EN

19.11 – 6228071_04
Translation from original

HMI

Installation manual

50Hz | R32 | INVERTER | INVERTER | ModBus | WiFi

REVERSIBLE AIR/WATER HEAT PUMP

Cooling capacity 3÷13 kW

Heating capacity 4÷ 15,5 kW

AERMEC

www.aermec.com

Dear customer,
Thank you for choosing an AERMEC product. It is the fruit of many years of experience and special design studies and has been made of the highest grade materials and with cutting edge technology.
In addition, all our products bear the EC mark indicating that they meet the requirements of the European Machine Directive regarding safety. The quality level is being constantly monitored, so AERMEC products are synonymous with Safety, Quality and Reliability.

The data may undergo modifications considered necessary for the improvement of the product, at any time and without the obligation for any notice thereof.

Thank you once again.
AERMEC S.p.A

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.

50Hz	R32			INVERTER
50Hz	Gas refrigerante R32	Raffreddamento e riscaldamento	ACS	Compressore rotativo a Inverter
50Hz	R32 refrigerant	Cooling and heating	DHW	Inverter rotary compressor
50Hz	Réfrigérant R32	Refroidissement et chauffage	ECS	Compresseur rotatif à inverseur
50Hz	R32-Kältemittel	Kühlung und Heizung	BWW	Inverter-Rollkolbenverdichter
50Hz	Refrigerante R32	Frío y calor	ACS	Compresor rotativo inverter

INVERTER			ModBus	2	WiFi
Ventilatore assiale a Inverter	Scambiatore a piastre	Gruppo di pompaggio	Protocollo ModBus	Per impianti a due tubi	Modulo WiFi
Inverter axial fan	Plate exchanger	Pump kit	ModBus protocol	For two pipes plants	WiFi module
Ventilateur axial à inverseur	Échangeur à plaques	Kit pompe	Protocole ModBus	Pour installations deux tubes	Module WiFi
Inverter-Axialventilator	Plattenwärmetauscher	Pumpensatz	Mit ModBus-Protokoll	Für 2-Rohr-Anlagen	WiFi-Modul
Ventilador axial inverter	Intercambiador de placas	Kit de bomba	Protocolo ModBus	Para plantas de dos tubos	Módulo WiFi

CERTIFICATIONS

COMPANY CERTIFICATIONS

PRESTATIONAL CERTIFICATIONS

Aermec participates in the EUROVENT program:
LCP The products involved can be found on the website
www.eurovent-certification.com

SAFETY CERTIFICATIONS

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.

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.

Refer to the minimum room area table.

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

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.

DISPOSAL OF R32 COOLANT 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

- 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.
- L'unità può essere riparata solo con il metodo suggerito dal produttore.

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.

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 authorised and qualified experienced technicians, in accordance with current regulations.

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 Aermec 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 extinguishers 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 CO_2 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 a 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 heat 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.

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 Aermec 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.

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.

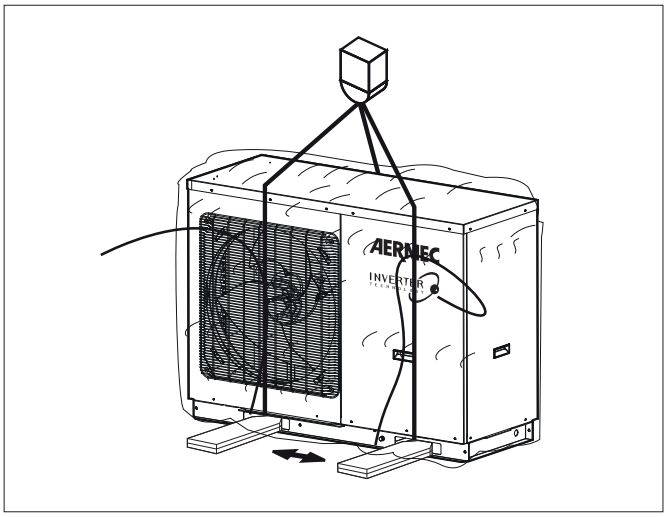
Should you desire to lift using the forklift, we recommend opening the forks as much as possible to make handling safer

- 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

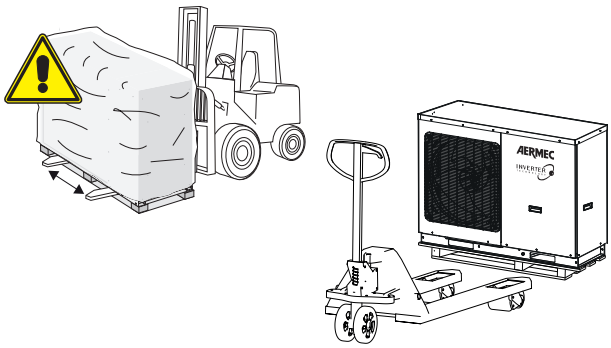
Attention: the units cannot be stacked

Packaging label

Technical plate



HANDLING



STORAGE

PLACEMENT AND INSTALLATION REQUIREMENTS

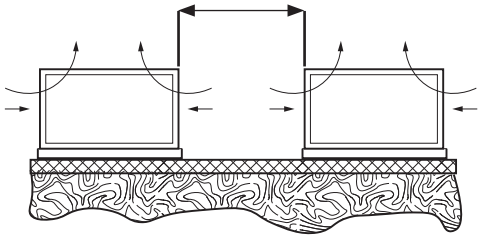
For unit installation it is important to perform the following preliminary preparation tasks:

- 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 Aermec before making any type of installation.
- The water-cooled units are designed for indoor installation. Contact Aermec 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.
- In locations exposed to frost, if the unit is installed on soil, the support base must rest on concrete columns with a depth greater than the normal depth of frost of the soil. 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.

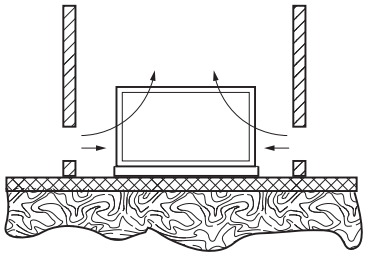
ATTENTION: The use of anti-vibration supports MUST be combined with the installation in the unit water piping of flexible couplings. The anti-vibration supports must be fixed to the unit BEFORE it is earthed. AERMEC is not responsible for the choice of capacity of the anti-vibration supports.

- 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.

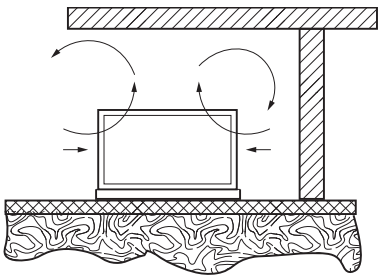
ATTENTION: It is important that the units are installed flat. The improper installation of the unit invalidates the warranty.



Recommended Installation



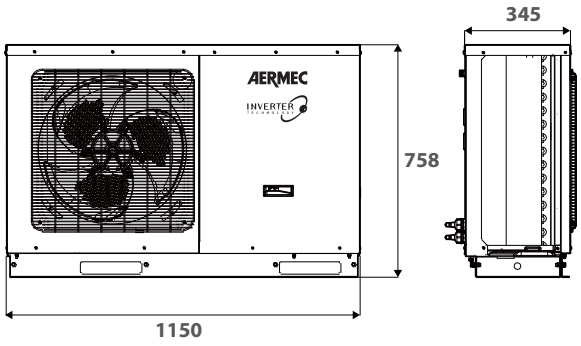
Windbreak
recommended with wind above 2,2 m/s



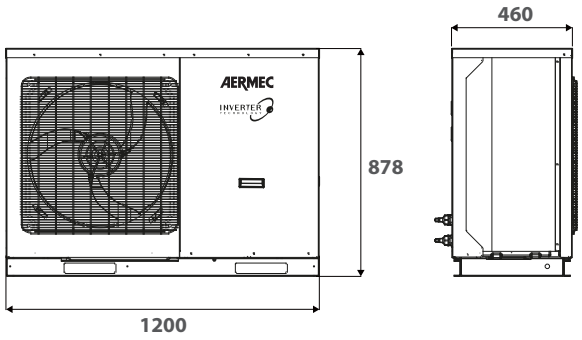
Installation not allowed

DIMENSIONS

HMI 040-060-080 (mm)

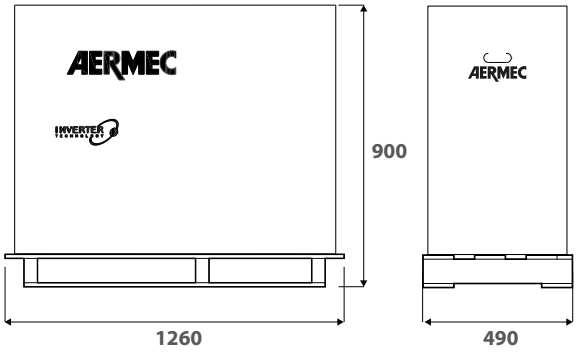


HMI 100-120-140-160 (mm)

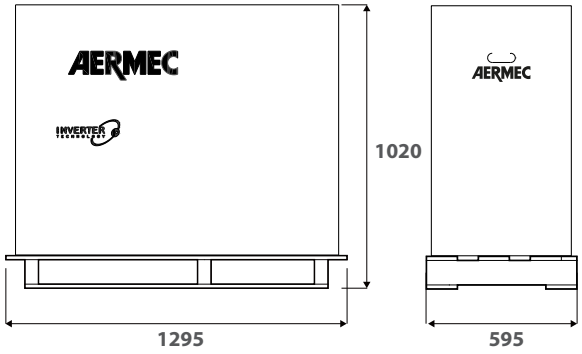


DIMENSIONS FOR HANDLING

HMI 040-060-080 (mm)

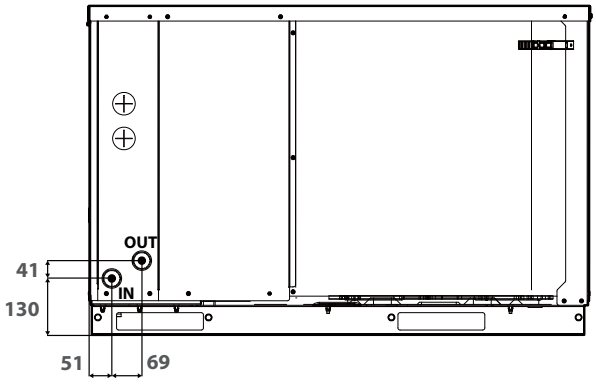


HMI 100-120-140-160 (mm)

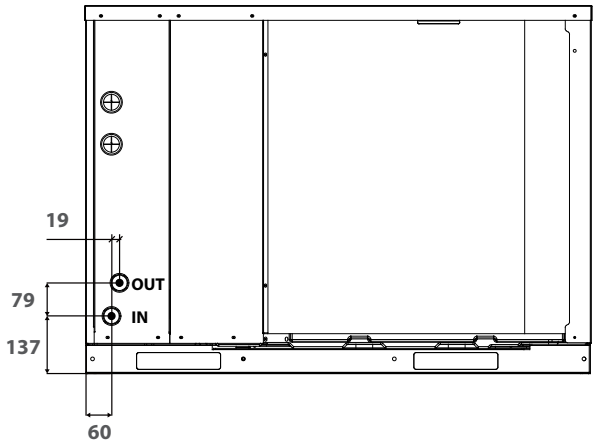


WATER CONNECTIONS

HMI 040-060-080 (mm)

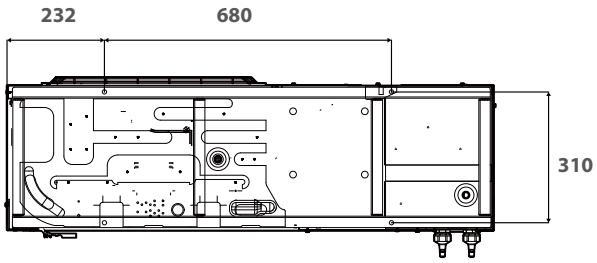


HMI 100-120-140-160 (mm)



BASE HOLES POSITION

HMI 040-060-080 (mm)



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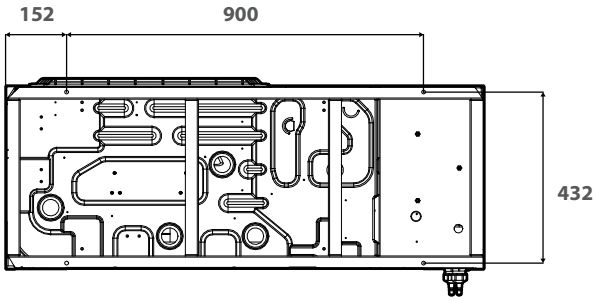
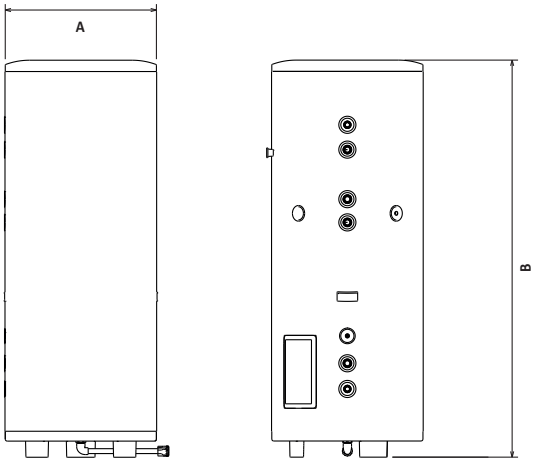


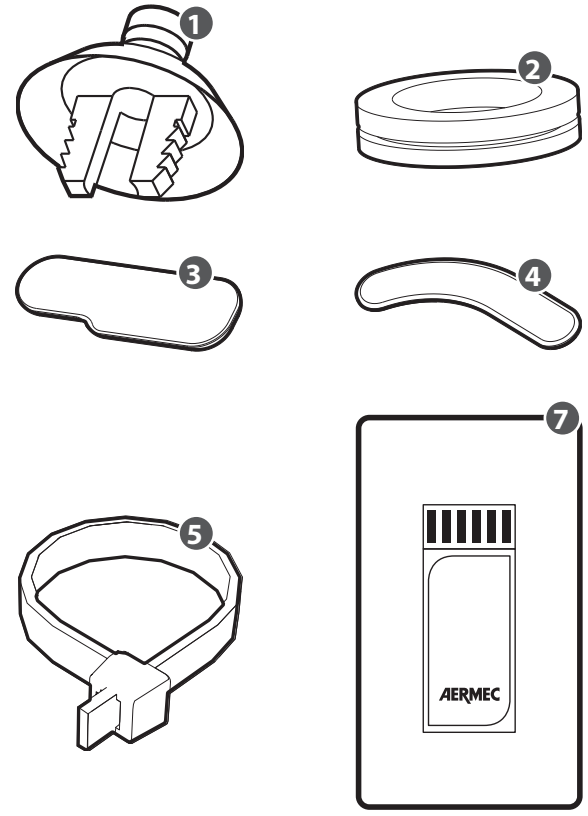
ACCESSORIES DIMENSIONS

HBI_WT (ACCESSORIES)



	A (mm)	B (mm)
HBI200WT	540	1595
HBI200WTS	540	1595
HBI300WT	620	1620
HBI300WTS	620	1620
HBI200WTT	540	1595
HBI200WTST	540	1595
HBI300WTT	620	1620
HBI300WTST	620	1620

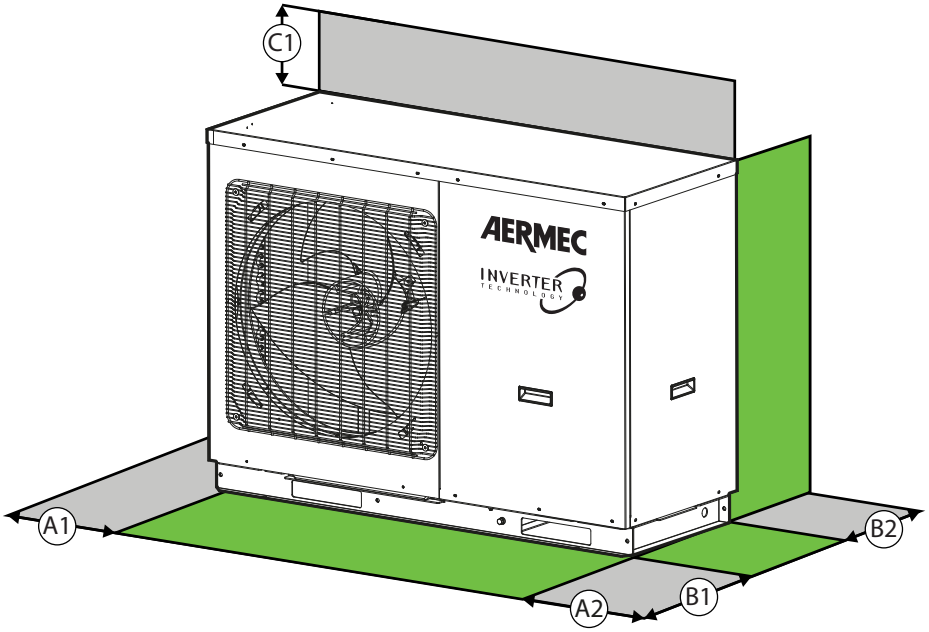
SUPPLIED MATERIAL



	Description	Quantity
1	Drainage joint	x1
2	Round cap	x1
3	Shaped cap	x1
4	"L"-shaped cap	x1
5	Cable clamp	x1
6	Internal temperature probe communication cable [10m]	x1
7	Internal temperature probe	x1
8	Water temperature probe (optional) [5m]	x1
9	Tank water probe [20m]	x1
10	Ferromagnetic ring	x1
11	Cable for communication between wired panel and unit [8m]	x1
12	Control panel	x1
13	Clamp	x1
14	Cable grommet	x1
15	Water circuit "Y"-shaped filter	x1

MINIMUM TECHNICAL CLEARANCES

HMI		040	060	080	100	120	140	160	100T	120T	140T	160T
MINIMUM TECHNICAL CLEARANCES												
A1	MM	500	500	500	500	500	500	500	500	500	500	500
A2	MM	500	500	500	500	500	500	500	500	500	500	500
B1	MM	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
B2	MM	500	500	500	500	500	500	500	500	500	500	500
C1	MM	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

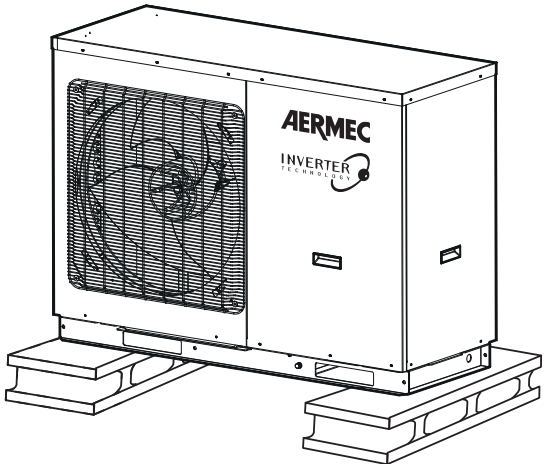


REQUIREMENTS FOR INSTALLATION IN HARSH CLIMATES

Protect the outer unit from direct snow fall and ensure that the unit does NOT get buried in snow.

WARNING:

1. **During the installation stage, take into account any accumulations of snow by fitting appropriate shims on the base where the unit will be mounted.**
2. **Make sure that the snow <u>NEVER</u> builds up on the unit.**
3. **Include at least 300mm of clearance between the unit base and the floor and at least 100mm above the snow level.**

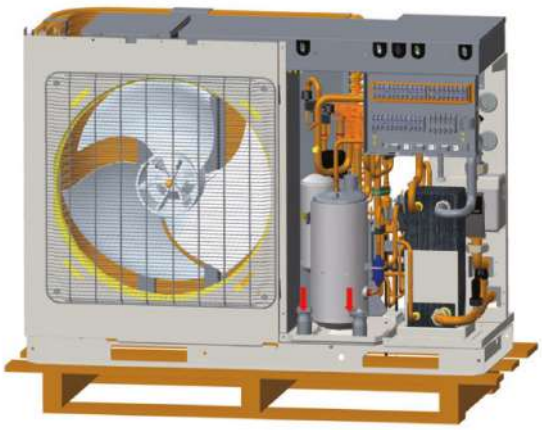


REMOVING THE COMPRESSOR RESTRAINTS

Units **HMI100-120-140-160-100T-120T-140T-160T** are delivered with 2 restraints mounted on the compressor feet to reduce vibration during transport. They must be removed before starting up the unit.

ATTENTION:
Failure to remove the compressor restraints will invalidate the warranty.

1. The unit must be installed according to national plant engineering regulations.
2. The standard of the installation will have a direct effect on normal unit operation. The user is forbidden from carrying out the installation: all installation tasks must be performed by personnel with the necessary legal requirements, trained and informed about the risks related to these operations. Installation personnel must follow the instructions given in the installation manual.
3. Do not connect the unit to the power supply until all installation work has been completed.
4. The foot brackets are used to reduce vibrations during the transport. It's mandatory before commissioning they must be removed,otherwise it would lead to unnecessary faults. When foot brackets have been removed, the hexagonal flanged nut must be tightened so as to prevent the compressor from jumping out during operation. This operation doesn't apply to the following models: HMI040-060-080.

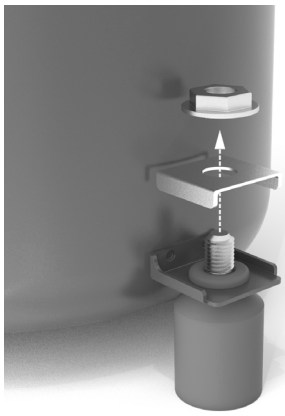


PROCEDURE FOR REMOVING THE FOOT BRACKETS:

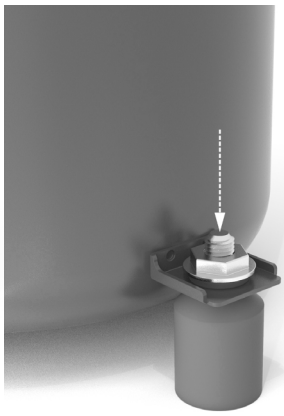
STEP 1

STEP 2

STEP 3



STEP 4



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 circulation pump must preferably be installed upstream so that the evaporator/condenser is subject to a positive pressure. The water inlet and outlet connections are indicated in the dimension tables in this manual, or available on www.aermec.com

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, you must install an expansion tank and a safety valve
- 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. As an option, you can also protect the pipes inside the unit.
- 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.

DISCHARGING SYSTEM

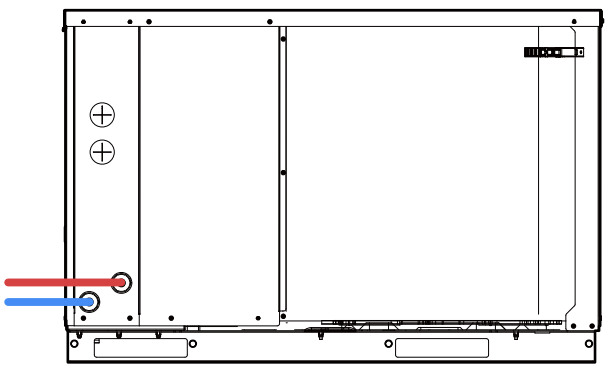
In the event the system is stopped during winter, the water in the heat exchanger can freeze damaging the heat exchanger irreversibly. To prevent danger of freezing, three solutions are possible:

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.

ANTI-FREEZE PROTECTION

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 TOTAL MINIMUM WATER VOLUME IS 20 LITRES.

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:

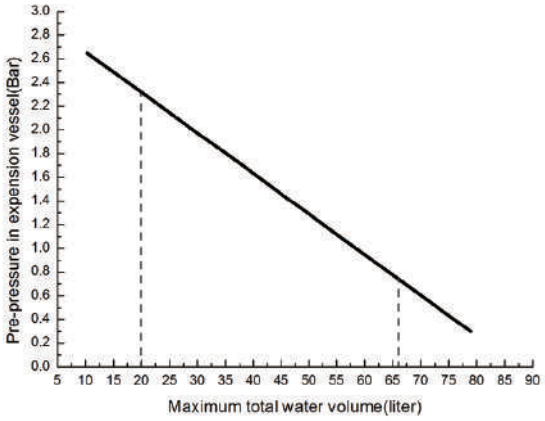
P_g = (H/10+0.3) bar

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

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.

SAFETY VALVE SET AT 2.5 bar.

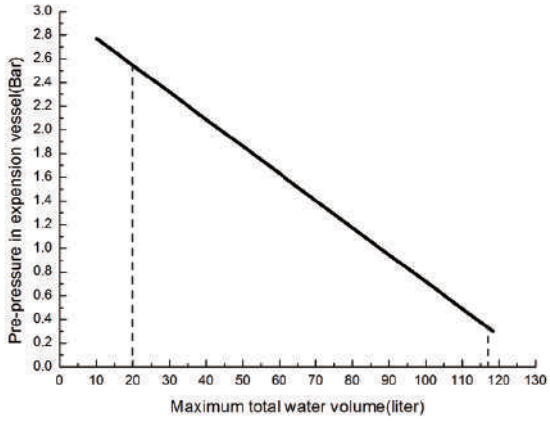
HMI 040-060-080



NOTE:
The expansion vasselcontains 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.

Difference in height of installation[1]	Water volume (see the diagram)	
	<44L	>44L
H < 12m	Adjustment is not necessary	• 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	• 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 vassel is too small and it is not possible to perform the adjustment.

HMI 100-120-140-160
HMI 100-120-140-160 T



NOTE:
The expansion vasselcontains 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.

Difference in height of installation[1]	Water volume (see the diagram)	
	<66L	>66L
H < 12m	Adjustment is not necessary	• 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	• 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 vassel 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:
HMI160 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 vassel.

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

$\mathbf{p_1}$ = Expansion tank pre-load pressure [bar].

$\mathbf{p_2}$ = Maximum pressure during system operation (safety valve intervention pressure) [bar].

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

EXTERNAL AND INTERNAL HYDRAULIC CIRCUIT HMI

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)

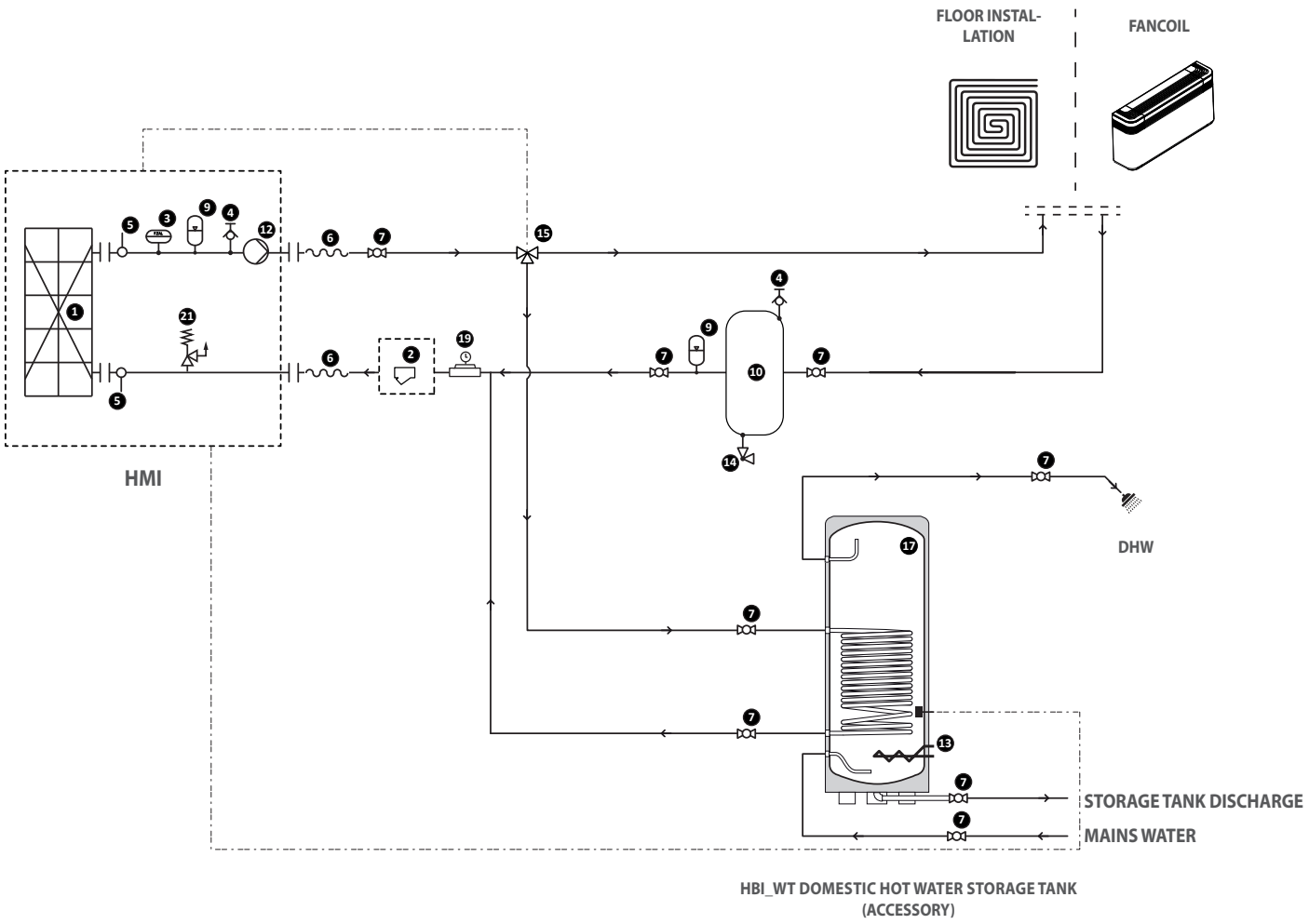
4. Air vent valve
6. Anti-vibration joints
7. Cut-off valve
9. Expansion Tank
10. System buffer tank (installation recommended whenever the system water content is less than that indicated in technical manual)
13. Antifreeze electric heater
14. Drain valve
15. 3 way valve
16. 2 way valve
17. Accessory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

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 $CaCO_3$)	< 70 mg/L
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

EXAMPLE 1 - CONFIGURATION: FLOOR INSTALLATION / FANCOIL + DHW



EXTERNAL AND INTERNAL HYDRAULIC CIRCUIT HMI

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)

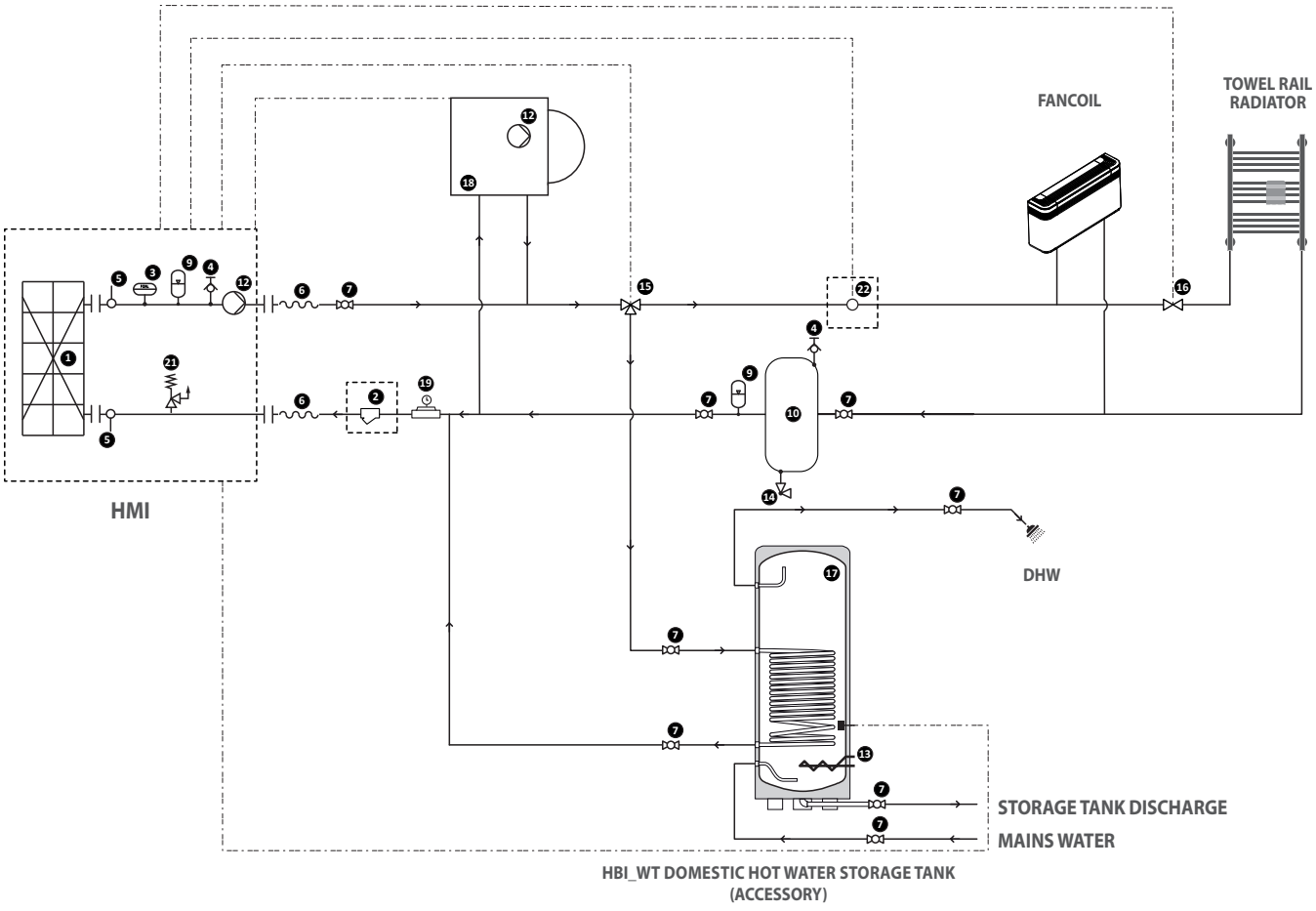
4. Air vent valve
6. Anti-vibration joints
7. Cut-off valve
9. Expansion Tank
10. System buffer tank (installation recommended whenever the system water content is less than that indicated in technical manual)
13. Antifreeze electric heater
14. Drain valve
15. 3 way valve
16. 2 way valve
17. Accessory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

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 $CaCO_3$)	< 70 mg/L
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.

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



EXTERNAL AND INTERNAL HYDRAULIC CIRCUIT HMI

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)

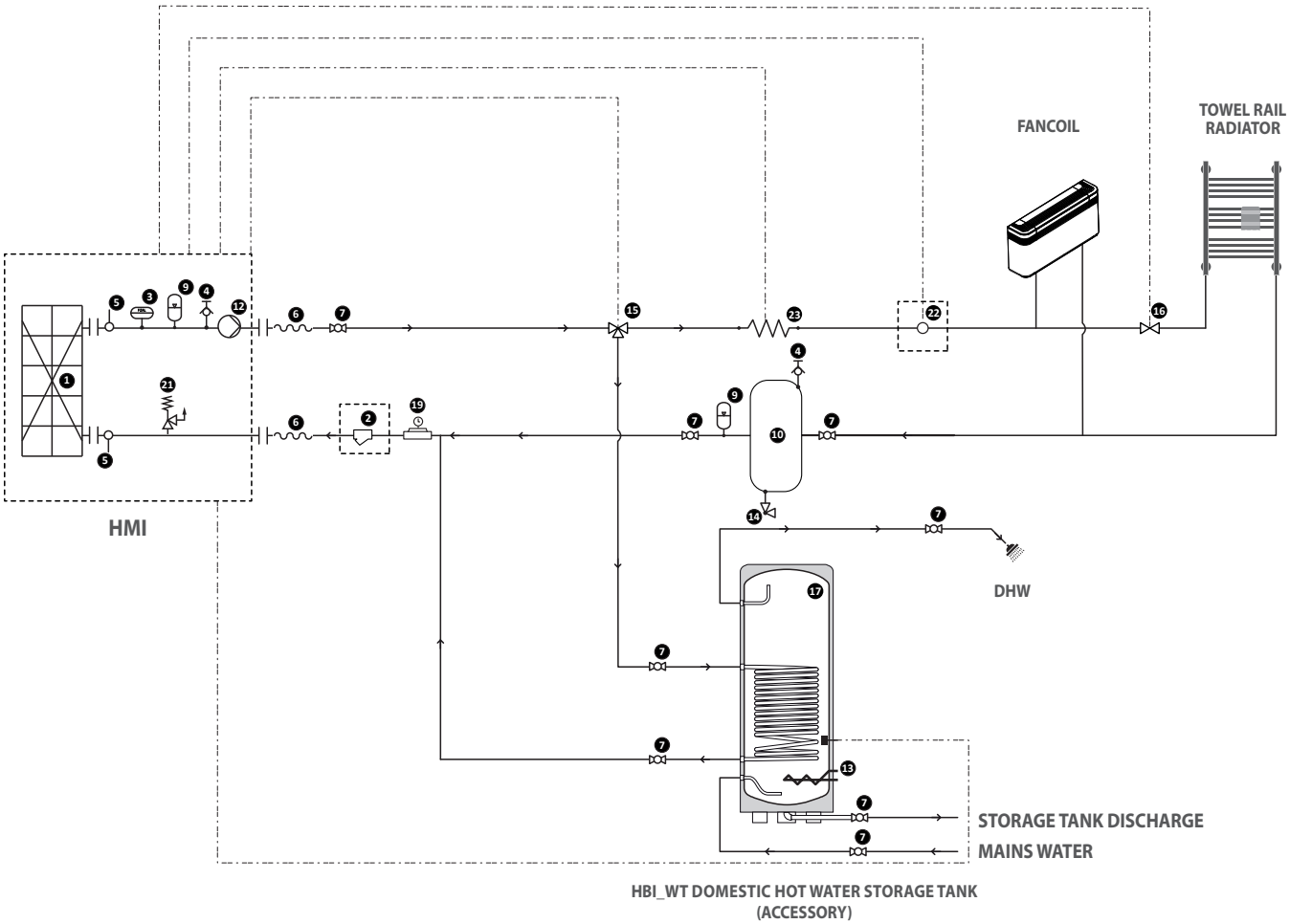
4. Air vent valve
6. Anti-vibration joints
7. Cut-off valve
9. Expansion Tank
10. System buffer tank (installation recommended whenever the system water content is less than that indicated in technical manual)
13. Antifreeze electric heater
14. Drain valve
15. 3 way valve
16. 2 way valve
17. Accessory HBI_WT
18. Other thermal source
19. Automatic Filling Valve
22. Water temperature probe - SUPPLIED AS STANDARD (optional)
23. 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 $CaCO_3$)	< 70 mg/L
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.

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

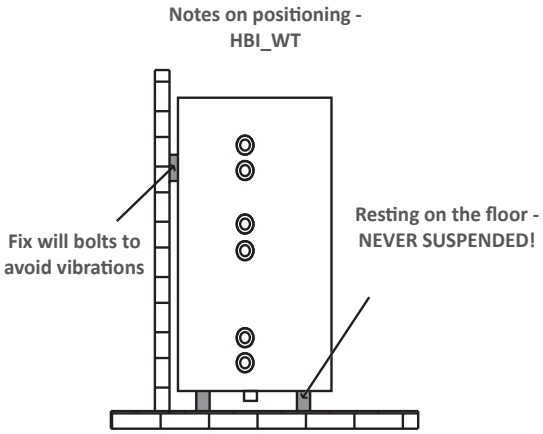


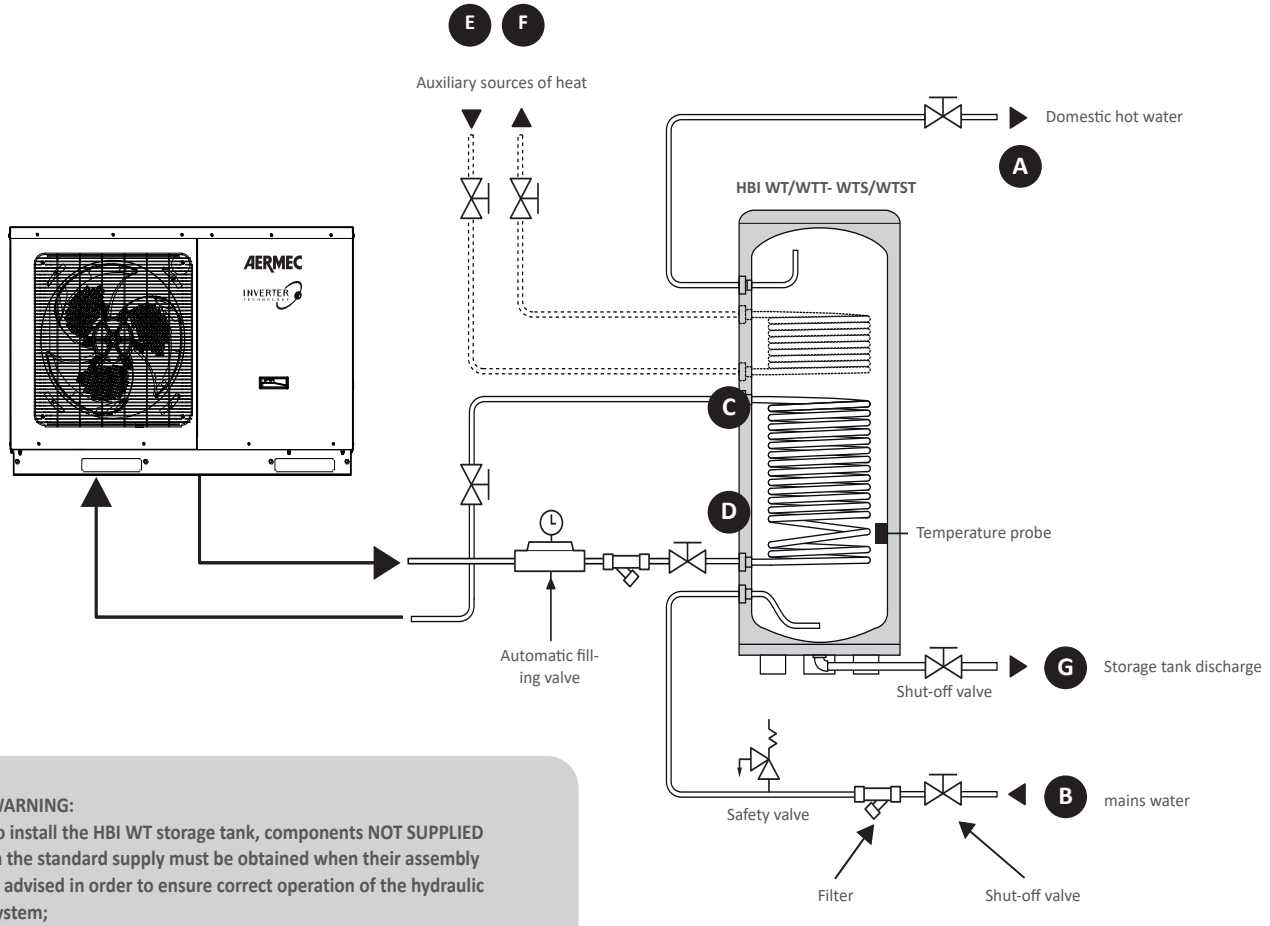
WATER CONNECTIONS WITH ACCESSORY HBI_WT

The HBI_WT storage tank must be installed and kept at a distance of 5m horizontally and 3m vertically from the indoor unit.
The water tank must be installed vertically with the base on the ground and never suspended.
The installation location must be sufficiently stable and the tank must be secured to the wall with bolts to avoid vibrations, as shown in the following figure at the side.
Maintain a minimum distance of 500 mm between the HBI_WT storage tank and any sources of heat.
Make hydraulic connections using PPR pipes and windings with thermal insulating tape.

WARNING:

- **To ensure safe use of water, the water in/out connections on the relative tank must be PPR pipes having a given length, L ≥70×R2 cm R is the internal radius of the pipe.**
- **Additionally, thermo-insulation is required and metal pipes must not be used.**
- **For first use, the water tank must be full before connecting the electrical power supply.**





WARNING:
To install the HBI WT storage tank, components NOT SUPPLIED in the standard supply must be obtained when their assembly is advised in order to ensure correct operation of the hydraulic system;

Recommended components
Manual shut-off valve (not supplied)
Water filter (additional)
Loading unit with pressure gauge (not supplied)
Safety valve (calibrated at 7 bar)/non-return valve supplied with the HBI_WT accumulation tank

Line	Description	Diameters of HBI lines			
		200WT/WTT	200WTS/WTST	300WT/WTT	300WTS/WTST
A	Domestic hot water user	G 1/2	G 1/2	G 1/2	G 1/2
B	Water mains	G 1/2	G 1/2	G 1/2	G 1/2
C	Water out (main coil)	G 3/4	G 3/4	G 3/4	G 3/4
D	Water in (main coil)	G 3/4	G 3/4	G 3/4	G 3/4
E	Water in (supplementary coil)	---	G 3/4	---	G 3/4
F	Water out (supplementary coil)	---	G 3/4	---	G 3/4
G	Storage tank discharge	G 3/4	G 3/4	G 3/4	G 3/4

If the connection between the water tank and the indoor unit must pass through the wall, drill a 70mm hole for the water pipe.

A PPR pipe having a rated outer diameter of dn20 - series S2.5 (thickness of wall = 3.4mm).

If other insulated pipes are used, refer to the dimensions indicated above for outer diameters and wall thicknesses.
At least one shut-off valve is required for the water outlet pipe.

Installation of the recirculation pipe at the bottom of the water tank: connect a section of PPR pipe with the drainage out drip on the floor. One shut-out valve must be installed in the centre of the drainage pipe in a location where users can easily operate it.
After connecting all pipes for hydraulic ducts, perform the first leak check test (see Unit Debug).
Then wind the water pipes, the water temperature probe and cables with thermal insulation tape.

WARNING:

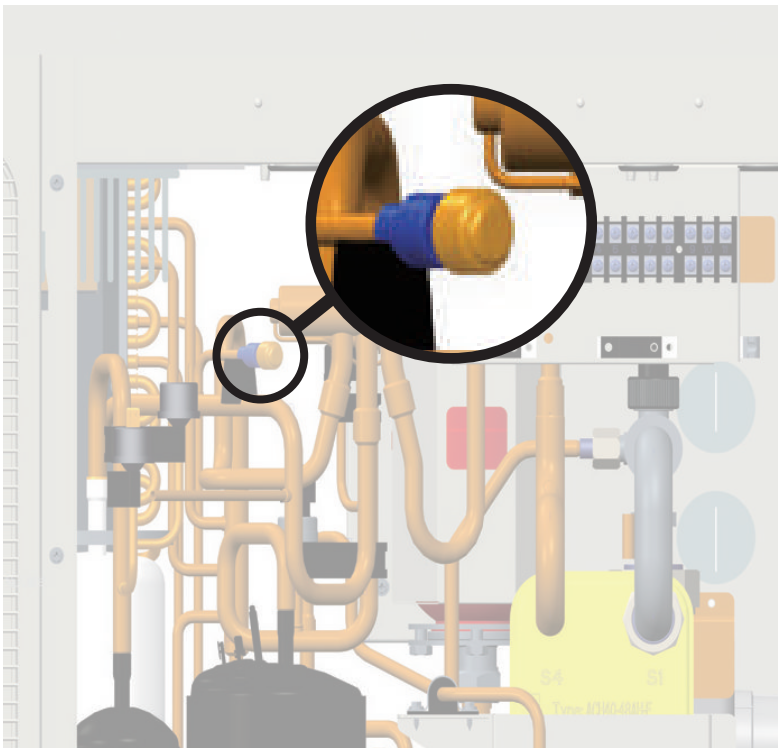
- **It is advised to install the tank in a position lower than the indoor unit**
- **Prepare the materials on the basis of the dimensions indicated on the page.**
- **If the shut-off valve is installed outside the room, it is advised to use a PPR pipe to avoid freezing.**
- **Before making hydraulic connections, secure the HBIWT-WTT/WTS-WTST storage tank to the floor to ensure that it is stable.**
- **Do not allow dust and other materials to enter the piping system during connection pipe installation procedures.**
- **After making the connection of all pipes in the hydraulic ducts, first of all perform the test to make sure there are no leaks. Then wind the pipes with thermal insulation tape. Pay special attention to the valves and pipe joints.**
- **if necessary, Install a heating device to avoid the pipes freezing.**
- **The tank must always be full of water to avoid deterioration of the coils**
- **During use, the shut-off valve on the cooling water inlet must be kept normally open.**
- **I metal pipes do not ensure that heat is stored in the tank; it is advisable not to use metal pipes.**

CHARGING AND DISCHARGING OF REFRIGERANT

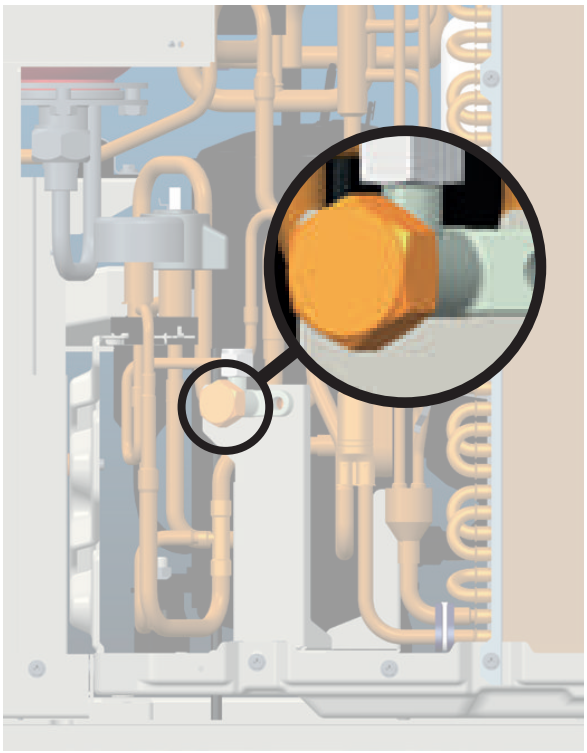
The unit has been charged with refrigerant before delivery. Overcharging or undercharging will cause the compressor to run improperly or be damaged. When refrigerant is required to be charged or discharged for installation, maintenance and other reasons, please follow steps below and nominal charged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

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

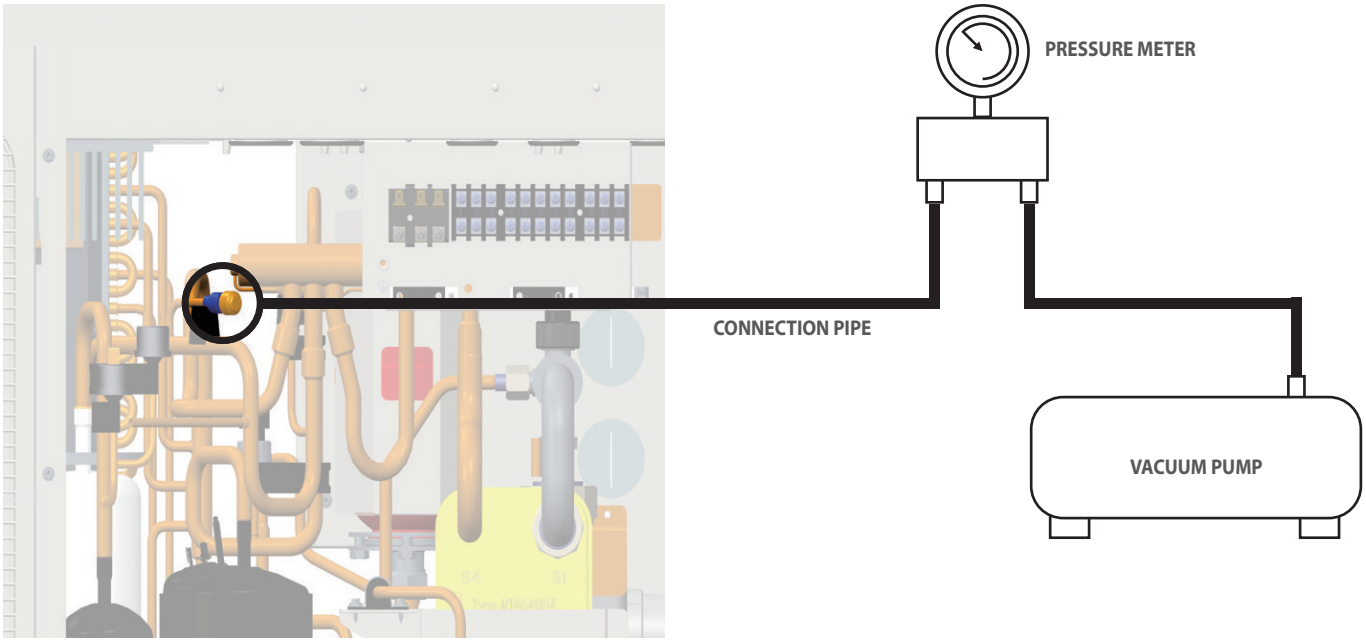
CHARGING VALVE 1



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 us 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 s 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 ±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.

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.***
- ***If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard***

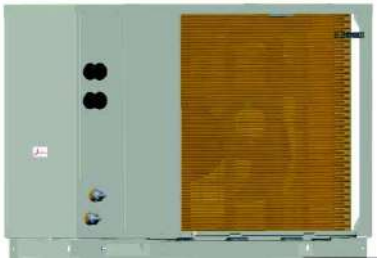
ELECTRICAL DATA

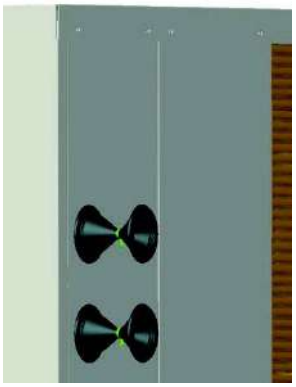
The cable section shown in the table are recommended for maximum lengths of 50m. For longer lengths or different cable laying, it is up to the PLANNER to calculate the appropriate line switch, the power supply line as well as the connection to the earth wire and connection cables depending on:

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

ELECTRICAL DATA

HMI	Power supply	Recommended minimum cross-section for power cables [EN60335 - 1]	Rated Current	Master switch
		(mm^2)	(A)	(A)
040	220-240V ~ 50Hz	3G1,5	10,4	16
060	220-240V ~ 50Hz	3G1,5	10,4	16
080	220-240V ~ 50Hz	3G1,5	10,4	16
100	220-240V ~ 50Hz	3G4	23,0	32
120	220-240V ~ 50Hz	3G4	25,0	32
140	220-240V ~ 50Hz	3G4	29,0	40
160	220-240V ~ 50Hz	3G4	29,0	40
100T	380-415V 3N ~ 50Hz	5G1,5	12,0	16
120T	380-415V 3N ~ 50Hz	5G1,5	12,0	16
140T	380-415V 3N ~ 50Hz	5G1,5	12,0	16
160T	380-415V 3N ~ 50Hz	5G1,5	12,0	16





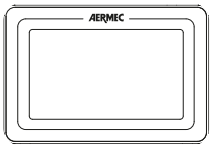
1. If necessary, remove the supplied original rubber rings, and replace them with long rubber rings (supplied).
2. The various power cables must pass through these rubber rings, such as; 2-way valve power cable, 3-way valve and general power cable. Be careful to separate the communication cables from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

CONTROL PANEL CONNECTION (SUPPLIED AS STANDARD)

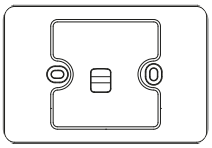
• Connect the control panel following the wiring diagram.
• The installation of the control panel is MANDATORY in enclosed spaces; outdoor installation is forbidden.

CONTROL PANEL KIT

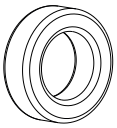
n°1 Control panel



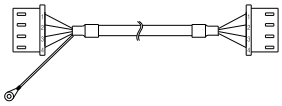
n°1 Wall support



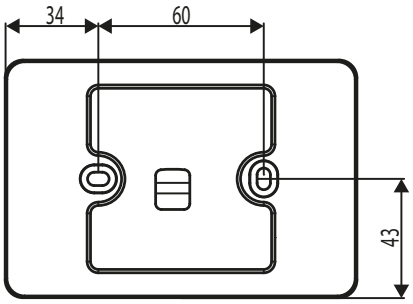
n°1 Magnetic ring



n°1 Communication cable [8m]

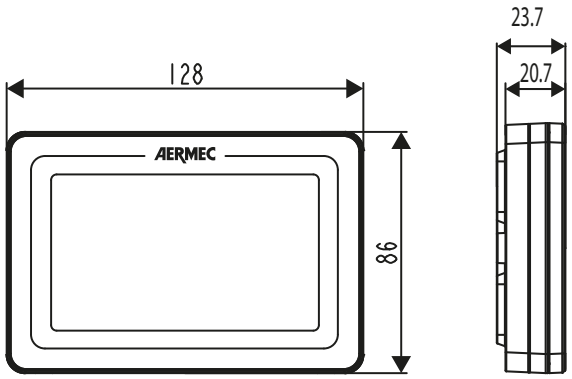


DIMENSIONS FOR WALL INSTALLATION (mm)

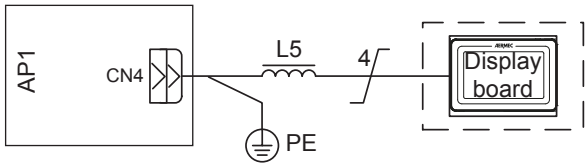


Wall support compatible with built-in module 502E.

CONTROL PANEL DIMENSIONS (mm)



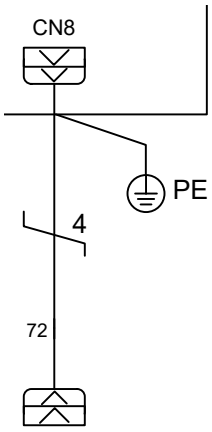
CONNECTION BETWEEN HMI AND CONTROL PANEL



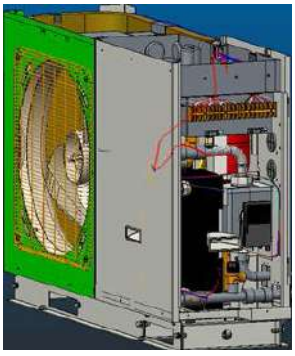
USE OF ADDITIONAL COMMUNICATION CABLE

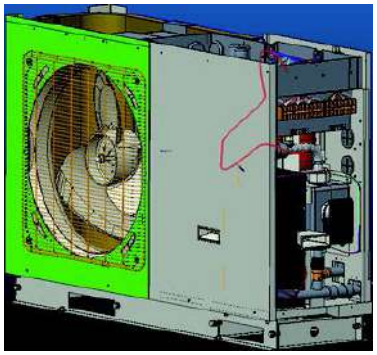
In case you need to check the unit on the machine (e.g.: maintenance, start-up) an already connected secondary communication cable is available, see images.
NB do not use two Control panels at the same time.

WIRING DIAGRAM

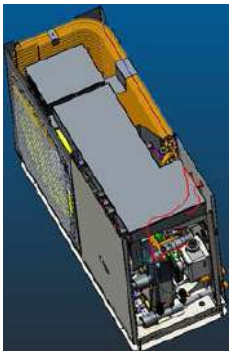


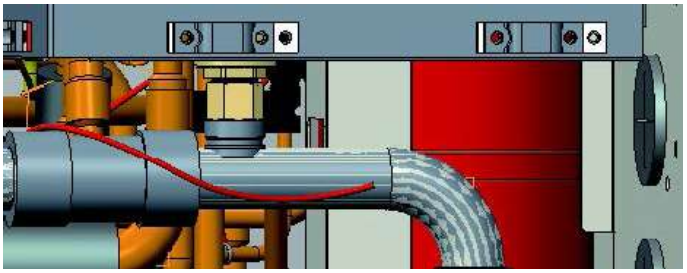
HMI 040-060-080

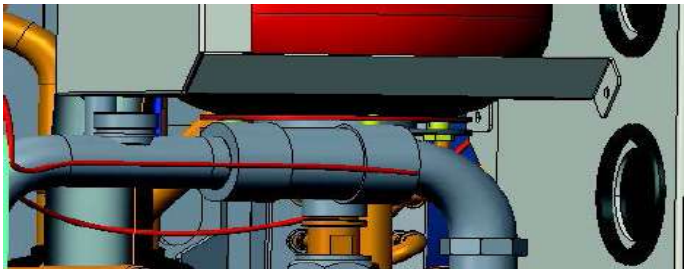




HMI 100-120-140-160



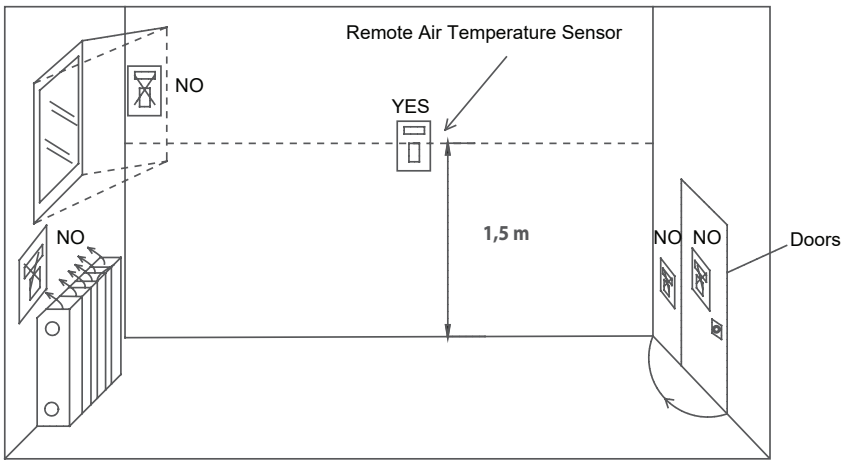


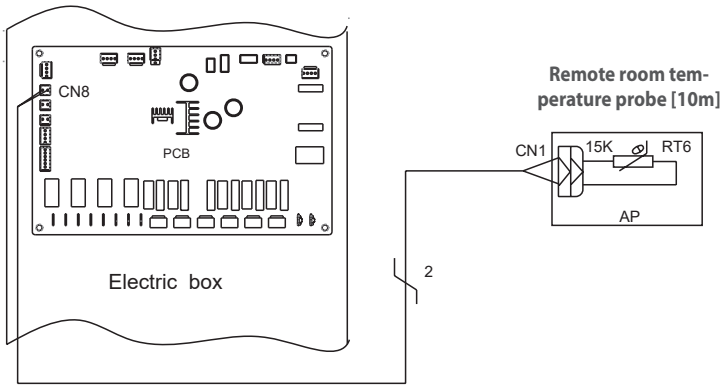


CONNECTING THE ROOM AIR TEMPERATURE PROBE (SUPPLIED AS STANDARD):

Front view

Rear view





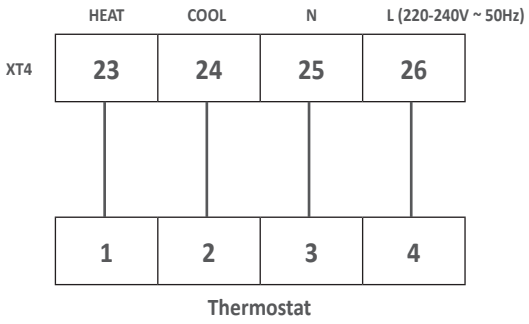
WARNING:

- The distance between the Indoor unit and the remote room temperature probe must be less than 10m
- 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:

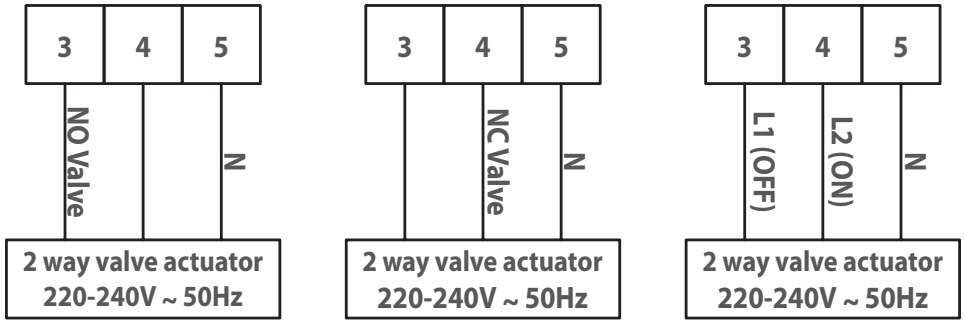
- **The temperature setting of the thermostat (heating or cooling) must be selected within the temperature range set for the product.**
- **Do not connect external electrical loads; wires (L) and (N) must ONLY be used for the electrical thermostat.**
- **Do not connect external electrical loads such 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 (NOT 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.



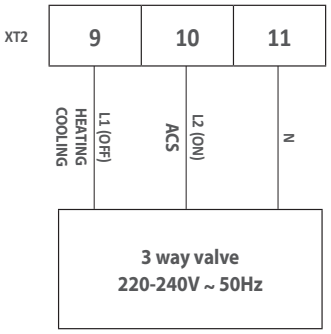
CONNECTING THE 3-WAY VALVE (NOT SUPPLIED AS STANDARD)

The 3-way valve (**SPDT** 3 wire) is necessary to allow the DHW production and ambient cooling / heating.
The 3-way valve must divert the flow of water between the system terminals and the heating circuit of the HBI_WT accessory.

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.



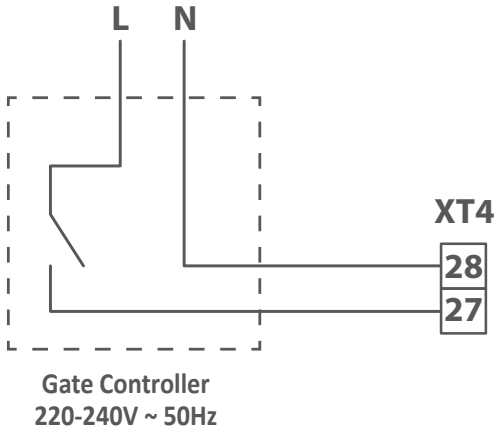
CONNECTING THE AUXILIARY DEVICE "GATE CONTROLLER" (NOT SUPPLIED AS STANDARD)

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.

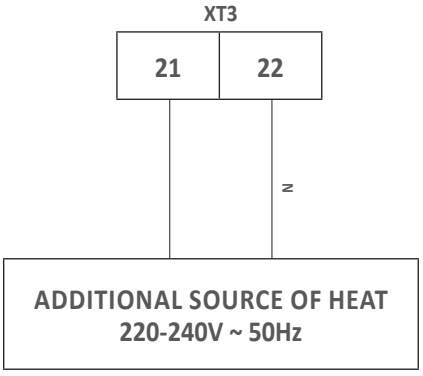


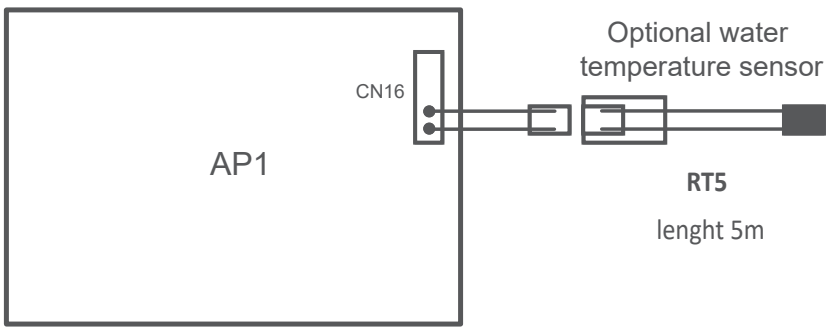
ON/OFF CONNECTION FOR ADDITIONAL HEAT SOURCE

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.
- **(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.

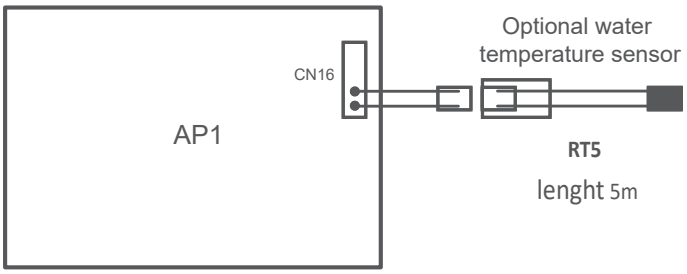
CONNECTING THE ADDITIONAL ELECTRICAL RESISTANCE (NOT SUPPLIED AS STANDARD)

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.

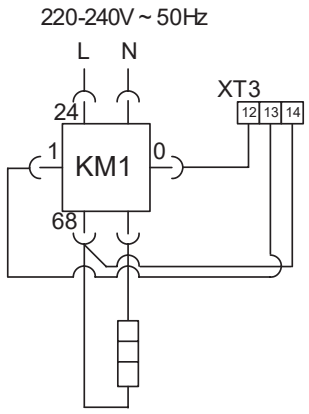
It is recommended to refer to EXAMPLE 3 for a correct installation; in particular:

- The addictional 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.**

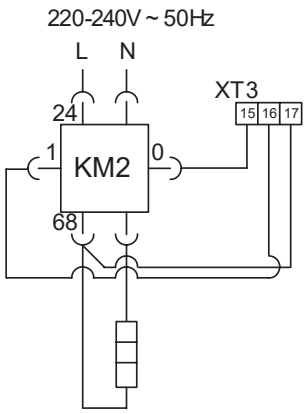
Each additional electrical resistance must have a dedicated contactor (not supplied) and correctly dimensioned (see chapter SELECTION OF CONTACTORS).



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



Additional electrical resistance 1

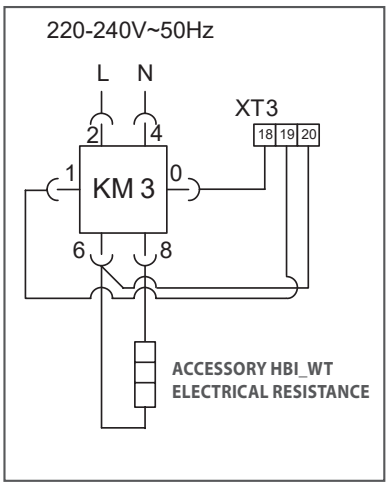


Additional electrical resistance 2

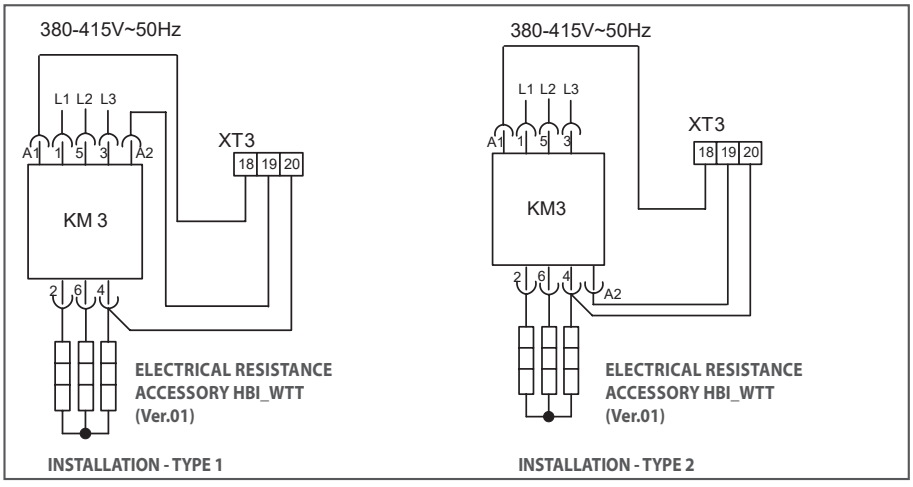
CONNECTING THE ACCESSORY HBI_WT ELECTRICAL RESISTANCE (NOT SUPPLIED AS STANDARD)

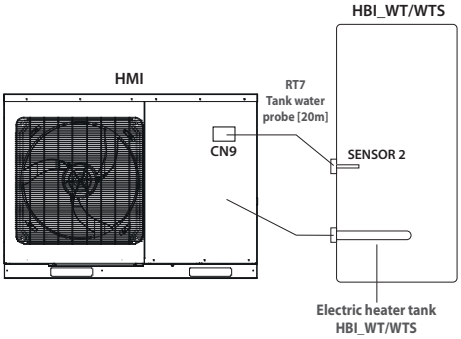
The accessory HBI_WT electrical resistance must have a dedicated contactor (not supplied) and correctly dimensioned (see chapter SELECTION OF CONTACTORS).

HMI 040 - 060 - 080 - 100 - 120 - 140 - 160
SINGLE PHASE MODELS



HMI 100 - 120 - 140 - 160 T
THREE-PHASE MODELS

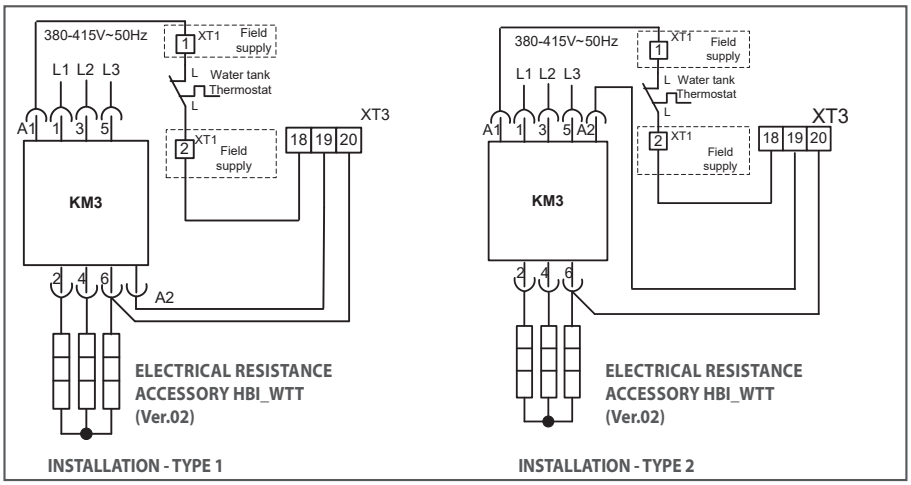


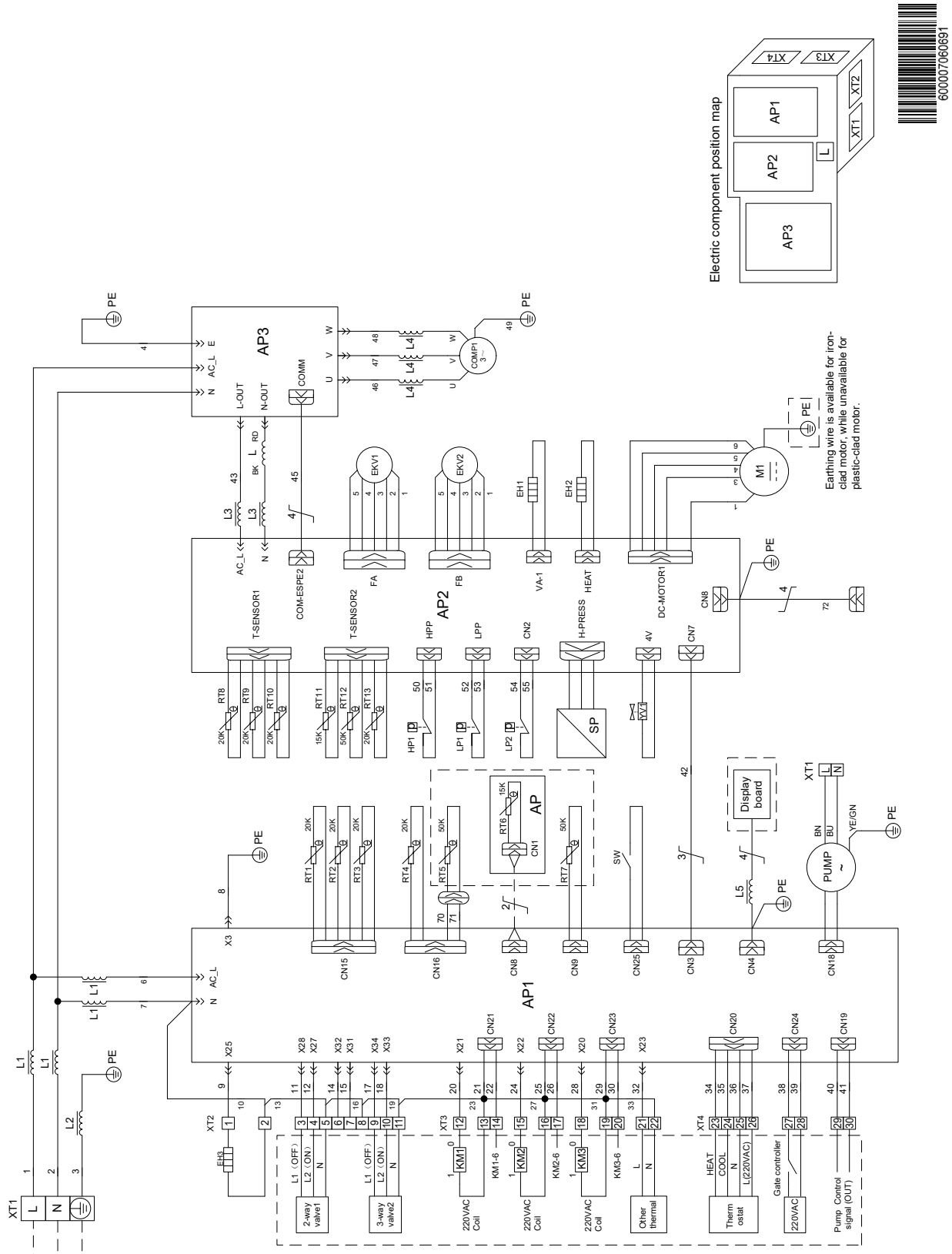


KEY

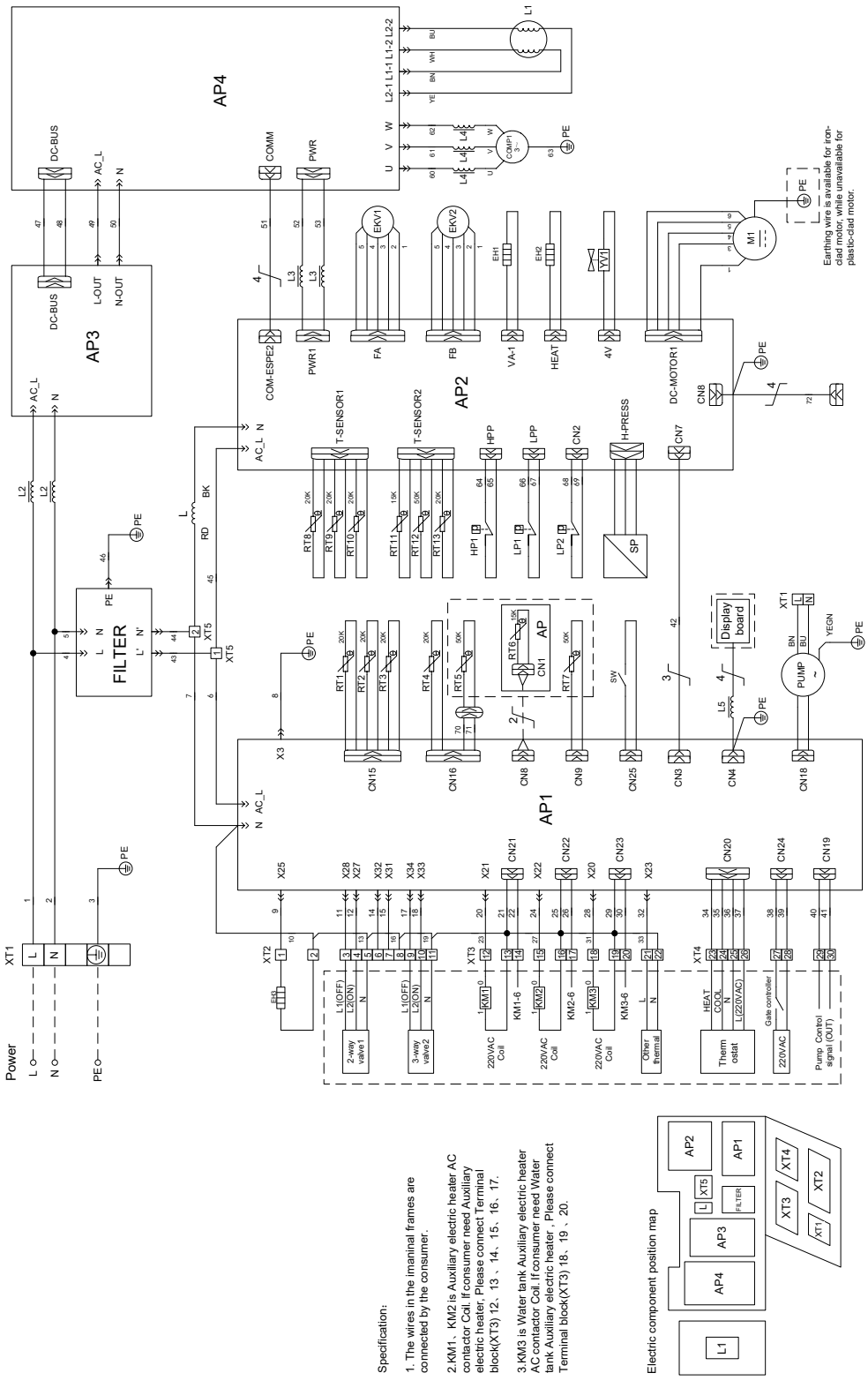
Field supply	Responsibility of the installer
Water tank Thermostat	Thermostat

HMI 100 - 120 - 140 - 160 T
THREE-PHASE MODELS

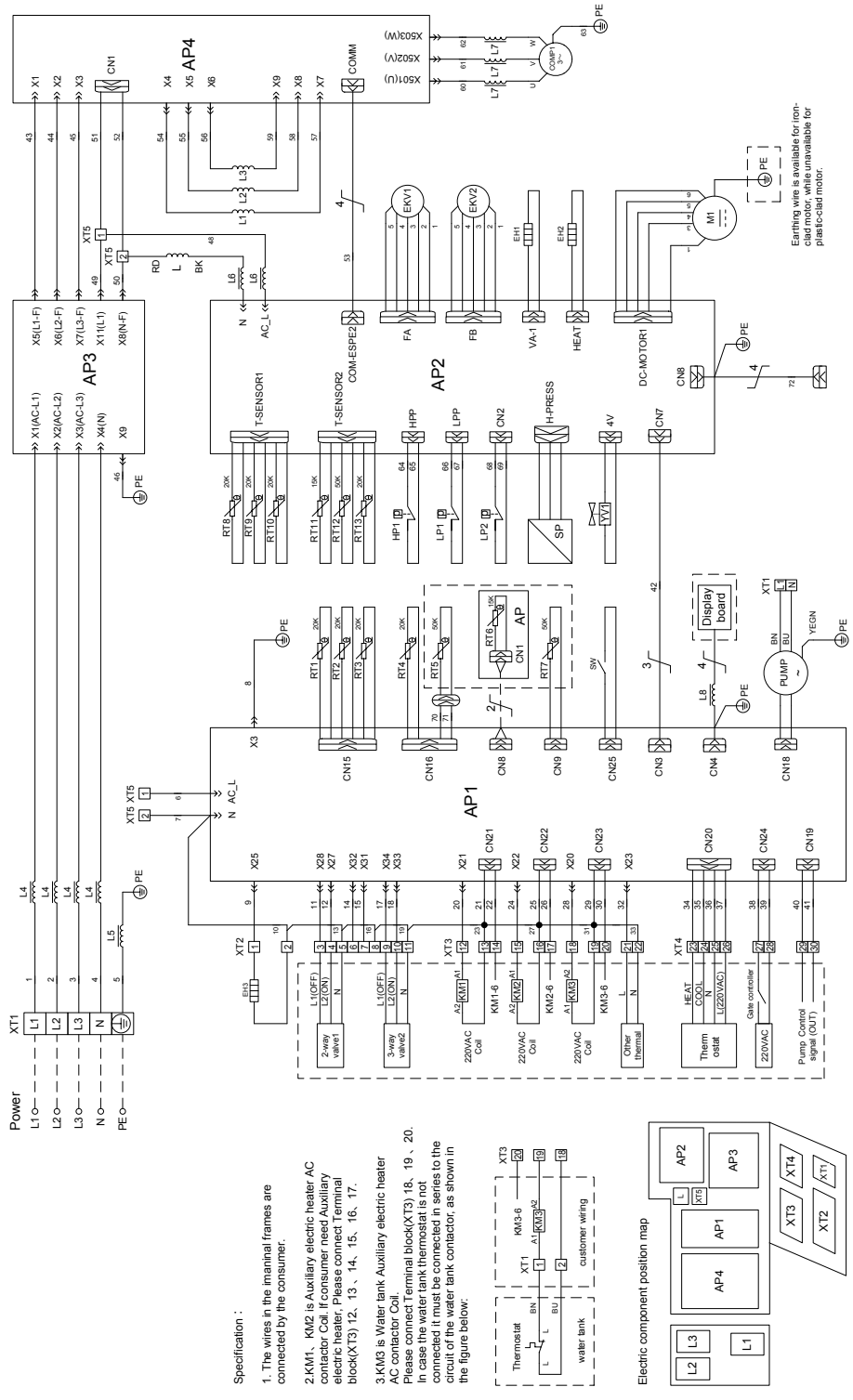



Electric component position map
AP1
AP2
AP3
XT1
XT2
XT3
XT4
Earthing wire is available for iron-clad motor, while unavailable for plastic-clad motor.
Power
L
N
PE
Specification:
1. The wires in the imaninal frames are connected by the consumer.
2.KM1、KM2 is Auxiliary electric heater AC contactor Coil. 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
KM3	Water tank electric heater HBI_WT
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	Water tank temp sensor HBI_WT
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


AP4
AP3
AP2
AP1
FILTER
Power
L
N
PE
XT1
DC-BUS
AC_L
N
L-OUT
N-OUT
COMM
PWR
COM-ESPE2
PWR1
FA
FB
VA-1
HEAT
4V
DC-MOTOR1
T-SENSOR1
T-SENSOR2
HPP
LPP
CN2
H-PRESS
CN7
CN8
EKV1
EKV2
EH1
EH2
YV1
M1
L1
L2-1 L1-1 L1-2 L2-2
BU
WH
BN
YE
U V W
COMP1
3~
PE
Earthing wire is available for iron-clad motor, while unavailable for plastic-clad motor.
L2
L3
L
BK
RD
RT1
RT2
RT3
RT4
RT5
RT6
RT7
RT8
RT9
RT10
RT11
RT12
RT13
20K
50K
19K
105K
HP1
LP1
LP2
SP
AP
CN1
SW
Display board
PUMP
YEGN
X3
CN15
CN16
CN9
CN25
CN3
CN4
CN18
X25
X28
X27
X32
X31
X34
X33
X21
X22
X20
X23
X24
CN21
CN22
CN23
CN20
CN19
XT2
XT3
XT4
XT5
EH
L1(OFF)
L2(ON)
2-way valve1
3-way valve2
KM1
KM2
KM3
KM1-6
KM2-6
KM3-6
220VAC Coil
Other thermal
HEAT
COOL
Therm ostat
Gate controller
220VAC
Pump Control signal (OUT)
Specification:
1. The wires in the imaninal 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.
Electric component position map
L1
AP4
AP3
AP2
AP1
FILTER
XT5
XT1
XT2
XT3
XT4

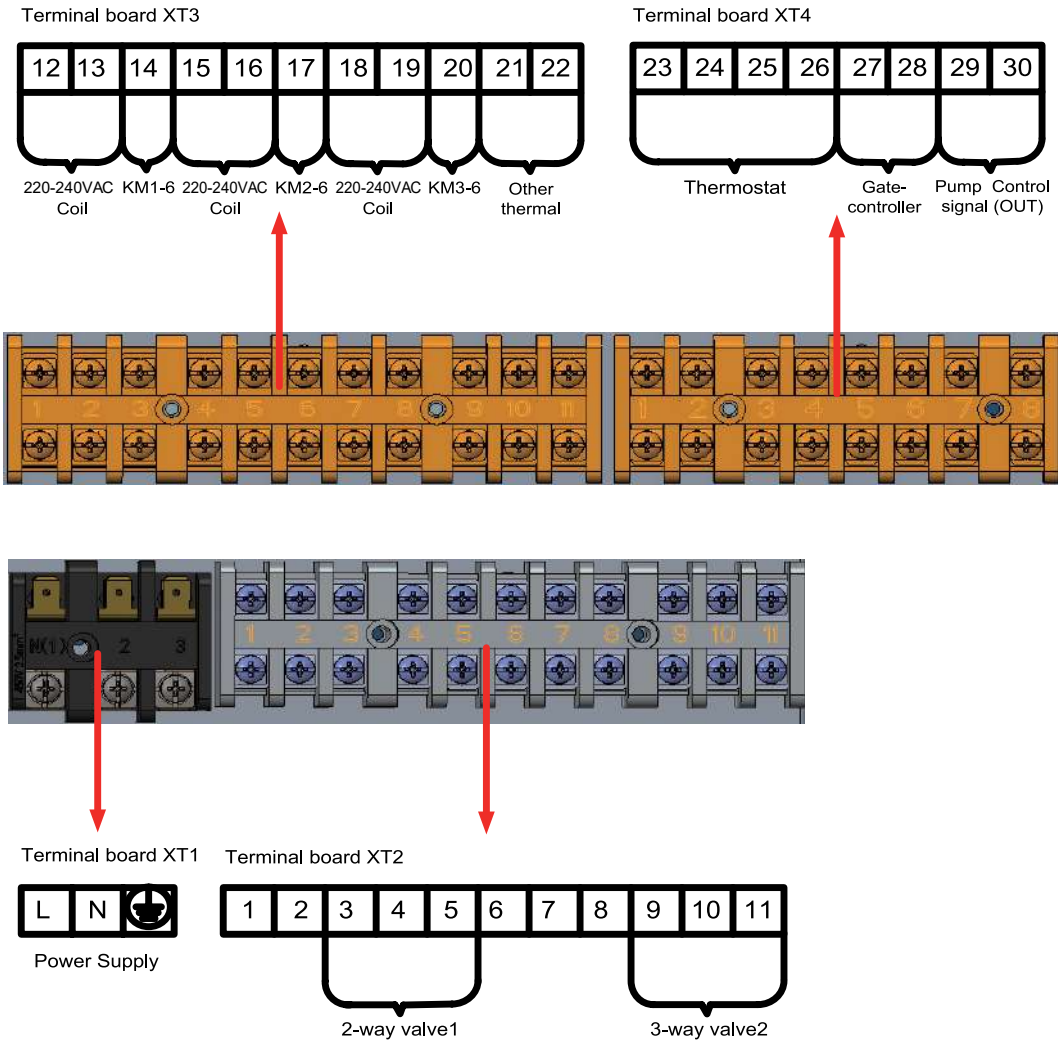
AP	Main board only for RT6
AP1	Indoor unit Main Board
AP2	Outdoor unit Min Board
AP3	Filter board
AP4	Drive Board
COMP1	Compressor
EH1	Bottom band heater
EH2	Compressor band heater
EH3	Plate heat exchanger anti-freezing
EKV1	Electronic expansion valve coil1
EKV2	Electronic expansion valve coil2
FILTER	Filter
HP1	High pressure switch
KM1	Optional electric heater 1 AC contactor
KM2	Optional electric heater 2 AC contactor
KM3	Water tank electric heater HBI_WT
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	Water tank temp sensor HBI_WT
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


Power
L1
L2
L3
N
PE
AP1
AP2
AP3
AP4
T-SENSOR1
T-SENSOR2
COM-ESPE2
H-PRESS
DC-MOTOR1
Display board
PUMP
2-way valve1
3-way valve2
220VAC Coil
Other thermal
Therm ostat
Gate controller
Pump Control signal (OUT1)
Thermostat
water tank
customer wiring
Earthing wire is available for iron-clad motor; while unavailable for plastic-clad motor.
Specification :
1. The wires in the imaninal 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

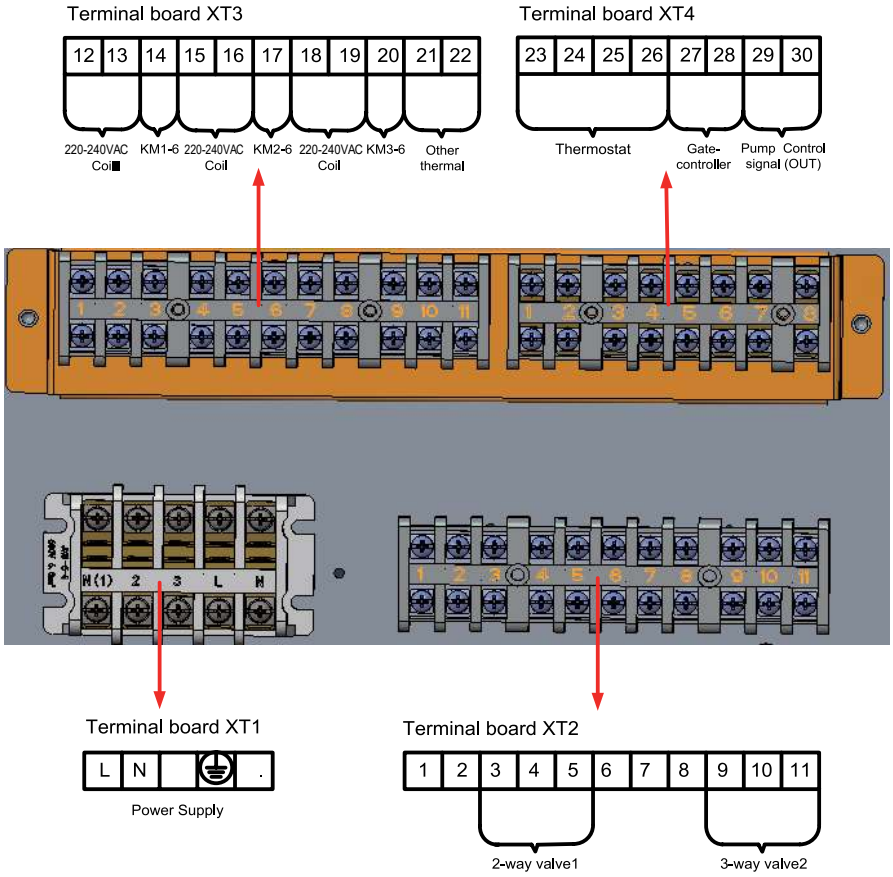
AP	Main board only for RT6
AP1	Indoor unit Main Board
AP2	Outdoor unit Min Board
AP3	Filter board
AP4	Drive Board
COMP1	Compressor
EH1	Bottom band heater
EH2	Compressor band heater
EH3	Plate heat exchanger anti-freezing
EKV1	Electronic expansion valve coil1
EKV2	Electronic expansion valve coil2
FILTER	Filter
HP1	High pressure switch
KM1	Optional electric heater 1 AC contactor
KM2	Optional electric heater 2 AC contactor
KM3	Water tank electric heater HBI_WT
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	Water tank temp sensor HBI_WT
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

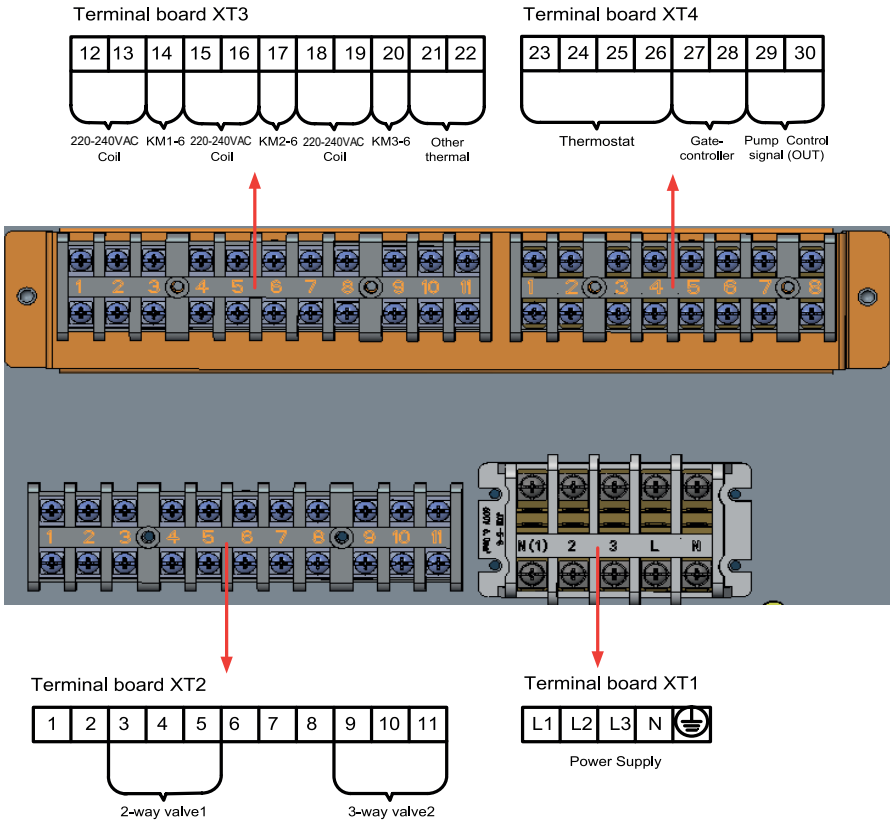
HMI 040 - 060 - 080



HMI 100 - 120 - 140 - 160



HMI 100T - 120T - 140T - 160T



COMMISSIONING - WARNINGS

Please note that, on request by the Aermec customer or the legitimate owner of the machine, the units in this series can be started up by the AERMEC After-Sales Service in your area (valid only on ITALIAN territory). The start of operation must be scheduled in advance based on the time frame for the completion of works for the system. Prior to the intervention, all other works (electrical and hydraulic hook-ups, priming and bleeding of air from the system) must have been completed.

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 ± 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

- Control of the water flow rate alarm, the unit provides for the management of a flow rate alarm controlled by a differential pressure switch or flow switch if provided. This type of safety device intervenes after the first 30 seconds of pump functioning, if the water flow rate is not sufficient. The intervention stops 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 (CO_2) 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 Aermec or from official dealers. Contact Aermec 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 Aermec;
- 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
- If replacing a fuse or a circuit breaker, details relating the type and ratings of fuses or circuit breakers are visible in the mark inside the electrical panel.

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 metratast 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, remove 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.

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 of 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.

SCARICA L'ULTIMA VERSIONE:

http://www.aermec.com/qrcode.asp?q=13934

DOWNLOAD THE LATEST VERSION:

http://www.aermec.com/qrcode.asp?q=13935

TÉLÉCHARGER LA DERNIÈRE VERSION:

http://www.aermec.com/qrcode.asp?q=14145

BITTE LADEN SIE DIE LETZTE VERSION HERUNTER:

http://www.aermec.com/qrcode.asp?q=14146

DESCARGUE LA ÚLTIMA VERSIÓN:

http://www.aermec.com/qrcode.asp?q=14147

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