

CRH-XHE2 14.2-44.4

"Roof top" water cooled heat pump



Dear Customer,

We congratulate you on choosing this product

For many years Clivet has been offering systems that provide maximum comfort, together with high reliability, efficiency, quality and safety.

The aim of the company is to offer advanced systems, that assure the best comfort, reduce energy consumption and the installation and maintenance cost for the life cycle of the system.

The purpose of this manual is to provide you with information that is useful from reception of the equipment, through installation, operational usage and finally disposal so that this advanced system offers the best solution.

Yours faithfully.

CLIVET Spa

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1 General description

1.1 Manual

The manual provides correct unit installation, use and maintenance.

Pay particular attention to:



Warning, identifies particularly important operations or information.



Prohibited operations that must not be carried out, that compromise the operating of the unit or may cause damage to persons or things.

- It is advisable to read it carefully so you will save time during operations.
- Follow the written indications so you will not cause damages to things and injuries people.

1.2 Preliminaries

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

1.3 Risk situations



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

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

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

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

1.4 Intended use

Use the unit only:

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

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

1.5 Installation

Outdoor installation



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

Follow local safety regulations.

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

1.6 Maintenance

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



Turn the unit off before any operation.

1.7 Modification



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

1.8 Breakdown/Malfuction

Disable the unit immediately in case of breakdown or malfunction.

Contact a certified service agent.

Use original spares parts only.

Using the unit in case of breakdown or malfunction:

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

1.9 User training



The installer has to train the user on:

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

1.10 Data update

Continual product improvements may imply manual data changes.

Visit manufacturer web site for updated data.

1.11 Indications for the User



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

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

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

In case of breakdown or malfunction:

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



The installer must train the user, particularly on:

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

1.12 Unit identification

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



The matriculation plate must never be removed.

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

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



It contains fluorinated greenhouse gases

Type of refrigerant: R410A

1.13 Serial number

It identifies uniquely each unit.

Must be quoted when ordering spare parts.

1.14 Assistance request

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

Series
Size
Serial number
Year of manufacture
Electrical wiring diagram

2 Reception



You have to check before accepting the delivery:

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

In case of damage or anomaly:

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



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

2.1 Storage

Observe external packaging instructions.

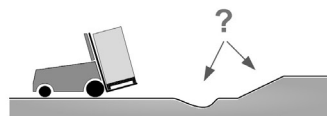
2.2 Handling

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
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.

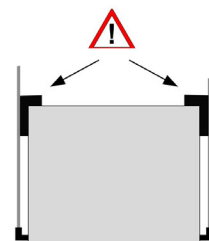
1



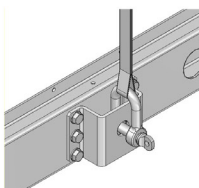
2



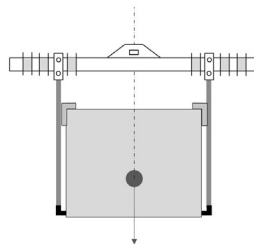
3



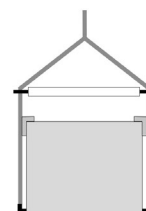
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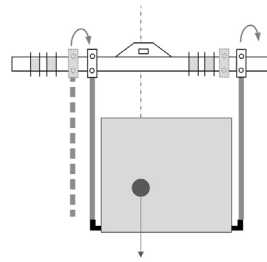
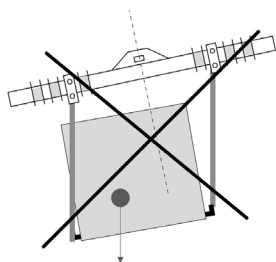
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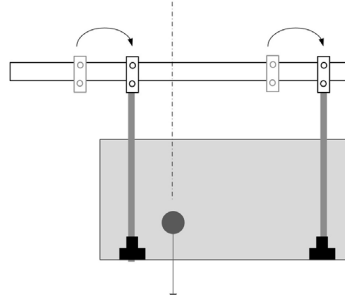
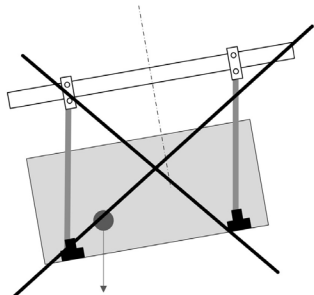
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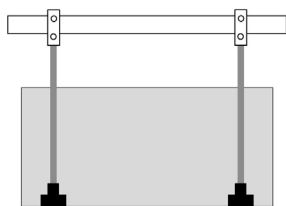
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7



8

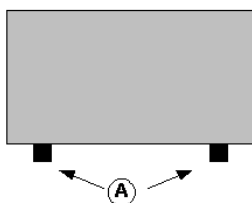


2.3 Packaging removing

Be careful not to damage the unit.

Keep packing material out of children's reach it may be dangerous.

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



- A Supports for handling: remove after the handling.
- B Remove the coil protective mesh before the start-up

3 Positioning

During positioning consider these elements:

- Technical spaces requested by the unit
- Electrical connections
- Water connections
- Spaces for air exhaust and intake

3.1 Functional spaces

Functional spaces are designed to:

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

Respect all functional spaces indicated in the DIMENSIONS section.

Double all functional spaces if two or more unit are aligned.

3.2 Safety valve gas side

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

3.3 Positioning



Units are designed to be installed:

- EXTERNAL
- in fixed positions

Limit vibration transmission:

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

Choose the installation place according to the following criteria:

- Customer approval
- safe accessible position
- technical spaces requested by the unit
- spaces for the air intake/exhaust
- max. distance allowed by the electrical connections
- install the unit raised from the ground
- verify unit weight and bearing point capacity
- verify that all bearing points are aligned and leveled
- condensate water draining
- consider the maximum possible snow level
- Avoid installations in places subject to flooding

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

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

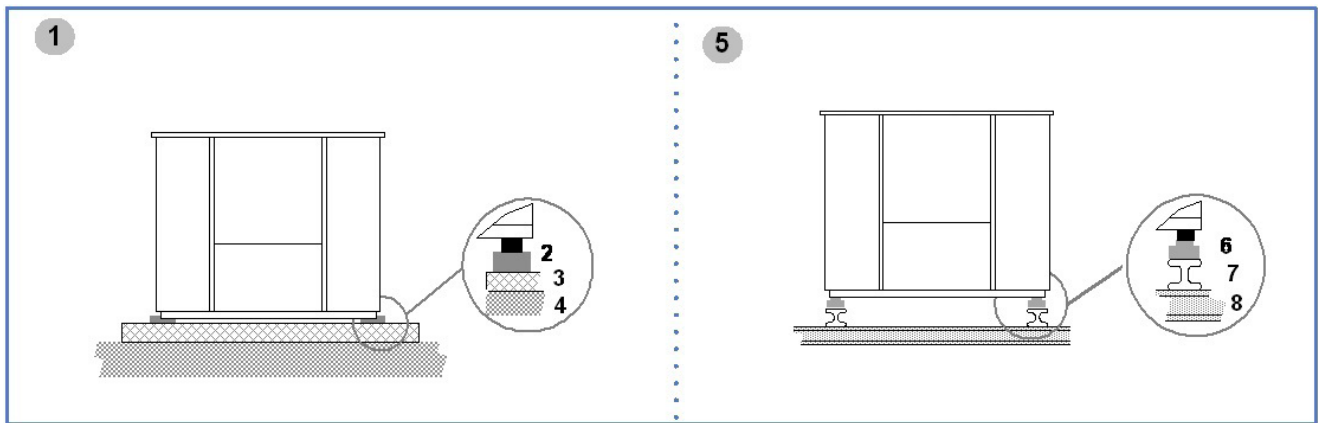


Avoid therefore:

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



Avoid the accumulation of snow and ice in front of the exhaust air outlet



- 1 Positioning on concrete floor
- 2 2 cm thick neoprene strips
- 3 concrete floor
- 4 insulation

- 5 Positioning on steel structure
- 6 antivibration mounts
- 7 steel structure
- 8 steel structure

4 Water connections

4.1 Water quality

Water features

- conforming to local regulations
- total hardness < 14°fr
- within the limits indicated by table

The water quality must be checked by qualified personnel.

Water with inadequate characteristics can cause:

- pressure drop increase
- reduces energy efficiency
- increased corrosion potential

Acceptable water quality values:

PH	7,5 ÷ 9,0	
SO₄²⁻	< 100	ppm
HCO₃⁻/SO₄²⁻	> 1	
Total Hardness	4,5 ÷ 8,5	dH
Cl⁻	< 50	ppm
PO₄³⁻	< 2,0	ppm
NH₃	< 0,5	ppm

Free Chlorine	< 0,5	ppm
Fe³⁺	< 0,5	ppm
Mn⁺⁺	< 0,05	ppm
CO₂	< 50	ppm
H₂S	< 50	ppb
Temperature	< 65	°C
Oxygen content	< 0,1	ppm

Provide a water treatment system if values fall outside the limits.



The warranty does not cover damages caused by limestone formations, deposits and impurities from the water supply and / or failure from failed system clearing to clean system.

4.2 Risk of freezing

If the unit or the relative water connections are subject to temperatures close to 0°C:

- mix water with glycol, or
- safeguard the pipes with heating cables placed under the insulation, or
- empty the system in cases of long non-use

4.3 Anti-freeze solution

The use of an anti-freeze solution results in an increase in pressure drop.



Make sure that the glycol type utilized is inhibited (not corrosive) and compatible with the water circuit components.



Do not use different glycol mixture (i.e. ethylene with propylene).

4.4 Water flow-rate

The project water-flow must be:

- inside the exchanger operating limits (see the TECHNICAL INFORMATION section)
- guarantee, also with variable system conditions (for example in systems where some circuits are bypassed in particular situations).

4.5 Water filter



It must be installed immediately in the water input of the unit, in a position that is easily accessible for cleaning.



The filter never should be removed, this operation invalidates the warranty.

4.6 Condensate drain

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

- Unit discharge fitting: the connection must not transmit mechanical stresses and must be performed taking care not to damage the unit discharge fitting.
- Provide a siphon that, eliminating the negative pressure caused by the fan, prevents the air intake from the discharge duct.
- The ducting must have a min. slope of 3% to allow the runoff.
- Anchor the ducting with an adequate number of supports.
- Insulate the duct and the siphon to avoid the condensate drippings.
- Connect the condensate discharge to a sewerage drainage network.

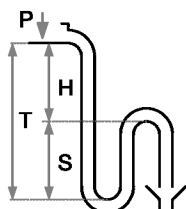
- ⊘ DO NOT use white water or drainage networks to avoid the aspiration of odours in the case of evaporation of water contained in the siphon.
 - ⚠ Check at the end of the work, the regular condensate runoff pouring some water in the tray.
- For details see:
14 Dimensional drawings p. 47

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)

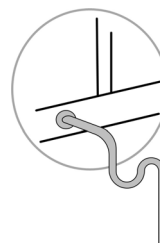


Example :

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

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

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



Condensate drain

4.7 Operation sequence

Close all vent valves in the high points of the unit hydraulic circuit

Close all drain valves in the low points of the unit hydraulic circuit:

- Heat exchangers
 - Pumps
 - collectors
1. Carefully wash the system with clean water: fill and drain the system several times.
 2. Apply additives to prevent corrosion, fouling, formation of mud and algae.
 3. Fill the plant
 4. Execute leakage test.
 5. Isolate the pipes to avoid heat dispersions and formation of condensate.
 6. Leave various point of service free (wells, vent-holes etc).

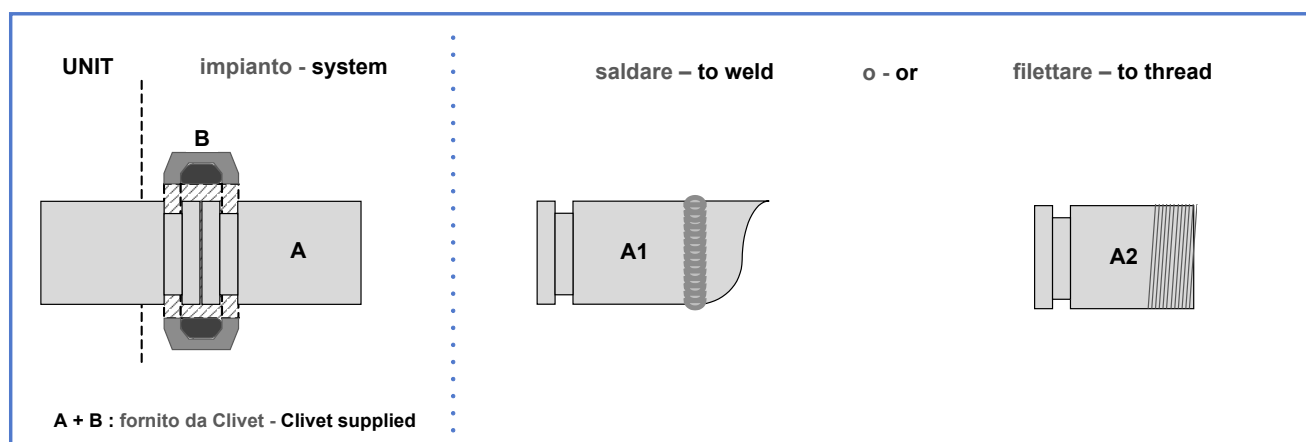
- ⚠ Neglecting the washing will lead to several filter cleaning interventions and at worst cases can cause damages to the exchangers and the other parts.

4.8 Humidifier

For details see:

10 Accessories p. 36

4.9 Hydraulic connections



- take away the supplied connection union by acting on the connection joint
- weld the union to the installation pipe
- perform the connection between the installation pipe and the evaporator, using the joint

- ⊘ Retirer le joint de connexion avant de souder le tuyau de l'installation.

- ⚠ The rubber gasket might be irreparably damaged.

5 Aeraulic connections

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

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



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

- the weight of the channels must not burden on the connection flange
- 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)

5.1 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.



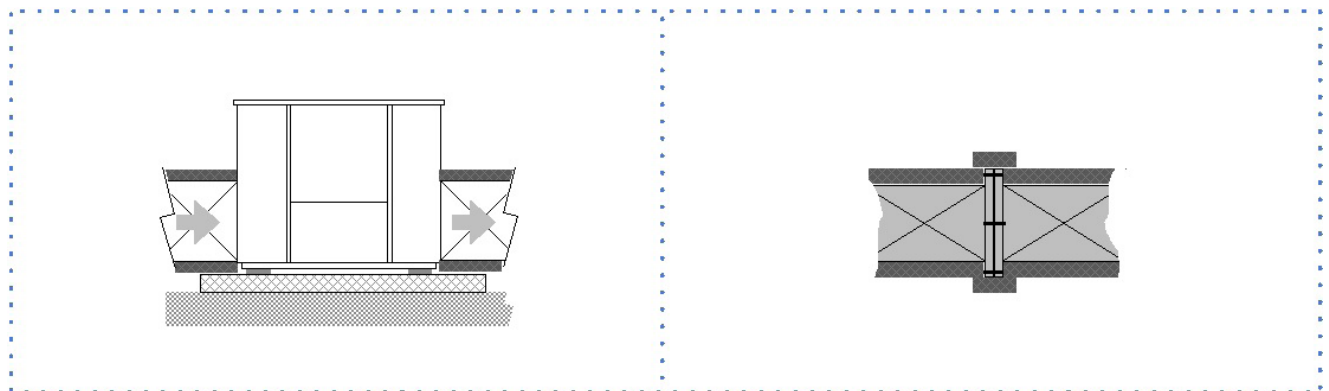
When choosing and positioning the grilles, inlets and diffuser, avoid:

- 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 of diffusers must be carried out with flexible elements
- the return grilles must be widely dimensioned



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

6 Electrical connections

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

The protection devices of the unit power line must be able to stop all short circuit current, the value must be determined in accordance with system features.

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

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

Operate in compliance with safety regulations in force.

6.1 Electrical data



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

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

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

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

6.2 Connections

1. Refer to the unit electrical diagram (the number of the diagram is shown on the serial number label).
2. Verify that the electrical supply has characteristics conforming to the data shown on the serial number label.
3. Before starting work, ensure the unit is isolated, unable to be turned on and a safety sign used.
4. Ensure correct earth connection.
5. Ensure cables are suitably protected.
6. Before powering up the unit, make sure that all the protections that were removed during the electrical connection work have been restored.

6.3 Signals / data lines

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

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

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

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

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

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

Respect impedance, capacity and attenuation indications.

6.4 Power input

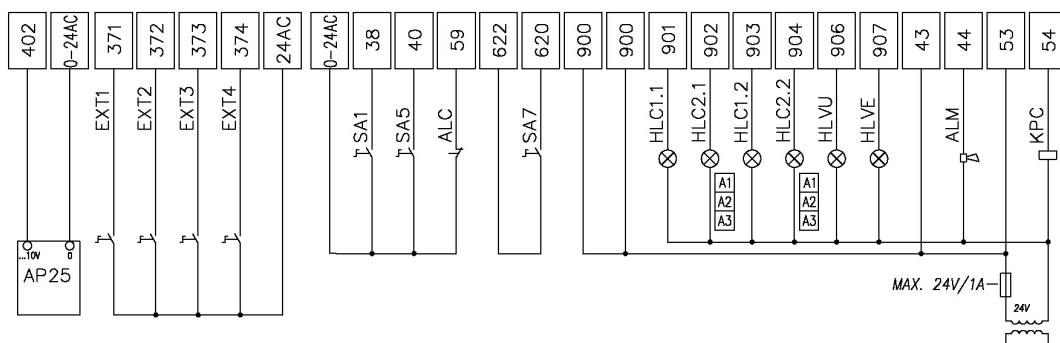


Fix the cables: if vacated may be subject to tearing.



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

6.5 Connections performed by customer



dwg n. WD7W04401

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 Sammelstörungsmeldung señalización bloqueo cumulativo
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 Verdichtierzustand lámpara de señalización estado compresor
SA5	ingresso configurabile settable input entrée configurable konfigurierbares Eingabe entrada configurable
HLVE	lampada segnalazione stato ventilatore di ripresa e/o estrazione 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 d'aspiración y/o impulsión
SA7	selettore abilitazione allo scarico manuale umidificatore enabling selector to the humidifier manual discharge sélecteur validation à la décharge manuelle humidificateur Freigabewähler auf den manuellen Ablauf des Befeuchters selector habilitación a la descarga manual humidificador
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
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 moduladora con señal 0-10V
EXT1.. ...EXT4	contatto pulito estrattore ambiente ambient extractor potential-free contact contact libre extracteur ambiant potentialfreier Kontakt des Raumabzug contacto libre extractor ambiente
	collegamento disponibili solo se richiesta opzione connections available only if option is requested raccordements disponibles seulement si demandée option verfügbaren Anschlüsse nur wenn Option angeforderte conexións disponibles solo si se requiere opción

6.6 SA5 input

- Summer / winter mode remote change
- function Fan only
- function CLEAN

Summer - winter mode remote change P008

enabled by SA5*	0
enabled by thermostat	1
enabled by BMS	2
automatic	3

*functions Fan /Clean from SA5 not available

function Fan only P263

disabled	0
enabled by BMS	1
enabled by SA5*	2

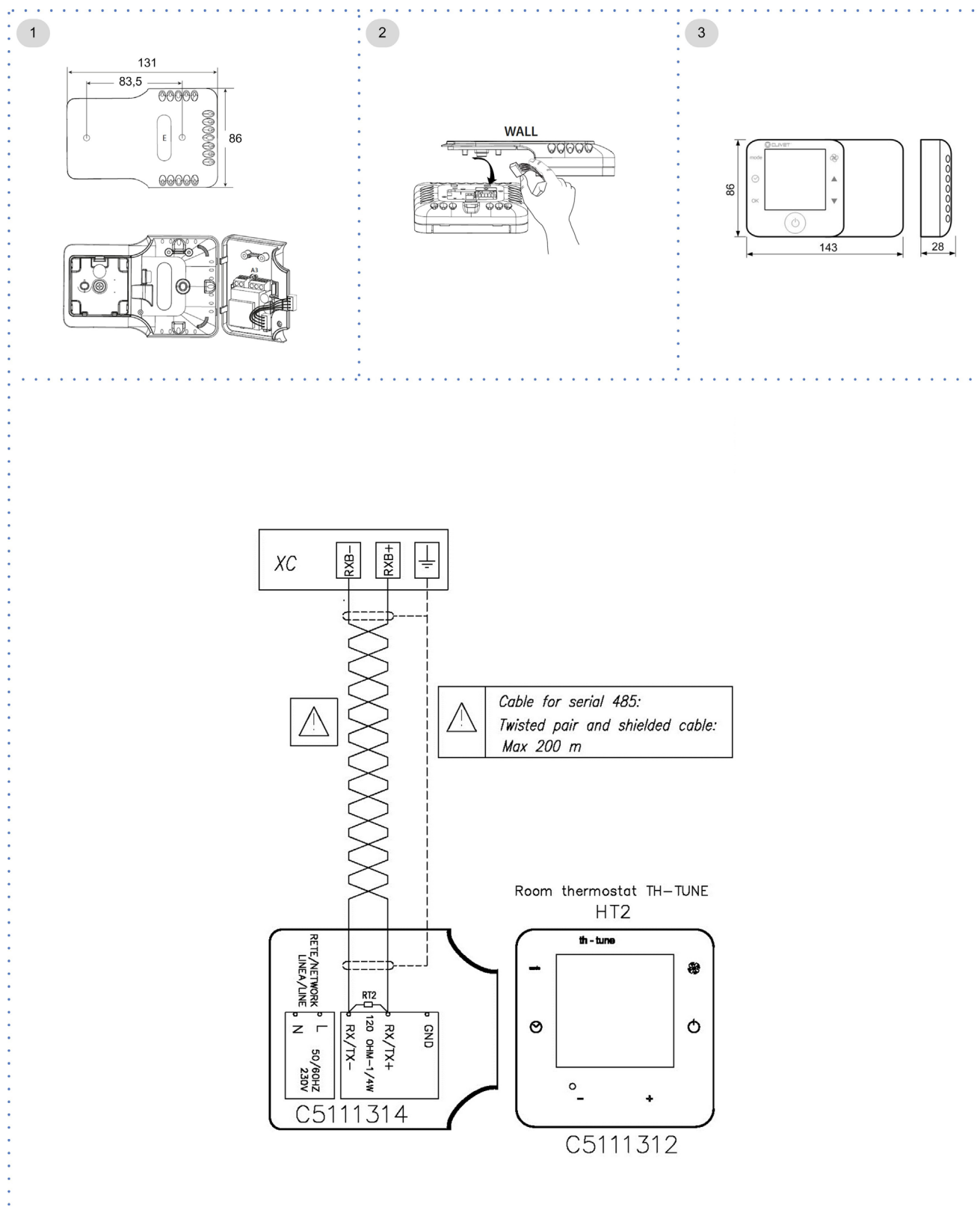
*functions Summer / winter /Clean from SA5 not available

function CLEAN P266

disabled	0
enabled by BMS	1
enabled by SA5*	2

*functions Summer-winter / Clean from SA5 not available

6.7 Wall mounted electronic room control



6.8 COMMUNICATION MODULES

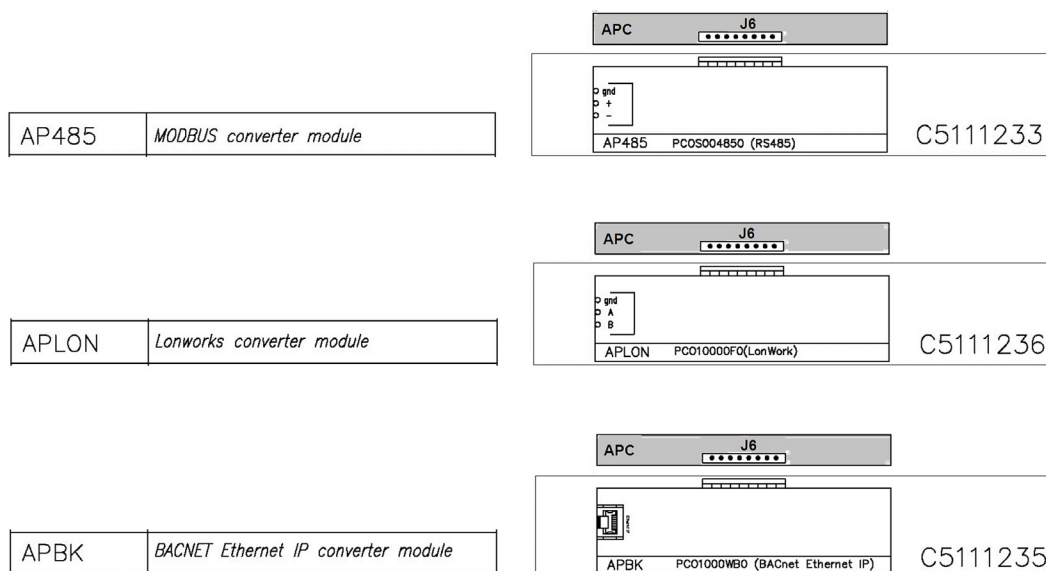
Serial communication module for Modbus supervisor

Serial communication module for BACnet supervisor

Serial communication module for LonWorks supervisor

DWG. Nr. : 8F4401

REV. Nr. : 3P



DATA LINE FEATURES

Every RS485 serial line must be set up using the 'In/Out' bus system.

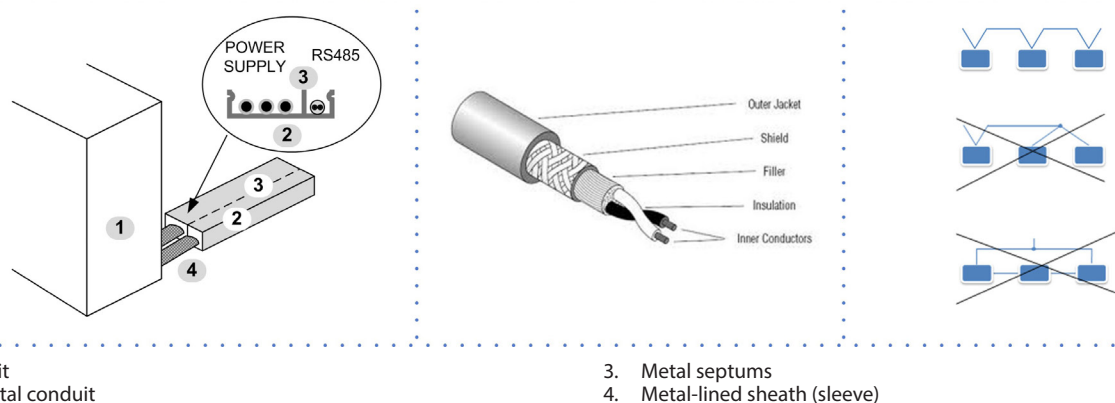
The difference in potential between the earth of the two RS485 devices that the cable shielding needs to be connected to must be lower than 7 V

There must be suitable arresters to protect the serial lines from the effects of 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 jump, 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.



7 Start-up

7.1 General description

The indicated operations should be done by qualified technician with specific training on the product.

Upon request, the service centres performing the start-up.

The electrical, water connections and the other system works are by the installer.

Agree upon in advance the start-up data with the service centre.

Before checking, please verify the following:

- the unit should be installed properly and in conformity with this manual
- the electrical power supply line should be isolated at the beginning
- the unit isolator is open, locked and equipped with the suitable warning
- make sure no tension is present



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



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

7.2 Preliminary checks

For details refer to the different manual sections.

Unit OFF power supply

1. safety access
2. functional spaces
3. structure integrity
4. fans run freely
5. unit on vibration isolators
6. air filters present and clean
7. completed aerodynamic system
8. unit input water filter + shut-off valves for cleaning
9. vibration isolators on water connections
10. minimum system water content
11. cleaned system
12. loaded system + possible glycol solution + corrosion inhibitor
13. system under pressure
14. vented system
15. refrigerant circuit visual check
16. earthing connection
17. power supply features
18. electrical connections provided by the customer

7.3 Start-up sequence

For details refer to the different manual sections.

Unit ON power supply

1. compressor crankcase heaters operating at least since 8 hours
2. off-load voltage measure
3. phase sequence check
4. shut-off valve refrigerant circuit open
5. load voltage measure and absorptions
6. liquid sight glass check (no bubbles)
7. check all fan operating
8. air flow rate measurement
9. supply, return and outdoor air temperature measurement
10. measure super-heating and sub-cooling
11. check no anomalous vibrations are present
12. climatic curve personalization
13. climatic curve personalization
14. scheduling personalization
15. fire alarm configuration *
16. complete and available unit documentation

* only if present

7.4 Refrigeration circuit

1. Check carefully the refrigerating circuit: the presence of oil stains can mean leakage caused by transportation, movements or other).
2. Verify that the refrigerating circuit is in pressure: Using the unit manometers, if present, or service manometers.
3. Make sure that all the service outlets are closed with proper caps; if caps are not present a leak of refrigerant can be possible.
4. Open the valves of the refrigerant circuit, if there are any.

7.5 Water circuit

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



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

Weight of glycol (%)	10	20	30	40
Freezing temperature (°C)	-3.9	-8.9	-15.6	-23.4
Safety temperature (°C)	+1	-4	-10	-19

7.6 Electric Circuit



Verify that the unit is connected to the ground plant.

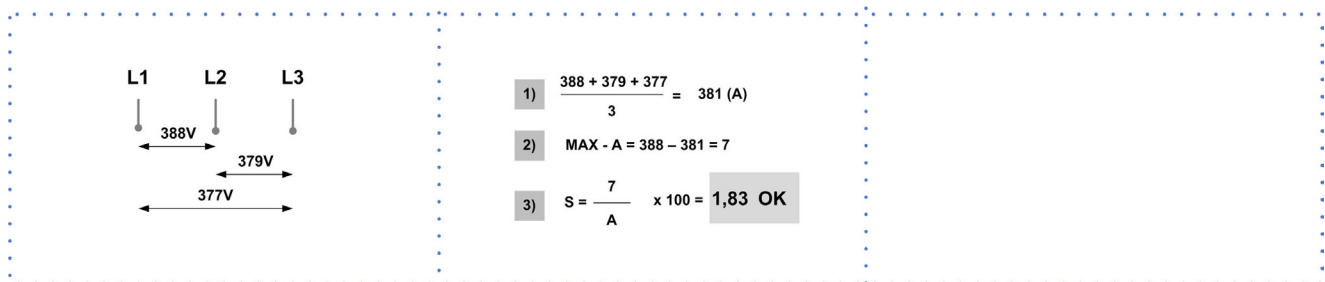
Check the conductors are tightened as: the vibrations caused by handling and transport might cause these to come loose.

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

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

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

Example



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

7.7 Compressor crankcase heaters

Connect the oil resistances on the compressor crankcase at least 8 hours before the compressor is to be started:

- at the first unit start-up
 - after each prolonged period of inactivity
1. Supply the resistances switching off the unit isolation switch.
 2. To make sure that heaters are working, check the power input.
 3. At start-up the compressor crank-case temperature on the lower side must be higher at least of 10°C than the outside temperature.



Do not start the compressor with the crankcase oil below operating temperature.

7.8 Voltages

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

Start-up the unit.

With unit operating in stable conditions, check:

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

7.9 Scroll compressor

The Scroll compressors have only one rotation direction.

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

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

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

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

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

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

7.10 Remote controls

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

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

7.11 Air flow setting

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

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

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

⚠ Calibration must be carried out with unit all in recirculation.

The unit is in full recirculation during the first 20 minutes from start-up.

Set the flow rate:

par 57 Sf_SpeedOut (l/sec)

7.12 Air flow management

Standard mode

The air flow supply remains constant in all heat load conditions and operation modes.

ECO mode

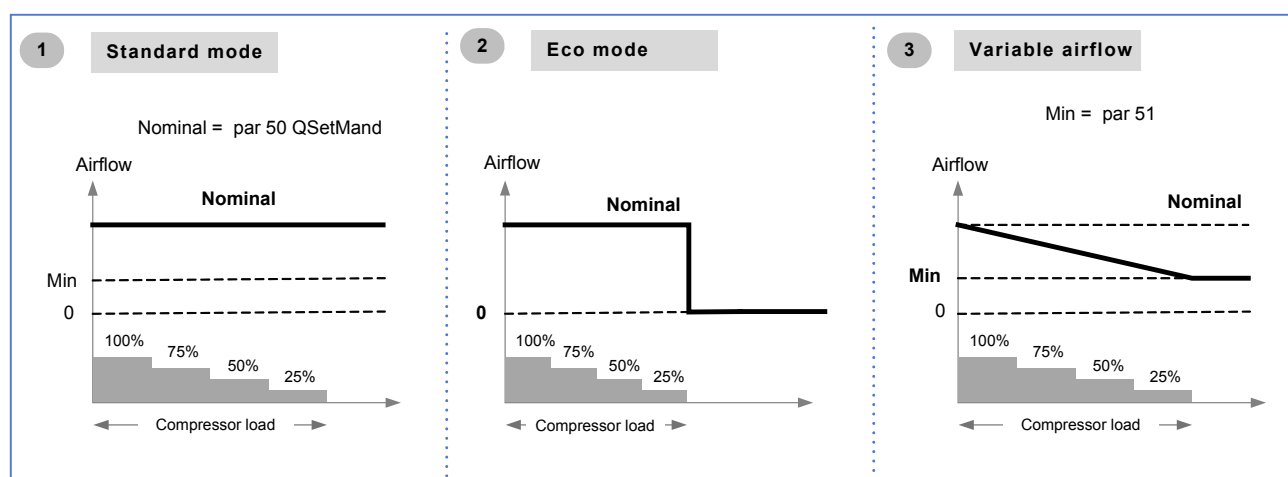
The air flow supply remains constant at varied heat loads and is shutdown when setpoint is fulfilled.

Variable airflow

Option

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

The ventilation remains active even when the setpoint is fulfilled.



7.13 ECO mode

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

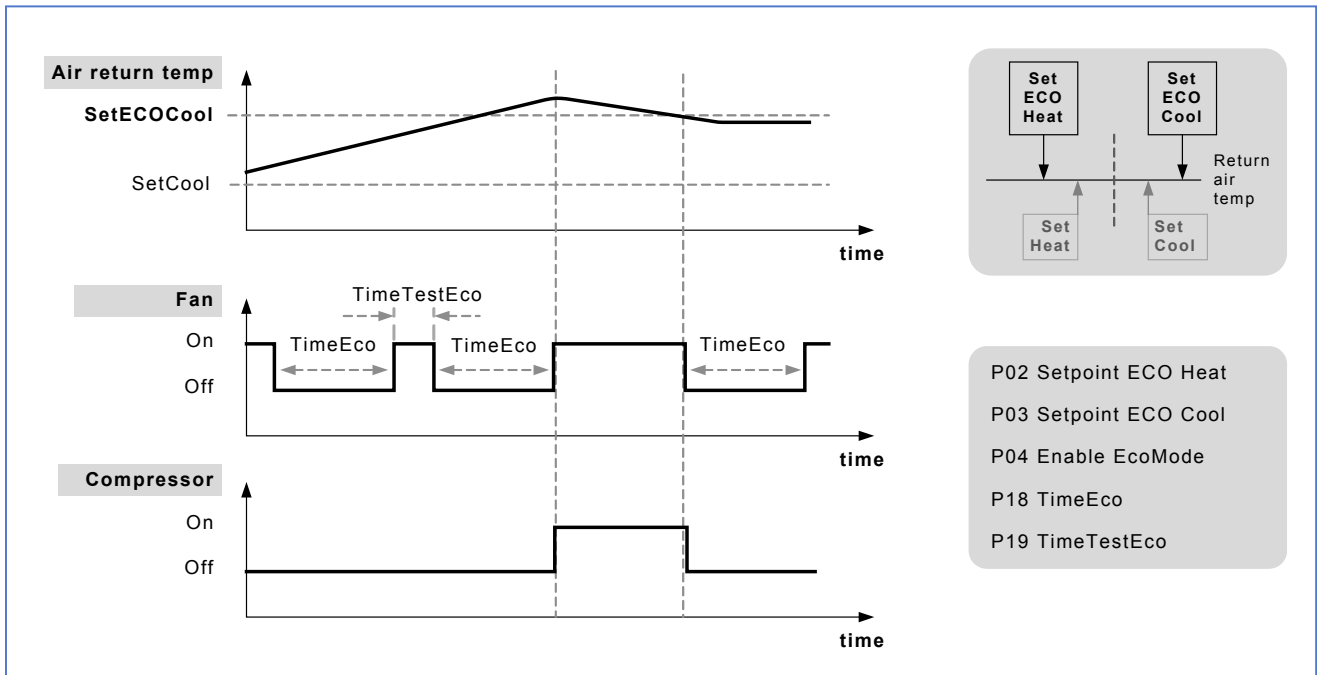
To further increase the energy savings in this condition, it is also possible to set less demanding operation setpoints for the unit in respect to the standard mode.

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

The ECO mode can be activated:

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

Example in cooling mode:

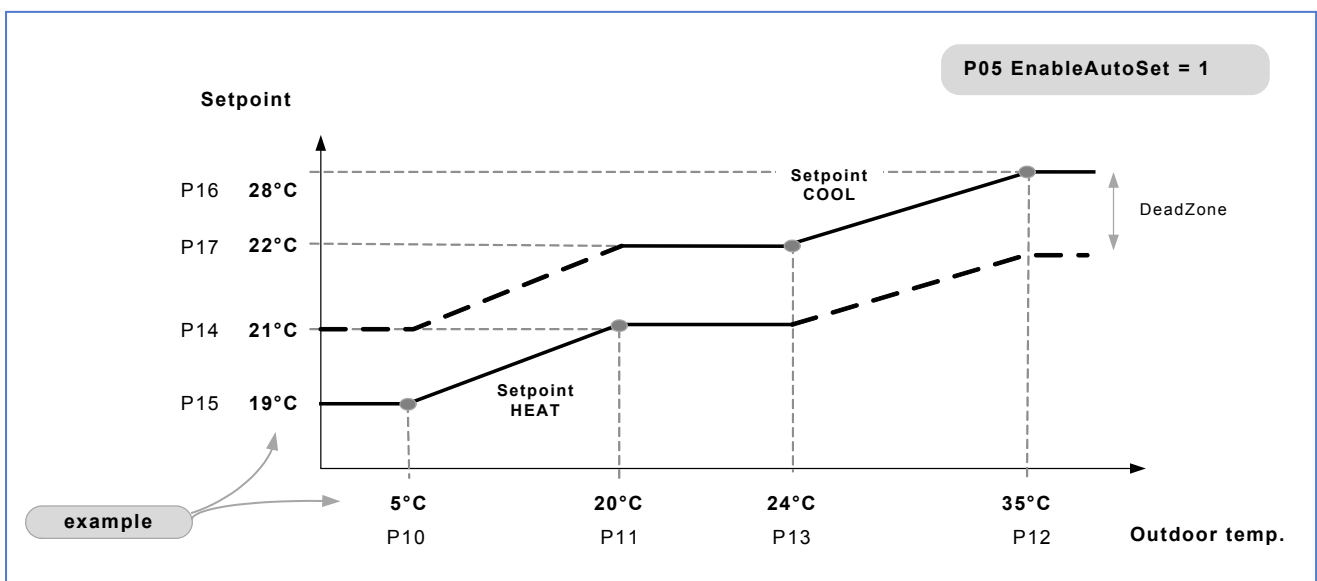


7.14 Set-point automatic compensation

The set changes automatically according to the outside temperature.

Even the operating mode changes automatically according to the outside temperature.

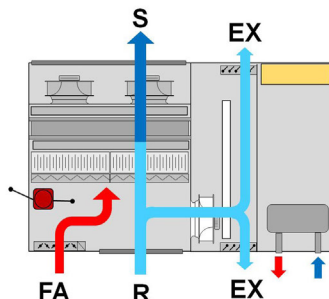
The variation is defined by the climatic curve.



7.15 Ambient pressure control

The ambient pressure control device compares the return pressure with the external pressure and compensates any variations by acting on the outdoor air damper.

This way, the unit maintains the relevant ambient pressure desired by the user, who can choose between the overpressure, depression or equal-pressure.

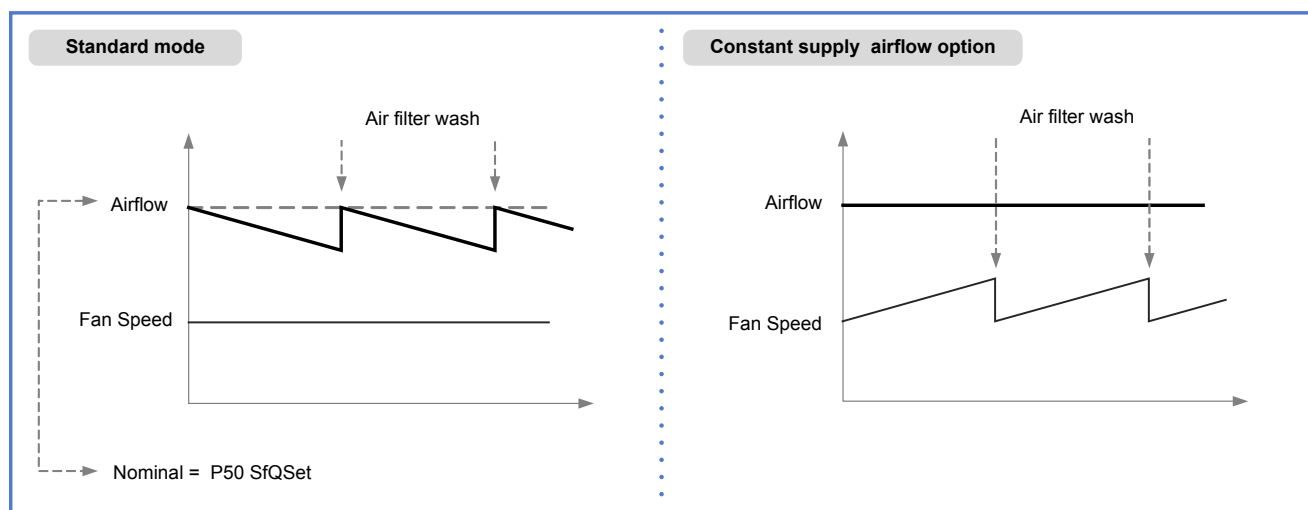


Room pressure calibration

1. check the doors and windows of the serviced room are closed
2. calibration must be carried out with unit all in recirculation
3. on display view the state: S10 Return air differential pressure
4. wait for the pressure value to stabilise and take note of the value
5. to maintain the room in neutral pressure, memorise the detected value in P071 SetPAmb
6. to maintain the room in overpressure, memorise a higher value respect to that detected
7. to maintain the room in depression, memorise a lower value

7.16 Constant supply airflow

Option



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

- ⚠ Before checking, make sure that the system has been completed in all its parts (shunts, dampers, grilles, diffusers e c.).
 - ⚠ Check the doors and windows of the serviced room are closed.
 - ⚠ Calibration must be carried out with unit all in recirculation.
- The unit is in full recirculation during the first 20 minutes from start-up.
- Set the flow rate:
- P50 SfQSet (l/s)

7.17 Fire alarm: configuration

The unit is able to manage the signal coming from a fire detection system or fire control unit installed built-in, activating one of the logics illustrated, which can be set by parameter.

Par 151 TypeFireMode

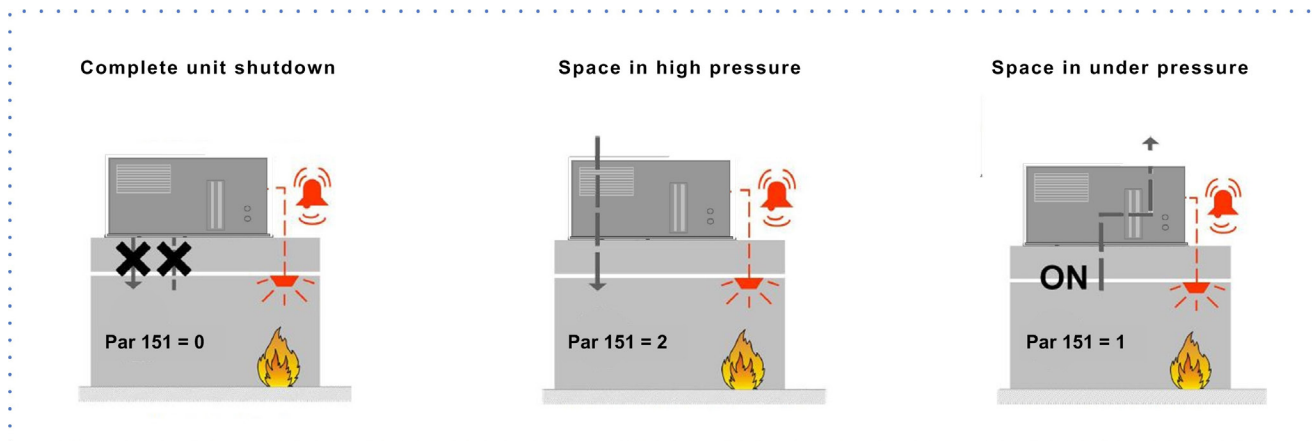
In the presence of alarm signal, the compressors are Always switched off; moreover, the remote on-off is disabled together with the switch on/off control from keypad.



The unit cannot be used as smoke extractor.



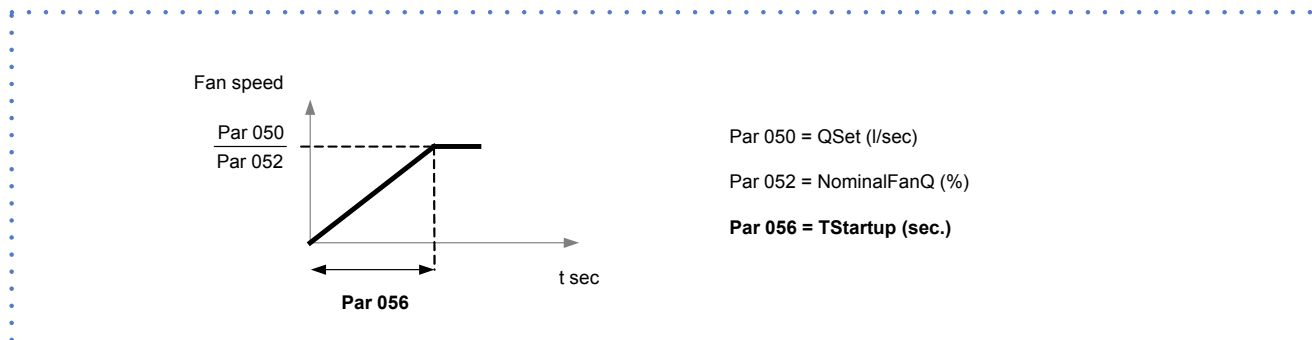
Any fire detection devices built-in the unit must be considered as an auxiliary safety system, and, accordingly, must not be a replacement for any fire detection devices in the room.



7.18 Textile channels

Option

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



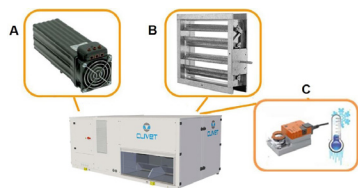
7.19 Application for low outdoor temperature

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

The option includes self-regulating heaters with thermostats that can protect the electrical panel from freezing to make sure it operates correctly.



The accessory is also active with unit OFF; the unit must remain powered.



- A. heaters with thermostats
- B. damper
- C. motorised actuator

7.20 Start-up report

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

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

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

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

7.21 2014/68/UE PED directive

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

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

Compulsory verification of the first installation:

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

Certification of setting in service:

- for all the units

Periodical verifications:

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

8 Control



KEY FUNCTION	
	ON-OFF Press 5 seconds to access or switch off the unit.
mode	MODE Change the operating mode : summer, winter, automatic
	CLOCK Date and hour control
OK	OK Confirm, display setpoint, display the outside temperature (tE)
	UP-DOWN Shift in the menu, increase-decrease the value
+	5 sec Access to the password menu (Code)
mode +	5 sec Access to the alarm menu ; only if the icon is present

SETPOINT




the display visualizes the **ambient temperature**

1. Press once or to display the setpoint (it appears on the display ^{set})
2. press to modify the working setpoint
3. Wait that the ambient temperature appears again on the display (disappears ^{set})






DISPLAY MEANING	
	Operating mode : summer
	Operating mode : winter
	Operating mode : automatic
	supply fan speed
	alarm
	Keyboard locked
	Time band activated
	Time band scheduling
	Active compressor
	Defrosting in progress
	External fan
	electric heaters , hot water coil - option

Control





ON / OFF

 Press for 5 seconds	
OFF	





MODE CHANGE

Press to set the operating mode: mode  Cooling  Heating AUTO Automatic	
Operating in:  Cooling	

BUTTON LOCK / UNLOCK

 Press together for 5 seconds OK	
Symbol appears 	

ON / OFF SCHEDULING

 Press for deactive or enable the scheduling.	
The deactivated scheduling, the symbol  doesn't appear	

DAY MODIFICATION

- Press the **CLOCK** button for 5 sec.
- By the **▲ ▼** buttons, select the **clock** menu
- Confirm with **OK**
- The hour is flashing : set with the **▲ ▼** buttons
- Confirm with **OK**
- Repeat the procedure for the minutes and week's day
- To go back to the main screen, select the **Esc** menu and confirm with **OK**

PARAMETERS

The setting parameters are protected by password to avoid inadvertent changes that can affect the unit operating.

To access to the parameters

1. press **On/Off + Fan** button for 5 sec.
2. enter password : with the **▲ ▼** button set **Code = 2**
3. Confirm with **OK**
4. Select the **PAr** menu and confirm with **OK**
5. Scroll the list **▲ ▼**
6. Select the parameter with **OK**
7. Modify the value **▲ ▼** and confirm with **OK**
8. To esc, scroll the lost, select **ESC** and confirm with **OK**

P02	SetPoint economic on heat mode
P03	SetPoint economic on cool mode
P04	Enable setpoint and the economic functions
P05	Enable automatic setpoint
P06	Set CO2
P200	Enable alarm buzzer : 0 = disabled, 1= enabled

Control

TIME BAND SCHEDULING

It is possible to set 4 types of scheduling:

- 7 days (from monday to sunday)
- 5 days (from monday to friday)
- 2 days (from saturday to sunday)
- Day by day

Day scheduling



At home



Outside



Return to home

Night scheduling



At home



Outside the home



Return to the home

Day by day scheduling



Press for 5 seconds



Select Time bands



Press OK



Select the scheduling:



- Day by day

Press OK



Press OK



Select the hour



Press OK



Select the minutes



Press OK



Set the temperature



Press OK



Select the next time band

Press OK and repeat from **point 05**



As all the programming is finished, select ESC



Press OK



Press OK to program the next day



Select the next day



Press OK

Repeat from **point 04**



To exit from the scheduling select ESC



Press OK



Select Esc to exit



Press OK



Control

ALARMS



Malfunctions are displayed with the ALARM icon.

Before resetting an alarm, identify and remove the cause that generated it.

Repeated reset may cause irreversible damages as a system malfunction.

The alarm can be signalled by the thermostat also by a buzzer.

To disable the buzzer, modify the P200 parameter.
(0 = disabled)

ALARM RESET

mode	The symbol is displayed	
	Press together for 5 seconds	
	Scroll the list	
	Select the alarm reset menu	
	Press OK	
	Select ESC	
	Press OK	

STORED ALARM (installer use only)

	Press buttons for 5 sec	
	Enter password	
	Confirm with OK	
	Select S ALM	
	Confirm with OK	
	Scroll alarm list (AL1, AL2...)	
	and display alarm detail	
	1° alarm - 1° display	
AL1	new alarm	
XX	alarm code (STD column pag. 20)	
	1° alarm - 2° display	
dA1	alarm day 1	
YY	day number after alarm	
	1° alarm - 3° display	
HA1	alarm hour 1	
hhmm	alarm storage hour	

Control

Stor	CODE	Description
100	AE01	Alarm of faulty return temp. probe
101	AE02	Alarm of faulty supply temp. probe
102	AE03	Alarm of faulty outside temp. probe
103	AE04	Alarm of faulty coil probe temp. probe circuit 1
104	AE05	Alarm of faulty differential pressure probe of the supply fan
105	AE06	Alarm of faulty condensing pressure probe circuit 1
106	AE07	Alarm of faulty evaporating pressure probe circuit 1
107	AE08	Alarm of faulty return temp. probe circuit 1
108	AE09	Alarm of faulty antifreeze probe temp. probe of the additional coil
109	AE10	Alarm of faulty air quality probe
110	AE11	Alarm of faulty ext. RH probe
111	AE12	Alarm of faulty return RH probe
112	AE13	Alarm of faulty diff. Detector of the fresh/ambient air
113	AE14	Alarm of faulty ambient thermostat temp. probe
114	AE15	Alarm of faulty ambient thermostat RH%
115	AE35	Faulty hydronic recovery temperature probe
200	AE20	pCOE communication alarm
201	AE21	Alarm of the humidifier communication
202	AE22	Alarm of ambient thermostat communication
203	AE23	Alarm of supply fan overload (cond. fan/pump) or compartment opening or supply flow alarm
204	AE26	Circuit 1 overload alarm
206	AE28	Phase monitor alarm
207	AE29	Alarm of faulty coil probe temp. probe circuit 2
208	AE30	Alarm of faulty condensing pressure probe circuit 2
209	AE31	Alarm of faulty evaporating pressure probe circuit 2
210	AE32	Alarm of faulty return temp. probe circuit 2
211	AE33	Circuit 2 overload alarm
213	AE40	Alarm gas burner module
214	AE39	Electronic filters alarm
215	AE41	Alarm offline board Pcoe adr 5

Stor	CODE	Description
300	AF01	HP alarm of the refrigerant circuit circuit 1
301	AF02	LP alarm of the refrigerant circuit circuit 1
302	AF03	HP1 high pressure prealarm circuit 1
303	AF04	LP1 low pressure prealarm circuit 1
304	AF05	HP2 high pressure prealarm circuit 1
305	AF06	LP2 low pressure prealarm circuit 1
306	AF07	HP alarm of the refrigerant circuit circuit 2
307	AF08	LP alarm of the refrigerant circuit circuit 2
308	AF09	HP1 high pressure prealarm circuit 2
309	AF10	LP1 low pressure prealarm circuit 2
310	AF11	HP2 high pressure prealarm circuit 2
311	AF12	LP2 low pressure prealarm circuit 2
400	AA01	Fire alarm
401	AA02	Dirty filter warning
402	AA03	Resistance high temperature alarm
500	AI01	Source water flow-rate alarm circuit 1
501	AI02	Antifreeze alarm of the source exchanger
502	AI03	Antifreeze alarm hot water coil
505	AI04	Source water flow-rate alarm circuit 2
506	AI05	Antifreeze alarm of the source exchanger
503	AI10	Humidifier alarm group 1
504	AI11	Humidifier alarm group 2
600	AE36	Alarm of faulty outside temp. from serial
601	AE37	Alarm of faulty external RH from serial probe
602	AE38	Alarm external serial probe offline
603	AE42	Alarm analogic signal ExpFlow

Control

STATA

To access to the stata:

1. Press the On/Off + Fan button for 5 sec.
2. Enter the password: with ▲ ▼ buttons, set **Code = 1**
3. Confirm with **OK**
4. The **Sta** menu appears, confirm with **OK**
5. Scroll the list of stata with ▲ ▼ buttons
6. To esc scroll the list, select **ESC** and confirm with **OK**

Stata	Description	UM
S001	Temperature setpoint	°C
S002	Set point humidity	%
S003	Request of total Vc capacity	%
S004	Capacity request to compressors	%
S005	Capacity delivered from free cooling/heating	%
S006	Capacity requested to the aux. element	%
S007	N. of active compressors	-
S008	Ext. damper opening	%
S009	Exhaust fan modulation	%
S010	Return air differential pressure	Pa
S011	Additional element modulation (electric resistances / hot water coil)	%
S012	Operative return temperature	°C
S013	Supply temperature	°C
S014	Operative ambient RH%	%
S015	CO2 probe	Ppm
S016	Fresh air temperature	°C
S017	Fresh air RH%	%
S018	Temperature of the coil probe/source exchanger circ.1	°C
S019	Temperature of the aux. element antifreeze probe	°C
S020	Condensing pressure circuit 1	Bar
S021	Evaporating pressure circuit 1	Bar
S022	Condensing fan signal circuit 1	%
S023	Return temperature circuit 1	°C
S024	Current overheating circuit 1	°C
S025	Thermostatic valve opening circuit 1	%
S026	Supply air flow	m3/h*10
S027	Signal of modulating supply fan	%
S028	Supply differential pressure	Pa

Stata	Description	UM
S029	Modulating humidifier signal	%
S030	Reheating request	%
S031	Functionning compressor 1 hours	hour
S032	Functionning compressor 2 hours	hour
S033	Compressor 1 starts	-
S034	Compressor 2 starts	-
S040	Temperature of the coil probe/source exchanger circ.2	°C
S041	Condensing pressure circuit 2	bar
S042	Evaporating pressure circuit 2	bar
S043	Condensing fan signal circuit 2	%
S044	Return temperature circuit 2	°C
S045	Current overheating circuit 2	°C
S046	Thermostatic valve opening circuit 2	%
S047	Inlet temperature recovery	°C
S048	Supply air flow	l/s
S049	Functionning hours compressor 1 circuit 2	hour
S050	Functionning hours compressor 2 circuit 2	hour
S051	Starts compressor 1 circuit 2	-
S052	Starts compressor 2 circuit 2	-
S053	Inlet signal % ExFlow =5	V
S054	Number extractor on (con 0<P_EnExFlow<5)	-
S055	Power reduction supply limit	-
S056	Power reduction demand limit	-
S057	Demand limit compressor power reduction	-
S058	Integration power reduction demand limit	-
S059	Integration power reduction demand limit	-
S995	Software type	-
S996	Software version number	-
S997	Software release day	-
S998	Software release month	-
S999	Software release year	-

9 Maintenance

9.1 General description

Maintenance must be done by authorized centres or by qualified personnel.

The maintenance allows to:

- maintain the unit efficiency
- increase the life span of the equipment
- assemble information and data to understand the state of the unit efficiency and avoid possible damages

Before checking, please verify the following:

- the electrical power supply line should be isolated at the beginning
- the unit isolator is open, locked and equipped with the suitable warning
- make sure no tension is present



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



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

9.2 Inspections frequency

Perform an inspection every 6 months minimum.

The frequency, however, depends on the use.



In the event of frequent use it is recommended to plan inspections at shorter intervals:

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

√	intervention frequency (months)	1	6	12
1	presence corrosion			X
2	panel fixing			X
3	fan fixing		X	
4	coil cleaning		X	
5	bowl cleaning + sanitisation		X	
6	outflow test		X	
7	air filters cleaning / inspection	X		
8	check of the fixing and the insulation of the power lead			X
9	check of the earthing cable			X
10	electric panel cleaning			X
11	capacity contactor status			X
12	terminal closing, cable insulation integrity			X
13	voltage and phase unbalancing (no load and on-load)		X	
14	absorptions of the single electrical loads		X	
15	test of the compressor crankcase heaters		X	
16	Checking for leaks			*
17	survey of the refrigerant circuit operating parameters		X	
18	safety valve			*
19	protective device test: pressure switches, thermostats, flow switches etc..		X	
20	control system test: setpoint, climatic compensations, capacity stepping, water / air flow-rate variations		X	
21	control device test: alarm signalling, thermometers, probes, pressure gauges etc..		X	

* Refer to the local regulations; and ensure correct adherence. Companies and technicians that effect interventions of installation, maintenance/repairs, leak control and recovery must be CERTIFIED as expected by the local regulations. The leak control must be effected with annual renewal.

9.3 Unit booklet

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

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

Report on the booklet:

- date
- intervention description
- carried out measures etc.

9.4 Standby mode

If a long period of inactivity is foreseen:

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

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



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

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

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

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

9.5 Outdoor air coil



Contact with the exchanger fins can cause cuts: wear protective gloves to perform the above described operations.

The finned surfaces of the cooling coils and, in particular, the condensate 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.

9.6 Condensation collection basin

Dirt or scale can give rise to clogging.

Also, microorganisms and mould can flourish in the bowl.

It is very important to foresee periodical cleaning with suitable detergents and, eventually, disinfect with sanitising products.

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

9.7 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 a hygienic-sanitary point of view.



Operation with clogged filters leads to a reduction in the airflow rate with malfunctions and block, up to possible breaks in the unit.

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



Frequency can indicatively vary from WEEKLY to MONTHLY.



It is advised to start with frequent checks, subsequently adjusting frequency to degree of detected dirt.

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

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

9.8 High efficiency air filter

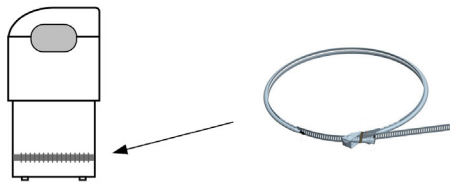
For details see:

10 Accessories p. 36

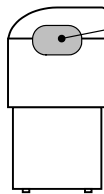
9.9 crankcase heater

Check:

- closure
- Operation



9.10 Copeland scroll compressor



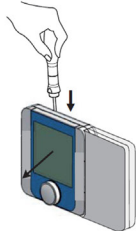
Advanced Scroll Temperature Protection

Compressor may stop Pumping With Motor Running
Turn Off And Wait Until Cool
May need More Than 1 Hour To Reset

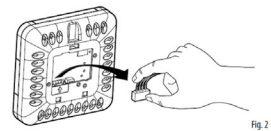
9.11 Wall mounted electronic room control

In the maintenance operations the keypad can be detached from the fixing support and directly connected to the unit electrical panel.

1



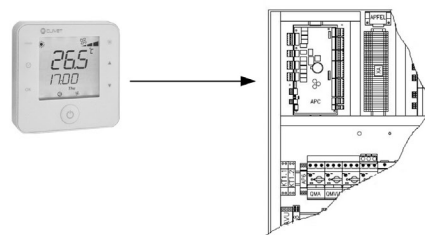
2



3

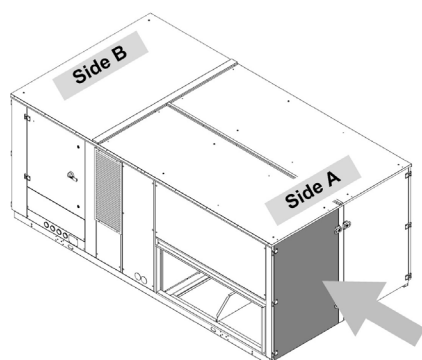


4



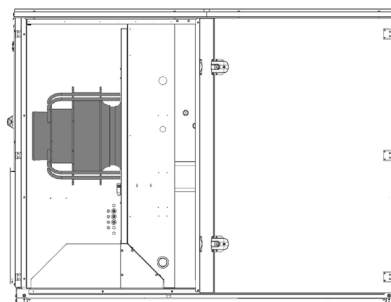
Supply fan: how to access

1



2

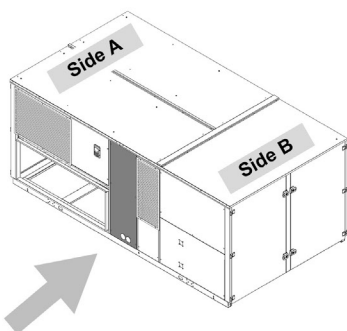
Side A



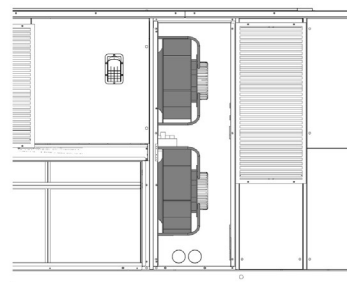
Exhaust fan: how to access

3

Only version: CCK - CCKP

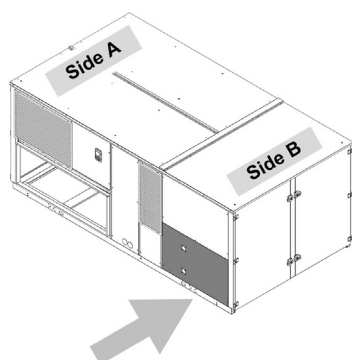


4



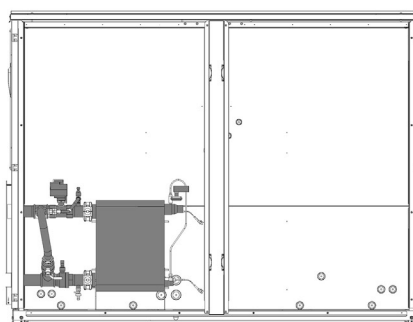
Water circuit: how to access

5



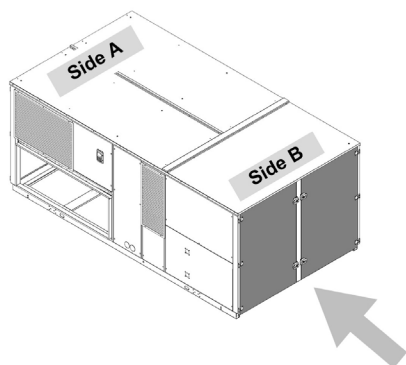
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Side B



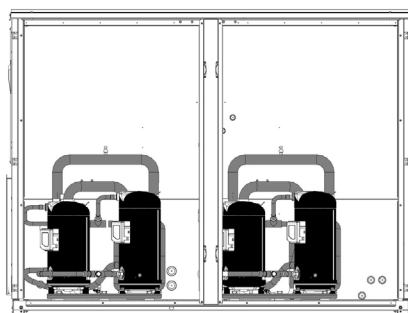
Refrigeration circuit: how to access

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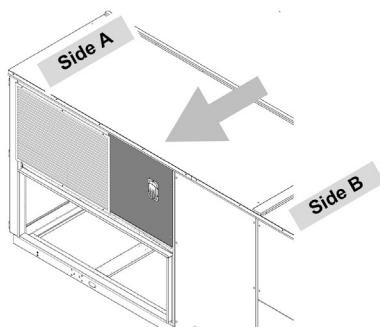
Side B



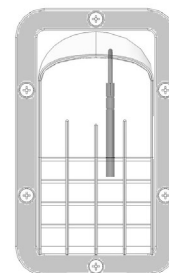
Outdoor temperature probe : how to access

9

Only version: CBK - CCK - CCKP



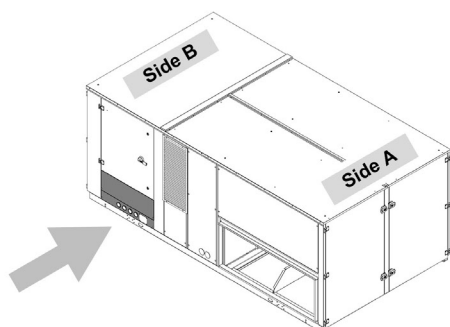
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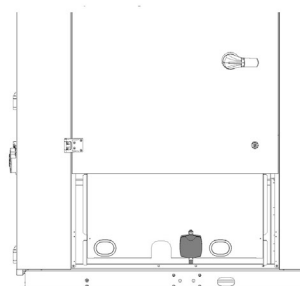
Enthalpy probe : how to access

11

Only version: CCK - CCKP



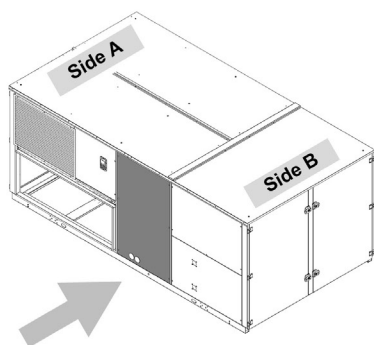
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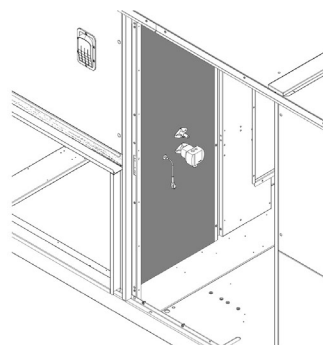
Return probe, UR, CO2 : how to access

13

Version : CAK - CBK

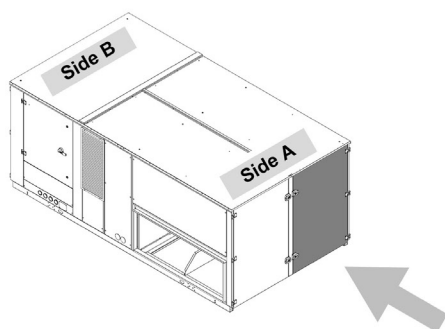


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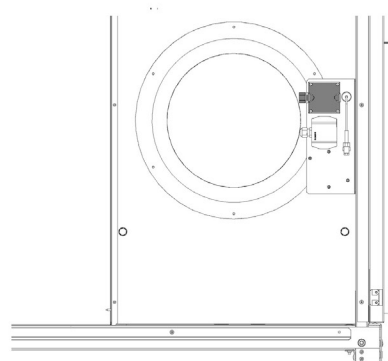


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Version : CCK - CCKP



16



9.12 Electric heaters

Check:

- cleaning state
- fastening
- presence of corrosion

9.13 Humidifier

For details see:

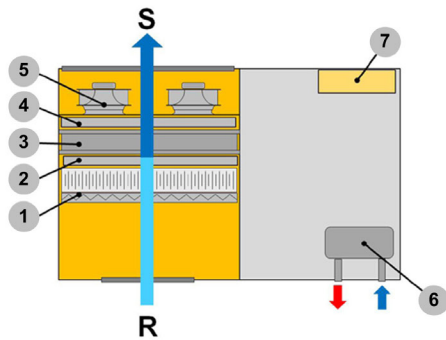
10 Accessories p. 36

10 Accessories

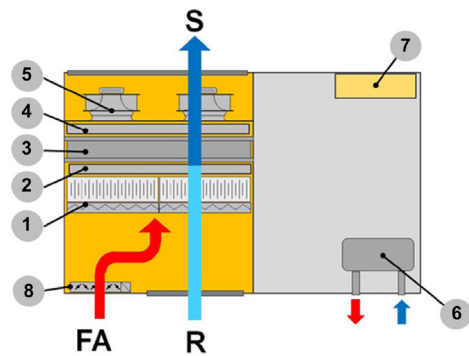
10.1 Configurations

- CAK Configuration with single fan section for full recirculation
 CBK Configuration with single fan section for recirculation and fresh air
 CCK Configuration with double fan section for recirculation, fresh air, exhaust and Free-Cooling
 CCKP Configuration with double fan section with fresh air, exhaust and THOR thermodynamic recovery

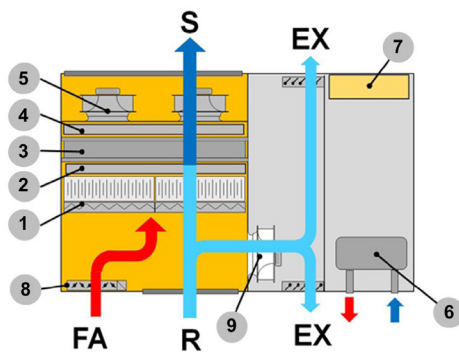
CAK



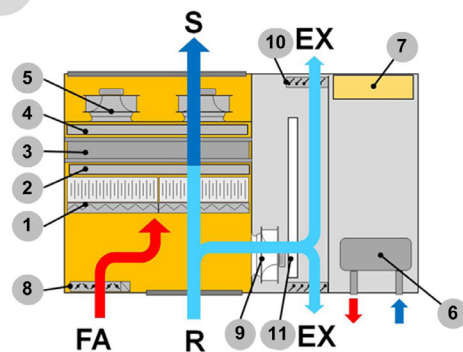
CBK



CCK



CCKP



1. G4 efficiency filters + H10 equivalent electronic filters
2. Hot water exchanger or electric heaters
3. Handling exchanger
4. Hot gas reheating exchanger
5. Return + supply fan section
6. Source side exchanger

R Return air
 S Supply air

7. Electrical panel
8. Renewal air damper
9. Exhaust fan
10. Overpressure damper
11. Thermodynamic recovery exchanger, THOR

FA Fresh air
 EX Exhaust air

10.2 Heater humidifier

Connexion humidificateur: 1/2" M

Start-up

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

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

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

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.

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

Maintenance

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

10.3 Immersed electrode humidifier

⚠ Connexion humidificateur: 1/2" M

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.

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 $\approx 0.93 \cdot \sigma_{25}$, R₁₈₀ $\approx 0.65 \cdot \sigma_{25}$

(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⁻

Periodical checks

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.

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 filter Drain solenoid valve: 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.

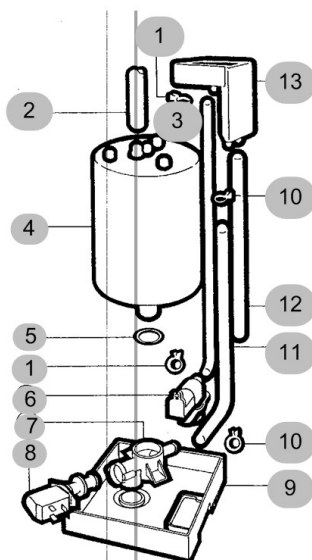
Replacement of the cylinder

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 filler (when filler is outside the cylinder)
- lift the cylinder to remove it

Before mounting it:

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

10.4 Electronic filters

The most common contaminants for which the filter is designed, are: air pollution by PM10, PM 2,5 and PM1

Contaminants that can be filtered:

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



Contaminants that can NOT be filtered:

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



Absolutely to avoid:

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

MATERIALS NECESSARY FOR MAINTENANCE

- Plastic or steel tank (750x750x310 mm) with settling bottom
- Acid detergent B01212 (code CLIVET C6460316)
- Protective gloves and goggles
- Graduated jug
- 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.

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

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. A slight chemical reaction is noticed within 2÷3 minutes with the development of foam. Wait 3 or 4 minutes.
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

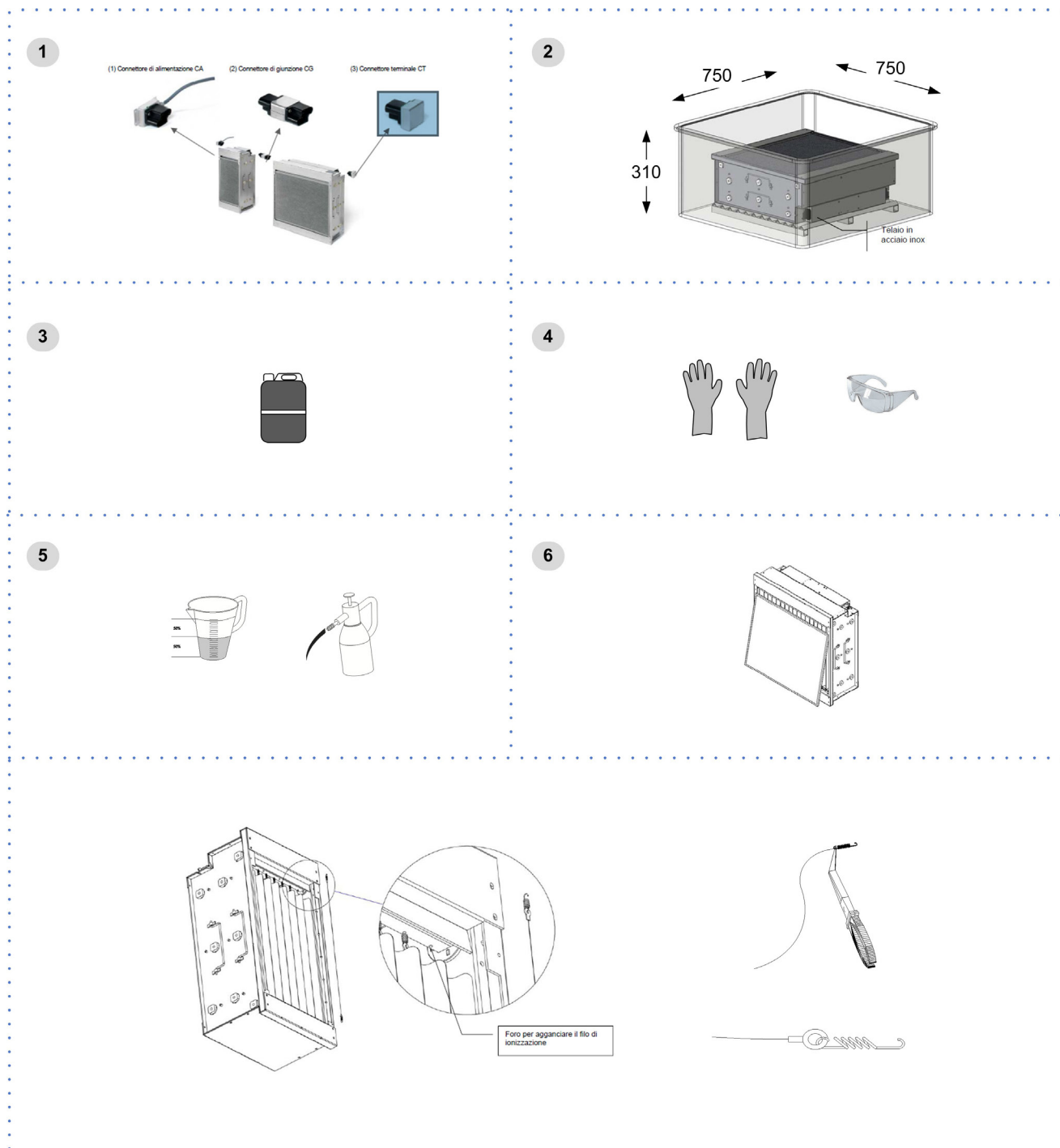
The impurities can determine oxidation or scaling on the wires, which can be removed using a cloth soaked in alcohol or an abrasive scourer with very fine grain.

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

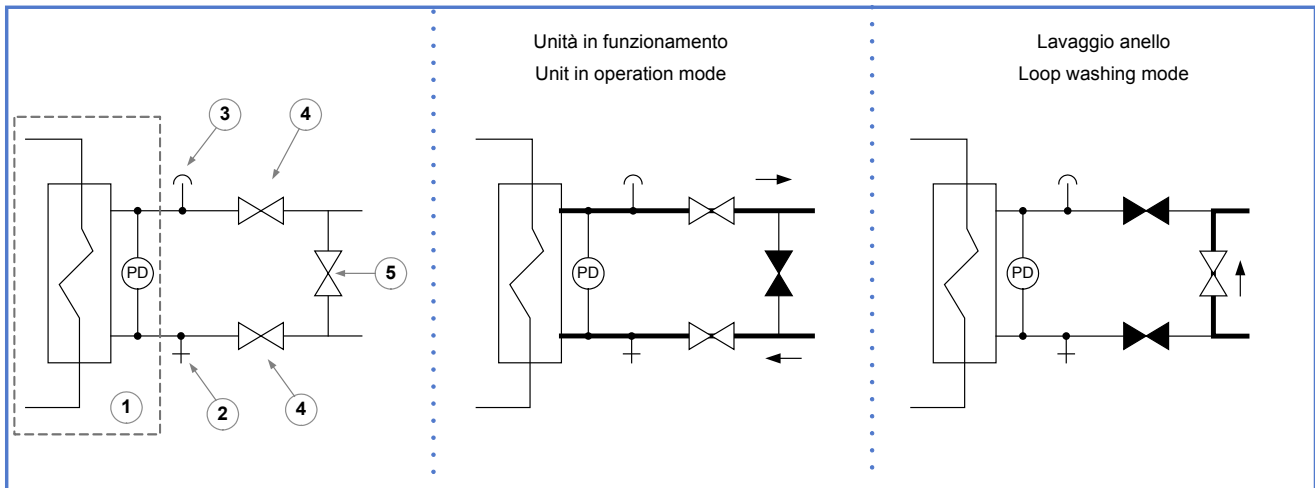


10.5 F7 Highly efficient filters

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

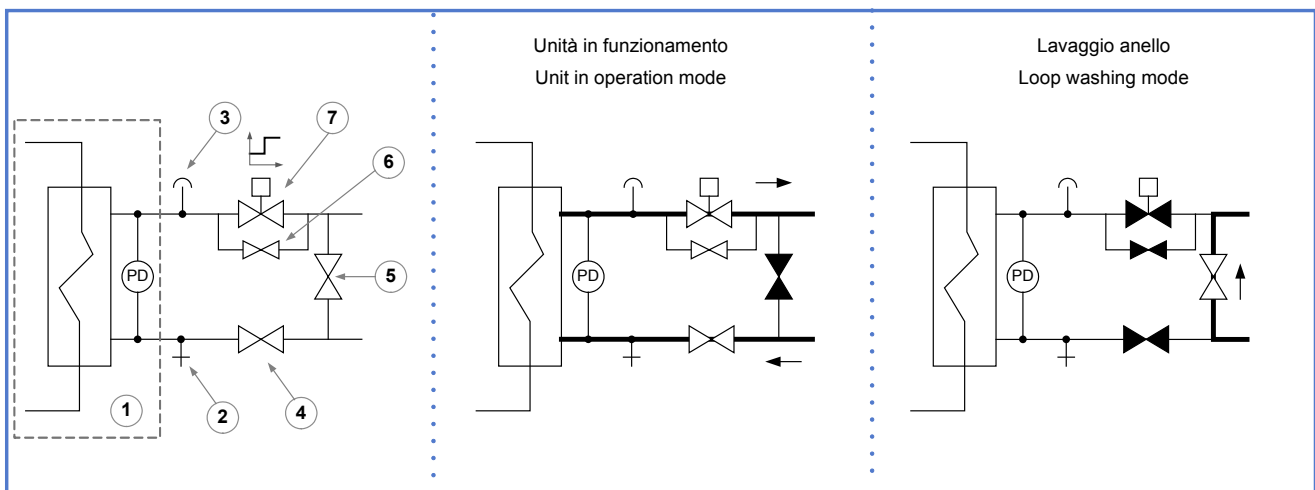
1. Open the access panel
2. Delicately remove the filter avoiding dirtying the area below
3. Insert the new filters
4. Close the panel
5. Dispose of the old filters sending them to specialised recycling or collection centres (keep to the standards in force)

10.6 Hydraulic pipework arrangement for loop with constant flow-rate



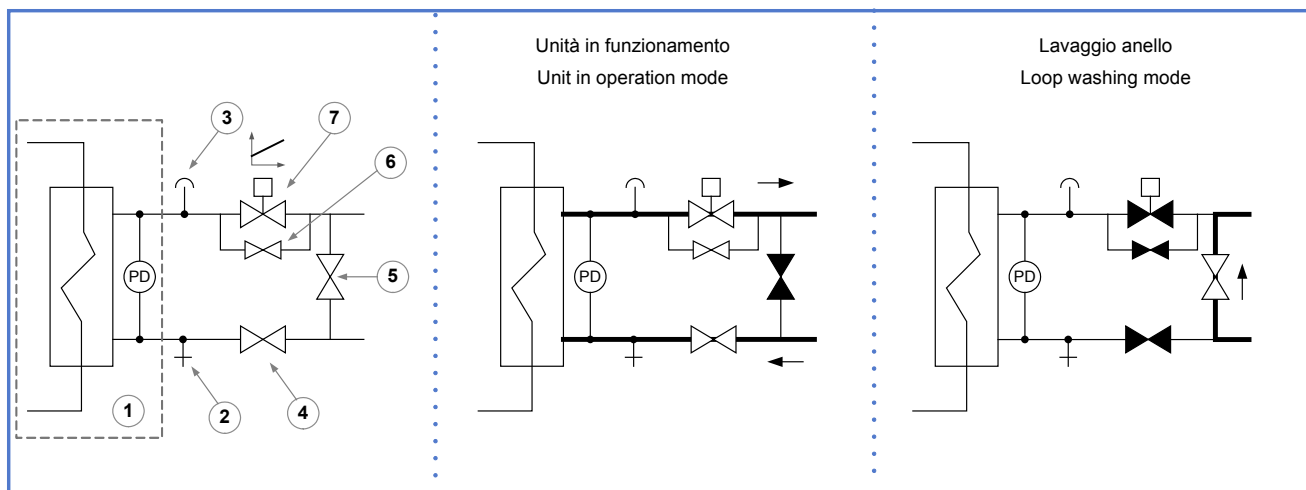
1. plate heat exchanger complete with water side differential pressure switch
- 2.
- 3.
- 4.
- 5.

10.7 Hydraulic pipework arrangement for loop with variable flow-rate



1. plate heat exchanger complete with water side differential pressure switch
- 2.
- 3.
- 4.
- 5.
6. anti-freeze by-pass with manual shut-off valve
- 7.

10.8 Hydraulic pipework arrangement for system with disposable water



1. plate heat exchanger complete with water side differential pressure switch
- 2.
- 3.
- 4.
- 5.
6. anti-freeze by-pass with manual shut-off valve
7. two-way modulating motorized valve

11 Decommissioning

11.1 Disconnecting

Only authorised personnel must disconnect the unit.

Avoid leak or spills into the environment.

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

- refrigerant gas
- anti-freeze solutions in the water circuit

Awaiting dismantling and disposal, the unit can also be stored outdoors, if the electrical, cooling and water circuits of the unit have 100% integrity and are isolated, bad weather and rapid change in temperature will not result in any environmental impact.

11.2 Dismantling and disposal

The unit must always be sent to authorised centres for dismantling and disposal.

When dismantling the unit, the fan, the motor and the coil, if operating, may be recovered by the specialist centres for reuse.

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

For further information on the decommissioning of the unit, contact the manufacturer.

11.3 Directive EC RAEE

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

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

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

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

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

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

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

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

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

This equipment may contain:

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

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

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



12 Residual risks

General description

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

Danger zone

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

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

Handling

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

Handle the unit following the instructions provided in the present manual regarding the packaging and in compliance with the local regulations in force. Should the refrigerant leak please refer to the refrigerant "Safety sheet".

Installation

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

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

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

Carefully check the positioning of the unit.

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

Carefully check the positioning and the anchoring of the unit.

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

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

General risks

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

Electrically isolate the unit (yellow-red isolator).

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

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

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

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

Always contact the qualified assistance centre.

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

Periodically check that all of the panels are correctly closed and fixed.

If there is a fire the temperature of the refrigerant could reach values that increase the pressure to beyond the safety valve with the consequent possible projection of the refrigerant itself or explosion of the circuit parts that remain isolated by the closure of the tap.

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

Electric parts

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

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

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

Always fix the unit cover properly.

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

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

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

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

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

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

Moving parts

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

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

Contact with the fans can cause injury.

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

Refrigerant

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

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

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

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

Do not place any heat source inside the danger zone.

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

Hydraulic parts

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

13 Technical information

STANDARD AIRFLOW

General technical data

Size				14.2	16.4	20.4	25.4	30.4	33.4	40.4	44.4
Cooling											
Cooling capacity	CAK	1	kW	51,0	66,5	82,8	93,2	104,0	121,0	152,0	163,0
Sensible capacity		1	kW	38,5	48,9	62,9	69,8	77,4	88,9	106,1	114,1
Compressor power input		1	kW	9,1	13,0	15,4	17,4	19,1	21,2	26,6	28,8
EER		1	-	5,60	5,12	5,38	5,36	5,45	5,71	5,71	5,66
SEER		9		5,12	5,22	5,51	5,46	5,35	6,15	6,99	6,58
ηsc		9	%	196,8	200,7	212,4	210,2	206,1	238,1	271,6	255,3
Water flow-rate			l/s	2,9	3,8	4,7	5,3	5,9	6,8	8,5	9,2
Pressure drop water side			kPa	29,5	34,8	39,8	35,3	43,2	28,5	43,9	36,5
Cooling capacity	CBK / CCK	2	kW	54,8	70,8	87,1	98,4	108,6	126,5	159,2	170,7
Sensible capacity		2	kW	40,3	51,2	65,6	71,7	79,7	91,2	109,3	117,4
Compressor power input		2	kW	9,0	12,7	15,0	17,0	19,1	21,2	26,7	28,9
EER		2	-	6,09	5,57	5,81	5,79	5,69	5,97	5,96	5,91
Water flow-rate			l/s	3,0	4,0	4,9	5,5	6,1	7,1	8,9	9,5
Pressure drop water side			kPa	33,38	38,41	43,05	38,35	46,40	30,59	47,37	39,39
Cooling capacity	CCKP	3	kW	54,8	70,8	87,4	98,6	108,6	126,5	159,2	170,7
Sensible capacity		3	kW	40,3	51,2	65,9	71,9	79,7	91,2	109,3	117,4
Compressor power input		3	kW	9,0	12,7	14,8	16,9	19,1	21,2	26,7	28,9
EER		3	-	6,09	5,57	5,91	5,83	5,69	5,97	5,96	5,91
Water flow-rate			l/s	2,7	3,6	4,4	5,0	5,5	6,4	8,1	8,7
Pressure drop water side			kPa	26,93	31,22	35,04	31,38	37,77	25,21	39,80	33,00
Heating											
Heating capacity	CAK	1	kW	52,5	72,2	85,5	98,4	108,9	124,6	158,9	173,8
Compressor power input		1	kW	9,9	15,5	18,2	20,4	23,8	27,7	30,1	33,3
COP		1	-	5,30	4,66	4,70	4,82	4,58	4,50	5,28	5,22
SCOP		9		3,99	4,26	4,03	4,59	4,32	4,66	5,38	4,79
ηsh		9	%	157	167	158	181	170	183	212	189
Heating capacity	CBK	2	kW	53,6	74,0	87,6	100,8	111,7	128,3	162,7	178,2
Compressor power input		2	kW	9,2	14,2	16,6	18,8	22,1	25,6	27,8	30,8
COP		2	-	5,83	5,21	5,28	5,36	5,05	5,01	5,85	5,79
Heating capacity	CCK	3	kW	53,6	74,0	87,6	100,8	111,7	128,3	162,7	178,2
Compressor power input		3	kW	9,2	14,2	16,6	18,8	22,1	25,6	27,8	30,8
COP		3	-	5,83	5,21	5,28	5,36	5,05	5,01	5,85	5,79
Heating capacity	CCKP	3	kW	53,6	74,0	87,6	100,8	111,7	128,3	162,7	178,2
Compressor power input		3	kW	9,2	14,2	16,6	18,8	22,1	25,6	27,8	30,8
COP		3	kW	5,83	5,21	5,28	5,36	5,05	5,01	5,85	5,79
Compressor											
Type of compressors		4	-	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors			Nr	2	4	4	4	4	4	4	4
Std Capacity control steps			Nr	2	4	4	4	4	4	4	4
Refrigerant charge (C1)	CAK	5	kg	8.0	9.0	13.0	14.0	14.5	19.0	21.0	22.0
Refrigerant charge (C2)		5	kg	8.0	9.0	13.0	14.0	14.5	19.0	21.0	22.0
Refrigerant charge (C1)	CBK	5	kg	8.0	9.0	13.0	14.0	14.5	19.0	21.0	22.0
Refrigerant charge (C2)		5	kg	8.0	9.0	13.0	14.0	14.5	19.0	21.0	22.0
Refrigerant charge (C1)	CCK	5	kg	8.0	9.0	13.0	14.0	14.5	19.0	21.0	22.0
Refrigerant charge (C2)		5	kg	8.0	9.0	13.0	14.0	14.5	19.0	21.0	22.0
Refrigerant charge (C1)	CCKP	5	kg	11.0	12.0	17.0	17.0	18.0	24.0	26.0	27.0
Refrigerant charge (C2)		5	kg	11.0	12.0	17.0	18.0	18.0	24.0	26.0	27.0
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	1	1	2	2	2	2	2	2
Fan diameter			mm	630	630	560	560	560	630	630	630
Supply airflow			m³/h	2500	3194	3750	4167	4722	5139	5833	6389
Supply airflow			l/s	9000	11500	13500	15000	17000	18500	21000	23000
Installed unit power			kW	2,75	2,75	2,90	2,90	2,90	2,75	2,75	2,75
Max. static pressure supply fan		7	Pa	510	390	510	510	510	510	440	380

Size	14.2	16.4	20.4	25.4	30.4	33.4	40.4	44.4
High static pressure air handling section fans (OPTIONAL)								
Type of supply fan				RAD	RAD	RAD	RAD	RAD
Number of supply fans			Nr	1	1	2	2	2
Fan diameter			mm	500	500	500	500	500
Supply airflow			l/s	2500	3194	3750	4167	4722
Supply airflow			m³/h	9000	11500	13500	15000	17000
Installed unit power			kW	5.5	5.5	5.5	5.5	5.5
Max. static pressure supply fan		7	Pa	1020	825	1020	1020	1020
Fans (Exhaust) (only CCK, CCKP-THOR configuration)								
Type of fans		6	-	RAD	RAD	RAD	RAD	RAD
No. of fans		8	-	1	1	2	2	2
Fan diameter		8	mm	500	500	400	400	400
Installed unit power		8	kW	2,68	2,68	1,32	1,32	1,32
Connections								
Condensate drain			mm	20	20	20	20	20
Water fitting IN/OUT source side				1" 1/2	1" 1/2	2"	2"	2"
Power supply								
Standard power supply			V	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50

Contains fluorinated greenhouse gases (GWP 2087,5)

Performances in cooling: Indoor air temp. 27°C/19°C W.B. Outdoor air 35°C D.B./24°C W.B. EER referred only to compressors, water entering/leaving temperature 30/35°C

Performance in Heating: Indoor air temp. 20°C D.B./12°C W.B. Outdoor air 7°C/6°C W.B. COP referred only to compressors, water entering/leaving temperature 15/10°C

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. SCROLL = scroll compressor

5. Indicative values for standard units with possible +/-10% variation. The actual data are indicated on the label of the unit

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. Data calculated in accordance with EN 14825: 2018

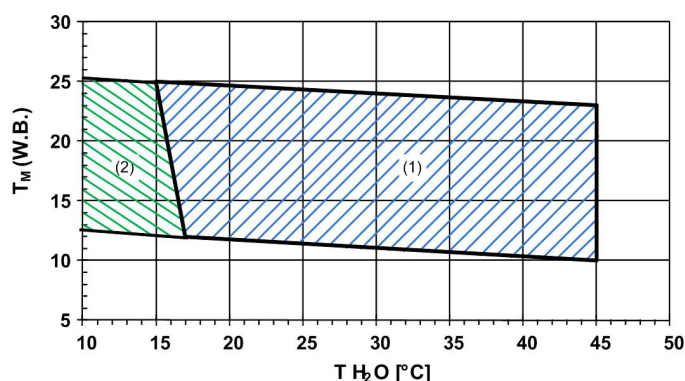
Sound levels

Size	Sound power level (dB)								Sound power level	Sound pressure level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
15.2	67	70	70	72	74	73	70	63	79	60
18.2	72	74	75	76	78	77	71	67	82	64
20.4	58	71	66	70	74	72	70	66	78	59
25.4	60	73	68	72	75	73	70	65	79	60
30.4	64	74	71	75	76	75	70	65	81	62
33.4	68	74	73	76	78	77	73	67	82	63
40.4	73	76	76	79	80	80	75	69	85	66
44.4	76	78	78	81	81	82	76	70	87	67

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.

Operating range (Cooling)



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

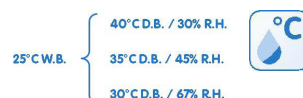
- general and non specific sizes,
- standard airflow,
- non-critical positioning and correct use of the unit,
- difference between inlet / outlet water temperature = 5°C

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

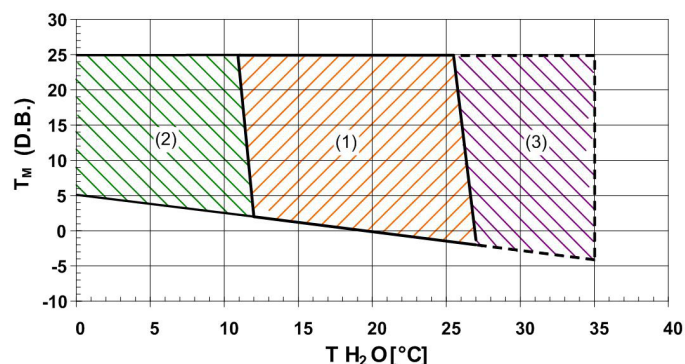
T_m = entering internal exchanger air temperature
Attention! Temperature measured with wet bulb (W.B.=WET BULB)

TH_{20} = water loop temperature (°C) (plate exchanger input)

1. Standard operating range
2. Unit operating range with pumping unit for installation with disposable water (optional)



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 and correct use of the unit,
- operating at full load
- difference between inlet / outlet water temperature = 5°C

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

T_m = entering internal exchanger air temperature
Attention! Temperature measured with dry bulb (D.B.=DRY BULB)

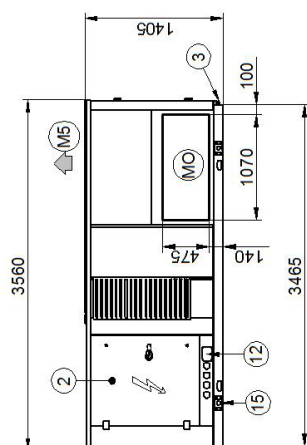
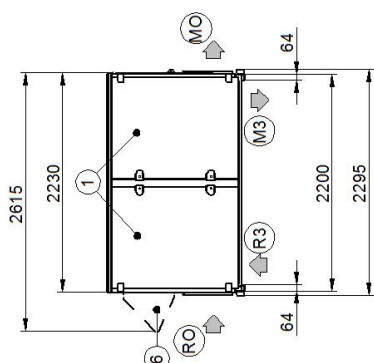
TH_{20} = water loop temperature (°C) (plate exchanger input)

1. Operation range at full load
2. Operating range for water glycol system (to prevent frost)
3. Unit operating range with pumping unit for installation with disposable water (optional)

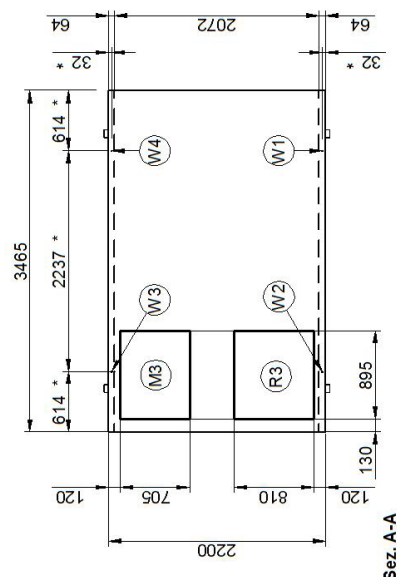
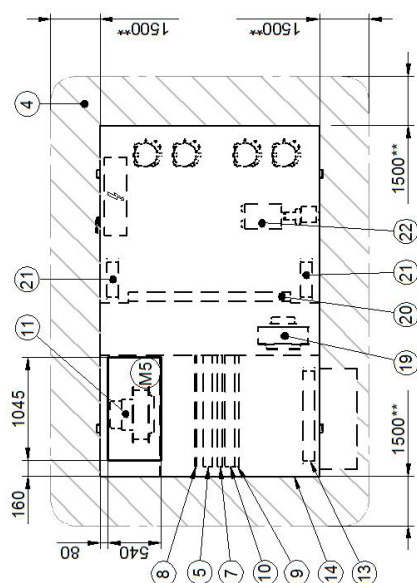
14 Dimensional drawings

Size 14.2 - 16.4 - CAK,CBK, CCK and CCKP configurations

DDAA7W14.2_CAK-CBK-CCK-CCKP_0
Date: 18/02/2016



- | | |
|--|--|
| 1. Compressor compartment and panel for exchanger inspection | |
| 2. Electrical panel | |
| 3. Condensate drain | |
| 4. Functional clearances | |
| 5. Internal exchanger | |
| 6. Outdoor air casing (Optional) | |
| 7. H2O heating coil / Rec. from food refrigeration /Heating elements (Optional) | |
| 8. Re-heating coil (Optional) | |
| 9. G4 air filters (Standard) | |
| 10. F7 filters / electrostatic filters (Optional) | |
| 11. Electric fan (Supply - return) | |
| 12. Power input | |
| 13. Outdoor air damper (CBK, CCK and CCKP config.) | |
| 14. Access for inspection of coils, filters, heating elements | |
| 15. Lifting brackets (removable) | |
| 16. Humidifier connections | |
| 17. H2O heating coil input Ø 1"1/4 / Input of rec. from food refrigeration coil Ø 1"1/4 (Optional) | |
| 18. H2O heating coil output Ø 1"1/4 / Output of rec. from food refrigeration coil Ø 1"1/4 (Optional) | |
| 19. Exhaust electric fan (CCK and CCKP config.) | |
| 20. Exhaust air recovery coil (CCKP config.) | |
| 21. Exhaust air dampers (CCK and CCKP config.) | |
| 22. Plate exchanger | |
| 23. Plate exchanger water input 1"1/2 | |
| 24. Plate exchanger water output 1"1/2 | |
| (R0) Horizontal air return | |
| (R3) Floor air return (Optional) | |
| (M0) Horizontal air supply | |
| (M3) Downward airflow (Optional) | |
| (M5) Upward airflow (Optional) | |
| (AE) Outdoor air return (CBK, CCK and CCKP config.) | |
| (ES) Air exhaust (CCK and CCKP config.) | |
| (**) Suggested clearance | |
| (*) Vibration mounts position | |

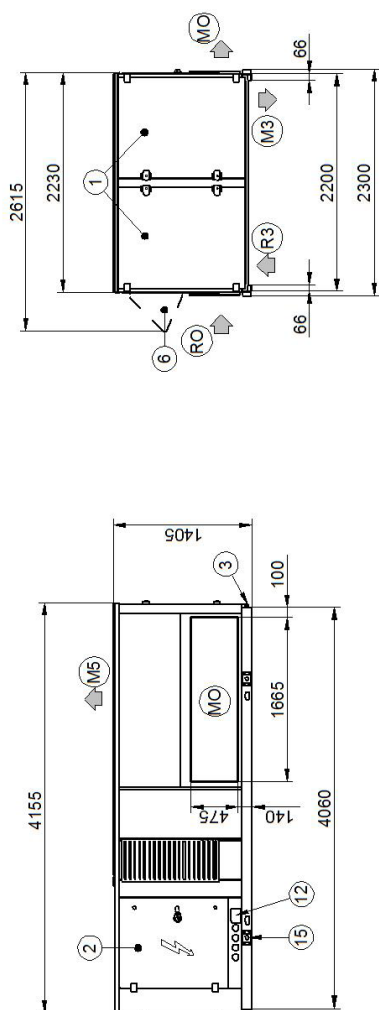


Size		14.2	14.2	14.2	16.4	16.4	16.4	
Configuration		CAK/CBK	CKK	CKKP	CAK/CBK	CKK	CKKP	
	W1 supporting point	kg	371	391	405	400	420	433
	W2 Supporting point	kg	286	306	316	287	307	317
	W3 Supporting point	kg	336	344	355	337	345	356
	W4 Supporting point	kg	403	411	425	432	440	453
	Operating weight	kg	1396	1452	1501	1456	1512	1559
Shipping weight		kg	1396	1452	1501	1456	1512	1559

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

Size 20.4 - 25.4 - 30.4 CAK,CBK, CCK and CCKP configurations

DAA7W20.4_CAK-CBK-CCK-CCKP_0
Date: 18/02/2016



1. Compressor compartment and panel for exchanger inspection

2. Electrical panel

3. Condensate drain

4. Functional clearances

5. Internal exchanger

6. Outdoor air casing (Optional)

7. H2O heating coil / Rec. from food refrigeration/Heating elements (Optional)

8. Re-heating coil (Optional)

9. G4 air filters (Standard)

10. F7 filters / electrostatic filters (Optional)

11. Electric fan (Supply - return)

12. Power input

13. Outdoor air damper (CBK,CCK and CCKP config.)

14. Access for inspection of coils, filters, heating elements

15. Lifting brackets (removable)

16. Humidifier connections

17. H2O heating coil input Ø 1"1/4 / Input of rec. from food refrigeration coil Ø 1"1/4 (Optional)

18. H2O heating coil output Ø 1"1/4 / Output of rec. from food refrigeration coil Ø 1"1/4 (Optional)

19. Exhaust electric fan (CCK and CCKP config.)

20. Exhaust air recovery coil (CCKP config.)

21. Exhaust air dampers (CCK and CCKP config.)

22. Plate exchanger

23. Plate exchanger water input 2"

24. Plate exchanger water output 2"

(RO) Horizontal air return

(R3) Floor air return (Optional)

(M0) Horizontal air supply

(M3) Downward airflow (Optional)

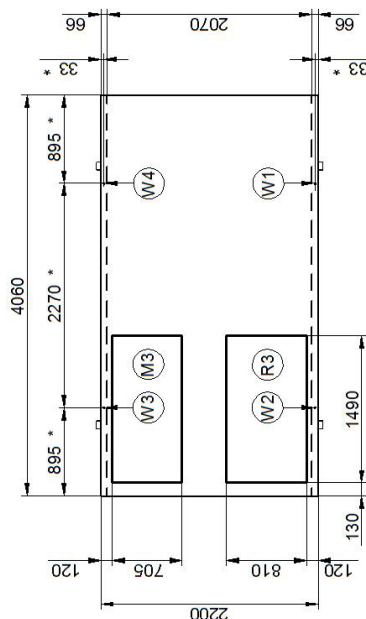
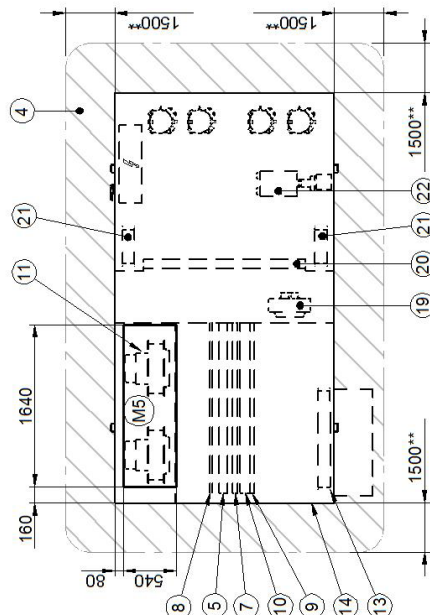
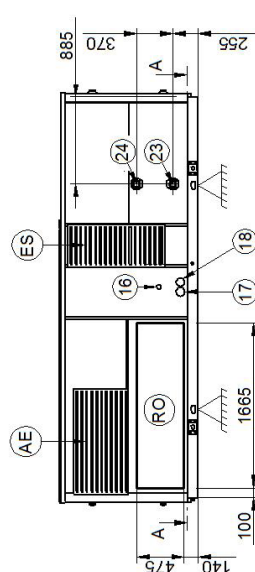
(M5) Upward airflow (Optional)

(AE) Outdoor air return (CBK,CCK and CCKP config.)

(ES) Air exhaust (CCK and CCKP config.)

(**) Suggested clearance

(*) Vibration mounts position



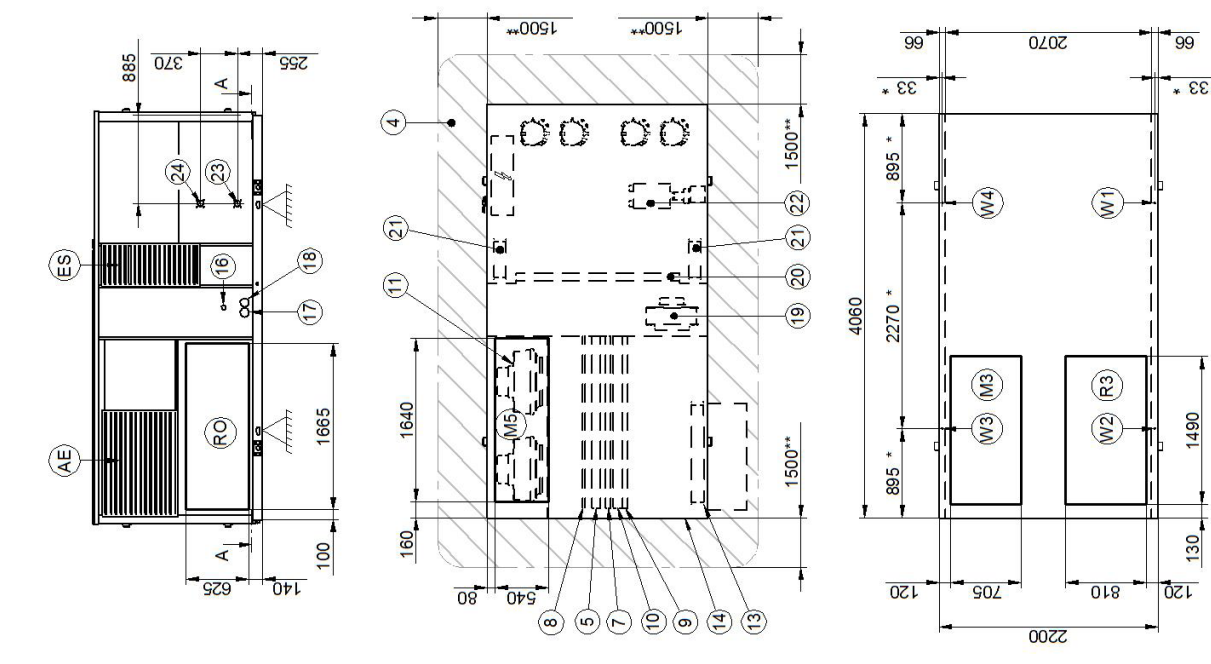
Sez. A-A

Size	20.4	20.4	20.4	25.4	25.4	25.4	30.4	30.4	30.4
Configuration	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP
W1 supporting point	kg	402	421	434	404	423	407	426	443
W2 Supporting point	kg	318	337	347	325	344	327	346	356
W3 Supporting point	kg	377	385	396	385	393	387	395	406
W4 Supporting point	kg	433	441	454	435	443	438	446	455
Operating weight	kg	1530	1584	1631	1549	1603	1559	1613	1660
Shipping weight	kg	1530	1584	1631	1549	1603	1559	1613	1660

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

Size 33.4 - 40.4 - 44.4 - CAK,CBK, CCK and CCKP configurations

DAA7W33.4_CAK-CBK-CCK-CCKP_0
Date: 18/02/2016



18. H2O heating coil output Ø 1"1/4 / Output of rec. from food refrigeration coil Ø 2"
- (Optional)
19. Exhaust electric fan (CCK and CCKP config.)
20. Exhaust air recovery coil (CCKP config.)
21. Exhaust air dampers (CCK and CCKP config.)
22. Plate exchanger
23. Plate exchanger water input 2"1/2
24. Plate exchanger water output 2"1/2
- (RO) Horizontal air return
- (R3) Floor air return (Optional)
- (M0) Horizontal air supply
- (M3) Downward airflow (Optional)
- (M5) Upward airflow (Optional)
- (AE) Outdoor air return (CBK,CCK and CCKP config.)
- (ES) Air exhaust (CCK and CCKP config.)
- (**) Suggested clearance
- (*) Vibration mounts position

1. Compressor compartment and panel for exchanger inspection
2. Electrical panel
3. Condensate drain
4. Functional clearances
5. Internal exchanger
6. Outdoor air casing (Optional)
7. H2O heating coil / Rec. from food refrigeration/Heating elements (Optional)
8. Re-heating coil (Optional)
9. G4 air filters (Standard)
10. F7 filters / electrostatic filters (Optional)
11. Electric fan (Supply - return)
12. Power input
13. Outdoor air damper (CBK,CCK and CCKP config.)
14. Access for inspection of coils, filters, heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 1"1/4 / Input of rec. from food refrigeration coil Ø 2" (Optional)

Size	33.4	33.4	33.4	40.4	40.4	40.4	44.4	44.4	44.4
Configuration	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP	CAK/CBK	CCK	CCKP
W1 supporting point	kg	406	441	457	413	448	415	450	465
W2 Supporting point	kg	335	370	383	343	378	344	379	392
W3 Supporting point	kg	411	424	438	420	433	421	434	448
W4 Supporting point	kg	450	463	479	460	473	461	474	490
Operating weight	kg	1602	1698	1757	1636	1732	1641	1737	1795
Shipping weight	kg	1602	1698	1757	1636	1732	1641	1737	1795

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

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