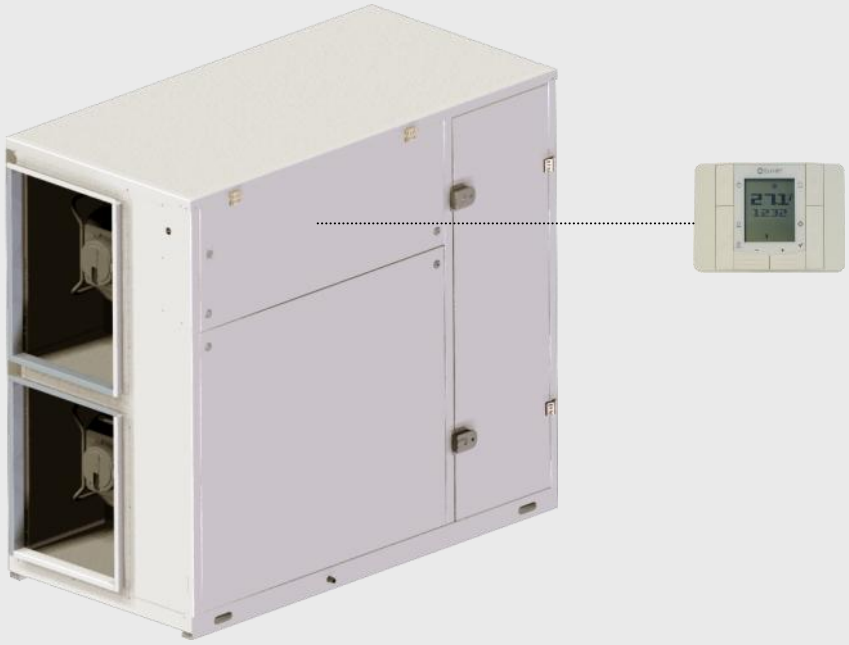
CPAN-XHE3 size1 - size6

Make-up unit, full fresh air
With return/exhaust and thermodynamic heat recovery Reversible heat pump technology

Installation use and maintenance manual



CLIVET®

R-410A

M05G40L12-04 17-11-16

Dear Customer,

Congratulations for having chosen this product.

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

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

With kind regards and... good reading!

CLIVET Spa

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

1.1 General warnings

Purpose of the manual

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

Manual instructions

It is of fundamental importance that the manual is carefully read.
Pay particular attention to:

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

WARNINGS
indicate potentially dangerous or damaging situations.

INFORMATION
indicate particularly useful information.

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

Preserving the manual

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

Systems designing

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

Qualified personnel

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

Installation

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

Electric network

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

Packaging

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

Maintenance

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

standards.

Periodical checks

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

entails the risk of damages to things and personal injuries.

Fault – Malfunctioning

Disconnect the equipment in case of fault or

malfunctioning.

Repair

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

Modifications

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

Destination of use

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

CIVIL AIR CONDITIONING

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

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

Safety integration principles

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

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

Data update

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

User training

The installer must train the user, particularly on:

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

1.2 Machine identification

Matriculation plate

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

The matriculation plate must never be removed.

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

- the type of machine
  range → **CSNX-XHE**
  size → **82 or 102 or ….**
- the serial number
  12 characters → **Axxxxxxxxxxx**
- the year of manufacture
- the wiring diagram number
- electrical data
- manufacturer logo and address

Serial number

Unambiguously identifies each machine.

Enables identifying the specific spare parts for the machine.

Intervention requests

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

For request of intervention, always give the following data.

Range
Size
Serial number
Year of manufacture
Wiring diagram

1.3 Versions - Options

VERSIONS

RTA Active thermodynamic recovery standard (std)

REFRIGERANT CIRCUIT

CCSTD Standard exchanger on exhaust air std

CESTD Standard exchanger on outdoor air std

EVE Electronic expansion valves std

CPHGM Hot gas re-heating coil with capacity modulation std

AIR SIDE FEATURES

PCOSME Air flow constant in delivery and expulsion std

PVARC Variable air flow on supply and exhaust with CO2 probe

PVARCV Variable air flow on supply and exhaust with CO2+VOC probe

FG4EE G4 class air filters on outdoor and exhaust air std

PSTAF Filters dirty differential pressure switch on extract and delivery std

MHSEX Immersed electrodes steam humidifying module

MCHSX Steam-powered humidifying module

FEL Electronic filters std

ELECTRIC CIRCUIT

CRC Remote control with user interface std

NCRC Remote control with user interface: not required

MOB Serial port RS485 with MODBUS protocol

LON Serial port RS485 with LONWORKS protocol

BAC Serial port RS485 with BACnet protocol

CTU Temperature and humidity control std

RE Electric heaters std

DESM Smoke detector

PM Phase monitor std

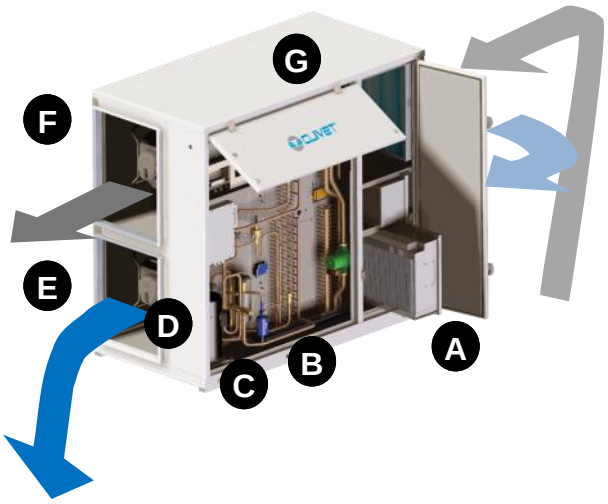
INSTALLATION

II Indoor installation

IO Outdoor installation std

AMRX Rubber antivibration mounts

1.4 Example referred on Size 2



Main components:

A Electronic filters

B Outdoor air exchanger

C Hot gas re-heating coil with capacity modulation

D Capacity modulating compressors

E Variable air flow fan on supply air

F Variable air flow fan on exhaust air

G Exhaust air exchanger

2.1 Preliminary information

Work respecting the current safety standards.

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

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

2.2 Check upon arrival

Before accepting delivery, check:

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

In case of damages or anomalies:

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

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

2.3 Storage

Respect the indications on the outside of the pack.

2.4 Removal of packaging

Attention not to damage the unit.

Recycle and dispose of the packaging material according to local standards.

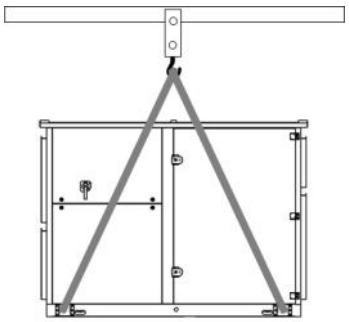
2.5 Handling

Check the weight of the unit (TECHNICAL INFORMATION chapter) and capacity of the lifting mean.

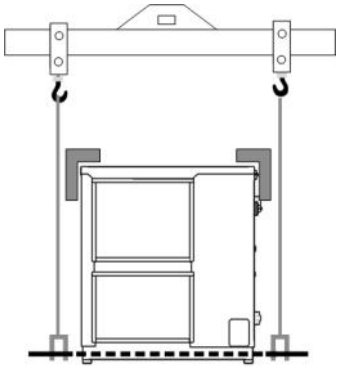
Identify the critical points in the handling path (holy paths, ramps, steps, doors).

Check the position of the centre of gravity in the TECHNICAL INFORMATIONS—DIMENSIONS section.

Ensure the unit is stably balanced before starting handling.

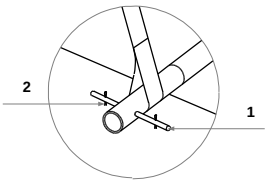


Use protections to avoid damaging the unit.



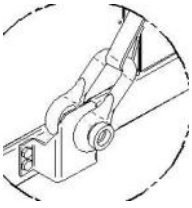
Size1, size2 - lifting holes

insert safety pins (1) and split pins (2)



Size3....size6

lifting bracket



3.1 Preliminary information

Work respecting the current safety standards.

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

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

3.2 Functional spaces

The functional spaces have the aim of:

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

Respect the functional spaces indicated in the TECHNICAL INFORMATION chapter

Double the functional spaces if more units are aligned.

3.3 Positioning

The units have been designed to be installed :

- OUTDOORS
- INDOORS (OPTION)
- in permanent position.

Choose the place of installation depending on the following criteria:

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

Prefer places where the unit does not disturb neighbours.

Avoid snow accumulating obstructing the coils

Avoid places that may be subject to floodings

Install the unit lifted from the ground.

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

Limit the transmission of vibrations:

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

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

Avoid:

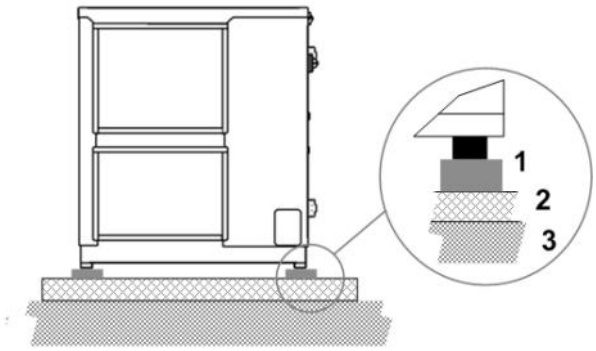
- obstacles to air flow (strong prevailing winds, hedges, fences, etc.)
- difficulty of exchange
- leaves or other bodies that can obstruct the exchange coils
- winds contrasting or favouring the air flow
- heat sources near the unit (chimneys, extractors, etc.)
- sources of dust or pollutants
- stratification (cold air that stagnates at the bottom)
- recirculation (ejected air that is taken back via suction)
- positioning underneath the ground level, near very high walls, underneath roofs or in corners (can give rise to stratification or recirculation phenomena).

Neglecting the previous indications can lead to:

- worsening of the energy efficiency.
- blocks due to HIGH PRESSURE (in summer) or LOW PRESSURE (in winter).

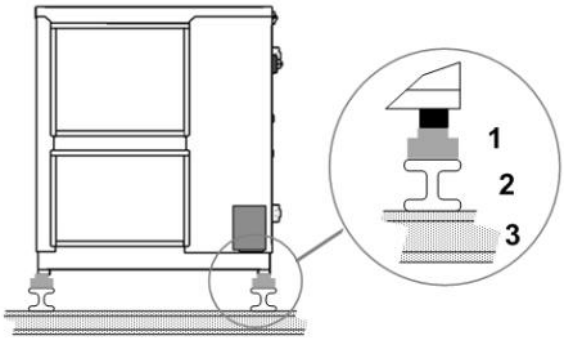
Avoid snow and ice accumulation in front of the external air outlets and of the exhaust air ejection.

Positioning on concrete floor



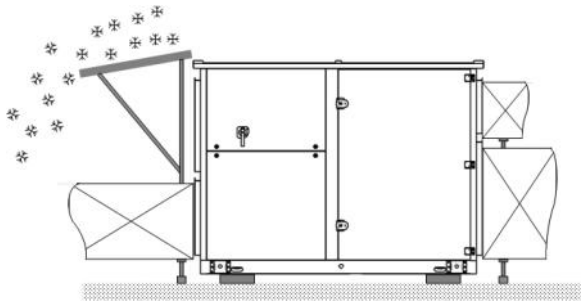
1 strisce in neoprene di spessore 2 cm
2 platea in calcestruzzo
3 solaio

Positioning on steel structure



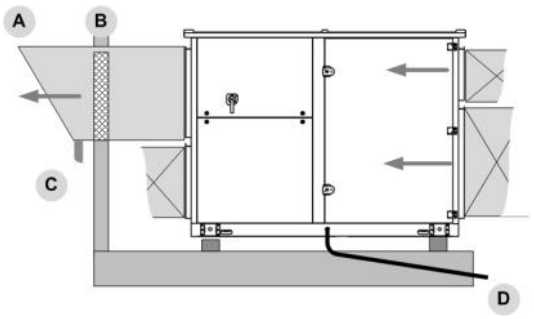
1 anti-vibration devices
2 steel structure
3 steel structure

Avoid snow and ice accumulating in front of the exhaust air ejection.



3.4 INDOOR INSTALLATION SET-UP

A Rain-proof protection
B Safety and anti-intrusion for small animals grille
C Rain drain
D Condensate drain



3.5 ELECTRONIC FILTER - OPTION

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

- Dry smokes
- powder (up to 0.3 microns)
- Smoke electrostatically charged

Contaminants that can NOT be filtered:

- Water vapors also in low concentrazione
- Oil vapors
- large amounts of dust
- Metal shavings,iron filing dusts and waste generally
- gas

Absolutely to avoid:

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

3.6 STEAM HUMIDIFICATION MODULE - OPTION

IMMERSED ELECTRODE STEAM HUMIDIFICATION MODULE

This accessory requires connection to a water supply network and discharge water circuit with adeguate frost protection. Requires its own power supply and have to be connected to the unit. Installation and wiring to customer care.

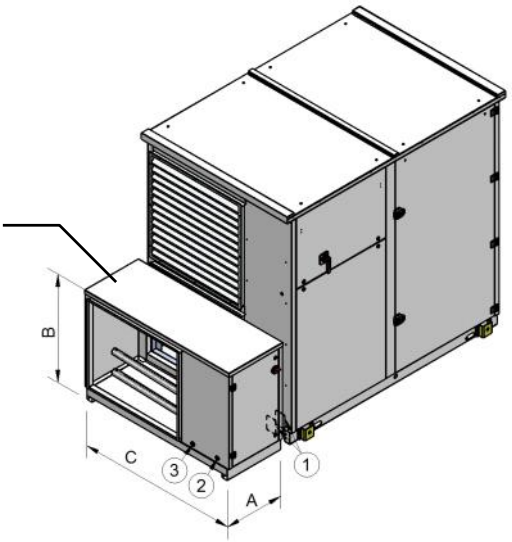
CENTRALISED STEAM HUMIDIFICATION MODULE

A shut-off valve in the unit's steam input line is to be provided (responsibility of the customer). Install the steam line in a position higher to the unit.

If the available steam supply exceeds the pressure operating range indicated, the required de-pressurization must take place outside the unit (responsibility of the customer).

Operating pressure: 1 bar

Risk of freezing: see par. 4.2



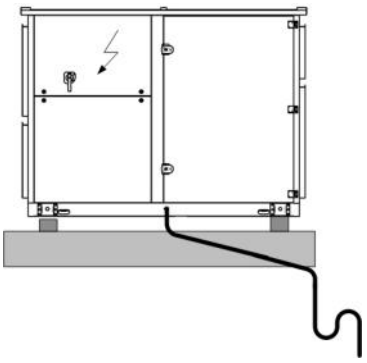
(1) Power input
(2) Steam inlet / Water inlet
(3) Condensate discharge

SIZE		SIZE 1	SIZE 2	SIZE 3	SIZE 4	SIZE 5	SIZE 6
A	mm	640	640	760	760	760	760
B	mm	800	800	835	1060	1060	1060
C	mm	905	905	1630	1630	1920	2225

4.1 Condensate drain

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

- Unit drain coupling: the connection must not transmit mechanical stresses and must be carried out paying attention not to damage the unit drain coupling.
- Foresee a siphon that, by eliminating the depression caused by the fan, prevents suction of air from the drain piping.
- The piping must have adequate slope to allow out flow.
- Anchor the piping with an adequate number of supports.
- On the contrary, cracking in the piping and air pockets obstructing the outflow, are generated.
- Isolate piping and siphon to avoid condensate dripping.
- Connect the condensate drain to a rain drain network.
- DO NOT use white waters or sewage drains to avoid possible inhaling of odours in case of evaporation of the water contained in the si phon.
- At work end, check the regular outflow of the condensate by pouring water in the bowl.

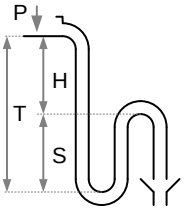


Siphon height calculation

T = 2P

S = T/2

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



Example :

P = 300 Pa = 30 mm

T = 2P = 60 mm

S = T/2 = 30 mm

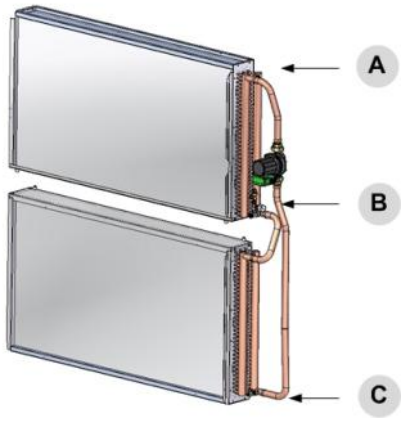
4.2 Risk of freezing

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

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

4.3 Hydronic recovery - option

The device is shipped filled with water and glycol.



A. vent
B. filling glycol
C. water filling tap

4.4 Immersed electrodes humidifier - option

SUPPLY WATER

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

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

Do not use :

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

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

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

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

DRAINAGE WATER

It can reach a temperature of 100°C.

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

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

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

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

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

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

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

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

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

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

No relation can be demonstrated between water hardness and conductivity.

5.1 Generality

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

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

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

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

5.2 Treated air channelling

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

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

DIFFUSERS INLETS GRILLES

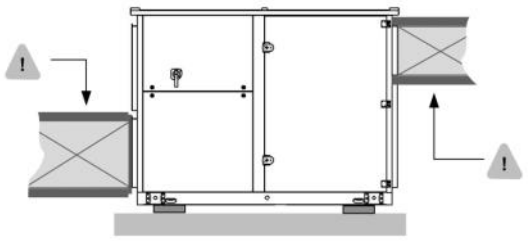
A correct diffusion of the air in the room is determining for the level of comfort.

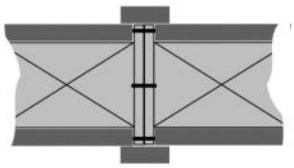
When choosing and positioning the grilles, inlets and diffusers, avoid:

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

For sound comfort, consider that：

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

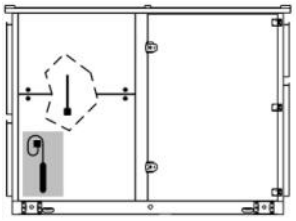




Thermally isolate the channels and the flanges to avoid energy losses and forming of condensation

Remote supply air sensor (standard size 3, 4, 5, 6)

1



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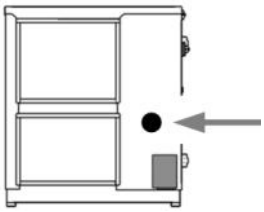

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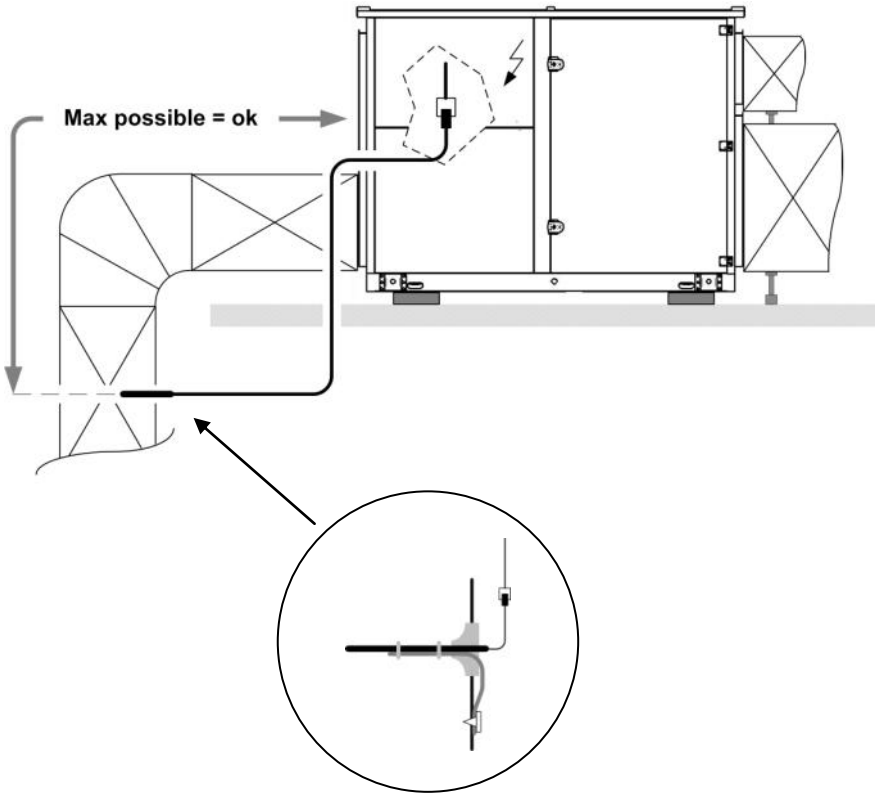


1. Probe kit position
2. Probe cable outlet

6.1 Preliminary information

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

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

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

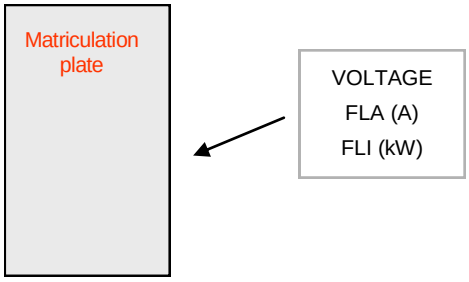
All electrical operations must be carried out by personnel having the legal requisites, trained on the risks related to these operations.

Work respecting the current safety standards.

6.2 Electric data

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

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



F.L.A. Full load ampere
absorbed current at maximum admitted conditions

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

6.3 Connections

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

Check the mains have features conform with the data reported on the matriculation plate

Before starting work, check the isolation device at unit power supply line start is open, blocked and provided with sign

First carry out the earth connection

Protect the cables using adequately sized cable glands

Before electrically powering the unit, ensure all protections removed during electric connection are restored.

6.4 Data-signal lines

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

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

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

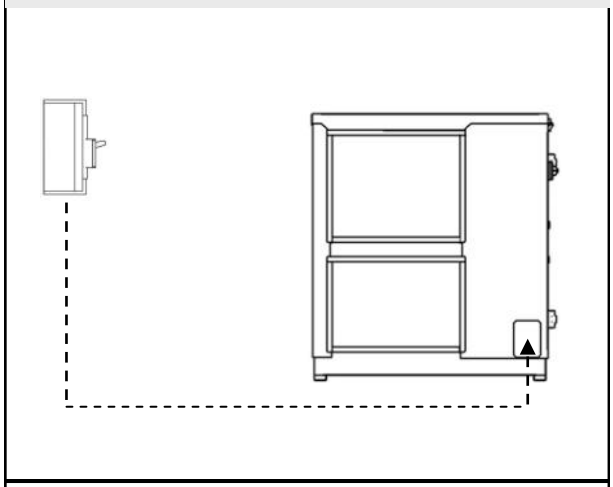
Avoid laying in parallel with other cables, any intersection with other cables is admitted only if at 90°C.

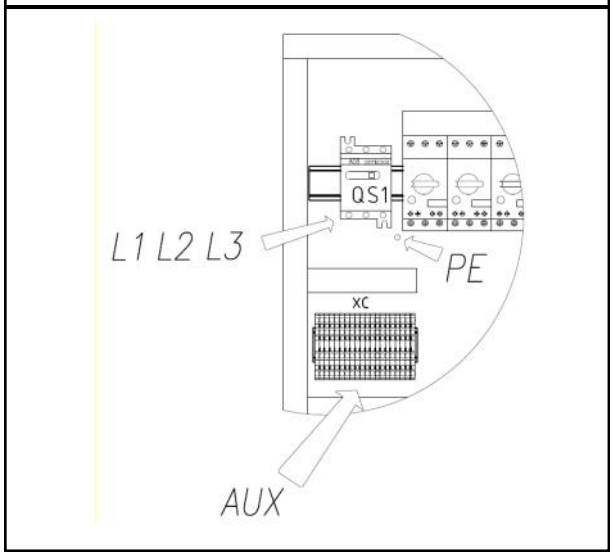
The screen must be connected to earth without interferences.

Guarantee screen continuity for the entire extension of the cable.

Respect the indications on impedance, capacity, attenuation.

6.5 Electric line input





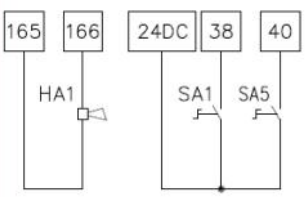
QS1 main isolator
AUX Customer connections terminal box

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

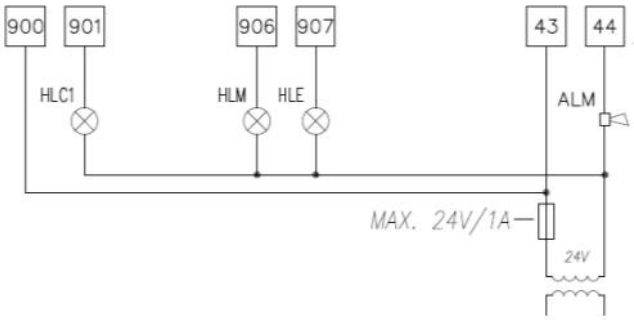
The cables must not touch the compressors or cooling piping (they reach high temperatures)

6.6 Connections by the Customer - XC

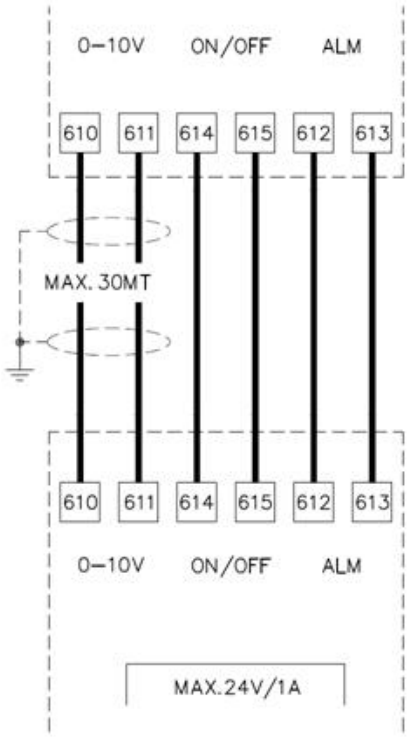
HA1 fire alarm
SA1 remote ON-OFF selector
SA5 remote SUMMER - WINTER selector

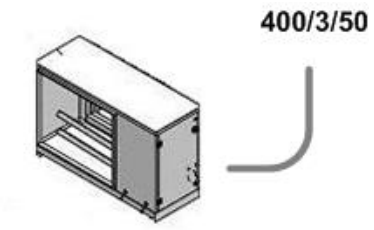


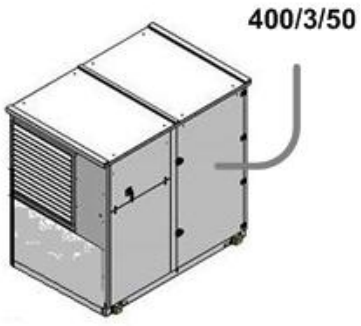
HLC1 compressor status signal lamp
HLM supply fan status
HLE indicating light of the return and/or supply fan status
ALM remote alarm signal



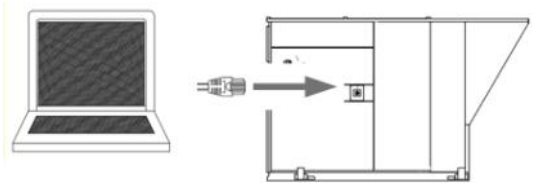
6.7 STEAM HUMIDIFICATION MODULE - OPTION



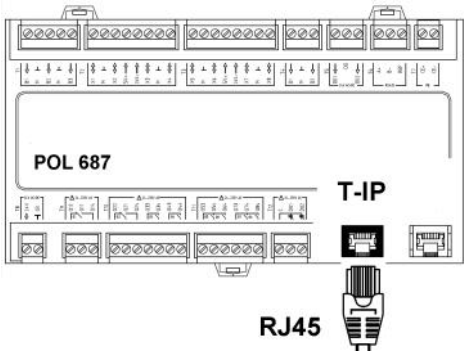




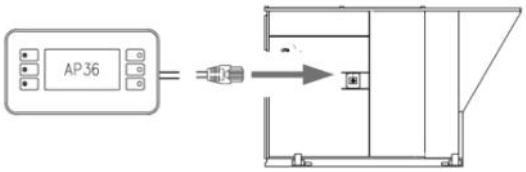
6.8 P.C. - not supplied



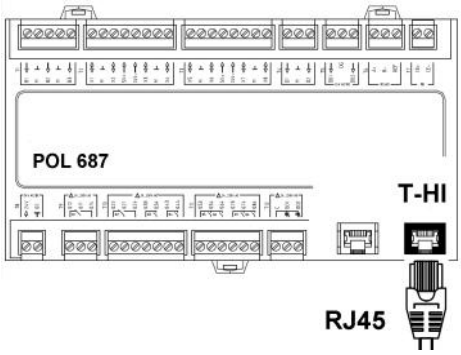
RJ45 : standard connection



6.9 SERVICE KEYPAD - OPTION

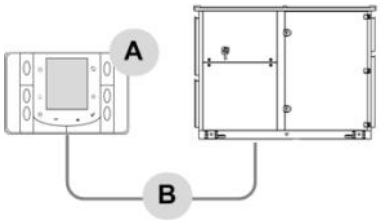


Shift RJ45 from T-IP to T-HI

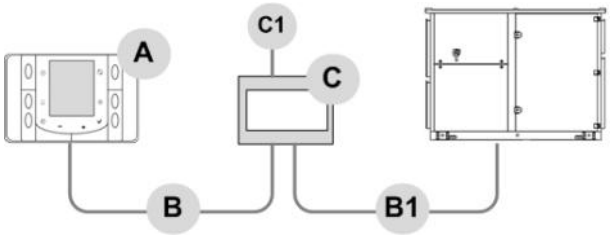


6.10 Room keypad

Distance up to 350 mt



Distance up to 700 mt



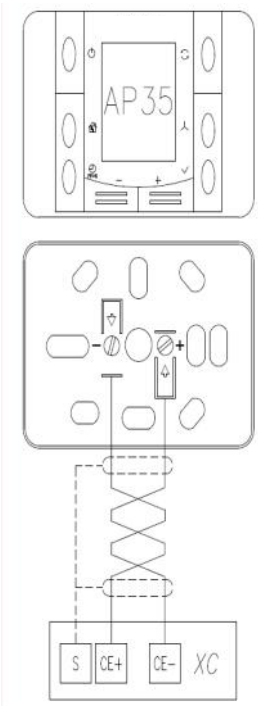
A user interface

B = B1 KNX bus, max 350 mt
twisted pair with shield, Ø 0,8 mm
EIB/KNX cable marking recommended

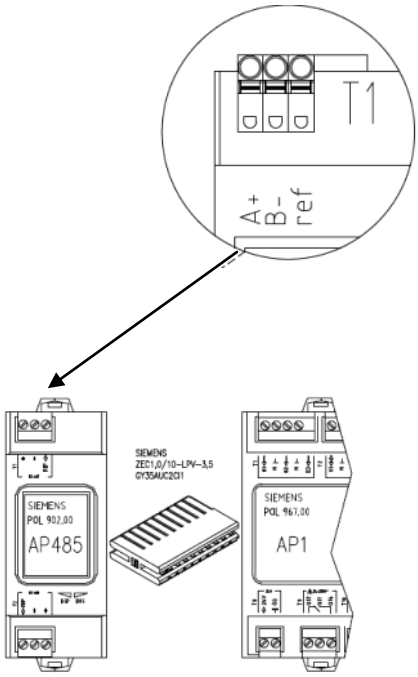
C power supply unit N125/11 5WG1 125-1AB11

C1 AC 120...230 V, 50...60 Hz

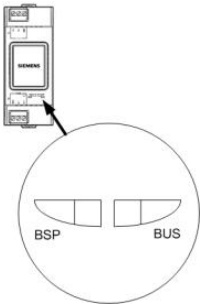
Connections



6.11 MODBUS - RS485

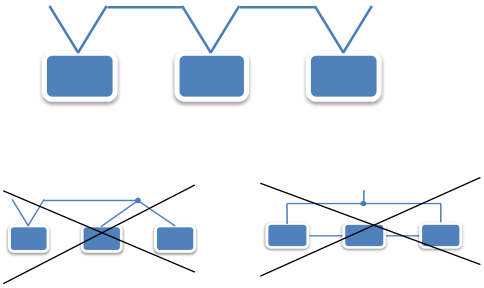


LED BSP	**communication with AP1 module**
green	communication ok
yellow down	software ok but communication with AP1
red	flashing : software error
	fixed : hardware error
LED BUS	**communication with MODBUS**
green	communication ok
yellow	startup / channel not communicating
red	communication down

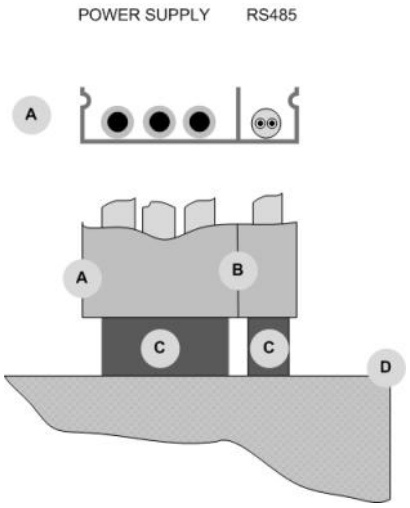


CABLE MODBUS, BACNET, LONWORK REQUIREMENTS
Couple of conductors twisted and shielded
Section of conductor 0.22mm^2…0,35mm^2
Nominal capacity between conductors < 50 pF/m
nominal impedance 120 Ω
Recommended cable BELDEN 3105A

- Every RS485 serial line must be set up using the 'In/ Out' bus system. Other types of networks are not allowed, such as Star or Ring networks

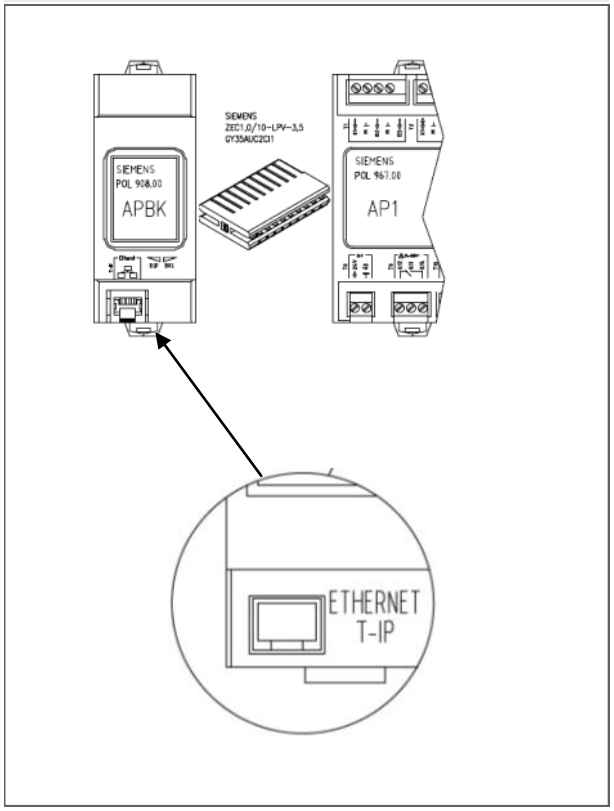


- The difference in potential between the earth of the two RS485 devices that the cable shielding needs to be connected to must be lower than 7 V
- Suitable arresters must be set up to protect the serial lines from the effects of the atmospheric discharges
- A 120 ohm resistance must be located on the end of the serial line. Alternatively, when the last serial board is equipped with an internal terminator, it must be enabled using the specific jumper, dip switch or link
- The cable must have insulation features and non-flame propagation in accordance with applicable regulations
- The RS485 serial line must be kept as far away as possible from sources of electromagnetic interference.

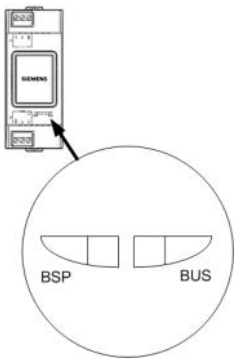


A metal conduit
B metal septums
C metal-lined sheath (sleeve)
D unit

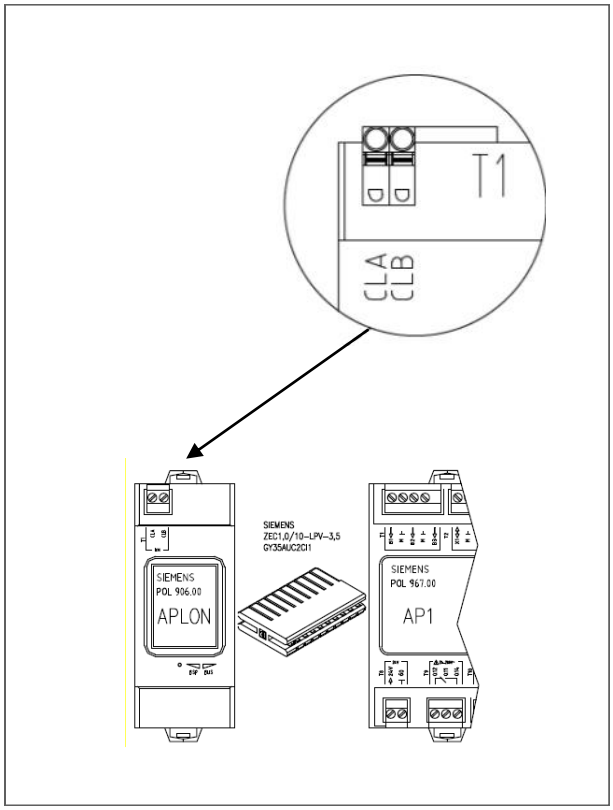
6.12 BACNET



LED BSP	communication with AP1 module
green	communication ok
yellow down	software ok but communication with AP1
red	flashing : software error
	fixed : hardware error
LED BUS	**communication with BACNET**
green	ready for communication
yellow	startup
red	BACnet server down
	restart after 3 sec.



6.13 LONWORK



LED BSP	communication with AP1 module
green	communication ok
yellow down	software ok but communication with AP1
red	flashing : software error
	fixed : hardware error
LED BUS	**communication with LONWORK**
green	communication ok
yellow	startup
	flashing: communicating not possible
red	communication down

Preliminary checks

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

√ **Unit OFF power supply**
• safe access
• integrity of structure
• functional spaces
• fresh air intake: grille free
• air expulsion: grille free
• unit on anti-vibration devices
• air filters present and clean
• completed aeraulic system
• steam humidification module connections
• cooling circuit visual control
• earth connection
• unit powered by fixed network or by electrogen group
• electric connections by customer

Start-up sequence

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

√ **unit ON power supply**
• Powered unit
• compressor carter heaters ON from at least 8 hours
• phases sequence control
• vacuum voltage measurement
• unit ON
• load voltage measurement and absorptions
• fans operation check
• set type reg.
• set air flow rate
• temperature set-point customisation
• humidity set-point customisation
• treated air flow rate measurement
• supply, return and outdoor air temperature measurement
• subcooling and overheating measurement
• no anomalous vibrations check
• set date and time
• fire alarm configuration *
• heater humidifier calibration *
• available machine documentation

* only if present

7.1 Preliminary information

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

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

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

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

7.2 Preliminary checks

Before starting any check, verify that :

- the unit is perfectly installed and in compliance with that reported in this manual
- the electric power supply line of the unit is isolated at start-up
- the isolation device of the line is open, blocked and equipped with relative signal.

7.3 Cooling circuit

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

7.4 Hydraulic circuit

Only with hot water coil - humidifier options

1. Find out if, before connecting the unit, the hydraulic system has been washed and the washing water drained.
2. Check the hydraulic circuit has been loaded and pressurised.
3. Check the shut-off valves on the circuit are in "OPEN" position.

7.5 Electric circuit

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

Power the unit by closing the isolation device but leave in OFF.

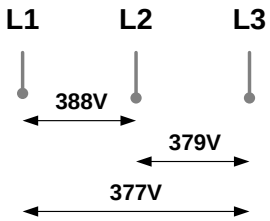
Check the network frequency and voltage values, that are within the limits:

400/3/50 +/- 10%

Check the unbalancing of the phases:

must be below 2% .

Example :



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

2) MAX - A = 388 – 381 = 7

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

Operation outside the limits can entail irreversible damages**.**

7.6 Compressor carter resistors

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

- upon unit commissioning
- after every prolonged stop period with unit not powered

Power the resistors by closing the unit isolator.

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

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

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

7.7 Voltages

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

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

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

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

7.8 Scroll compressors (size 2, 3, 4, 5, 6)

The Scroll compressors have only one direction of rotation.

In the event that the direction is reversed, the compressor will not be damaged, but its noisiness will increase and pumping will be negatively affected.

After a few minutes, the compressor will stop because of the activation of the thermal protection.

In this event, cut the power and reverse the 2 phases on the machine power.

Prevent the compressor from working with in reverse rotation: more than 2-3 anomalous starts up can damage it.

Make sure the direction of rotation is correct, measure the condensation and suction pressure.

Pressure must clearly differ: at the start, the suction pressure decreases whilst the condensation pressure increases.

7.9 Remote consents

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

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

7.10 Operation type setting

Refer to 7.11, 7.12, 7.13.

1. Define operation type
   - maximum capacity available (MC)
   - constant supply control (CS)
   - high air flow (HA)
2. set air flow setpoint
3. set temperature setpoint
4. set humidity setpoint
5. confirm setting

7.14 Start-up report

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

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

- Overall absorptions and voltages with unit in full load
- Absorptions of the various electric loads (compressors, fans, pumps etc)
- Temperatures and flow rates of the various fluids (water, air) at input and output of the unit
- Temperatures and pressures in the feature points of the cooling circuit (compressor, liquid, suction drain/ unload)

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

7.15 EC Directive 97/23 PED

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

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

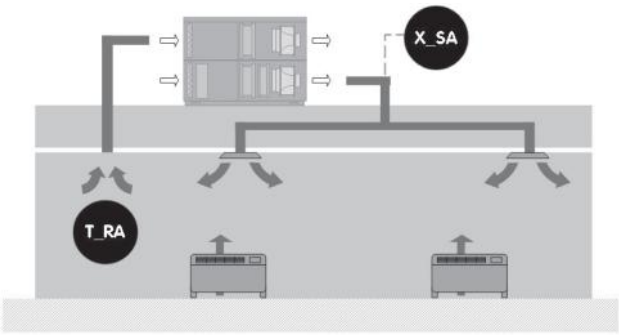
- Compulsory check of first system:
  only for units assembled on site by the installer (e.g. condensing + direct expansion unit)
- Declaration of start-up:
  for all units
- Periodical checks:
  to be carried out as frequently as defined by the Manufacturer
  (see MAINTENANCE section) .

7.11 Maximum capacity available (MC)

In this operating mode, the supply air temperature (T_SA) can vary in accordance with the temperature of the air extracted from the room (T_RA) and their deviation from the set value.

Therefore, there is feedback from the room.

In cooling mode the humidity control of the supply air is standard and a priority.



Type of adjustment

Main index \ Parameter machine \ Plant config

- set P0001 TypeReg = MC

Air flow rate

The air flow rate control depends on the device connected to the X2 input

Constant air flow rate, X2 input not used:

- set P0032 X2Config = None (Main index \ Parameter machine \ configure machine)
- set rated air flow rate P0002 SetQAirPlant (Main index \ Parameter machine \ Plant config)

Variable air flow rate, CO2 probe connected to the X2 input:

- set P0032 X2Config = CO2 (Main index \ Parameter machine \ configure machine)
- set air flow rate with quality NOT met: P0002 SetQAirPlant (Main index \ Parameter machine \ Plant config)
- set air flow rate with quality met: P0004SetQAirCO2Ok (P0004<P0002) (Main index \ Parameter machine \ Plant config)

Constant supply pressure, pressure detector connected to the X2 input:

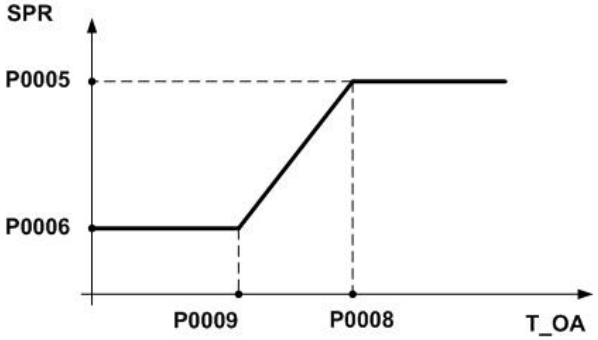
- set P0032 X2Config = Supply (Main index \ Parameter machine \ configure machine)
- set the supply pressure setpoint: P0003 SetPSupplyPlant (Main index \ Parameter machine \ Plant config)

Temperature setpoint

Set the values related to the SPR return air setpoint in relation to the T_OA external temperature:

(Main index \ Parameter machine \ plant config)

- P0005 SetCool
- P0006 SetHeat
- P0008 MC_TExtCool
- P0009 MC_TExtHeat

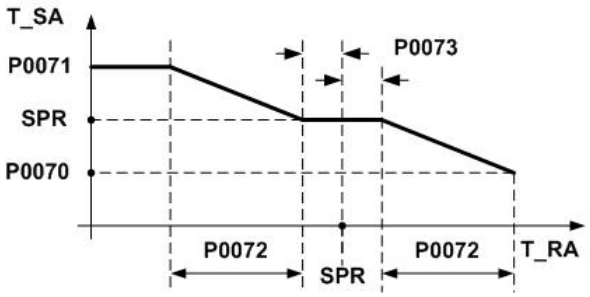


The T_SA supply setpoint is calculated in relation to the SPR return setpoint.

Set the values related to the T_SA supply air setpoint in relation to the T_RA return temperature:

Main index \ Parameter machine \ Thermoregulator

- P0070 LimMinSupplyT
- P0071 LimMaxSupplyT
- P0072 MC_BandPr
- P0073 MC_DeadBand



Humidity setpoint

Main index \ Parameter machine \ Plant config

- set the specific supply humidity setpoint in cooling mode: P0017 SetXSA
- set the specific return humidity setpoint in heating mode: P0018 SetXSR

Confirm configuration

Main index \ Parameter machine \ Plant config

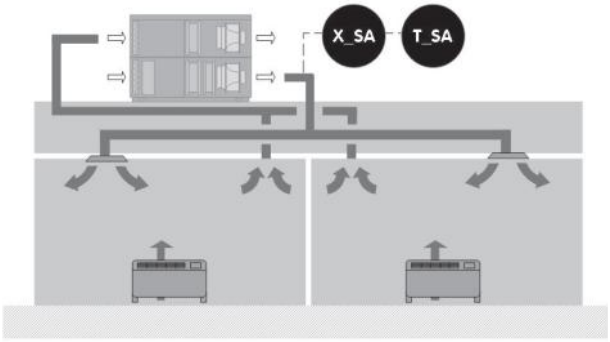
- set P0020 ConfirmConf = Yes

7.12 Constant supply control (CS)

In this operating mode the external air is treated based on the supply conditions set in accordance with one of the following two criteria:

- with two fixed seasonal setpoints, for operation in cooling and heating mode
- with two dynamic seasonal setpoints, in which the supply temperature is offset automatically in accordance with the external dry bulb temperature T_OA, with climatic regulation.

There is no feedback from the room.
In cooling mode the humidity control of the supply air is standard and a priority.



Type of adjustment

Main index \ Parameter machine \ Plant config

- set P0001 TypeReg = CS

Air flow rate

The air flow rate control depends on the device connected to the X2 input

Constant air flow rate, X2 input not used:

- set P0032 X2Config = None (Main index \ Parameter machine \ configure machine)
- set rated air flow rate P0002 SetQAirPlant (Main index \ Parameter machine \ Plant config)

Variable air flow rate, CO2 probe connected to the X2 input:

- set P0032 X2Config = CO2 (Main index \ Parameter machine \ configure machine)
- set air flow rate with quality NOT met: P0002 SetQAirPlant (Main index \ Parameter machine \ Plant config)
- set air flow rate with quality met: P0004SetQAirCO2Ok (P0004<P0002) (Main index \ Parameter machine \ Plant config)

Constant supply pressure, pressure detector connected to the X2 input:

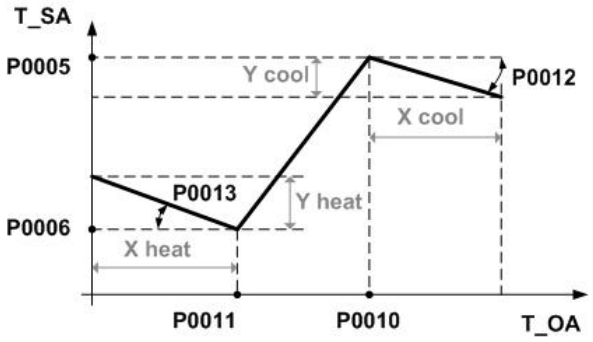
- set P0032 X2Config = Supply (Main index \ Parameter machine \ configure machine)
- set the supply pressure setpoint: P0003 SetPSupplyPlant (Main index \ Parameter machine \ Plant config)

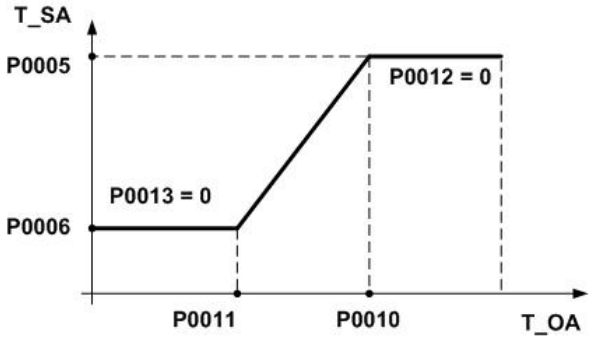
Temperature setpoint

Set the values related to the T_SA supply air setpoint in relation to the T_OA external temperature:

(Main index \ Parameter machine \ plant config)

- P0005 SetCool
- P0006 SetHeat
- P0010 CS_TExtCool
- P0011 CS_TExtHeat
- P0012 CS_GainCool (Ycool/Xcool)
- P0013 CS_GainHeat (Yheat/Xheat)





Humidity setpoint

Main index \ Parameter machine \ Plant config

- set the specific supply humidity setpoint in cooling mode: P0017 SetXSA
- set the specific return humidity setpoint in heating mode: P0018 SetXSR

Confirm configuration

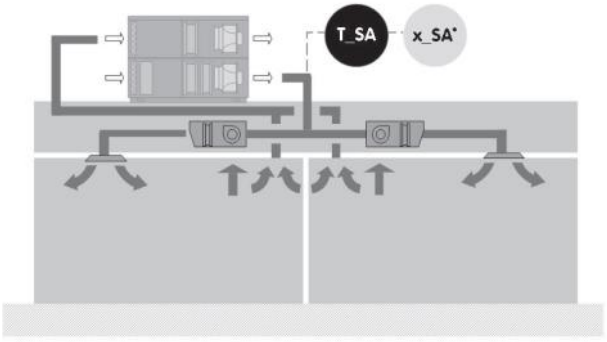
Main index \ Parameter machine \ Plant config

- set P0020 ConfirmConf = Yes

7.13 High air flow (HA)

In this operating mode the external air T_OA is treated until it reaches the value of the supply air temperature T_SA).

There is no feedback from the room.
The humidity control of the supply air is running only in heating mode.



x_Sa* solo con umidificatore

Type of adjustment

Main index \ Parameter machine \ Plant config

- set P0001 TypeReg = HA

Air flow rate

The air flow rate control depends on the device connected to the X2 input

Constant air flow rate, X2 input not used:

- set P0032 X2Config = None (Main index \ Parameter machine \ configure machine)
- set rated air flow rate P0002 SetQAirPlant (Main index \ Parameter machine \ Plant config)

Variable air flow rate, CO2 probe connected to the X2 input:

- set P0032 X2Config = CO2 (Main index \ Parameter machine \ configure machine)
- set air flow rate with quality NOT met: P0002 SetQAirPlant (Main index \ Parameter machine \ Plant config)
- set air flow rate with quality met: P0004SetQAirCO2Ok (P0004<P0002) (Main index \ Parameter machine \ Plant config)

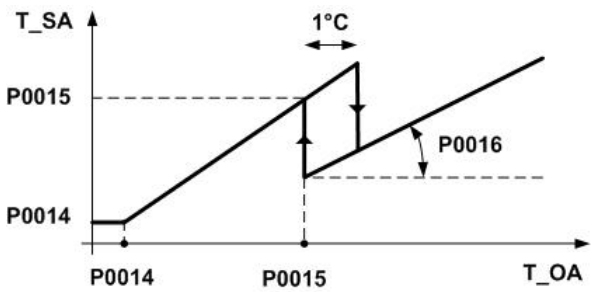
Constant supply pressure, pressure detector connected to the X2 input:

- set P0032 X2Config = Supply (Main index \ Parameter machine \ configure machine)
- set the supply pressure setpoint: P0003 SetPSupplyPlant (Main index \ Parameter machine \ Plant config)

Temperature setpoint

Set the values related to the T_SA supply setpoint in relation to the T_OA external temperature:
(Main index \ Parameter machine \ Plant config)

- P0014 HA_SetHeat
- P0015 HA_TExtLg
- P0016 HA_GainExtLg (Yt_sa/Xt_oa)



Humidity setpoint

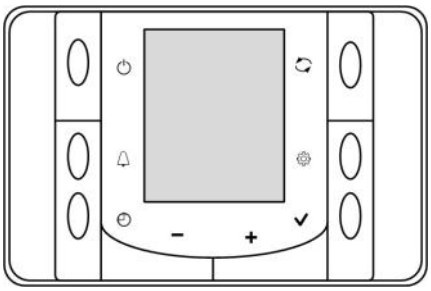
Main index \ Parameter machine \ Plant config

- set the specific return humidity setpoint in heating mode: P0018 SetXSR

Confirm configuration

Main index \ Parameter machine \ Plant config

- set P0020 ConfirmConf = Yes

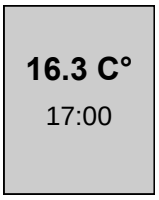
Keypad


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

Symbols			
	ON / OFF OFF status. On the top field of the thermostat, the temperature and OFF indication are alternated every 2 seconds. When the status is OFF, changes to the SETPOINT and schedule are blocked.		Humidifier / Dehumidifier mode The Humidifier mode is active If flashing, it means the Dehumidifier mode is active
	Defrosting Mode: The machine is defrosting.		Compressor ON: At least one compressor is active
	Scheduling Mode: The scheduling is active.		Alarm: There is at least one alarm Press the "alarm" key to view it

8.1 PARAMETERS MENU

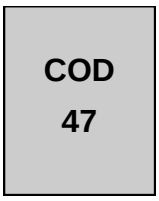
press



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

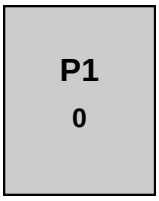
enter password (0047)

confirm



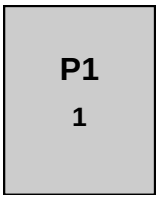
scroll the parameters

enable the parameter change
P1 starts flashing



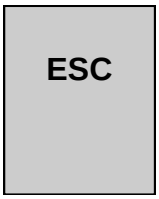
change the value of the parameter

confirm the new value



select
to enable the new value and exit

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



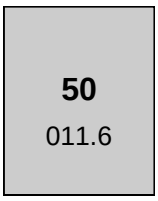
code	Short description	Description
0	PriorityCmd	Priority commands On/change mode (0=keyboard, 1=BMS)
1	Enscheduler	Enable schedular (0=disable, 1=enable)

8.2 STATA MENU

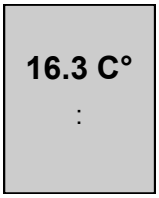
Press ✓

scroll the statuses − +

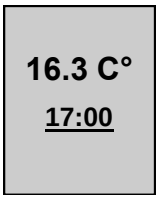
exit ✓



wait for 3 sec



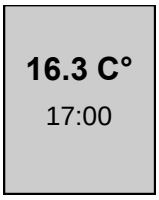
when the time is displayed
it is possible to carry out other operations



Code	Description
0	Operating return temperature
1	Outdoor temperature
2	Supply temperature
3	Return specific humidity
4	Outdoor specific humidity
5	Supply specific humidity
6	Air quality (option)
7	Active compressors number
8	Compressors fuctioning mode: 0= off; 1=cool; 2=heat
9	Active cooling capacity
10	Active cooling capacity circuit 1
11	Active cooling capacity circuit 2 (only size 3, 4, 5, 6)
12	Capacity control circuit1 status: 0=off; 1=on
13	Postheating valve circuit 1 opening
14	Postheating valve circuit 2 status (only size 3, 4, 5, 6): 0=off, 1=on

8.3 DATE AND HOUR

Press



HOUR digits start flashing

edit

confirm

MINUTE digits start flashing

edit

confirm

HOUR - MINUTE digits start flashing

choose format
24h / am - pm

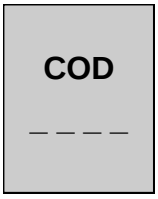
set
year, month, day

main menu

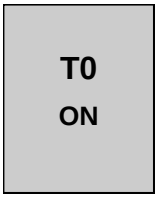
8.4 BUTTON LOCK

Press for 4 sec.

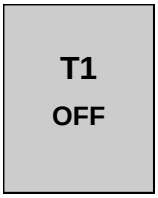
enter password
confirm



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



scroll the keys

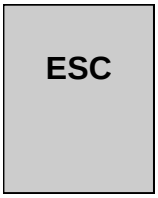


select the key
(ALL starts flashing)

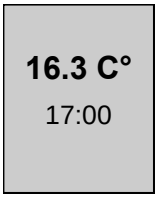
set active-ON / disabled-OFF
example:
ALL = OFF
all keys disabled

select to confirm

exit



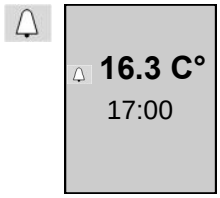
Key-code table			
n. key	key	n. key	key
T0	–	T5	
T1	+	T6	
T2		T7	
T3		ALL	All keys
T4			



8.5 TO VISUALIZE ALARM IN PROGRESS

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

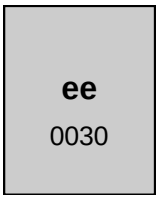
press
only if the ALARM symbol is flashing



ee type of alarm (see table)

0 generic alarm (1 circuit1 alarm, etc.)

030 progressive alarm number



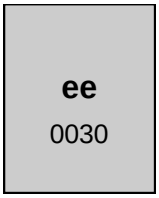
press

7 days since the alarm was triggered

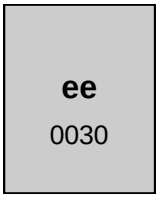
17:00 alarm time

previous menu

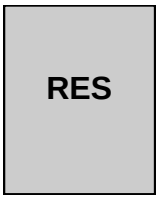
scroll the alarms



exit without alarms RESET



exit with alarms RESET:
scroll and select RES



8.6 SCHEDULER

Enable scheduler (8.1 menu parametres)

It is possible to set up to 7 schedules (1 for every day of the week)

It is possible to set up to 6 status changes for each day (On, Off, Eco, Fan).

In the days not included in the schedule, the unit maintains the most recent status defined in the schedule. Example:

- Monday scheduled, 23h unit in ECO mode
- Tuesday not scheduled, the unit remains in ECO mode

Scheduling example:

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

Sequence of operations.:

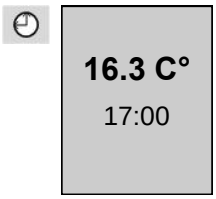
Chose the days

(e.g. 1 = Monday, 3 = Wednesday, 4 = Thursday)

1. set event 1 time
2. set event 1
3. set event 2 time
4. set event 2
5. repeat for the other events (max. 6)
6. to insert other scheduling (max. 7) repeat from step 1 to 6

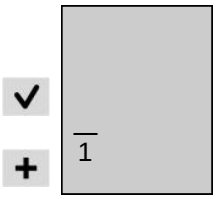
The most recent schedule saved overrides the existing one. For instance, if a day is included in two different schedules, the most recent one saved prevails.

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

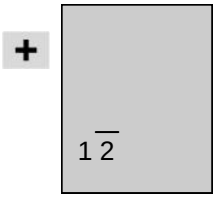


day 1 starts flashing

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

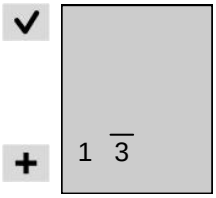


to schedule day 2 press



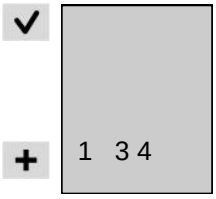
to schedule day 3 press
(3 starts flashing)

press



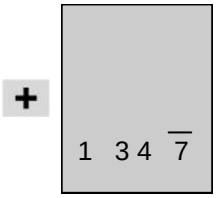
to schedule day 4 press
(4 starts flashing)

press



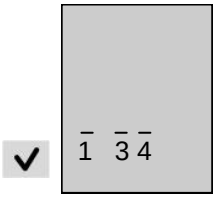
7 starts flashing

to confirm selected days press

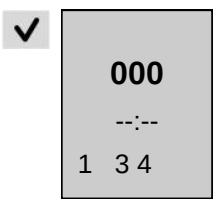


1 3 4 starts flashing

press

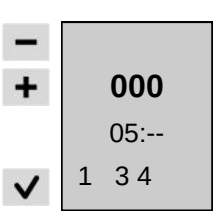


press
(ref. A)
-- starts flashing



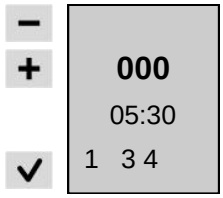
set
- time of the event

press



set
- minutes of the event

press

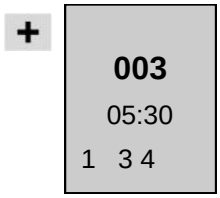


set
- desired event
  0 = null, 1 = OFF, 2 = ON,
  3 = Fan

press

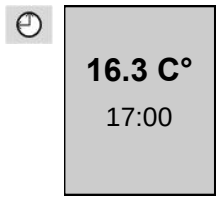
example: 5:30 o'clock unit in FAN mode (003)

press
to set altri the events 2,3,…..6

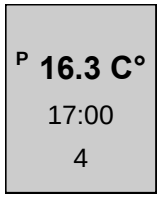


Ripeat from (ref. A)

press 2 times to exit

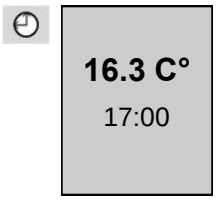


P flashing, active scheduling



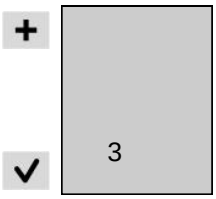
Modify day 3 day scheduling
(ref. scheduling example)

Press 2 sec



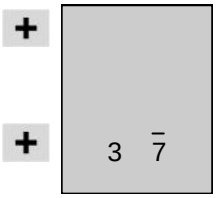
press
to schedule day 3 press (Wednesday)

press
(3 stays steady)



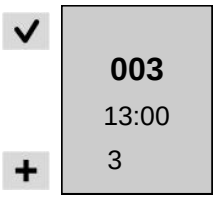
press
7 starts flashing

press
to confirm selected days



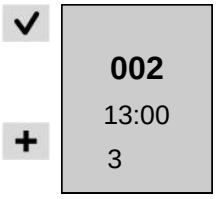
press

select the event 3 (h.13:00)



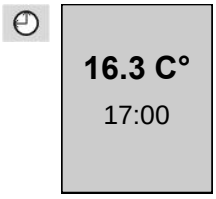
press 3 times
starts flashing 003 (= FAN)

press
set
- desired event 002 (= ON)

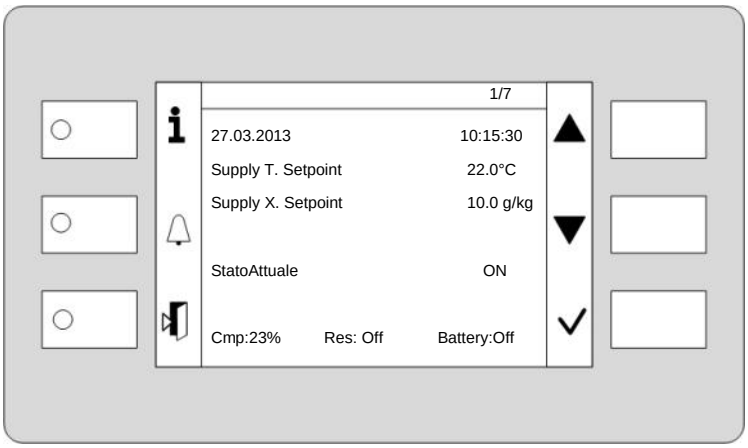


press

press 2 times to exit



8.7 SERVICE KEYPAD



Function keys	
	Main menu
	Alarm display
	Exit Previous level Keyboard settings
	Up Increases value
	Down Decreases value
	Confirm Password

8.8 COMMON OPERATIONS

ON, OFF, ECO		main menu → cmd local status → scegliere OFF - ON - FAN
change MODE		main menu → cmd local mode → select COOL - HEAT
change SETPOINT		main menu → unit parameters → setpoint

8.9 SCHEDULER

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

Scheduler must be enabled:

display : actual value = On

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

Select

Confirm

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

Select

Confirm

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

Select

Confirm

Setting

Exit

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

Select

Confirm

Setting

Exit

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

8.10 KEYBOARD SETTINGS

Press 3 sec

Select

Confirm

HMI settings
local connection

exit :

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

To exit :

Select

Confirm

HMI settings
local connection

8.11 ALARMS

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

Press

Last alarm

alarm log detail
+ eE001 : Phase monitor : Fault

1 Critico (A)

14.02.2012 11.30.10

Press

alarm list

(*)
reset alarms
access

Alarm list
Acknowledge (*) 3

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

Press

alarm log

(*)
reset alarms
access

alarm log
Acknowledge (*) Passivo
10
+ eE001 : Monitore fase : Fault
- EE003 : Guasto P1 Util : Ok
+ EE003 : Guasto P1 Util : Fault

Fault = active alarm
Ok = resetted alarm

Press

alarm ing

Reset

Reset alarm log :

select
RESET

select
EXECUTED

Alarms encoding		
Code	**Type**	**Reset**
eE	Electrical	From Auto to Man
EE	Electrical	Manual
ee	Electrical	Automatic
iI	Hydraulics	From Auto to Man
II	Hydraulics	Manual
ii	Hydraulics	Automatic

Alarms encoding		
Code	**Type**	**Reset**
fF	refr. circuit	From Auto to Man
FF	refr. circuit	Manual
ff	refr. circuit	Automatic
aA	Air	From Auto to Man
AA	Air	Manual
aa	Air	Automatic

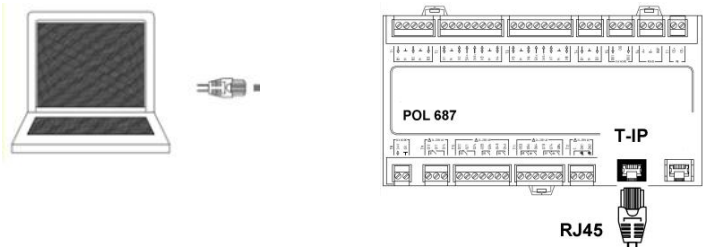
From Auto to Man: automatic reset , after N alarm → manual reset

ALARMS - Tab 1		
Code	**Short description**	**description**
AA003	Fire	Units on alert for fire alarm in progress
aa004	DirtyFilter	Air dirty filter
eE001	Phase monitor	Fault on the network power supply
EE002	Opening Vain	Access compartments open
EE005	Electrical Filter	Electrical Filter fault
ee006	PlantConfig	Absence of a configuration of the type of unit operation upon starting
eE007	SupplyFan	Intervention of the protections of air supply fan
eE009	Exhaust Fan	Intervention of the protections of return / exaust fan
EE010	High Temp. Integration	Protection of maximum temperature on the auxiliary heater
EE011	Ovl Integration	Intervention of the protection of the auxiliary heater
ee020	Offline thermostat.	User POL822 interface module not responding
ee027	ReturnTemp	Return temperature probe fault
ee028	SupplyTemp	Supply temperature probe fault
ee029	AirExtTemp	External air temperature probe fault
ee030	RHSupply	Supply RH probe fault
ee031	RHReturn	Return RH probe fault
ee032	RHOutdoor	Outdoor air RH probe fault
ee033	QualityAir	Room air quality probe fault
ee035	SupplyPDiff	Differential pressure trasducer supply fan fault
ee037	ExhaustPDiff	Differential pressure trasducer exaust fan fault
ee039	PSupply	Pressure trasducer suply fan fault
ee044	Humidifier alarm	Humidifier board disconnected
ee050	H2O plant temp	Plant water temperature probe fault
ee051	H2O freeze temp	Heating water coil temperature probe fault
ee052	Recover temp	Recovery temperature probe fault
ee059	PostRiscMod HwError	Post-heating control board fault
ee060	PostRiscMod BlkError	Post-heating control board fault
ee061	PostRiscMod FailSaveState	Post-heating control board fault
ee062	PostRiscMod UpsNotAv	Post-heating UPS board fault
ee063	PostRiscMod PBTime	Post-heating control board not responding
ee064	Pump recover	Recovery pump fault
ee065	PostRiscMod HW-FailSaveState	Post-heating control board fault
ee068	ExhaustPDiff 2nd	Differential pressure trasducer exaust 2nd fan fault
ee069	Exhaust Fan 2nd	Intervention of the protections of return / exaust 2nd fan
ee090	SafeMode	SafeMode

ALARMS - Tab 2		
Code	**Short description**	**description**
ee101	TimeOutModCirc	Circuit board not responding
ee102	TimeOutDriver	Expansion valve module not responding
ee104	EEVBlockedOut	Expansion valve blocked
EE106	Comp 1 protections	C1 compressor protection intervention
EE107	Comp 2 protections	C2 compressor protection intervention
EE108	Comp 3 protections	C3 compressor protection intervention
ee122	Discharge temp. C1	Refrigerant discharge temperature probe fault - C1
ee125	Source 1 temp.	Source side coil temperature probe fault
ee126	DFR temperature	Defrost temperature probe fault
ee127	Suction temperature	Refrigerant suction temperature probe fault
ee128	Discharge pressure	High pressure probe fault
ee129	Suction pressure	Low pressure probe fault
ee201	Timoeout comm. Module circuit	Control circuit board not responding
ee202	Timeout comm. Driver	Expansion valve control board not responding
ee204	EEV blocked	Expansion valve blocked
EE206	Comp 1 protections	C1 compressor protection intervention
EE207	Comp 2 protections	C2 compressor protection intervention
EE208	Comp 3 protections	C3 compressor protection intervention
ee222	Discharge temp. C2	Refrigerant supply temperature probe fault - C2
ee226	DFR temperature	Defrost temperature probe fault
ee227	Suction temperature	Refrigerant suction temperature probe fault - C2
ee228	Discharge pressure	High pressure probe fault
ee229	Suction pressure	Low pressure probe fault
ff055	Room condition Heat mode	Heat mode - room temperature too low (outside operating limits).
ff056	Outdoor condition Heat mode	Heat mode - outdoor temperature too low (outside operating limits).
ff057	Room condition Cool mode	Cool mode - room temperature too high (outside operating limits)
ff058	Outdoor condition Cool mode	Cool mode - Outdoor temperature too high (outside operating limits)
ff066	Freeze Extrapower	Freeze Extrapower
FF067	Gas Alarm	Gas Alarm
ff105	Min overheating	Overheating too low
fF109	Low pressure from DI	low pressure, digital input
fF112	Low pressure from AI	low pressure alarm, analogic input
fF113	High pressure from DI	high pressure, digital input
fF115	High pressure from AI	high pressure, analogic input
FF134	VacuumCirc	vacuum circuit (refrigerant)
FF137	Alarm Inverter 1 on Circuit 1	compressor 1 inverter alarm
FF138	Alarm missing comunication inv1 - C1	Missing comunication compressor 1 inverter
FF139	Timeout comunication inv1 - C1	Missing comunication compressor 1 inverter
FF140	Alarm Inverter 2 on Circuit 1	compressor 2 inverter alarm
FF141	Alarm missing comunication inv2 - C1	Missing comunication compressor 2 inverter
FF142	Timeout comunication inv2 - C1	Missing comunication compressor 2 inverter
FF143	Alarm Inverter 3 on Circuit 1	compressor 3 inverter alarm
FF144	Alarm missing comunication inv3 - C1	Missing comunication compressor 3 inverter
FF145	Timeout comunication inv3 - C1	Missing comunication compressor 3 inverter

ALARMS - Tab 3		
Code	**Short description**	**description**
FF147	Alarm Envelop Comp1 - C1	Compressor 1 outside operating limits
FF148	Alarm Envelop Comp2 - C1	Compressor 2 outside operating limits
FF149	Alarm Envelop Comp3 - C1	Compressor 3 outside operating limits
ff205	Min overheating	Overheating too low
fF209	Low pressure from DI	low pressure, digital input
fF212	Low pressure from AI	low pressure alarm, analogic input
fF213	High pressure from DI	high pressure, digital input
fF215	High pressure from AI	high pressure, analogic input
FF234	VacuumCirc	vacuum circuit (refrigerant)
FF237	Alarm Inverter 1 on Circuit 2	compressor 1 inverter alarm - circuit 2
FF238	Alarm missing comunication inv1 - C2	Missing comunication compressor 1 inverter - circuit 2
FF239	Timeout comunication inv1 - C2	Missing comunication compressor 1 inverter - circuit 2
FF240	Alarm Inverter 2 on Circuit 2	compressor 2 inverter alarm - circuit 2
FF241	Alarm missing comunication inv2 - C2	Missing comunication compressor 2 inverter - circuit 2
FF242	Timeout comunication inv2 - C2	Missing comunication compressor 2 inverter - circuit 2
FF243	Alarm Inverter 3 on Circuit 2	compressor 3 inverter alarm - circuit 2
FF244	Alarm missing comunication inv3 - C2	Missing comunication compressor 3 inverter - circuit 2
FF245	Timeout comunication inv3 - C2	Missing comunication compressor 3 inverter - circuit 2
FF247	Alarm Envelop Comp1 - C2	Compressor 1 outside operating limits
FF248	Alarm Envelop Comp2 - C2	Compressor 2 outside operating limits
FF249	Alarm Envelop Comp3 - C2	Compressor 3 outside operating limits

P.C. CONNECTION



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

2 check in the taskbar that the connection is active

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

4 Select ***Modify board setting***

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

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

7 Set the IP address ***192.168.1.100***

8 Set Subnet mask as ***255.255.255.0***

9 confirm (**OK**)

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

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

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

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

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

15 Userid = **ADMIN**

16 Password = **SBTAdmin!**

9.1 Recommended periodical checks sheet

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

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

Notes/interventions recommended to Owner

* Refer to the local implemented standards.
Companies and technicians carrying out installation, maintenance/repair interventions, leaks check and recovery must be CERTIFIED as foreseen by the local standards.
The leaks check must be carried out on a yearly basis

9.2 Generality

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

Maintenance allows:

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

9.3 Frequency of interventions

Frequency of the inspections must be at least six-monthly

However, frequency depends on the type of use.

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

9.4 Machine schedule

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

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

On the schedule note:

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

9.5 Stand-by

If foreseen a long period of inactivity:

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

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

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

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

9.6 Structure

Check the state of the parts constituting the structure.

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

Check fastening of the unit external panelling.

Bad fastening give rise to anomalous noises and vibrations.

9.7 G4 Folded air filters

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

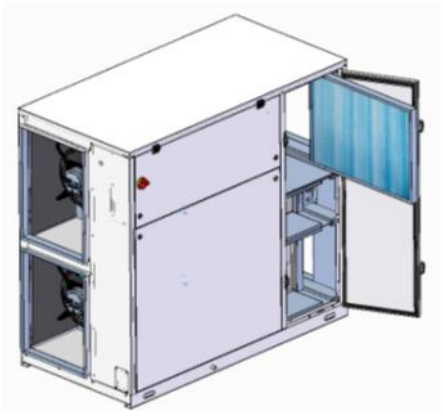
Operation with clogged filters leads to a reduction in the air flow rate with malfunctionings and block, up to possible breaks in the unit.

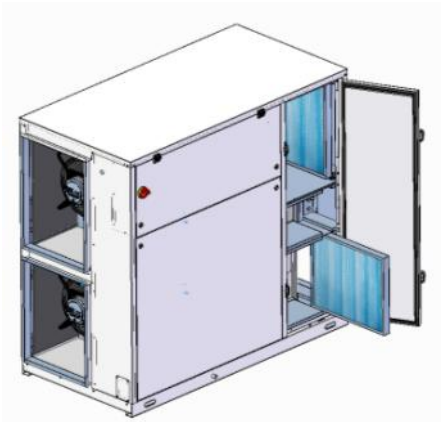
The frequency with which the filters must be checked depends on the quality of the outdoor air, the unit operation hours, the dustiness and crowding of rooms.

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

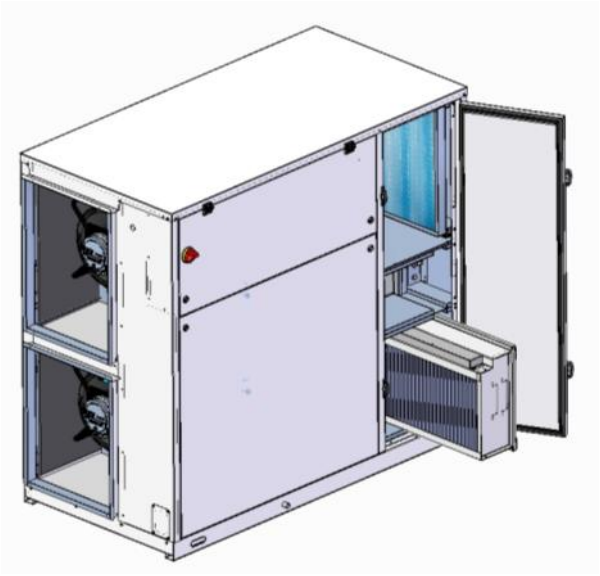
1. Remove the closing panels
2. Delicately remove the filter avoiding dirtying the area below
3. Wash the filtering jacket in warm water with common detergent
4. Accurately rinse in running water avoiding spilling in the room
5. Dry the filter
6. Insert it back in its seat
7. Remount the closing panels

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





9.8 Filtri elettronici - opzione



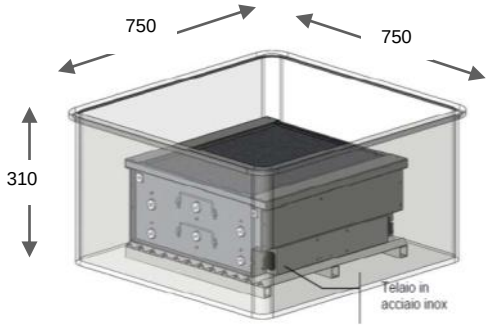
La regolazione elettronica è integrata nel filtro; la manutenzione può essere effettuata senza rimuoverla .

MATERIALS NECESSARY FOR MAINTENANCE

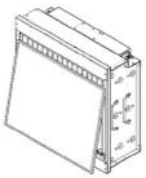
1. Acid detergent B01212 (code CLIVET C6460316)
2. plastic or steel tank (750x750x310 mm) with settling bottom
3. Protective gloves and goggles
4. Graduated jug;
5. Pump for manual or pneumatic spraying.

Do not use aluminum tanks or galvanized.

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



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



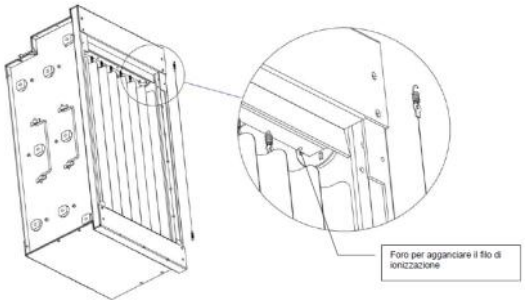
1. Position the filter to be washed on a support to facilitate work.
2. Prepare a tank with a solution of B01212 detergent and water at 1÷20.Do not use galvanised steel sheet or aluminium tanks.
3. Immerse the filter in this solution
4. Ensure the solution covers the entire filter
5. Immerse it for about 5-7 minutes. A slight chemical reaction is noticed within 2÷3 minutes with the development of foam indicating the occurred elimination of residues.
6. Rinse the filter with a jet of water or using a low-pressure water jet machine.
7. Leave the electrostatic cells to dry in a hot room or directly in the sun for a few hours.Keep the cells lifted from the ground using two metal or wooden laths.

Check the ionisation wires before remounting the filter.
The cleaner can be used to clean about 20 filters.
Can be recovered and placed in plastic containers closed; the air oxidizes the cleaner and reduces its effectiveness.

IONISATION WIRES

The impurities can determine oxidation or scaling on the wires, which can be removed using a cloth soaked in alcohol or an abrasive scourer with very fine grain.
Due to the high voltage powering them, the ionisation wires are subject to wear.
To foresee a yearly replacement OF ALL WIRES avoids unexpected breaks.
In case of break: :

1. remove all wire pieces present in the cell and remove the springs stretching the wire;
2. hook the spring to the wire eyelet;
3. grip the ionisation wire with curved beaks pliers;
4. hook the top of the spring with the open eyelet to the wire stretcher rod of the electrostatic cell;
5. keeping the ionisation wire stretched, with the other hand hook it to the other wire stretching rod, always by means of the curved beaks pliers.

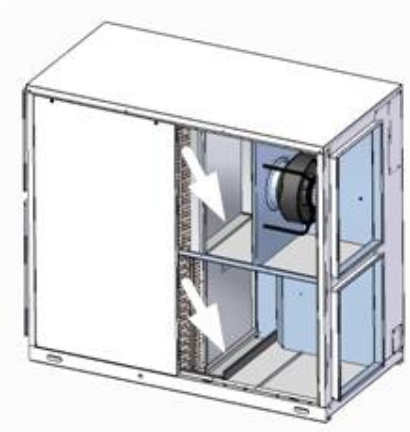


9.9 Condensate collection bowl

Dirt or scale can give rise to clogging.

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

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



9.10 Indoor air coil

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

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

9.11 Immerged electrodes humidifier- option

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

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

PERIODICAL CHECKS

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

HUMIDIFIER CYLINDER DRAINAGE

Cylinder must be drained in these situations:

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

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

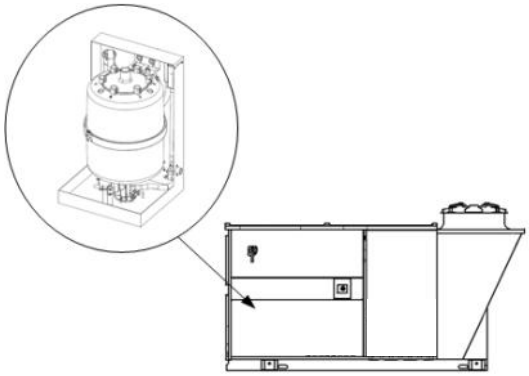
REPLACEMENT OF THE CYLINDER

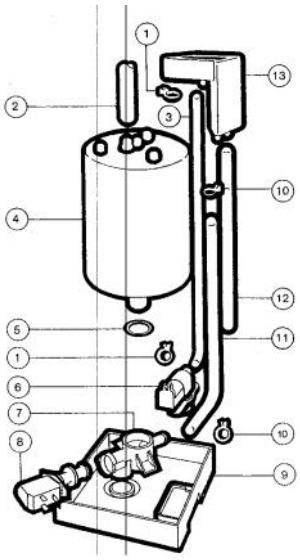
To remove the cylinder: :

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

Before mounting it :

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





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

Generality

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

Dangerous area

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

Handling

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

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

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

Installation

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

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

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

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

Carefully check positioning and anchoring of the unit.

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

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

General risks

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

Electrically isolate the unit (yellow-red isolator).

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

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

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

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

Always contact a qualified after-sales assistance centre.

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

Periodically check closing of all panels and their correct fastening.

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

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

Electrical part

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

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

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

Always securely fasten the lid to the unit.

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

Carefully execute connection to the earth system.

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

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

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

When not necessary.

Moving parts

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

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

Contact with the fans can cause injuries.

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

Coolant

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

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

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

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

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

Hydraulic part

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

11.1 Disconnection

The disconnection operations must be carried out by qualified technicians.

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

11.2 Dismantling

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

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

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

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

11.3 EC WEEE Directive

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

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

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

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

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

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

General technical data

General technical data - Performance

Size			Size 1	Size 2	SIZE 3	Size 4	Size 5	Size 6
Operation with constant supply temperature								
Standard air flow								
Nominal air flow		l/s	361	611	1278	2000	2638	3333
Nominal air flow		m^3/h	1300	2200	4600	7200	9500	12000
Max external static pressure (supply)		Pa	630	630	630	600	420	630
Max external static pressure (extraction)		Pa	630	630	630	630	540	630
Cooling								
Total cooling capacity	1	kW	10,60	17,50	38,7	58,4	79,0	95,9
Re-heating capacity	1	kW	2,70	4,20	10,9	14,9	21,3	22,9
Compressor power input	1	kW	2,91	4,92	11,10	15,70	20,40	23,20
EER_C	1	-	4,57	4,41	4,47	4,67	4,91	5,12
Heating								
Heating capacity	2	kW	5,93	10,00	21,0	32,9	43,4	54,9
Compressor power input	2	kW	0,71	1,35	2,54	4,22	5,75	8,77
COP_C	2	-	8,38	7,45	8,28	7,80	7,55	6,26
Operation at the maximum available capacity								
Standard air flow								
Nominal air flow		l/s	361	611	1278	2000	2638	3333
Nominal air flow		m^3/h	1300	2200	4600	7200	9500	12000
Max external static pressure (supply)		Pa	630	630	630	600	420	630
Max external static pressure (extraction)		Pa	630	630	630	630	540	630
Cooling								
Total cooling capacity	3	kW	10,60	17,50	38,7	58,4	79.0	95.9
Compressor power input	3	kW	3,26	5,52	12,5	17,7	22,9	26.1
Additional available capacity to space	3	kW	3,57	5,67	14,0	19.8	27.7	30.9
EER_C	3	-	3,25	3,18	3,10	3,31	3.45	3.68
Heating								
Heating capacity	4	kW	10,50	17,80	37,1	58,2	76,8	96,9
Compressor power input	4	kW	2,28	3,77	7,13	11,2	14,4	18,3
COP_C	4	-	4,61	4,72	5,21	5,20	5,33	5,29
Operation with high airflow								
Maximum air flow								
Nominal air flow		l/s	528	972	1944	2556	3194	3889
Nominal air flow		m^3/h	1900	3500	7000	9200	11500	14000
Max external static pressure (supply)		Pa	630	470	630	450	345	630
Max external static pressure (extraction)		Pa	630	630	630	530	400	630
Cooling								
Total cooling capacity	5	kW	9,20	18,20	31,9	45,1	62,0	80,6
Compressor power input	5	kW	1,56	3,38	4,46	6,97	13,8	17,8
EER_C	5	-	5,89	5,38	7,15	6,48	4,50	4,51
Heating								
Heating capacity	6	kW	6,00	11,10	22,10	29,10	36,30	44,20
Compressor power input	6	kW	0,54	1,31	2,48	3,11	3,40	5,44
COP_C	6	-	11,10	8,46	8,91	9,36	10,7	8,14

DB = dry bulb

WB = wet bulb

EER_C = Thermodynamic efficiency of the system in cooling mode

COP_C = Thermodynamic efficiency of the system in heating mode

1. Outdoor air temperature: 35°C D.B./ 24°C W.B.. Extracted air temperature 26°C D.B.. Supply air humidity ratio: 11g/kg. Supply air temperature 24°C D.B.
2. Outdoor air temperature 7°C D.B./ 6.0°C W.B.. External air temperature 20°C D.B. / 12°C W.B.. Supply air temperature 20°C D.B.
3. Outdoor air temperature 35°C D.B./ 24°C W.B.. Extracted air temperature: 26°C D.B.. Supply air humidity ratio: 11g/kg
4. Outdoor air: 7°C D.B./ 6.0°C W.B.. Extracted air temperature: 20°C D.B. / 12°C W.B.. Supply air temperature: 30°C D.B.
5. Outdoor air temperature 35°C D.B./ 24°C W.B.. Extracted air temperature 26°C D.B.. Supply air temperature 22°C D.B.
6. Outdoor air temperature: 7°C D.B./ 6.0°C W.B.. Extracted air temperature: 20°C D.B. / 12°C W.B.. Supply air temperature: 16°C D.B.

General technical data - Construction

Size			Size 1	Size 2	SIZE 3	Size 4	Size 5	Size 6
Compressor								
Type of compressors			ROT	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors		No	1	1	2	2	3	3
Std Capacity control steps		No	20-100%	20-100%	10-100%	10-100%	8-100%	8-100%
Refrigeration circuits		No	1	1	2	2	2	2
Air Handling Section Fans (Supply)								
Type of supply fan			RAD	RAD	RAD	RAD	RAD	RAD
Number of supply fans		No	1	1	1	1	1	2
Fan diameter		mm	310	355	500	630	630	500
Minimum air flow		l/s	278	444	917	1444	2083	2639
Minimum air flow		m^3/h	1000	1600	3300	5200	7500	9500
Maximum air flow		l/s	528	972	1944	2556	3194	3889
Maximum air flow		m^3/h	1900	3500	7000	9200	11500	14000
Installed unit power		kW	0,80	0,90	2,70	2,80	2,80	2,70
Max. static pressure supply fan		Pa	630	630	630	600	420	630
Fans (Exhaust)								
Type of exhaust fan			RAD	RAD	RAD	RAD	RAD	RAD
Number of exhaust fans		No	1	1	1	1	1	2
Fan diameter		mm	310	355	500	630	630	500
Exhaust air flow		l/s	361	611	1278	2000	2638	3333
Installed unit power		kW	0,80	0,90	2,70	2,80	2,80	2,70
Max. exhaust static pressure		Pa	630	630	630	600	540	630
Connections								
Condensate discharge			1" GAS	1" GAS	1" GAS	1" GAS	1" GAS	1" GAS
Power supply								
Standard power supply		V	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Dimensions								
A - Length		mm	1895	1895	2465	2465	2465	2465
B - Width		mm	950	950	1735	1735	2025	2330
C - Height		mm	1025	1625	1810	2260	2260	2260
Standard unit weights								
Shipping weight		kg	320	450	1070	1285	1450	1670
Operating weight		kg	320	450	1070	1285	1450	1670

ROT = rotary compressor

SCROLL = scroll compressor

RAD = radial fan

Sound levels

The sound pressure level refers to a distance of 1 meter from the outer surface of the unit operating in open field.

Static pressure 50 Pa (UNI EN ISO 9614-2)

For the standard air supply the total sound power levels for the diverse values of available static pressure are shown.

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.

AIR SUPPLY MINIMUM (50 Pa)

Size	Sound power level (dB)								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
Size 1	54	52	56	59	68	69	62	70	58	74
Size 2	55	53	57	60	69	70	63	71	59	75
SIZE 3	60	58	61	64	72	73	66	74	61	79
Size 4	66	68	66	66	71	72	66	73	59	79
Size 5	67	69	67	67	72	73	67	74	60	80
Size 6	69	68	70	73	75	74	69	74	62	81

AIR SUPPLY STANDARD (50 Pa)

Size	Sound power level (dB)								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
Size 1	59	60	65	69	72	72	63	69	60	77
Size 2	60	61	66	70	73	73	65	70	61	78
SIZE 3	66	65	67	70	73	74	67	74	61	80
Size 4	67	69	67	67	72	73	67	74	60	80
Size 5	74	75	75	74	75	74	69	74	62	83
Size 6	74	75	77	79	78	76	71	73	64	85

AIR SUPPLY STANDARD (100,200,300 Pa)

Size	Sound power level (dB)		
	Available head (Pa)		
	100	200	300
Size 1	77	77	78
Size 2	78	78	79
SIZE 3	80	80	81
Size 4	80	80	81
Size 5	83	84	84
Size 6	85	85	86

MAXIMUM AIR SUPPLY (50 Pa)

Size	Sound power level (dB)								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
Size 1	65	69	75	77	77	73	65	68	64	82
Size 2	66	70	76	78	78	74	66	69	65	83
SIZE 3	74	75	77	79	78	77	72	74	66	85
Size 4	77	78	77	76	77	77	71	75	64	85
Size 5	78	80	79	78	77	76	71	74	64	86
Size 6	77	78	80	82	81	79	74	75	67	88

Operation with constant supply temperature
T_OA = 35/24°C
T_RA = 26°C
T_SA = 24°C
X_SA = 11g/kg
T_OA = Outdoor air temperature at Dry/Wet bulb [°C]
T_OA = Exhaust air temperature at Dry bulb [°C]
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]

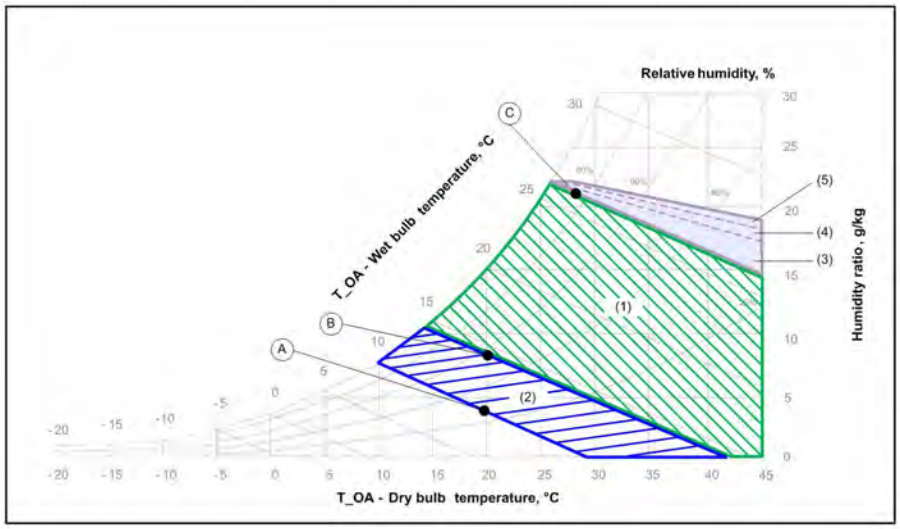
Operating ranges

Operating range (Cooling)

The limits are indicative and take into consideration:

- general and non specific sizes
- unit correctly installed and serviced

Outdoor air



1 = Normal operating range
2 = Operating range with capacity modulation
3 = With option RECH - "Hydronic recovery device", with T_RA = 26° D.B.
4 = With option RECH - "Hydronic recovery device", with T_RA = 24° D.B.
5 = With option RECH - "Hydronic recovery device", with T_RA = 22° D.B.

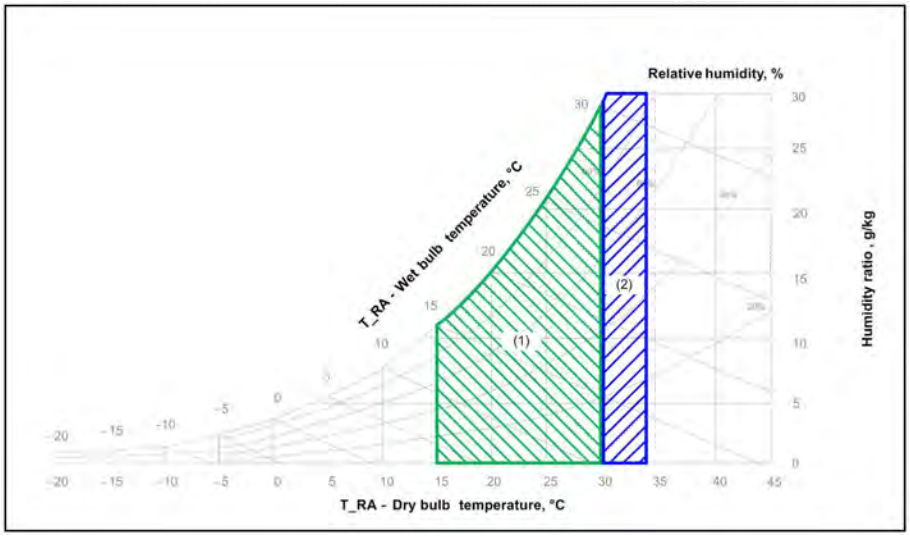
T_OA = outdoor air temperature
T_RA = extracted air temperature
DB = dry bulb
WB = wet bulb

Outdoor air temperature limit at wet bulb

			T_OA (W.B)
A		°C	10
B		°C	14
C		°C	26

T_RA = extracted air temperature

Extracted air



1 = Normal operating range
2 = Operating range with capacity modulation

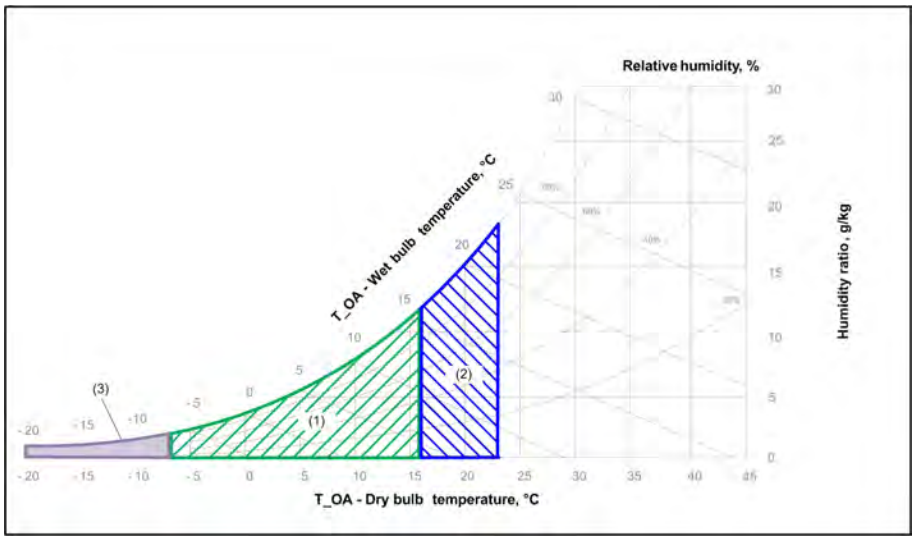
T_RA = extracted air temperature
DB = dry bulb
WB = wet bulb

Operating range (Heating)

The limits are indicative and take into consideration:

- general and non specific sizes
- unit correctly installed and serviced

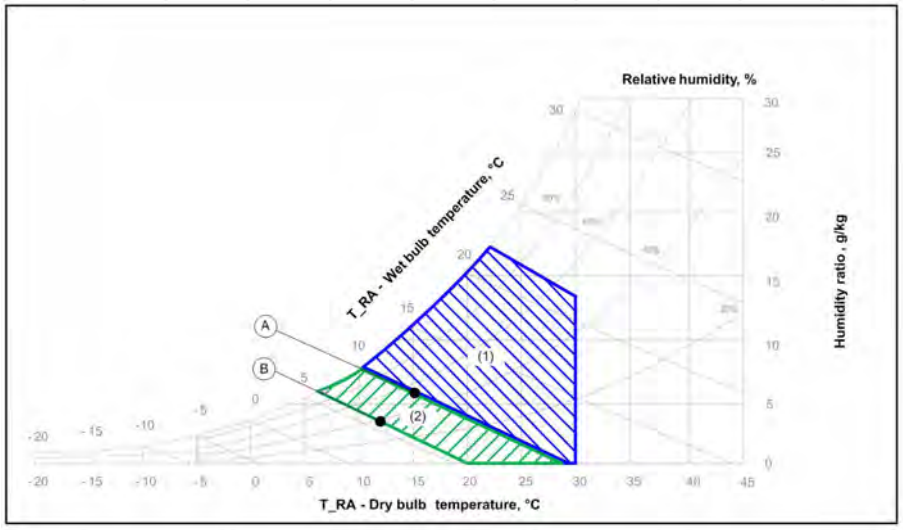
Outdoor air



1 = Normal operating range
2 = Operating range with capacity modulation
3 = With "RECH - Hydronic recovery device"

T_OA = outdoor air temperature
DB = dry bulb
WB = wet bulb

Extracted air



1 = Normal operating range
2 = Operation in which they could be defrost cycles

T_RA = extracted air temperature
DB = dry bulb
WB = wet bulb

Extracted air temperature limit at wet bulb

			T_RA (W.B)
A		°C	10,2
B		°C	6,0

T_RA = extracted air temperature
WB = wet bulb

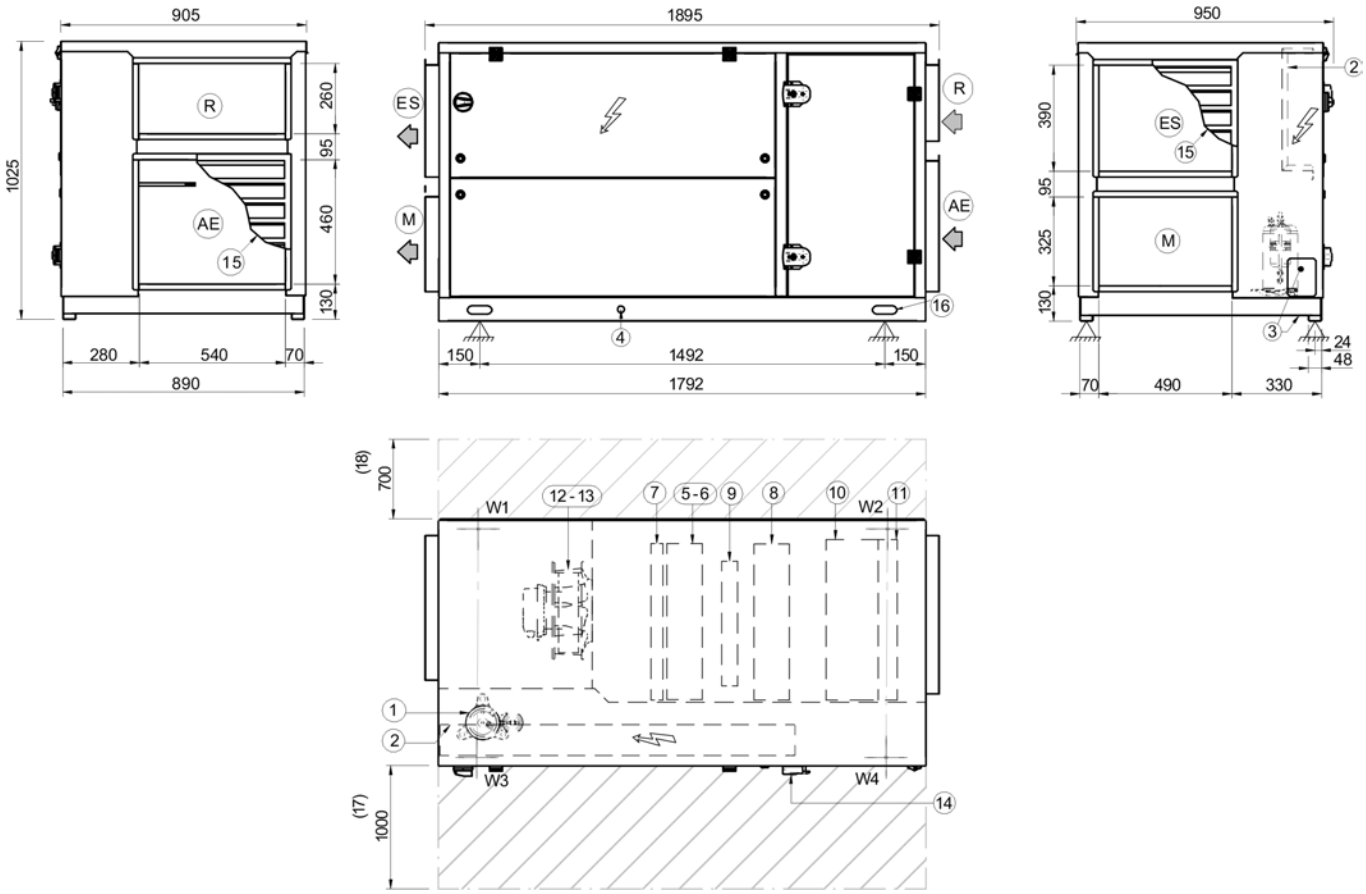
WARNING: failure to comply with the lower limit of wet bulb temperature can cause the unit to stop.

Dimensional drawings

SIZE 1

DAA5Gsize1_0

Date: 21/09/2012



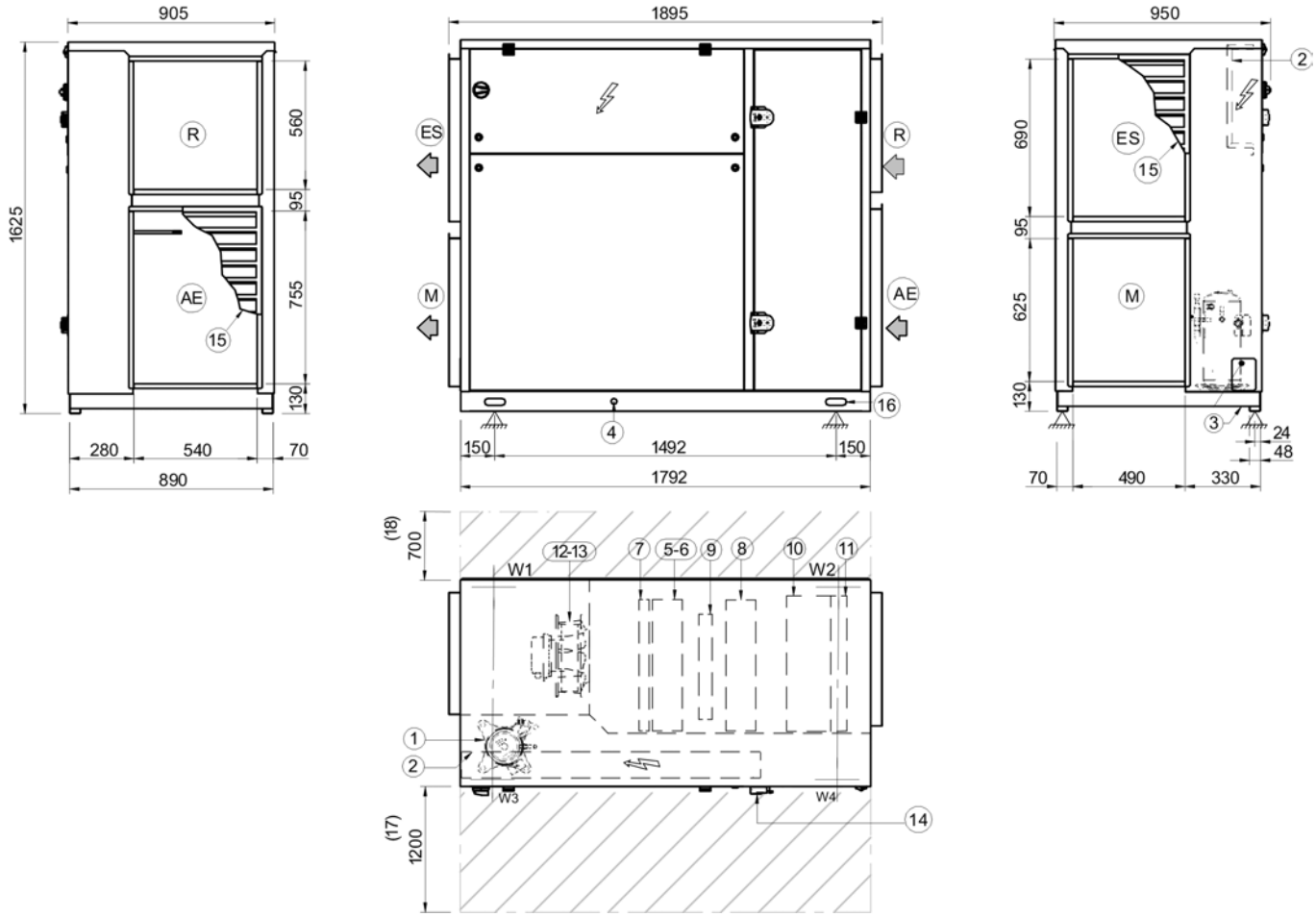
(1) Capacity modulating compressor
(2) Electrical panel
(3) Power input
(4) Condensation drain pipe Ø 20 mm
(5) Standard outdoor air exchanger (below)
(6) Exhaust air standard exchanger (above)
(7) Capacity modulating post-heating with hot gas recovery
(8) Hydronic recovery device for extended operating range (Optional)
(9) Electrical heaters
(10) Electronic filters
(11) Class G4 air filters on outdoor and exhaust air
(12) Supply fan (below)
(13) Exhaust fan (above)
(14) Air filters access
(15) Grid for indoor installation (Optional)
(16) Lifting holes
(17) Functional spaces
(18) If the unit is placed against the wall provide the space for the replacement of the roof electric fan
(R) Return Air
(M) Supply Air
(AE) Outdoor air intake
(ES) Exhaust air

WEIGHT DISTRIBUTION			
Size			Size 1
W1 Supporting Point		kg	78
W2 Supporting Point		kg	82
W3 Supporting Point		kg	82
W4 Supporting Point		kg	78
Shipping weight		kg	320

SIZE 2

DAA5Gsize2_0

Date: 21/09/2012



(1) Capacity modulating compressor
(2) Electrical panel
(3) Power input
(4) Condensation drain pipe Ø 20 mm
(5) Standard outdoor air exchanger (below)
(6) Exhaust air standard exchanger (above)
(7) Capacity modulating post-heating with hot gas recovery
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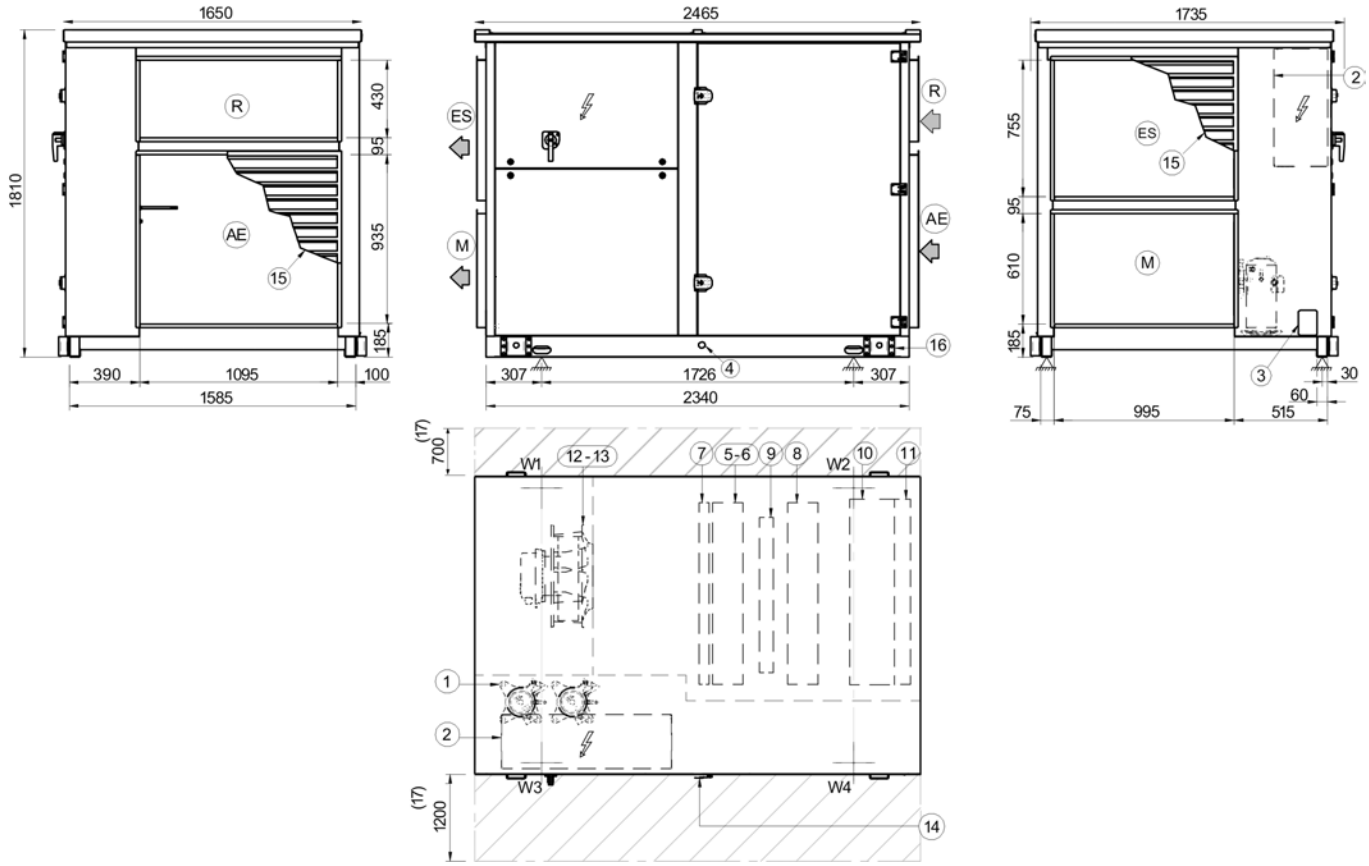
(15) Grid for indoor installation (Optional)
(16) Lifting holes
(17) Functional spaces
(18) If the unit is placed against the wall provide the space for the replacement of the roof electric fan
(R) Return Air
(M) Supply Air
(AE) Outdoor air intake
(ES) Exhaust air

WEIGHT DISTRIBUTION			
Size			Size 2
W1 Supporting Point		kg	110
W2 Supporting Point		kg	115
W3 Supporting Point		kg	116
W4 Supporting Point		kg	109
Shipping weight		kg	450

SIZE 3

DAA5Gsize3_0

Date: 21/09/2012



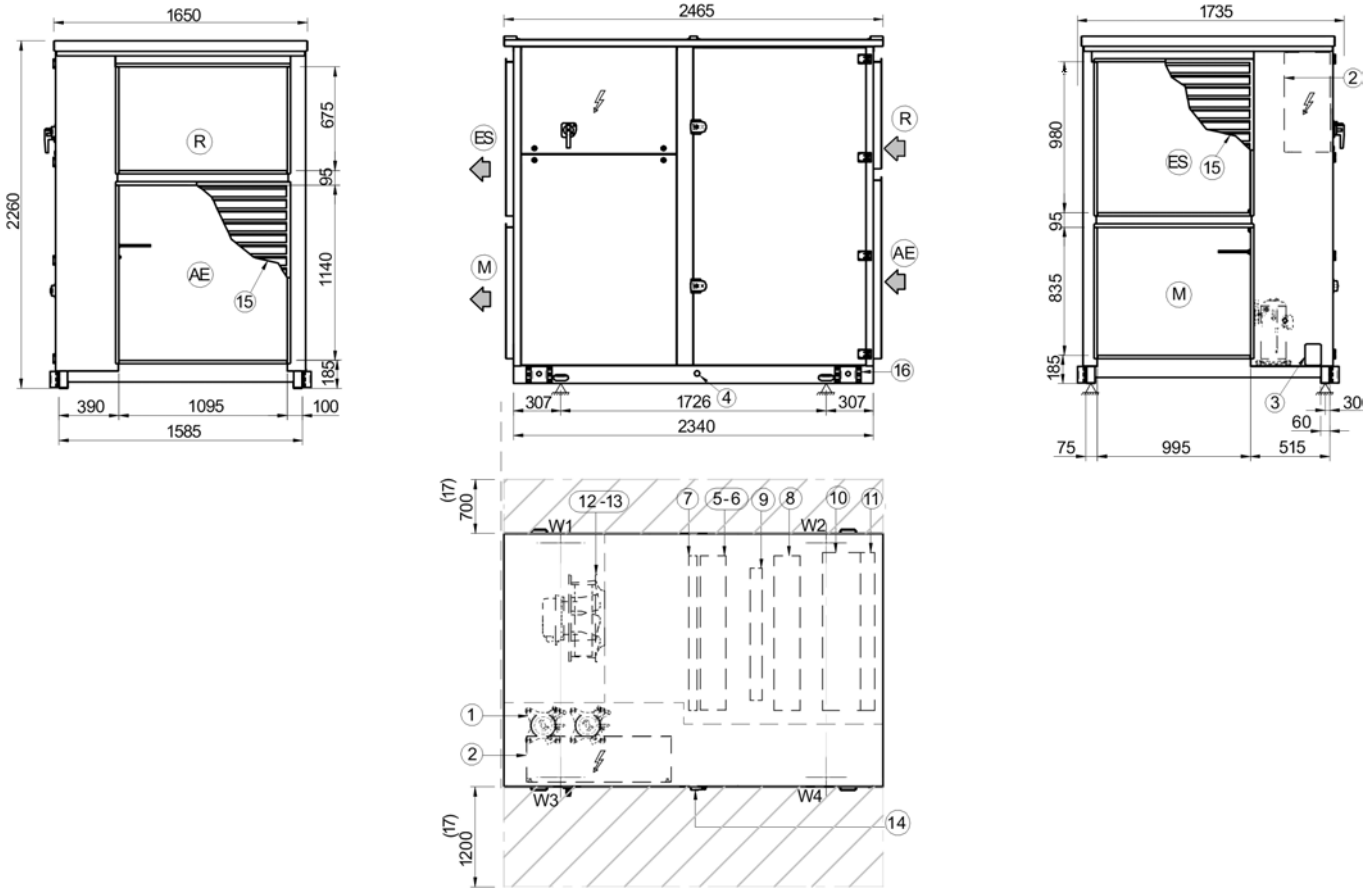
(1) Capacity modulating compressor
(2) Electrical panel
(3) Power input
(4) Condensation drain pipe Ø 20 mm
(5) Standard outdoor air exchanger (below)
(6) Exhaust air standard exchanger (above)
(7) Capacity modulating post-heating with hot gas recovery
(8) Hydronic recovery device for extended operating range (Optional)
(9) Electrical heaters
(10) Electronic filters
(11) Class G4 air filters on outdoor and exhaust air
(12) Supply fan (below)
(13) Exhaust fan (above)
(14) Air filters access
(15) Grid for indoor installation (Optional)
(16) Support brackets (can be removed after the unit is positioned)
(17) Functional spaces
(18) If the unit is placed against the wall provide the space for the replacement of the roof electric fan
(R) Return Air
(M) Supply Air
(AE) Outdoor air intake
(ES) Exhaust air

WEIGHT DISTRIBUTION			
Size			SIZE 3
W1 Supporting Point		kg	259
W2 Supporting Point		kg	273
W3 Supporting Point		kg	289
W4 Supporting Point		kg	249
Shipping weight		kg	1070

Size 4

DAA5Gsize4_0

Date: 21/09/2012



(1) Capacity modulating compressor
(2) Electrical panel
(3) Power input
(4) Condensation drain pipe Ø 20 mm
(5) Standard outdoor air exchanger (below)
(6) Exhaust air standard exchanger (above)
(7) Capacity modulating post-heating with hot gas recovery
(8) Hydronic recovery device for extended operating range (Optional)
(9) Electrical heaters
(10) Electronic filters
(11) Class G4 air filters on outdoor and exhaust air
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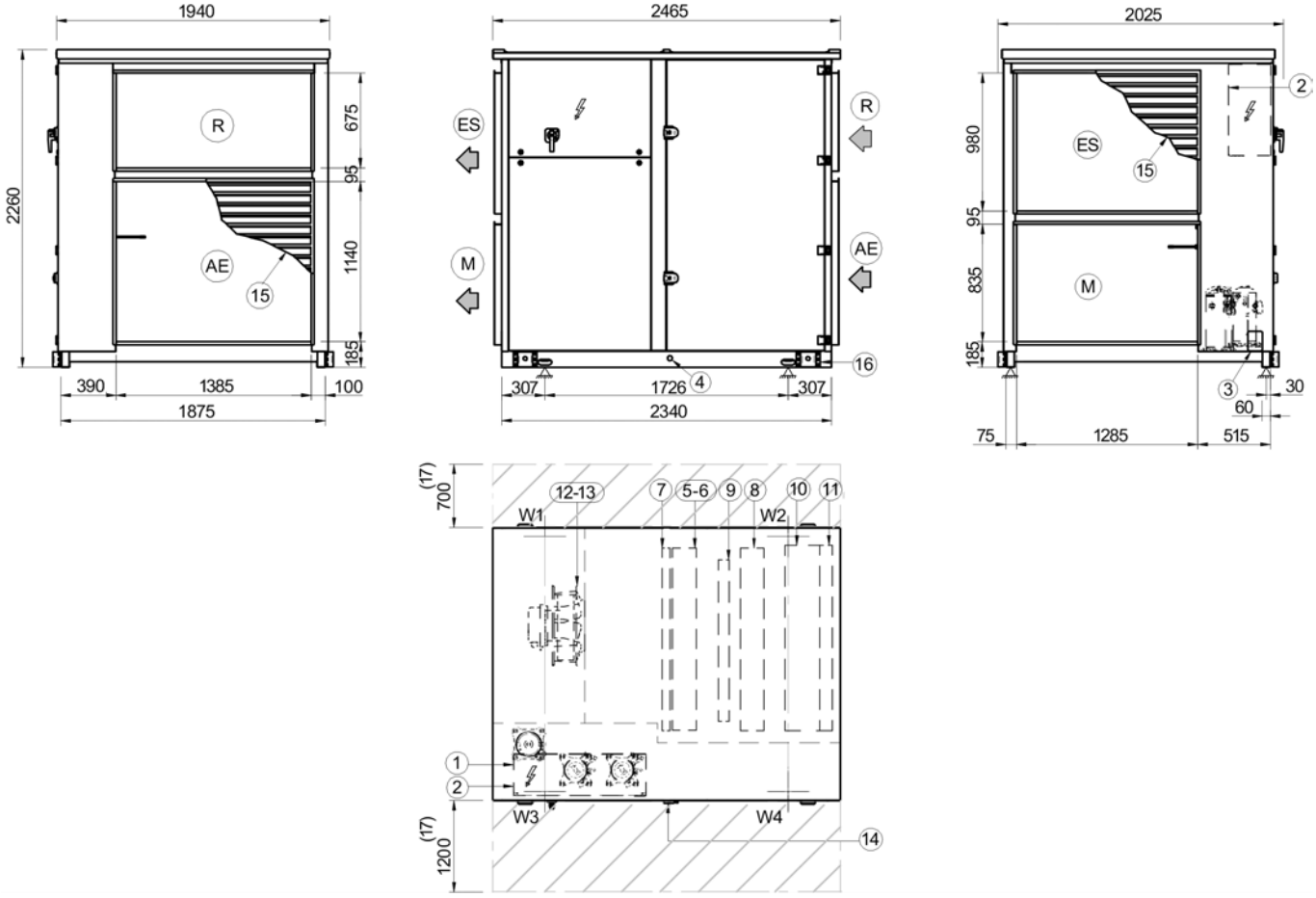
(13) Exhaust fan (above)
(14) Air filters access
(15) Grid for indoor installation (Optional)
(16) Support brackets (can be removed after the unit is positioned)
(17) Functional spaces
(18) If the unit is placed against the wall provide the space for the replacement of the roof electric fan
(R) Return Air
(M) Supply Air
(AE) Outdoor air intake
(ES) Exhaust air

WEIGHT DISTRIBUTION			
Size			Size 4
W1 Supporting Point		kg	312
W2 Supporting Point		kg	328
W3 Supporting Point		kg	347
W4 Supporting Point		kg	299
Shipping weight		kg	1285

SIZE 5

DAA5Gsize5_0

Date: 21/09/2012



(1) Capacity modulating compressor
(2) Electrical panel
(3) Power input
(4) Condensation drain pipe Ø 20 mm
(5) Standard outdoor air exchanger (below)
(6) Exhaust air standard exchanger (above)
(7) Capacity modulating post-heating with hot gas recovery
(8) Hydronic recovery device for extended operating range (Optional)
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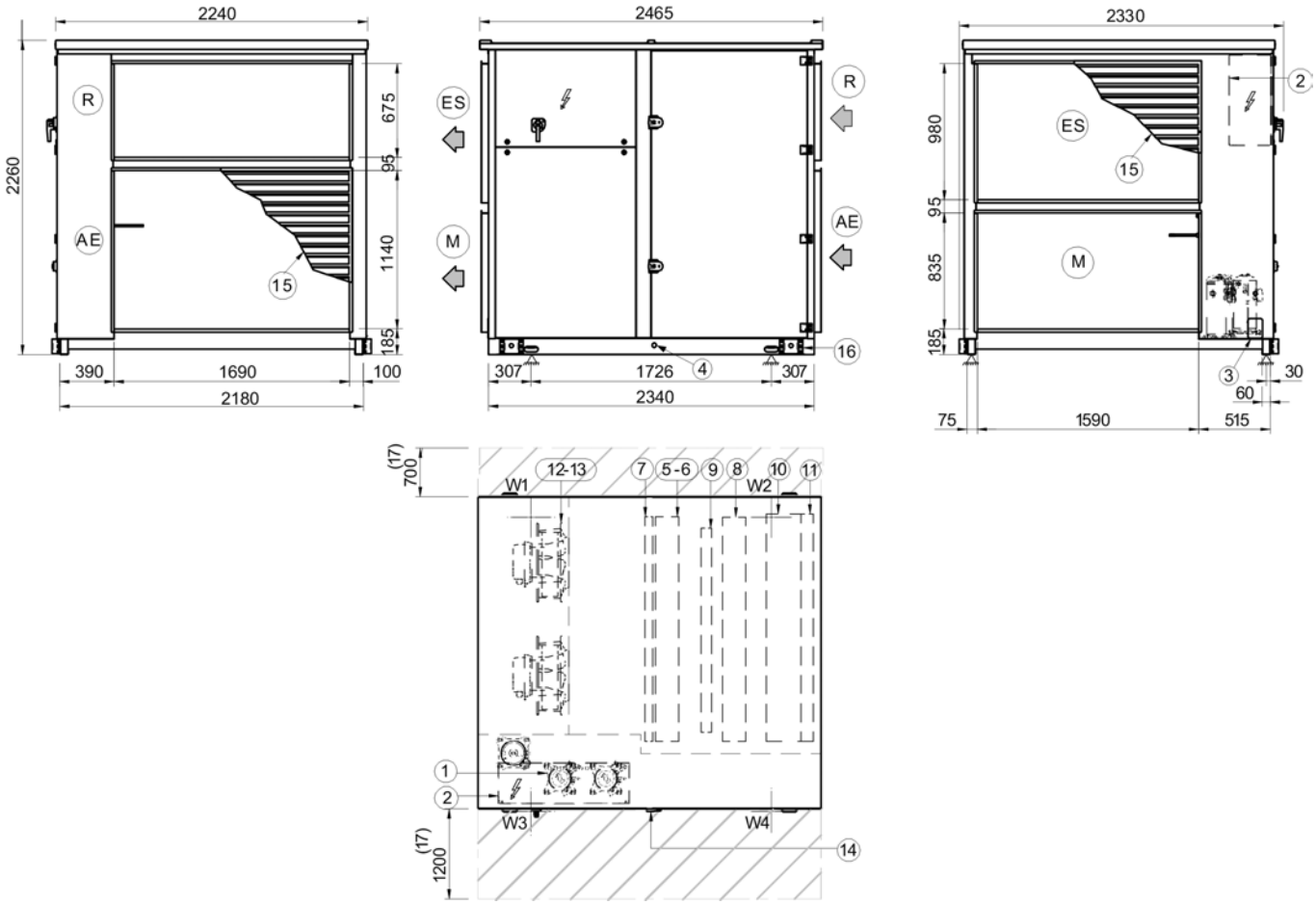
(10) Electronic filters
(11) Class G4 air filters on outdoor and exhaust air
(12) Supply fan (below)
(13) Exhaust fan (above)
(14) Air filters access
(15) Grid for indoor installation (Optional)
(16) Support brackets (can be removed after the unit is positioned)
(17) Functional spaces
(18) If the unit is placed against the wall provide the space for the replacement of the roof electric fan
(R) Return Air
(M) Supply Air
(AE) Outdoor air intake
(ES) Exhaust air

WEIGHT DISTRIBUTION			
Size			Size 5
W1 Supporting Point		kg	348
W2 Supporting Point		kg	370
W3 Supporting Point		kg	399
W4 Supporting Point		kg	334
Shipping weight		kg	1450

SIZE 6

DAA5Gsize6_0

Date: 21/09/2012



(1) Capacity modulating compressor
(2) Electrical panel
(3) Power input
(4) Condensation drain pipe Ø 20 mm
(5) Standard outdoor air exchanger (below)
(6) Exhaust air standard exchanger (above)
(7) Capacity modulating post-heating with hot gas recovery
(8) Hydronic recovery device for extended operating range (Optional)
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(10) Electronic filters
(11) Class G4 air filters on outdoor and exhaust air
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(14) Air filters access
(15) Grid for indoor installation (Optional)
(16) Support brackets (can be removed after the unit is positioned)
(17) Functional spaces
(18) If the unit is placed against the wall provide the space for the replacement of the roof electric fan
(R) Return Air
(M) Supply Air
(AE) Outdoor air intake
(ES) Exhaust air

WEIGHT DISTRIBUTION			
Size			Size 6
W1 Supporting Point		kg	401
W2 Supporting Point		kg	426
W3 Supporting Point		kg	459
W4 Supporting Point		kg	384
Shipping weight		kg	1670

CLIVET SPA
Via Camp Lonc 25, Z.I. Villapaiera - 32032 Feltre (BL) - Italy
Tel. + 39 0439 3131 - Fax + 39 0439 313300 - info@clivet.it

CLIVET UK LTD (Sales)
4 Kingdom Close, Segensworth East - Fareham, Hampshire - PO15 5TJ - United Kingdom
Tel. + 44 (0) 1489 572238 - Fax + 44 (0) 1489 573033 - info@clivet-uk.co.uk

CLIVET AIRCON LTD (Service and Maintenance Division)
Units F5&F6 Railway Triangle Ind Est, Walton Road - Portsmouth, Hampshire - PO6 1TG - United Kingdom
Tel. +44 (0) 2392 381235 - Fax. +44 (0) 2392 381243 - info@clivetaircon.co.uk

CLIVET ESPAÑA COMERCIAL S.L. (Sales)
Calle Gurb, 17 1º 1ª - 08500 Vic, Barcelona - España
Tel: +34 93 8606248 - Fax +34 93 8855392 - info@clivetcomercial.com

CLIVET ESPAÑA S.A.U. (Service and Maintenance Division)
Calle Real de Burgos Nº 12 - 28860 Paracuellos del Jarama, Madrid - España
Tel. +34 91 6658280 - Fax +34 91 6657806 - info@clivet.es

CLIVET GmbH
Hummelsbütteler Steindamm 84, 22851 Norderstedt - Germany
Tel. + 49 (0) 40 32 59 57-0 - Fax + 49 (0) 40 32 59 57-194 - info.de@clivet.com

CLIVET RUSSIA
Elektrozavodskaya st. 24, office 509 - 107023, Moscow, Russia
Tel. + 74956462009 - Fax + 74956462009 - info.ru@clivet.com

CLIVET MIDEAST FZCO
Dubai Silicon Oasis (DSO), High Bay Complex, Ind Unit No. 3, PO BOX 342009, Dubai, UAE
Tel. + 9714 3208499 - Fax + 9714 3208216 - info@clivet.ae

CLIVET AIRCONDITIONING SYSTEMS PRIVATE LIMITED
4BA, Gundecha Onclave - Kherani Road,Saki Naka, Andheri (East) - Mumbai 400 072 - India
Tel. +91 22 6193 7000 - Fax +91 22 6193 7001 - info.in@clivet.com