Combustion module

Double chamber (GC12X 130 kW - GC13X 1640 kW - GC06X 200 kW)
(GD16X 147kW - GD17X 200 kW)

1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 2"
9. Water heating coil outlet Ø 2"
10. Reheat coil (optional)
11. Treatment coil
12. Water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters

15. Electric fan (supply - return)
16. Exhaust electric fan (CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)
23. Gas module (to be connected to the unit during installation)

(R0) Horizontal air return
(R3) Downflow return (optional)
(M0) Horizontal air supply
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

Size		90.4			100.4			110.4		
Configuration	kg	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP
W1 supporting point	kg	669	706	738	717	754	786	822	860	891
W2 Supporting point	kg	600	634	662	643	677	705	738	772	800
W3 Supporting point	kg	497	525	549	533	561	584	611	640	663
W4 Supporting point	kg	497	525	549	533	561	584	611	640	663
W5 Supporting point	kg	549	580	605	588	619	645	675	706	731
W6 Supporting point	kg	617	652	681	661	696	725	759	794	823
Operating weight	kg	3430	3622	3784	3674	3867	4029	4217	4411	4571
Shipping weight	kg	3430	3622	3784	3674	3867	4029	4217	4411	4571

GAS MODULE WEIGHT DISTRIBUTION

Size		90.4	100.4	110.4
W7 Supporting point	kg	155	155	155
W8 Supporting point	kg	110	110	110
W9 Supporting point	kg	110	110	110
W10 Supporting point	kg	155	155	155
Operating weight	kg	530	530	530
Shipping weight	kg	530	530	530

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

Size 90.4 - 100.4 - 110.4 Combustion module

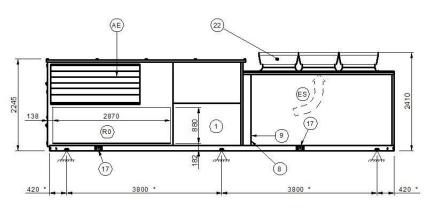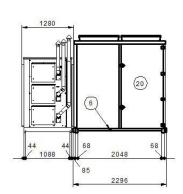DAA7V90 4_110 4_GC13X_GC06X_01
Date: 15/04/2016

Size 90.4 - 100.4 - 110.4 Combustion module

Triple chamber (GC07X 300 kW)
(GD18X 300 kW)

1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 2"
9. Water heating coil outlet Ø 2"
10. Reheat coil (optional)
11. Treatment coil
12. Water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters

15. Electric fan (supply - return)
16. Exhaust electric fan (CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)
23. Gas module (to be connected to the unit during installation)

(R0) Horizontal air return
(R3) Downflow return (optional)
(M0) Horizontal air supply
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

Size		90.4			100.4			110.4		
Configuration	kg	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP
W1 supporting point	kg	669	706	738	717	754	786	822	860	891
W2 Supporting point	kg	600	634	662	643	677	705	738	772	800
W3 Supporting point	kg	497	525	549	533	561	584	611	640	663
W4 Supporting point	kg	497	525	549	533	561	584	611	640	663
W5 Supporting point	kg	549	580	605	588	619	645	675	706	731
W6 Supporting point	kg	617	652	681	661	696	725	759	794	823
Operating weight	kg	3430	3622	3784	3674	3867	4029	4217	4411	4571
Shipping weight	kg	3430	3622	3784	3674	3867	4029	4217	4411	4571

GAS MODULE WEIGHT DISTRIBUTION

Size		90.4	100.4	110.4
W7 Supporting point	kg	190	190	190
W8 Supporting point	kg	165	165	165
W9 Supporting point	kg	165	165	165
W10 Supporting point	kg	190	190	190
Operating weight	kg	710	710	710
Shipping weight	kg	710	710	710

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

Size 90.4 - 100.4 - 110.4 Combustion module
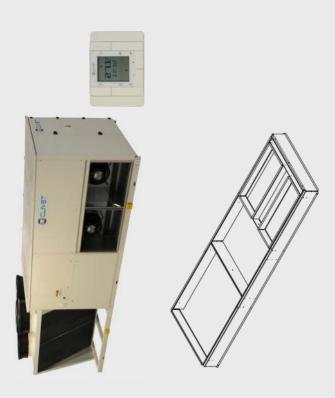
DAA7V90 4_110 4_GC07X_01
Date: 15/04/2016

CSRN-XHE2

49.4 - 110.4

Roof Curb

2

Tetto

Foro per Canali Aria

3

4

C6360105

PE7V00002 L = xxx m
PE7V00016 L = xxx m
PE7V00017 L = xxx m

C6380295

PE7V00002 L = xxx m
PE7V00016 L = xxx m
PE7V00017 L = xxx m

46 X

M8 x 20
M8 x 16
M8 x 16
M8

Elenco Componenti	
Rif.	Qtà
A	1
B	1
C	4
D	1
E	1
F	1
G	2
H	1
I	1
L	6

5

F 1x

G 2x

PE7V00002 L = 6595
PE7V00016 L = 5173
PE7V00017 L = 8435

300

2149

423

H 1x

67

2161

I 1x

67

2149

L 6x

57

L

PE7V00002 L = 2200
PE7V00016 L = 1726
PE7V00017 L = 2813

A 1x

426

2149

B 1x

247

712

844

2149

C 4x

247

L

PE7V00002 L = 2015
PE7V00016 L = 1420
PE7V00017 L = 2605

D 1x

247

712

844

2149

E 1x

423

2149

B

C

C

C

C

D

i

i

i

6

A

D

E

F

G

I

I

I

7

Roof Curb

9

H - I

Coibentazione

A - E

L

Coibentazione

G

A

G

G

E

Coibentazione

10

92

11

H

A

G

G

I

L

E

L

Fissate con Silicone

L

12

C6380295

C6380295

C6360105

C6360105

C6360105

Neoprene

C6380295

Guarnizione

13

Canali aria

Roof Curb

Canale aria

14

15

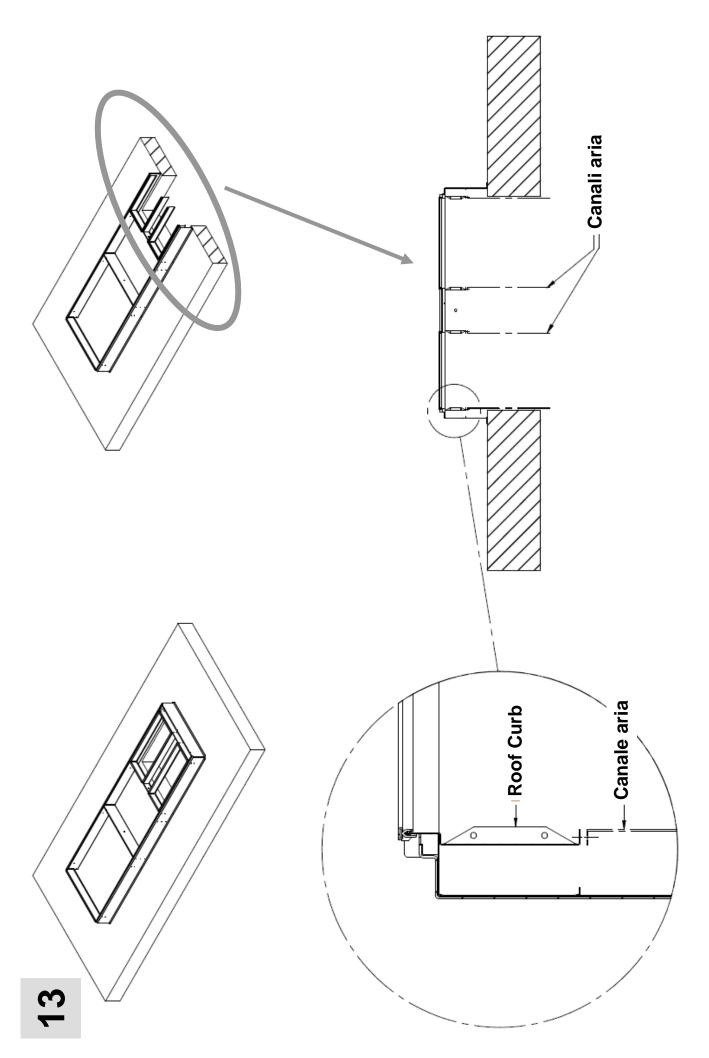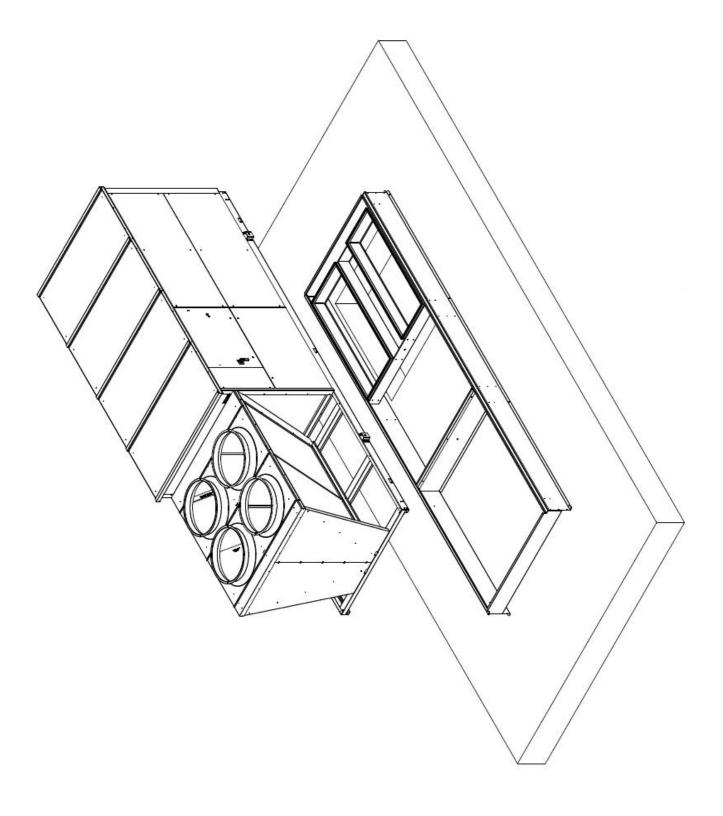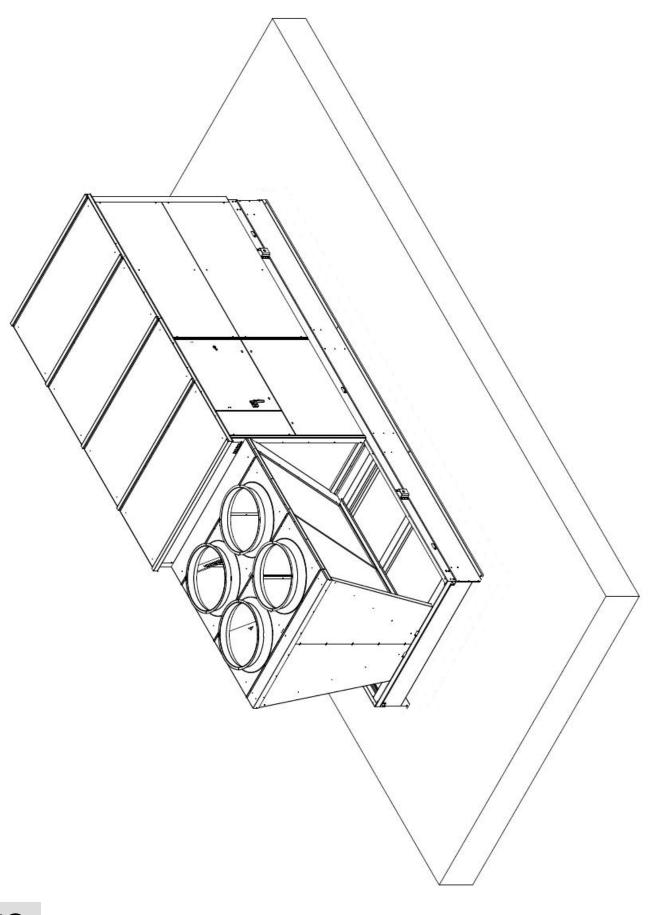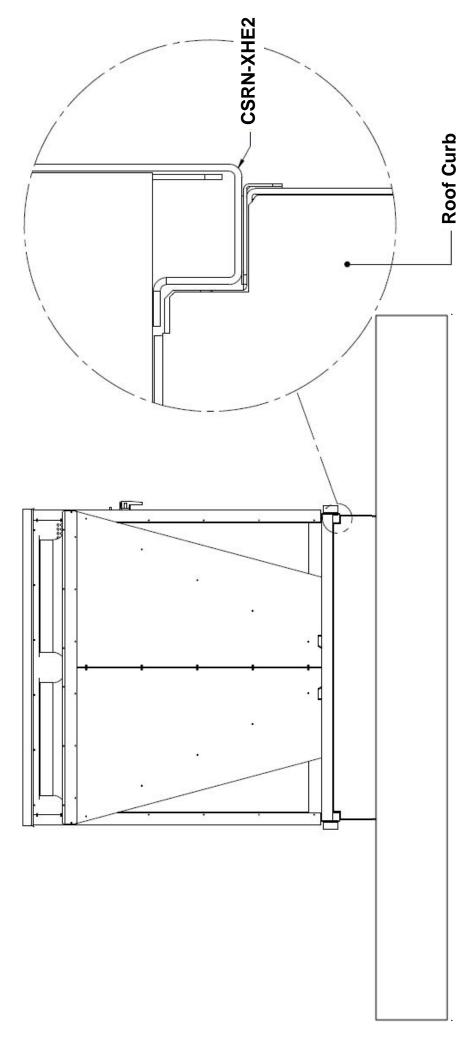**16**

CSRN-XHE2

Roof Curb

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