Installation and
Owner's manual

EVH-X SPACE 2.1-12.1

Internal horizontal autonomous air-conditioner

Dear Customer,

We congratulate you on choosing this product.

Clivet is being working for years to offer systems able to assure the maximum comfort for long time with high reliability, efficiency , quality and safety. The target of the company is to offer advanced systems, that assure the best comfort, reduce the energy consumption, the installation and maintenance costs for all the life-cycle of the system.

With this manual, we want to give you information that are useful in all the phases: from the reception, to the installation and use until the disposal so that a system so advanced offers the best procedure of installation and use.

Best regards and have a nice reading.

CLIVET Spa

The precautions in this manual are divided as indicated on the side.

They are important, so make sure you follow them closely.

Please read these instructions carefully before installing.

Keep this manual handy for future reference.

This unit contains fluorinated gases. For specific information on gas types and quantities, please refer to the plate found on the unit.

Please contact your dealer for future assistance.

Meaning of the symbols DANGER, WARNING, CAUTION and NOTE

DANGER

⇒ *It indicates a situation of imminent danger that, if not avoided, will cause death or serious lesions.*

WARNING

⇒ *It indicates a potentially dangerous situation that, if not avoided, may cause death or serious lesions.*

CAUTION

⇒ *It indicates a potentially dangerous situation that, if not avoided, may cause slight or moderate injury. Also used to warn against unsafe practices.*

NOTE

⇒ *It indicates situation that may cause accidental damage to the equipment or property.*

DANGER

⇒ *An incorrect installation of equipment or accessories may provoke electric shocks, short circuits, leaks, fire or other damages to the equipment. Make sure you only use accessories provided by the supplier - which are designed specifically for the equipment - and make sure they are installed by a professional.*

⇒ *All activities described in this manual must be performed by authorised technicians. Make sure to wear suitable personal protection such as gloves and safety goggles while installing the unit or performing maintenance operations.*

⇒ *Switch off the power switch before touching electrical components and terminals.*

⇒ *When the service panels are removed, the live parts can easily be touched by mistake.*

⇒ *Never leave the unit unattended during installation or maintenance operations while the service panel is removed.*

⇒ *Do not touch the water pipes during and after performing welding or junction work as the pipes may be very hot and you may burn your hands. To avoid lesions, wait until the pipes return to a normal temperature or make sure you are wearing protective gloves.*

⇒ *Do not touch any switch with wet hands. Touching a switch with wet hands may lead to electric shock.*

WARNING

⇒ *Maintenance operations must be performed as recommended by the manufacturer. Maintenance and reparation operations requiring the assistance from specialized personnel must be performed under the supervision of the person competent as regards flammable refrigerants.*

⇒ *Tear and dispose of plastic bags so that children may not play with them. Children playing with plastic bags risk choking.*

⇒ *Some products use PP packaging straps. Do not pull the straps or use them to lift or move the product. It may be dangerous should the straps break.*

⇒ *Dispose safely of packaging material such as nails or other metal or wooden parts that may cause lesions.*

⇒ *Ask your dealer or qualified personnel to perform installation operations according to this manual. Do not install the unit yourself. An incorrect installation may cause water leaks, electric shock or fire.*

⇒ *Make sure to only use accessories and parts specified for installation operations. Failing to use specific parts may cause*

⇒ *water leaks, electric shock, fire or the unit falling from its support.*

⇒ *Install the unit on a structure that can withstand its weight. An insufficiently robust structure may lead to the unit falling causing possible lesions.*

⇒ *Perform installation operations considering the possibility that strong winds, hurricanes or earthquakes may occur. Incorrect installation operations may lead to accidents caused by falling equipment.*

⇒ *Make sure all electrical operations are performed by qualified personnel in accordance with the law, local regulations and this manual.*

⇒ *Connect the unit to a separate power supply circuit. An insufficient capacity of the power supply circuit or incorrect connections may lead to electric shock or fire.*

⇒ *Make sure to install an additional differential circuit-breaker against a leakage to earth compliant with the law and local regulations: omnipolar circuit breaker, at least 3 mm separation in all poles, residual current device (RCD) with a rated value not exceeding 30 mA.*

⇒ *Failing to install a differential circuit -breaker may lead to electric shock and fire.*

⇒ *Make sure all the wiring is safe. Use the specified wires and make sure terminal connections and wires are protected against the water, external forces or other phenomena. Incomplete connections or fixing may cause a fire.*

⇒ *When connecting the power supply, arrange the wires so that the front panel can be fixed properly. If the front panel is not in position, it may lead to terminals overheating, electric shock or fire.*

⇒ *People working or intervening on a cooling circuit must hold a suitable certification issued by an authorised assessment centre proving their suitability to handle refrigerants safely in compliance with a specific assessment recognised by industry associations.*

⇒ *After installation operations are over, verify that there are no refrigerant leaks.*

⇒ *Never touch the leaking refrigerant directly, as it may lead to serious frostbite injuries. Do not touch the refrigerant pipes during and right after functioning, as they may be hot or cold depending on the*

conditions of the refrigerant flowing through the pipes, compressor and other parts of the cooling circuit. Burns or frostbite may occur if you touch the refrigerant pipes. If it is necessary to touch the pipes, wait for them to return to a normal temperature or wear protective gloves and clothes.

⇒ *Do not touch the internal parts during and immediately after functioning. Touching internal parts may cause burns. To avoid lesions, wait until the internal parts have returned to a normal temperature or, if touching them is necessary, wear protective gloves.*

⇒ *Do not pierce nor burn.*

⇒ *Be aware that refrigerants are odourless.*

CAUTION

⇒ *Place the unit on the ground.*

⇒ *The earth resistance should comply with the law and local regulations.*

⇒ *Do not connect the earth cable to gas or water mains, lightning rods or phone earth cables.*

⇒ *Incomplete earthing may cause electrical shocks.*

- Gas mains: fires or explosions may occur in case of a gas leak.
- Water mains: rigid vinyl tubes are not effective.
- Lightning rods or phone earth cables: the electrical threshold can increase abnormally if hit by lightning.

⇒ *Do not wash the unit as it may cause electric shocks or fires.*

⇒ *Do not install the unit in the following places:*

- Where there is mineral oil, even in form of vapour. Plastic parts may deteriorate, disperse and cause water leaks.
- Where corrosive gases (such as sulphurous acid) are produced.
- Where the corrosion of copper pipes or welded parts may cause refrigerant leaks.
- Where there are devices emitting electromagnetic waves. Electromagnetic waves may disturb the control system and cause malfunctions.
- Where flammable gases may leak, or carbon fibre or flammable powers may be found in the air or where volatile flammable materials such as paint thinners or petrol are handled. These gases may cause a fire.
- Where the air contains high levels of salt, such as the seaside.
- Where the power supply voltage is subject to fluctuations, such as in factories.
- On vehicles or ships.
- Where there are acid or alkaline vapours.

⇒ *Prior to installation, verify if the user's power supply meets the unit's installation requirements (including reliable earthing, differential circuit-breaker, component size, wire section, etc.). If the electrical installation requirements are not met, the unit cannot be installed until the electrical system is rectified.*

⇒ *Before the hydraulic connection and electrical wiring operations, verify that the installation area is safe and without hidden dangers such as water, electricity and gas conduits.*

⇒ *Do not touch the fins of the heat exchanger as they may cause injury.*

⇒ *If installing multiple units in a centralised manner, adjust the electric load on the various phases. Do not connect multiple units to the same phase of the three-phase supply.*

⇒ *The following subjects may use the unit if supervised or instructed on safe usage and capable of understanding the possible dangers: children who are minimum 8 years old, people with no experience or knowledge, people with limited physical, sensory or mental abilities.*

⇒ *Children must not play with the unit.*

⇒ *Cleaning and maintenance operations to be carried out by the user must not be performed by unsupervised children.*

⇒ *Once the installation is complete, the unit tested and functioning is normal, instruct the client as regards the use and maintenance of the unit as indicated in this manual. In addition, make sure that the manual is suitably kept for future reference.*

⇒ *DISPOSAL: do not dispose of this product as unsorted waste. Contact the local authorities for information on the collection systems available. If electrical equipment is disposed of in landfills, dangerous substances may infiltrate the waste water and enter the food chain, harming the health and well-being of people and animals.*

Manual

The manual provides correct unit installation, use and maintenance.

Pay particular attention to:

⇒ Warning / prohibited / danger indicate particularly important operations or information, operations that must not be carried out, that compromise the operating of the equipment or may cause damage to persons or things.

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

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

Preliminaries

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

Risk situations

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

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

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

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

Intended use

Use the unit only for the:

- air treatment
- Follow the limits defined in the technical bulletin and on this manual.

Any use other than intended does not involve the manufacturer in any commitment or obligation.

Installation

Internal installation.

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

Follow local safety regulations.

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

Maintenance

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

Turn the machine off before any operation.

Modification

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

Breakdown/Malfunction

Disable the unit immediately in case of breakdown or malfunction.

Contact a constructor certified assistance service.

Use original spares parts only.

Using the unit in case of breakdown or malfunction:

- voids the warranty
- may compromise the safety of the machine
- may increase time and repair costs.

User training

The installer has to train the user on:

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

Data update

Continual product improvements may imply manual data changes.

Visit manufacturer web site for updated data.

Indications for the user

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

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

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

In case of breakdown or malfunction:

- immediately deactivate the unit
- Contact a constructor certified assistance service

Ask the installer to format on:

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

This unit can be used by children aged 8 or over and by people with limited physical, sensory or mental abilities or with no experience or knowledge if they are supervised or have been shown how to use the appliance safely and have understood the possible risks.

Children must not play with the appliance.

Cleaning and maintenance operations to be carried out by the user must not be performed by unsupervised children.

Unit identification

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

It reports the regulations indications such as:

- Unit type
- Serial number (12 characters)
- Year of manufacture
- Wiring diagram number
- Electrical data
- Refrigerant type
- Refrigerant charge
- Manufacturer logo and address

It has not to be removed for any reason.

Contains fluorinated greenhouse gases

- Refrigerant type: R-410A

Serial number

It identifies uniquely each machine.

It identifies specific spare parts for the machine.

Assistance requests

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

Serie
Size
Serial number
Year of manufacture
Wiring diagram

Delivery control

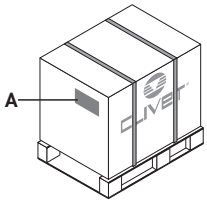
Before accepting the delivery you have to check:

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

In case of damage or anomaly:

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

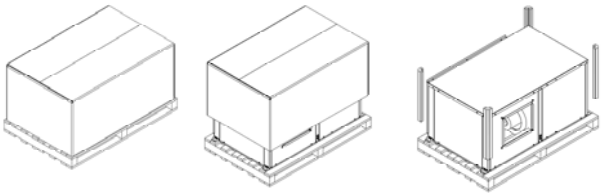
⇒ *Any disputes must be made within the 8 days following the delivery. Complaints after this period are invalid.*



Packing removing

Be careful not to damage the unit.

Recycle and dispose of packing material in conformity with local regulations.



Storing

Observe external packing instructions.

Keep the unit in a dry place.

Particularl:

⇒ *minimum room temperature -10°C (possible damage to components)*

⇒ *maximum room temperature +50°C (possible opening of the pressure relief valves)*

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

Handling

⇒ *Check that all handling equipment complies with the local safety regulations (cranes, forklift trucks, ropes, hooks, etc.).*

⇒ *Provide personnel with personal protective equipment appropriate for the situation, such as hard hat, gloves, safety shoes, etc.*

⇒ *Follow all safety procedures to ensure the safety of personnel and materials.*

1 Verify unit weight and handling equipment lifting capacity.

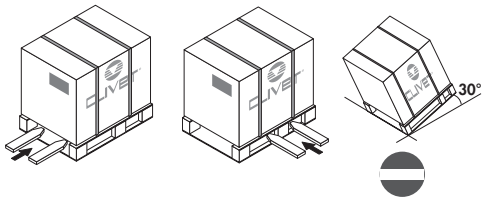
2 Identify critical points during handling (disconnected routes, flights, steps, doors).

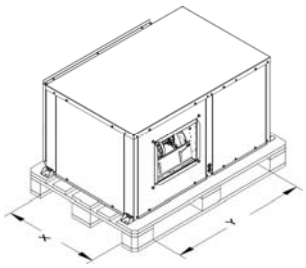
3 Suitably protect the unit to prevent damage.

4 Insert the forks as shown in the figure.

⇒ *In case of lifting of more units at the same time, an appropriate container must be used.*

⇒ *It is forbidden to lift simultaneously more packages letting them looses.*





Size	X	y
2.1 3.1	530	710
5.1 7.1	640	920
10.1 12.1	NO - CLOSED	1360

General

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

During positioning consider these elements:

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

Functional clearances

The functional clearances have to:

- guarantee the unit good operating
- allow the maintenance operations
- safeguard the authorized operators and the exposed person.

⇒ *Respect all functional spaces*

Positioning

The units are designed to be installed:

- iside
- in fixed positions

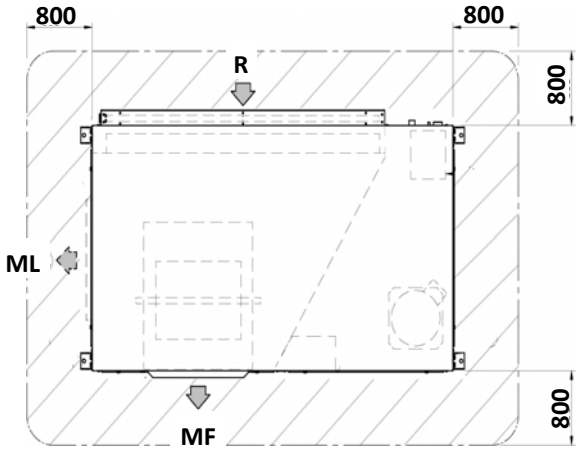
Limit vibration transmission:

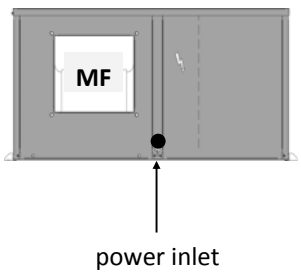
- use antivibration devices on unit bearing/ supporting points;
- install flexible joints on the hydraulic/ aeraulic/ cooling connections
- plan in the false ceiling the openings indicated in the functional clearances to allow the access to the unit for the maintenance operations.

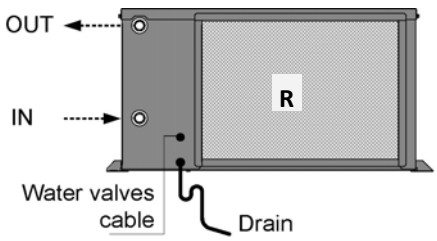
Ceiling positioning:

- let free the projection to the ground of the unit and of the functional clearances to allow the access with ladders or other means.

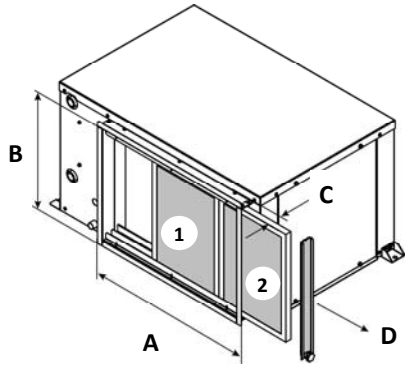
800	functional spaces
R	air inlet
MF	front outflow
ML	side outflow





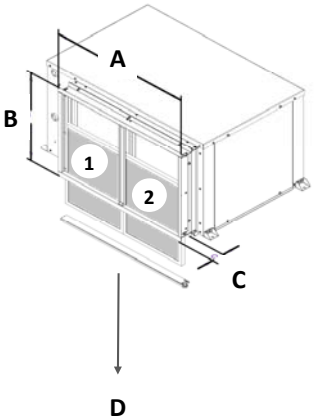


Extracting the side filter - standard



Size	A	B	C
2.1-3.1	625	460	100
5.1-7.1	845	560	100
10.1-12.1	1085	650	100

Extracting the filter from underneath - option

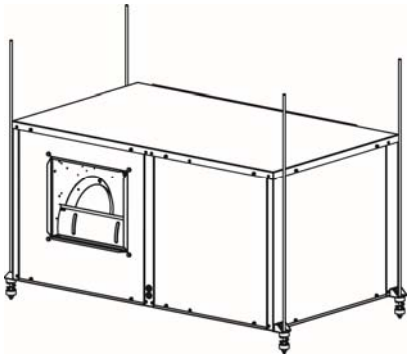


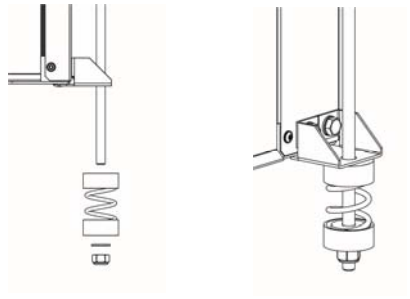
Size	A	B	C
2.1-3.1	625	460	100
5.1-7.1	845	560	100
10.1-12.1	1085	650	100

Ceiling positioning

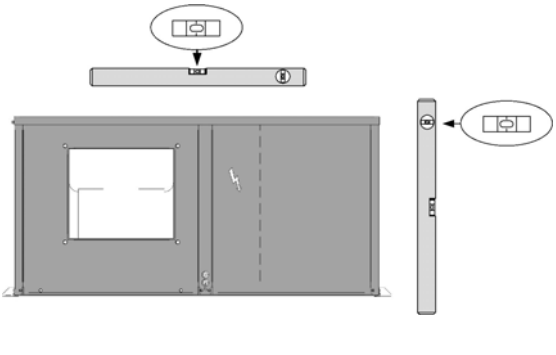
1 Fix some M10 threaded bars (not supplied) to the ceiling.
2 Pass the M10 threaded bars in the brackets on the unit.
3 Insert the threaded rod inside the anti-vibration mount.
4 The antibration device must be positioned with the interior threaded downward
5 Insert the flat washer and screw the nut to lock.

⇒ *Avoid to over tighten the nuts, the springs, because if too much crushed they don't absorb vibrations.*





Unit in bubble level



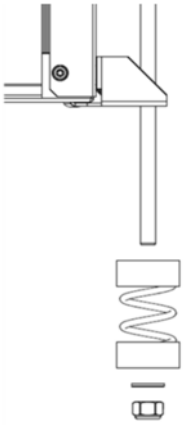
Anti-vibration mount support (option)

Kit composition

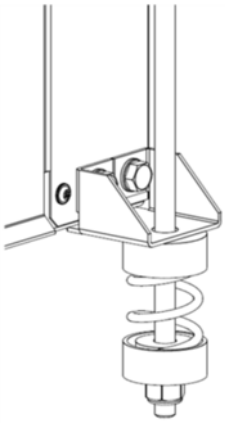
- Flat washer 10x40, 2x nut M10 low

Installation

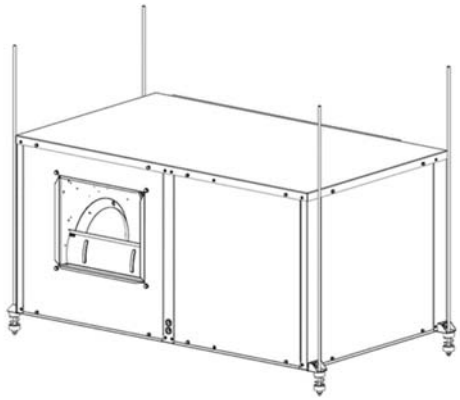
M10 threaded bars (not supplied)



Insert the threaded rod inside the anti-vibration mount.



Lock the lower and the upper nut M10 and make sure they are properly tightened.



Kit code	Size	Anti-vibration supporting points			
		W1	W2	W3	W4
PE7O00006	2.1 - 3.1	MNZr 3 F11	MNZr 3 F11	MNZr 3 F11	MNZr 3 F11
PE7O00007	5.1 - 7.1	MNZr 5 F11	MNZr 5 F11	MNZr 5 F11	MNZr 5 F11
PE7O00008	10.1 - 12.1	MNZr 8 F11	MNZr 8 F11	MNZr 8 F11	MNZr 8 F11

Thermostat positioning (option)

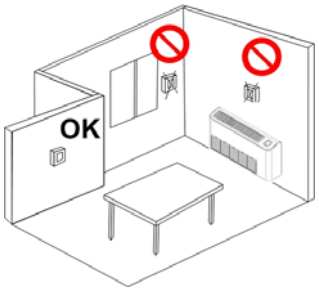
The choice of the installation point is important for the comfort of the served area and the energy consumptions.

The thermostat must be positioned:

- in a room with medium temperature and humidity conditions, representative of the other rooms
- at a height of 150 cm
- preferably on an inner wall

Positions to avoid:

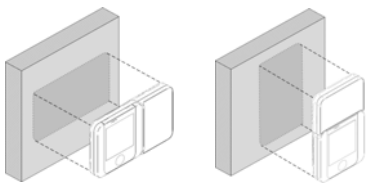
- near heat sources
- exposed to direct solar radiation
- in a position with exhaust air from outlets or diffusers
- behind curtains or pieces of furniture
- near doors and windows to the outside
- on walls crossed by heating chimneys or pipes
- on external walls.

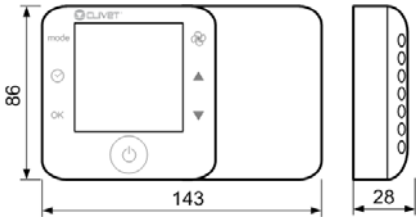


Wall installation

Enables the unit to be remotely controlled. It can be attached to a wall with the support in a horizontal or vertical position.

► Electrical connections



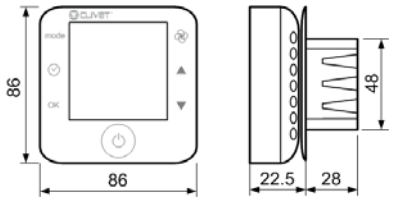


Wall instalaltion with uncased box

Enables the unit to be remotely controlled.

It can be easily installed in the main square or round uncased section boxes with 65 mm diameters and a depth of at least 31 mm.

► Electrical connections



Hidraulic system

The pipes must be designed and manufactured to limit pressure drops as much as possible, i.e. optimise performance of the system.

Keep the following to a minimum:

- overall length
- number of bends
- number of vertical changes of direction

If the unit is to replace an existing unit, clean the system thoroughly:

see Operation sequence on the following pages.

Water quality

Water quality can be verified by specialized personnel.

Water with inadequate characteristics can cause:

- pressure drop increase
- energy efficiency decrease
- corrosive symptom increase

Water features:

- within the limits indicated by table

PH	7,5÷9	
SO_4^{2-}	< 100	ppm
HCO_3^-/SO_4^{2-}	> 1	
Total hardness	8 ÷ 15	f°
Cl^-	< 50	ppm
PO_4^{3-}	< 2,0	ppm
NH3	< 0,5	ppm
Free Chlorine	< 0,5	ppm
Fe_3^+	< 0,5	ppm
Mn^{++}	< 0,05	ppm
CO_2	< 50	ppm
H_2S	< 50	ppb
Temperature	< 65	°C
Oxygen content	< 0.1	ppm

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

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

Risk of freezing

⇒ *The unit must always be protected against freezing. Otherwise irreversible damages may occur.*

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

- Mix water with ethylene glycol
- Safeguard the pipes with heating cables placed under the insulation
- Empty the system in cases of long non-use

Anti-freeze solution

Consider that the use of anti-freeze solution determines an increase in a pressure drop.

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

Do not use glycol mixtures of different type (for example ethylene + propylene).

Water flow-rate

The project water-flow must be:

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

Min. installation water contents

Minimum system water volumes are described within 'General technical data' section and they have to be satisfied to avoid continuous compressor switching on and off.

Water filter

Use filter with mesh pitch:

Size 2.1-7.1 = 0,5 mm (400 mesh)

Size 10.1-12.1 = 0,6 mm (500 mesh)

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

⇒ *The filter never should be removed, this operation invalidates the guaranty.*

Operating pressure

Max. pressure in the hydraulic circuit **6bar.**

Condensate discharge connection

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

Unit discharge fitting:

- Connect the condensate discharge to a rainwater drain.
- the connection must avoid the transmission of mechanical stresses and must be performed paying attention to avoid the damaging of the unit discharge fitting.
- Make a trap that, eliminating the depression caused by the fan, stops the return of gas from the discharge pipe
- Connect the condensate discharge to a rainwater drain. Do NOT use sewerage drains, so as to avoid the return of odours if the water contained in the trap evaporates.
- Finally, check that the condensate will drain correctly by pouring water into the tray stud.
- RISK OF FREEZE : If the unit operates in cooling with external temperatures lower than 0°C, value the possibility that the condensate can freeze blocking the downflow and provoking flooding. Use heat cables or other devices to guarantee the disposal.

Siphon height calculation

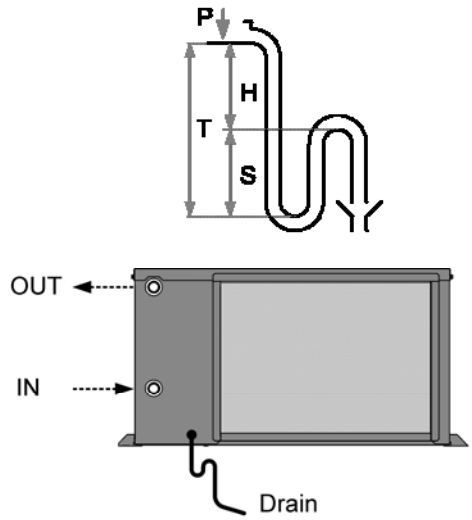
T = 2P

S = T/2

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

Example:

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



Connection to the system

Connect the pipes to the fittings on the side of the unit.

It is advisable to use hemp and green paste to fit the gasket.

⇒ *A unit inlet water filter is mandatory*

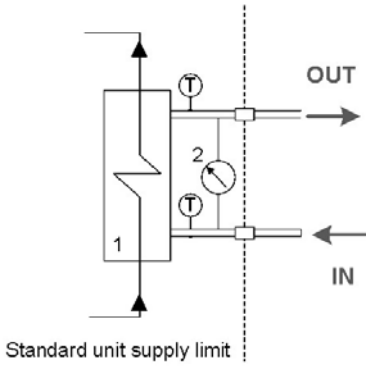
Standard hydraulic group

The standard unit includes the following components:

1 plate exchanger and water temperature control probes on the inlet and the outlet (to preventive from forming and to disable the compressor when the water temperature drops below a limit value)

2 water side differential pressure switch (to control the water flow rate presence)

⇒ *It is compulsory the water filter on the unit input.*



Condensate drain pump (option)

It is necessary in installations where the external outlet is placed at a higher height than the condensate tray. The integrated sensor activates the pump only when necessary.

If the water level in the tray should be greater than the pre-set limit, the unit stops the compressor to avoid the tray overflowing, signalling the fault with an alarm.

Kit composition

- Condensate drain pump
- Pump support bracket

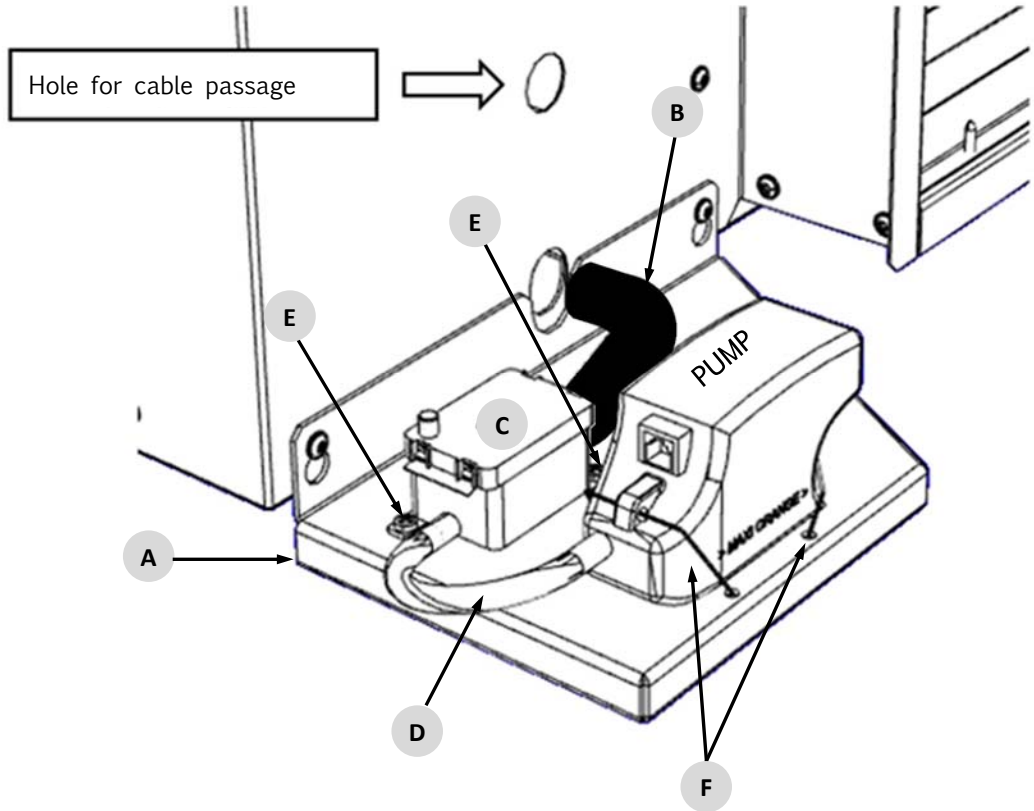
Warning

⇒ Assemble and perform the hydraulic connections first, then the electrical connections.

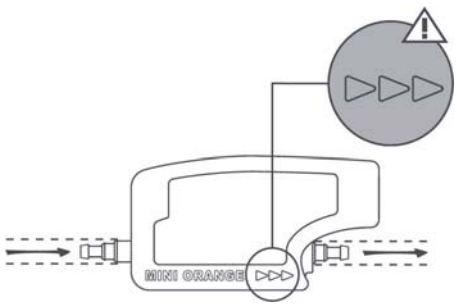
⇒ If in doubt, refer to the component manufacturer's instructions.

Water connections

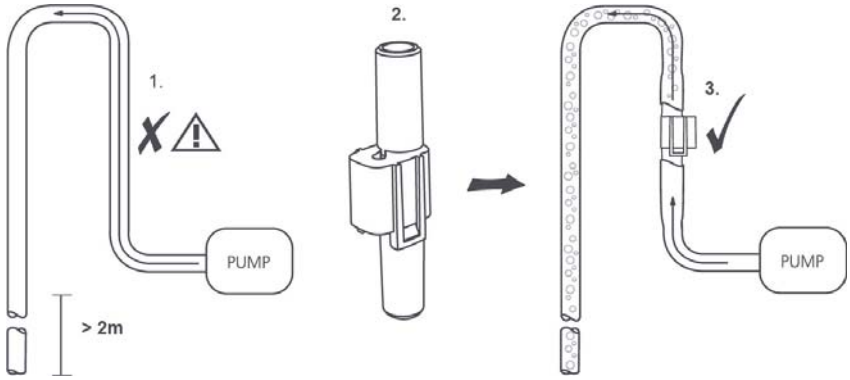
- Install pump support bracket (A)
- Connect black L-tube (B) to the unit condensate drain and to the pump tank (C)
- Connect the tank (C) to the pump with the pipe (D) and fix with clamps
- Fix the tank (C) to the bracket with the screws (E)
- Fix the pump with the clamps (F)

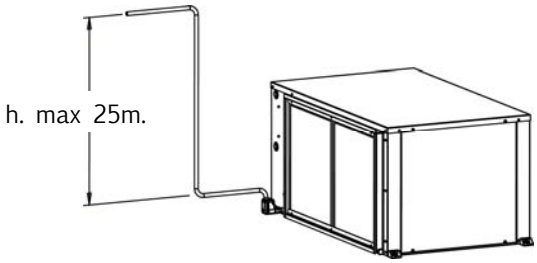


- Sound-absorbent
- Respect the flow direction indicated on the pump.
- Do not crush the pipe that could limit the passage of water
- Install the anti-siphon device (supplied with the pump)
- Connect the condensate discharge pipe to a drainage network.



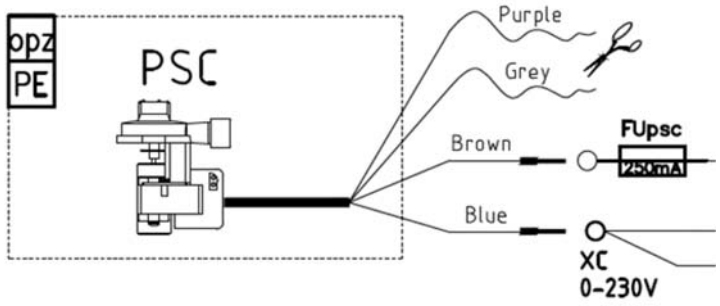
Anti-siphon device



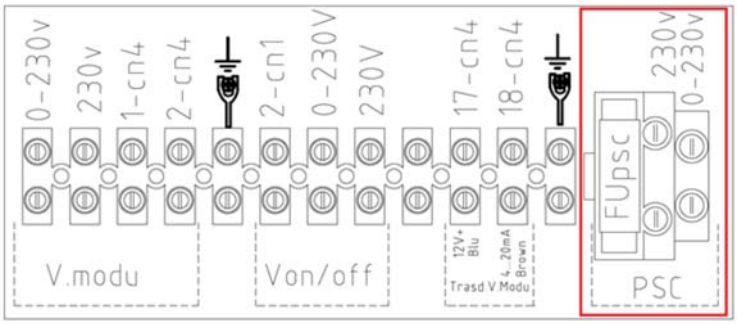


Electrical connections

⇒ Perform the electrical connections after the hydraulic connections
⇒ Perform the electrical connections with the unit disconnected.
⇒ Make sure that the cables are not damaged along the way.
⇒ Use the cable prearranged glands
⇒ Cable passage inside the unit (it is necessary to remove the compressor side panels).
⇒ Follow the connections on the wiring diagram.
⇒ If in doubt, refer to the unit's wiring diagram
⇒ Carefully tighten the terminals.



XC



Flow Switch (option)

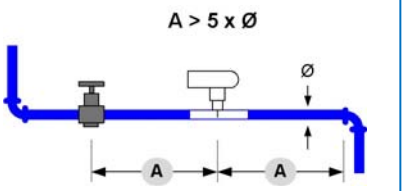
Kit composition

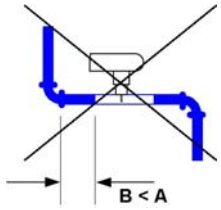
- Flow switch
- T fitting
- Power supply connection

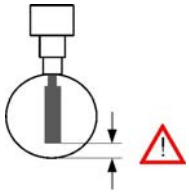
Warning

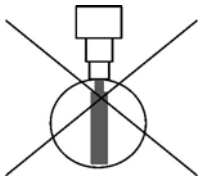
⇒ Assemble and perform the hydraulic connections first, then the electrical connections.
⇒ Install the flow switch in a straight section of the pipe, away from any bends.
⇒ Assemble the flow switch with the blade facing downwards.
⇒ Follow the direction of flow indicated.
⇒ Use a sealant to ensure tightness of the fittings.
⇒ If in doubt, refer to the component manufacturer's instructions.

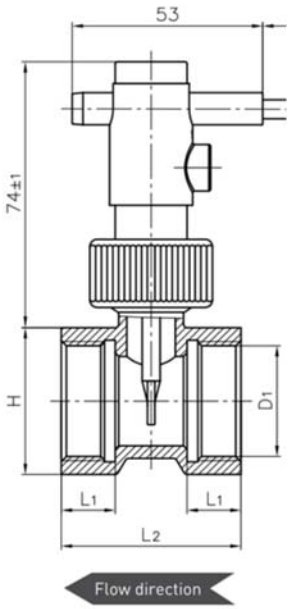
Water connections



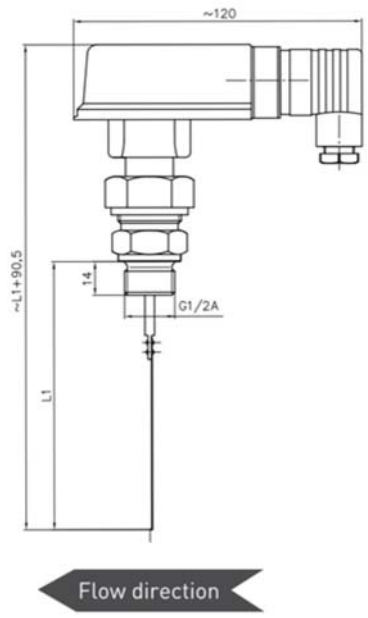


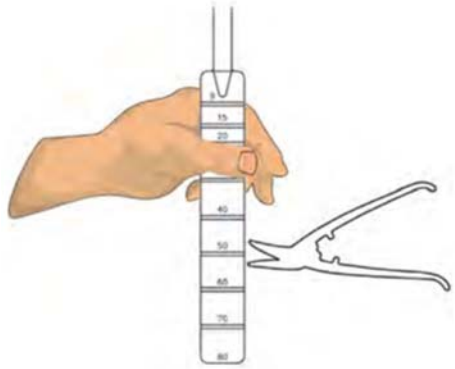






Size	DN	Rp	fittings
2.1-3.1-5.1-7.1	25	1"	F



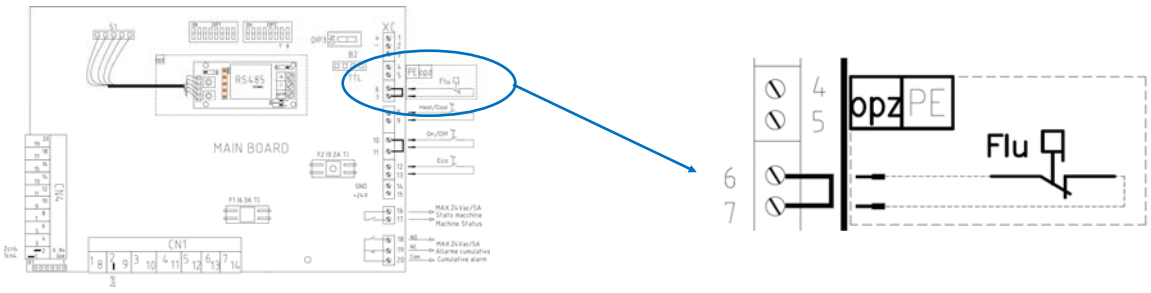


Cut on the “30” mark

Size	DN	Rp	L1 [mm]	fittings
10.1-12.1	40	1”1/2	61	F

Electrical connections

⇒ Perform the electrical connections after the hydraulic connections
⇒ Perform the electrical connections with the unit disconnected.
⇒ Make sure the cable is not damaged along the path between the electrical panel and the valve, use the cable gland provided.
⇒ Follow the connections on the wiring diagram.
⇒ If in doubt, refer to the unit’s wiring diagram
⇒ Carefully tighten the terminals.



Steel mesh filter and manually operated shut-off valve (option)

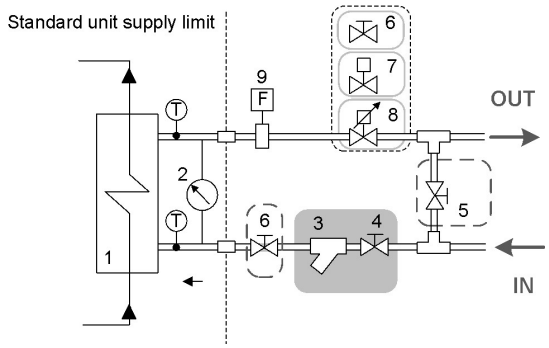
Kit composition

- Two-way ball valve
- Steel mesh filter

Warning

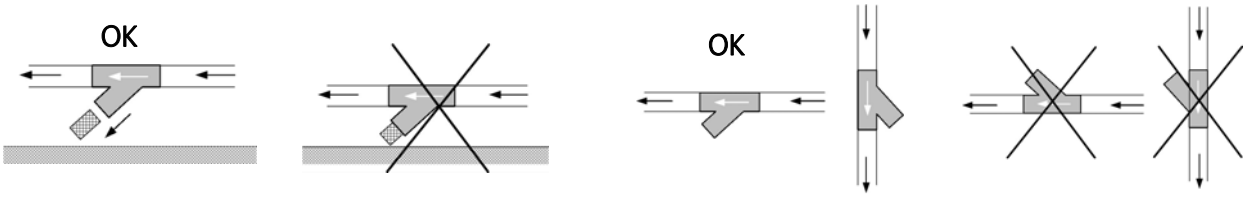
⇒ Follow the direction of flow
⇒ Use a sealant to ensure tightness of the fittings.

Water connections



1 Internal exchanger
2 Differential pressure switch
3 Filter
4 Manually operated shut-off valve
5 By-pass shut-off valve *
6-7-8 Regulating / shut-off valves for the system *
9 Flow switch *

* components not supplied with the kit



Size	ø Filter	ø Water fitting	fittings	Degree of filtration
2.1-3.1	1”	1”	F	400 µm
5.1-7.1	1”	1”	M	400 µm
10.1-12.1	1”1/2	1”1/2	M	500 µm

Two-way modulating valve for system with disposable water (option)

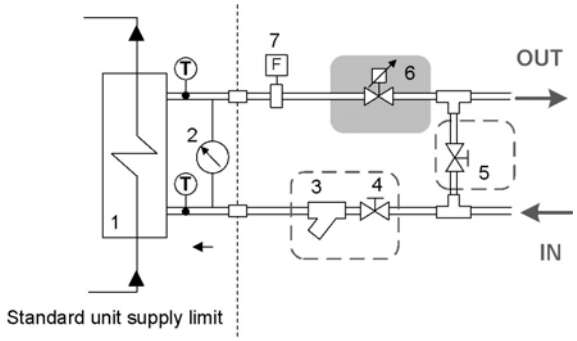
Kit composition

- Two-way ball valve
- 0-10V modulating actuator
- Pressure transducer with cable
- Power supply connection

Warning

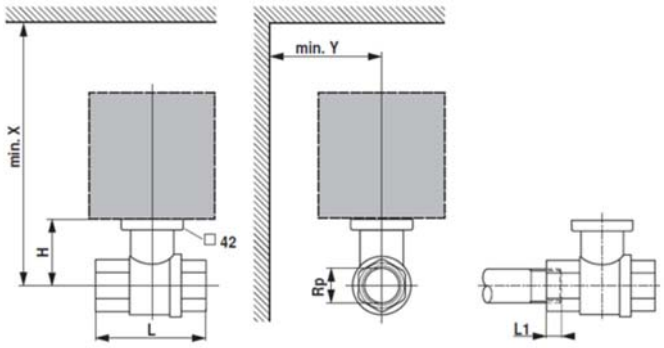
⇒ Assemble and perform the hydraulic connections first, then the electrical connections.
⇒ Observe the minimum spaces indicated.
⇒ Follow the direction of flow indicated on the valve body.
⇒ Do not assemble the actuator lower than the valve body.
⇒ The valve opens in an anticlockwise direction and closes in a clockwise direction.
⇒ Use a sealant to ensure tightness of the fittings.
⇒ If in doubt, refer to the component manufacturer's instructions.

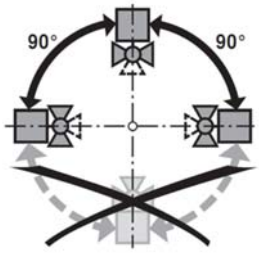
Water connections



1 Internal exchanger
2 Differential pressure switch
3 Filter *
4 Manually operated shut-off valve *
5 By-pass shut-off valve *
6 Two-way modulating valve
7 Flow switch *

* components not supplied with the kit

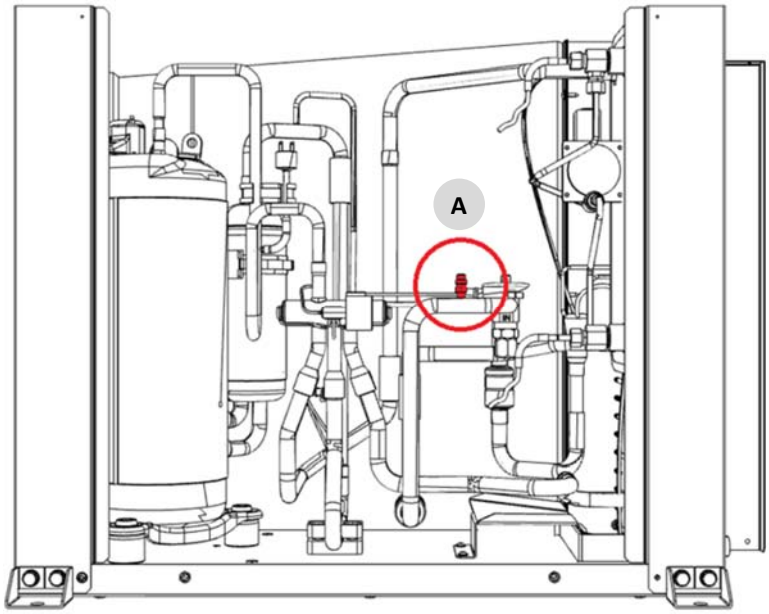




Size	DN	Rp	L [mm]	L1 [mm]	H [mm]	X [mm]	Y [mm]	fittings
2.1-3.1-5.1-7.1	20	3/4"	78	14	46	235	90	F
10.1-12.1	25	1"	87	16	46	235	90	F

Refrigerant connections

⇒ Remove the side panel from the unit to access the compressor compartment.
⇒ Find the pressure tap (A)
⇒ Remove the protective cap and connect the pressure transducer

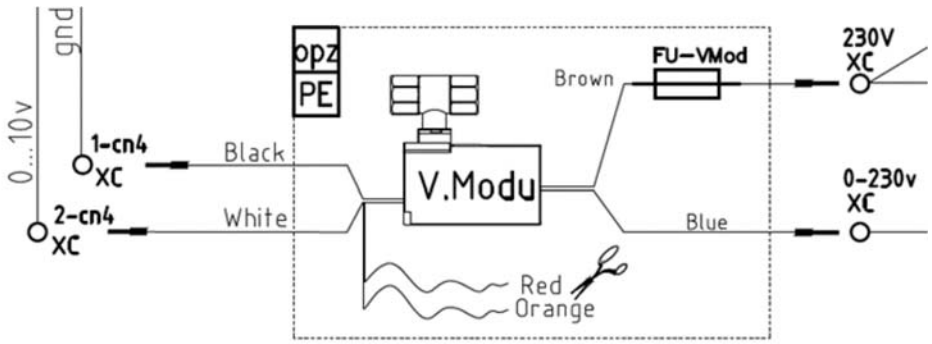


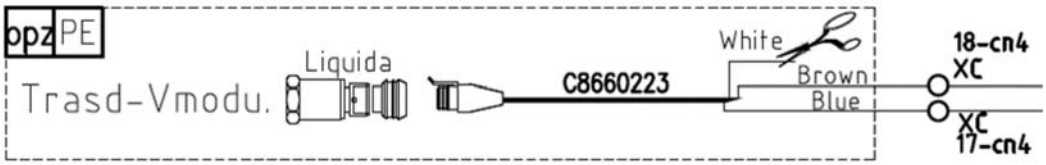
(Indicative image of the position of the pressure tap)

Attention!
The unit is pressurised. A refrigerant leak can compromise smooth operation of the unit.

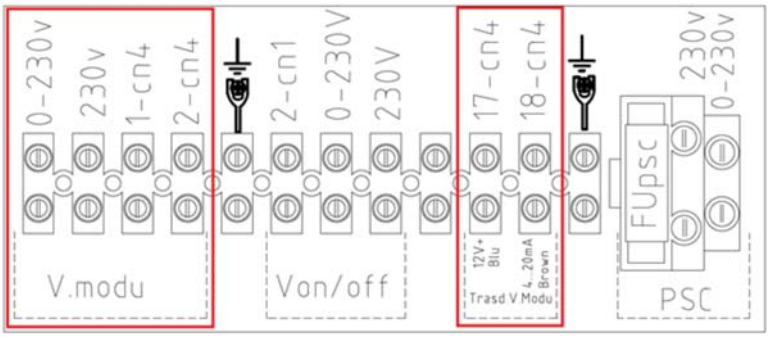
Electrical connections

⇒ Perform the electrical connections after the hydraulic and refrigeration connections.
⇒ Perform the electrical connections with the unit disconnected.
⇒ Make sure the cable is not damaged along the path between the electrical panel and the valve, use the cable gland provided.
⇒ Follow the connections on the wiring diagram.
⇒ If in doubt, refer to the unit's wiring diagram
⇒ Carefully tighten the terminals.





XC



Two-way ON-OFF valve for variable flow rate loop (option)

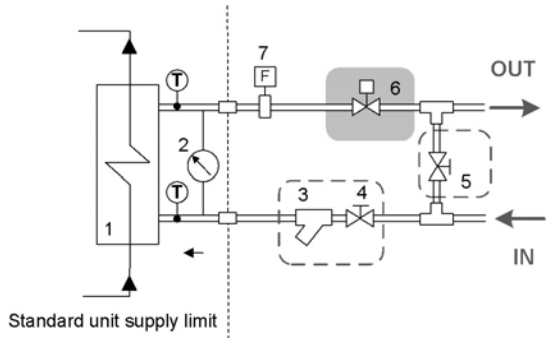
Kit composition

- Two-way ball valve
- 230V on/off actuator

Warning

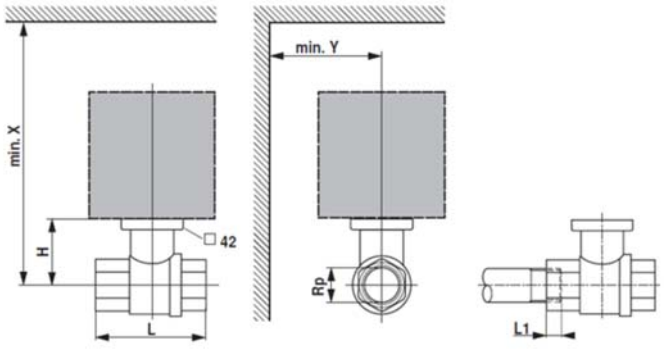
⇒ Assemble and perform the hydraulic connections first, then the electrical connections.
⇒ Observe the minimum spaces indicated.
⇒ Follow the direction of flow indicated on the valve body.
⇒ Do not assemble the actuator lower than the valve body.
⇒ The valve opens in an anticlockwise direction and closes in a clockwise direction.
⇒ Use a sealant to ensure tightness of the fittings.
⇒ If in doubt, refer to the component manufacturer's instructions.

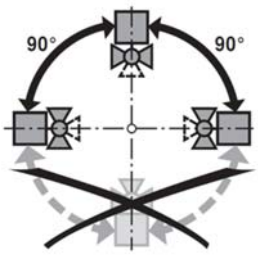
Water connections



1 Internal exchanger
2 Differential pressure switch
3 Filter *
4 Manually operated shut-off valve *
5 By-pass shut-off valve *
6 Two-way ON/OFF
7 Flow switch *

* components not supplied with the kit

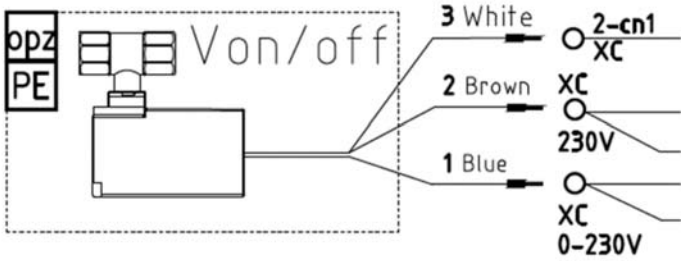




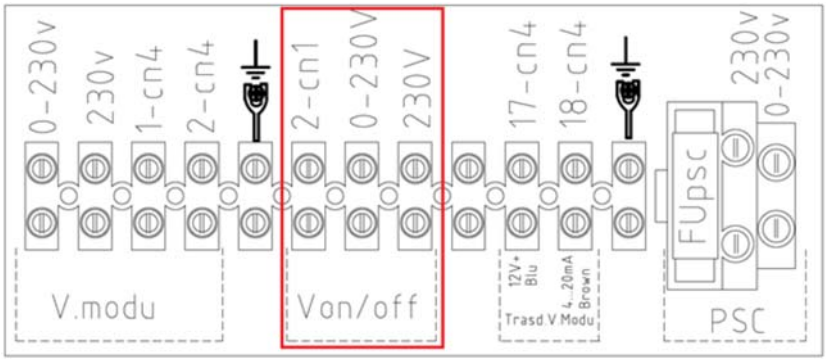
Size	DN	Rp	L [mm]	L1 [mm]	H [mm]	X [mm]	Y [mm]	fittings
2.1-3.1-5.1-7.1	25	1"	87	16	46	235	90	F
10.1-12.1	40	1" 1/2	111	19	50.5	240	90	F

Electrical connections

⇒ Perform the electrical connections after the hydraulic and refrigeration connections.
⇒ Perform the electrical connections with the unit disconnected.
⇒ Make sure the cable is not damaged along the path between the electrical panel and the valve, use the cable gland provided.
⇒ Follow the connections on the wiring diagram.
⇒ If in doubt, refer to the unit's wiring diagram
⇒ Carefully tighten the terminals.



XC



2-way manual shut-off valve (option)

Kit composition

- Two-way ball valve

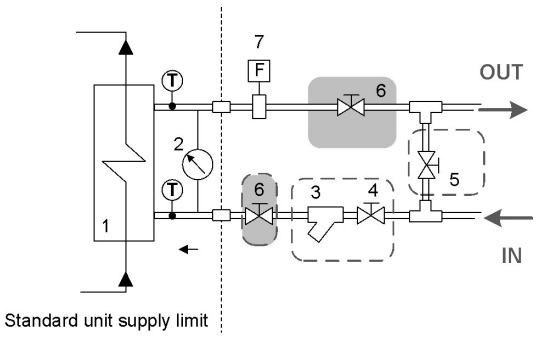
Size	ø Water fitting	fittings
2.1-3.1-5.1-7.1	1”	F
10.1-12.1	1”1/2	F

Warning

⇒ Use a sealant to ensure tightness of the fittings.

Water connections

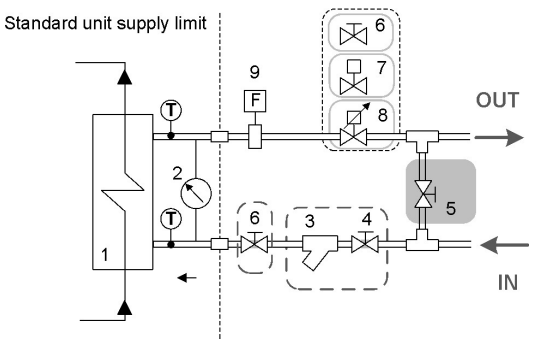
Application: constant flow-rate loop



1 Internal exchanger
2 Differential pressure switch
3 Filter *
4 Manually operated shut-off valve *
5 By-pass shut-off valve *
6 2-way manual shut-off valve
7 Flow switch *

* components not supplied with the kit

Application: bypass



1 Internal exchanger
2 Differential pressure switch
3 Filter *
4 Manually operated shut-off valve *
5 By-pass shut-off valve
6-7-8 Regulating / shut-off valves for the system *
9 Flow switch *

* componenti non forniti con il kit

Manual balancing valve (option)

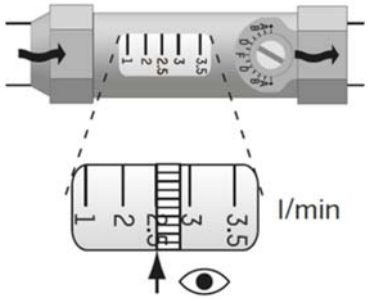
Kit composition

- Balancing valve

Warning

⇒ Assemble and perform the hydraulic connections first.
⇒ Install the valve near to the unit.
⇒ Follow the direction of flow indicated on the valve body.
⇒ Adjust the valve to the desired flow rate within the limits allowed by the unit
⇒ Use a sealant to ensure tightness of the fittings.
⇒ If in doubt, refer to the component manufacturer's instructions.

Water connections



Size	DN	Rp	fittings	Field flow control [l/min]	kvs	Max p [bar]
2.1-3.1	20	1"	MM	10-40	5	10
5.1-7.1	25	1"	MM	20-90	17	
10.1-12.1	40	1"1/2	FF	30-120	30	

Operation sequence

Before starting the unit pump :

1 Close all vent valves in the high points of the unit hydraulic circuit.
2 Close all drain valves in the low points of the unit hydraulic circuit
   - Exchangers
   - Pumps
   - collectors
   - storage tanks
3 Carefully wash the system with clean water: use the bypass to exclude the exchanger from the flow (diagram on previous page) fill and drain the system several times.
4 fill and drain the system several times.
5 Apply additives to prevent corrosion, fouling, formation of mud and algae.
6 Fill the plant
   Do not use the unit pump
7 Execute leakage test.
8 Isolate the pipes to avoid heat dispersions and formation of condensate.
9 Leave various point of service free (wells, vent-holes etc).

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

General

Proper execution and sizing of air connections are essential for ensuring correct operation of the unit and an acceptable level of silence in the room.

When designing and creating ducts, consider PRESSURE DROPS, FLOW RATE and AIR SPEED which need to be compatible with the characteristics of the unit.

⇒ *Special consideration needs to be made for pressure drops that are greater than the unit's static pressure, which would lead to a reduction in flow rate resulting in unit shutdown.*

- the weight of the ducts must not be supported by the connection flanges
- place anti-vibration joints between the ducts and the unit
- the connection to the flanges and between the various sections of the ducts must ensure an airtight seal, preventing leakage in delivery and return which would compromise overall system efficiency.
- limit pressure drops by optimizing the path, the type and number of curves and the branches
- use curves with a wide radius. Consider whether it might be useful to equip them with deflectors (especially if the air speed is high or if curves are tight)

Features for ducts for treated air

- The inner surface of the duct must be smooth and washable. It must not contaminate the air.
- Thermally insulate the ducts and the flanges so as to prevent loss of energy and condensation build-up.

GRILLES OUTLETS DIFFUSERS

Proper distribution of air in the room is essential for ensuring comfort levels.

In the selection and positioning of grilles, outlets and diffusers, the following are to be avoided:

- excessive air speed
- formation of stagnant zones and layering
- entry of cold air into the room
- formation of localized currents (due to uneven air distribution)
- excessive variations in ambient temperature in the vertical and horizontal planes
- short circuiting of delivery air towards return air

For purposes of comfort, the following things need to be considered:

- air diffusers must be selected by checking the sound power generated at nominal flow rate conditions
- the disconnections to the diffusers are to be made using flexible elements

the return grilles must be amply sized

APPLICATIONS AT HIGH DEGREE OF SILENCE

For applications that require a high degree of silence in the system:

- In delivery and return, provide septum silencers, preferably inserted in sections of ducts located outside the building.
- Equip all curves with deflectors

7 ELECTRICAL CONNECTIONS

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

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

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

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

Operate in compliance with safety regulations in force.

Electrical data

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

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

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

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

Connections

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

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

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

First create the earthing connection.

Shelter the cables using adequate measure fairleads.

Prior to powering the unit ensure that all the protections that were removed during the electrical connection work have been restored.

Attention

It is mandatory to use appropriately sized wire end sleeves for connection of the power supply to the terminal block (XC1).

Type of cable to be used for all sizes

Min.section 2.5 mm^2 Max.section 6 mm^2

Signal lines/data-lay

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

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

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

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

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

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

Respect impendency, capacity and attenuation indications.

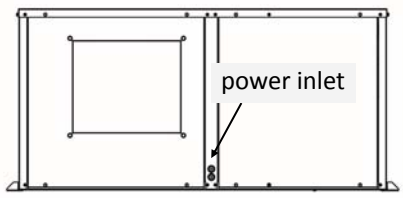
Power supply input

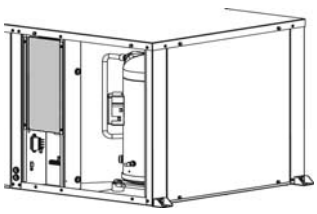
Fix the cables: if vacated may be subject to tearing.

The cable don't have to touch the compressor and the refrigerant piping (they reach high temparatures).

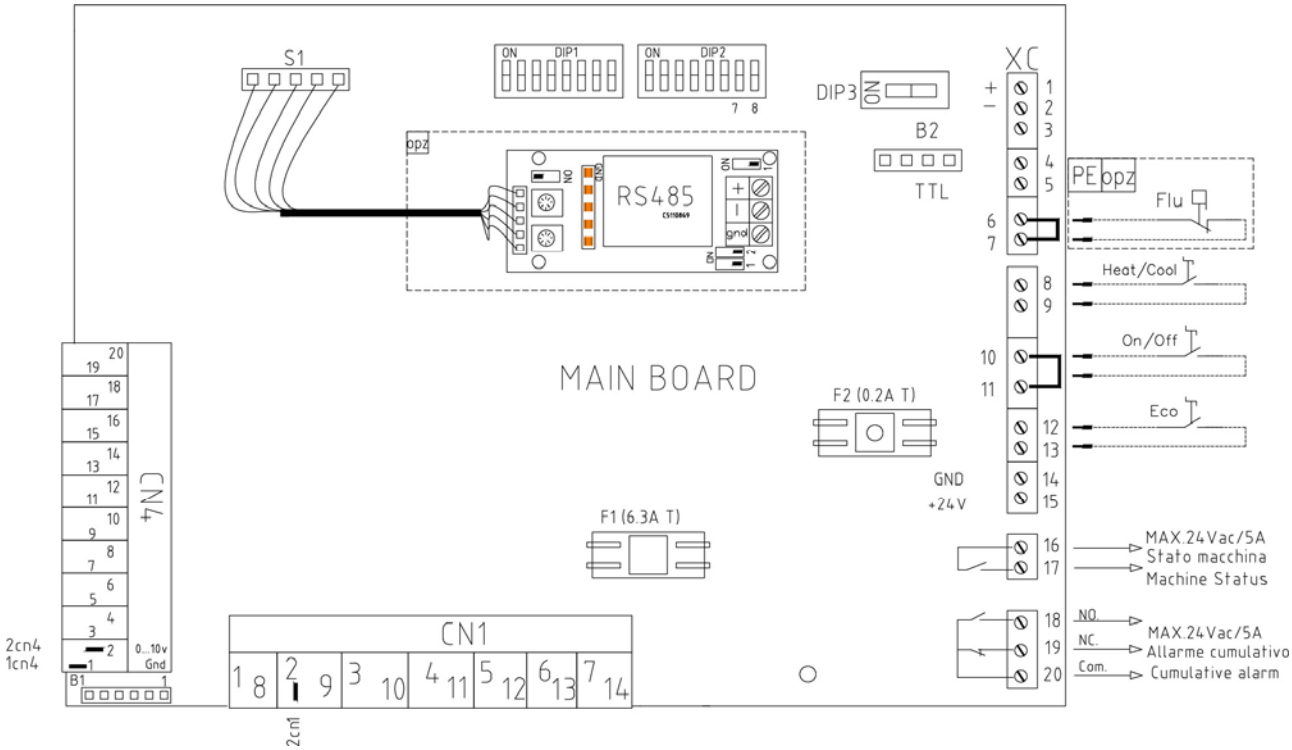
Electrical panel protection

Do not remove the protection.





Connections performed by customer



Attention!

It is mandatory to use appropriately sized wire end sleeves for connection of the power supply to the terminal block (XC1).

Discharge condensate pump

brown ——— 230V - XC

blue ——— 0-230V - XC

ON-OFF valve

white ——— 2-cn1

brown ——— 230V - XC

blue ——— 0-230V - XC

Modulating valve

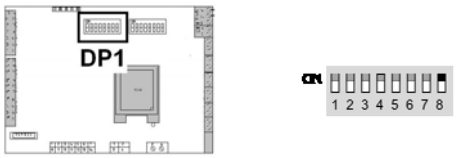
brown ——— 230V - XC

blue ——— 0-230V - XC

black ——— 1-cn4 - gnd

white ——— 2-cn4 - 0...10V

Configurations- DIP 1



1 : ON = disabled compressor in HEAT
OFF = enabled compressor in HEAT
2 : ON = enabled resistances in HEAT
OFF = disabled resistances in HEAT
3 : ON = active fan at satisfied thermoregulator in COOL
OFF = stopped fan
4 : ON = active fan at satisfied thermoregulator in HEAT
OFF = stopped fan
5 : ON = periodical ventilation in COOL enabled
OFF = periodical ventilation in COOL disabled
6 : ON = periodical ventilation in HEAT enabled
OFF = periodical ventilation in HEAT disabled
7 : ON 2-way modulating valve
OFF 2-way ON-OFF valve
8 : ON = Heat/Cool change from remote selector
OFF = Heat/Cool change from thermostat

In ECO mode 3, 4, 5, 6 are not managed.

The “fan at satisfied thermoregulator" function (3, 4) is active only if 5 , 6 in OFF.

Enable input Heat-Cool

Enabled input only if

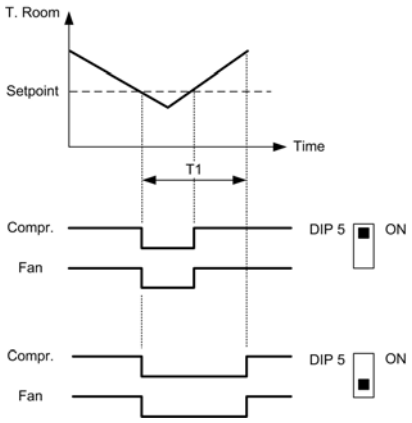
DP1-8 = ON .

if DP1-8 =off : mode Heat-Cool from the keyboard

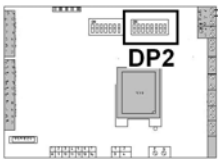
Ventilation

Example: summer

T1 = par. TOFFPeriodic



Room temperature probe - DIP 2



Room temperature probe

DP2-8 = ON return board unit probe
OFF probe on room thermostat

Mini-network

DP2-1 . . 7 = unit addresses

► Mini-network

Supervision - Modbus network

MODULE RS 485 (Accessory separately supplied)

Perform the addressing by S3, S4 S5 ; allowed and valid addresses from 1 to 127

S3 it sets the address dozens

S4 it sets the address units

S5 it sets the address hundreds : ON = 100, OFF = 0

S1 485 terminator : ON = termination YES

S2 line polarizer : OFF = polarization NO

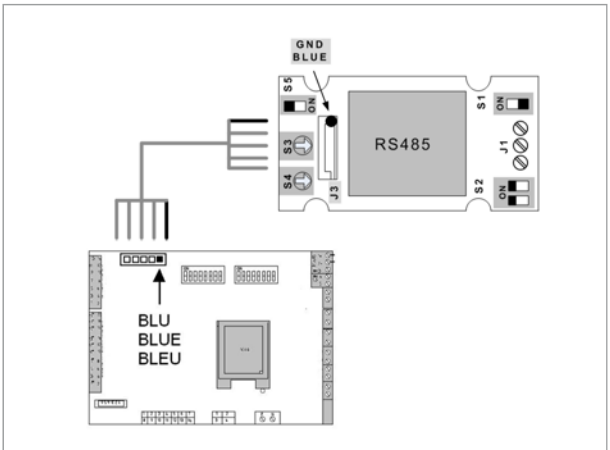
Check that it is OFF on all the cards

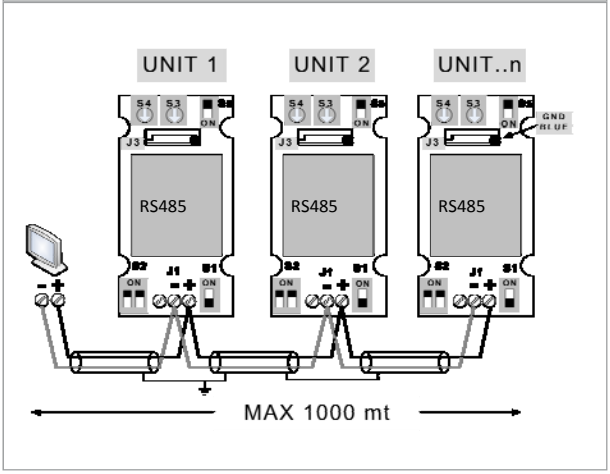
For improve the comunication put S2 = ON on a single card.

If more cards are polarized, faults occur

J1 RS 485 serial

J3 TTL serial





Bus connection features

Couple of conductors twisted and shielded

Section of conductor 0,22mm2...0,35mm2

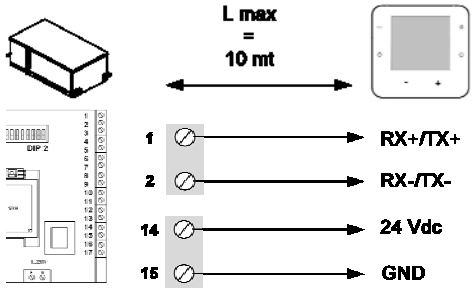
Nominal capacity between conductors < 50 pF/m

nominal impedance 120 Ω

Recommended cable BELDEN 3105A

Thermostat : connection up to 10m

The signal and the power supply are taken directly from the built-in unit card.



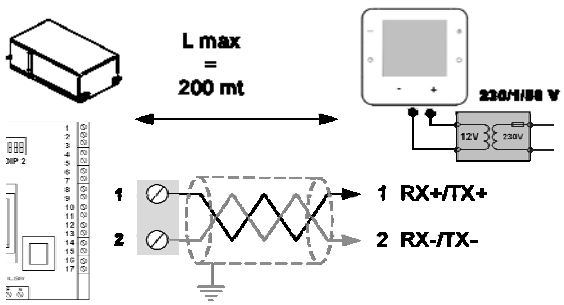
Thermostat : connection up to 200m

Power supply taken by the trasformer (included in the packaging) to connect to the 230/1/50 network.

The signal is taken directly from the built-in unit card.

Type of shielded twisted duplex cable:

Min 0,5/max 1,5 mm^2



Mini-Network

Max 15 unit: 1 master + 14 slave.

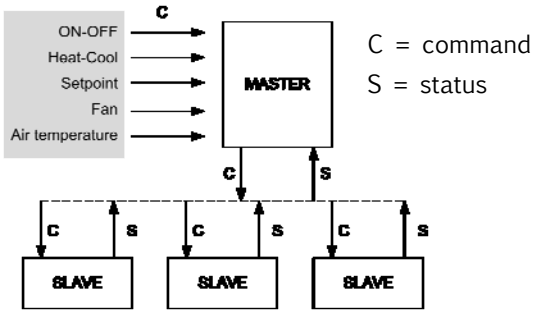
Maximum total length: 100 mt

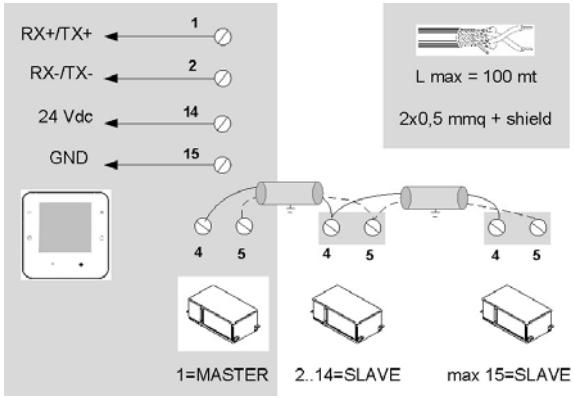
Wire: 2x0,5 mmq + display

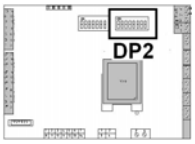
Changing a setting on the MASTER, it is to all the SLAVE units.

Es.: Master = Cool ⟶ Slave = Cool

Master = Heat ⟶ Slave = Heat







MASTER : dip 1...4 = num slave in rete
dip 7 = ON

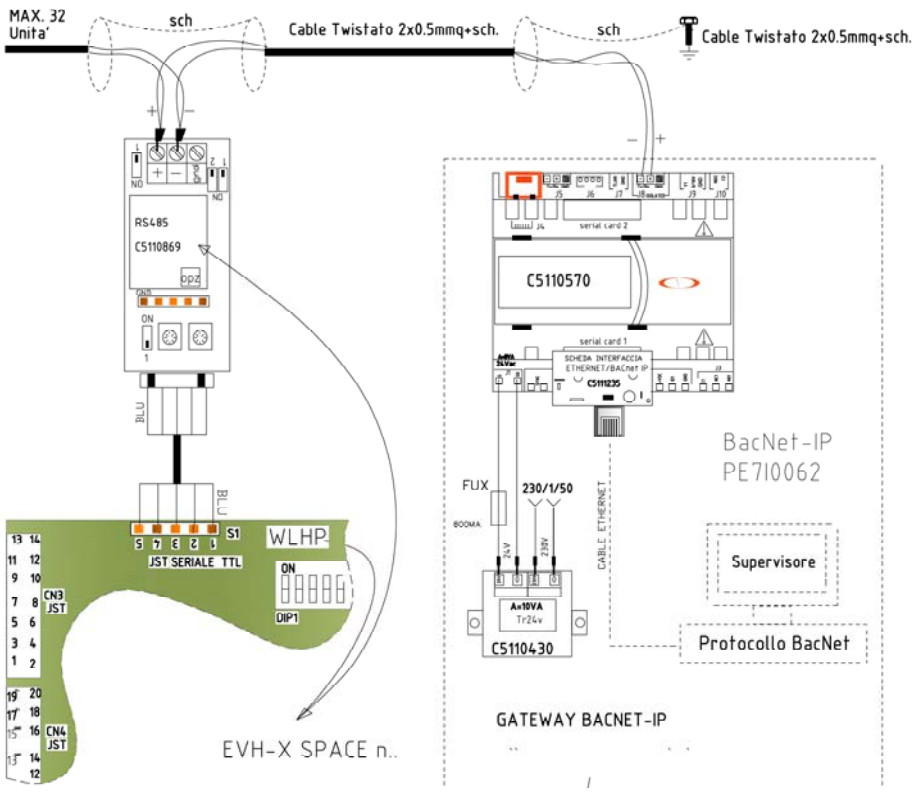
SLAVE : dip 1...4 = indirizzo 1...15
(1, 2, 3, 4 = ok ; 1, 2, 4 ,= no)
dip 7 = OFF

NON IN RETE : dip 1...4 = off

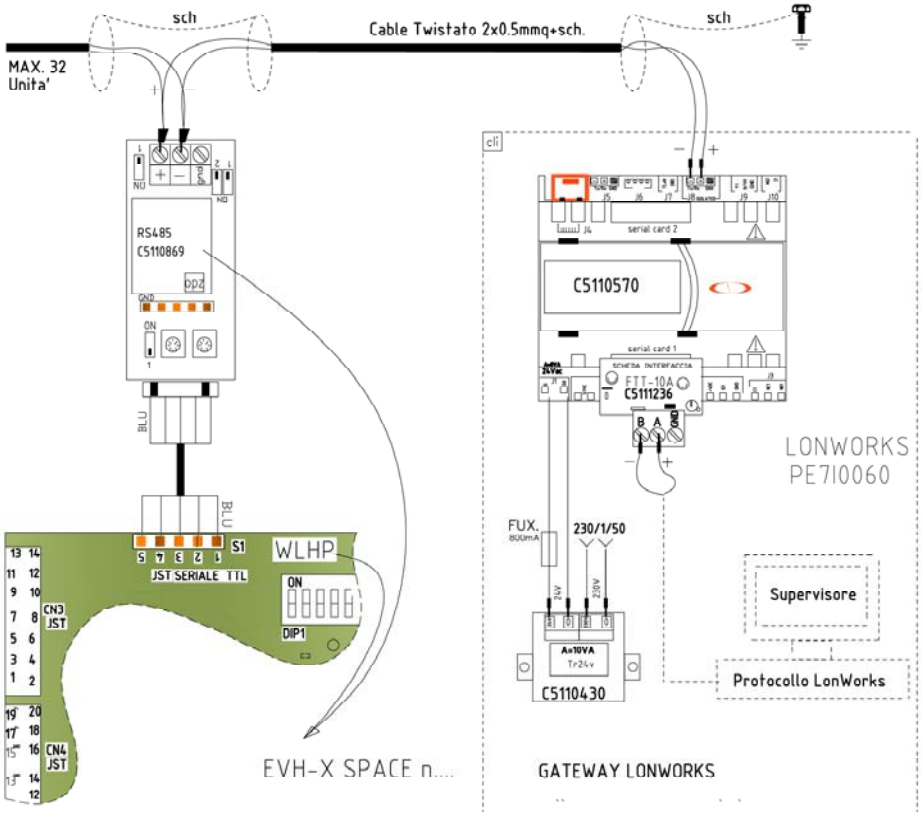
DP2 : ADDRESSING EXAMPLES

1 master	
1 slave	
2 slave	
3 slave	
4 slave	
5 slave	
6 slave	
7 slave	
8 slave	
9 slave	
10 slave	
11 slave	
12 slave	
13 slave	
14 slave	
15 slave	

KIT GATEWAY BACNET



KIT GATEWAY LONWORKS



General

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

The electrical and hydraulic connections upon request; the remaining work on the system is the responsibility of the installer.

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

For details refer to the different manual sections.

Before checking, please verify the following:

- the unit should be installed properly and in conformity with this manual
- the electrical power supply line should be sectioned at the beginning
- the line sectioning device is open, locked and equipped with the suitable warning signs
- ensure no voltage is present

After turning off the power, wait at least 10 minutes before accessing to the electrical panel or any other electrical component.

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

Preliminary checks

Unit OFF power supply

1 safety access
2 functional clearances
3 structure integrity
4 ventilatori girano liberamente
5 unit on vibration isolators
6 unit input water filter + shut-off valves for cleaning
7 vibration isolators on water connections
8 expansion tank (indicative volume = 10% system content)
9 minimum system water content
10 cleaned system
11 loaded system + possible glycol solution + corrosion inhibitor
12 system under pressure
13 vented system
14 refrigerant circuit visual check
15 earthing connection
16 power supply features
17 electrical connections provided by the customer

Start-up sequence

Power unit ON

1 compressor crankcase heaters operating at least since 8 hours
2 off-load voltage measure
3 phase sequence check
4 unit ON
5 load voltage measure and absorptions
6 measure return and supply water temperature
7 check no anomalous vibrations are present
8 climatic curve personalization
9 climatic curve personalization
10 scheduling personalization
11 complete and available unit documentation

Refrigerantion circuit

1 Visually check the refrigerating circuit: the presence of oil stains can mean leakage (caused, for example, by transport, handling or other).
2 Check that the refrigerating circuit is under pressure: use service pressure gauges to check that the refrigerant circuit is pressurized.
3 Ensure that all the service outlets are closed with the proper caps; if caps are not present a leak of refrigerant is possible.
4 Aprire tutti i rubinetti del circuito frigorifero (se presenti).

Water circuit

1 Before realizing the unit connection make sure that the hydraulic system has been cleaned up and the clearing water has been drained .
2 Check that the water circuit has been charged and pressurised .
3 Check that the cut-off valves on the circuit are in the "OPEN" position.
4 Check that no air is present in the circuit, if required, evacuate using the air bleeding valve placed at the system
5 When using antifreeze solutions, make sure the glycol percentage is suitable for the type of use envisaged.. → table page following

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

Glycol solutions			
Weight of glycol (%)	10	20	30
Freezing temperature (°C)	-3,9	-8,9	-15,6
Safety temperature (°C)	+1	-4	-10

Electrical circuit

Verify that the unit is connected to the ground plant.

Check tightening of the conductors: the vibrations caused by handling and transport might cause loosing .

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

Check the tension and line frequency values which must be within the limits:

220/240/1/50 +/-6%

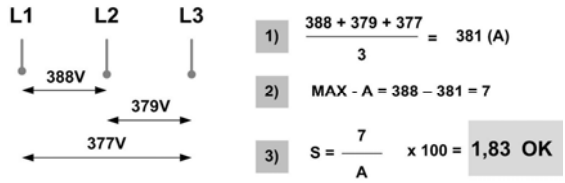
380-415/ /3/50 +N +/-6%

Check that the phases unbalancing must be lower than 2%

Example:

380-415/ - 6% = 376

380-415/ + 6% = 424



The working out of the limits can cause irreversible damages and voids the warranty.

Voltage

Check that the air and water temperatures are included in the working limits.

Start the unit.

With unit of full load, namely in stable conditions and close to those of work, check:

- power supply tension
- total absorption of the unit
- absorption of the single electric loads

Remote controls

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

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

Scroll compressor (only units 7.1-10.1-12.1)

The Scroll compressors have only one rotation direction.

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

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

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

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

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

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

Starting report

Reading the objective operating conditions is useful for checking the unit over time.

With unit of full load, namely in stable conditions and close to those of work, take the following data:

Tension and general absorptions with unit at full load

Absorption of varied electrical loads (compressors, fans, pumps etc)

Temperatures and capacities of different liquid (water, air) in the inlet and outlet of the unit.

Temperature and pressures on the characteristic points of the refrigerating circuit (compressor discharge, liquid, intake).

The readings should be stored and made available during maintenance.

2014/68/UE PED Directive

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

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

Obligatory testing of first system:

- only for the units assembled on site be installer (e.g. condensate unit + direct expansion unit)

Commissioning declaration:

- for all units

Periodic checks:

- to be carried out with the frequency indicated by the Manufacturer (see the “maintenance” section)

KEYS AND DISPLAY OPERATING

FUNCTION OF THE BUTTONS

mode	Mode change : heat, cool, auto
✓	clock , time band scheduling
OK	mode ECO / COMFORT
	fan speed control
▲	increases setpoint value
▼	decreases setpoint value
⏻	ON-OFF

Display information

	Unit Mode : cooling
	Unit Mode : heating
Auto	Unit Mode : auto (cooling - heating)
Auto	Fan speed : 1, 2, 3, auto
	Time band are activated if the clock is visible
	Time band scheduling
	Present alarm
	Active compressor
	Locked keypad

FUNCTIONS

To access to the functions see the following pages.

Mode change AUTO - HEAT - COOL

AUTO :

The unit heats with a temperature lower than set.

It cools with a temperature higher than set

HEAT :

The unit heats with a temperature lower than set

It is in stand-by with a temperature higher than set

COOL :

The unit cools with a temperature higher than set

It is in stand-by with a temperature lower than set.

ECO / COMFORT SETTING

ECO :

Max energy saving, min comfort.

COMFORT :

max comfort, min energy saving.

SETPOINT CONTROL

Room temperature control.

TIME BAND SCHEDULING

Programs personalization.

ALARMS

If alarms are present the symbol is displayed

PARAMETER

For installer use only.

STATUS

Consultation only.

ON / OFF

Press for 5 seconds

Spento

MODE CHANGE

Press to set the operating mode:

Cooling

Heating

AUTO

Operating in:

Cooling

VENTILATION ADJUSTMENT

Press to control the fan

Low

Medium

High

Auto

Medium setting

SETPOINT CONTROL

Press for increase or decrease the setpoint

Back to the main screen and to the room temperature displaying.

ECO / COMFORT SETTING

OK Press for 5 seconds

ECO Mode

Press to increase or decrease the ECO setpoint

OK Press for 5 seconds

COMFORT mode of the main screen

ALARM RESET

The symbol is displayed

Press together for 5 seconds

Scroll the list

Select the alarm reset menu

Press OK

Select ESC

Press OK

Alarm reset

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

Repeated reset can cause irreversibile damages.

BUTTON LOCK / UNLOCK

Press together for 5 seconds

OK

Symbol appears

STATA (VISUALIZATION ONLY)

Press for 5 seconds plus the fan button	
Enter as password any number Press OK	
Select STAT	
Scroll the stata	
Select ESC Press OK	
Select ESC Press OK	
Initial Screen	

PARAMETER (only installer use)

Press for 5 seconds plus the fan button	
Enter the password Press OK	
Select the group Press OK	
Scroll the parameters Press OK	
Set the new value Press OK	
Select ESC Premere OK	
Select others parameters or ESC Press OK	
Initial Screen	

HOUR AND DAY

Press for 5 seconds	
Select CLOC Press OK	
Change the hour Press OK	
Modify the minutes Press OK	
Select the day Press OK	
Select ESC Press OK	
Initial Screen	

TIME BAND SCHEDULING

It Is possible to set 4 types of scheduling:

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

Day scheduling

 At home (comfort)

 Outside (eco)

 Return to home (comfort)

Night scheduling

 At home (comfort)

 Outside the home (eco)

 Return to the home (comfort)

DAY BY DAY SCHEDULING

Press for 5 seconds

Select Time bands

Press OK

Select the scheduling:

Day by day

Press OK

Press OK

Set the hour

Press OK

Set the minutes

Press OK

Set the temperature

Press OK

Select the next time band

Press OK and repeat from **point 05**

As all the programming is finished, select ESC

Press OK

Press OK to program the next day

Select the next day

Press OK

Repeat from **point 04**

To exit from the scheduling select ESC

Press OK

Select Esc to exit

Press OK

ON / OFF SCHEDULING

Press for deactive or enable the scheduling.

The deactived schedulino, the symbol ● doesn't appear

UNIT STATUS

During the operation is possible to visualize the unit status by the values obtained from sensors and from the main unit operating parameters.

N.	Description	U.M.
1	Current set point	°C
2	Operative T return	°C
3	Return Temperature I/O	°C
4	Return Temperature from sensor thermostat	°C
5	Input water Temperature source I/O	°C
6	Output water Temperature source I/O	°C
7	Exchanger Temperature treatment coil utility I/O	°C
9	-	
10	High/low Pressure	bar
11	-	
12	Thermal load to the source	°C
13	-	
14	-	
15	-	
16	-	
17	-	
18	Modulating fan output Out	%
19	Modulating compressor output Out	%
20	Source water valve output Out	%
21	Digital input status	bitmap-byte
22	Digital output status	bitmap-byte
23	Compressor 1 starts	bitmap-byte
24	Compressor 1 hours	bitmap-byte
25	Unit hours in ON	bitmap-byte
26	Topographic map of the nodes connected in the mininet	bitmap-byte
27	Filter timer	days
28	1 alarms log	numeric
29	2 alarms log	numeric
30	3 alarms log	numeric
31	4 alarms log	numeric
32	5 alarms log	numeric

- Not used

UNIT PARAMENTERS

The parameters accessible by password or supervision system can be modified only by qualified personnel after having read the specific manuals of the electronic system and of the supervision protocols.

GRUP.	ID	MNEMONICO	DESCRIPTION	U.M.
SET	PA01	SetpointComfort	Point de consigne confort (default)	°C
	PA02	MaxSet	Max configurable set, both Eco and Confort	°C
	PA03	MinSet	Min configurable set, both Eco and Confort	°C
	PA04	SetCoolEco	Standard Set Eco in Cool	°C
	PA05	SetHeatEco	Standard Set Eco in Heat	°C
	PA06	MaxOffsetSet	Max. correction accepted to the set point from the thermostat	°C
	PA07	ZonaNeutraComfort	Neutral zone for the Auto mode in confort	°C
	PA08	ZonaNeutraEco	Neutral zone for the Auto mode in Eco	°C
	PA09	IsteresiHeat	Thermoregulation hysteresis in Heat	°C
	PA10	IsteresiAux	Thermoregulation hysteresis in Heat for Aux	°C
	PA11	IsteresiCool	Thermoregulation hysteresis in Cool	°C
	PA12	FBandIsteresiEco	Value to sum to thermoregulation hysteresis when ECO mode is active	°C
	PA13	TimerOverride	Random time between 0 and TimerOverride seconds for step insertion/release	sec.
SORG	PB01	SetLowSorgHeat	Low temperature thereshold source water	°C
	PB02	SetHiSorgCool	High temperature thereshold source water	°C
	PB03	IstLowTempSorg	Hysteresis for reset of high and low source temperature thereholds	°C
	PB04	MinApValvSorg	Min. source valve opening	%
	PB05	MaxApValvSorg	Max. source valve opening	%
	PB06	StartApValvSorg	Percentage of source valve opening at the start up	%
	PB07	TStartValvSorg	Valve opening time at % StartApValvSorg source	sec.
UTIL	PC03	VccMinFanCool	Min voltage applicable to control 0-10 Vdc in Cool	%
	PC04	VccMaxFanCool	Max voltage applicable to control 0-10 Vdc in Cool	%
	PC05	VccMinFanHeat	Min voltage applicable to control 0-10 Vdc in Heat	%
	PC06	VccMaxFanHeat	Max voltage applicable to control 0-10 Vdc in Heat	%
	PC07	RitCpDaFan	Compressor activation delay from utility fan start	sec.
	PC08	RitOffFanDaCp	Delay of utility fan stopping from compressor Off	sec.
	PC09	RitOffFanDaAux	Delay of utility fan stopping from Off of the aux heater	sec.
	PC16	MinFanAuxOn	Min percentage of utility fan if Aux=ON	%
	PC18	FilterAlarmTimer	Time interval setting for air filter maintenance	days
CNF	PD05	SetAllLP	Low pressure alarm Set point from analogical input	bar
	PD06	DeltaAllLP	Hysteresis of low pressure alarm reset from analogical input	bar
TARA	PE01	OffsetAI1	Setting of AI1 analogical input (Return Temperature I/O)	°C
	PE02	OffsetAI2	Setting of AI2 analogical input (Return Temperature from sensor thermostat)	°C
	PE03	OffsetAI3	Setting of AI3 analogical input (Output water Temperature source I/O)	°C
	PE04	OffsetAI4	Setting of AI4 analogical input (Exchanger Temperature treatment coil utility I/O)	°C
	PE05	OffsetAI5	Setting of AI5 analogical input (Electronic thermostatic return Temperature)	°C
	PE06	OffsetAI6	Setting of AI6 analogical input (High/low Pressure)	bar
	PE07	OffsetAI7	Setting of AI7 analogical input (Electronic thermostatic return pressure)	bar
	PE08	OffsetAITer	Setting of the ambient probe analogical input on thermostat board	°C
BMS *	PF01	AddressTh	ModBus address of the thermostat (Slave)	-
	PF02	BaudRateTh	Serial communication speed for thermostat 0=2400 1=4800 2=9600 3=19200	-
	PF03	ParityTh	Thermostatparity 0=No 1= Odd 2=Even	-
	PF04	Address	ModBus address of the WLHP for the supervisor	-
	PF05	BaudRate	Communication speed of the supervision serial 0=2400 1=4800 2=9600 3=19200	-
	PF06	Parity	Parity of the supervision serial 0=No 1= Odd 2=Even	-

*** the modification of these parameters makes impossible the communication between thermostat and unit**

LIST OF ALARMS

Alarm reset: switch on and off the unit

⇒ *Before resetting an alarm identify and remove its cause.*

⇒ *Repeated resets can cause irreversible damage.*

⇒ *Before performing any intervention, read the warnings in the Maintenance chapter.*

A = AUTOMATIC reset

M = MANUAL reset

ID	DESCRIPTION	RESET	ALARM LOG
A A08	Dirty filters alarm (timer elapsed)	M	408
A E00	TimeOut RS2 Display_Scheda base serial fault	A	200
A E01	Return temperature probe alarm	A	201
A E02	Temperature probe alarm of source input water	A	202
A E03	Temperature probe alarm of source output water	A	203
A E04	Treatment coil temperature probe alarm	A	204
A E05	Return temperature probe alarm of the electronic thermostatic	A	205
A E06	High/low transducer alarm	A	206
A E08	Thermostat return temperature probe alarm	A	208
A E10	Not used	-	210
A E11	Utility fan protection alarm	M	211
A F01	Refrigerant protection alarm	M	301
A F02	LP alarm from analogical input	A	302
A I01	Condensate drain alarm	A	101
A I02	Source flow alarm	A/M	102
A I03	Source high temperature alarm in Cool	A	103
A I04	Source low temperature alarm in Heat	A	104
A I05	Source frost alarm	A/M	105
A I06	Utility frost alarm	A/M	106

General

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

The maintenance enables:

- maintain the unit efficiency;
- reduce the deterioration speed to whom every equipment is subject over time;
- assemble information and data to understand the state of the unit efficiency and avoid possible damages.

Inspections frequency

The inspections should be carried out at least:

- Every year for only the cooling units
- Every six months for the cooling and heating units

The frequency, however, depends on the use.

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

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

Machine blooklet

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

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

Report on the booklet:

- data
- intervention description
- carried out measures etc..

Put at reset

If a long period of inactivity is foreseen:

- Turn of the power
- avoid the risk of frost (evacuate the system or add glycol)

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

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

It's recommended that the starter after the period of detention is made by a qualified technician, especially after seasonal stops or seasonal switch.

When restarting, refer to that indicated in the START-UP section .

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

Water exchanger

It is very important for the exchanger to be able to provide the maximum thermal exchange. Therefore, it is essential for the inner surfaces to be clean of dirt and incrustations.

Periodically check the difference between the temperature of the supply water and the condensation temperature. If the difference is greater than 8 °C – 10 ° C it is advisable to clean the exchanger.

The clearing must be effected:

- With circulation opposite to the usual one
- With a speed at least 1,5 times higher than the nominal one
- With an appropriate product moderately acid (95% water + 5% phosphoric acid
- after cleaning rinse with water to avoid any detergent residues

Water filter

Verify that there are no impurities that obstruct the smooth passage of water.

Condensate discharge

Dirt or scale could cause blockages.

Also in the drain pain can proliferate microorganisms and mold.

To provide for a periodic cleaning with appropriate detergents and in case a disinfection with sanitizing products.

When the clearing is finished, put some water in the drain pain to check the regular down flow.

Air filter

Cleaning and replacement of filters are very important in terms of health and hygiene.

How often the filters need to be checked depends on the quality of outdoor air, unit operating hours, dust and number of persons in the rooms.

Approximately, cleaning should ideally take place between weekly and monthly. It is advisable to start with frequent checks, and to adjust the frequency based on how much dirt is discovered.

Change the PC18 Filter alarm parameter if necessary (page 46)

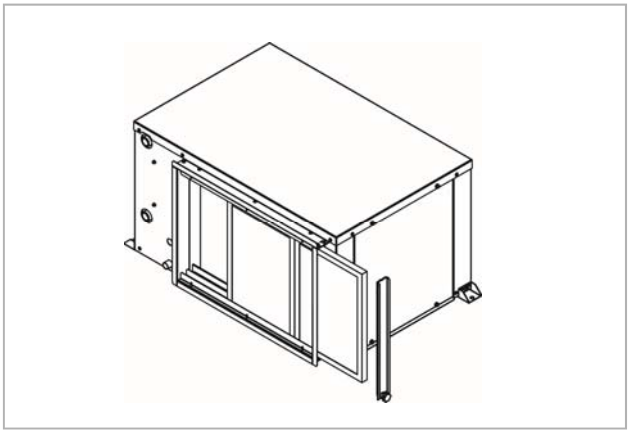
⇒ *Therefore, the unit must always operate with the filters installed and clean.*

⇒ *Operation with clogged filters leads to a reduction in the air flow rate, resulting in malfunctions and unit shutdowns. It may even cause the unit to break down*

If alarm A A08 is triggered, clean or replace the filter.

Caution: if the filter is replaced before the timer has elapsed, change the value of parameter PC18 to increase or decrease the timer so that the count starts again from zero.

Extraction of the air filter



Air battery

Accidental contact with the exchanger fins can cause cuts: wear protective gloves.

It is extremely important that the battery gives the maximum thermal exchange; therefore, its surface must be cleaned from dust and deposits.

Remove all impurities from the surface.

Using an air pressure gun, clean the aluminum surface of the battery; be careful to direct the air in the opposite direction of the fan air movement.

Hold the gun parallel to the fins to avoid damages.

As an alternative, vacumn cleaner can be used to suck impurities from the air input side.

Verify that the aluminium fins are not bent or damaged. In the event of damages, contact an authorised assistance centre that can 'iron out' the battery in order to allow an optimal airflow.

Safety valve (size 12.1 only)

The pressure relief valve must be replaced:

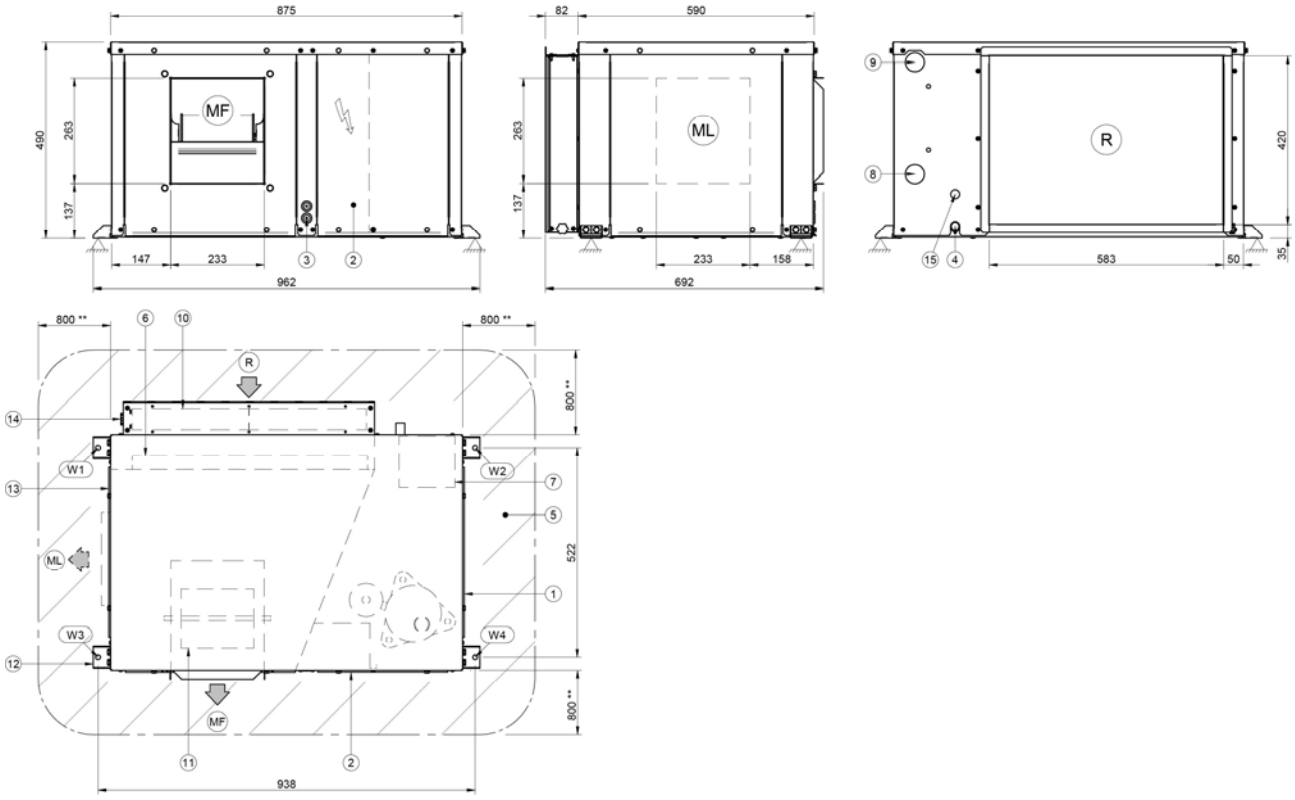
- if it has intervened
- if there is oxidation
- based on the date of manufacture, in compliance with local regulations.

Recommended periodic checks

√	interval check (months)	1	6	12
□	Presence of corrosions			●
□	Panel fixing			●
□	Fan fixing		●	
□	Battery cleaning		●	
□	Drain pain cleaning + sanification		●	
□	Condensate discharge test		●	
□	Air filter cleaning	●		
□	Charged pressure of water system		●	
□	Air in the pipes		●	
□	Water filter cleaning		●	
□	Water flow-rate		●	
□	Flow switch / differential pressure switch function		●	
□	Check of the fixing and the insulation of the power lead			●
□	earthing connection check			●
□	Electric panel cleaning			●
□	Capacity contactor status,			●
□	terminal closing, cable insulation integrity			●
□	Voltage and phase unbalancing (no load and on-load)		●	
□	Absorptions of the single electrical loads		●	
□	Leak control *			●
□	Work parameters of the refrigerant circuit		●	
□	4-ways valve check		●	
□	Protective device test : safety valves, pressure switches, thermostats, flow switches etc		●	
□	Control system test: setpoint, climatic compensations, capacity stepping, water / air flow-rate variations etc		●	
□	Control device test : alarm signalling, thermometers, probes, pressure gauges etc		●	

* Refer to the local actuation regulations;

Dimensional drawings
SIZE 2.1-3.1

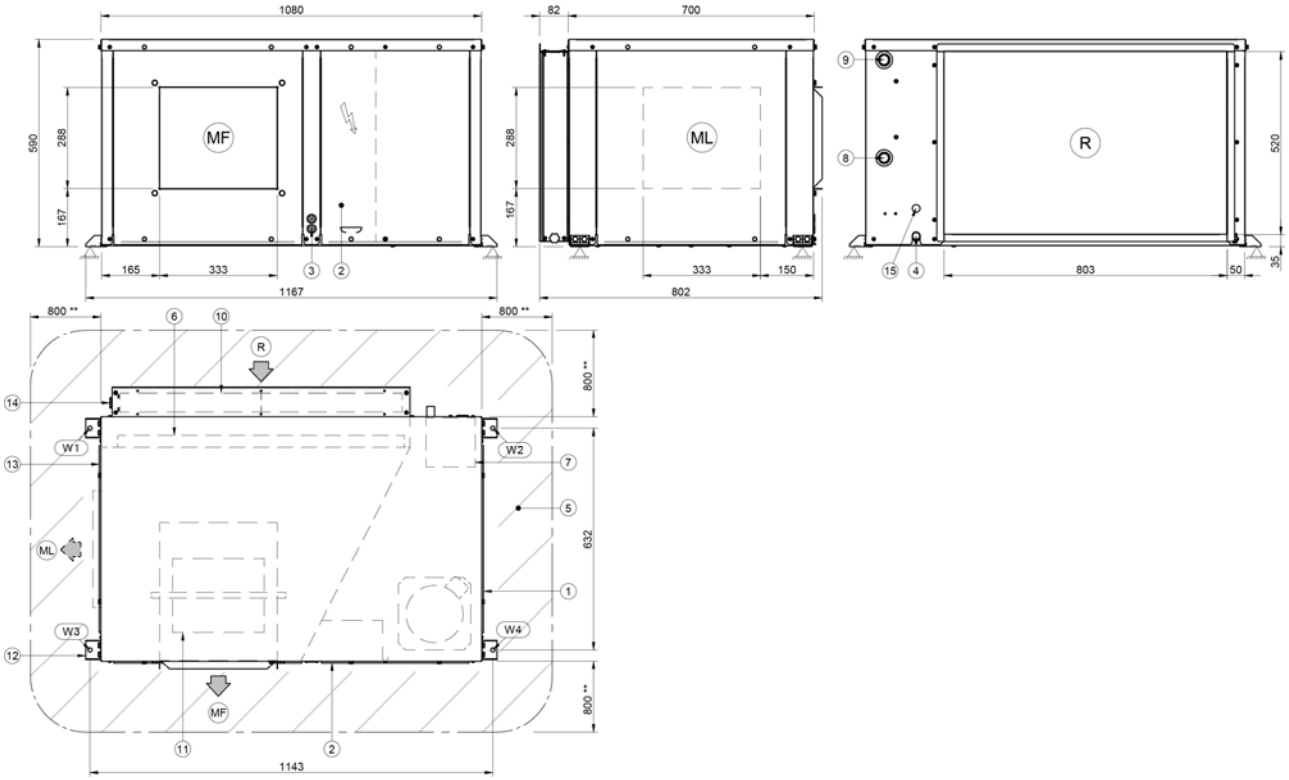


1 Compressor enclosure
2 Electrical panel
3 Power input
4 Condensate drain
5 Functional spaces
6 Treatment coil
7 Plate exchanger
8 Plate exchanger water input 1"
9 Plate exchanger water output 1"
10 Air filters
11 Electric fan (supply-return)
12 Lifting bracket
13 Coil - electric fan inspection
14 Filters inspection
15 Hidraulic circuit valve connection
(R) Air inlet
(MF) Front air supply
(ML) Lateral air supply
(**) Minimun suggested clearance

Size		2.1	3.1
Lenght	mm	962	962
Height	mm	490	490
Depth	mm	692	692
Operation weight	Kg	98	103
Shipping weight	Kg	102	107

Weight distribution		2.1	3.1
Support point W1	Kg	22	24
Support point W2	Kg	25	25
Support point W3	Kg	24	26
Support point W4	Kg	27	28

SIZE 5.1-7.1

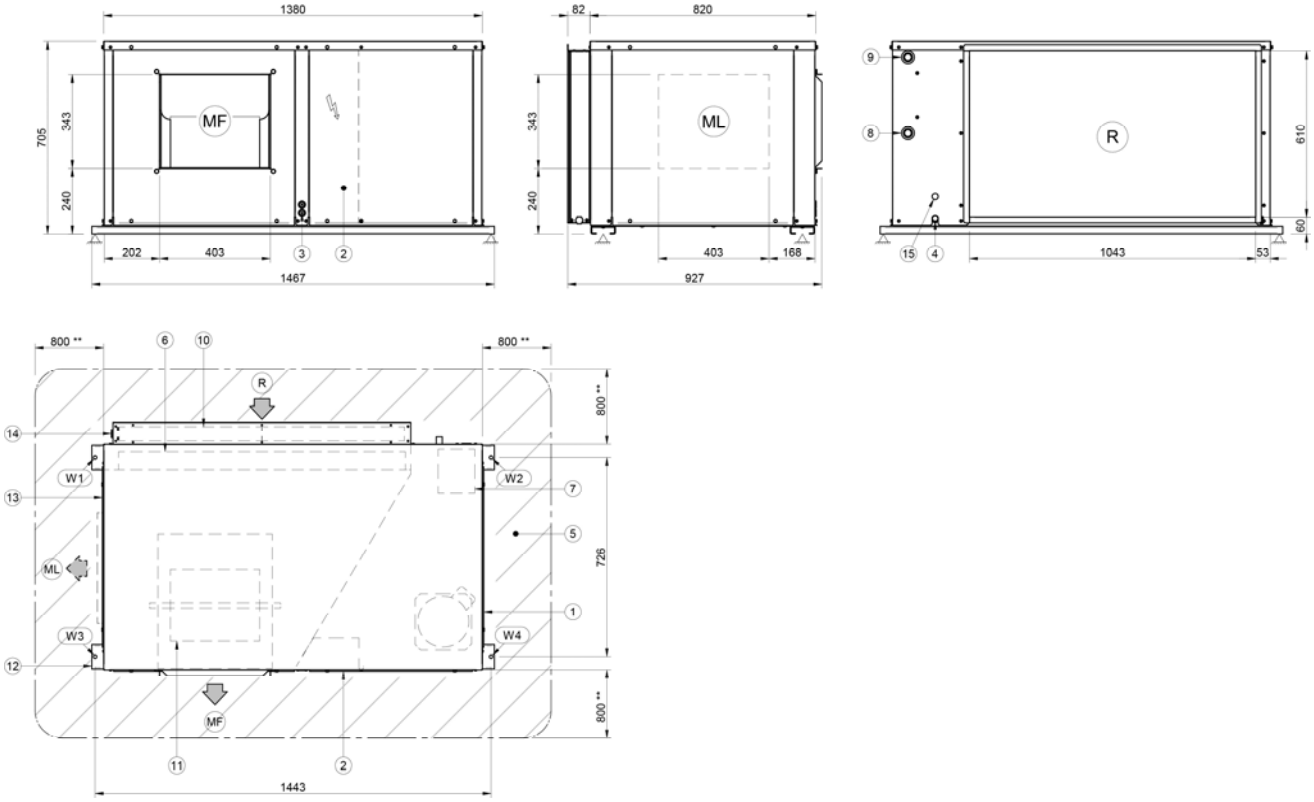


1 Compressor enclosure
2 Electrical panel
3 Power input
4 Condensate drain
5 Functional spaces
6 Treatment coil
7 Plate exchanger
8 Plate exchanger water input 1"
9 Plate exchanger water output 1"
10 Air filters
11 Electric fan (supply-return)
12 Lifting bracket
13 Coil - electric fan inspection
14 Filters inspection
15 Hidraulic circuit valve connection
(R) Air inlet
(MF) Front air supply
(ML) Lateral air supply
(**) Minimun suggested clearance

Size		5.1	7.1
Lenght	mm	1167	1167
Height	mm	590	590
Depth	mm	802	802
Operation weight	Kg	138	151
Shipping weight	Kg	143	156

Weight distribution		5.1	7.1
W1 Support point	Kg	31	34
W2 Support point	Kg	36	39
W3 Support point	Kg	33	36
W4 Support point	Kg	38	42

SIZE 10.1-12.1



1 Compressor enclosure
2 Electrical panel
3 Power input
4 Condensate drain
5 Functional spaces
6 Treatment coil
7 Plate exchanger
8 Plate exchanger water input 1"1/2
9 Plate exchanger water output 1"1/2
10 Air filters
11 Electric fan (supply-return)
12 Lifting bracket
13 Coil - electric fan inspection
14 Filters inspection
15 Hidraulic circuit valve connection
(R) Air inlet
(MF) Front air supply
(ML) Lateral air supply
(**) Minimun suggested clearance

Size		10.1	12.1
Lenght	mm	1467	1467
Height	mm	705	705
Depth	mm	927	927
Operation weight	Kg	200	225
Shipping weight	Kg	225	250

Weight distribution		10.1	12.1
W1 Support point	Kg	37	42
W2 Support point	Kg	54	57
W3 Support point	Kg	52	59
W4 Support point	Kg	57	67

11 GENERAL TECHNICAL DATA

Size			2.1	3.1	5.1	7.1	10.1	12.1
Cooling			A 27/19 W 30					
Cooling capacity (EN14511:2018)	1	[kW]	4,56	8,08	10,6	16,9	25,0	28,9
Total power input (EN14511:2018)	1	[kW]	1,30	2,07	3,04	4,15	5,85	7,43
EER (EN14511:208)	1		3,52	3,90	3,53	4,07	4,27	3,89
SEER	2		3,28	3,93	3,57	4,23	4,47	3,97
Cooling capacity	3	[kW]	4,81	8,46	11,2	17,9	25,9	30,8
Sensible capacity	3	[kW]	3,74	6,44	8,84	13,9	20,0	22,4
Compressor power input	3	[kW]	0,96	1,61	2,27	3,07	4,74	5,36
Total power input	3	[kW]	1,34	2,09	3,13	4,29	6,11	7,75
Heating			A 20 W 20					
Heating capacity (EN14511:2018)	4	[kW]	7,55	10,3	14,4	23,1	33,2	38,2
Total power input (EN14511:2018)	4	[kW]	1,75	2,39	3,35	5,23	7,21	8,47
COP (EN14511:2018)	4		4,30	4,31	4,30	4,41	4,60	4,52
SCOP	2		3,81	3,82	3,81	3,91	4,08	4,01
Heating capacity	5	[kW]	7,06	9,83	13,5	22,1	32,3	36,4
Compressor power input	5	[kW]	1,46	1,99	2,56	4,02	6,04	6,23
Total power input	5	[kW]	1,76	2,4	3,4	5,3	7,3	8,6
Compressor								
Type of compressors	6		ROT	ROT	ROT	SCROLL	SCROLL	SCROLL
No. of compressors			1	1	1	1	1	1
Refrigerant charge		kg	0,7	0,95	1,1	1,3	3,2	4,1
Air Handling Section Fans (Supply)								
Type of fans	7		CFG	CFG	CFG	CFG	CFG	CFG
No. of fans			1	1	1	1	1	1
Airflow	8	l/s	278	416	778	1056	1351	1657
Airflow		m^3/h	1000	1500	2800	3800	4900	6000
Max external static pressure	9	Pa	250	270	290	310	220	410
External section								
Water flow-rate	10	l/s	0,27	0,47	0,64	1,00	1,47	1,72
Pressure drop	11	kPa	13,0	15,8	17,6	19,4	18,6	20,4
Connections								
Water fittings	12		1"	1"	1"	1"	1"1/2	1"1/2
Condensate drain	13		22	22	22	22	22	22
Power supply								
Standard power supply			220-240/1/50			380-415/3/50 +N		

Contains fluorinated greenhouse gases (GWP 2087,5)

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

A 27/19 W 30 = Unit inlet air temperature 27°C D.B. / 19°C W.B. Unit inlet water temperature

A 20 W 20 = Unit inlet air temperature 20°C Unit inlet water temperature 20°C

DB = Dry bulb WB = Wet bulb

1 Ambient air 27°C D.B./19°C W.B. Exchanger water temperature 30°C / 35°C. Values read in compliance with EN14511:2018 and including the required system fan motor and water pump capacity for overcoming pressure drops inside the unit.

2 SEER e SCOP in conformità EN 14825-2016.

3 Prestazioni lorda. Ambient air 27°C D.B./19°C W.B. Exchanger water temperature 30°C / 35°C. The value does not take into account the power of the fan's motor and the part related to the pumps and required to overcome the pressure drops for the circulation of the solution inside the exchangers.

4 Ambient air 20°C D.B. Exchanger inlet water temperature 20°C. The water temperature at the exchanger output is read in relation to the flow of water being chilled. Values read in compliance with EN14511:2018 and including the required system fan motor and water pump capacity for overcoming pressure drops inside the unit.

5 Ambient air 20°C D.B. Exchanger inlet water temperature 20°C. The value does not take into account the power of the fan's motor and the part related to the pumps and required to overcome the pressure drops for the circulation of the solution inside the exchangers

6 ROT = Rotary compressor. SCROLL = Scroll compressor

7 CFG = Centrifugal fan

8 Standard airflow

9 Available static pressure with standard air flow and clean air filter

10 Water flow calculated in relation to the performances in cooling.

11 Total pressure drop of the standard unit (without optional hydraulic pipe works). To obtain the total drops with any additional hydraulic components see accessory section.

12 Water inlet/outlet diameter

13 Condensation drain pipe, external diameter

Sound levels - Extraquiet = Fan maximum speed

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)
2.1	30	47	47	49	45	42	37	32	37	50
3.1	30	47	48	49	46	42	36	31	38	51
5.1	34	53	54	51	49	44	32	34	40	54
7.1	35	53	54	52	50	44	31	33	41	54
10.1	48	54	55	58	52	47	42	35	44	58
12.1	59	57	62	61	59	56	50	55	50	64

Sound levels - Quiet (standard) = Fan medium speed

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)
2.1	34	49	50	53	49	47	43	33	42	55
3.1	34	49	50	54	49	47	42	33	42	55
5.1	35	55	56	56	54	49	37	39	44	58
7.1	35	56	57	55	54	49	38	39	45	58
10.1	49	53	56	59	53	48	43	38	45	59
12.1	59	57	62	61	59	56	50	55	50	64

Sound levels - Powerfull = Fan maximum speed

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)
2.1	42	53	54	58	57	54	51	37	48	62
3.1	42	53	54	58	57	55	52	37	49	62
5.1	42	57	59	58	59	54	49	36	48	62
7.1	42	58	59	58	58	54	49	35	49	62
10.1	54	54	60	60	55	51	46	41	47	61
12.1	59	59	64	62	63	60	53	56	53	67

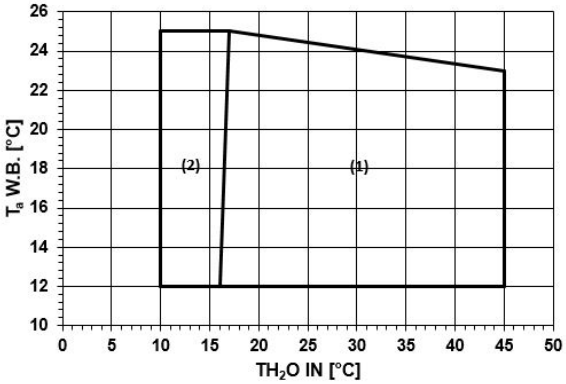
Sound levels refer to the unit at full load installed on the ceiling, ducted, with minimum, standard and maximum air flow rate of the fan. Available static pressure 40 Pa.

In accordance with the UNI-EN ISO 3744 regulation, the average sound pressure level refers to a distance of 1 m from the outer surface of a ducted unit installed on the ceiling.

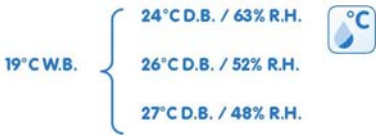
Measurements are made in accordance to the UNI EN ISO 9614-2, with units installed over two sound reflective surfaces.

If the unit is installed in conditions other than the nominal ones (for instance, near walls or obstacles in generally) the sound levels may undergo substantial variations.

Operating range (Cooling)



WET BULB TEMPERATURE - EXAMPLE



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

- general and non specific sizes
- standard airflow (Fan speed: Medium speed (M)
- non-critical positioning and correct use of the unit
- operation at full load
- difference between inlet / outlet water temperature = 5°C

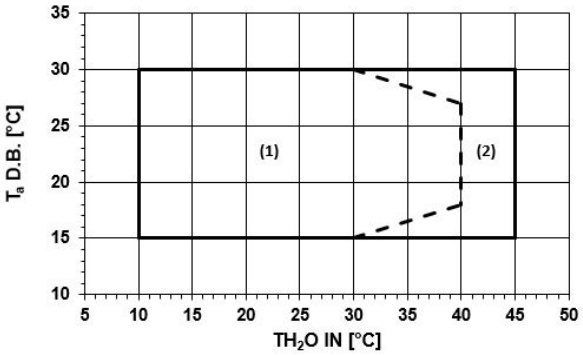
Ta = Handling air coil entering air temperature (°C)
warning! wet bulb temperature
(W.B. = WET BULB)
TH2O = Water temperature at plate exchanger input (°C)

1 Standard operating range
2 Operating range for unit equipped with 'V2MODX - 2-way modulating valve for installation with disposable water' option, i.e. , groundwater or anyway a source at low water temperature. By this option the water feeding system must be at variable flow-rate.

!! Warning: the graph refers to a water temperature differential of 5°C with a reduced water flow rate, the temperature differential is more than 5°C, so it is necessary to reduce the specified operating range for steps exceeding the nominal 5°C.

Example: with a temperature differential of 8°C, the upper TH2O limit is no longer 45°C but 42°C.

Operating range (Heating)



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

- general and non specific sizes
- standard airflow (Fan speed: Medium speed (M)
- non-critical positioning and correct use of the unit
- foperation at full load
- difference between inlet / outlet water temperature = 5°C

Ta = handling air coil entering air temperature (°C)
Warning! dry bulb temperature (d.b.=dry bulb)

TH2O = Water temperature at plate exchanger input (°C)

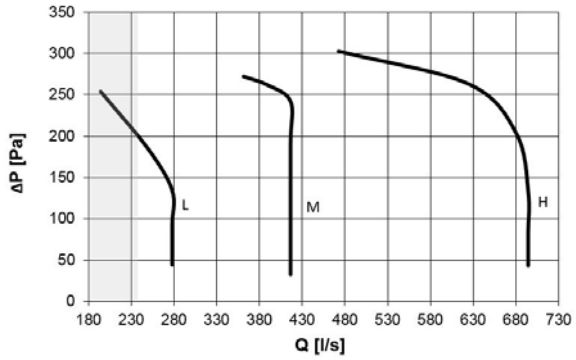
1 Standard operating range.
2 Standard unit operating range. In this range the COP efficiency can be increased equipping the unit with the "V2MODX - 2-way modulating valve for installation with disposable water" option, that controls the heat exchange with the source. In this way the unit performances are similar to the unit ones with feeding water temperature (T H2O) equal to 25°C. With this option the water feeding system must be at variable flow-rate.

Warning: the graph refers to a water temperature differential of 5°C with a reduced water flow rate, the temperature differential is more than 5°C, so it is necessary to reduce the specified operating range for steps exceeding the nominal 5°C.

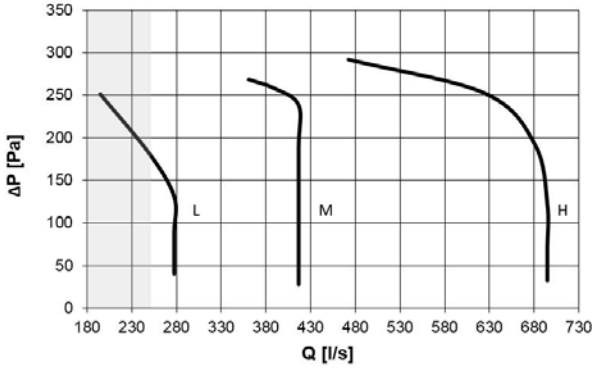
Example: with a temperature differential of 8°C, the lower TH2O limit is no longer 10°C but 13°C.

Airflow / head curves

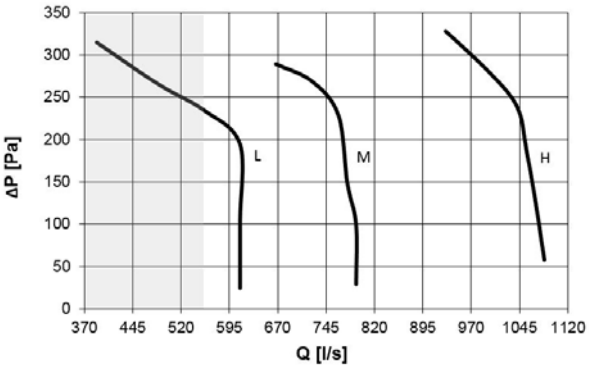
Size 2.1



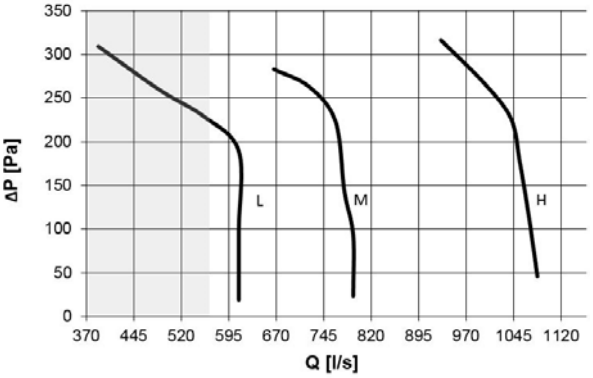
Size 3.1



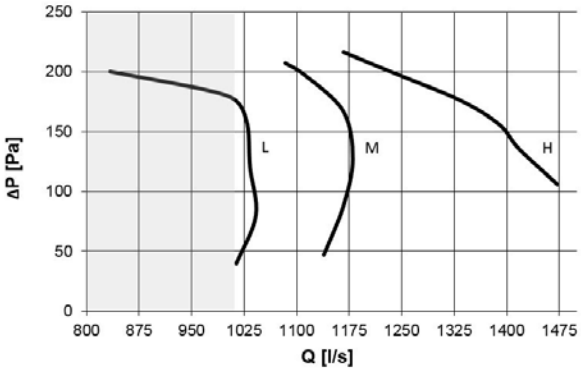
Size 5.1



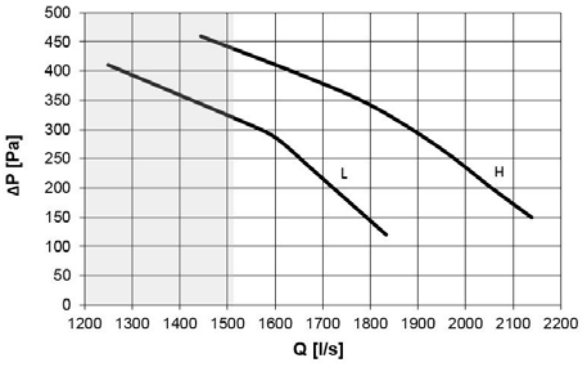
Size 7.1



Size 10.1



Size 12.1



The letters next to the identification number of the unit size indicate:
L = Minimum speed (Extraquiet)
M = Average speed (Quiet)
H = Maximum speed (Powerful)
Q = Airflow (l/s)
DP = Available head (Pa)
DP = Available pressure (Pa)
The grey area identifies the minimum allowable airflow which guarantees the correct air distribution on the internal exchanger.

Size	Air flow limit [m^3/h]
2.1	880
3.1	900
5.1	2000
7.1	2000
10.1	3600
12.1	5800

Water flow-rate

Size		2.1	3.1	5.1	7.1	10.1	12.1.
Q min	[l/s]	0,16	0,23	0,28	0,35	0,56	0,71
Q standard (1)	[l/s]	0,37	0,48	0,65	1	1,47	1,74
Q max	[l/s]	0,46	0,74	0,94	1,39	2,04	2,28

Minimum and maximum admitted water flow from the unit

1- Water flow rate at nominal conditions with standard water flow and in/out water temperature 5°C.

Disconnection

⇒ *Before performing any intervention, read the warnings in the Maintenance chapter.*

Avoid leak or spills into the environment.

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

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

When awaiting dismantling and disposal, the unit can also be stored outdoors, as bad weather and rapid changes in temperature will not cause damage to the environment, if the unit's electric, cooling and hydraulic circuits are integral and closed.

CE WEEE DIRECTIVE

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

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

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

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

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

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

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

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

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

This equipment may contain:

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

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

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

General

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

Danger zone

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

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

Handling

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

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

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

Installation

An incorrect installation of the unit could cause water leaks, condensate accumulation, leaking of the refrigerant, electric shock, bad functioning or damage to the unit itself.

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

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

Carefully check the positioning of the unit.

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

Carefully check the positioning and the anchoring of the unit.

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

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

General risks

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

Electrically isolate the unit (yellow-red isolator).

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

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

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

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

Always contact the qualified assistance centre.

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

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

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

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

Electric parts

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

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

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

Always fix the unit cover properly.

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

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

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

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

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

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

Moving parts

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

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

Contact with the fans can cause injuries.

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

Refrigerant

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

L'intervento delle valvole di sicurezza, e la conseguente espulsione del gas refrigerante possono causare lesioni ed intossicazioni.

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

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

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

Do not place any heat source inside the danger zone.

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

Hidraulic parts

Defects in tubing, the attachments or the cut-off parts may cause a leak or water projection with the consequent damages to people things or short-circuit the unit.

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