









INSTALLATION MANUAL **EN**



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 The appliance may undergo updates and therefore have details different from those represented, without prejudice to the texts contained in this manual.

Thank you.
 OLIMPIA SPLENDID

	IT	EN	FR	DE	ES
	Gas refrigerante R32	R32 refrigerant	Réfrigérant R32	R32-Kältemittel	Refrigerante R32
	Raffreddamento e riscaldamento	Cooling and heating	Refroidissement et chauffage	Kühlung und Heizung	Frío y calor
	ACS	DHW	ECS	BWW	ACS
	Compressore rotativo a Inverter	Inverter rotary compressor	Compresseur rotatif à inverseur	Inverter-Rollkolbenverdichter	Compresor rotativo inverter
	Ventilatore assiale a Inverter	Inverter axial fan	Ventilateur axial à inverseur	Inverter-Axialventilator	Ventilador axial inverter
	Scambiatore a piastre	Plate exchanger	Échangeur à plaques	Plattenwärmetauscher	Intercambiador de placas
	Gruppo di pompaggio	Pump kit	Kit pompe	Pumpensatz	Kit de bomba
	Per impianti a due tubi	For two pipes plants	Pour installations deux tubes	Für 2-Rohr-Anlagen	Para plantas de dos tubos

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GAS R32 - WARNINGS

GAS R32 GENERAL WARNINGS

**WARNING**

Please read this manual carefully before using the unit.

**WARNING**

Please read this manual carefully before installing the unit.

**WARNING**

Please read this manual carefully before repairing or performing maintenance on the unit.

**WARNING**

This unit contains flammable R32 gas.

WARNINGS FOR R32 REFRIGERANT GAS

- The unit uses eco-friendly R32 refrigerant gas.
- The refrigerant gas is odourless.
- R32 refrigerant gas is flammable, but only in the presence of flames.
- There is a chance of explosion but only if a certain concentration is reached in the air.
- Smoking near the unit is prohibited.
- Provide signage prohibiting smoking near the unit.
- The flammability of the gas is very low.
- Keep the room where the unit is installed well ventilated.
- Do not pierce or burn the unit.
- The unit cannot be placed near ignition sources such as open flames, electric heaters, etc.
- All repairs or extraordinary maintenance operations must be carried out by specialised technicians or qualified personnel.
- Leak test must be done after the installation.

R32 GAS ADVANTAGES

- Compared to common refrigerants, R32 is a non-polluting refrigerant. It causes no damage to the ozone layer and does not add to the greenhouse effect..
- R32 has excellent thermodynamic features that lead to high energy efficiency.

WARNINGS FOR MAINTENANCE OR REPAIR GAS R32

THESE PROCEDURES MAY ONLY BE FOLLOWED BY SPECIALISED TECHNICIANS OR QUALIFIED PERSONNEL.

Please follow the steps below::

1. Turn off the unit and disconnect it from the electrical power supply.
2. Drain the refrigerant gas
3. Extract the remaining gas.
4. Clean with Nitrogen N₂.
5. Ensure that there are not naked flames.
6. The refrigerant must be recycled in the special tanks.

FILLING R32 REFRIGERANT GAS

THESE PROCEDURES MAY ONLY BE FOLLOWED BY SPECIALISED TECHNICIANS OR QUALIFIED PERSONNEL.

- Make sure that other types of refrigerant do not contaminate the R32.
- The gas tank must be kept in a vertical position during filling.
- Apply the specified label to the unit after filling.
- Do not add more refrigerant gas than necessary.
- Once filling is finished, carry out the leak detection operations before testing its functioning.
- A second check for gas leaks must be performed once all of the previous operations are completed.

FILLING R32 REFRIGERANT GAS

THESE PROCEDURES MAY ONLY BE FOLLOWED BY SPECIALISED TECHNICIANS OR QUALIFIED PERSONNEL.

- Do not dispose of it in areas with a risk of formation of explosive mixtures with the air. The gas must be disposed of in a suitable torch with an anti-flame-return device.

Contact the supplier if you need instructions for use.

SAFETY STANDARDS FOR TRANSPORTATION AND STORAGE GAS R32

- Using a suitable gas detector, check that there are no gas leaks in the environment before opening the packaging of the unit.
- Ensure there are no ignition sources near the unit.
- Smoking near the unit is prohibited.
- The transportation and the storage must be done according to the current national regulations.

QUALIFICATION REQUIREMENT FOR INSTALLATION AND MAINTENANCE

- All the operators who are engaging in the refrigeration system should bear the valid certification awarded by the authoritative organization and the qualification for dealing with the refrigeration system recognized by the company or the institution where this operation is carried out. If it needs other technician to maintain and repair the appliance, they should be supervised by the person who bears the qualification for using the flammable refrigerant.
- The unit must be installed in a room that is larger than the minimum room area.
- Maintenance must be done in a room that is larger than the minimum room area.
- Check whether the maintenance area is well-ventilated.
The continuous ventilation status should be kept during the operation.
- The unit can only be repaired by the method suggested by the manufacturer.

WARNINGS DURING WELDING OPERATIONS

If it is necessary to cut or weld the pipes of the refrigeration system, please follow the points below:

- Operations must be carried out by specialised technicians or qualified personnel.
- Shut down the unit and cut off power supply.
- Discharge the refrigerant following the required procedures; the gas must be disposed of in a suitable torch with an anti-flame-return device.
- Make sure that there isn't any naked flame near the outlet of the vacuum pump and it's well-ventilated.

WARNING:

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacture. Should repair be necessary, contact your nearest authorized Service Centre. Any repairs carried out by unqualified personnel may be dangerous.

The appliance shall be stored in a room without continuously operating ignition sources. (for example: open flames, an operating gas appliance or an operating electric heater.) Do not pierce or burn.

Appliance filled with flammable gas R32. For repairs, strictly follow manufacturer's instructions only.

Be aware that refrigerants not contain odour. Read specialist's manual.



GENERAL WARNINGS

This product is a complex machine. Things and persons may be exposed to risks during installation, operation, maintenance or repair, caused by certain conditions or components, such as for example, but not only, refrigerant, oils, moving mechanical parts pressure, heat sources, electricity.

This products and its documentation, including this manual, are intended for persons in possession of appropriate training to enable them to operate correctly and safely. Before performing any operation on this equipment, it is essential for the operating personnel to have read and understood all manuals and any other material of reference.

They must also know and observe the standards applicable to the activities to be performed.

ATTENTION:

Any intervention on the unit must be performed by authorized and qualified experienced technicians, in accordance with current regulations.

GENERAL WARNINGS

The unit shows the following risks:

- Risk of electric discharges.
- Risk of injuries due to rotating parts.
- Risk of injuries due to sharp edges and heavy weights.
- Risk of injuries due to high pressure gas.
- Risk of injuries due to high or low temperatures of components.
- Substances inside the water;
- Fire risk.
- In the event of the refrigerant catching fire, hazardous gases may be generated.

It is vital that all work on the unit is performed in compliance with the local standards. All work on the system must be performed to perfection.

PRECAUTIONS AGAINST RESIDUAL RISKS

INSTRUCTIONS

- Install the unit according to the requirements herein
- The personnel nearing the machine must be competent in the use of this refrigerant and observe the current regulations.
- Personnel that come into contact with the machine must be competent in the use of this refrigerant and respect regulations currently in force. Assess the procedures OLIMPIA requires and local fire prevention regulations to prevent inconsistencies in our requirements and regulations currently in force.
- Regularly perform all maintenance operations provided for in this manual
- Wear personal protective equipment (gloves, eye protection, helmet, ...) appropriate to the operations to be performed; do not wear clothes or accessories that may get caught or be sucked by the air flows; gather and tie your hair up before entering the unit
- The machine must be transported in compliance with current regulations, taking into account the features of the fluids inside and their characterisation described in the safety data sheet
- An inadequate transport may damage the machine, also generating refrigerant leaks. Before commissioning, check for leaks and make any necessary repairs.
- The installation must comply with the requirements of EN378-3 and the local current regulations. In particular, indoor installation must ensure adequate ventilation and provide refrigerant detectors when necessary.
- The machine must not be installed in environments with risk of explosion but in a suitable place. In particular, if intended for indoor use, it cannot be installed outdoors
- The machines must be installed in structures protected from lightning as provided by the applicable laws and technical standards
- The overall fire risk assessment at the place of installation (i.e.. fire load calculation) is the responsibility of the user
- Keep fire extinguisher near the machine suitable for putting out fires on electrical equipment and, for lubricant oil of the compressor and the refrigerant as provided by the relative safety data sheets (for example a CO2 - fire extinguisher)
- It is not permitted to walk or place other bodies on the machines
- Make the plant engineering connections to the unit according to the instructions in this manual
- It is mandatory to install a water filter on the evaporator, penalty invalidation of the warranty
- Do not bend or hit pipes containing under pressure fluids
- Do not exceed the maximum allowable pressure (PS) of the unit's water circuit shown on the serial number plate
- Before removing elements along the under pressure water circuits, shut-off the pipe section involved and gradually drain the fluid until its pressure and that of the atmosphere are balanced.
- The unit contains under pressure refrigerant gas: no operation must be performed on under pressure equipment except during maintenance that must be carried out by competent and authorised personnel
- Perform brazing or welding only on empty pipes and clear of any lubricating oil residues; do not near flames or other heat sources to the pipes containing refrigerant fluid
- Do not work with naked flames near the unit
- In order to avoid an environmental risk make sure that any fluid leaks are recovered in suitable devices in compliance with local regulations.
- Do not use your hands to control any refrigerant leaks
- An accidental release of refrigerant may cause risk of suffocation due to lack of oxygen: install the machine in a well ventilated environment in accordance with EN 378-3 and local regulations currently in force. Those who come into contact with the machine must be equipped with a leak detector that is calibrated and validated to reveal any used refrigerant leaks.
- The unit is fitted out with overpressure relief devices

(safety valves): in the event that these devices start, the refrigerant gas is released at high temperature and high velocity. Prevent the gas flow from harming people or things; if necessary, channel the leak according to the EN 378-3 standard and local regulations currently in force, paying particular attention to channel fluids that pertain to safety groups other than A1 toward open and secure spaces.

- Keep all lubricants in properly marked containers do not keep flammable liquids near the plant
- Do not remove the protections from mobile elements while the unit is running
- Do not use cables with inadequate section or flying connections, not even for limited periods or emergencies
- Check the unit is properly earthed before starting it
- Before opening the electrical panel, disconnect the unit from the mains by means of the external isolator
- In case of units with shunt capacitors, wait 3 minutes from when power supply was disconnected from the unit before accessing inside the electrical panel
- If the unit is equipped with integrated inverter compressors, disconnect the power supply and wait at least 15 minutes before accessing for maintenance: the internal components remain live for this time, generating the risk of electrocution
- The safety devices must be maintained efficient and periodically checked as prescribed by current regulations
- In case a piece is disassembled, make sure it is correctly reassembled before restarting the unit
- Even with the unit off, prevent the fluid in contact with the exchangers exceed the temperature limits indicated in the documentation and freeze.
- Do not send the heat exchangers fluids other than water or its mixtures with ethylene glycol/propylene in a maximum concentration of 30%

- The machine must only be employed for the use for which it was made; any other use can be dangerous and void the warranty
- Install the unit at a distance enough from the exhaust wells, to ensure that the possible loss of gas may reach and pollute the aquifer.

PREVENTIONS

- Make sure that the protections of mobile elements are correctly in place before restarting the unit
- Fans, motors and belt drives may be in motion: always wait for them to stop and take appropriate precautions to prevent their activation before accessing them
- The machine and the pipes have very hot and very cold surfaces that lead to risk of burns
- Before opening a machine panel, ascertain whether it is or not firmly connected to it by hinges
- Louvers of the heat exchangers, edges of the components and metal panels can generate cuts
- The installation must ensure that the temperature of the fluid entering the unit is maintained stable and within the provided limits; therefore, pay attention to the adjustment of any external thermal exchange and control devices (drycooler, evaporating towers, area valves, ...), to the adequate dimensioning of the mass of fluid circulating in the plant (in particular when plant areas are excluded) and to install systems for the recirculation of the necessary fluid flow rate so as to maintain the machine temperatures within the allowed limits (e.g. during the start-up phase).
- The material used for the machine protective packaging must always be kept out of the reach of children as it is a source of danger
- In units with compressors in parallel, do not disable the individual compressors for long periods.
- This appliance can be used by children over the age of 8 and persons with reduced physical, sensory or mental capabilities or lack of experience and necessary knowledge if they are supervised or have received instructions concerning use of the appliance in a safe way and understand the hazards involved. Children should not play with the appliance. Cleaning and maintenance intended to be performed by the user should not be performed by children without supervision.
- To protect the unit against short circuits, mounted on the supply line of thermomagnetic isolator switch with a minimum contact separation of at least 3mm in all poles.
- If the power cable is damaged, it must be replaced to



avoid any risk of danger. When replacing the power cable, the new one must be of the type indicated in the manual. This operation must only be carried out by "Personnel with specific technical skills".

- The unit must be installed according to national plant engineering regulations

NOTE:

During installation, before starting, remove the compressor rubber feet to prevent damage. After this operation, secure the compressor screws to avoid vibrations.

LIFTING

The units are delivered on a pallet; they must be lifted using suitable belts. Place protections between the belts (rope or chains) and the framework to prevent damage to the structure.

Should you desire to lift using the forklift, we recommend opening the forks as much as possible to make handling safer

- Follow all safety regulations and standards
- Wear protective goggles and work gloves
- Pay the utmost attention to heavy and bulky equipment during lifting and handling, and when placing it on the ground.
- All panels must be tightly fixed before moving the unit;
- Before lifting, check the specific weight on the technical plate.
- Use all, and only, the lifting points indicated;
- Use ropes in compliance with Standards and of equal length;
- Handle the unit with care and without sudden movements
- Do not stand under the unit during lifting
- The machine must be kept in a vertical position

Attention: the units cannot be stacked

RECEPTION

TRANSPORT AND HANDLING

The unit must be handled by qualified personnel. Carefully follow the lifting instructions on the labels placed on the unit.

The unit must be lifted with extreme care to prevent knocks to the frame, panels, electrical panel, etc..

NOTE: Plastic elements can be used to protect the units against damage during transport. The machine is also wrapped in packaging. We recommend keeping this protection during all transport and lifting operations and not remove the plastic elements until commissioning.

If the unit has anti-vibration supports, they must be installed on the unit before final positioning.

Inspection upon receipt

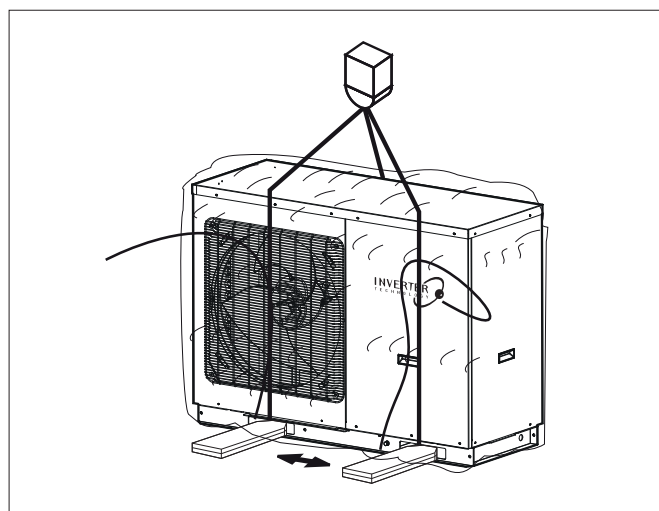
Perform the following check upon receipt of the product.

- Check that the exterior has not been damaged in any way.
- Check that the lifting and transport devices are appropriate to the type of equipment and compliant with the transport and handling instructions attached to this manual.
- Check that the accessories required for on-site installation have been delivered and are operational.
- If the unit is provided pre-loaded with refrigerant, make sure there have been no leaks.
- Check that the equipment supplied corresponds to the order and delivery note

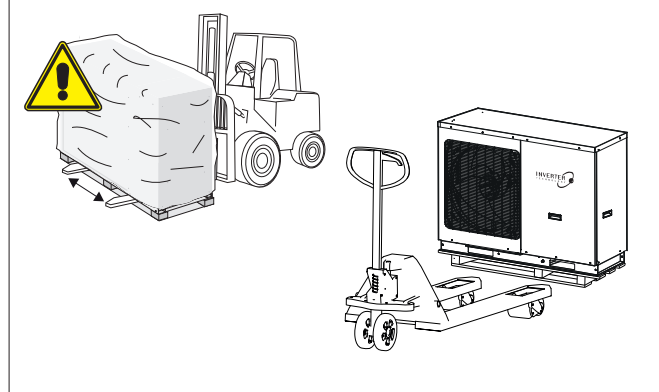
Product identification

The OLIMPIA products can be identified by the **packaging label** bearing the identification data of the product and by the **technical plate** bearing the performance and technical data of your unit.

If the product is damaged, send a registered letter with the details of the problem to the shipping company within 48 working hours from delivery.



HANDLING



INSTALLATION

PLACEMENT AND INSTALLATION REQUIREMENTS

For unit installation it is important to perform the following preliminary preparation tasks:

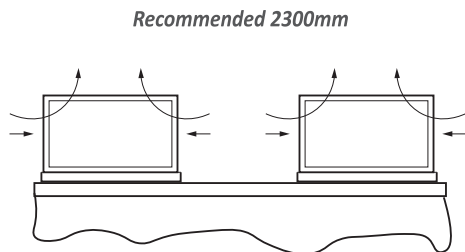
- When installing, make sure that the atmospheric or environmental agents do not affect and corrode the cooling circuit components, causing the refrigerant to leak in the environment and, if so, make the appropriate adjustments.
- The air-cooled units with fans are designed for outdoor installation. Contact OLIMPIA before making any type of installation.
- The water-cooled units are designed for indoor installation. Contact OLIMPIA before making any type of installation.
- For the positioning of the air-cooled units for outdoor use, choose a place that is not exposed to excessive wind (install windbreaks if the wind speed exceeds 2.2 m/s).
- The soil under the unit must be flat, smooth and sufficiently strong to withstand the weight of the unit with a full refrigerant load, as well as the occasional presence of the normal maintenance equipment.
- It is always advisable to build a support base separate from the main building to avoid the transmission of vibrations.

- For normal applications, the rigidity of the unit and the positioning of point loads allow for an installation that minimises vibrations. In the case of installations requiring particularly low vibration levels, you can use the anti-vibration supports.

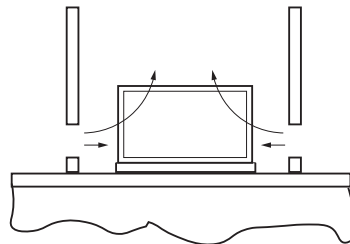
ATTENTION: The use of anti-vibration supports **MUST** be combined with the installation in the unit water piping of flexible couplings. The anti-vibration supports must be fixed to the unit **BEFORE** it is earthed. OLIMPIA is not responsible for the choice of capacity of the anti-vibration supports.

- The unit must be fixed to the anti-vibration supports and these firmly fixed to the concrete base, see chapter weight distribution and minimum technical spaces
- Check that the contact surfaces of the anti-vibration supports are levelled to the base. If necessary, use spacers or level the base but, in any case, make sure that the anti-vibration supports rest flat on the base surface.
- It is essential that the units are installed leaving sufficient space around them to allow easy access to the components for maintenance and repair purposes.

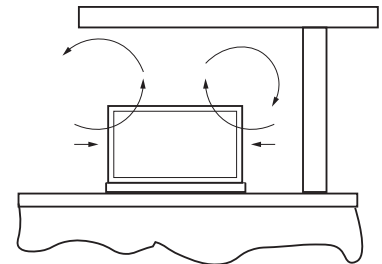
ATTENTION: It is important that the units are installed flat. The improper installation of the unit invalidates the warranty.



Recommended Installation



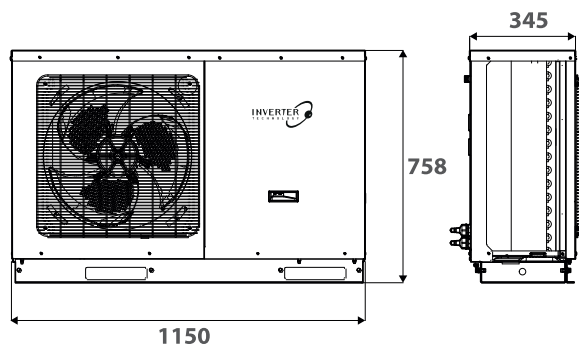
Windbreak
recommended with wind above 2,2 m/s



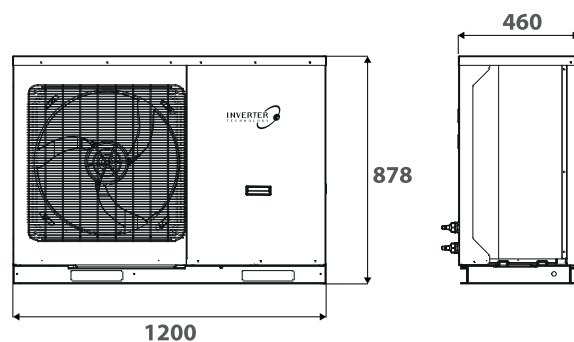
Installation not allowed

DIMENSIONS

S1 E 6 - S1 E 8 (mm)

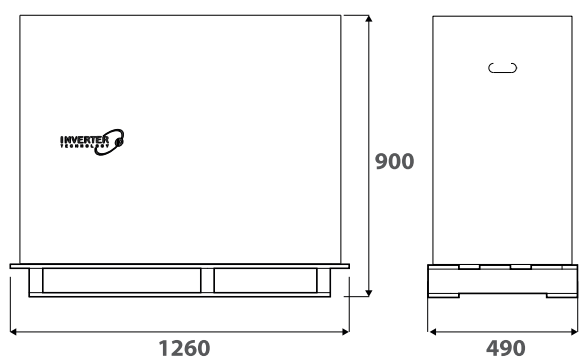


S1 E 12 - S1 E 16 - S1 E 12T - S1 E 16T (mm)

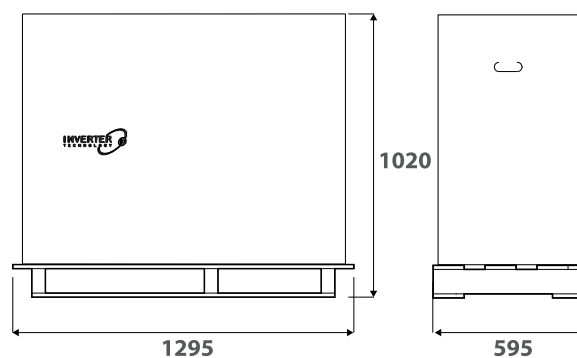


DIMENSIONS FOR HANDLING

S1 E 6 - S1 E 8 (mm)

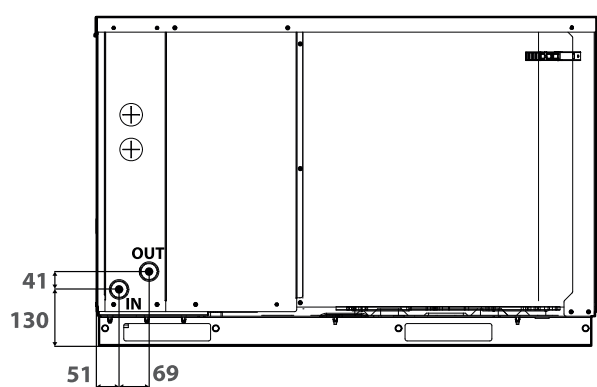


S1 E 12 - S1 E 16 - S1 E 12T - S1 E 16T (mm)

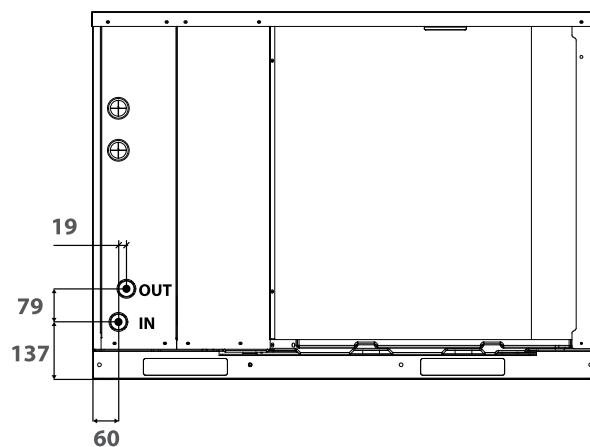


WATER CONNECTIONS

S1 E 6 - S1 E 8 (mm)

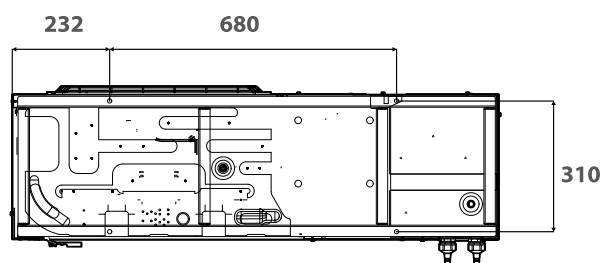


S1 E 12 - S1 E 16 - S1 E 12T - S1 E 16T (mm)

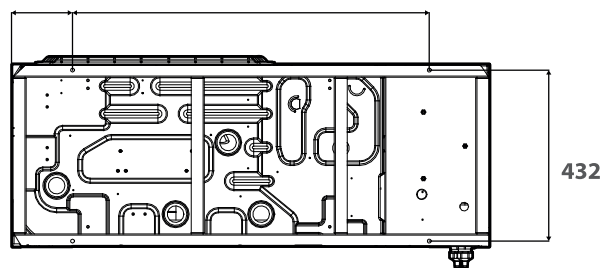


BASE HOLES POSITION

S1 E 6 - S1 E 8 (mm)



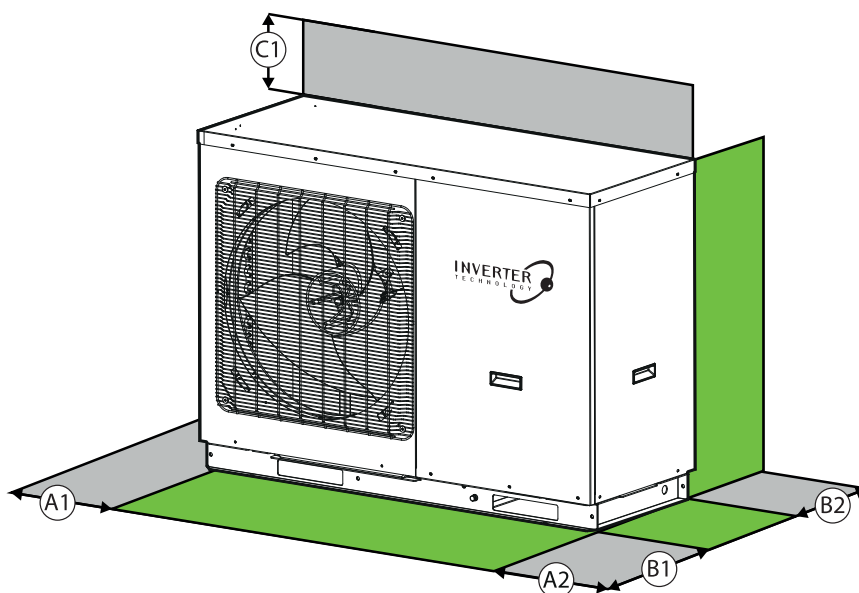
S1 E 12 - S1 E 16 - S1 E 12T - S1 E 16T (mm)



MINIMUM TECHNICAL CLEARANCES

S1 E		6	8	12	16	12T	16T
<i>Minimum technical clearances</i>							
A1	mm	500	500	500	500	500	500
A2	mm	500	500	500	500	500	500
B1	mm	2000	2000	2000	2000	2000	2000
B2*	mm	500	500	500	500	500	500
C1	mm	1000	1000	1000	1000	1000	1000

* In the case of small spaces the minimum distance can be reduced up to 200 mm without loss of performance.



HYDRAULIC CONNECTIONS

ATTENTION The choice and installation of components external to the unit is up to the installer, who must operate according to the rules of good technical design and in compliance with the regulations in force in the country of destination.

ATTENTION Wash the system thoroughly before connecting the unit. This cleaning will eliminate any residues such as welding drips, scale, rust, or other impurities from the piping. These substances can also deposit inside and cause unit malfunctions. The connection piping must be adequately supported so that its weight does not rest on the appliance

CONNECTIONS

Before starting the system, check that the hydraulic circuits are connected to the current exchangers (or, that the evaporator in the air/water units or evaporator and condenser in the water water units or the intake and flow fittings have not been reversed).

The water inlet and outlet connections are indicated in the dimension tables in this manual, or available on :

www.olimpiasplendid.it

It is important to follow the recommendations (not complete) below:

- The water pipes must not transmit radial or axial forces or vibrations to the exchangers (use flexible hoses to reduce the transmitted vibrations)
- It is necessary to install manual or automatic vent valves in the highest points of the circuit; and also provide discharge fittings in the lowest points to allow emptying the entire circuit
- To maintain the pressure in the circuits, it is necessary to add an expansion tank if the existing one is not sufficient.
- Respect the water inlet and outlet connections shown on the unit
- Install manometer on the water inlet and outlet fittings.
- Install stop valve near the water inlet and outlet fittings.
- After performing a leak test, insulate the pipes to reduce heat loss and prevent the formation of condensation
- If the external water pipes are in an area where it is likely that the environment temperature drops below 0°C, insulate the pipes and provide an electric heater.
- Check the continuity of the earthing.

ATTENTION You must install the water filter supplied, in the hydraulic circuit upstream of the heat exchanger. FAILURE TO DO THIS INVALIDATES THE WARRANTY.

ATTENTION The charge or discharge of the heat exchange fluids must be made during installation by qualified technicians using the fittings provided on the hydraulic circuit. Never use the unit heat exchangers to top-up the heat exchanger fluid.

ANTI-FREEZE PROTECTION

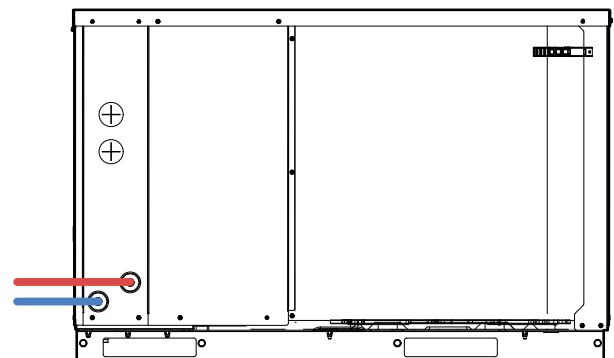
In the event the system is stopped during winter, the water in the heat exchanger can freeze damaging the heat exchanger irreversibly. To prevent danger of freezing, three solutions are possible:

1. Full water discharge from the unit.
2. Using the resistances. In this case the resistances must always be supplied with electrical power for the entire period of possible freezing (machine in stand-by).
3. Operation with glycol/water fluid, with a percentage of glycol based on the minimum outdoor temperature expected.
4. Appropriate antifreeze safety devices (emptying valve in conditions of risk of freezing water in the pipes).

ATTENTION: the addition of glycol is the only effective protection against freezing; the glycol/water solution must be sufficiently concentrated to ensure proper protection and prevent ice forming at minimum temperature provided for a given installation. Take the necessary precautions if using non-passivated anti-freeze solutions (monoethylene glycol or monopropylene glycol). Corrosion phenomena may occur with these anti-freeze solutions in contact with oxygen. However, always refer to the glycol supplier documentation to check its recommended concentration.



Do not fill up the hydraulic system by glycol near the suction of the pump. High concentration of glycol could stuck the pump. Do not use the pump to mix water and glycol



ATTENTION:

It is recommended to connect water pipe in horizontal direction. Do Not connect water pipe in vertical direction.

WATER VOLUME AND EXPANSION VESSEL PRESSURE

The method of calculating the charging pressure of expansion vessel needed to be adjusted is as follows:

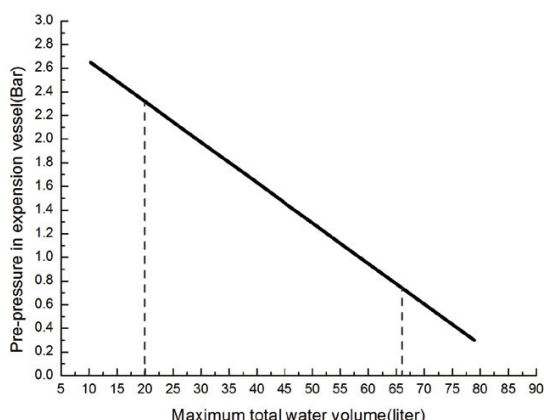
During installation, if the volume of water system has changed, please check if the pre-set pressure of the expansion vessel needs to be adjusted according to the following formula:

$$P_g = (H/10 + 0.3) \text{ bar}$$

H = the difference between installing location of unit and the highest spot of hydraulic system.

Ensure that the volume of hydraulic system is lower than the maximum volume required in the graphic diagrams. Otherwise, the expansion vessel does not meet the installing requirement.

S1 E 6 - S1 E 8



NOTE:

The expansion vessel contains 2 litres at a pre-load pressure of 1,5 bar. The total water volume of 44 litres is pre-set. If it has to be changed because of installation conditions, the pre-load pressure must be adjusted to ensure appropriate operation.

If the indoor unit is positioned at the highest point, no adjustment is necessary.

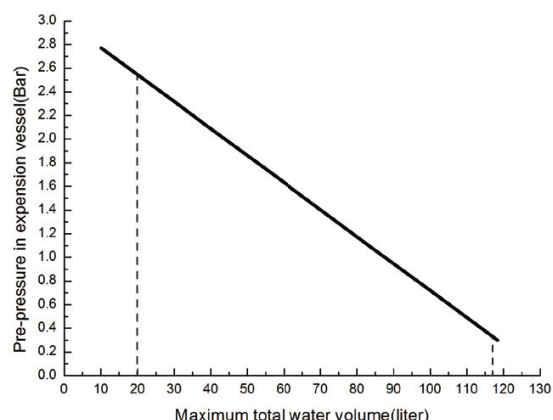
The total minimum water volume is 20 litres.

The total maximum water volume is 66 litres.

To adjust the pre-load pressure, use nitrogen from a certified technical installation supplier.

The minimum amount of water for each heat pump is 5L/Kw

S1 E 12 - S1 E 16 S1 E 12T - S1 E 16T



NOTE:

The expansion vessel contains 3 litres at a pre-load pressure of 1,5 bar. The total water volume of 66 litres is pre-set. If it has to be changed because of installation conditions, the pre-load pressure must be adjusted to ensure appropriate operation.

If the indoor unit is positioned at the highest point, no adjustment is necessary.

The total minimum water volume is 20 litres.

The total maximum water volume is 118 litres.

To adjust the pre-load pressure, use nitrogen from a certified technical installation supplier.

The minimum amount of water for each heat pump is 5L/Kw

Difference in height of installation ⁽¹⁾	Water volume (see the diagram)	
	<44L	>44L
H < 12m	Adjustment is not necessary	<ul style="list-style-type: none"> The pre-set pressure must be adjusted using the above formula. Check that the volume of water is less than maximum. (Refer to the figure above).
H ≥ 12m	<ul style="list-style-type: none"> The pre-set pressure must be adjusted using the formula provided above. Check that the volume of water is less than maximum. (Refer to the figure above). 	The expansion vessel is too small and it is not possible to perform the adjustment.

Difference in height of installation ⁽¹⁾	Water volume (see the diagram)	
	<66L	>66L
H < 12m	Adjustment is not necessary	<ul style="list-style-type: none"> The pre-set pressure must be adjusted using the above formula. Check that the volume of water is less than maximum. (Refer to the figure above).
H ≥ 12m	<ul style="list-style-type: none"> The pre-set pressure must be adjusted using the formula provided above. Check that the volume of water is less than maximum. (Refer to the figure above). 	The expansion vessel is too small and it is not possible to perform the adjustment.

⁽¹⁾ **NOTE:** the difference in installation height is the difference between the indoor unit installation position and the highest point of the hydraulic system. If the indoor unit is positioned at the highest installation point, the difference will be assumed to be 0m.

Example 1:

S1 E 16 is installed 5m below the highest point of the plant, and the total volume of the hydraulic system is 60 l.

With reference to the table, it is not necessary to adjust the pressure of the expansion vessel.

SELECTING THE EXPANSION TANK

Formula:

$$V = \frac{c \cdot e}{1 - \frac{1+p_1}{1+p_2}}$$

V = Expansion tank volume

c = Total water volume

p₁ = Expansion tank pre-load pressure

p₂ = Maximum pressure during system operation (safety valve intervention pressure).

e = Water expansion factor (the difference between the original water temperature expansion factor and the highest water temperature).

WATER EXPANSION FACTOR AT VARIOUS TEMPERATURES	
Temperature (°C)	Expansion factor (e)
0	0,00013
4	0
10	0,00027
20	0,00177
30	0,00435
40	0,00782
45	0,0099
50	0,0121
55	0,0145
60	0,0171
65	0,0198
70	0,0227
75	0,0258
80	0,029
85	0,0324
90	0,0359
95	0,0396
100	0,0434

INSTALLATION - HYDRAULIC CIRCUITS

EXTERNAL AND INTERNAL HYDRAULIC CIRCUIT S1 E

COMPONENTS PROVIDED AS STANDARD

1. Plate heat exchanger
2. Water filter (supplied as standard)
3. Flow switch
4. Air vent valve
5. Water temperature sensors (IN/OUT)
9. Expansion Tank
12. Pump
21. Safety valve

HYDRAULIC COMPONENTS RECOMMENDED EXTERNAL TO UNIT (RESPONSIBILITY OF THE INSTALLER)

4. Air vent valve
6. Anti-vibration joints
7. Cut-off valve
9. Expansion Tank
10. System buffer tank (installation recommended whenever the system water content is less than that indicated in technical manual)
13. Antifreeze electric heater
14. Drain valve
15. 3 way valve
16. 2 way valve
19. Automatic Filling Valve

ATTENTION:

In case of floor installation, the by-pass valve must be installed to ensure the circulation of a minimum water content to the system.

The water flow rate under which the protection device operates is approximately 450 l/h.

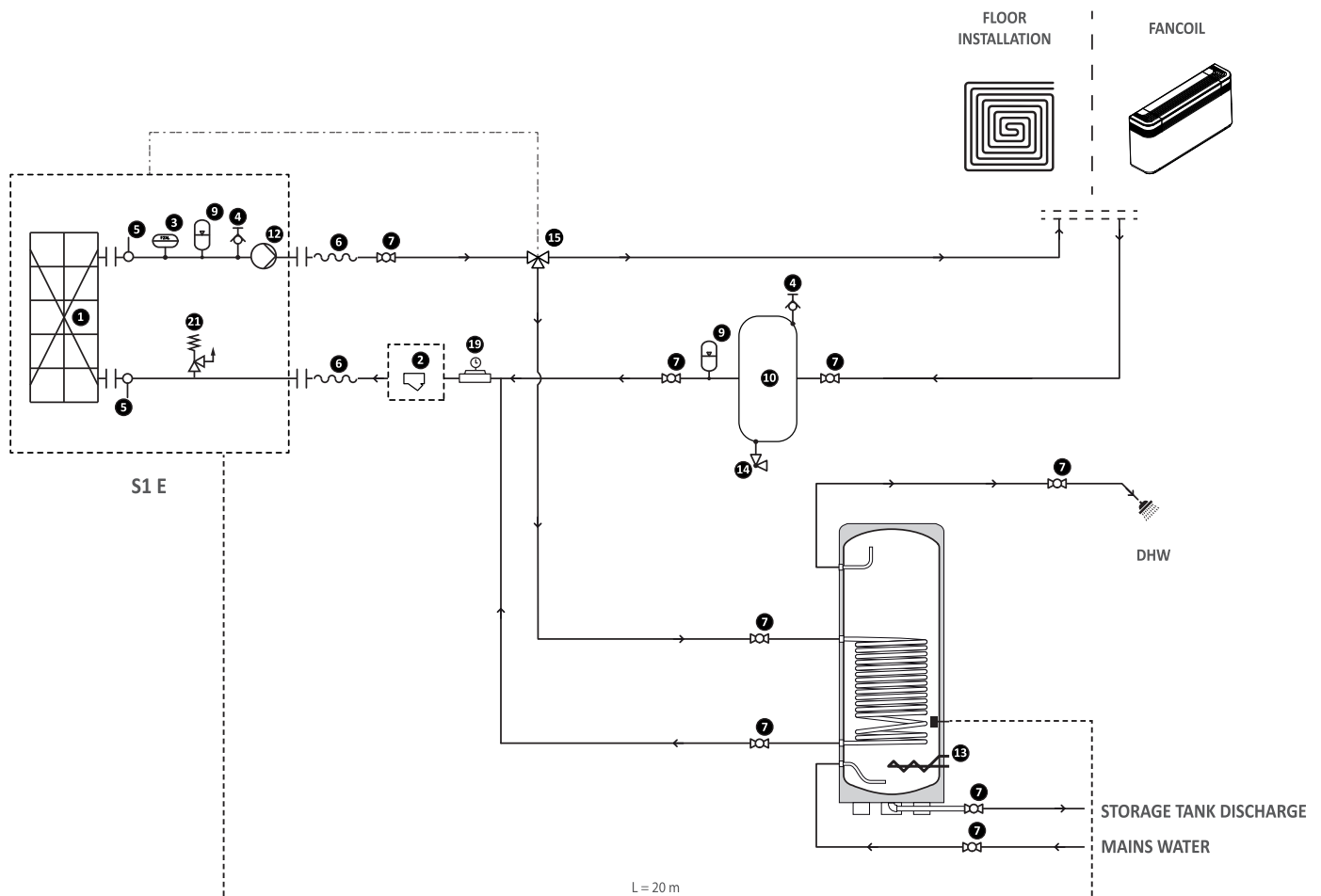
water features

System: Heat pump with plate heat exchanger	
pH (25°C)	6,8~8,0
Electric conductivity (25°C)	< 300 µS/cm
Total hardness (limestone CaCO ₃)	< 7 F
Temperature	< 60°C
Oxygen content	< 3 mg/L
Max. glycol amount	50%
Phosphates (PO ₄)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Iron (Fe)	< 0,3 mg/L
Alkalinity (CaCO ₃)	< 50 mg/L
Chloride ions (Cl ⁻)	< 50 mg/L
Sulphate ions (SO ₄)	< 50 mg/L
Sulphide ion (S)	none
Ammonium (count N)	< 0,5 mg/L
Silica (SiO ₂)	< 30 mg/L
Cloudy	< 1 NTU
Chloride	< 50 mg/L
Fluoride	< 1 mg/L
Nitrate (count N)	< 10 mg/L
Ammonia (count N)	< 0,5 mg/L
Sodium	< 150 mg/L

ATTENTION:

The other thermal source and the additional electric resistances cannot work simultaneously.

EXAMPLE 1 - CONFIGURATION: FLOOR INSTALLATION / FANCOIL + DHW



EXTERNAL AND INTERNAL HYDRAULIC CIRCUIT S1 E

COMPONENTS PROVIDED AS STANDARD

1. Plate heat exchanger
2. Water filter (supplied as standard)
3. Flow switch
4. Air vent valve
5. Water temperature sensors (IN/OUT)
9. Expansion Tank
12. Pump
21. Safety valve

HYDRAULIC COMPONENTS RECOMMENDED EXTERNAL TO UNIT (RESPONSIBILITY OF THE INSTALLER)

4. Air vent valve
6. Anti-vibration joints
7. Cut-off valve
9. Expansion Tank
10. System buffer tank (installation recommended whenever the system water content is less than that indicated in technical manual)
13. Antifreeze electric heater
14. Drain valve
15. 3 way valve
16. 2 way valve
18. Other thermal source
19. Automatic Filling Valve
22. Water temperature probe - SUPPLIED AS STANDARD (optional) (L= 5 m)

ATTENTION:

In case of floor installation, the by-pass valve must be installed to ensure the circulation of a minimum water content to the system.

The water flow rate under which the protection device operates is approximately 450 l/h.

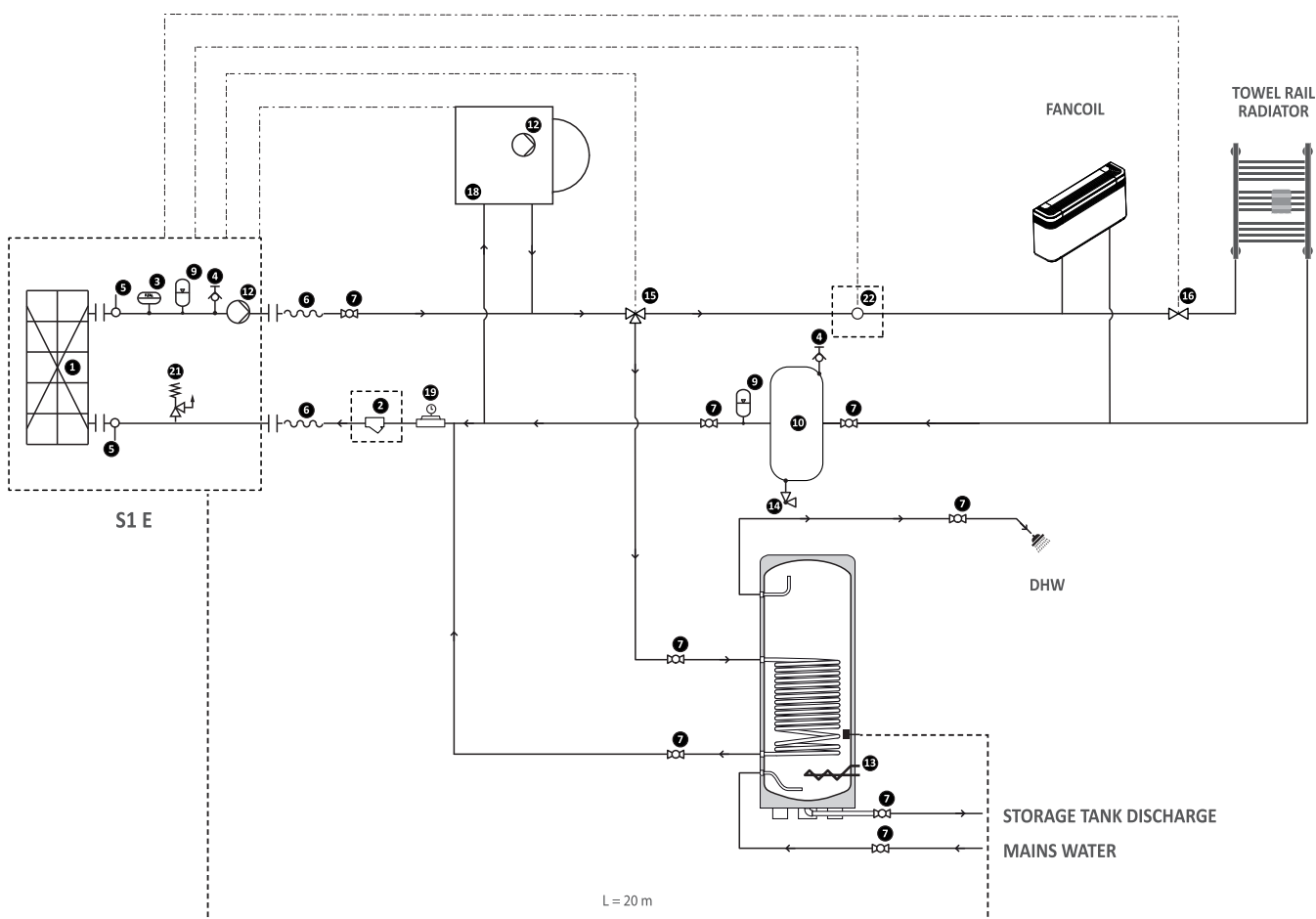
water features

System: Heat pump with plate heat exchanger	
pH (25°C)	6,8~8,0
Electric conductivity (25°C)	< 300 µS/cm
Total hardness (limestone CaCO ₃)	< 7 F
Temperature	< 60°C (7 F)
Oxygen content	< 3 mg/L
Max. glycol amount	50%
Phosphates (PO ₄)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Iron (Fe)	< 0,3 mg/L
Alkalinity (CaCO ₃)	< 50 mg/L
Chloride ions (Cl ⁻)	< 50 mg/L
Sulphate ions (SO ₄)	< 50 mg/L
Sulphide ion (S)	none
Ammonium (count N)	< 0,5 mg/L
Silica (SiO ₂)	< 30 mg/L
Cloudy	< 1 NTU
Chloride	< 50 mg/L
Fluoride	< 1 mg/L
Nitrate (count N)	< 10 mg/L
Ammonia (count N)	< 0,5 mg/L
Natrium	< 150 mg/L

ATTENTION:

The other thermal source and the additional electric resistances cannot work simultaneously.

EXAMPLE 2 - CONFIGURATION: FANCOIL + TOWEL RAIL RADIATOR + DHW + OTHER THERMAL SOURCE



EXTERNAL AND INTERNAL HYDRAULIC CIRCUIT S1 E

COMPONENTS PROVIDED AS STANDARD

1. Plate heat exchanger
2. Water filter (supplied as standard)
3. Flow switch
4. Air vent valve
5. Water temperature sensors (IN/OUT)
9. Expansion Tank
12. Pump
21. Safety valve

HYDRAULIC COMPONENTS RECOMMENDED EXTERNAL TO UNIT (RESPONSIBILITY OF THE INSTALLER)

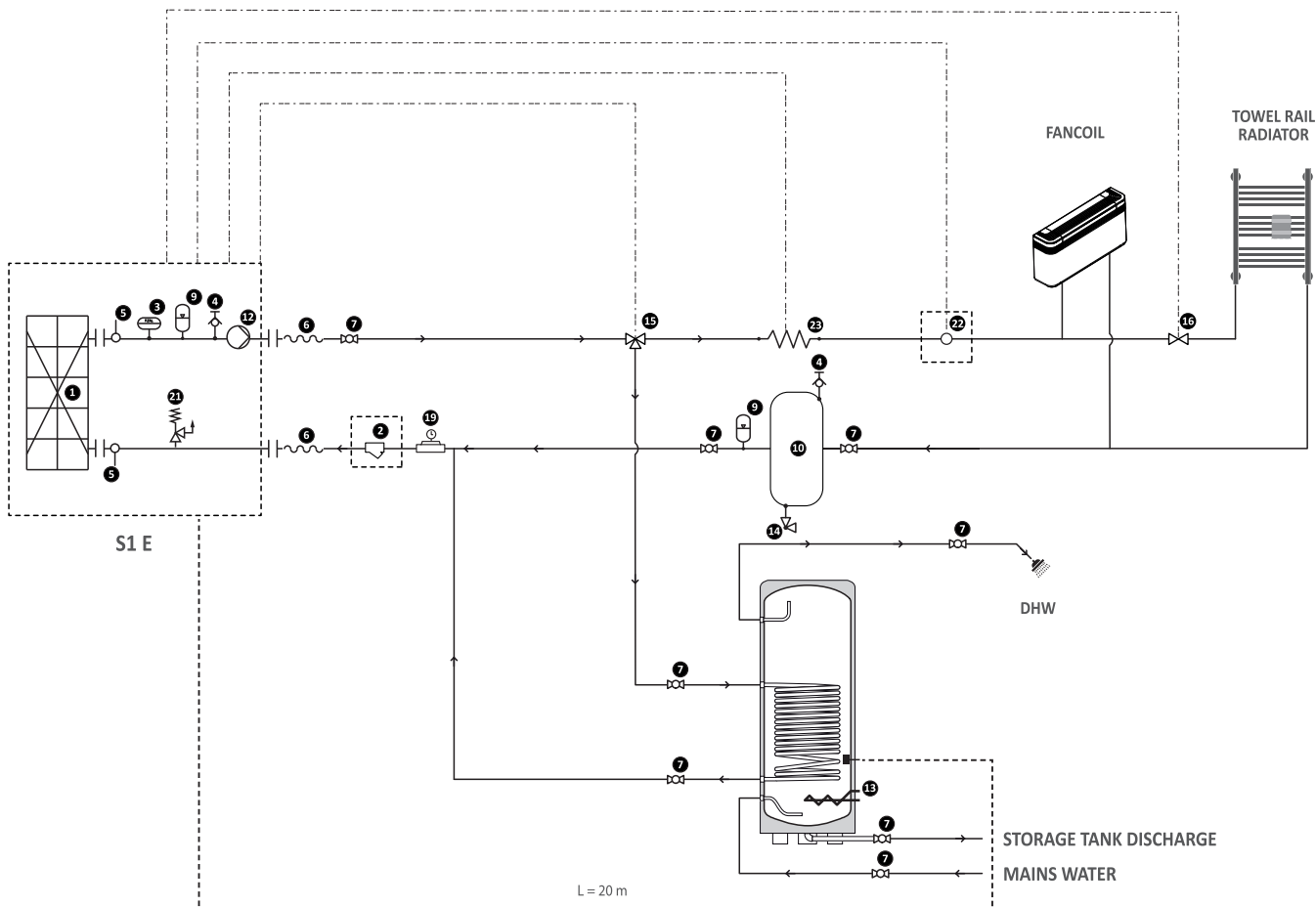
4. Air vent valve
6. Anti-vibration joints
7. Cut-off valve
9. Expansion Tank
10. System buffer tank (installation recommended whenever the system water content is less than that indicated in technical manual)
13. Antifreeze electric heater
14. Drain valve
15. 3 way valve
16. 2 way valve
18. Other thermal source
19. Automatic Filling Valve
22. Water temperature probe - SUPPLIED AS STANDARD (optional) (L= 5 m)
23. Additional electric resistance (power limit depends on end user).

ATTENTION:

In case of floor installation, the by-pass valve must be installed to ensure the circulation of a minimum water content to the system.

The water flow rate under which the protection device operates is approximately 450 l/h.

EXAMPLE 3 - CONFIGURATION: FANCOIL + TOWEL RAIL RADIATOR + DHW + ADDITIONAL ELECTRIC RESISTANCE



water features

System: Heat pump with plate heat exchanger	
pH (25°C)	6,8~8,0
Electric conductivity (25°C)	< 300 µS/cm
Total hardness (limestone CaCO ₃)	< 7 F
Temperature	< 60°C
Oxygen content	< 3 mg/L
Max. glycol amount	50%
Phosphates (PO ₄)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Iron (Fe)	< 0,3 mg/L
Alkalinity (CaCO ₃)	< 50 mg/L
Chloride ions (Cl ⁻)	< 50 mg/L
Sulphate ions (SO ₄)	< 50 mg/L
Sulphide ion (S)	none
Ammonium (count N)	< 0,5 mg/L
Silica (SiO ₂)	< 30 mg/L
Cloudy	< 1 NTU
Chloride	< 50 mg/L
Fluoride	< 1 mg/L
Nitrate (count N)	< 10 mg/L
Ammonia (count N)	< 0,5 mg/L
Natrium	< 150 mg/L

ATTENTION:

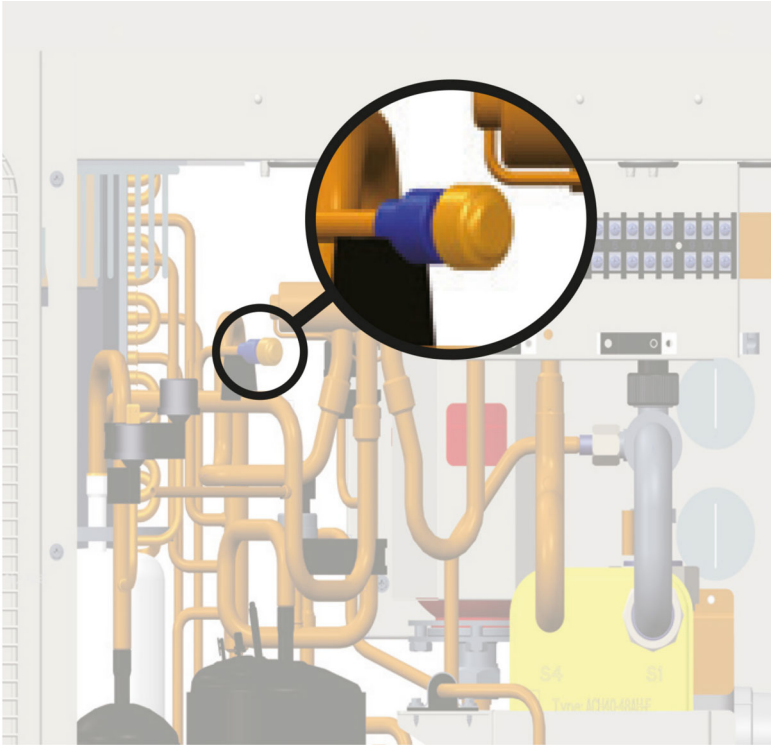
The other thermal source and the additional electric resistances cannot work simultaneously.

CHARGING AND DISCHARGING OF REFRIGERANT

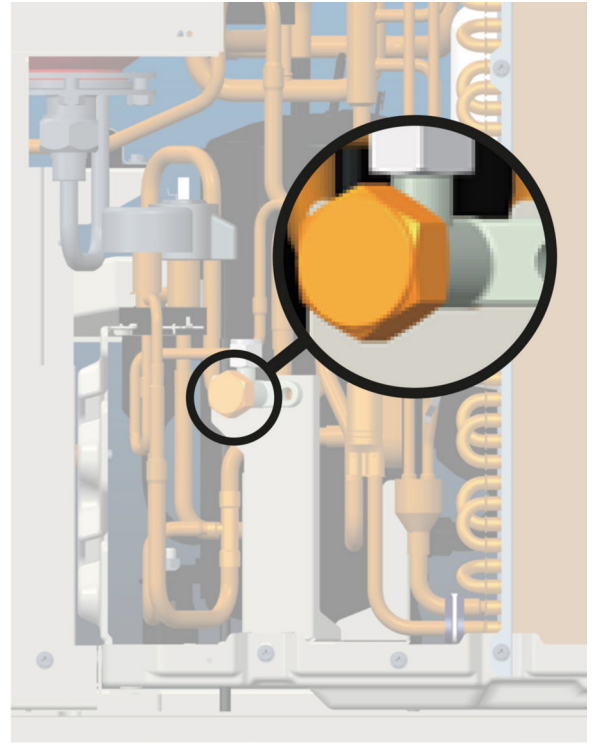
The unit has been charged with refrigerant before delivery. Overcharging or undercharging will cause the compressor to run improperly or be damaged. When refrigerant is required to be charged or discharged for installation, maintenance and other reasons, please follow steps below and nominal charged volume on the nameplate.

Discharging: remove metal sheets of the outer casing, connect a hose to the charging valve and then discharge refrigerant.

CHARGING VALVE 1

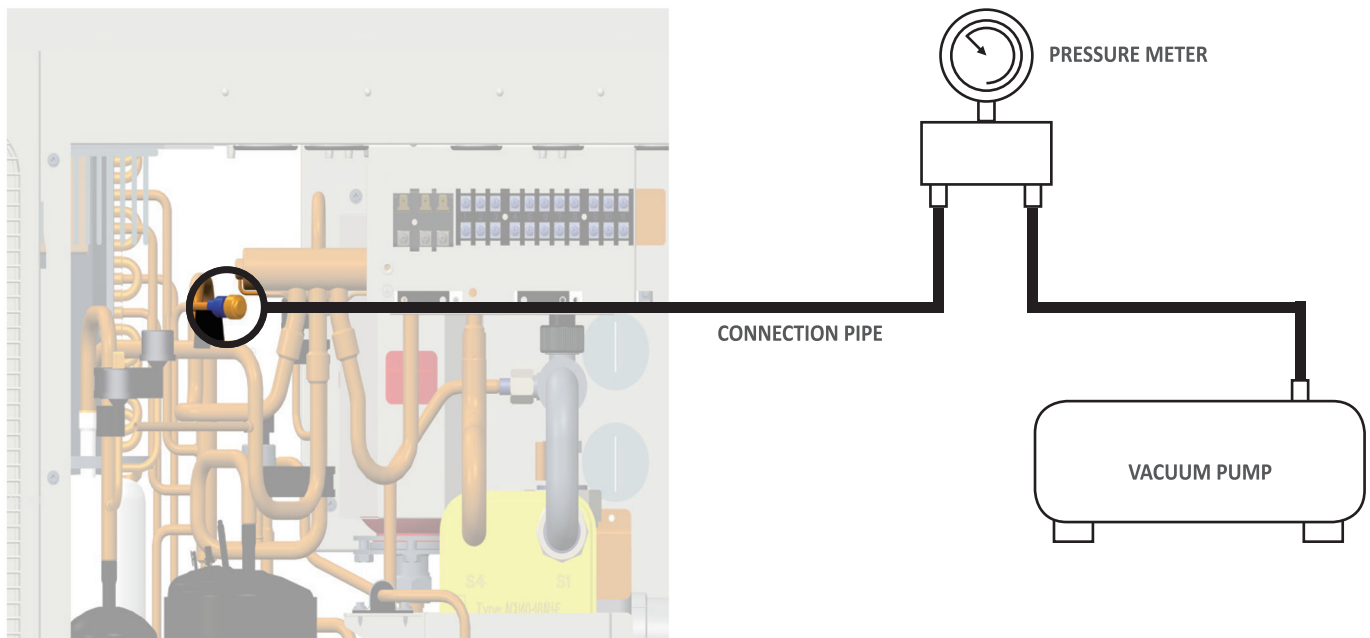


CHARGING VALVE 2



Notes

- (a) Discharge is allowed unless the unit has been stopped. (Cut off the power and repower it 1 minutes later)
- (b) Protective measures should be taken during discharging to avoid frost bites.
- (c) When discharging is finished, if vacuuming cannot be done immediately, remove the hose to avoid air or foreign matters entering the unit.
- (d) Vacuuming: when discharging is finished, use hoses to connect the charging valve, manometer and vacuum pump to vacuum the unit.



Note

when vacuuming is finished, pressure inside the unit should be kept lower than 80Pa for at least 30 minutes to make sure there is no leak. Either charging valve 1 or charging valve 2 can be used for vacuuming.

Charging: when vacuuming is finished and it is certain that there is no leak, charging can be done.

- (1) Be sure to charge the specified amount of refrigerant in liquid state.
- (2) Since this refrigerant is a mixed refrigerant, adding it in gas form may cause the refrigerant composition to change, preventing normal operation.
- (3) Before charging, check whether the refrigerant cylinder is equipped with a siphon tube or not.

LEAK DETECTION METHODS

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.

Electronic leak detector shall be used to detect flammable refrigerant, but the sensitivity may not be adequate, or may need re-calibration (Detection equipment shall be calibrated in a refrigerant-free area).

Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.

Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25% maximum) is confirmed.

Leak detection fluids are suitable for use with most refrigerant but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed / extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

NOTICE: Before and during operation, use an appropriate refrigerant leak detector to monitor the operation area and make sure the technicians can be well aware of any potential or actual leakage of inflammable gas. Make sure the leak detecting device is applicable to inflammable refrigerant. For example, it should be free of sparks, completely sealed and safe in nature.

ELECTRICAL CONNECTIONS

The units are completely wired at the factory and only require connection to the electric power supply mains, downstream from a unit switch, according to that envisioned by the Standards in force on this subject in the country of installation.

It is also advised to check that:

- The electrical mains features are suitable for the absorption values indicated in the electrical data table, also taking into consideration any other machines functioning at the same time.
- The unit is only powered when installation has been completed (hydraulic and electric).
- Respect the connection indications of the phase, and earth wires.
- The power supply line must have a relevant protection mounted upstream against short circuits and dispersions to earth, which isolates the system with respect to other utilities.
- The voltage must be within a tolerance of $\pm 10\%$ of the nominal power supply voltage of the machine (for unbalanced three-phase unit max 3% between the phases). Whenever these parameters are not respected, contact the electric energy public body.
- For electric connections, use the cables with double isolation according to the Standards in force on this subject in the different countries.

It is mandatory:

- The use of an omnipolar magnet circuit breaker switch, in compliance with the current Standards (contact opening at least 3 mm), with suitable cut-off power and differential protection on the basis of the electric data table shown below, installed as near as possible to the appliance.
- To make an effective earth connection. The manufacturer cannot be considered responsible for any damage caused by the lack of or ineffective appliance earth connection.
- For units with three-phase power supply, check the correct connection of the phases.

ELECTRICAL DATA

S1 E	Power supply	Recommended cable cross section (earth)	Recommended cable cross section (power cable)	Master switch
		(mm ²)	(mm ²)	(A)
6	220-240V ~ 50Hz	2,5	3G2,5	16
8	220-240V ~ 50Hz	2,5	3G2,5	16
12	220-240V ~ 50Hz	6	3G6	40
16	220-240V ~ 50Hz	6	3G6	40
12T	380-415V 3N ~ 50Hz	2,5	5G2,5	16
16T	380-415V 3N ~ 50Hz	2,5	5G2,5	16

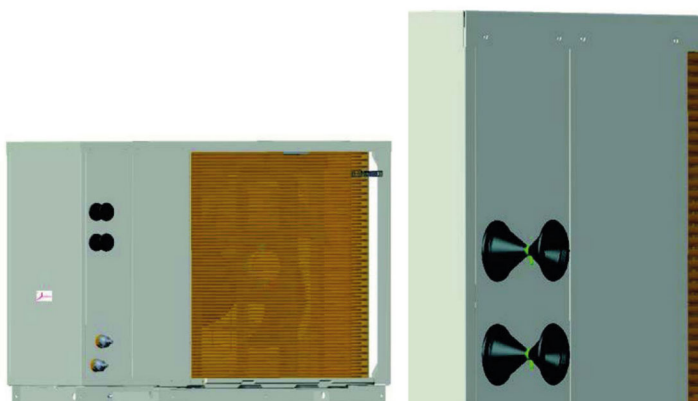
ATTENTION

- *All the electrical operations must be carried out by personnel in possession of the necessary qualifications by law, suitably trained and informed on the risks related to these operations.*
- *The characteristics of the electrical lines and of the related components must be determined by staff qualified to design electrical systems, in compliance with the international and national regulations of the place of installation of the unit and in compliance with the regulations in force at the moment of installation*
- *For the installation requirements refer only to the wiring diagram supplied with the unit. - The wiring diagram along with the manuals must be kept in good condition and always available for any future servicing on the unit.*
- *IT IS mandatory to verify that the machine is watertight before making the electrical connections and it must only be powered up after the hydraulic and electrical works have been completed.*

ELECTRICAL DATA

The cable section shown in the table are recommended for maximum lengths of 50m. For longer lengths or different cable laying, it is up to the PLANNER to calculate the appropriate line switch, the power supply line as well as the connection to the earth wire and connection cables depending on:

- The length
- The type of cable
- The absorption of the unit and the physical location, and the ambient temperature.

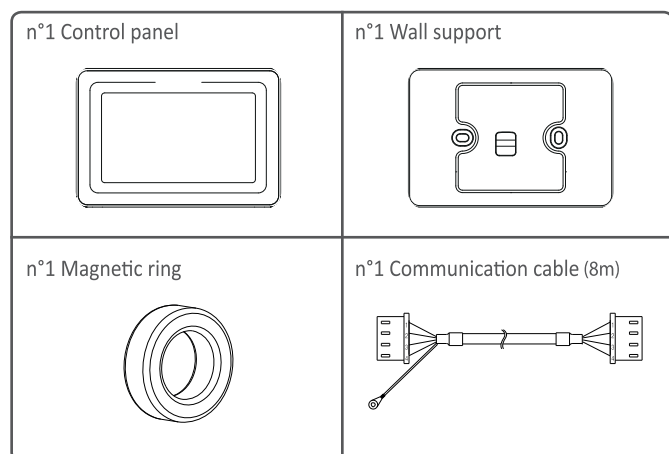


1. If necessary, remove the supplied original rubber rings, and replace them with long rubber rings (supplied).
2. The various power cables must pass through these rubber rings, such as; 2-way valve power cable, 3-way valve and general power cable. Be careful to separate the communication cables from the power cables.
3. Tighten the rubber rings after terminating the cable connection.

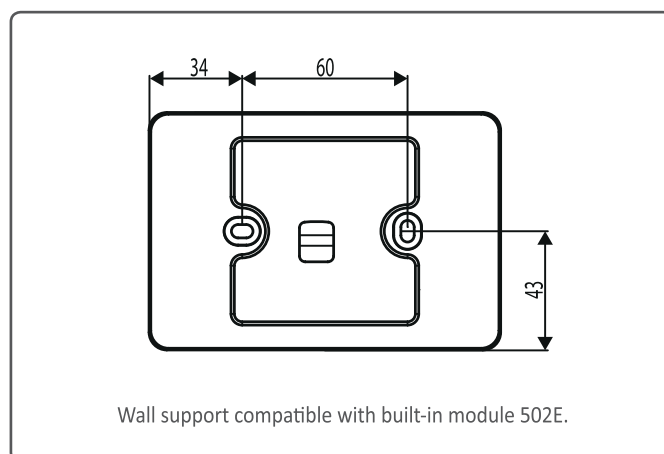
CONTROL PANEL CONNECTION (SUPPLIED AS STANDARD)

- Connect the control panel following the wiring diagram.
- The installation of the control panel is MANDATORY in enclosed spaces; outdoor installation is forbidden.

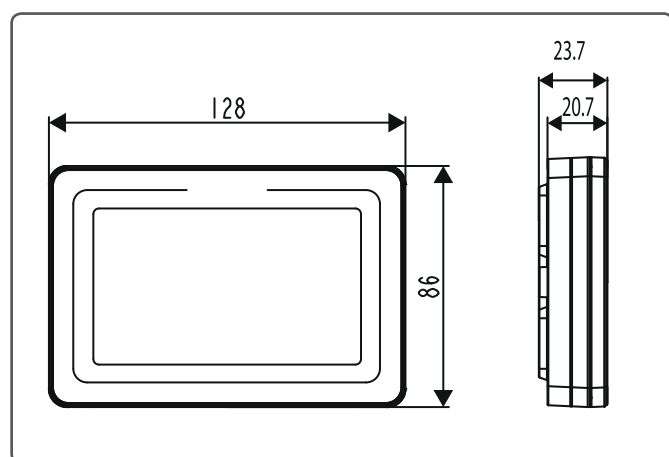
CONTROL PANEL KIT



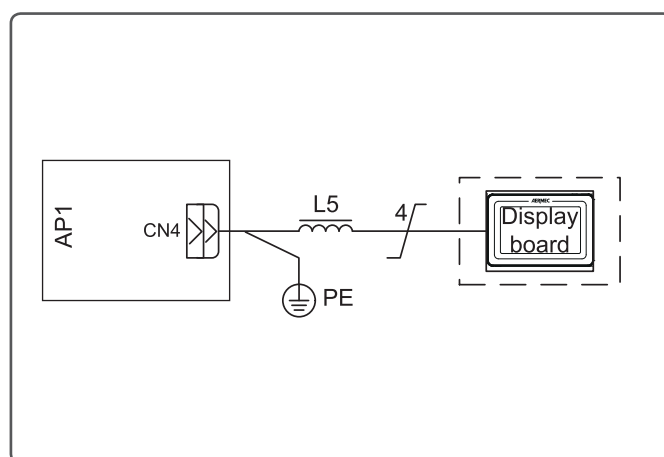
DIMENSIONS FOR WALL INSTALLATION (mm)



CONTROL PANEL DIMENSIONS (mm)



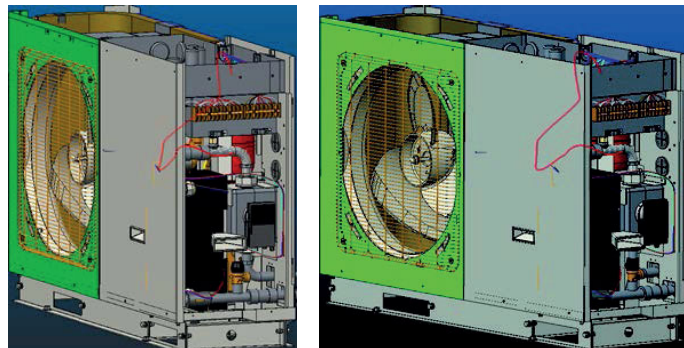
CONNECTION BETWEEN S1 E AND CONTROL PANEL



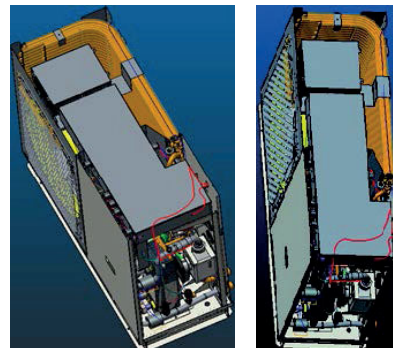
USE OF ADDITIONAL COMMUNICATION CABLE

For commission and troubleshooting, use the reserve communication cable (1,8m) to connect displayboard to review parameters and status of the unit.

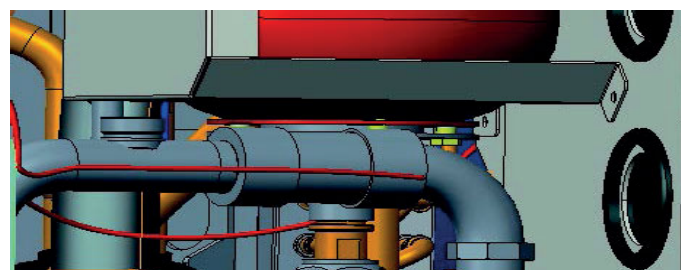
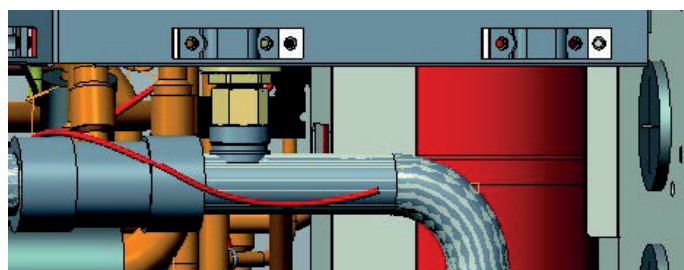
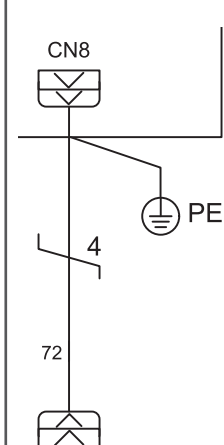
S1 E 6 - S1 E 8



S1 E 12 - S1 E 16



WIRING DIAGRAM



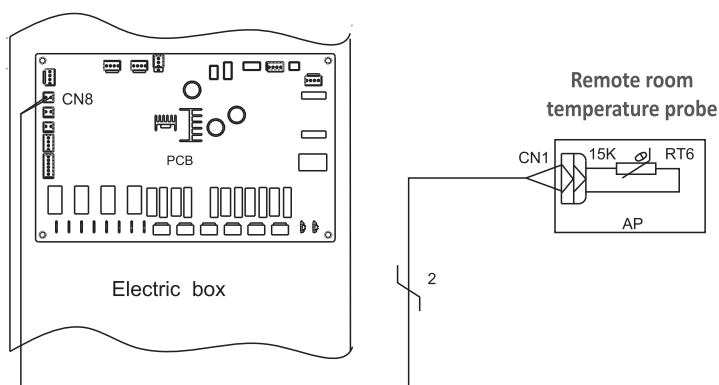
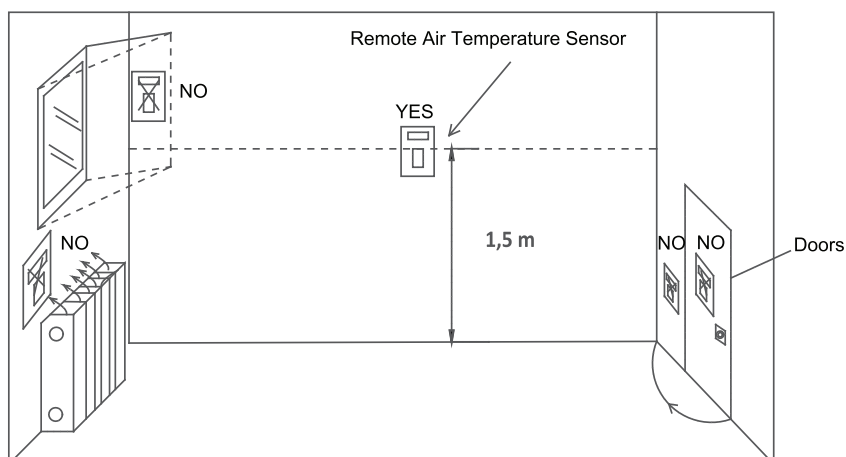
CONNECTING THE ROOM AIR TEMPERATURE PROBE (SUPPLIED AS STANDARD):



Front view



Rear view



WARNING:

- The distance between the Indoor unit and the remote room temperature probe must be less than 15m
- The height from the floor must be about 1.5m.
- The remote room temperature probe must not be positioned in areas which may be covered when doors or windows are open.
- The remote room temperature probe must not be positioned in areas affected by external thermal affects.
- The remote room temperature probe must be installed in areas where room heating is not generally used.
- To activate the remote room temperature probe control, once installed, use the control panel on board the machine and set the parameters indicated in the Instruction Manual.

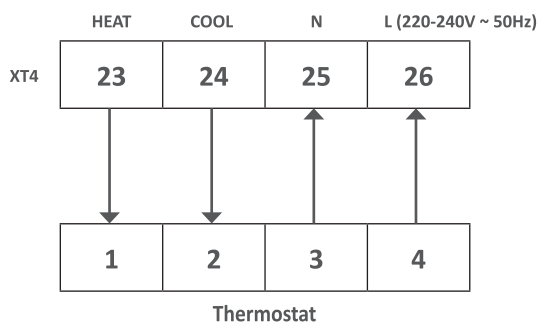
CONNECTING THE THERMOSTAT (NOT SUPPLIED AS STANDARD)

To connect the thermostat, remove the shell and connect the wires as indicated in the layout, paying close attention to the voltage rating of the thermostat supplied.

Power supply for the thermostat: utilizzare i morsetti 25 e 26 (220V) per l'alimentazione del Termostato.

Heating mode: the thermostat must enable the supply to terminal 23

Cooling mode: the thermostat must enable the supply to terminal 24



WARNING:

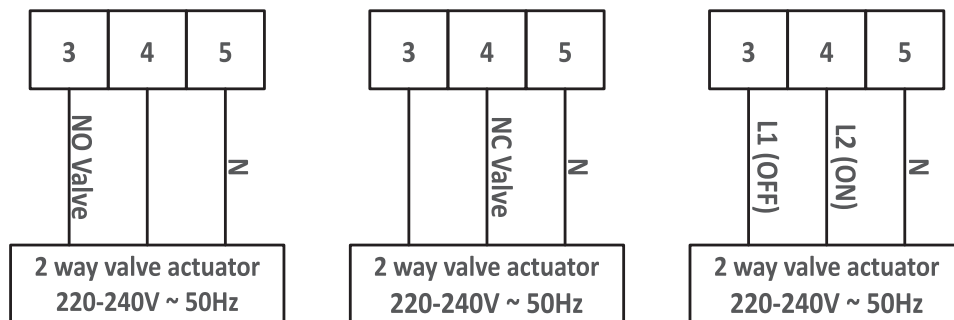
- The temperature setting of the thermostat (heating or cooling) must be selected within the temperature range set for the product.
- Do not connect external electrical loads; wires (L) and (N) must ONLY be used for the electrical thermostat.
- Do not connect external electrical loads such as valves, fan coils etc. (the printed circuits of the indoor unit may be seriously damaged).
- Do not use individual contacts to manage the unit but use them only through a suitable electronic thermostat.

CONNECTING THE 2-WAY VALVE (SUPPLIED AS STANDARD)

Electromechanic valve capable to intercept or divert the water flow, with the possibility to exclude part of the plant depending on the operating mode.

- **NORMALLY OPEN:** Connected to the wire (ON) and the wire (N).
- **NORMALLY CLOSED:** Connected to the wire (OFF) and the wire (N).

*Refer to the hydraulic diagrams shown in this manual.
For more information, refer to the user manual.*



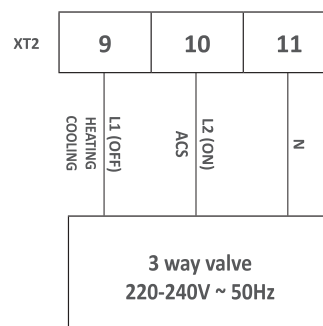
CONNECTING THE 3-WAY VALVE (SUPPLIED AS STANDARD)

The 3-way valve (SPDT 3 wire) is necessary to allow the DHW production and ambient cooling / heating.

SPDT: Single pole, double contact.

- The 3-way valve must switch to the DHW when the clamp is powered L2 (ON) + N.
- The 3-way valve must switch to the system terminals when the clamp is powered L1 (OFF) + N.

*Refer to the wiring diagrams shown in this manual.
For more information, refer to the user manual.*



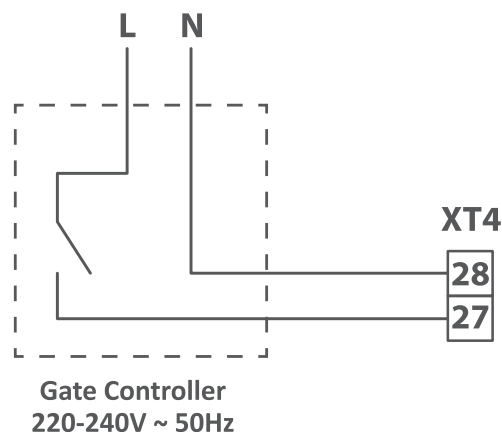
CONNECTING THE AUXILIARY DEVICE “GATE CONTROLLER” (NOT SUPPLIED AS STANDARD)

The auxiliary device allows the unit to be unusable if the device opens the circuit connected to the terminals indicated (for example, card reader for hotel applications); this device must provide a 220-240V ~ 50Hz AC signal in normal operating conditions.

WARNING:

To use the auxiliary device, enable it through the control panel on board the machine (more information is provided in the unit User Manual);
The system will be halted when the auxiliary device opens the circuit and interrupts the 220-240V ~ 50Hz AC signal.

*Refer to the hydraulic diagrams shown in this manual.
For more information, refer to the user manual.*

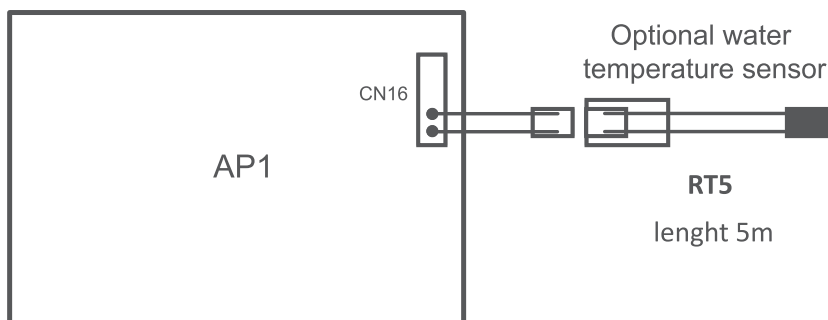
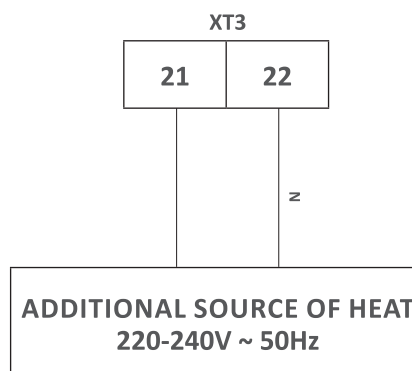


ON/OFF CONNECTION FOR ADDITIONAL HEAT SOURCE

The unit provides a signal 220-240V ~ 50Hz for activate an additional heat source.
For the logics or more information, refer to the user manual.

It is recommended to refer to EXAMPLE 2 for a correct installation; in particular:

- The additional heat source to be installed before of the 3-way valve.
- The optional water temperature sensor (RT5) standard supply it must necessarily be installed after of the 3-way valve on the branch of the plant terminals.
- Very ATTENTION to the set temperature on the additional heat source according to the logic set.
- In the case of an auxiliary generator, the probe checks whether the water temperature is greater than 60°C and stops the auxiliary generator to prevent this condition from occurring.
- **(Temperature Max. 60°C).**
- It is not possible to use at the same time the additional heat source with an additional resistance.



*Refer to the hydraulic diagrams shown in this manual.
For more information, refer to the user manual.*

CONNECTING THE ADDITIONAL ELECTRICAL RESISTANCE (NOT SUPPLIED AS STANDARD)

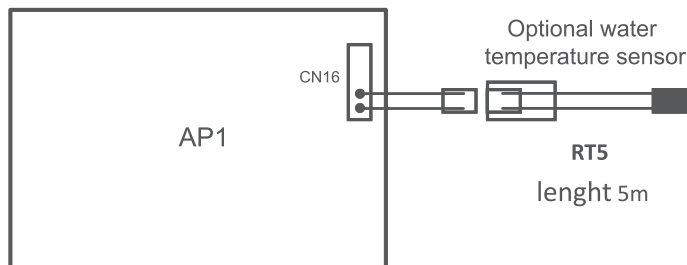
The unit provides a 220-240V ~ 50Hz signal to activate one or two additional electrical resistance. (Only heating mode).

For the logics or more information, refer to the user manual.

It is recommended to refer to EXAMPLE 3 for a correct installation;

in particular:

- The additional electrical resistance to be installed after 3-way valve.
- The optional temperature probe (RT5) standard supplied must necessarily be installed after of the additional resistances on the system terminals branch.
- It is not possible to use at the same time the additional heat source with an additional resistance.

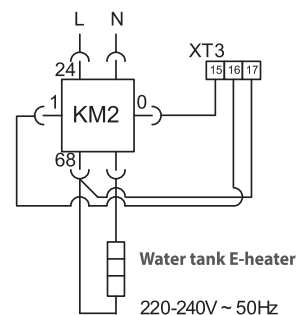
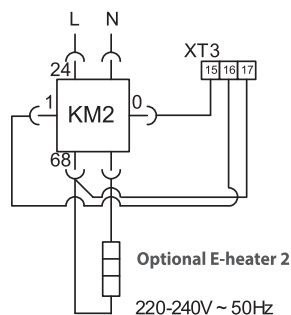
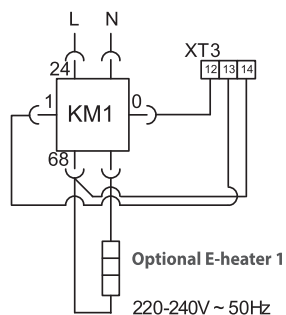


Refer to the hydraulic diagrams shown in this manual.

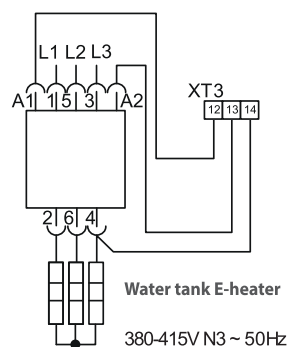
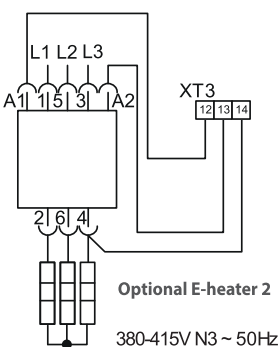
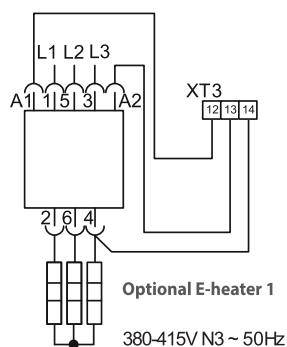
For more information, refer to the user manual.

Each additional electrical resistance must have a dedicated contactor (not supplied) and correctly dimensioned

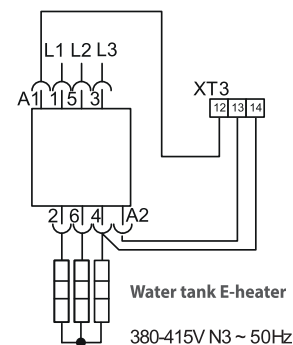
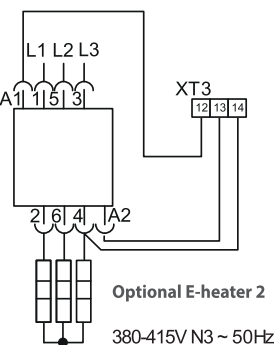
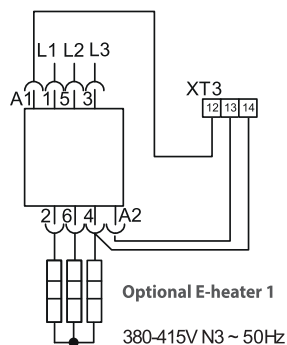
Single phase version

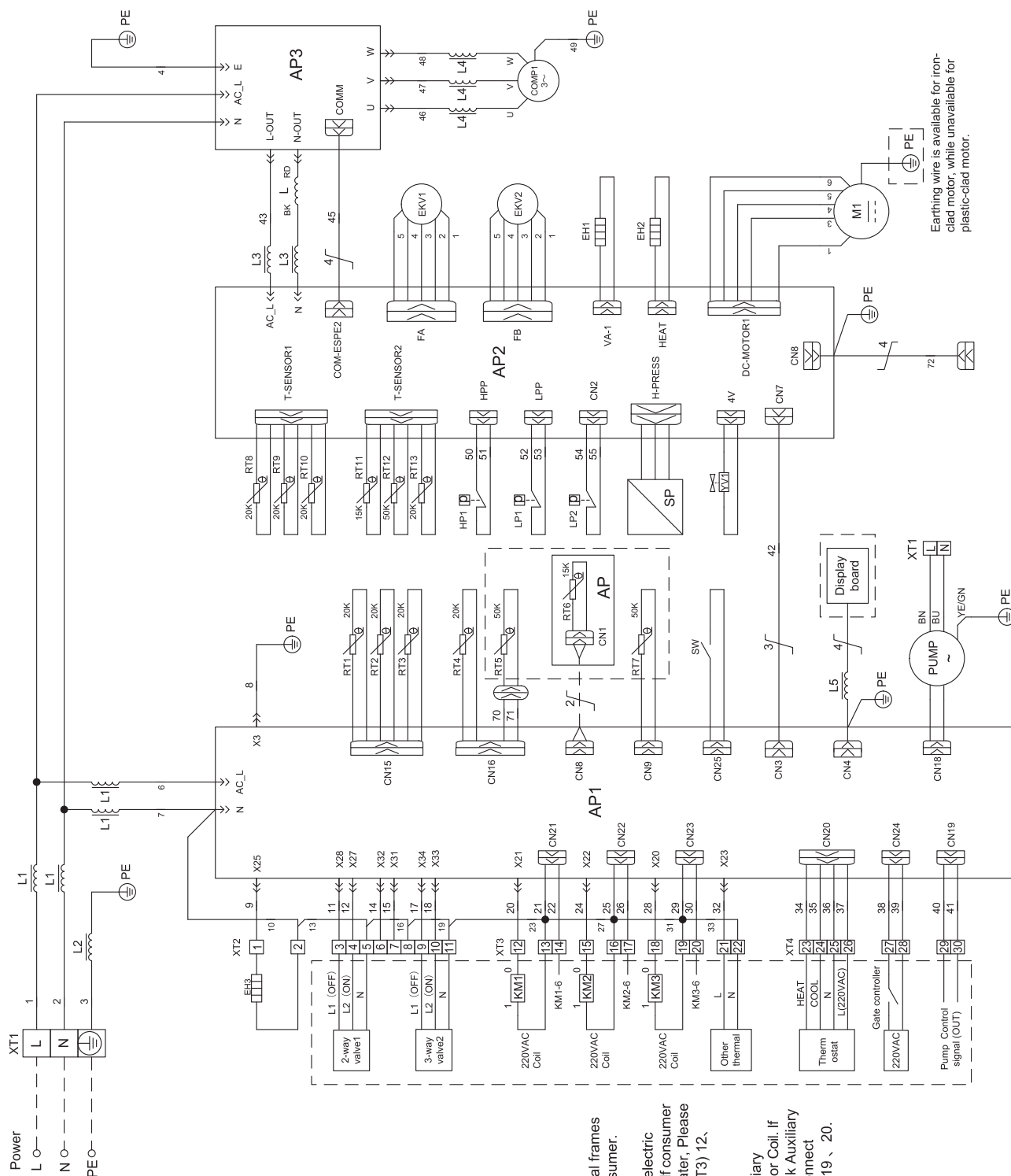


Three-phase version 1 case

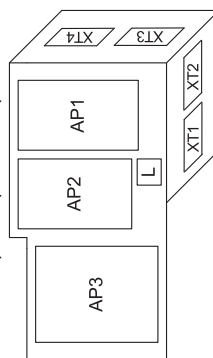


Three-phase version 2 case





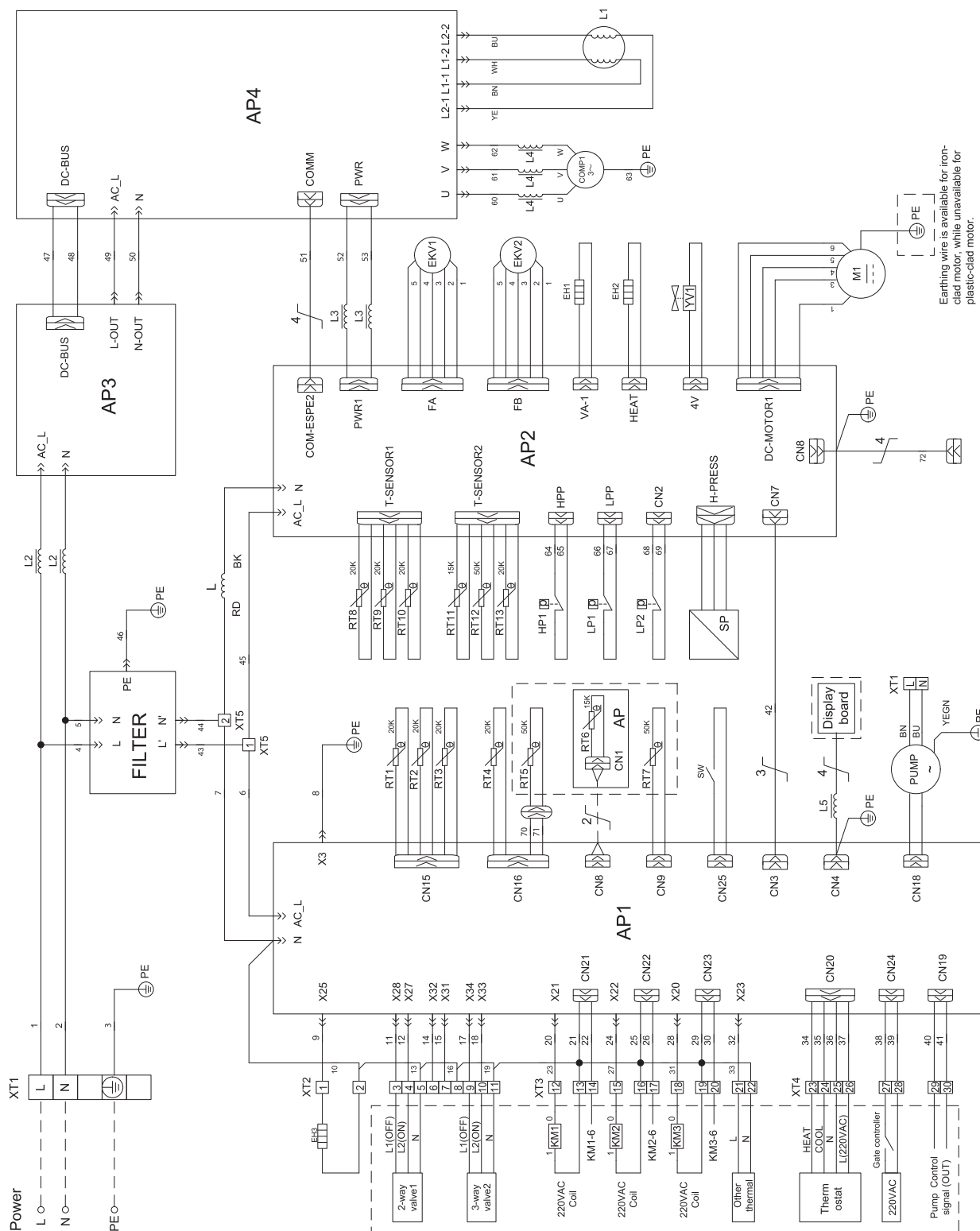
Electric component position map



Specification :

1. The wires in the imanal frames are connected by the consumer.
2. KM1, KM2 is Auxiliary electric heater AC contactor Coil. If consumer need Auxiliary electric heater, Please connect Terminal block(XT3) 12, 13, 14, 15, 16, 17.
3. KM3 is Water tank Auxiliary electric heater AC contactor Coil. If consumer need Water tank Auxiliary electric heater , Please connect Terminal block(XT3) 18, 19, 20.

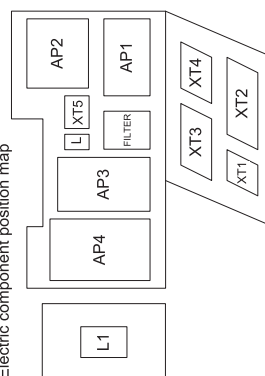
AP	Main board only for RT6
AP1	Indoor unit Main Board
AP2	Outdoor unit Min Board
AP3	Drive Board
COMP	Compressor
EH1	Bottom band heater
EH2	Compressor band heater
EH3	Plate heat exchanger anti-freezing
EKV1	Electronic expansion valve coil1
EKV2	Electronic expansion valve coil2
HP1	High pressure switch
KM1	Optional electric heater 1 AC contactor
KM2	Optional electric heater 2 AC contactor
L	Electrical Inductance
L1~L5	Magnetic ring
LP1	Low pressure switch for heating
LP2	Low pressure switch for cooling
M1	Motor
PUMP	Indoor unit pump
RT1	Water in temp. Sensor of the whole unit
RT2	Water out temp. Sensor of the whole unit
RT3	Liquid pipe temp. Sensor
RT4	Gas pipe temp. Sensor
RT5	Optional water temp sensor
RT6	Remote room temp. Sensor
RT7	Boiler water temperature probe
RT8	Inlet temp sensor of economizer
RT9	Outlet temp sensor of economizer
RT10	Defrosting temp sensor
RT11	Outdoor temp sensor
RT12	Discharged temp sensor
RT13	Suction temp sensor
SP	High pressure sensor
SW	Waterflow switch
XT1	Power terminal block
XT2	Terminal block (1~11)
XT3	Terminal block (12~22)
XT4	Terminal block (23~30)
YV1	4 way valve coil



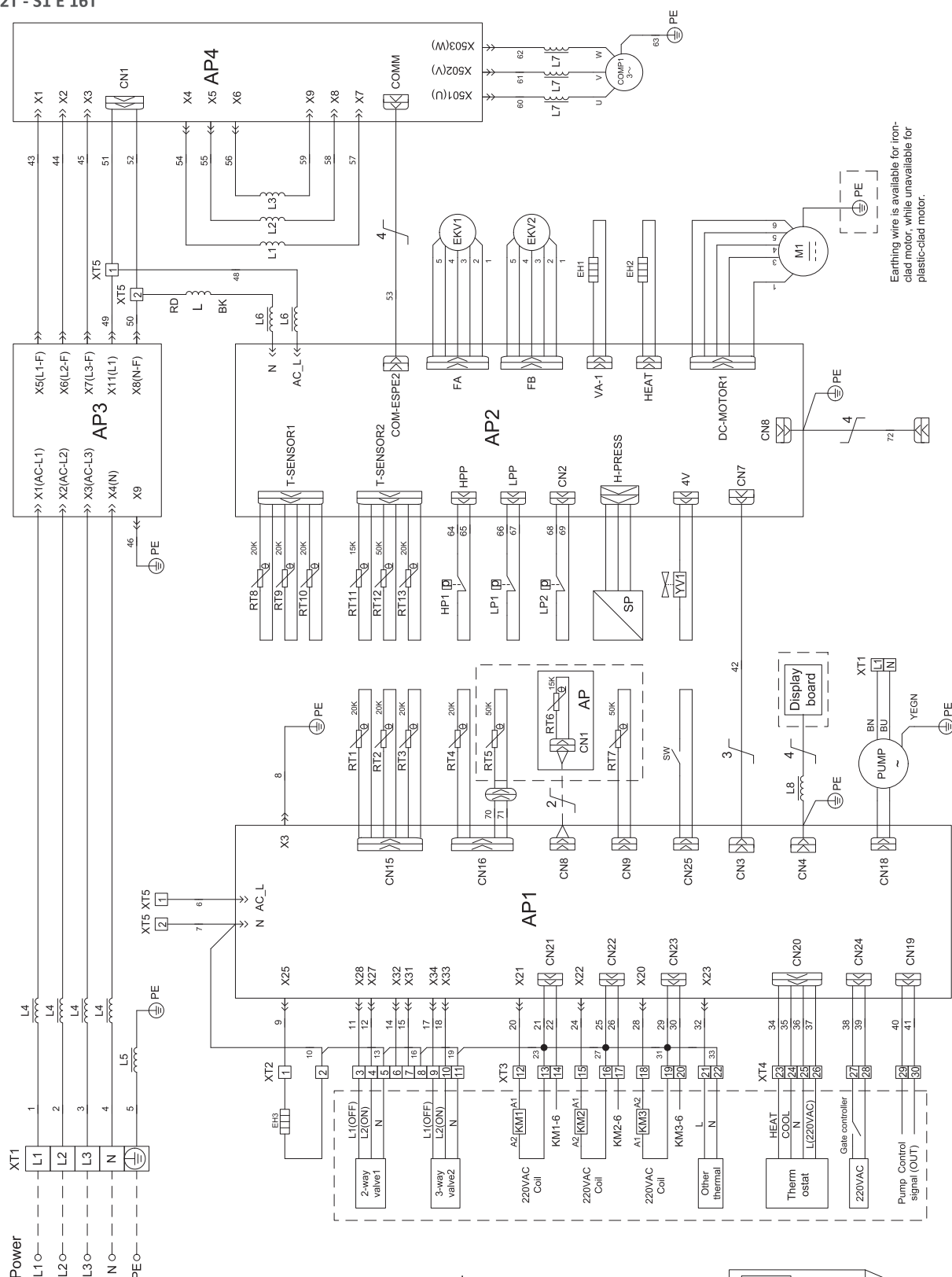
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Electric component position map

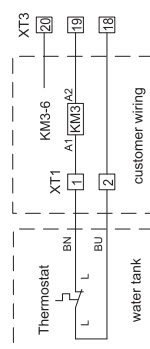


AP	Main board only for RT6
AP1	Indoor unit Main Board
AP2	Outdoor unit Min Board
AP3	Filter board
AP4	Drive Board
COMP1	Compressor
EH1	Bottom band heater
EH2	Compressor band heater
EH3	Plate heat exchanger anti-freezing
EKV1	Electronic expansion valve coil1
EKV2	Electronic expansion valve coil2
FILTER	Filter
HP1	High pressure switch
KM1	Optional electric heater 1 AC contactor
KM2	Optional electric heater 2 AC contactor
L	Electrical Inductance
L1	PFC Electrical Inductance
L1~L5	Inductor
LP1	Low pressure switch for heating
LP2	Low pressure switch for cooling
M1	Motor
PUMP	Indoor unit pump
RT1	Water in temp. Sensor of the whole unit
RT2	Water out temp. Sensor of the whole unit
RT3	Liquid pipe temp. Sensor
RT4	Gas pipe temp. Sensor
RT5	Optional water temp sensor
RT6	Remote room temp. Sensor
RT7	Boiler water temperature probe
RT8	Inlet temp sensor of economizer
RT9	Outlet temp sensor of economizer
RT10	Defrosting temp sensor
RT11	Outdoor temp sensor
RT12	Discharged temp sensor
RT13	Suction temp sensor
SP	High pressure sensor
SW	Waterflow switch
XT1	Power terminal block
XT2	Terminal block (1~11)
XT3	Terminal block (12~22)
XT4	Terminal block (23~30)
XT5	Terminal block (1~2)
YV1	4 way valve coil

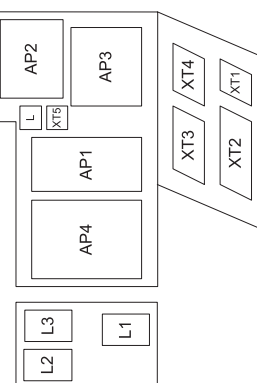


Specification :

1. The wires in the inmaninal frames are connected by the consumer.
2. KM1, KM2 is Auxiliary electric heater AC contactor Coil. If consumer need Auxiliary electric heater, Please connect Terminal block(XT3) 12、13、14、15、16、17.
3. KM3 is Water tank Auxiliary electric heater AC contactor Coil.
Please connect Terminal block(XT3) 18、19、20.
In case the water tank thermostat is not connected it must be connected in series to the circuit of the water tank contactor, as shown in the figure below:



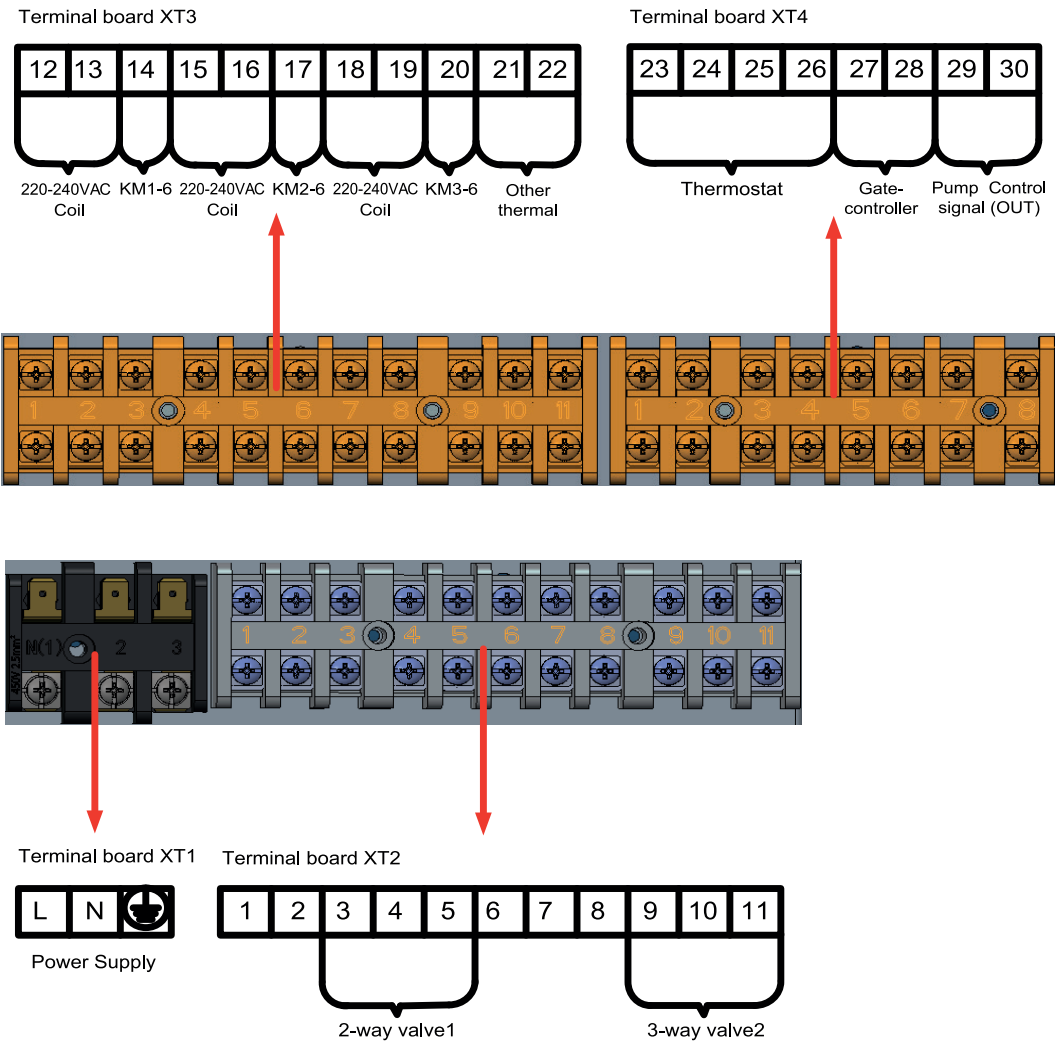
Electric component position map

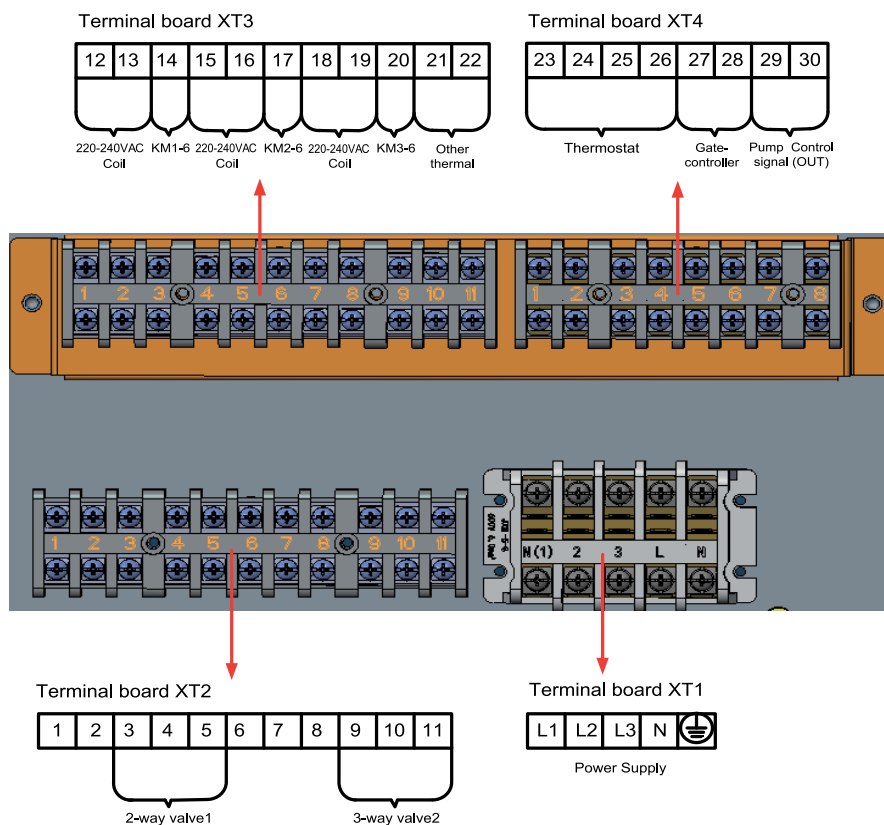
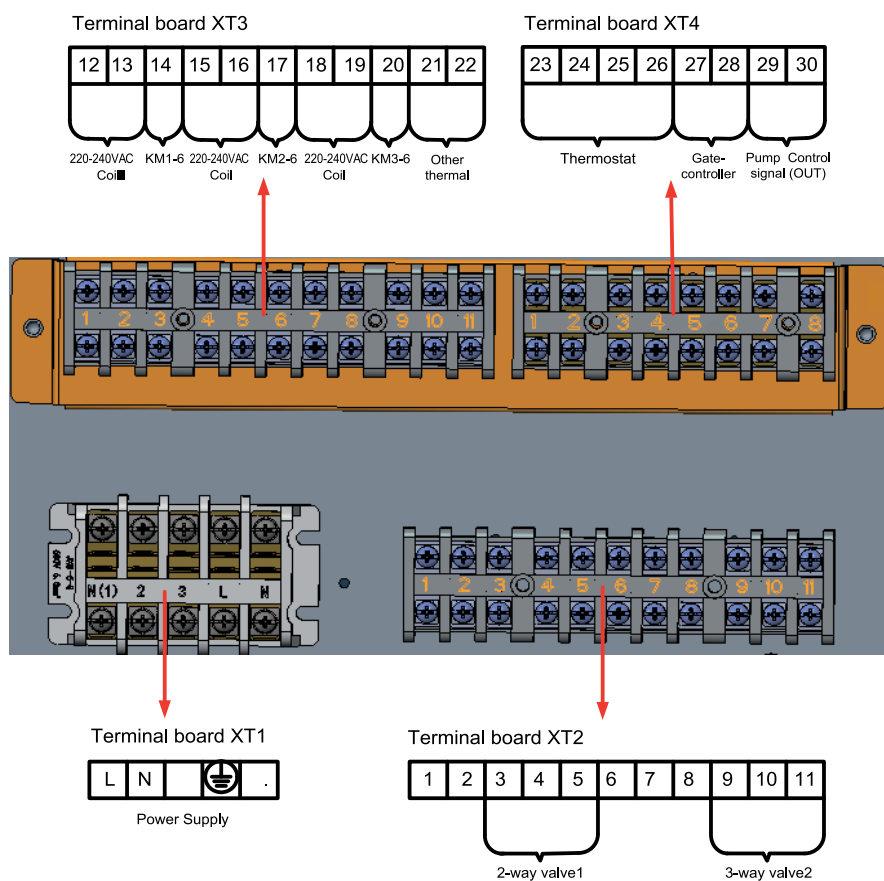


AP	Main board only for RT6
AP1	Indoor unit Main Board
AP2	Outdoor unit Min Board
AP3	Filter board
AP4	Drive Board
COMP1	Compressor
EH1	Bottom band heater
EH2	Compressor band heater
EH3	Plate heat exchanger anti-freezing
EKV1	Electronic expansion valve coil1
EKV2	Electronic expansion valve coil2
FILTER	Filter
HP1	High pressure switch
KM1	Optional electric heater 1 AC contactor
KM2	Optional electric heater 2 AC contactor
L	Electrical Inductance
L1~L3	Inductor
L4~L8	Magnetic ring
LP1	Low pressure switch for heating
LP2	Low pressure switch for cooling
M1	Motor
PUMP	Indoor unit pump
RT1	Water in temp. Sensor of the whole unit
RT2	Water out temp. Sensor of the whole unit
RT3	Liquid pipe temp. Sensor
RT4	Gas pipe temp. Sensor
RT5	Optional water temp sensor
RT6	Remote room temp. Sensor
RT7	Boiler water temperature probe
RT8	Inlet temp sensor of economizer
RT9	Outlet temp sensor of economizer
RT10	Defrosting temp sensor
RT11	Outdoor temp sensor
RT12	Discharged temp sensor
RT13	Suction temp sensor
SP	High pressure sensor
SW	Waterflow switch
XT1	Power terminal block
XT2	Terminal block (1~11)
XT3	Terminal block (12~22)
XT4	Terminal block (23~30)
XT5	Terminal block (1~2)
YV1	4 way valve coil

TERMINAL BOARD

S1 E 6 - S1 E 8





COMMISSIONING - WARNINGS

START-UP

OPERATIONS TO BE PERFORMED WITH NO VOLTAGE PRESENT

ATTENTION

the unit is not working:

Check:

- All safety conditions have been respected
- The unit is correctly fixed to the support surface
- The minimum technical spaces have been respected
- That the main power supply cables have appropriate cross-section, which can support the total consumption of the unit. (see electric data sections) and that the unit has been duly connected to the ground.
- That all the electrical connections have been made correctly and all the terminals adequately tightened.

OPERATIONS TO BE PERFORMED WITH THE UNIT LIVE

ATTENTION

the unit is still not working:

- Supply power to the unit by turning the master switch to the ON position.
- Use a tester to verify that the value of the power supply voltage to the phases is equal to $400V \pm 10\%$; also verify that the unbalance between phases is no greater than 3%.
- Check that the connections made by the installer are in compliance with the documentation.
- Verify that the resistor of the compressor sump is working by measuring the increase in temperature of the oil pan. The resistance/s must function for at least 12 hours before start-up of the compressor and in any event, the temperature of the oil pan must be 10-15°C higher than room temperature.

HYDRAULIC CIRCUIT CONTROLS

- Check that all hydraulic connections are made correctly, that the plate indications are complied with and that a mechanical filter has been installed in each inlet heat exchanger. **(Mandatory component for warranty to be valid).**
- Make sure that the circulation pump/s is operating and that the water flow rate is sufficient to close the contact of the flow switch, if installed.
- Check the water flow rate, measuring the pressure difference between inlet and outlet of the evaporator and calculate the flow rate using the evaporator pressure drop tables present in this manual.
- Check the correct functioning of the flow meters if installed. Closing the cut-off valve at the output of the heat exchanger; the unit control panel must show the block. Finally re-open the valve and rearm the block

COMMISSIONING

- Once all the aforementioned checks have been carried out, the unit can be commissioned
- Close the door of the electrical panel.
- Set the unit main switch to ON, the unit will start after a few minutes

OPERATIONS TO BE PERFORMED WITH MACHINE ON

ATTENTION

the unit is working:

Check:

- That the compressor input current is lower than the maximum indicated in the electrical data table.
- Before starting the unit, check that the compressor rotates in the correct direction through a three-phase protection. The spiral compressors compress in one direction of rotation only. Therefore, it is essential for the phase of the three-phase spiral compressors to be correctly connected (the correct direction of rotation can be controlled when the pressure on the intake side decreases and that on the flow side increases with the compressor in operation). If the connection is incorrect, the direction of rotation is reversed: this causes a loud noise and the reduction of current consumption. In this case, the protection system inside the compressor activated turning off the unit. To solve the problem, disconnect and swap the wires between two of the phases, then connect the three-phases again.
- That the voltage value lies within the pre-fixed limits and that unbalance between the three phases (three-phase power supply) is not above 3%.
- If having to take measurements and perform checks that require the machine to run, you must:
 - make sure that any remote control systems are disconnected; however, keep in mind that the PLC on the machine controls its functions and can enable and disable the components creating hazardous situations (e.g. power and rotate the fans and their mechanical drive systems).
 - Operate with the electrical board open the shortest time possible
 - Close the electrical board as soon as the single measurement or control is performed

ATTENTION

The anti-freeze set temperature can only be varied by an authorised after-sales centre and only after having checked that there is a suitable % of anti-freeze solution in the water circuit.

Whenever this alarm intervenes, call the nearest authorised after-sales service immediately

- Water flow alarm control, the unit provides for the management of a water flow alarm controlled by a differential pressure switch or a flow switch if provided. This type of security can intervene after the first 30 sec. of pump operation, if the water flow rate is not sufficient (minimum flow rate for all models equal to 450 l/h), the intervention will block the compressor and the pump itself.

MAINTENANCE

ATTENTION

Any cleaning, inspection, control, routine and extraordinary maintenance must be performed by experienced, authorised personnel and qualified to perform the above tasks. These tasks must be performed to perfection as prescribed by M.D. 37/2008.

During the execution of

- Risks of electric discharges;
- Risk of injuries due to the presence of rotating parts;
- Risk of injuries due to the presence of sharp edges and heavy weights;
- Risks of injuries due to the presence of components containing high pressure gas;
- Risks of injuries due to high or low temperature components.
- Noise-related risks of the machine functioning;
- Risks related to the presence of harmful substances in hydronic circuits.

These tasks must be performed using the appropriate personal protective equipment, see figure below

Maintenance operations are essential to maintain the refrigerant unit efficient, from a purely functional point of view and with regard to energy and safety.

In the absence of specific regulations regarding HFO refrigerants, the manufacturer prescribes the application of and compliance with that indicated in the:

- Regulation (EC) No.842/2006- art.3 concerning the "leakage containment"
- Regulation (EC) No.1516/2007 concerning the "standard leakage checking requirements" and related national laws implementing the above European regulations.

ATTENTION

For the unit, the user must provide a system booklet which he must ensure, or its designee authorised to service the machine, will contain all required records in order to have a historical documentation of the unit functioning. The absence of records in the booklet may count as evidence of lack of maintenance..

PRECAUTIONS TO BE OBSERVED DURING MAINTENANCE

ATTENTION

Maintenance operations can only be performed by authorised technicians

PRECAUTIONS AGAINST RESIDUAL RISKS

MECHANICAL RISKS

- Before opening a machine panel, ascertain whether it is or not firmly connected to it by hinges;
- In case a piece is disassembled, make sure it is correctly reassembled before restarting the unit;
- Louvers of the heat exchangers, edges of the components and panels, screws can generate cuts;
- Do not remove the protections from mobile elements while the unit is running;
- Make sure that the protections of mobile elements are correctly in place before restarting the unit;
- It is not permitted to walk or place other bodies on the machine;
- Fans, motors and belt drives may be in motion, always wait for them

to stop and take appropriate precautions to prevent their activation before accessing them;

- Isolate the unit from the mains by means of the external isolator provided for the insertion of padlocks (up to 3) for blocking in "open" position.
- Place a sign reading "Do not turn on - maintenance in progress" on the open isolator
- Equip yourself with the appropriate personal protective equipment (helmet, insulated gloves, protective goggles, accident-prevention shoes, etc.)
- Equip yourself with tools in good condition and make sure to have fully understood the instructions before using them
- For outdoor units, do not perform interventions in dangerous weather conditions such as rain, snow, fog, etc.
- The cooling circuit contains under pressure refrigerant gas: any operation must be performed by competent personnel in possession of the authorisations and qualifications required by current laws

ATTENTION

it is forbidden to LOAD the cooling circuit with a refrigerant gas different from that indicated. Using different refrigerant gas can severely damage the unit

- never disperse the fluid contained in the cooling circuit in the environment
- never keep the cooling circuit open, because the oil absorbs humidity and degrades
- during venting protect yourself against any leakage of fluids at dangerous temperatures and/or pressures
- always use appropriate equipment (extractor, antistatic bracelet, etc.) when replacing electronic boards
- if replacing a motor, compressor, evaporator, condensing coils or any other heavy element, make sure that the lifting devices are compatible with the weight to be handled
- in air units with independent compressor compartment, do not access the fan compartment without having first disconnected the machine through the isolator on the board and having placed a sign reading "Do not turn on - maintenance in progress"
- contact the company if changes must be made to the refrigerant, hydraulic or electric diagram of the unit, as well as its control logic

PREVENTION OF CHEMICAL / FIRE / ENVIRONMENTAL RISKS

- Any intervention on the machine must be performed with "NO SMOKING";
- The water circuit may contain harmful substances. Prevent the contents coming into contact with skin, eyes and clothing. Use the prescribed personal protective equipment. (chemical risk);
- If there is a need to perform a braze-welding, so with the use of special torch with naked flame, the same flame must only be activated if in the absence of freon gas in the environment and on the cooling circuit pipes. Inside piping must be "washed" and contain nitrogen type inert gas. The presence of flame and freon gas decomposes the same, forming lethal and carcinogenic compounds.
- Hot works require the availability of a Carbon Dioxide (CO₂) fire extinguisher. DO NOT USE WATER, leachates could be hazardous for the discharges; if using water, provide a containment tank.

PREVENTION AGAINST RESIDUAL RISKS DUE TO PRESSURE OR HIGH/LOW TEMPERATURE

- The unit contains under pressure gas: no operation must be performed on under pressure equipment except during maintenance that

- must be carried out by competent and authorised personnel;
- Perform brazing or welding only on empty pipes and clear of any lubricating oil residues; do not near flames or other heat sources to the pipes containing under pressure fluids;
- Do not work with naked flames near the unit;
- Do not bend or hit pipes containing under pressure fluids;
- The unit is equipped with overpressure release devices (safety valve): if these devices intervene, the refrigerant gas is released at high temperature and speed;
- The machine and the pipes have very hot or very cold surfaces that lead to risk of burns by contact;
- Do not use your hands to control any refrigerant leaks;
- Before removing elements along the under pressure hydronic circuits, shut-off the pipe section involved and gradually drain the fluid until its pressure and that of the atmosphere are balanced.

PREVENTION AGAINST RESIDUAL ELECTRICAL RISKS

- Before opening the electrical panel, disconnect the unit from the mains by means of the external isolator;
- Wait the time indicated on the machine plate from when the power supply was disconnected from the unit before accessing inside the electrical panel;
- If the unit is equipped with integrated inverter type compressors, disconnect the power supply and wait at least 5 minutes before accessing for maintenance: the internal components remain live for this time, generating the risk of electrocution.
- If the power supply cable is damaged, it must be replaced by the manufacturer, After Sales Service or by another similarly qualified person, to avoid dangerous situations.

CLEANING THE MACHINE

The machine must be turned off and electrically disconnected when being cleaned.

INSPECTION AND CONTROL

The machine must be turned off and electrically disconnected during its inspection and leak check.

ROUTINE AND EXTRAORDINARY MAINTENANCE

The machine must be turned off and electrically disconnected during its maintenance (with possible replacement of components). In particular:

- Before any intervention, isolate the unit from the mains by means of the external isolator provided for the insertion of padlocks (up to 3) for blocking in "open" position;
- Place a sign reading "Do not turn on – maintenance in progress" on the open isolator;
- Equip yourself with tools in good condition and make sure to have fully understood the instructions before using them;
- Equip yourself with the appropriate personal protective equipment as indicated in paragraph 1 of this report;
- For outdoor units, do not perform interventions in dangerous weather conditions such as rain, snow, fog, thunderstorms, etc;
- The cooling circuit components must be replaced after draining the refrigerant gas contained in the circuit;
- During venting protect yourself against any leakage of fluids at dangerous temperatures and/or pressures;
- Always use appropriate equipment (extractor, antistatic bracelet etc) when replacing electronic boards;
- If replacing a motor, compressor, evaporator, condensing coil or any

other heavy element, make sure that the lifting devices are compatible with the weight to be handled;

- In air units with independent compressor compartment, do not access the fan compartment without having first disconnected the machine through the isolator on the board and having placed a sign reading "Do not turn on – maintenance in progress";
- Always and only use original spare parts purchased directly from OLIMPIA or from official dealers. Contact OLIMPIA should it be necessary to move the unit one year after its positioning on-site or it must be dismantled;
- It is not permitted to change the refrigerant, hydraulic or electric layout of the unit, or its control logic unless expressly authorised by OLIMPIA;
- The machine must be loaded with the refrigerant in the feature label and in the required quantity;
- Make sure to have removed all tools, electrical cables or other loose object and having perfectly connected the machine to the system before closing it and starting it;
- The inspections and measurements necessary to establish the correct functioning of the machine to be run with the machine in operation, must be performed with the machine closed (framework fixed on the machine), reading the measurements collected by the control board and viewable in the control panel of the same. In the case of machines with cooling circuit compartment open, stand in front of the control panel of the electrical panel remaining distant and not exposed to the under pressure parts of the cooling circuit

ATTENTION

When having to take measurements with the machine on and the electrical panel and cooling circuit open, be careful since the machine is live, the cooling circuit contains high pressure gas, the pipes may be hot or cold, some parts may be in motion.

Any absorption measurements of the compressors, compressor casings, pumps and fans as well as the power supply measurements, must be taken as follows:

- With machine off, access its panel;
- Connect the measuring instruments such as current clamps (to measure the current) and multimeters (to measure the voltage). These instruments must be fitted with appropriate terminals/clamps that allow to remotely control the measurement;
- Access the machine and read the measurements made by the instruments, keeping AWAY from live electrical parts;
- As soon as the measurements are taken, turn off the machine, remove the instruments and close the electrical panel.

The measurements of the compressor inlet and outlet temperature and pressure to determine the overheating and subcooling of the machine, must be carried out as follows:

- With machine off, access its cooling circuit;
- Connect the necessary instruments,
 - Pressure gauges connected through appropriate extensions to the compressor inlet and outlet pressure plugs;
 - Thermometers connected to thermocouple probes that are fixed to the compressor inlet and outlet pipes. Avoid using metratst that require the operator to near the machine cooling circuit;
- Access the machines **and acquire the measurements, keeping AWAY from the under pressure parts of the cooling circuit;**
- As soon as the measurements are taken, turn off the machine, remo-

ve the instruments and close the cooling circuit compartment.

The high/low pressure switch, where present must be tested with the machine “closed”, reading the high pressure circuit pressure on the machine control panel.

In case of machines with the cooling circuit compartment not closed by framework, the high/low pressure switch must be tested by standing in front of the machine panel where the control panel is located, remaining distant and not exposed to the under pressure parts of the cooling circuit.



Warning;
Hot surface



Warning;
Electricity



Warning;



Warning;
Flammable material



Warning;
Sharp element



Warning;
Biological hazard



Wear head
protection



Wear protective
gloves



Wear eye protection



Wear ear protection



Wear safety
footwear

Notice before Seasonal Use

1. Check whether air inlets and air outlets of indoor and outdoor units are blocked;
2. Check whether ground connection is reliable or not;
3. If unit starts up after not operating for a long time, it should be power on 8 hours before operation starts so as to preheat the outdoor compressor;
4. Precautions for subzero climatic conditions: anti-freeze fluid must be added into the water cycle and external water pipes should be properly insulated.

MAINTENANCE - LIST OF THE RECOMMENDED PERIODIC INTERVENTIONS

RECOMMENDED PERIODIC MAINTENANCE INTERVENTIONS					
DESCRIPTION	FREQUENCY				
	3/4 months	6 months	12 months	24 months	functioning hours
GENERAL INTERVENTIONS					
Check of any refrigerant leaks (this must be done respecting the deadlines recommended by the current European regulations)	•				
Check of the unit power supply voltage	•				
Check of the compressors' power supply voltage	•				
Check of the fan power supply voltage	•				
Check of the solenoid valves	•				
Functioning and calibration check of the pressure switches, if and where present	•				
Replacement of the safety valve				•	
Check and reading of the pressure/temperature probes	•				
Check and possible replacement of the dehydrating fans			•		
Check of compressors contactors	•				
Check of fans contactors, where present			•		
Exchanger coils cleaning		•			
Check and cleaning of shell and tube heat exchangers if necessary where present (1)			•		
Check of electric resistances of the heat exchangers		•			
Check for rust and corrosion in components, paying particular attention to under pressure containers. In this case replace them or intervene with specific products			•		
General cleaning of the unit			•		
Bleed the hydraulic circuit and the heat exchangers, the simultaneous presence of air and water reduces yield and can benefit the arising of rust					
INTERVENTIONS TO COOLING CIRCUIT Functioning at full load					
Overheating temperature measurement		•			
Subcooling temperature measurement		•			
Exhaust gas temperature measurement		•			
Fans absorption measurement		•			
Compressors absorption measurement		•			
COMPRESSOR CHECKS					
Check oil level	•				
Check oil acidity			•		
Check the proper functioning of the casing resistance		•			
Check oil level sensor, if any		•			
CHECKS ON HYDRAULIC CIRCUIT					
Pumps absorption measurement		•			
Check the pump rotor gasket	•				
Check the flexible joints	•				
Check the seal of the shell and tube heat exchanger heads, where present		•			
Check the proper functioning and calibration of the flow switch, where present	•				
Check the proper functioning of the differential pressure switch, where present	•				
Check the concentration of glycol solution, if provided	3 months*				
Cleaning the water filter	•				

* To replace the glycol, refer to the documentation provided by the supplier.

The frequency of the operations described herein is a guideline one and they may vary depending on how the unit is used and the type of system where it is installed. However, if the unit is installed in harsh environments, we recommend reducing the time of intervention

1 we do not recommend swabbing as it can ruin the inner lining of the pipes, we recommend using appropriate chemicals

RECOMMENDED PERIODIC MAINTENANCE INTERVENTIONS TO UNITS WITH CENTRIFUGAL COMPRESSORS

DESCRIPTION	FREQUENCY		
	6 months	12 months	other
GENERAL CHECKS			
Check that the compressor is not damaged	•		
Check that there are no excessive vibrations induced by other operating components	•		
CHECKS ON ELECTRICAL PARTS			
Check the power supply voltage	•		
Check the proper fastening of the compressor power supply cables		•	
Check the good condition of the electrical cables	•		
Check that the electric current value (A) is that specified in the technical plate	•		
Check the voltage value (A) on the storage tank capacitors	•		
Replace the storage tank condensers			every 5 years
Check the correct functioning of the safety system (alarms)		•	
CHECKS ON ELECTRONIC PARTS			
Check that all communication cables between the compressor and its components are firmly fastened	•		
Check that all electronic devices are firmly in their seat	•		
Visually check that the electronic boards are have no burns or are damaged		•	
Check that the reading of the pressure/temperature sensors is correct			
CHECKS ON THE COOLING CIRCUIT PARTS			
Check the proper functioning of the thermostatic valve		•	
Check the charge of refrigerant gas (1)	•		
Check the proper functioning of the solenoid valves	•		

DECOMMISSIONING AND DISPOSAL OF THE MACHINE COMPONENTS

ATTENTION

The unit contains greenhouse effect fluoride gases covered by the Kyoto Protocol. The law prohibits its dispersion in the environment and requires its recovery and delivery to the dealer or collection centre.

When components are removed to be replaced or when the entire unit reaches the end of its life and it must be removed from the installation, in order to minimise the environmental impact, respect the following disposal requirements:

- The refrigerant gas must be fully recovered in special containers and brought to collection centres by specialised personnel having the necessary qualification;
- The lubricating oil in the compressors and cooling circuit must be recovered and brought to collection centres;
- The structure, electric and electronic equipment and components must be separated according to their type and construction material and brought to collection centres;
- If the water circuit contains mixtures with anti-freeze, the content must be collected and brought to collection centres;
- Observe the current national laws



This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled disposal of Waste Electrical and Electronic Equipment (WEEE), please return the device using appropriate collection systems, or contact the retailer where the product was purchased. Please contact your local authority for further details. Illegal dumping of the product by the user entails the application of administrative sanctions provided by law.