

WAAL-HUNG INDOOR UNITS
FOR REVERSIBLE SPLIT HEAT PUMPS WITH DC INVERTER COMPRESSOR

















- Read the warnings in this instruction booklet carefully since they provide important information on safe installation, use and maintenance.
- This instruction booklet is an integral and essential part of the product and must be kept with care by the user for future reference.
- If the unit is sold or transferred to another owner or if it is to be moved, always make sure the booklet stays with the appliance so that it can be consulted by the new owner and/or installer.
- Installation and maintenance must be carried out by professionally qualified personnel, according to current regulations and the manufacturer's instructions.
- Incorrect installation or inadequate maintenance can result in damage or injury. The manufacturer declines any liability for damage caused by errors in installation and use or by failure to follow the instructions provided.
- Before carrying out any cleaning or maintenance operation, disconnect the unit from the power supply using the system switch and/or the special cut-off devices.
- In case of a fault and/or poor operation, deactivate the unit and do not try to repair it or directly intervene. Contact professionally qualified personnel. Any repair/replacement of the products must only be carried out by qualified personnel using genuine parts. Failure to comply with the above cancompromise the safety of the unit.
- Periodic maintenance performed by qualified personnel is essential in order to ensure proper operation of the unit.
- This unit must only be used for its intended purpose. Any other use is deemed improper and therefore hazardous.

- After unpacking, check the good condition of the contents. The packing
 materials are potentially hazardous and must not be left within the
 reach of children.
- The unit can be used by children aged at least 8 years and by persons with reduced physical, sensory or mental capabilities, or lacking experience or the necessary knowledge, only if under supervision or they have received instructions on its safe use and the related risks. Children must not play with the unit. Cleaning and maintenance intended to be done by the user can be carried out by children aged at least 8 years only if under supervision.
- In case of doubt, do not use the unit. Contact the supplier.
- The unit and its accessories must be appropriately disposed of in compliance with current regulations.
- The images given in this manual are a simplified representation of the product. In this representation there may be slight and insignificant differences with respect to the product supplied.



This symbol, which is used on the product, packaging or documents, means that at the end of its useful life, this product must Mnot be collected, recycled or disposed of together with domestic waste.

Improper management of electric or electronic waste can lead to the leakage of hazardous substances contained in the product. For the purpose of preventing damage to health or the environment, users are kindly asked to separate this equipment from other types of waste and to ask for it to be dealt with by the municipal waste service or dealer under the conditions and according to the methods set down in national and international laws transposing the Directive 2012/19/EU.

Separate waste collection and recycling of unused equipment helps to save natural resources and to guarantee that this waste is processed in a manner that is safe for health and the environment. For more information about how to collect electric and electronic equipment and appliances, please contact your local Council or Public Authority competent to issue the relevant permits.

Allowed uses

This series of heat pumps is designed to produce cold or hot water for use in hydronic systems for conditioning/heating purposes and production of domestic hot water in an indirect way through an external storage boiler equipped with a heat exchanger.

Any use differing from this proper use or beyond the operating limits indicated in this manual is forbidden unless previously agreed with the manufacturer.

Note

This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.



The CE marking certifies that the products meet the essential requirements of the relevant directives in force. The declaration of conformity may be requested from the manufacturer.

The original documentasion is written in English. All other languages are translations.

The manufacturer declines all responsibility for any inaccuracies in this manual due to printing or typing errors.

The manufacturer reserves the right to modify the products contents in this catalogue without previous notice.



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1. SAFETY PRECAUTIONS

The precautions listed here are divided into the following types. They are quite important, so be sure to follow them carefully. Meanings of DANGER, WARNING, CAUTION and NOTE symbols.



DANGER

Indicates an imminently hazardous situation which if not avoided, will result in death or serious injury.



WARNING

Indicates a potentially hazardous situation which if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which if not avoided, may result in minor or moderate injury. It is also used to alert against unsafe practices.



NOTE

Indicates situations that could only result in accidental equipment or property damage.

Read these instructions carefully before installation. Keep this manual in a handy for future reference.

Improper installation of equipment or accessories may result in electric shock, short-circuit, leakage, fire or other damage to the equipment. Be sure to only use accessories made by the supplier, which are specifically designed for the equipment and make sure to get installation done by a professional.

All the activities described in this manual must be carried out by a licensed technician. Be sure to wear adequate personal protection equipment such as gloves and safety glasses while installation the unit or carrying out maintenance activities.

Contact your dealer for any further assistance.

Tabella. 1 - Information symbols

Symbol	Explanation
	This symbol shows that this appliance used a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.
	This symbol shows that the operation manual should be read carefully
	This symbol shows that a service personnel should be handling this equipment with reference to the installation manual.
i	This symbol shows that information is available such as the operating manual or installation manual.



WARNING

Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.



1.1 Special requirements for R32 refrigerant

∕**!**\ WARNING

- Do NOT have refrigerant leakage and open flame.
- Be aware that the R32 refrigerant does NOT contain an odour.

∕**!**\ WARNING

The appliance shall be stored so as to prevent mechanical damage and in a well-ventilated room without continuously operating ignition sources (example:open flames,an operating gas appliance) and have a room size as specified below.



- · Do NOT re-use joints which have been used already.
- Joints made in installation between parts of refrigerant system shall be accessible for maintenance purposes.

MARNING

Make sure installation, servicing, maintenance and repair comply with instractions and with applicable legislation (for example national gas regulation) and are executed only by authorised persons.

Symbol m_c denotes the refrigerant charge of a single refrigerating system. Where multiple refrigerating systems are servicing the same space, the refrigerating system with the largest refrigerant charge shall be used.

- Pipework should be protected from physical damage.
- Installation of pipework shall be kept to a minimum.

If the total refrigerant charge in the system (m_x) is <1.84 kg, there are no additional minimum floor area requiements.

If the total refrigerant charge in the system (m_x) is ≥1.84 kg, you need to comply with additional minimum floor area requirements as describrd in the following flow chart.

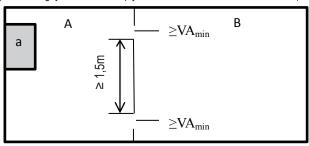


fig. 1 - indoor unit installation

The area of A plus B has to be greater than or equal to 4.5 m²

Legend

a Indoor unit

A Room where the indoor unit is installed.

B Room adjacent to room A.

 ${
m VA}_{\mbox{\tiny min}}$ n°2 openings (n°1 at the top and n°1 at the bottom) between Room A and Room B.



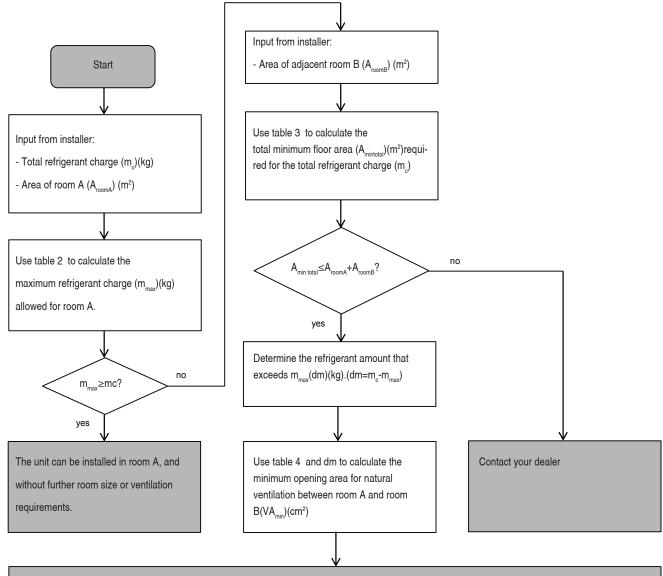
Spaces connected by only drop ceilings, duct work, or similar connections shall not be considered a single space.

For units mounted higher than 1,6 m, spaces divided by partition walls which are no higher than 1,6 m shall be considered a single space.

For fixed appliances, rooms on the same floor and connected by an open passageway between the spaces can be considered a single room when determining compliance to A_{\min} , if the passageway complies with all of the following .

- · It is a permanent opening.
- · It extends to the floor.
- It is intended for people to walk through.





Unit can be installed at room A if:

- 2 ventilation openings (permanently open) are provided between room A and B, 1 at the top and 1 at the bottom.
- Bottom opening: The bottom opening must meet the minimum area requirements (VA_{min}). It must be as close as possible to the floor. If the ventilation opening starts from the floor, the height must be ≥ 20 mm. The bottom of the opening must be situated ≤ 100 mm from the floor. At least 50% of the required opening area must be situated ≤ 200 mm from the floor. The entire area of the opening must be situated ≤ 300 mm from the floor.
- Top opening: The area of the top opening must be larger than or equal to the bottom opening. The bottom of the top opening must be situated at least 1.5 m above the top of the bottom opening.
- Ventilation openings to the outside are NOT considered suitable ventilation openings (the user can block them when it is cold).



The flow chart uses the following tables:

Tabella. 2 - Maximum refrigerant charge allowed in a room

A [m2]	0,5	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6	6,5	7	7,5	8	8,5	9	9,5	10
mmax [kg]	0,21	0,41	0,62	0,83	1,04	1,24	1,45	1,66	1,87	2,07	2,28	2,49	2,62	2,72	2,82	2,91	3,00	3,09	3,17	3,25



NOTE

For wall mounted models, the value of "Installation height (H)" is considered 1800 mm to comply to IEC 60335-2-40:2018 Clause GG2.

For intermediate Aroom values (i.e. when A_{room} is between two values from the table), consider the value that corresponds to the lower A_{room} value from the table. If A_{room} =3,6 m², consider the value that corresponds to " A_{room} =3,5 m²".

Tabella. 3 - Minimum floor area

mc [kg]	1,9	2	2,1	2,2	2,3	2,4	2,5
A _{mintotal} [m ²]	4,58	4,83	5,07	5,31	5,55	5,79	6,03



NOTE

For wall mounted models, the value of "Installation height (H)" is considered 1800 mm to comply to IEC 60335-2-40:2018 Clause GG2.

For intermediate mc values (i.e. when mc is between two values from the table), consider the value that corresponds to the higher mc value from the table. If m_c =1,97kg , consider the value that corresponds to " m_c =2kg". Systems with total refrigerant charge lower than 1.84kg are not subjected to any room requirements.

Tabella. 4 - Minimum venting opening area for natural ventilation

	Subt	able m _c = 1,9 kg			Subta	ble m _c = 2,0 kg			Subtal	ole m _c = 2,1 kg		Subtable m _c = 2,2 kg					
A _{roomA} [m ²]	m _{max} [kg]	dm=m _c -m _{max} [kg]	VA _{min} [cm ²]	A _{roomA} [m ²]	m _{max} [kg]	dm=m _c -m _{max} [kg]	VA _{min} [cm ²]	A _{roomA} [m ²]	m _{max} [kg]	dm=m _c -m _{max} [kg]	VA _{min} [cm ²]	A _{roomA} [m ²]	m _{max} [kg]	dm=m _c -m _{max} [kg]	VA _{min} [cm ²]		
0,5	0,21	1,69	395	0,5	0,21	1,79	419	0,5	0,21	1,89	442	0,5	0,21	1,99	465		
1	0,41	1,49	347	1	0,41	1,59	370	1	0,41	1,69	394	1	0,41	1,79	417		
1,5	0,62	1,28	299	1,5	0,62	1,38	322	1,5	0,62	1,48	345	1,5	0,62	1,58	369		
2	0,83	1,07	250	2	0,83	1,17	274	2	0,83	1,27	297	2	0,83	1,37	320		
2,5	1,04	0,86	202	2,5	1,04	0,96	225	2,5	1,04	1,06	248	2,5	1,04	1,16	272		
3	1,24	0,66	153	3	1,24	0,76	177	3	1,24	0,86	200	3	1,24	0,96	223		
3,5	1,45	0,45	105	3,5	1,45	0,55	128	3,5	1,45	0,65	152	3,5	1,45	0,75	175		
4	1,66	0,24	57	4	1,66	0,34	80	4	1,66	0,44	103	4	1,66	0,54	127		
4,5	1,87	0,03	8	4,5	1,87	0,13	32	4,5	1,87	0,23	55	4,5	1,87	0,33	78		
	· · · · ·							5	2,07	0,03	6	5	2,07	0,13	30		

	Subt	able m _c = 2,3 kg			Subta	ble m _c = 2,4 kg		Subtable m _c = 2,5 kg				
A _{roomA} [m ²]	m _{max} [kg]	dm=m _c -m _{max} [kg]	VA _{min} [cm ²]	A _{roomA} [m ²]	m _{max} [kg]	dm=m _c -m _{max} [kg]	VA _{min} [cm ²]	A _{roomA} [m ²]	m _{max} [kg]	dm=m _c -m _{max} [kg]	VA _{min} [cm ²]	
0,5	0,21	2,09	489	0,5	0,21	2,19	512	0,5	0,21	2,29	535	
1	0,41	1,89	440	1	0,41	1,99	464	1	0,41	2,09	487	
1,5	0,62	1,68	392	1,5	0,62	1,78	415	1,5	0,62	1,88	439	
2	0,83	1,47	344	2	0,83	1,57	367	2	0,83	1,67	390	
2,5	1,04	1,26	295	2,5	1,04	1,36	319	2,5	1,04	1,46	342	
3	1,24	1,06	247	3	1,24	1,16	270	3	1,24	1,26	294	
3,5	1,45	0,85	198	3,5	1,45	0,95	222	3,5	1,45	1,05	245	
4	1,66	0,64	150	4	1,66	0,74	173	4	1,66	0,84	197	
4,5	1,87	0,43	102	4,5	1,87	0,53	125	4,5	1,87	0,63	148	
5	2,07	0,23	53	5	2,07	0,33	77	5	2,07	0,43	100	
5,5	2,28	0,02	5	5,5	2,28	0,12	28	5,5	2,28	0,22	52	
								6	2,49	0,01	3	



NOTE

For wall mounted models, the value of "Installation height (H)" is considered 1800 mm to comply to IEC 60335-2-40:2018 Clause GG2.

Based on the value of m_c (total refrigerant change of the system) use the subtable with the higher value, for instance if m_c= 2,05 kg use subtable m_c=2,1 kg



CAUTION

Frequency of Refrigerant Leakage Checks

For unit that contains fluorinated greenhouse gases in quantities of 5 tonnes of CO₂ equivalent or more, but of less than 50 tonnes of CO₂ equivalent, at least every 12 months, or where a leakage detection system is installed, at least every 24 months.

For unit that contains fluorinated greenhouse gases in quantities of 50 tonnes of CO₂ equivalent or more, but of less than 500 tonnes of CO₂ equivalentat least every six months, or where a leakage detection system is installed, at least every 12 months.

For unit that contains fluorinated greenhouse gases in quantities of 500 tonnes of CO₂ equivalent or more, at least every three months, or where a leakage detection system is installed, at least every six months.

Only certificated person is allowed to do installation, operation and maintenance.

7



∕!\ DANGER

- Before touching electric terminal parts, turn off power switch.
- When service panels are removed, live parts can be easily touched by accident.
- Never leave the unit unattended during installation or servicing when the service panel is removed.
- Do not touch water pipes during and immediately after operation as the pipes may be hot and could burn your hands. To avoid injury, give the piping time to return to normal temperature or be sure to wear protective gloves.
- Do not touch any switch with wet fingers. Touching a switch with wet fingers can cause electrical shock.
- Before touching electrical parts, turn off all applicable power to the unit.

№ WARNING

- Tear apart and throw away plastic packaging bags so that children will not play with them. Children playing with plastic bags face danger of death by suffocation.
- Safely dispose of packing materials such as nails and other metal or wood parts that could cause injuries.
- Ask your dealer or qualified personnel to perform installation work in accordance with this manual. Do not install the unit yourself. Improper installation could result in water leakage, electric shocks or fire.
- Be sure to use only specified accessories and parts for installation work. Failure to use specified parts may result in water leakage, electric shocks, fire, or the unit falling from its mount.
- Install the unit on a wall that can withstand its weight. Insufficient physical strength may cause the equipment to fall and possible injury.
- Perform specified installation work with full consideration of strong wind, hurricanes, or earthquakes. Improper installation work may result in accidents due to equipment falling.
- Make certain that all electrical work is carried out by qualified personnel according to the local laws and regulations and this manual using a separate circuit. Insufficient capacity of the power supply circuit or improper electrical construction may lead to electric shocks or fire.
- Be sure to install a ground fault circuit interrupter according to local laws and regulations. Failure to install a ground fault circuit interrupter may cause electric shocks and fire.
- Make sure all wiring is secure. Use the specified wires and ensure that terminal connections or wires are protected from water and other adverse external forces. Incomplete connection or affixing may cause a fire.
- When wiring the power supply, form the wires so that the front panel can be securely fastened. If the front panel is not in place there could be overheating of the terminals, electric shocks or fire.
- After completing the installation work, check to make sure that there is no refrigerant leakage.
- Never directly touch any leaking refrigerant as it could cause severe frostbite. Do not touch the refrigerant pipes
 during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition
 of the refrigerant flowing through the refrigerant piping, compressor and other refrigerant cycle parts. Burns or
 frostbite are possible if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal
 temperature or, if you must touch them be sure to wear protective gloves.
- Do not touch the internal parts (pump, backup heater, etc.) during and immediately after operation. Touching the internal parts can cause burns. To avoid injury, give the internal parts time to return to normal temperature or, if you must touch them, be sure to wear protective gloves.

 EN



^

CAUTION

Ground the unit.

Grounding resistance should be according to local laws and regulations.

Do not connect the ground wire to gas or water pipes, lightning conductors or telephone ground wires.

Incomplete grounding may cause electric shocks.

Gas pipes: Fire or an explosion might occur if the gas leaks.

Water pipes: Hard vinyl tubes are not effective grounds.

Lightning conductors or telephone ground wires: electrical threshold may rise abnormally if struck by a lightning bolt.

Install the power wire at least 1 meter away from televisions or radios to prevent interference or noise.

(Depending on the radio waves, a distance of 1 meter may not be sufficient to eliminate the noise.)

Do not wash the unit. This may cause electric shocks or fire. The appliance must be installed in accordance with national wiring regulations. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Do not install the unit in the following places:

- Where there is mist of mineral oil, oil spray or vapors. Plastic parts may deteriorate, and cause them to come loose or water to leak.
- Where corrosive gases (such as sulphurous acid gas) are produced. Where corrosion of copper pipes or soldered parts may cause refrigerant to leak.
- Where there is machinery which emits electromagnetic waves. Electromagnetic waves can disturb the control system and cause equipment malfunction.
- Where flammable gases may leak, where carbon fiber or ignitable dust is suspended in the air or where volatile flammables such as paint thinner or gasoline are handled. These types of gases might cause a fire.
- Where the air contains high levels of salt such as near the ocean.
- Where voltage fluctuates a lot, such as in factories.
- In vehicles or vessels.
- Where acidic or alkaline vapors are present.

This appliance can be used by children 8 years old and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they are supervised or given instruction on using the unit in a safe manner and understand the hazards involved. Children should not play with the unit. Cleaning and user maintenance should not be done by children without supervision.

Children should be supervised to ensure that they do not play with the appliance.

If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person.

DISPOSAL: Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary. Do not dispose of electrical appliances as municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substance can leak into the groundwater and get into the food chain, damaging your health and well-being.

The wiring must be performed by professional technicians in accordance with national wiring regulation and this circuit diagram. An all-pole disconnection device which has at least 3mm separation distance in all pole and a residual current device(RCD) with the rating not exceeding 30mA shall be incorporated in the fixed wiring according to the national rule.

Confirm the safety of the installation area (walls, floors, etc.) without hidden dangers such as water, electricity, and gas. Before wiring/pipes.

Before installation, check whether the user's power supply meets the electrical installation requirements of unit (including reliable grounding, leakage, and wire diameter electrical load, etc.). If the electrical installation requirements of the product are not met, the installation of the product is prohibited until the product is rectified.

When installing multiple air conditioners in a centralized manner, please confirm the load balance of the three-phase power supply, and multiple units are prevented from being assembled into the same phase of the three-phase power supply.

Product installation should be fixed firmly, Take reinforcement measures, when necessary.

ΕN





NOTE

About Fluorinated Gasses

- This air-conditioning unit contains fluorinated gasses. For specific information on the type of gas and the amount, please refer to the relevant label
 on the unit itself. Compliance with national gas regulations shall be observed.
- Installation, service, maintenance and repair of this unit must be performed by a certified technician.
- Product uninstallation and recycling must be performed by a certified technician.
- If the system has a leak-detection system installed, it must be checked for leaks at least every 12 months. When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.

↑ WARNING

Be sure to adopt adequate measures to prevent the unit from being used as a shelter by small animals. Small animals making contact with electrical parts can cause malfunction, smoke or fire. Please instruct the customer to keep the area around the unit clean.

Select an installation site where the following condition are satisfied and one that meets with your customer's approval.

- Places that are well-ventilated.
- Places where the unit does not disturb next-door neighbors.
- Safe places which can bear the unit's weight and vibration and where the unit can be installed at an even level.
- Places where there is no possibility of flammable gas or product leak.
- The equipment is not intended for use in a potentially explosive atmosphere.
- Places where servicing space can be well ensured.
- Places where the units' piping and wiring lengths come within the allowable ranges.
- Places where water leaking from the unit cannot cause damage to the location.
- Places where rain can be avoided as much as possible.
- Do not install the unit in places often used as a work space. In case of construction work (e.g. grinding etc.)
 where a lot of dust is created, the unit must be covered.
- Do not place any object or equipment on top of the unit (top plate)
- Do not climb, sit or stand on top of the unit.
- Be sure that sufficient precautions are taken in case of refrigerant leakage according to relevant local laws and regulations.
- Don't install the unit near the sea or where there is corrosion gas.

MARNING

Ask your dealer for installation of the heat pump.

Incomplete installation performed by yourself may result in a water leakage, electric shock, and fire.

Ask your dealer for improvement, repair, and maintenance.

Incomplete improvement, repair, and maintenance may result in a water leakage, electric shock, and fire.

- In order to avoid electric shock, fire or injury, or if you detect any abnormality such as smell of fire, turn off the
 power supply and call your dealer for instructions.
- Never let the indoor unit or the controller get wet.

It may cause an electric shock or a fire.

Never press the button of the controller with a hard, pointed object.

The controller may be damaged.

Never replace a fuse with that of wrong rated current or other wires when a fuse blows out.

Use of wire or copper wire may cause the unit to break down or cause a fire.

Never use a flammable spray such as hair spray, lacqueror paint near the unit.



It may cause a fire.

 Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary.

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.

Contact your local government for information regarding the connection systems available.

- If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.
- To prevent refrigerant leak, contact your dealer.

When the system is installed and runs in a small room, it is required to keep the concentration of the refrigerant, if by any chance coming out, below the limit. Otherwise, oxygen in the room may be affected, resulting in a serious accident.

• The refrigerant in the heat pump is safe and normally does not leak.

If the refrigerant leaks in the room, contact with a fire of a burner, a heater or a cooker may result in a harmful gas.

Turn off any combustible heating devices, ventilate the room, and contact the dealer where you purchased the
unit.

Do not use the heat pump until a service person confirms that the portion where the refrigerant leaks is repaired.

CAUTION

Do not use the heat pump for other purposes.

In order to avoid any quality deterioration, do not use the unit for cooling precision instruments, food, plants, animals or works of art.

Before cleaning, be sure to stop the operation, turn the breaker off or pull out the supply cord.

Otherwise, an electric shock and injury may result.

- In order to avoid electric shock or fire, make sure that an earth leak detector is installed.
- Be sure the heat pump is grounded.

In order to avoid electric shock, make sure that the unit is grounded and that the earth wire is not connected to gas or water pipe, lightning conductor or telephone earth wire.

Do not operate the heat pump with a wet hand.

An electric shock may happen.

• Do not place items which might be damaged by moisture under the indoor unit.

Condensation may form if the humidity is above 80%.

After a long use, check the unit stand and fitting for damage.

If damaged, the unit may fall and result in injury.

- To avoid oxygen deficiency, ventilate the room sufficiently if equipment with burner is used together with the heat pump.
- Arrange the drain hose to ensure smooth drainage.

Incomplete drainage may cause wetting of the building, furniture etc.

Never touch the internal parts of the controller.

Do not remove the front panel. Some parts inside are dangerous to touch, and a machine trouble may happen.

Never do the maintenances work by yourself.

Please contact your local dealer to do the maintenances work.

Adverse influence to little children, animals and plants may result.

Do not allow a child to mount on the unit or avoid placing any object on it.

Falling or tumbling may result in injury.

Do not operate the heat pump when using a room fumigation - type insecticide.

Failure to observe could cause the chemicals to become deposited in the unit, which could endanger the health of those who are hypersensitive to chemicals.

 Do not place appliances which produce open fire in places exposed to the air flow from the unit or under the indoor unit.

It may cause incomplete combustion or deformation of the unit due to the heat.

Do not install the heat pump at any place where flammable gas may leak out.



If the gas leaks out and stays around the heat pump, a fire may break out.

- The appliance is not intended for use by young children or infirm persons without supervision.
- Young children should be supervised to ensure that they do not play with the appliance.
- The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.



Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

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 .

Be aware that refrigerants may not contain an odour.

1.2 Information servicing

1) Checks to the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minmised. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

2) Work procedure

Works shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.

3) General work area

All mintenance staff and others working in the local area shall be instructed on the nature of work being carried out. work in confined sapces shall be avoided. The area

4) Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware

of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. no sparking, adequately sealed or intrinsically safe.

5) Presence of fire extinguisher.

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry power or CO2 fire extinguisher adjacent to the charging area.

6) No ignition sources

No person carrying out work in relation to a refrigerating system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion.

All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. NO SMOKING signs shall be displayed.

7) Ventilated area

Ensure that the area is in the open or that it it adequately ventilated before breaking into the system or conducting any hot work.

A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

8) Checks to the refrigerating equipment

 EN

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer s maintenance and service guidelines shall be followed. If in doubt consult the manufacturer s technical department for assistance. The following checks shall be applied to installations using flammable refrigerants:

- The actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed;
- The ventilation machinery and outlets are operating adequately and are not obstructed;
- If an indirect refrigerating circuit is being used, the secondary circuits shall be checked for the presence of refrigerant; marking to the equipment continues to be visible and legible.
- · Marking and signs that are illegible shall be corrected;
- Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing
 components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so
 corroded.



9) Checks to electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, and adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised. Initial safety checks shall include:

- That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- That there no live electrical components and wiring are exposed while charging, recovering or purging the system;
- That there is continuity of earth bonding.

10) Repairs to sealed components

- a) During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
- b) Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
- · Ensure that apparatus is mounted securely.
- Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer s specifications.



The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Instrinsically safe components do not have to be isolated prior to working on them.

11) Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use. Intrinscially safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

12) Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

13) Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

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

Electronic leak detectors shall be used to detect flammable refrigerants, 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. 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 also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

NOTE

Examples of leak detection flu ids are

- bubble method
- fluore scent method agents

If a leak is suspected, ali naked flames shall be removed/extinguished.

If a leakage of refrigerant is found which requires brazing, ali 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.

Removal of refrigerant shall be according to Clause DD.9.

14) Removal and evacuation

When breaking into the refrigerant circuit to make repairs of for any other purpose conventional procedures shall be used, However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- Remove refrigerant;
- · Purge the circuit with inert gas;
- · Evacuate;
- Purge with inert gas;
- · Open the circuit by cutting or brazing.



The refrigerant charge shall be recovered into the correct recovery cylinders. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process may need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosp here, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take piace. This operation is absolutely vital if brazing operations on the pipe-work are to take piace.

Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

15) Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed:

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the
 amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the refrigerating system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete(if not already).
- Extreme care shall be taken not to overfill the refrigerating system.

Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

16) Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken. In case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

- a) Become familiar with the equipment and its operation.
- b) Isolate system electrically
- c) Before attempting the procedure ensure that:
- · Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
- All personal protetive equipment is available and being used correctly;
- The recovery process is supervised at all times by a competent person;
- Recovery equipment and cylinders conform to the appropriate standards.
- d) Pump down refrigerant system, if possible.
- e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f) Make sure that cylinder is situated on the scales before recovery takes place.
- g) Start the recovery machine and operate in accordance with manufacturer s instructions.
- h) Do not overfill cylinders. (No more than 80% volume liquid charge).
- i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

17) Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

18) Recovery

When removing refrigerant from a system, either for service or decommissioning, it is recommended good practice that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct numbers of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant(i.e special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order.

Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to retruning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

ΕN



20) Transportation, marking and storage for units

- General. The following information is provided for units that employ flammable refrigerants.
- Transport of equipment containing flammable refrigerants. Attention is drawn to the fact that additional transportation regulations may exist with respect to equipment containing flammable gas. The maximum number of pieces of equipment or the configuration of the equipment permitted to be transported together will be determined by the applicable transport regulations.
- Marking of equipment using signs. Signs for similar appliances used in a work area are generally addressed by local regulations and give the minimum requirements for the provision of safety and/or health signs for a work location. All required signs are to be maintained and employers should ensure that employees receive suitable and sufficient instruction and training on the meaning of appropriate safety signs and the actions that need to be taken in connection with these signs. The effectiveness of signs should not be diminished by too many signs being placed together. Any pictograms used should be as simple as possible and contain only essential details.
- Disposal of equipment using flammable refrigerants. See national regulations.
- Storage of equipment/appliances. The storage of the appliance should be in accordance with the applicable regulations or instructions, whichever is more stringent.
- Storage of packed (unsold) equipment. Storage package protection should be constructed in such a way that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge. The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.



2. GENERAL FEATURES

2.1 Presentation of the system

> GENERAL CHARACTERISTICS:

This series of air-water heat pumps satisfies the winter and summer air conditioning needs of residential and commercial systems of small and medium power and allows the production of domestic hot water (DHW) through an external boiler.

All the units are suitable for split installation (which avoids the risk of freezing in particularly rigid outdoor applications) and are capable of producing water up to 65 °C and can therefore be used in radiant systems, fan coil units, radiators.

The user interface consists of a digital controller mounted on the indoor unit, equipped with a large display and simple setting commands.

> INDOOR UNIT FEATURES

- All the components (plate heat exchanger, circulator, etc.) and all the pipes of the hydraulic circuit are thermally insulated to avoid the formation of condensation and reduce
 heat losses.
- · Brazed stainless steel water / gas plate heat exchanger controlled and protected by temperature probes on both the water and refrigerant side
- · Low consumption circulator with brushless DC motor
- System electric heater (3 kW single stage for mod. 4 6 8 10 12 14 16, 6 kW single stage for mod. 12T 14T 16T)
- · Water flow switch
- · Plant expansion vessel of 10 liters
- 3-way diverter valve for DHW production
- · Automatic air vent
- · Water pressure gauge
- · 3 bar safety valve
- · Water filter (Y-shape) supplied (not installed)

> OUTDOOR UNIT FEATURES

- · Refrigerant circuit contained in a compartment sheltered from the air flow to facilitate maintenance operations
- · Reduced inrush current thanks to Inverter technology
- Compressor with twin rotary DC INVERTER motor equipped with crankcase oil heater, positioned on anti-vibration rubber supports and wrapped in a double layer of soundabsorbing material to minimize vibrations and noise
- DC inverter compressor that allows to modulate the capacity from 30 to 120% of the rated capacity
- · Electronic biflow expansion valve
- · Reverse cycle valve
- · Axial fans with brushless DC motor complete with safety protection grilles
- · Finned coil consisting of copper pipes and hydrophilic aluminium fins with anti-corrosion treatment
- · The circuit is controlled by temperature probes and pressure transducers and protected by high and low pressure switches.
- All the units are equipped with variable speed control of the fans which allows operation with low external temperatures in cooling and high external temperatures in heating.
- External air temperature probe already installed on the unit.

> OUTDOOR UNIT ACCESSORIES

• AVG - Rubber antivibration dampers.

> SYSTEM ACCESSORIES

TP - Temperature probe: this is a probe that can be used to expand the control functions of the unit.

In fact, it can be used for:

- management of a 2-zone kit (direct and mixed) external to the unit for reading the mixed zone flow
- · solar thermal management for reading the temperature of the solar collector

2.2 Components supplied with the indoor unit

		Q	.ty
Description	Shape	Indoor unit 10	Indoor unit 16 - 16T
Installation, maintenance and user manual (this manual)		1	1
Water filter (Y-shape)		1	1
T5: temperature probe for the domestic hot water tank (cable length =10 m)	0	1	1
Energy label		1	1
Brass reduction fitting 3/8" SAE - 1/4" SAE		1	-



2.3 The control system

The user interface consists of a controller integrated into the indoor unit with a multilingual menu that allows the management of:

- HEATING AND COOLING SYSTEM where the heat pump is the only energy source. If the unit is activated in heating or cooling mode, it works by modulating the compressor frequency to maintain the produced water temperature at the set point value set by the controller.
- DOMESTIC HOT WATER PRODUCTION (DHW). The unit is activated in heating mode to maintain the DHW external tank temperature at the set point value.

ADDITIONAL ENERGY SOURCES:

- System electric heater (IBH). Depending on the parameters set, it can be activated in Integration or substitution of the heat pump when the system serves the heating plant. The electronic board will activate the electric heater if the heat pump does not work due to an alarm or due to reached operating limits.
- Boiler (if installed). Depending on the parameters set, it can be activated in Integration or substitution of the heat pump when the system serves the plant in heating or DHW production. The electronic board will activate the boiler if the heat pump does not work due to an alarm or due to reached operating limits.
- ELECTRIC HEATER DHW TANK. In sanitary mode it can manage an electric
 heater inserted in the DHW tank as an integration to the heat pump, antilegionella function, or as a backup energy source for DHW production if the
 heat pump does not work due to an alarm or due to operating limits. The
 DHW tank electric heater is essential for the anti-legionella function and for
 the photovoltaic input function.
- FAST DHW. This function can be activated manually that allows you to give
 priority to the domestic hot water by activating all the energy sources (heat
 pump, electric resistances, boiler) available for DHW heating to bring the
 DHW tank to the set point in the shortest possible time.
- ANTI-LEGIONELLA FUNCTION. It is possible to set anti-legionella weekly
 cycles from the controller. In order to carry out these cycles correctly, the heat
 pump must be integrated with the DHW tank or boiler electric heater.
- SILENT MODE. If active, it involves a reduction of the maximum compressor frequency and fan speed to reduce the noise emitted and the power absorbed by the unit. There are 2 levels of silencing. Through time programming, it is possible to define the desired silencing level for 2 daily time bands (e.g. at night).
- ON / OFF via an external contact. The unit can be activated and deactivated (e.g. zone thermostat / remote switch) via an external contact: in this case the unit will operate in the way set via the controller keyboard.
- **HEATING / COOLING** via external contacts. The unit can be activated and deactivated in cooling and heating mode via 2 external contacts (eg. Zone thermostat that manages the request for cooling and heating / remote switch).
- ECO. Possibility of warmly defining the time bands and relative setpoint for the ECO mode.

- WEEKLY SCHEDULE. It allows differentiated hourly programming for each day
 of the week by defining the mode (COOL/HEAT/DHW) and the working setpoint
 for each band.
- ANTIFREEZE PROTECTION. It is activated if the water temperature measured by the temperature probes present in the indoor unit falls below 4 ° C: it provides for the activation of the internal circulator and possibly the heat pump in heating mode, and / or the electric heater for DHW boiler (if installed) and / or the boiler (if installed).
- MANAGEMENT OF UP TO 2 ZONES (1 MIXED AND 1 DIRECT). The unit
 is able to manage the pumps of both zones and, for the mixed zone only, the
 mixing valve and the water delivery temperature probe.
- SOLAR THERMAL MANAGEMENT. The unit is able to manage the solar pump and the temperature of the solar collector.
- PHOTOVOLTAIC INPUT AND SMART GRID INPUT. The unit is equipped with 2 digital inputs for the management of an input from the photovoltaic system and from the electricity grid. Working logic:
 - if the photovoltaic input is closed, the unit activates the DHW mode with DHW setpoint = 70 $^{\circ}$ C and will activate the electric heater of the DHW tank (if installed). The unit will continue to operate in cooling / heating mode with the normal logic set.
 - If the photovoltaic input is open and the smart grid input is closed, the unit works normally.
 - If the photovoltaic input is open and the smart grid input is open, the unit deactivates the DHW mode and can operate in cooling / heating mode for a defined period (which can be set via a parameter), then it will be deactivated.
- CURRENT LIMITATION BY PARAMETER.
- REMOTE CONTROL OF THE UNIT VIA APP (available for IOS and Android).
- Detailed ERROR DIAGNOSTICS with historical alarms.
- DISPLAY OF ALL OPERATING PARAMETERS.

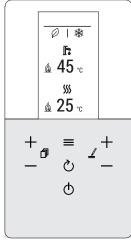


fig. 2 - user interface



3. TECHNICAL DATA AN PERFORMANCE

3.1 System technical data

-	Models		4	6	8	10	12	14	16	12T	14T	16T	UM
	Heating capacity	nom	4,20	6,35	8,40	10,0	12,1	14,5	15,9	12,1	14,5	15,9	kW
32	Power input	nom	0,82	1,28	1,63	2,02	2,44	3,15	3,53	2,44	3,15	3,53	kW
A7W35	COP		5,10	4,95	5,15	4,95	4,95	4,60	4,50	4,95	4,60	4,50	W/W
A	Water flow rate		722	1092	1445	1720	2081	2494	2735	2081	2494	2735	l/h
	Available static pressure		81	76	61	47	58	42	34	58	42	34	kPa
	Heating capacity	nom	4,30	6,30	8,30	10,0	12,3	14,1	16,0	12,3	14,1	16,0	kW
A7W45	Power input	nom	1,13	1,70	2,16	2,67	3,32	3,92	4,57	3,32	3,92	4,57	kW
1	COP		3,80	3,70	3,85	3,75	3,70	3,60	3,50	3,70	3,60	3,50	W/W
A.	Water flow rate		740	1084	1428	1720	2116	2425	2752	2116	2425	2752	l/h
	Available static pressure	81	76	62	47	57	45	33	57	45	33	kPa	
	Heating capacity	4,40	6,00	7,50	9,50	11,9	13,8	16,0	11,9	13,8	16,0	kW	
A7W55	Power input	nom	1,49	2,03	2,36	3,06	3,90	4,68	5,61	3,90	4,68	5,61	kW
>	COP		2,95	2,95	3,18	3,10	3,05	2,95	2,85	3,05	2,95	2,85	W/W
A.	Water flow rate		473	645	806	1021	1279	1484	1720	1279	1484	1720	l/h
	Available static pressure		83	81	80	77	85	79	71	85	79	71	kPa
	Cooling capacity	nom	4,50	6,50	8,30	9,90	12,0	12,9	13,6	12,0	12,9	13,6	kW
50	Power input	nom	0,82	1,35	1,64	2,18	3,04	3,49	3,77	3,04	3,49	3,77	kW
435W18	EER		5,50	4,80	5,05	4,55	3,95	3,70	3,61	3,95	3,70	3,61	W/W
A3	Water flow rate		774	1118	1428	1703	2064	2219	2339	2064	2219	2339	l/h
	Available static pressure		80	75	62	48	58	53	48	59	53	48	kPa
	Cooling capacity nom		4,70	6,50	7,45	8,20	11,5	12,4	14,0	11,5	12,4	14,0	kW
7	Power input nom		1,36	2,17	2,22	2,52	4,18	4,96	5,60	4,18	4,96	5,60	kW
A35W7	EER		3,45	3,00	3,35	3,25	2,75	2,50	2,50	2,75	2,50	2,50	W/W
A	Water flow rate	808	1118	1281	1410	1978	2133	2408	1978	2133	2408	l/h	
	Available static pressure		80	75	68	63	61	56	46	61	56	46	kPa

The values are referred to units without options and accessories.

Data declared according to EN 14511:

EER (Energy Efficiency Ratio) = ratio of the total cooling capacity to the effective power input of the unit COP (Coefficient Of Performance) = ratio of the total heating capacity to the effective power input of the unit

A7W35 = source : air in 7°C d.b. 6°C w.b. / plant : water in 30°C out 35°C A7W45 = source : air in 7°C d.b. 6°C w.b. / plant : water in 40°C out 45°C A7W55 = source : air in 7°C d.b. 6°C w.b. / plant : water in 47°C out 55°C A35W18 = source : air in 35°C d.b. / plant : water in 23°C out 18°C A35W7 = source : air in 35°C d.b. / plant : water in 12°C out 7°C

Outdoor unit technical da	ata	4	6	8	10	12	14	16	12T	14T	16T	UM	
Power supply	utu	7			20/240-1-		17	10		80/415-3-		V-ph-Hz	
Compressor type							tary DC					-	
N° compressors / N° refrig	erant circuits					1	/1					n°	
Heat exchanger type					stain	less stee	l brazed p	lates				-	
Fans type						DC	axial					-	
N° fans							1					n°	
Hydraulic fittings / liquid lin		1/4" SAE	/ Ø 6,35			- (O", O A F	3/8" SAE / Ø 15,88	/ Ø 9,52				-	
Hydraulic fittings / gas line				- -									
Refrigerant type GWP							32					type kg-CO2 eq.	
Refrigerant factory charge	*	15/	675 1,5 / 1,01										
Refrigerant lines (max length)	may difference in height)	1,57	30 / 20										
Trongorant in oo (maxiongan)	A7W35	56	58	59	60	64	65	68	64	65	68	dB(A)	
SWL - Sound power leve	Max	60	61	61	62	65	65	69	65	65	69	dB(A)	
Heating **	Sil. 1	56	56	57	58	62	62	63	62	62	63	dB(A)	
	Sil. 2	53	53	55	55	56	56	56	56	56	56	dB(A)	
	A35W18	56	58	60	60	64	64	69	64	64	69	dB(A)	
SWL - Sound power leve	Max	60	61	61	62	65	65	69	65	65	69	dB(A)	
Cooling **	Sil. 1	55	57	57	58	62	62	63	62	62	63	dB(A)	
	Sil. 2	52 12	54 14	54	54	56	56	56	56	56	56	dB(A)	
Max. current input	Max. current input			16	17	25	26	27	10	11	12	Α	
Net weight		58 77 96 112							kg				
Packed unit weight		65 94 114 130							kg				

^{*} The factory refrigerant charge allows a maximum length of the refrigeration lines of 15 meters. The maximum length of the refrigeration lines is 30 meters: in this case it is necessary to integrate the charge during installation.

A7W35 = source : air in 7°C d.b. 6°C w.b. / plant : water in 30°C out 35°C

A35W18 = source : air in 35°C d.b. / plant : water in 23°C out 18°C

Max = at maximum conditions in heating / cooling mode Sil. 1 = if silent level 1 active in heating / cooling mode

Sil. 2 = if silent level 2 active in heating / cooling mode

The Total sound power level in dB(A) measured in compliance with ISO 9614 standards.

^{**:} **SWL** = Sound power levels, with reference to 1x10-12 W with unit operating in conditions:



Indoor unit technical data			1	10			16			16T		UM	
Power supply				2:	20/240-1-	50			38	30/415-3-	50	V-ph-Hz	
Heat exchanger type					Stain	less steel	brazed p	lates				-	
Pump type		Ele	ctronic circ	culator (8 r	nca)			tronic circ	ulator (9 n	nca)		-	
System expansion tank volume						1	0						
System safety water valve set				,		3	}					bar	
System water connections						1" G/						-	
DHW water connections			3/4" GAS F									-	
Hydraulic fittings / liquid line ***			3/8" SAE / Ø 9,52										
Hydraulic fittings / gas line		5/8" SAE / Ø 15,88							-				
Minimum plant water content			_			4	0						
DHW boiler - minimum surface of the coil	steel			/ 2,5					/ 4,0			m²	
(minimum / recommended)	enamel		1,7	/ 3,0 2,5 / 5,6					m²				
System electric heater					3					6		kW	
System temperature (min-max)						5 -	65					°C	
System pressure (min-max)						1 -	3					bar	
SWL - Sound power level		39	39	39	39	40	40	40	40	40	40	dB(A)	
Max current input		14 10							Α				
Net weight			3	33			35			36		kg	
Operation weight ****			3	35			37			38		kg	
Packed unit weight		35 37 38							kg				

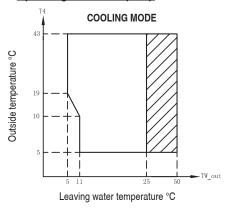
^{***} For matching with external units mod. 4-6 a reduction fitting from 3/8 "SAE to 1/4" SAE is provided for liquid line Ø 6.35.

3.2 ERP data

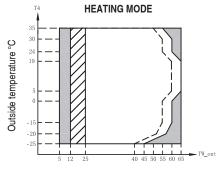
	Models	4	6	8	10	12	14	16	12T	14T	16T	UM
	low temperature (water outlet at 35°C)	191	195	205	204	189	185	182	189	185	182	ηs (%)
Seasonal space	sonal space ting energy		A+++									
efficiency class	medium temperature (water at 55°C)	129	138	131	136	135	135	133	135	135	133	ηs (%)
-	medium temperature (water at 55 C)					•	\++					class
SCOP	low temperature (water outlet at 35°C)	4,85	4,95	5,21	5,19	4,81	4,72	4,62	4,81	4,72	4,62	W/W
3004	medium temperature (water at 55°C)	3,31	3,52	3,36	3,49	3,45	3,47	3,41	3,45	3,47	3,41	W/W
CEED	water at 7°C	4,99	5,34	5,83	5,98	4,89	4,86	4,69	4,86	4,83	4,67	W/W
SEER	water at 18°C		8,21	8,95	8,78	7,10	6,90	6,75	7,04	6,85	6,71	W/W

NOTA: Declared according to European regulation 811/2013. The values are referred to units without options and accessories.

3.3 Operating limits heat pump



Operation range by heat pump with possible limitation and protection.

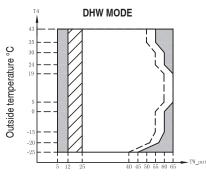


Leaving water temperature °C

Operation range by heat pump with possible limitation and protection.

With IBH (system electric heater) installed.

Maximum inlet water temperature line for heat pump operation.



Leaving water temperature °C

Operation range by heat pump with possible limitation and protection.

With IBH (system electric heater) installed.

Maximum inlet water temperature line for heat pump operation.

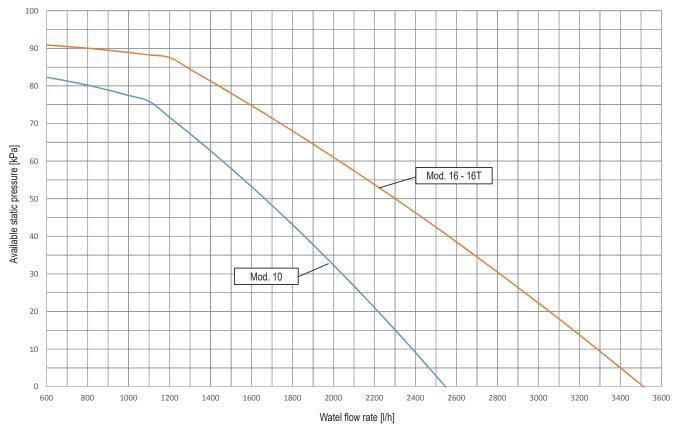
NOTE FOR DHW MODE: leaving water temperature is the temperature of the water produced by the unit and not the DHW temperature available to the user; the DHW temperature is in fact a function of this parameter and of the coil surface of the DHW boiler.

^{****} Weight refers to basic unit without accessories



3.4 Available static pressure

3.4.1 Heat pump circulator indoor unit



The graph provides the available static pressure granted by the internal circulator (P_i) a the maximum speed. The internal circulator speed is managed by the hydronic board in order to insure the correct water temperature difference as in the table below:

	Cooling mode	Heatin	g mode
	For all set point	Set point <50°C	Set point >50°C
$\Delta T = T_{Win} - T_{Wout}$	5	5	8

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4. DIMENSIONAL AND PHYSICAL DATA

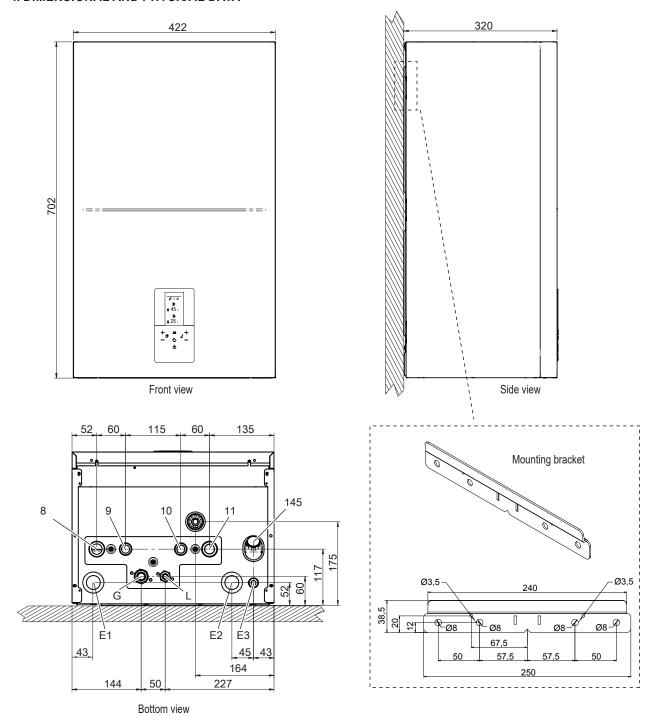


fig. 3 - dimensional data and connections

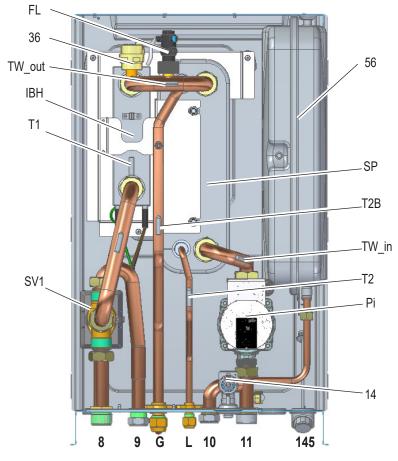
- 8 Plant outlet Ø 1"
- 9 DHW outlet Ø 3/4"
- **10** DHW inlet Ø 3/4"
- **11** Plant inlet Ø 1"
- 145 Water pressure gauge
- **G** Gas line Ø 15,88 (5/8")
- L* Liquid line Ø 9,52 (3/8")

- E1 Signal wires cable gland
- **E2** Power wires cable gland
- E3 Power supply cable with cable gland

^{*} For matching with outdoor units mod. 4-6 a reduction fitting from 3/8 "SAE to 1/4" SAE is provided for liquid line Ø 6.35.



5. GENERAL VIEW AND INTERNAL UNIT HYDRAULIC DIAGRAM





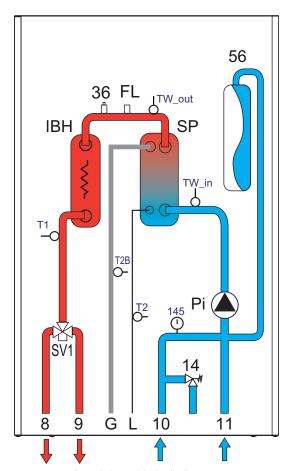


fig. 5 - Indoor unit hydraulic diagram

LEGEND

- 8 Plant outlet
- 9 DHW outlet
- 10 DHW inlet
- 11 Plant inlet
- 14 Safety valve
- 36 Automatic air vent
- 56 Expansion vessel
- 145 Water pressure gauge
- **FL** Flow switch
- G Gas line

IBH System electrical heater

L Liquid linePi Water circulatorSP Plate heat exchanger

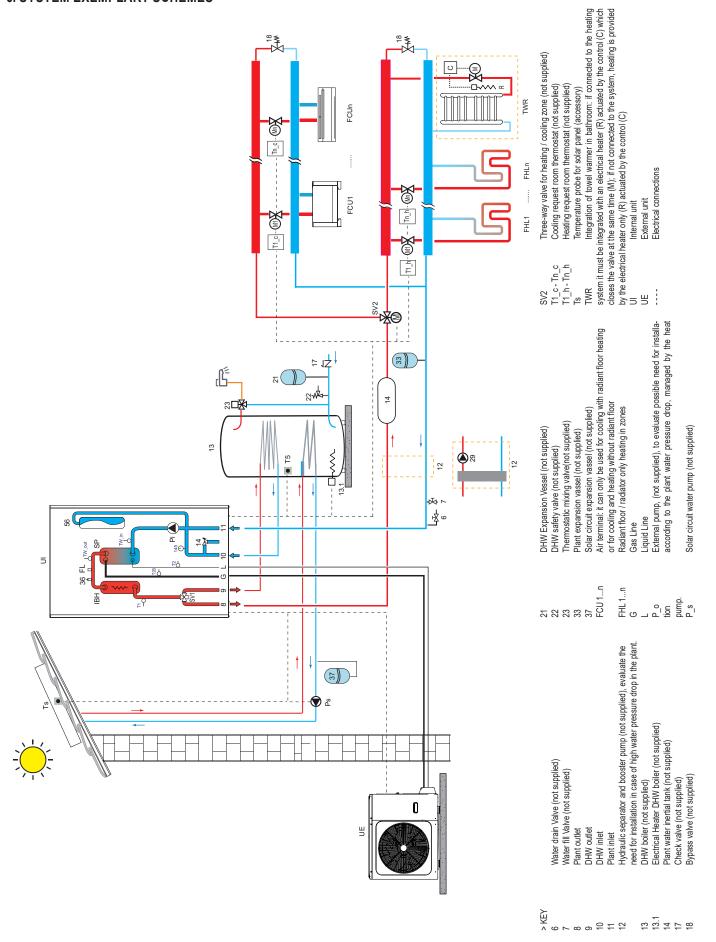
SV1 Diverter valve

T1 Heat pump outlet water temperature probe
 T2 Heat pump liquid refrigerant temperature probe
 T2B Heat pump gas refrigerant temperature probe
 TW_in Plate heat exchanger water inlet temperature probe

TW_out Plate heat exchanger water outlet temperature probe

Lamborghini CALORECLIMA

6. SYSTEM EXEMPLARY SCHEMES





7. INSTALLATION

7.1 Inspections on arrival

Upon receipt of the unit it is essential to check that you have received all the material indicated on the accompanying document, and also that it has not been damaged during transport. If so, have the dispatcher ascertain the extent of the damage suffered, alerting our customer management office in the meantime. Only by acting in this way and in a timely manner will it be possible to have the missing material or compensation for damages.

7.1.1 Packing and storing

All machines are packed in cardboard boxes specific for each unit. The indications required to correctly handle the appliance while storing and installing it are written on the packing.

The storage temperature must be between -25°C and 55°C.



NOTE

Do not dispose of the packaging in the environment.

Do not dispose of, leave or leave within the reach of children the packaging material as it may be a potential source of danger.

Once the place in which the unit is to be installed has been chosen (see the relative sections) proceed as follows to unpack the indoor unit.

Installation requirements

- · The indoor unit is packed in a box.
- At delivery, the unit must be checked and any damage must be reported immediately to the carrier claims agent.
- · Check if all indoor unit accessories are enclosed.
- Bring the unit as close as possible to the final installation position in its original package in order to prevent damage during transport.
- The indoor unit weight is approximately 40 kg and should be lifted by two persons.

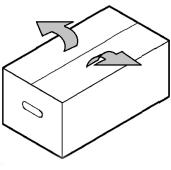


fig. 6 -

7.1.2 Selecting the installation site and minimum operating area for indoor unit



WARNING

There is flammable refrigerant in the unit and it should be installed in a well-ventilated site. If the unit is installed inside, an additional refrigerant detection device and ventilation equipment must be added in accordance with the standard EN378. Be sure to adopt adequate measures to prevent the unit from being used as a shelter by small animals.

Small animals making contact with electrical parts can cause malfunction, smoke or fire. Please instruct the customer to keep the area around the unit clean.

The equipment is not intended for use in a potentially explosive atmosphere.

- · Select an installation site where the following conditions are satisfied and one that meets with your customer's approval.
 - Places that are well-ventilated.
 - Safe places which can bear the unit's weight and vibration and where the unit can be installed at an even level.
 - Places where there is no possibility of flammable gas or product leak.
 - Places where servicing space can be well ensured.
 - Places where the units' piping and wiring lengths come within the allowable ranges.
 - Places where water leaking from the unit cannot cause damage to the location.
 - Places where rain can be avoided as much as possible.
 - Do not install the unit in places often used as a work space. In case of construction work (e.g. grinding etc.) where a lot of dust is created, the unit must be covered.
 - Do not place any object or equipment on top of the unit (top plate)
 - Do not climb, sit or stand on top of the unit.

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- Be sure that sufficient precautions are taken in case of refrigerant leakage according to relevant local laws and regulations.
- Don't install the unit near the sea or where there is corrosion gas.

The place of installation must be free of powders, flammable objects or materials or corrosive gases.

The unit is designed for wall hanging installation and is equipped as standard with a mounting bracket. The fixing to the wall must guarantee a stable and effective support.





NOTE

For the dismantling of the paneling and for normal maintenance activities the minimum operating spaces must be respected.

Select an installation location where the following conditions are met:

- Place that allows to respect the maximum lengths allowed for pipes, connections to the unit of temperature probes, remote control etc ..
- Do not place objects or equipment on top of the unit.
- Make sure that all the precautions and prescriptions foreseen by local laws and regulations regarding possible refrigerant leaks are correctly applied.
- It is advisable to place the boiler for domestic hot water production as close as possible to the indoor unit.

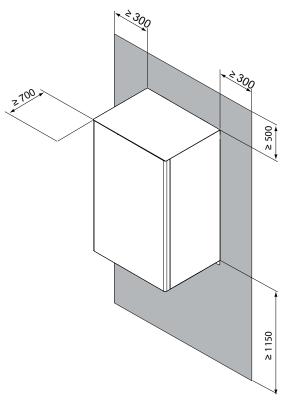


fig. 7 - minimum operating area for indoor unit



CAUTION

The indoor unit should be installed in an indoor water proof place, or the safety of the unit and the operator cannot be ensured.

- The indoor unit is to be wall mounted in an indoor location that meets the following requirements:
- The installation location is frost-free.
- The space around the unit is adequate for serving, see fig. 7.
- The space around the unit allows for sufficient air circulation.
- · There is a provision for pressure relief valve blow-off.



CAUTION

When the unit running in the cooling mode, condensate may drop from the water inlet and water outlet pipes. Please make sure the dropping condensate will not result in damage of your furniture and other devices.

- The installation surface is a flat and vertical non-combustible wall, capable of supporting the operation weight of the unit.
- All piping lengths and distance have been taken into consideration.

7.2 Minimum plant water content and requirements for DHW boiler (not supplied with the unit)

Indoor unit technical data		10	16	16T	UM
Minimum plant water content		15	2	5	1
DHW boiler - minimum surface of the coil	steel	1,4 / 2,5	1,75	/ 4,0	m ²
(minimum / recommended)	enamel	1,7 / 3,0	2,5	75,6	m ²

Requirement	Value
Maximum allowable piping length between the domestic hot water tank and the indoor unit (only for installations with domestic hot water tank). The temperature probe cable supplied with the indoor unit is 10m in length.	8m

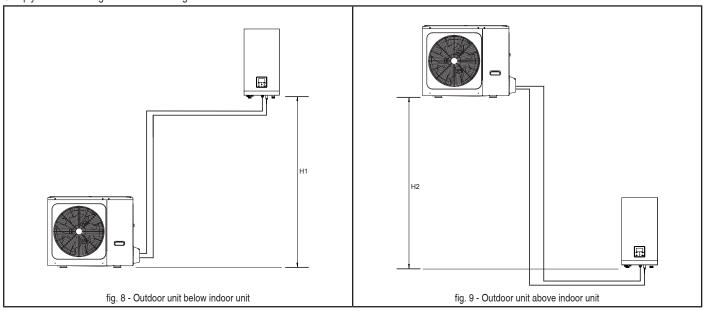


7.3 Limits to the length and heigth difference of refrigerant pipes

The length of the refrigerant pipes between the indoor and outdoor units must be as short as possible and is in any case limited by compliance with the maximum height difference values between the units.

Diminution of the difference in height between the units (H1,H2) and of the pipe lengths (L) will limit the load losses, consequently increasing the overall efficiency of the machine.

Comply with the limits given in the following tables.



Outdoor unit	4	6	8	10	12	14	16	12T	14T	16T	UM
Liquid refrigerant connection	1/4"	1/4"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	SAE
Gas refrigerant connection	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	SAE
Standard refrigerant charge (R32)	1,5	1,5	1,65	1,65	1,84	1,84	1,84	1,84	1,84	1,84	kg

Indoor unit	10			16			16T			UM	
Liquid refrigerant connection	3/8" (1)	3/8" (1) 3/8" (1) 3/8" 3/8"			3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	SAE
Gas refrigerant connection	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	SAE

⁽¹⁾ For matching with outdoor units mod. 4-6 a reduction fitting from 3/8 "SAE to 1/4" SAE is provided for liquid line Ø 6.35.

Refrigerant pipes	4	6	8	10	12	14	16	12T	14T	16T	UM
Liquid refrigerant pipe (external diameter)	6,35	6,35	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	mm
Gas refrigerant pipe (external diameter)	15,88	15,88	15,88	15,88	15,88	15,88	15,88	15,88	15,88	15,88	mm
Max pipe length with standard refrigerant charge	15	15	15	15	15	15	15	15	15	15	m
charge Refrigerant charge for each meter more than 15m length	20	20	38	38	38	38	38	38	38	38	g/m
Max length between indoor and outdoor unit	30	30	30	30	30	30	30	30	30	30	m
Max different in height (H1)	20	20	20	20	20	20	20	20	20	20	m
Max different in height (H2)	20	20	20	20	20	20	20	20	20	20	m

Contact our technical department for the required modifications if the units must operate beyond the specifications given above.

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NOTE

Refrigerant pipes containing R32 refrigerant which connect refrigerating system components shall not be considered a source of leaked refrigerant for the purpose of evaluating potential for fire or explosion hazard relative to potential ignition sources within the appliance if the piping within the area of the appliance to be evaluated complies with ali of the following;

no connecting joints;

no bends with centreline bend radius less than 2,5 times the external pipe diameter;

protected from potential damage during normal operation, service or maintenance.

♠ CAUTION

To prevent the refrigerant piping from oxidizing inside when welding, it is necessary to charge nitrogen, or oxide will chock the circulation system.

Pressured nitrogen [4.3MPa (43bar) for R32] should be used in the airtight testing.

Tighten high/low pressure valves before charging pressured nitrogen.

Charge pressure nitrogen from the connector on the pressure valves.

The airtight testing should never use any oxygen, flammable gas or poisonous gas.

7.4 Refrigerant connections

Comply with the following indications when connecting the refrigerant pipes:

- Make sure that the refrigerant pipes can withstand the refrigerant maximum pressure (PS= 4,3MPa).
- Make sure there is no any dirt or water before connectiong the piping to the outdoor and indoor units.
- · Wash the pipes with high pressure nitrogen, never use refrigerant of outdoor unit.
- Match the ends of the previously flared pipe with those of the connections on the indoor units (see part. L e G "fig. 3 dimensional data and connections" a pagina 21).
- Tighten the union by hand and then torque it with the aid of an adequate wrench.

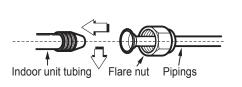
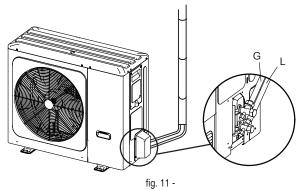


fig. 10 -

To the outdoor unit

- Match the ends of the pipe previously flared with those of the taps on the outdoor unit.
- Screw the fitting by hand and then tighten it with a suitable wrench.



The protective cap is a one-time part, it can not be reused. In case it is removed, it should be replaced with a new one.

Outer diam.	Tightening torque (Nm)	Additional tightening torque (Nm)
Ø 6.35	15	16
Ø 9.52	25	26
Ø 15.88	45	47

A CAUTION

To prevent the refrigerant piping from oxidizing inside when welding, it is necessary to charge nitrogen, or oxide will chock the circulation system.



7.4.1 Airtight test and leakage detection

Before setting the system in a vacuum, it is advisable to make sure that the refrigerant circuit is tight, including the connecting joints between the pipes and the indoor unit. Proceed in the following way:

- With the service valves of the outdoor unit completely shut, remove the cap from the service tap (part 1 fig. 12) and the union (part 2 fig. 12) of the gas valve (the larger one)
- · Connect the service valve to a manometric unit plus oxigen free nitrogen (OFN) bottle.
- Pressurize the system to a maximum 43 bar (44kg/cm²) using the oxigen free nitrogen (OFN) in the bottle.
- · Use liquid soap to check that the joints are tight and without leaks.

Keep the bottle vertical during the pressurizing operation to prevent liquid nitrogen from infiltrating into the system!

- Check all the connection joints on both the outdoor and indoor units to make sure that they are tight. Bubbles will form if leaks are present. If bubbles appear, make sure that the unions have been tightened and that the flares are the right shape.
- · Wipe off the liquid soap with a rag.
- Reduce the pressure of the nitrogen in the circuit by loosening the charge pipe from the bottle.
- · Having reduced the pressure, disconnect the nitrogen bottle.

CAUTION

The airtight testing should never use any oxygen, flammable gas or poisonous gas.

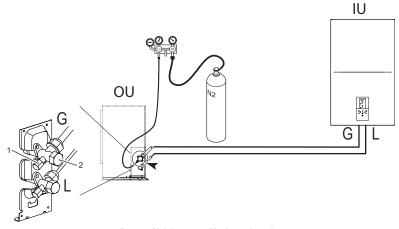


fig. 12 - Airtight test and leakage detection

7.4.2 Air purge with vacuum pump

Air and humidity in the cooling circuit impair the operation of the unit with effects such as: increased pressure, reduced efficiency, formation of ice on the capillary and subsequent blockage of the same, corrosion in the circuit.

This is why a vacuum must be created in the connection pipes and indoor unit. Proceed in the following way:

- · Connect the previously described charging pipe to the vacuum pump.
- Turn on the relative knob on the monometric unit to allow the pump to access the cooling circuit.
- Wait until the pressure level measured by the pressure gauge is around 3 mm Hg (400 Pa)
- · As soon as the required vacuum value is reached, shut the connection cock and stop the vacuum pump.

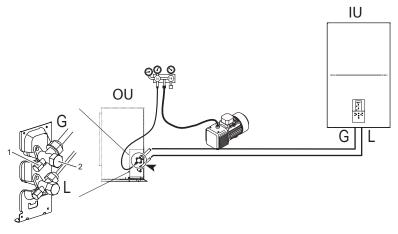


fig. 13 - Air purge with vacuum pump

Note

OU = Outdoor unit IU = Indoor unit

 EN



7.4.3 Heat insulation

In order to avoid the release of cold or heat from the connecting pipeline to the external environment during the operation of the equipment, please take effective insulation measures for the gas pipe and liquid pipe separately.

- 1) The gas side pipe should use closed cell foamed insulation material, which the fire-retardant is B1 grade and the heat resistance over 120 °C.
- 2) When the external diameter of copper pipe≤Φ12.7mm, the thickness of the insulating layer at least more than 15mm; When the external diameter of copper pipe≥Φ15.9mm, the thickness of the insulating layer at least more than 20mm.
- 3) Please use heat-insulating materials to do the heat insulation without clearance for the connecting parts of the indoor unit pipes.

7.4.4 Refrigerant amount to be added

Calculate the added refrigerant according to the diameter and the length of the liquid side pipe of the outdoor unit/indoor unit connection.

If the length of the liquid side pipe is less than 15 meters it is no need to add more refrigerant, so than calculating the added refrigerant the length of the liquid side pipe must subtract 15 meters.

Pofrigorant to be added	System model	Total liquid pip	e length L (m)
Refrigerant to be added	System model	≤15m	>15m
T. 1. 1197 1 67	4/6	0g	(L-15)×20g
Total additional refrigerant	8/10/12/14/16/12T/14T/16T	0g	(L-15)×38g

7.5 Hydraulic connections



CAUTION

The safety valve outlet must be connected to a funnel or collection pipe to prevent water spurting onto the floor in case of overpressure in the heating circuit. Otherwise, if the discharge valve cuts in and floods the room, the manufacturer cannot be held liable.



NOTE

The water may drip from the discharge pipe of the pressure-relief device and that this pipe must be left open to the atmosphere.

The pressure-relief device is to be operated regularly to remove lime deposits and to verify that it is not blocked.

Before installation, flush all the pipes of the system thoroughly to remove any residuals or impurities that could affect proper operation of the unit.

In case of replacement of generators in existing installations, the system must be completely emptied and cleaned of any sludge and pollutants. For that purpose only use suitable guaranteed products for heating systems (see next section), that do not harm metals, plastics or rubber.

The manufacturer declines any liability for damage caused to the generator by failure to properly clean the system.



NOTE

Since the joints of the unit are made of brass and brass is an easily deformable material, using appropriate tools for connecting the hydraulic circuit, inappropriate tools will cause damage to the pipes.

Make the connections to the respective points (see "fig. 3 - dimensional data and connections" a pagina 21) and to the symbols given on the unit.

7.5.1 Antifreeze plant, antifreeze fluids, additives and inhibitors

When necessary, antifreeze fluids, additives and inhibitors can be used only if the manufacturer of such fluids or additives guarantees that they are suitable and do not cause damage to the exchanger or other components and/or materials of the boiler/heat pump and plant. Do not use generic antifreeze fluids, additives or inhibitors that are not specific for use in heating systems and compatible with the materials of the boiler/heat pump and plant.

Only use conditioners, additives, inhibitors and antifreeze liquids declared by the producer suitable for use in heating systems and that do not cause damage to the heat exchanger or other components and/or materials of the boiler and plant.

Chemical conditioners must ensure complete deoxygenation of the water, contain specific protection for yellow metals (copper and its alloys), anti-fouling agents for scale, neutral pH stabilizers and, in low-temperature systems, specific biocides for use in heating systems.

Recommended chemical conditioners:

SENTINEL X100 and SENTINEL X200

FERNOX F1 and FERNOX F3

7 5 2 Water filter

It is mandatory to install at the inlet of the unit the Y-shape water filter (supplied with the unit).



NOTE

The presence of deposits on the indoor unit exchange surfaces due to non-compliance with the above requirements will involve non-recognition of the warranty.



7.5.3 Tips for a successful installation

For a correct design and installation of the hydraulic plant comply the local laws governing safety matters and sound.

The following information is suggestion for a correct installation of the unit.

- · Before connecting the unit to the plant wash adequately the pipes using clean water, filling and emptying and cleaning the filters.
- Only after that proceed connecting the unit to the plant; this operation is crucial to ensure proper start-up without the need to have repeated stops to clean the
 filter, with the possible risk of damage to heat exchangers and other components.
- Check by qualified personnel the quality of the water or of the mixture used; avoid the presence of inorganic salts, biological load (seaweeds, etc.) suspended solids, dissolved oxygen and the pH. Water with inadequate characteristics can cause a pressure drop increase due to a rapid fouling of the filter, energy efficiency decrease and corrosive symptom increase that can damage the unit.
- The pipes must have the least possible number of bends to minimize load losses and must be adequately supported in order to prevent the connections of the
 unait from being excessively stressed.
- Install on-off valves near components that need to be serviced to isolate them when maintenance work needs to be done and to allow them to be replaced without
 having to discharge the plant.
- · Before isolating the pipes and charging the system, carry out preliminary inspections to make sure that there are no leaks.
- Isolate all the chilled water pipes to prevent condensation from forming along the pipes themselves. Make sure that the material used is the steam barrier type, failing this, cover the insulation with an appropriate protection. Also make sure that the air venting valves can be accessed through the insulation.
- The circuit can be maintained under pressure using an expansion vessel (present in the unit) and a pressure reducer. A system filling device can be used that automatically, under a pressure value, provides for the loading and maintenance of the desired pressure.
- Check that all plant components are able to withstand the maximum static pressure (depending on the height of the building to be served).



NOTE

If there is no glycol in the system (antifreeze) or if the unit is not able to remain electrically powered for possible blackouts, in order to avoid possible icing problems, empty the water during winter.

The unit is only to be used in a closed water plant. Application in an open water circuit can lead to excessive corrosion of the water piping.

Water connections must be made in accordance with the outlook diagram delivered with the unit, with respect to the water intake and water outlet.

If air, moisture or dust gets in the water circuit, problems may occur. Therefore, always take into account the following when connecting the water circuit:

Use clean pipes only.

Hold the pipe end downwards when removing burrs

Cover the pipe end when inserting it through a wall so that no dust and dirt enter.

Use a good thread sealant for sealing the connections. The sealing must be able to withstand the pressures and temperatures of the plant.

When using non-brass metallic piping,make sure to insulate both materials from each other to prevent galvanic corrosion. Never use Zn-coated parts in the water circuit. Excessive corrosion of these parts may occur as copper piping is used in the unit's internal water circuit.

7.5.4 Filling with water

- 1. Connect the water supply to the fill valve and open the valve.
- 2. Make sure the automatic air purge valve is open (at least 2 turns).
- 3. Fill with water until the manometer indicates a pressure of approximately 2.0 bar. Remove air in the circuit as much as possible using the air purge valves. Air present in the water circuit might cause malfunctioning of the backup heater.



NOTE

During filling, it might not be possible to remove all air in the system. Remaining air will be removed through the automatic air purge valves during the first operating hours of the system. Topping up the water afterwards might be required. The water pressure indicated on the manometer will vary depending on the water temperature (higher pressure at higher water temperature). However, at all times water pressure should remain above 0.3 bar to avoid air entering the circuit.

The unit is only to be used in a closed water plant. Application in an open water circuit can lead to excessive corrosion of the water piping:

Never use Zn-coated parts in the water circuit. Excessive corrosion of these parts may occur as copper piping is used in the unit's internal water circuit.

When using a 3-way valve or a 2-way valve in the water circuit. The recommended maximum changeover time of the valve should be less than 60 seconds.

7.5.5 Water circuit anti-freeze protection

ΕN

All internal hydronic parts are insulated to reduce heat loss. Insulation must also be added to the field piping.

The software contains special functions using the heat pump and backup heater to protect the entire system against freezing. When the temperature of the water flow in the system drops to a certain value, the unit will heat the water, either using the heat pump, the electric heating tap, or the backup heater. The freeze protection function will turn off only when the temperature increases to a certain value.

In event of a power failure, the above features would not protect the unit from freezing.

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CAUTION

When the unit is not running for a long time,make sure the unit is powered on all the time,if you want to cut off the power,the water in the system pipe needs to be drained clean, avoid the pump and pipeline system be damaged by freezing. Also the power of the unit needs to be cut off after water in the system is drained clean.

- The unit might drain-off too much water through the pressure relief valve.
- Water quality should be complied with EN 98/83 EC Directives.
- Detailed water quality condition can be found in EN 98/83 EC Directives.

7.5.6 Water piping insulation

The complete water circuit including all piping, water piping must be insulated to prevent condensation during cooling operation and reduction of the heating and cooling capacity as well as prevention of freezing of the outside water piping during winter. The insulation material should at least of B1 fire resistance rating and complies with all applicable legislation. The thickness of the sealing materials must be at least 13 mm with thermal conductivity 0.039 W/mK in order to prevent freezing on the outside water piping.

If the outdoor ambient temperature is higher than 30°C and the humidity is higher than RH 80%, then the thickness of the sealing materials should be at least 20 mm in order to avoid condensation on the surface of the seal.

7.6 Electrical connections

7.6.1 Electrical data

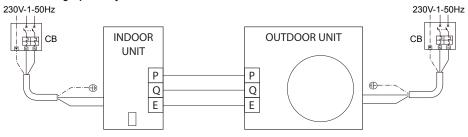
Tabella. 5 - Electrical data

Indoor unit	MOD.	10	16	16T
Power input	"	220-240V 50 Hz	220-240V 50 Hz	380-415 3+N+PE 50 Hz
Max current input	А	13	13	10
Automatic circuit breaker	Α	16	16	16
Power cable section	mm²	3x1,5	3x1,5	5x1,5

The customer must install the automatic circuit breaker.

Communication cable between indoor and outdoor unit	MOD.	10	16	16T
Wiring size (shielded cable)	mm²		3x0,75	

Example of basic connections for a single phase system



WARNING

A main switch or other means of disconnection, having a contact separation in all poles, must be incorporated in the fixed wiring in accordance with relevant local laws and regulations.

Switch off the power supply before making any connections.

Use only copper wires. Never squeeze bundled cables and make sure they do not come in contact with the piping and sharp edges. Make sure no external pressure is applied to the terminal connections.

All field wiring and components must be installed by a licensed electrician and must comply with relevant local laws and regulations.

The field wiring must be carried out in accordance with the wiring diagram supplied with the unit and the instructions given below.

Be sure to use a dedicated power supply. Never use a power supply shared by another appliance.

Be sure to establish a ground. Do not ground the unit to a utility pipe, surge protector, or telephone ground. Incomplete grounding may cause electrical shock.

Be sure to install a ground fault circuit interrupter (30 mA). Failure to do so may cause electrical shock.

Be sure to install the required fuses or circuit breakers.

 EN

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WARNING

Cut off all power supply— i.e. unit power supply and backup heater and domestic hot water tank power supply (if applicable) — before removing front panel. Parts inside the unit may be hot.



NOTE

The ground fault circuit interrupter must be a high-speed type breaker of 30 mA (<0.1 s).

This unit is equipped with an inverter. Installing a phase advancing capacitor not only will reduce the power factor improvement effect, but also may cause abnormal heating of the capacitor due to high-frequency waves. Never install a phase advancing capacitor as it could lead to an accident.



WARNING

Before any operation which requires removing the cover, disconnect the indoor unit from the power supply through the main switch.



DANGER

Do not touch the electrical components in any case with the closed main switch! There is the risk of electric shock with risk of injury or death!

The appliance must be connected to an effective earthing system, as provided for by the current safety regulations. Have the efficiency and suitability of the earthing system checked by professionally qualified personnel, the manufacturer is not responsible for any damage caused by lack of earthing of the system.

The indoor unit is prewired and provided with a three-pole cable or five-pole cable, without a plug, for connection to the electric line. The connections to the grid must be made with a permanent connection and equipped with a switch (2 poles or 4 poles) whose contacts have a minimum opening of at least 3 mm, interposing an automatic circuit breaker (refer to "Tabella. 5 - Electrical data" a pagina 31) between the indoor unit and the line.

For single-phase units (mod. 10 and 16)

Make sure to respect the polarities (LINE: brown wire / NEUTRAL: blue wire / GROUND: yellow-green wire) in the connections to the electric line.

For three-phase units (mod. 16T)

Make sure to respect the polarities (L1-L2-L3 - N - PE) in the connections to the electric line.



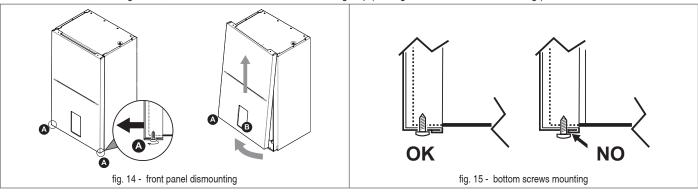
DANGER

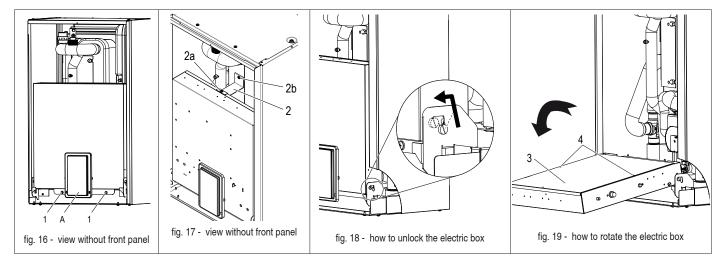
The unit's supply cable MUST NOT BE REPLACED BY THE USER. If the cable gets damaged, turn the unit off and have the cable replaced only by professionally qualified personnel. In case of replacement, only use cable "HAR H05 VV-F" 3x0.1.5 mm² (mod. 10 and 16) or 5x1,5 mm² (mod. 16T) with a max external diameter of 11mm.



7.6.2 How to access to the electric box

- 1. To dismount the front panel of the indoor unit:
 - Partially unscrew the screws A (see "fig. 14 front panel dismounting").
 - Pull the panel B out and release it from the upper fixings (see "fig. 14 front panel dismounting").
- 2. Make the connections referring to the functional electrical diagram present in this manual.
- 3. Proceed in reverse order to reassemble the front panel. Make sure that it is correctly attached to the upper fixing and completely resting on the side panels. The head of the screw "A", once tightened, must not be underneath the lower bending stop (see "fig. 15 bottom screws mounting")...





To access to the terminals of the indoor unit:

- unscrew the two screws (part. 1 fig. 16) under the electrical box
- unscrew the upper screw (part. 2a fig. 17)
- catch the electric box, and unlock (fig. 18)
- rotate forward (fig. 19)
- remove the back metal sheet (part. 3 fig. 19) that is fixed with 2 screws (part. 4 fig. 19)

NB

It is possible to remove the back locking bracket (part. 2 - fig. 17) unscrewing the screw (part. 2b - fig. 17).

Legend:

- A Display panel and keyboard (fig. 16)
- **B** Electronic hydronic board (fig. 20)
- C Safaty thermal cut-out for single phase electrical heater with manual reset button (part. C1 fig. 20)
- D Safaty thermal cut-out for three phase electrical heater with manual reset button (part. D1 fig. 20)

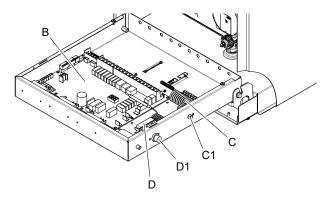


fig. 20 - internal view of the electric box



7.6.3 <u>User connections</u>

All the connections have to be done on the terminals of the hydronic board placed in the electric box.

Hydronic board

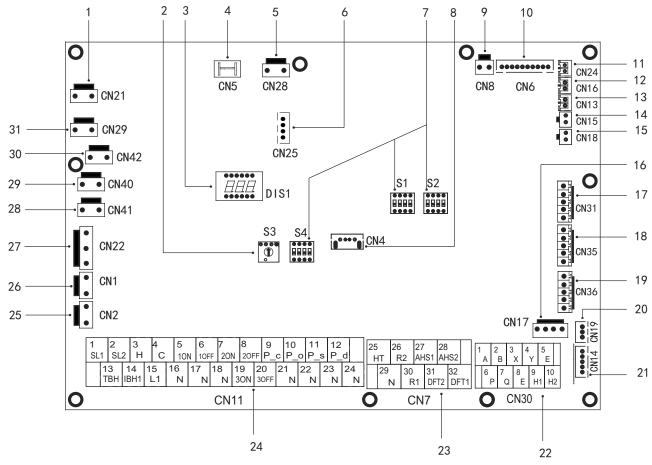


fig. 21 - Hydronic board

Order	Port	Code	Assembly unit	Note
1	CN21	POWER	Power supply to hydronic board	В
2	S3	1	Rotary dip switch	1
3	DIS1	1	Digital display	/
4	CN5	GND	Ground to hydronic board	В
5	CN28	PUMP	Power supply to internal water pump Pi	В
6	CN25	DEBUG	Port for IC programming	/
7	S1, S2, S4	1	Dip switch	/
8	CN4	USB	Port for USB programming	1
9	CN8	FS	Connection to internal water flow switch	/
		T2 *	Port for temperature probe of refrigerant liquid side temperature of indoor unit (heating mode)	В
		T2B *	Port for temperature probe of refrigerant gas side temperature of indoor unit (heating mode)	В
10	CN6	TW_in *	Port for temperature probe of inlet water temperature of plate heat exchanger	В
		TW_out *	Port for temperature probe of outlet water temperature of plate heat exchanger	В
		T1 *	Port for temperature probe of final outlet water temperature of indoor unit	В
11	CN24	Tbt1	Port for temp. sensor probe in the plant tank	A
12	CN16	Tbt2	Reserved	1
13	CN13	T5	Port for temp. sensor probe in the DHW boiler	A
14	CN15	Tw2	Port for outlet water for zone 2 temp. probe probe	A
15	CN18	Tsolar **	Port for solar panel temp. sensor	A
16	CN17	PUMP_BP	PWM signal to internal water pump Pi	В
		HT	Control port for room thermostat (heating mode)	1
17	CN31	COM	Power port for room thermostat	1
		CL	Control port for room thermostat (cooling mode)	1
18	CN35	SG	Port for smart grid (grid signal)	1
10	CINOO	EVU	Port for smart grid (photovoltaic signal)	1
19	CN36	M1 M2	Reserved	/
18	CINOU	T1 T2	Reserved	/
20	CN19	PQ	Reserved	1
21	CN14	ABXYE	Port for communication with the display panel	В



Order	Port	Co	de	Assembly unit	Note
		1	А	.,	
		2	В		
		3	Х	Reserved	1
		4	Υ		
		5	Е		
22	CN30	6	Р		
		7	Q	3 Wires for connection with outdoor unit	1
		8	Ē	, V 11100 101 001110 101110 101110 101110 101110 101110 101110 101110 101110 101110 101110 101110 101110 101110	,
		9	H1		
		10	H2	eserved	
		26	R2		
		30	R1	Compressor run (the contact is closed when the compresor is working)	1
		31	DFT2		
		32	DFT1	Defrost run (the contact is closed when the defrost is active)	1
23	CN7	25	HT		
		29	N	Reserved	2
		27	AHS1		
		28	AHS2	Gas boiler (the contact is closed when the gas boiler is request)	1
		1	SL1		
		2	SL2	Reserved	1
		3	Н		
		4	C	Room thermostat input (high voltage)	2
		15	L1	Troom tromosat input (ingrirolage)	_
		5	10N		
		6	10FF	SV1 (3-way diverter valve) plant / DHW	В
		16	N	(o na) anoid: nand) plant 2	_
	7 20N				
		8	20FF	SV2 (3-way valve) heat / cool	2
		17	N		
		9	P_c	7 0	
0.4	ONIAA	21	N	Zone2 pump	2
24	CN11	10	P_o	Outside singulation arranged and arranged	0
		22	N	Outside circulation pump / zone 1 pump	2
		11	P_s	Solar panel pump	2
		23	N		۷
		12	P_d	DHW boiler recirculation pump	2
		24	N	Ditivi boiler recirculation pump	
		13	TBH	DHW electric heater	2
		16	N	DTTY GOODIO NOCICI	
		14	IBH1	Internal backup heater 1	В
		17	N	Internal basical Francisco	
		18	N		
		19	30N	SV3 mixing (3-way valve zone 2)	2
		20	30FF		
25	CN2	TBH_FB		Port for automatic circ. breaker of TBH (shorted in default)	1
26	CN1	IBH1/2_FB		Port for automatic circ. breaker of IBH (shorted in default)	
07	CNICO	IBH1		Control port for internal backup heater 1	1
27	CN22	IBH2		Reserved	1
20	CNI44	TBH		Control port for DHW boiler electrical heater	
28 29	CN41 CN40	HEAT8 HEAT7		Reserved Reserved	1
30	CN40 CN42	HEAT6		Reserved	I
31	CN42 CN29			Reserved	1
NOTES:	CINZS	HEAT5		IVESCIACA	1

NOTES:

- A: With accessory Temperature Probe. All these temp. probes can be used or not as a function of the type of the plant served by the unit.
- B: Internal connections, it means that these terminals are used for the management of the indoor unit.
- 1: Dry contact without voltage.
- 2: Port provide 220-240VAC voltage. If the current of load is <0.2A, load can connect to the port directly. If the current of load is >=0.2A, the AC contactor is required to supply for the load.

Voltage	220-240VAC
Maximum running current (A)	0.2
Wiring size (mm ²)	0.75

Connect the cable to the appropriate terminals as shown in the following pictures.

Fix the cable reliably and provide to pass the cable through the appropriate cable gland (refer to "dimensional data and connections" a pagina 21.

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P_o - For outside circulation pump or water pump zone 1

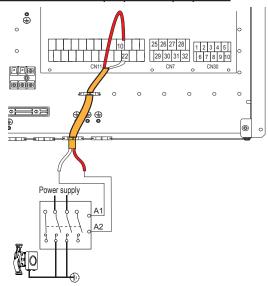


fig. 22 -

P c - Water pump of zone 2

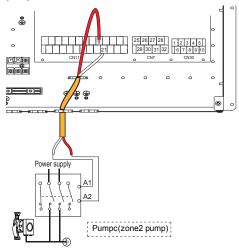
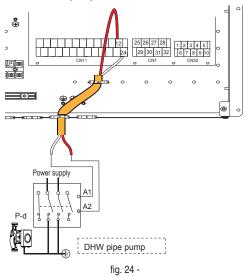
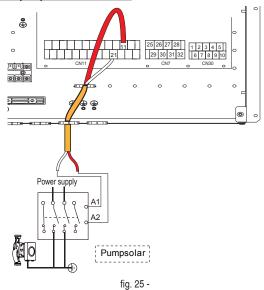


fig. 23 -

P_d - DHW recirculation pump



P_s - Water pump of the solar circuit



SV2 - 3-way diverter valve for heat/cool

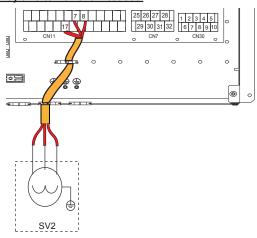


fig. 26 -

	Terminals	
Mode	7 (20N)	8 (20FF)
Heat	230V	0V
Cool	0V	230V

SV3 - 3-way mixing valve for zone 2

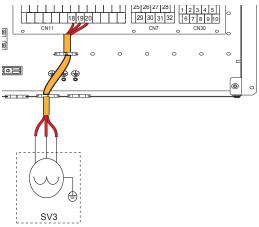
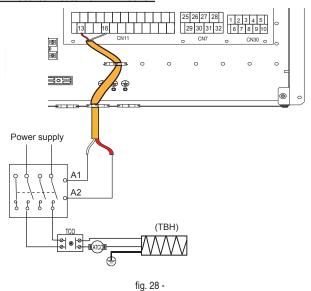


fig. 27 -

ΕN

Lamborghini CALORECLIMA

TBH - Electrical heater for DHW boiler



H-L1-C - For room thermostat (high voltage)

There are three methods for connecting the thermostat.

Room thermostat method A (mode set control)

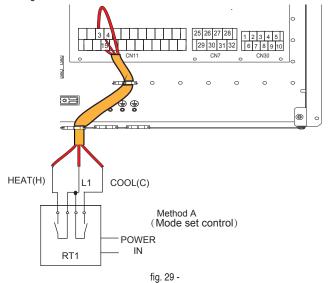
To activate this function set the service parameter 6.1 "Room thermostat" = 1 (mode setting) refer "9.2 Service parameters table" a pagina 51.

A.1 When unit detect voltage is 230VAC between C and L1 ,the unit operates in the cooling mode.

A.2 When unit detect voltage is 230VAC between H and L1, the unit operates in the heating mode.

A.3 When unit detect voltage is 0VAC for both side(C-L1, H-L1) the unit stop working for space heating or cooling.

A.4 When unit detect voltage is 230VAC for both side(C-L1, H-L1) the unit working in cooling mode.

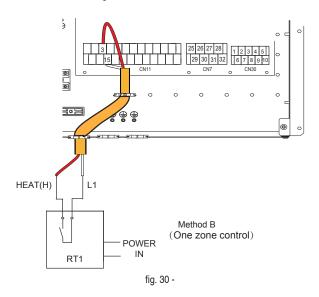


Room thermostat method B (one zone control)

To activate this function set the service parameter 6.1 "Room thermostat" = 2 (one zone) refer "9.2 Service parameters table" a pagina 51.

B.1 When unit detect voltage is 230VAC between H and L1, unit turns on.

B.2 When unit detect voltage is 0VAC between H and L1, unit turns off.



Room thermostat method C (double zone control))

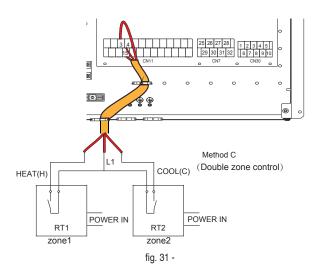
To activate this function set the service parameter 6.1 "Room thermostat" = 3 (double zone) refer "9.2 Service parameters table" a pagina 51.

C.1 When unit detect voltage is 230VAC between H and L1,zone1 turns on. When unit detect voltage is 0VAC between H and L1, zone1 turns off.

C.2 When unit detect voltage is 230VAC between C and L1, zone2 turns on according to climate temp curve. When unit detect voltage is 0V between C and L1, zone2 turns off.

C.3 When H-L1 and C-L1 are detected as 0VAC, unit turns off.

C.4 when H-L1 and C-L1 are detected as 230VAC, both zone1 and zone2 turn on.





HT-COM-CL - Room thermostat (Low voltage)

There are three methods for connecting the thermostat.

Room thermostat method A (mode set control)

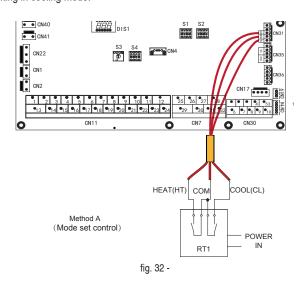
To activate this function set the service parameter 6.1 "Room thermostat" = 1 (mode setting) refer "9.2 Service parameters table" a pagina 51.

A.1 When unit detect voltage is 12VDC between CL and COM ,the unit operates in the cooling mode.

A.2 When unit detect voltage is 12VDC between HT and COM, the unit operates in the heating mode.

A.3 When unit detect voltage is 0VDC for both side(CL-COM, HT-COM) the unit stop working for space heating or cooling.

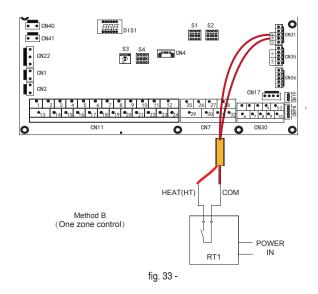
A.4 When unit detect voltage is 12VDC for both side(CL-COM, HT-COM) the unit working in cooling mode.



Room thermostat method B (one zone control)

To activate this function set the service parameter 6.1 "Room thermostat" = 2 (one zone) refer "9.2 Service parameters table" a pagina 51.

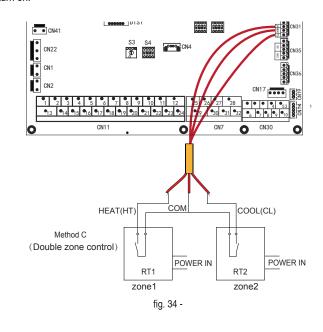
B.1 When unit detect voltage is 12VDC between HT and COM, unit turns on. B.2 When unit detect voltage is 0VDC between HT and COM, unit turns off.



Room thermostat method C (double zone control)

To activate this function set the service parameter 6.1 "Room thermostat" = 3 (double zone) refer "9.2 Service parameters table" a pagina 51.

- C.1 When unit detect voltage is 12VDC between HT and COM ,zone1 turn on.When unit detect voltage is 0VDC between HT and COM, zone1 turn off.
- C.2 When unit detect voltage is 12VDC between CL and COM, zone2 turn on according to climate temp curve. When unit detect voltage is 0V between CL and COM, zone2 turn off.
- C.3 When HT-COM and CL-COM are detected as 0VDC, unit turn off.
- C.4 when HT-COM and CL-COM are detected as 12VDC, both zone1 and zone2 turn on.



The wiring of the thermostat should correspond to the settings of the user interface.

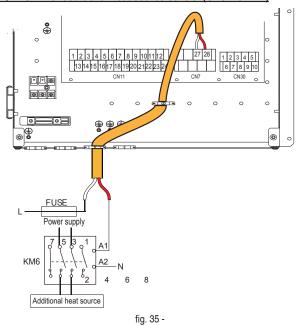
Power supply of machine and room thermostat must be connected to the same Neutral Line .

Zone 2 can only operate in heating mode, When cooling mode is set on user interface and zone1 is OFF, "CL" in zone2 closes, system still keeps 'OFF'. While installation, the wiring of thermostats for zone1 and zone2 must be correct.

 EN



AHS1, AHS2 - For additional heat source control (GAS BOILER)



Photovoltaic input and smart grid operation:

1. When EVU input is closed, the unit operates as below:

DHW mode turn on, the DHW setting temperature will be changed to 70°C automatically, and the TBH (electrical heater of DHW boiler) will be activated if : T5 (DHW boiler temperature) <69°C. The unit operates in cooling/heating mode as the normal logic.

2. When EVU input is open and SG input is closed, the unit operates normally.

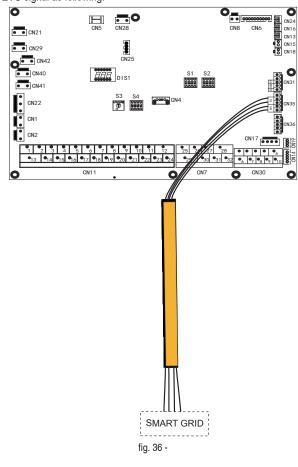
3. When EVU input is open and SG input is open, the DHW mode is off, the TBH is off, the disinfect function is off. The max running time for cooling/heating is "Smart Grid Run Time Set", then unit will be off.

The parameter "Smart Grid Run Time Set" is settable by user menù (refer to "8.5 User menu" a pagina 43.

EVU INPUT	SG INPUT	Operation
closed	open	photovoltaic operation
closed	closed	photovoltaic operation
open	closed	normal operation
open	open	smart grid operation

EVU-SG - Photovoltaic input and smart grid

The unit has smart grid function, there are two ports on PCB to connect SG signal and EVU signal as following.

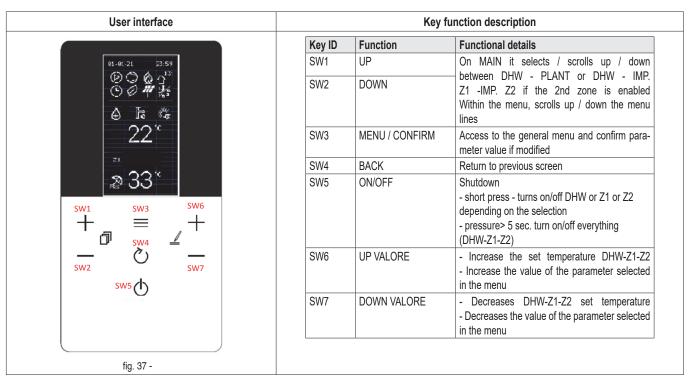




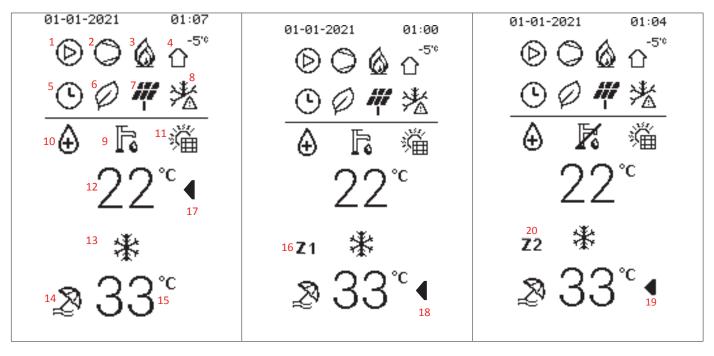
8. USER INTERFACE

The user interface consists of 7 keys and a display with dot matrix technology.

8.1 Key function description



8.2 Meaning of display icons



Index	Icon	Description	Function	Additional Notes
1	(b)	Water circulator	It activates when the pump is active	
2	0	compressor	It activates when the compressor is active	
3	6	Supplementary heating source (boiler)	It is activated when the boiler is active	
	<u>_W_</u>	Electric heater	It is activated when the electric heater is active	
4	습-5'*	External temperature	Allows the external air temperature to be displayed.	



Index	Icon	Description	Function	Additional Notes	
5	©	timer	It is activated when one of the timed functions is active	-	
6	0	Eco function	It is activated when the ECO function is active	It can be active 24 hours a day or based on a schedul event.	
7		Photovoltaic PV	It is activated when in-dig FV = closed	They appear only if the smart-grid function is enabled. The	
	Ф	Smart grid SG	It is activated when in-dig SG = closed	icons appear according to the status of the in-digs. EVU and SG hydronic board.	
	ŒΦ	Maximum energy consumption	Appears when in-dig EVU and SG = both open.	33 flydroffic board.	
8	**	Antifreeze	It is activated when the antifreeze is in progress	Shared display position Appears depending on the active	
	***	Defrost	It is activated when defrosting is in progress	function. Priority index	
	(tr	Silent mode	Activates when silent mode is in progress	In case of contemporaneity 1 antifreeze 2 defrost 3 silent mode	
9	l K	Healthcare symbol	DHW mode.	if crossed out = disabled	
10		Anti-legionella	Anti-legionella in progress		
11	`	Solar panels	It is activated when the solar thermal panel is in operation	Shared display position. They appear depending on the active function.	
	\	DHW boiler electric heater	It is activated when the DHW boiler electric heater is in operation.	It is not possible contemporaneity.	
12	22°°	Temper. DHW - DHW set point	View temp. DHW tank probe (if present)	View the setp. DHW while editing. If DHW = off, OFF appears instead of the temperature.	
13	>>>	Heating symbol	Heating mode active	Shared display position.	
	*	Cooling symbol	Cooling mode active	They appear depending on the active function.	
14	Z)	Vacation mode	Active vacation period		
15	33°	- Water flow set point - Zone 1 delivery set point - Zone 2 delivery set point	-Single-zone water flow setpoint - without Z1-Z2 alongside Zone 1 water flow setpoint if a has Z1 next to it - Zone 2 water flow setpoint if a has Z2 next to it	If it is configured only in single zone, it will not have Z1 / Z2 alongside. If double zone is configured, it will always have either Z1 or Z2 next to it to indicate which zone the displayed value refers to. If single zone or Z1 or Z2 = off, OFF appears	
16	Z 1	Zone 1 indicator	appears when zone management is enabled and is always present next to the set point (15)	Indicates that zone 1 set point is displayed. Not present if double zone is not enabled.	
17-18- 19	4	Selection indicator between DHW-Z1-Z2 to modify the set point	Indicates the set point selected for modification	When it appears next to a set point, it means that it can be changed. It can be moved by acting on the SW1-SW2 keys	
20	Z 2	Zone 2 indicator	appears when zone management is enabled and is always present next to the set point (15)	Indicates that the zone 2 set point is displayed. Not present if double zone is not enabled.	

8.3 Switching ON and OFF DHW and plant

Switching on or off (ON / OFF) is done with the SW5 key.

When a mode is turned off, OFF appears in place of the current display.

When a mode is turned on, the current display appears.

There are two possibilities of switching on / off: for single function and general.

Single function power off / on:

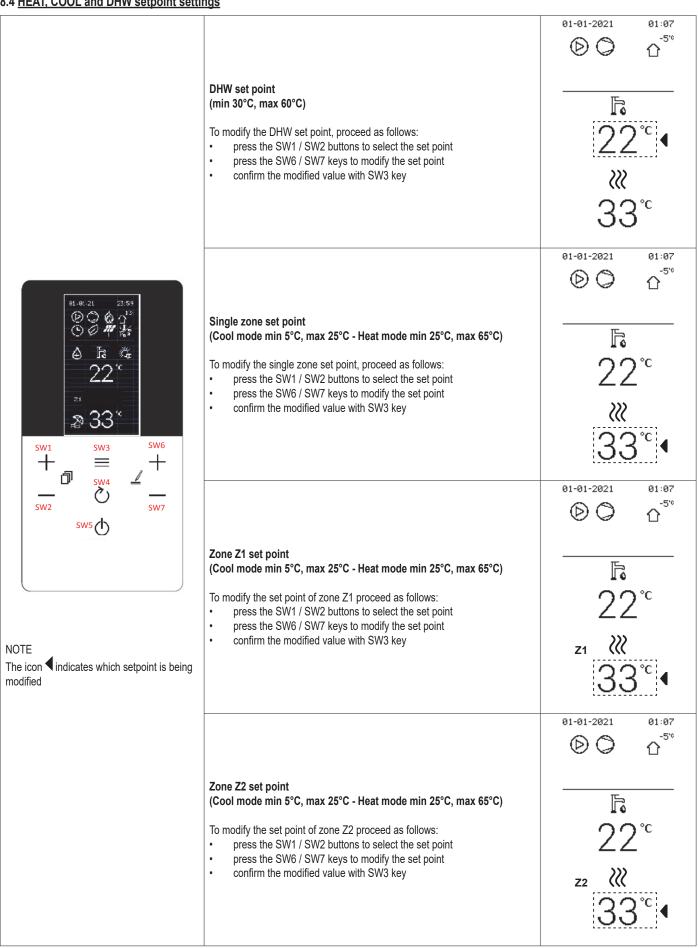
- DHW is selected and with 1sec pressure. of OFF switches off / on DHW only
- One-zone selection is selected with 1sec pressure. of OFF switches off / on DHW only
- Z1 is selected and with 1sec pressure. of OFF turns off / on only Z1
- Z2 is selected and with 1sec pressure. of OFF turns off / on only Z2

General shutdown:

With a long OFF pressure> 3 sec of OFF, all DHW and zones are switched on or off.



8.4 HEAT, COOL and DHW setpoint settings





8.5 <u>User menu</u>

Press the SW3 key to access the user menu which is structured on several levels as indicated in the following table:

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description	Lower limit	Upper limit	Resolu- tion	Unit of measure	Default value
0					2: Cooling, 3: Heating, 0: Invalid	2	3	1	Label	3
			Event 1	Enabled y/n	Enables the Eevent	YES	NO	1	1	NO
			Event 2	Time	Start time hh.mm	00.00	23.59	1 min	hh:mm	00.00
		Monday	Event 3	Temperature	Water temperature setpoint	min*	max*	1	°C	8
		Wionday	Event 4							
			Event 5							
			Event 6			1/50	110		,	
			Event 1 Event 2	Enabled y/n Time	Enables the Eevent Start time hh.mm	YES 00.00	NO	1 min	hh.mm	NO 00.00
			Event 3	Temperature	Water temperature setpoint	5	23.59 25	1 min	hh:mm °C	8
		Tuesday	Event 4	Temperature	Water temperature setpoint	- 3	20	'		
			Event 5							
			Event 6							
			Event 1	Enabled y/n	Enables the Eevent	YES	NO	1	/	NO
			Event 2	Time	Start time hh.mm	00.00	23.59	1 min	hh:mm	00.00
		Madagaday	Event 3	Temperature	Water temperature setpoint	5	25	1	°C	8
		Wednesday	Event 4							
			Event 5							
			Event 6	<u> </u>						
			Event 1	Enabled y/n	Enables the Eevent	YES	NO	1	/	NO
	Drooot Town		Event 2 Event 3	Time Temperature	Start time hh.mm	00.00	23.59 25	1 min	hh:mm °C	00.00
	Preset Temp Cool	Thursday	Event 4	remperature	Water temperature setpoint	5	20		C	0
	C00I	,	Event 5							
			Event 6	+						
			Event 1	Enabled y/n	Enables the Eevent	YES	NO	1	1	NO
		Friday	Event 2	Time	Start time hh.mm	00.00	23.59	1 min	hh:mm	00.00
			Event 3	Temperature	Water temperature setpoint	5	25	1	°C	8
			Event 4							
			Event 5							
			Event 6							
		Saturday	Event 1	Enabled y/n	Enables the Eevent	YES	NO	1	1	NO
			Event 2	Time	Start time hh.mm	00.00	23.59	1 min	hh:mm	00.00
Preset			Event 3	Temperature	Water temperature setpoint	5	25	1	°C	8
Temp.			Event 4							
			Event 5	+						
			Event 6 Event 1	Enabled y/n	Enables the Eevent					
			Event 2	Time	Start time hh.mm					
			Event 3	Temperature	Water temperature setpoint					
		Sunday	Event 4							
			Event 5							
			Event 6							
			Event 1	Enabled y/n	Enables the Eevent	YES	NO	1	1	NO
			Event 2	Time	Start time hh.mm	00.00	23.59	1 min	hh:mm	00.00
		Monday	Event 3	Temperature	Water temperature setpoint	25	65	1	°C	35
		onauy	Event 4					-		
			Event 5							
			Event 6	Enobled ::/=	Frahles the Fovent	VEC	NO	1	1	NO
			Event 1 Event 2	Enabled y/n Time	Enables the Eevent Start time hh.mm	YES 00.00	NO 23.59	1 min	hh:mm	NO 00.00
			Event 2 Event 3	Temperature	Water temperature setpoint	25	65	1 min	°C	35
		Tuesday	Event 4	Tomporature	Trator temperature ocuponit	20	- 55	<u> </u>		- 55
			Event 5							
	Preset Temp		Event 6							
	Heat Temp		Event 1	Enabled y/n	Enables the Eevent	YES	NO	/	/	NO
			Event 2	Time	Start time hh.mm	00.00	23.59	1 min	hh:mm	00.00
		Wodpoodov	Event 3	Temperature	Water temperature setpoint	25	65	1	°C	35
		Wednesday	Event 4							
			Event 5							
			Event 6							
			Event 1	Enabled y/n	Enables the Eevent	YES	NO	/	/	NO
			Event 2	Time	Start time hh.mm	00.00	23.59	1 min	hh:mm	00.00
		Thursday	Event 3	Temperature	Water temperature setpoint	25	65	1	°C	35
		,	Event 4 Event 5							
			Event 6							
L			L ACIII O		1				L	



Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description	Lower limit	Upper limit	Resolu- tion	Unit of measure	Default value
			Event 1	Enabled y/n	Abilita l'Eevent	YES	NO	1	1	NO
			Event 2	Time	Ora inizio hh.mm	00.00	23.59	1 min	hh:mm	00.00
		Friday	Event 3	Temperature	Setpoint della temperatura dell'acqua	25	65	1	°C	35
		i iluay	Event 4							
			Event 5							
			Event 6							
	Ī		Event 1	Enabled y/n	Abilita l'Eevent	YES	NO	/	/	NO
			Event 2	Time	Ora inizio hh.mm	00.00	23.59	1 min	hh:mm	00.00
	Preset Temp	Ì	Event 3	Temperature	Setpoint della temperatura dell'acqua	25	65	1	°C	35
	Heat	Saturday	Event 4							
			Event 5							
			Event 6							
			Event 1	Enabled y/n	Abilita l'Eevent	YES	NO	1	1	NO
			Event 2	Time	Ora inizio hh.mm	00.00	23.59	1 min	hh:mm	00.00
			Event 3	Temperature	Setpoint della temperatura dell'acqua	25	65	1	°C	35
Preset		Sunday	Event 4							
Temp.			Event 5							
			Event 6							
			Enabled y/n		Enables climatic curve for zone 1 in cooling mode	YES	NO	1	1	NO
		Z1 Cool Mode	Clim Curve Sel		to select the climatic curve in cooling mode	1	9	1	1	5
			Enabled y/n		Enables climatic curve for zone 1 in heating mode	YES	NO	1	1	NO
	Weather Temp	Z1 Heat Mode	Clim Curve Sel		to select the climatic curve in heating mode	1	9	1	1	5
	Set '		Enabled		to select the climatic curve in cooling mode	YES	NO	1	1	NO
	001	Z2 Cool Mode	Clim Curve Sel		to select the climatic curve in heating mode	1	9	1	1	5
			Enabled y/n		Enables climatic curve for zone 2 in heating mode	YES	NO	1	1	NO
		Z2 Heat Mode	Clim Curve Sel		to select the climatic curve in heating mode	1	9	1	1	5
		Enabled y/n	ves/no		enables ECO function (not availbale for 2 zones)	YES	NO	1	1	NO
		Clim Curve Sel			select the climatic curve from 1 to 9	1	9	1	1	5
		Timer enabled								
	, t	y/n	yes/no		Enables the timer	YES	NO	/	/	NO
		Start	hh.mm		start time	00.00	23.59	1 min	hh:mm	00.00
		End	hh.mm		end time	00.00	23.59	1 min	hh:mm	00.00
		Enabled y/n	yes/no		enables the disinfect function amtilegionella	YES	NO	1	1	NO
	[Operate Day	Sunday/Mon- day		antolegionella day	Sunday	Monday	1	1	Friday
		Start	hh.mm		antolegionella starting time	00.00	23.59	1 min	hh:mm	00.00
					activates all sources to heat dhw quickly - with the satisfied		20.00			
	Fast Dhw	Enabled Y/N	yes/no		setpoint the function is automatically disabled and remains disabled.	YES	NO	1	1	NO
	Tank Heater	Enabled Y/N	ves/no		activates the electrical heater of the DHW boiler	YES	NO	1	1	NO
		T1 Enabled	Start hh.mm		if yes, you can set the start time and at that time the pump will		NO	,	1	NO
		y/n	Start IIII.IIIII		work for a time defined by the parameter t_INTERVAL_DHW	IES	INO	/	1	NO
		T2 Enabled	Start hh.mm		if yes, you can set the start time and at that time the pump will	YES	NO	,	1	NO
		V/II			work for a time defined by the parameter t_INTERVAL_DHW	ILO	INO	_ ′	,	NO
		T3 Enabled y/n	Start hh.mm		if yes, you can set the start time and at that time the pump will work for a time defined by the parameter t INTERVAL DHW	YES	NO	1	1	NO
Dhw Set-		T4 Enabled	Start hh.mm		if yes, you can set the start time and at that time the pump will work for a time defined by the parameter t INTERVAL DHW	YES	NO	1	1	NO
tings		y/n T5 Enabled y/n	Start hh.mm		if yes, you can set the start time and at that time the pump will work for a time defined by the parameter t INTERVAL DHW	YES	NO	1	1	NO
		T6 Enabled	Start hh.mm		if yes, you can set the start time and at that time the pump will work for a time defined by the parameter t INTERVAL DHW	YES	NO	1	1	NO
	Dhw Pump Circ	y/n T7 Enabled	Start hh.mm		if yes, you can set the start time and at that time the pump will	YES	NO	,	1	NO
		y/n T8 Enabled	Start hh.mm		work for a time defined by the parameter t_INTERVAL_DHW if yes, you can set the start time and at that time the pump will		NO	,	1	NO
		y/n T9 Enabled			work for a time defined by the parameter t INTERVAL DHW if yes, you can set the start time and at that time the pump will			,	,	
		y/n	Start hh.mm		work for a time defined by the parameter t_INTERVAL_DHW	YES	NO	1	1	NO
		y/n	Start hh.mm		if yes, you can set the start time and at that time the pump will work for a time defined by the parameter t_INTERVAL_DHW	YES	NO	1	1	NO
		T11 Enabled y/n	Start hh.mm		if yes, you can set the start time and at that time the pump will work for a time defined by the parameter t_INTERVAL_DHW	YES	NO	1	1	NO
		T12 Enabled y/n	Start hh.mm		if yes, you can set the start time and at that time the pump will work for a time defined by the parameter t INTERVAL DHW	YES	NO	1	1	NO



Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description	Lower limit	Upper limit	Resolu- tion	Unit of measure	Default value
		Enable Y/N	yes/no	20.3.0	enables the silent mode	YES	NO	/	/	NO
		Silent Level 1-2			to setup the silent level	0	2	1	/	0
		Timer 1 Start			you can set the start time of timer 1	00.00	23.59	1 min	hh:mm	00.00
	Silent Mode	Timer 1 End			you can set the stop time of timer 1	00.00	23.59	1 min	hh:mm	00.00
	Siletit Mode	Timer 1 On/Off			enables or not the timer 1	ON	OFF	1	1	OFF
		Timer 2 Start			you can set the start time of timer 2	00.00	23.59	1 min	hh:mm	00.00
		Timer 2 End			you can set the stop time of timer 2	00.00	23.59	1 min	hh:mm	00.00
		Timer 2 On/Off			enables or not the timer 2	ON	OFF	/	/	OFF
		Enabled Y/N			enables holyday mode	YES	NO	/	/	NO
Options		Dhw Mode On/ Off			to setup if DHW is On/Off during the holiday	ON	OFF	1	1	ON
	Holiday	Disinfect On/ Off			to setup if disinfect function is On/Off during the holiday	ON	OFF	1	1	ON
		Heat Mode On/ Off			to setup if heat mode is On/Off during the holiday	ON	OFF	1	1	ON
		From Date			first day of holiday	01.01.2000	31.12.3000	1	dd:mm:yyyy	01.01.2021
		Until Date			last day of holiday	01.01.2000	31.12.3000	1	dd:mm:yyyy	01.01.2021
	Backup Heater	Bckp Heat On/ Off			Activate / deactivate backup electrical heater (1=ON - 2=OFF)	ON	OFF	1	1	OFF
		Error List	Code		error code with date and time of the event	/	1	/	/	1
	Error Code		Date		event date	1	1	1	1	1
			Hh.Mm		event time	1	1	1	/	/
		Main Set Temp			temp set point for plant as a function of the selected mode	5	65	1	°C	12 cooling / 40 heating
		Main Actual			Water flow temperature (TW_OUT)	1	1	1	°C	1
Service	Parameters	Tank Set Temp			DHW boiler setpoint (T5s)	30	60	1	°C	50
Informa-		Tank Actual Temp T5			DHW boiler actual temperature (T5)	1	1	1	°C	1
tions		Smart Grid Run Time Info			total daily operating time of the smart grid	0	24	1	hh	1
		Time			to set time	00.00	23.59	1 min	hh:mm	00.00
		Date			to set the date	01.01.2000	31.12.3000	1	dd:mm:yyyy	01.01.2021
	Display	Language			to set the language	1	1	/	/	English
		Backlight	on/off		to set the activation of the backlight	ON	OFF	/	/	ON
		Smart Grid Run Time Set			Working time set for SMART GRID	0	24	1	hh	2
	Online Units N°				UNIT ONLINE INFO	1	1	1	1	1
	Operate Mode				Operating mode (Heat or Cool or Off)	0	3	1	1	1
	Sv1 State		on/off		State of the 3-way valve SV1 (plant=off, DHW=on)	ON	OFF	/	/	1
	Sv2 State				State of the 3-way valve SV2 (off=cool, on=heat)	ON	OFF	1	/	1
	Sv3 State				State of the 3-way valve of zone 2 (mixing valve)	ON	OFF	/	/	1
	Pump_I				State of the water pump of the unit	ON	OFF	1	/	1
	Pump_O				State of the water pump of zone 1	ON	OFF	1	/	1
	Pump_C				State of the water pumpe zone 2	ON	OFF	1	/	1
	Pump_S				State of the solar water pump	ON	OFF	1	1	1
	Pump_D				State of the DHW recirculation pump	ON	OFF	/	/	1
	Pipe Bckp He				State of the backup heater IBH1	ON	OFF	1	/	1
	Tank Bckp He				State of the DHW boiler el. heater TBH	ON	OFF	/	/	1
	Gas Boiler				State of the gas boiler	ON	OFF	1	1	1
	T1 Leav W Temp				Water temperature measured by probe T1	1	1	1	°C	1
	Water Flow				Water flow rate (estimated)	1	1	0,001	m3/h	1
	Heat Pump Cap				Heat pump capacity (estimated)	1	1	0,1	kW	/
	Power Consum.				Measured power consumption (estimated)	1	1	1	kWh	1 /
Operation	T5 W. Tank Tw2 Cir2 W.				Water temperature measured by probe T5 Water temperature measured by probe Tw2	1	1	1	°C	1
Parameter	Temp. T1S1 Cir1 Cli				Water setpoint calculated by climatic curve for zone 1	,	,	1	°C	,
	Temp T1S2 Cir2 Cli				,	,	,			,
	Temp Tw O Plate Out				Water setpoint calculated by climatic curve for zone 2	1	/	1	°C	/
	Temp.				Water temperature measured by probe Tw_out	1	1	1	°C	1
	Tw_I Plate Inl Temp.				Water temperature measured by probe Tw_in	1	1	1	°C	1
	Tbt1 Buf Tank Up Temp.				Water temperature measured by probe Tbt1	1	1	1	°C	1
	Tbt12 Buf Tank Low Temp.				not used	1	1		°C	1
	Tsolar				Water temperature measured by probe Tsolar	1	1	1	°C	1
	Idu Sw				IDU Software	1	1	1	1	1
	Odu Model				ODU model	1	,	1	,	1
	Compr Current				Compressor input current	1	1	1	A	1
	Compr Freq				Compressor working frequency	1	1	1	Hz	1
	Compr Run				Working time from the last start of the compressor	1	1	1	min	1





Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description	Lower limit	Upper limit	Resolu- tion	Unit of measure	Default value
	Compr Tot Run Time				Total workin time of the compressor	1	1	1	hh	1
	Exp Valve Open				Expansion valve opening steps	0	500	1	STEP	/
	Fan Speed				Fan speed	0	650	10	RPM	1
	Unit Target Freg.				Unit target frequency	1	1	1	Hz	1
	Freq Lim Type				Frequency limiting scheme	1	1	1	/	1
	Supply Voltage				Supply voltage	0	450	1	V	/
	Dc Gener Vol- tage				DC bus voltage	0	255	1	V	1
	Dc Gener Cur- rent				DC bus current	0	255	1	А	1
	T2 Plate Gas Out T.				Water temperature measured by probe T2	1	1	1	°C	1
0 "	T2B Plate Gas In T.				Water temperature measured by probe T2B	1	1	1	°C	1
Operation Parameter	Th Comp Suc Temp				Water temperature measured by probe Th	1	1	1	°C	1
	Tp Comp Disch				Water temperature measured by probe Tp	1	1	1	°C	1
	T3 Outd Exch				Water temperature measured by probe T3	1	1	1	°C	1
	T4 Outd Air Temp.				Water temperature measured by probe T4	1	1	1	°C	1
	Tf Modul Temp				Water temperature measured by probe Tf	1	1	1	°C	1
	P1 Compr H_ Press				P1 high press compressor	0	5000	1	KPa	1
	P2 Compr L_ Press				P2 low press compressor	0	5000	1	KPa	1
	Odu Sw Date				Outdoor unit SW date	1	1	1	1	1
	Odu Sw Ver				Outdoor unit SW version	1	,	1	1	1
	Idu Sw Date				Indoor unit SW date	1	1	1	/	1
	Idu Sw Ver				Indoor unit SW version	1	1	1	/	1
For service- man					Password to access to service menù	0000	9999	1	1	1



Premere il tasto SW3, spostarsi tra le righe con i tasti SW1 / SW2, quindi selezionare la riga con il tasto SW3, quindi con i tasti SW6 / SW7

8.5.1 Heat / Cool operating mode selection (Operation Mode)

User menù > Operation mode > select the mode and confirm with the button SW3

8.5.2 Daily schedule / climatic curves / Eco mode (Preset Temp)

User menù > Preset temp >

Weekly schedule

This function acts only on single zone, and if 2 zones are enabled only on zone 1: therefore it has no effect on zone2.

If the unit is in Cool mode, the events to be considered are those in the "Preset Temp. Cool" menu, while if the machine is in Heat mode the events to be considered are those in the "Preset Temp. Heat" menu.

When the operation mode is changed, the function is automatically deactivated and it is therefore necessary to reset the function.

The current default temperature is invalid when the unit is turned off (OFF).

The unit will operate at the default temperature of the first event following the activation time of the unit itself.

Cool mode weekly schedule (Preset Temp. Cool)

User menù > Preset temp > Preset Temp Cool

The submenu with the 7 days of the week will appear, for each day there are 6 possible events to be set from Event 1 to Event 6 will appear.

	Event 1	Enabled y/n	Enables the Eevent
	Event 2	Time	Start time hh.mm
	Event 3	Temperature	Water temperature setpoint
Monday	Event 4		
	Event 5		
	Event 6		

Heat mode weekly schedule (Preset Temp. Heat)

User menù > Preset temp > Preset Temp Heat

The submenu with the 7 days of the week will appear, for each day there are 6 possible events to be set from Event 1 to Event 6 will appear.

	Event 1	Enabled y/n	Enables the Eevent
	Event 2	Time	Start time hh.mm
Mandan	Event 3	Temperature	Water temperature setpoint
Monday	Event 4		
	Event 5		
	Event 6		

The temperature setting remains active until the next enabled event. At the start of this new enabled event, the new associated temperature is set on the machine and so on.

Climatic curves (Weather Temp Set)

User menù > Preset temp > Weather Temp Set

The function allows you to set the water flow temperature set point for Heat mode and Cool mode as a function of the outside air temperature.

Z1 Cool Mode	Enabled y/n	Enables climatic curve for zone 1 in cooling mode
Z1 Cool Wode	Clim Curve Sel	to select the climatic curve in cooling mode
Z1 Heat Mode	Enabled y/n	Enables climatic curve for zone 1 in heating mode
Z i neat Mode	Clim Curve Sel	to select the climatic curve in heating mode
Z2 Cool Mode	Enabled	to select the climatic curve in cooling mode
ZZ Cool Wode	Clim Curve Sel	to select the climatic curve in heating mode
Z2 Heat Mode	Enabled y/n	Enables climatic curve for zone 2 in heating mode
ZZ Heat Mode	Clim Curve Sel	to select the climatic curve in heating mode

When the climatic curves are enabled, it is not possible to modify the T1S set point manually and a warning message will appear.

Modalità Economy (Eco Mode)

User menù > Preset temp > Eco Mode

Enabled y/n	yes/no	enables ECO function (not availbale for 2 zones)
Clim Curve Sel	1-9	select the climatic curve from 1 to 9
Timer enabled y/n	yes/no	Enables the timer
Start	hh.mm	start time
End	hh.mm	end time

If ECO mode is enabled:

• Timer = not enabled, ECO is always active.

Timer = enabled, the start and end times must be set



8.5.3 DHW setting (Dhw settings)

User menù > Dhw settings

Antilegionella (Disinfect)

User menù > Dhw settings > Disinfect

It allows to eliminate the Legionella bacteria. In the disinfection function, the tank temperature necessarily reaches 65 ~ 70 ° C.

The disinfection temperature and relative times are set in the "For serviceman" menu (refer to "9.2 Service parameters table" a pagina 51).

Enabled y/n	yes/no	enables the disinfect function antilegionella
Operate Day	Sunday/Monday	giorno settimana antilegionella
Start	hh.mm	ora di inizio antilegionella

When the anti-legionella function is working, the relative icon appears on the display.

Fast DHW (Fast Dhw)

User menù > Dhw settings > Fast Dhw

The function allows you to force all available system heat sources (heat pump, DHW boiler electric heater and gas boiler) to meet the domestic hot water set point as soon as possible. Once the setpoint is satisfied, the function is automatically disabled and remains disabled until it is called up manually.

Tank heater (Tank Heater)

User menù > Dhw settings > Tank Heater

The function allows you to force the heating of the water in the DHW tank with the TBH electric heater.

In case of simultaneous cooling / heating and DHW request, to guarantee both services, the heat pump will work for the plant and with the TBH electric heater for DHW. If the temperature sensor (T5) of the DHW tank is faulty, the TBH electric heater cannot work.

DHW pump (Dhw Pump Circ)

User menù > Dhw settings > Dhw Pump Circ

This function allows you to manage a timed recirculation pump on the domestic hot water ring.

There are 12 hourly events that can be set and enabled individually.

Each event is only a start, there is no stop event.

T1 Enabled y/n	i Start nn mm	if yes, you can set the start time and at that time the pump will work for a time defined by the parameter t_INTERVAL_DHW
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The pump will run for a preset time defined in the "For serviceman" menu (refer to "9.2 Service parameters table" a pagina 51).

8.5.4 Options

Silent Mode (Silent Mode)

User menù > Options > Silent Mode

It is possible to enable the mode by choosing between 2 silencing levels:

- Level 1, silent
- · Level 2, extra silent

It is possible to program 2 activation time bands (Timer 1 and Timer 2).

Enable Y/N	yes/no	enables the silent mode
Silent Level 1-2		to setup the silent level
Timer 1 Start		you can set the start time of timer 1
Timer 1 End		you can set the stop time of timer 1
Timer 1 On/Off		enables or not the timer 1
Timer 2 Start		you can set the start time of timer 2
Timer 2 End		you can set the stop time of timer 2
Timer 2 On/Off		enables or not the timer 2

If Timer 1 and / or Timer 2 are disabled, the silent mode is always active.



Holiday mode (Holiday)

User menù > Options > Holiday

This function is intended to prevent the house from freezing in winter when you are away from home for holidays and to reactivate the unit shortly before the end of the holidays. In holiday mode, the heating set point, the DHW set point, the management of the DHW valves / pumps and the system are managed independently by the hydronic hoard.

Enabled Y/N	enables holyday mode
Dhw Mode On/Off	to setup if DHW is On/Off during the holiday
Disinfect On/Off	to setup if disinfect function is On/Off during the holiday
Heat Mode On/Off	to setup if heat mode is On/Off during the holiday
From Date	first day of holiday
Until Date	last day of holiday

If DHW and Anti-legionella is enabled, the Anti-legionella function is temporarily disabled and an anti-legionella cycle will be performed at 11.00 pm on the last day of vacation.

All timed functions are disabled.

The climatic curves are temporarily disabled and will automatically return to validity at the end of the holiday period.

The set point is not valid, but the value still appears on the main page.

Plant Backup Heater (Backup Heater)

User menù > Options > Backup Heater

It allows (only in Heat mode) to force the activation of the electric system heater and make the heating of the water sent to the heating system more speedy.

Bckp Heat On/Off	Activate / deactivate backup electrical heater (1=ON - 2=OFF)
------------------	---

8.5.5 Service information

Error code (Error code)

User menù > Service information > Error code

In this menu you can consult the chronological list of the last 10 alarms (the first in the list is the last one) complete with the date and time of the intervention.

Error List	Code	error code
	Date	event date
	Hh.Mm	event time

Parameters (Parameters)

User menù > Service information > Paramenters

In this menu it is possible to consult the following parameters:

		01				
Main Set Temp temp set point for plant as a function of the selected mode						
Main Actual Temp	W	Water flow temperature (TW OUT)				
Tank Set Temp DHW boiler setpoint (T5s)						
Tank Actual Temp T5		DHW boiler actual temperature (T5)				
Smart Grid Run Time Info	tot	tal daily operating time of the smart grid				

Display

User menù > Service information > Display

In this menu it is possible to set the time, date, language, backlighting, unit operating time with Smart Grid input active .

Time		to set time
Date		to set the date
Language		to set the language
Backlight	on/off	to set the activation of the backlight
Smart Grid Run		Working time set for CMART CRID
Time Set		Working time set for SMART GRID

8.5.6 Operation Parameter (Operation Parameter)

User menù > Operation Parameter

It allows you to view all the operating parameters of the unit.



9. START-UP AND CONFIGURATION

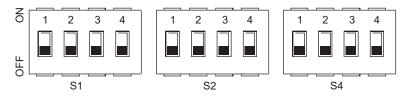
The unit should be configured by the installer to match the installation environment (outdoor climate, installed options, etc.) and user expertise.

9.1 Dip switch setting

DIP switch S1,S2 is located on the indoor unit electronic hydronc board (refer to "fig. 21 - Hydronic board" a pagina 34) and allows configuration of additional heating source thermistor installation, the second inner backup heater installation, etc.



Switch off the power supply before opening the switch box service panel and making any changes to the DIP switch settings.



DIP switch		ON=1 OFF=0		Factory defauts
	1/2	0/0=3kW IBH(One-stage control) 0/1=6kW IBH(Two-stage control) 1/1=9kW IBH(Three-stage control)		OFF/OFF
S1	3/4	0/0=Without IBH and AHS 1/0=With IBH 0/1=With AHS for heat mode 1/1=With AHS for heat mode and DHW mode		ON/OFF
DIP switch		ON=1	OFF=0	Factory defauts

DIP s	witch	ON=1 OFF=0		Factory defauts
	1	Start pumpo after six hours will be invalid	Start pumpo after six hours will be valid	OFF
	2	without TBH with TBH		ON *
\$2	3/4	0/0=variable speed pump,Max head: 8.5m(GR 0/1=constant speed pump(WILO) 1/0=variable speed pump,Max head: 10.5m(G 1/1=variable speed pump,Max head: 9.0m(WII	RUNDFOS)	ON/ON

DIP switch		ON=1 OFF=0		Factory defauts
1		Reserved	Reserved	OFF
S4	2	Reserved	Reserved	OFF
	3/4	Reserved		OFF/OFF

NOTE

9.1.1 Access to Service menu (For Serviceman)

User menù > For Serviceman

This menù is dedicated to service and installer to setup the control of system.

The password to access to the service menù is 1234.

Important: When accessing the service menu, the "HEAT / COOL and DHW" functions are forced to OFF. When exiting the service menu, the "HEAT / COOL and DHW" functions must be switched on again manually.

All the service parameters are shown in the following table.

^{*:} to setup OFF with DHW boiler electrical heater is installed.



9.2 <u>Service parameters table</u>

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Description	Lower limit	Upper limit	Resolution	Unit of measure	Default value
		1.1 Dhw Mode		DHW ENABLE YES/NO	0	1	1	1	1
		1.2 Disinfect		ANTILEGIONELLA ENABLE	0	1	1	1	1
		1.3 Dhw Priority		DHW MODE PRIORITY- heating/coolig or DHW	0	1	1	1	1
		1.4 Dhw Pump		To enable DHW recirculation pump 1= present, 0= not present	0	1	1	1	0
		1.5 Dhw Priority Time Set		To enable minimum working time for DHW mode and plant	0	1	1	1	0
		1.6 Dt5_On		Hysteresis of DHW boiler set point	1	30	1	°C	5
		1.7 Dt1S5		Set point temperature difference between the water sent to the coil of DHW boiler and the DHW boiler temperature.	5	40	1	°C	10
		1.8 T4Dhwmax		The maximum ambient temperature that the heat pump can operate at for domestic water heating	35	43	1	°C	43
		1.9 T4Dhwmin		The minimum ambient temperature that the heat pump can operate for domestic water heating	-25	30	1	°C	-10
		1.10 T_Interval_Dhw		The minimum compressor off time interval between 2 starts in DHW mode	5	5	1	min	5
	1 Dhw Mode	1.11 Dt5_Tbh_Off		the temperature difference between T5 and T5S that turns the electric heater for DHW boiler off.	0	10	1	°C	5
For Serviceman	Settings	1.12 T4_Tbh_On		Maximum outdoor air temperature at which the DHW boiler electric resistance (TBH) can operate.	-5	50	1	°C	5
		1.13 T_Tbh_Delay		the time that the compressor has run before starting the electric heater for DHW boiler	0	240	5	min	30
		1.14 T5S_Di		DHW storage tank temperature holding time at a value greater than "T5S_Di" in the anti-legionella function	60	70	1	°C	65
		1.15 T_Di_Hightemp		the time that the highest temperature of dhw water tank in the DISINFECT function will last	5	60	5	min	15
		1.16 T_Di_Max		the maximum time that disinfection will last	90	300	5	min	210
		1.17 T_Dhwhp_Restrict		the operation time for the space heating/cooling operation.	10	600	5	min	30
		1.18 T_Dhwhp_Max		the maximum continuous working period of the heat pump in DHW PRIORITY mode.	10	600	5	min	90
		1.19 Dhw Pump Time Run		Enables / disables the timer of DHW recirculation pump	0	1	1	1	1
		1.20 Pump Running Time		t_pumpDHW - time that the DHW recirculation pump will keep running for	5	120	1	min	5
		1.21 Dhw Pump Di Run		Enables / disables the DHW circulation pump during the anti-legionella function	0	1	1	1	1
		2.1 COOL MODE		Enables or disables the cooling mode:0=NON,1=YES	0	1	1	1	1
		2.2 t_T4_FRESH_C		The set point update time calculated from the climatic curve for the cooling mode	0,5	6	0,5	hours	0,5
		2.3 T4CMAX		The highest ambient operation temperature for cooling mode	35	52	1	°C	52
		2.4 T4CMIN		the lowest ambient operating temperature for cooling mode	-5	25	1	°C	10
		2.5 dT1SC		the temperature difference for starting the heat pump(T1)	2	10	1	°C	5
		2.6 Reserved		Reserved	1	1	1	1	1
	2 Cool Mode	2.7 t_INTERVAL_C		Time between stop and start of the compressor in cooling mode	5	30	1	min	5
For Serviceman	Settings	2.8 T1SetC1		The setting temperature 1 of climatic curve n°9 for cooling mode.	5	25	1	°C	10
		2.9 T1SetC2		The setting temperature 2 of climatic curve n°9 for cooling mode.	5	25	1	°C	16
		2.10 T4C1		The outdoor air temperature 1 of climatic curve N°9 for cooling mode.	-5	46	1	°C	35
		2.11 T4C2		The outdoor air temperature 2 of climatic curve N°9 for cooling mode.	-5	46	1	°C	25
		2.12 ZONE1 C-EMISSION		The type of zone1 terminal for cooling mode: 0=FCU(fan coil unit): 1=RAD.(radiator): 2=FLH(floor heating)	0	2	1	1	0
		2.13 ZONE2 C-EMISSION		The type of zone2 terminal for cooling mode: 0=FCU(fan coil unit): 1=RAD.(radiator): 2=FLH(floor heating)	0	2	1	1	0



Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Description	Lower limit	Upper limit	Resolution	Unit of measure	Default value
		3.1 Heat Mode		Enable or disable the heating mode	0	1	1	1	1
		3.2 T_T4_Fresh_H		The refresh time of climate related curves for heating mode	0,5	6	0,5	hours	0,5
		3.3 T4Hmax		The maximum ambient operating temperature for heating mode	20	35	1	°C	25
		3.4 T4Hmin		The minimum ambient operating temperature for heating mode	-25	15	1	°C	-15
		3.5 Dt1Sh		The temperature difference for starting the unit (T1)	2	10	1	°C	5
		3.6 Reserved		Reserved	1	1	1	1	1
		3.7 T_Interval_H		Time between stop and start of the compressor in heating mode	5	60	1	min	10
For Serviceman	3 Heat Mode	3.8 T1Seth1		The setting temperature 1 of climatic curve n°9 for heating mode.	25	60	1	°C	1
	Setting	3.9 T1Seth2		The setting temperature 2 of climatic curve n°9 for heating mode.	25	60	1	°C	0,5
		3.10 T4H1		The outdoor air temperature 1 of climatic curve N°9 for heating mode.	-25	35	1	°C	25
		3.11 T4H2		The outdoor air temperature 2 of climatic curve N°9 for heating mode.	-25	35	1	°C	-15
		3.12 Zone1 H-Emission		The type of zone1 terminal for cooling mode: 0=FCU(fan coil unit): 1=RAD.(radiator): 2=FLH(floor heating)	0	2	1	1	0
		3.13 Zone2 H-Emission		The type of zone2 terminal for cooling mode: 0=FCU(fan coil unit): 1=RAD.(radiator): 2=FLH(floor heating)	0	2	1	1	0
		3.14 T_Delay_Pump		Delay between pump activation and subsequent compressor activation	2	20	0,5	MIN	2
		5.1 Water Flow Temp.		Reserved	0	1	1	1	1
For Serviceman		5.2 Room Temp.		Reserved	1	/	1	1	1
T of Corvicontan		5.3 Double Zone	Double one: 0=Non,1=Yes	Enable or disable 2 zone management	0	1	1	1	0
For Serviceman	6 Room Thermostat	6.1Room Thermostat	none/mode stting/one zone/double zone	Select the type of control on the thermostat digital input (0 = none, 1 = mode setting, 2 = one zone, 3 = double zone)	0	3	1	1	0
		7.1 dT1_IBH_ON		The temperature difference betw een T1S and T1 for starting the backup heater.	2	10	1	°C	5
		7.2 t_IBH_DELAY		The time that the compressor has run before the first backup heater turns on	15	120	5	MIN	30
		7.3 T4_IBH_ON		Maximum outdoor air temperature below which the backup heater can be activated	-15	10	1	°C	-5
		7.4 dT1_AHS_ON		The temperature difference between T1S and T1 for switching on the additional heating source (gas boiler)	2	20	1	°C	5
	7 Other Heating	7.5 t_AHS_DELAY		Compressor run time before activation of additional heating source (gas boiler)	5	120	5	MIN	30
For Serviceman	Source	7.6 T4_AHS_ON		Maximum outside air temperature below which the additional heating source (gas boiler) can be activated	-15	30	1	°C	-5
		7.7 IBH LOCATE	Pipe Loop=0; Buffer Tank=1	IBH backup heater installation location PIPE LOOP = 0 if the heater is installed in series with the heat pump; BUFFER TANK = 1 if the heater is installed on the plant tank	0	0	0	1	0
		7.8 P_IBH1		Power input of IBH1	0	20	0,5	kW	0
		7.9 P_IBH2		Power input of IBH2	0	20	0,5	kW	0
		7.10 P_TBH		Power input of TBH	0	20	0,5	kW	2
F 0 :	8 Holiday	8.1 T1S_H.AH		The target outlet water temperature for space heating when in holiday aw ay mode	20	25	1	°C	25
For Serviceman	Setting	8.2 T5S_H.ADHW		DHW boiler water temperature set point in holiday mode	20	25	1	°C	25
For Serviceman	9 Reserved	Reserved		Reserved	1	1	/	/	1
For Serviceman	10 Restore Factory Settings	10, 1 Restore Factory Settings		Reset to factory parameters	Y	N	1	1	N



Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Description	Lower limit	Upper limit	Resolution	Unit of measure	Default value				
		11.1 Test Run Enable		TEST RUN ENABLE 0=OFF 1=ON - to activate the menù "11.2 Trail run steps"	0	1	1	N	0				
		11.2 Trail run steps		0 = to activate the menù "11.3 Point Check" 1=ON - to activate air purge 2=ON - to activate water pump 3=ON - to activate Cooling mode 4=ON - to activate Heating mode 5=ON - to activate Dhw mode	0	5	1	N	0				
			3way-valve 1	TEST ON-OFF	0	1	1	N	0				
			3way-valve 2	It allows you to perform a functional test on individual loads, individually forcing their activation	0	1	1	N	0				
For Serviceman	11 Test Run		PUMPI	and subsequent shutdown.	0	1	1	N	0				
			PUMPO	It also allows you to temporarily force the system	0	1	1	N	0				
			PUMPC	into specific functional states for testing (air purge, circ pump running)	0	1	1	N	0				
		11.3 Point Check	PUMPSOLAR	The on / off action of each function is always	0	1	1	N	0				
			PUMPDHW	voluntary manual.	0	1	1	N	0				
			INNER BACKUP HEATER	Only one function can be switched on / off at a time, contemporaneity is not allowed.	0	1	1	N	0				
			TANK HEATER	If a function is on and you exit the Test Run menu	0	1	1	N	0				
			3WAY-VALVE 3	while it is on, the function will automatically shut down.	0	1	1	N	0				
For Serviceman	12 Reserved	Reserved		Reserved	/	/	/	1	1				
For Serviceman	13 Auto	13.1 COOL/HEAT MODE		Auto restart cooling/heating mode. 0=NON,1=YES	0	1	1	1	1				
	Restart *	13.2 DHW MODE		Auto restart DHW mode. 0=NON,1=YES	0	1	1	1	1				
For Serviceman	14 Power Input Limitation	14.1 POWER LIMITATION		The type of power input limitation (refer to "Tabella. 6 - Max current input (A) for different level of power input limitation" a pagina 53).	0	8	1	1	0				
		15.1 On/Off(M1M2)		1	0	1	1	1	0				
		15.2 Smart Grid		Enable or disable the SMART GRID; 0=NON,1=YES	0	1	1	1	0				
		15.3 T1B(Tw2)		Enable or disable the T1b(Tw 2); 0=NON,1=YES	0	1	1	1	0				
		15.4 Tbt1		Enable or disable the Tbt1; 0=NON,1=YES	0	1	1	1	0				
		15.5 Reserved		Reserved	/	1	1	1	1				
		15,6 Reserved		Reserved	/	1	1	1	1				
For Serviceman	15 Input Define	15 Input Define	15 Input Define	15 Input Define	15 Input Define		SOLAR ENABLE	Enable solar input: 0 = NOT, 1 = YES	0	1	1	1	0
											15.7 Solar Input	IN SOLAR 0=CN18 Tsolar	Solar input type; 0 = no solar input; 1 = CN18_Tsolar (to enable Tsolar solar panel temperature probe); 2 = do not use
		15.8 F-Pipe Length		Choose the total length of the liquid pipe(F-PIPE LENGTH); 0=F-PIPE LENGTH: 10m,1=F-PIPE LENGTH≥ 10m	0	1	1	1	0				
		15.9 Reserved		Reserved	1	1	1	1	0				
		15.10 Rt/Ta_Pcb		Enable or disable the RT/Ta_PCB; 0=NON,1=YES	0	1	1	1	0				
For Serviceman	16 Reserved	1	1	1	1	1	1	1	1				
For Condeans	17 Hmi Address	17.1 Reserved	1	1	1	1	1	1	/				
For Serviceman	Set	17.2 Hmi Address For Bms	1	To set the BMS address of the heat pump	1	16	1	1	0				

NOTE

Tabella. 6 - Max current input (A) for different level of power input limitation

1 \ /									
Level of power input limitation	0	1	2	3	4	5	6	7	8
Model	18	18	16	15	14	13	12	12	12
4-6	19	19	18	16	14	12	12	12	12
8-10	30	30	28	26	24	22	20	18	16
12-14-16	30	30	29	27	25	23	21	19	17
12T-14T-16T	14	14	13	12	11	10	9	9	9

^{*} It allows you to enable or disable the functions that can be restarted in the event of a power failure.



9.3 Climatic curves

The climate related curves can be selected in the user interface. Once the curve is selected, the target water flow temperature in each mode is calculated by the curve. It's possible to select curves even double zone function is enabled.

The relationship between outdoor temperature (T4/°C) and the target water temperature(T1S/°C) is described in the tables and pictures.

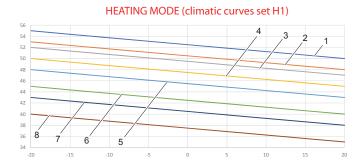
9.3.1 Temperature curves for heating mode and ECO heating mode

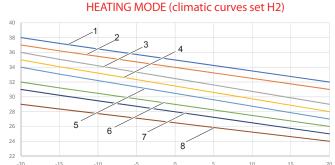
User terminals type (to setup on service menu Cool and heat mode setting)

Based on the type of user terminal selected the climatic curves set is limited, refer to the below table:

Terminal Type selected	Climatic curves set available in heating	Climatic curves set available in heating		
FLH (radiant floor)	H2	C2		
FCU (fancoil)	H1	C1		
RAD (radiator)	H1	C2		

CLIMATIC CURVES (WTS) HEATING MODE										
, ,									Terminal Type	
T4 (T_outdoor_air) [°C]	-20	-15	-10	0	7	15	20	id Climatic curve	selected on remote	Climatic curves set
									controller	
	55,0	54,4	53,7	52,5	51,6	50,6	50,0	1		
	53,0	52,4	51,7	50,5	49,6	48,6	48,0	2		
	52,0	51,4	50,7	49,5	48,6	47,6	47,0	3		
	50,0	49,4	48,7	47,5	46,6	45,6	45,0	4	Fancoil or Radiators	H1
	48,0	47,4	46,7	45,5	44,6	43,6	43,0	5	Fallcoll of Radiators	
	45,0	44,4	43,7	42,5	41,6	40,6	40,0	6		
	43,0	42,4	41,7	40,5	39,6	38,6	38,0	7		
T1C or T2C (Motor flow Tomp) [°C]	40,0	39,4	38,7	37,5	36,6	35,6	35,0	8		
T1S or T2S (Water flow Temp) [°C]	38,0	37,2	36,5	35,0	33,9	32,7	32,0	1		
	37,0	36,2	35,5	34,0	32,9	31,7	31,0	2		
	36,0	35,1	34,2	32,5	31,3	29,9	29,0	3		
	35,0	34,1	33,2	31,5	30,3	28,9	28,0	4	Dadient floor Heating	H2
	34,0	33,1	32,2	30,5	29,3	27,9	27,0	5	Radiant floor Heating	ПZ
	32,0	31,2	30,5	29,0	27,9	26,7	26,0	6		
	31,0	30,2	29,5	28,0	26,9	25,7	25,0	7		
	29,0	28,4	27,7	26,5	25,6	24,6	24,0	8		





Climatic curve 9 in heating mode settable by the user

The climatic curve 9 is defined by 4 parameters that can be set by the user (T4H1, T4H2, T1SETH1, T1SETH2, refer to "9.2 Service parameters table" a pagina 51).

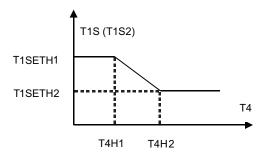


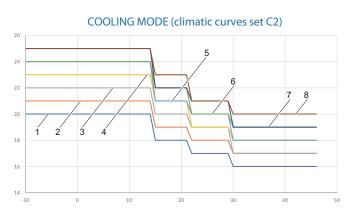
fig. 38 - Climatic curve 9 in heating mode



9.3.2 Temperature curves for cooling mode

CLIMATIC CURVES (WTS) COOLING MODE											
T4 (T_outdoor_air) [°C]	-10	14	15	21	22	29	30	46	id Climatic curve	Terminal Type selected on remote controller	Climatic curves set
	16,0	16,0	11,0	11,0	8,0	8,0	5,0	5,0	1		
	17,0	17,0	12,0	12,0	9,0	9,0	6,0	6,0	2		
	18,0	18,0	13,0	13,0	10,0	10,0	7,0	7,0	3		
	19,0	19,0	14,0	14,0	11,0	11,0	8,0	8,0	4	Fancoil	C1
	20,0	20,0	15,0	15,0	12,0	12,0	9,0	9,0	5	Fallcoll	CI
	21,0	21,0	16,0	16,0	13,0	13,0	10,0	10,0	6		
	22,0	22,0	17,0	17,0	14,0	14,0	11,0	11,0	7		
T1S or T2S	23,0	23,0	18,0	18,0	15,0	15,0	12,0	12,0	8		
(Water flow Temp) [°C]	20,0	20,0	18,0	18,0	17,0	17,0	16,0	16,0	1		
	21,0	21,0	19,0	19,0	18,0	18,0	17,0	17,0	2		
	22,0	22,0	20,0	20,0	19,0	19,0	17,0	17,0	3		
	23,0	23,0	21,0	21,0	19,0	19,0	18,0	18,0	4	Radiant floor Heating	C2
	24,0	24,0	21,0	21,0	20,0	20,0	18,0	18,0	5	or radiator	02
	24,0	24,0	22,0	22,0	20,0	20,0	19,0	19,0	6		
	25,0	25,0	22,0	22,0	21,0	21,0	19,0	19,0	7		
	25,0	25,0	23,0	23,0	21,0	21,0	20,0	20,0	8		

COOLING MODE (climatic curves set C1) 24 22 20 18 16 14 12 3 4



Climatic curve 9 in cooling mode settable by the user

The climatic curve 9 is defined by 4 parameters that can be set by the user (T4C1, T4C2, T1SETC1, T1SETC2, refer to "9.2 Service parameters table" a pagina 51).

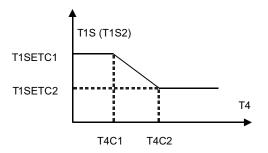


fig. 39 - Climatic curve 9 in cooling mode



10. TROUBLESHOOTING

This section provides useful information for diagnosing and correcting certain troubles which may occur in the unit.

10.1 General guidelines

Before starting the troubleshooting procedure, carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.



WARNING

When carrying out an inspection on the switch box of the unit, always make sure that the main switch of the unit is switched off.

When a safety device was activated, stop the unit and find out why the safety device was activated before resetting it. Under no circumstances can safety devices be bridged or changed to a value other than the factory setting. If the cause of the problem cannot be found, call your local dealer.

If the pressure relief valve is not working correctly and is to be replaced, always reconnect the flexible hose attached to the pressure relief valve to avoid water dripping out of the unit!

10.2 General symptoms

Symptom 1: The unit is turned on but is not heating or cooling as expected

Possible causes	Corrective action
The setting of some parameters is not correct .	Check the parameters T4HMAX, T4HMIN in heating mode. T4CMAX, T4CMIN in cooling mode T4DHWMAX, T4DHWMIN in DHW mode.
The water flow is too low.	Check that all the hydraulic circuit shut-off valves are open. Check if the water filter is clogged. Check that there is no air in the hydraulic circuit. Check the water pressure. The water pressure must be> 1 bar (measured with cold water). Check that the expansion tank is not broken. Check that the pressure drop in the hydraulic circuit is not too high for the pump.
The volume of water in the installation is too low.	Make sure that the volume of water in the installation is above the minimum required value

Symptom 2: The unit is turned on but the compressor is not starting (space heating or domestic water heating)

Possible causes	Corrective action
The unit may operate outside its operating range (the water temperature is too low).	In case of low water temperature, the system uses the backup system electric heater to first reach the minimum water temperature (12 ° C). Check that the power supply of the backup system electric heater is correct. Check that the electrical protection of the backup system electric heater is closed. Check that the safety thermal switch of the backup system electric heater is not activated. Check that the backup system electric heater contactors are not faulty.

Symptom 3: Pump is making noise (cavitation)

Possible causes	Corrective action
There is air in the system.	Purge the air.
The water pressure at the pump inlet is too low.	Check the water pressure. The water pressure must be > 1 bar (measured with cold water). Check that the expansion tank is not broken or discharged. Check that the pre-charge of the expansion vessel is correct

Symptom 4: The water pressure relief valve opens

Possible causes	Corrective action					
The expansion tank is broken or drained	Replace the expansion tank. Recharge the expansion tank.					
The pressure of the filling water in the system is higher than 3 bar.	Make sure that the filling water pressure in the system is approximately 1 and 2 bar.					



Symptom 5: The water pressure relief valve leaks

Possible causes	Corrective action
	Check the correct operation of the safety valve by turning the red knob on the valve counterclockwise: If you do not hear a clicking noise, contact your local technical support service. If water continues to flow out of the unit, close the water inlet and outlet shut-off valves and then contact your local technical assistance service.

Symptom 6: Space heating capacity shortage at low outdoor temperatures

Possible causes	Corrective action
The backup system electric heater operation is not activated.	Check that the backup system electric heater is enabled (see "9.1 Dip switch setting" a pagina 50). Check whether the thermal protection of the backup system electric heater has been activated or not. Check if the electric heater of the DHW tank is working, the backup heater and the electric heater of the DHW tank cannot work at the same time.
A high heating capacity is required in DHW mode or some parameters are not set correctly (only applicable to installations with DHW tank).	Check that the parameters "t_DHWHP_MAX " and "t_DHWHP_RESTRICT " are configured in an appropriate manner: Ensure that the parameter "DHW Priority " is = 0 (priority ACS disabilitat in) . • Enable the DHW boiler electric resistance (TBH, see "9.1 Dip switch setting" a pagina 50) .

Symptom 7: Heat mode can't change to DHW mode immediately

Possible causes	Corrective action
The volume of ACS tank is too small and the position d she water temperature probe not high enough.	

Symptom 8: DHW mode can't change to Heat mode immediately

Possible causes	Corrective action
Insufficient surface of the DHW tank coil	Set the parameter "Dhw Priority" = 0 and set the parameter "t_DHWHP_MAX" to the minimum value (the suggested value is 60min).
The heating load of the system is reduced	Normal, it does not require heating.
The disinfection function is enabled but without TBH	Disable the disinfection function. Add TBH or AHS for the DHW mode and for anti-legionella disinfection.
Switching manual FAST DHW function, in this case the heat pump may switch to the heating mode for the plant only after the setpoint of the DHW tank has been satisfied	Manual deactivation of the FAST DHW function.
DHW mode priority	If the "Dhw Priority" parameter = 1, the heat pump will be able to switch to system heating mode only after the setpoint of the DHW tank has been satisfied.

Symptom 9: DHW mode heat pump stop work but setpoint not reached, space heating require heat but unit stay in DHW mode

Possible causes	Corrective action
Insufficient surface of the DHW tank coil	Set the parameter "Dhw Priority" = 0 and set the parameter "t_DHWHP_MAX" to the minimum value (the suggested value is 60min).
TBH or AHS not available	If the "Dhw Priority" parameter = 1, the heat pump will be able to switch to system heating mode only after having satisfied the DHW setpoint . If the "Dhw Priority" parameter = 0, the heat pump will remain in DHW mode for the time defined by the "t_DHWHP_MAX" parameter. Add TBH or AHS for DHW mode.



10.3 Error codes

When a safety device is activated, an error code(which does't include external failure) will be displayed on the user interface. A list of all errors and corrective actions can be found in the table below. Reset the safety by turning the unit OFF and back ON. In case this procedure for resetting the safety is not successful, contact your local dealer.

Error code	Malfunction or protection	Failure causeand corrective action
E0	Water flow falut (after 3 times E8)	1.The wire circuit is short connected or open. Reconnect the wire correctly. 2.Water flow rate is too low. 3. Water flow switch is failed, switch is open or close continuously, Replace the water flow switch.
E1	Phase loss or neutral wire and live wire are connected reversely (only for three phase unit)	1.Check the power supply cables should be connected stable,,avoid phase loss. 2.Check the phase sequence and if necessary connect reversely.
E2	Communication fault between controller and hydronic board	1.Wire of connession is broken or loose. 2.Communication wire sequence is not correct. Reconnect the wire in the right sequence. 3.Whether there is a high magnetic field or high power interfere, such as lifts, large power transformers, etc To add a barrier to protect the unit or to move the unit to the other place.
E3	Fault of the final outlet water temp. probe (T1)	1.Check the resistance of the probe- 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape. 4.Probe broken, replace it.
E4	Fault of the Water boiler temp. probe (T5)t	1. Check the resistance of the probe- 2. The probe connector is disconnected. Reconnect it. 3. The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape. 4. Probe broken, replace it.
E5	Fault of the condenser outlet refrigerant temperature probe (T3)	1.Check the resistance of the probe- 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape. 4.Probe broken, replace it.
E6	Fault of the outdoor air temperature probe (T4)	1.Check the resistance of the probe- 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape. 4.Probe broken, replace it.
E7	Fault of the buffer tank up temp. probe (Tbt1)	1.Check the resistance of the probe- 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape. 4.Probe broken, replace it.
E8	Water flow failure	Check that all shut off valves of the water circuit are completely open. 1. Check if the water filter needs cleaning. 2. Make sure there is no air in the system (purge air). 3. Check the water pressure. The water pressure must be >1 bar. 4. Check that the pump speed setting is on the highest speed. 5. Make sure that the expansion vessel is not broken. 6. Check that the resistance in the water circuit is not too high for the pump
E9	Fault of the suction temperature probe (Th)	1.Check the resistance of the probe- 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape. 4.Probe broken, replace it.
EA	Fault of the discharge temperature probe (Tp)	1.Check the resistance of the probe- 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape. 4.Probe broken, replace it.
Eb	Fault of the solar temp. probe (Tsolar)	1.Check the resistance of the probe- 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape. 4.Probe broken, replace it.
Ec	Fault of the buffer tank low temp. probe (Tbt2)	1.Check the resistance of the probe- 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape. 4.Probe broken, replace it.
Ed	Fault of the inlet water temp. probe (Tw_in)	1.Check the resistance of the probe- 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape. 4.Probe broken, replace it.
EE	Hydronic board EEprom failure	The hydronic board is broken, replace it.



F	Malfaration and C	Fellows account a sound the section
Error code	Malfunction or protection Communication fault between indoor unit	Failure causeand corrective action 1.wire doesn't connect between main control board PCB B and main control board of indoor unit. connect the
110	and outdoor unit	wire doesn't connect between main control board PGB B and main control board of indoor unit. Connect the wire.
H0	and oddoor and	2. Whether there is a high magnetic field or high power interfere, such as lifts, large power transformers, etc To add a barrier to protect the unit or to move the unit to the other place.
	Communication error between inverter mo-	1. Whether there is power connected to the PCB and driven board. Check the inverter module PCB indicator light
H1	dule PCB A and main control board PCB B	is on or off. If Light is off, reconnect the power supply wire. 2.if light is on, check the wire connection between inverter module PCB and main control board PCB, if the wire
111		loosen or broken, reconnect the wire or Replace a new wire.
		3. Replace a new main PCB and driven board in turn.
	Refrigerant liquid temp. probe(T2) fault	1.Check the resistance of the probe-
H2		2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape.
		4.Probe broken, replace it.
	Refrigerant gas temp. probe(T2B) fault	1.Check the resistance of the probe-
H3		2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape.
		4.Probe broken, replace it.
H4	Three times P6 protect	Refer to P6
	Room temp. probe(Ta) fault	1.Check the resistance of the probe-
H5		2.The probe connector is disconnected. Reconnect it.
110		3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape. 4.Probe broken, replace it.
	The DC fan failure	Strong wind blow toward to the fan, to make the fan running in the opposite direction. Change the unit direction
H6		or make shelter to avoid typhoon below to the fan.
	Voltage protection	2.fan motor is broken, Replace it with a new fan motor. 1. Whether the power supply input is in the available range.
117	Voltage protection	2. Power off and power on for several times rapidly in short time. Remain the unit power off for more than 3
H7		minutes than power on.
	D	3. the circuit defect part of Main control board is defective. Replace a new Main PCB.
H8	Pressure sensor failure	Pressure sensor connector is loosen, reconnect it. Pressure sensor failure. Replace it with a new sensor.
	Outlet water for zone 2 temp. probe (Tw2)	1.Check the resistance of the probe-
H9	fault	2.The probe connector is disconnected. Reconnect it.
		3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape. 4.Probe broken, replace it.
	Fault of the outlet water temp. probe (Tw_	1.Check the resistance of the probe-
HA	out)	2.The probe connector is disconnected. Reconnect it.
117		3.The probe connector is wet. Remove the water, dry the connector. Apply waterproof adhesive tape. 4.Probe broken, replace it.
Шh	Three times "PP" protection and Tw_out<	Refer to "PP".
Hb	7°C	
	Communication fault between hydronic boards (for cascade application)	1.The signalwires of slave units and master unit are not effactively connected. After checking all signalwires are well connected, and making sure there is no strong electricity or strong magnetic interference, power on again;
	arus (ioi cascaue application)	2. There are two or more units connected to the wired controllar. After removing the excess wired controllar and
		keep only the wired controllar of the master unit, power on again;
		3. The power-on interval between the master unit and the slave unit is longer than 2min. After ensuring that the interval between the power on again.
Hd		interval between the power-on of ali the master units and slave units is less than 2min, power on again; 4.The addresses of master unit and slave units are repeated:
110		by pressing the SW2 button on main board once on slave units, the address code of the slave unit will be
		displayed on the digitaitube (Normally address code, one of 1, 2, 3 15 will be shown on main board), check
		whether there is a duplicate address. If there is a duplicate address code, after powering off the system,set the S4-1 to "ON"on master outdoor unit main board or the salve outdoor unit main board which display "Hd" error.
		Power on again, all the units last for 5 minutes without "Hd" error, power off again and set the S4-1to "OFF".
	O	The system will recover.
	Communication error between main board and thermostat transfer board	RT/Ta PCB is setto be valid on user interface but thermostat transfer board is not connected or the communication between thermostat transfer board and main board is
HE		not effectively connected.If thermostat transfer board is not needed, set the RTfTa PCB to invalid. If thermostat
HE		transter board is needed,
		please connect it to main board and make sure the communication wire is connected well and there is no strong electricity or strong magnetic interference.
	Inverter module board EE prom failure	The EEprom is in error, please rewrite the data on the EEprom.
HF		2. The EEprom is broken, replace it with a new one.
1 11 1	U6 displayed 10 times in 2 hours	3. The inverter module board is broken, replace it with a new one.
HH	H6 displayed 10 times in 2 hours	Refer to H6



Error code	Malfunction or protection	Failure causeand corrective action	
HP	Low pressure protection in cooling Pe<0.6 occurred 3 times in an hour	Refer to P0	
P0	Low pressure switch protection	1. The system refrigerant charge is too low. Search for the leak, repair it and charge with the correct charge. The water flow is too low in cooling mode. Increase the flow of water. 4. The electrical expansion valve is studied or the power connector is loose. Try to unlock the valve by tapping it lightly. Plug / unplug the connector seventimes to make sure the valve is working properly.	
P5	Temperature difference between Tw_out and Tw_in too high	1. Check that all shut off valves of the water circuit are completely open. 2. Check if the water filter needs cleaning. 3. Make sure there is no air in the system (purge air). 4. Check the water pressure. The water pressure must be >1 bar(water is cold). 5. Check that the pump speed setting is on the highest speed. 6. Make sure that the expansion vessel is not broken. 7. Check that the resistance in the water circuit is not too high for the pump.	
Pb	Anti-freeze protection	Unit will return to the normal operation autornatically.	
PP	Error due to temperature difference between TWout and Twin not in line with the operating mode. The error appears in heating mode if Twout is less than Twin for more than 15 minutes	1.Check the resistance of the two probe. 2.Check the two probes locations. 3.The water inlet/outlet probe wire connector is loosen. Reconnect it. 4.The water inlet/outlet (IW_in fTW_out) probe is broken, Replace with a new probe. 5.Four-way valve is blocked. Restart the unit again to let the valve the direction. 6.Four-way valve is broken. Replace it with a new valve.	



11. COMMISSIONING

11.1 Heat pump commissioning

Before starting for the first time, after a long pause it is necessary to carry out the following preliminary checks concerning the electrical part and the refrigerating part...

11.1.1 Preliminary heat pump checks

Refrigerating part

- Check that the unit is charged with refrigerant. The control can be carried out with portable freon pressure gauges fitted with a 1/4 "SAE revolving coupling with a depressor connected to the tap service outlet. The pressure read must correspond to the saturation pressure corresponding to the ambient temperature (~ 7 bar).
- · Perform a visual check on the refrigeration circuit making sure it is not damaged.
- Check that the pipes are not dirty with oil (oil stains allow the refrigeration circuit to break).



Disconnect the power supply before carrying out any operation on the electrical panel of the unit.

After installing the indoor and outdoor units, check the following before powering them up:

- Wiring. Make sure that the electrical connections of the various parts of the system such as boiler, temperature probes, 2 and 3-way valves, pumps have been
 carried out in accordance with the instructions in this manual, the wiring diagram supplied with the unit and in compliance with the laws and local regulations.
- Fuses, switches, or protection devices. Check that the fuses or protection devices installed locally are adequately sized based on the maximum current absorbed by the unit as reported in this manual. Check that these protection devices are not bypassed.
- · Grounding. Make sure that the earth wires have been connected correctly and that the earth terminals are tightened.
- Visually check the electrical panel to check for loose connections or damaged electrical components.
- · Mounting. Check that the unit is mounted correctly to avoid abnormal noise and vibration when starting up the unit.
- Damaged components. Check the inside of the unit to check for damaged components or crushed pipes.
- Refrigerant leakage. Check the inside of the unit to check for refrigerant leaks. If there is a loss of refrigerant, contact the technical assistance service.
- · Supply voltage. Check that the supply voltage to the unit corresponds to the power supply voltage indicated on the nameplate of the unit.
- · Make sure the water shut-off valves are completely open

11.2 Setting to be done during the initial check of the product

For the correct functioning of the system it is mandatory to make the correct settings that depend on the type on the system served by the unit. For more details see "9. START-UP AND CONFIGURATION" a pagina 50.

11.3 Final check before turning on the unit

When the installation is complete and all the necessary settings have been made, reassemble and close all the panels of the unit.

11.4 Turn on the unit

When power is supplied to the unit, the controller display needs around 10 seconds for the activation (initialization phase). During this process the user interface cannot be used. To activate the system, refer to "8. USER INTERFACE" a pagina 40.

12. MAINTENANCE

12.1 General notes

In order to ensure optimal availability of the unit, a number of checks and inspections on the unit and the field wiring have to be carried out at regular intervals.

IMPORTANT



DANGER

All maintenance work and replacements must be carried out by skilled qualified personnel.

Before carrying out any operation inside the indoor unit, disconnect the power and close the gas cock upstream. Otherwise there may be a danger of explosion, electric shock, suffocation or poisoning.

Do not touch the refrigerant circuit pipes and the internal parts (pump, safety valve, etc.) during and immediately after switching off the unit as they can be very hot or very cold, causing scucking or burning or freezing. To avoid injury, allow sufficient time for the temperature of the pipes to drop to normal values and wear protective gloves.

Before carrying out any maintenance or repair work, always disconnect the power supply to the unit and to all electrical loads (pumps, valves, electric heater for DHW boiler and plant, etc.).

Some electrical components may be very hot.

Due to the risk of high residual voltage, after having disconnected the power supply to the outdoor unit, wait at least 10 minutes before touching live parts.

The compressor oil heater can work even if the compressor is stopped.

Make sure not to touch powered electrical cables.

Do not wash the unit. This may cause electric shock or fire.

When the service panels are removed, live parts could easily be touched by mistake.

Never leave the unit unattended during installation or maintenance when the service panel has been removed.

It is not allowed to tamper with or modify any component, nor the settings of the intervention values of the protection devices installed in the unit.

Do not pull, disconnect, twist the electric cables coming from the unit even if disconnected from the power supply.

It is forbidden to leave containers of inflammable substances near the unit.



Do not touch the appliance with bare feet or with wet or moist parts of the body.

The checks described must be performed at least once a year by qualified personnel.

Electrical cabinet

Carry out a thorough visual inspection of the components of the electrical panel to check for damaged or incorrectly connected components or cables (check the tightness of the terminal screws).

Residual Risks

The machines has been designed with a view to reducing the risks to persons and the environment in which it is installed, to the minimum. To eliminate residual risks, it is therefore advisable to become as familiar as possible with the machine in order to avoid accidents that could cause injuries to persons and/or damage to property. a. Access to the unit

Only qualified persons who are familiar with this type of machine and who are equipped with the necessary safety protections (footwear, gloves, helmet, etc.) may be allowed to access the machine. Moreover, in order to operate, these persons must have been authorized by the owner of the machine and be recognized by the actual Manufacturer.

b. Elements of risk

The machine has been designed and built so as not to create any condition of risk. However, residual risks are impossible to eliminate during the designing phase and are therefore listed in the following table along with the instructions about how to neutralize them.

Indoor unit residual risks

Part in question	Residue hazard	Mode	Precautions
Refrigerant and hydraulic pipes	Burns	Contact with the pipes	Avoid contact by wearing protective gloves
Refrigerant pipes, plate heat exchanger.	Explosion	Excessive pressure	Turn off the machine, check the high pressure switch and safety valve, the fans and condenser
Refrigerant pipes	Ice burns	Leaking refrigerant	Do not pull on the pipes
Electrical cables, metal parts	Electrocution, serious burns	Defective cable insulation, live metal parts	Adequate electrical protection (correctly ground the unit)

Outdoor unit residual risks

Part in question	Residue hazard	Mode	Precautions	
Compressor and delivery pipe	Burns	Contact with the pipes and/or compressor	Avoid contact by wearing	
			protective gloves Turn off the machine,	
Discharg pipes and coil	Explosion	Excessive pressure	check the high pressure switch	
Discharg pipes and con			and safety valve,	
			the fans and condenser	
Refrigerant pipes	Ice burns	Leaking refrigerant	Do not pull on the pipes	
Electrical cables, metal parts	Electrocution, serious burns	Defective cable insulation, live metal parts	Adequate electrical protection (correctly ground the unit)	
Heat exchange coils	Cuts	Contact	Wear protective gloves	
Fans	Cuts	Contact with the skin	Do not push the hands or objects through the fan grille	

General Rules for Maintanance

The maintenance is extremely important for the functioning of the system and the regular working of the unit over time.

In accordance with the European Regulation EC 303/2008, it should be noted that companies and engineers in maintenance, repair, leak testing and recovery / recycle refrigerant gases should be CERTIFIED in accordance with local regulations.

Maintenance must be performed in compliance with the safety rules and tips given in the manual supplied with the unit.

Routine maintenance helps maintain unit efficiency, reduce the rate of deterioration which each device is subject in time and gather information and data to understand the efficiency of the unit and prevent failures.

For extraordinary maintenance or in case you need service, contact only to a specialized service center approved by the manufacturer and use original spare parts. In accordance with the European Regulation EC 1516/2007 it is necessary to prepare a "equipment record".

Provide anyway a databook (not supplied) that allows you to keep track of interventions made on the unit; in this way it will be easier to properly program the various interventions and will facilitate a possible troubleshooting.

Bring on the databook : date, type of intervention made, description of the intervention , measurements , reported anomalies , alarms recorded in the alarm history , etc. ...

12.2 Access to internal components

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CAUTION

Some internal components of the indoor unit can reach temperatures high enough to cause severe burns. Before carrying out any operation, wait for these components to cool or else wear suitable gloves.

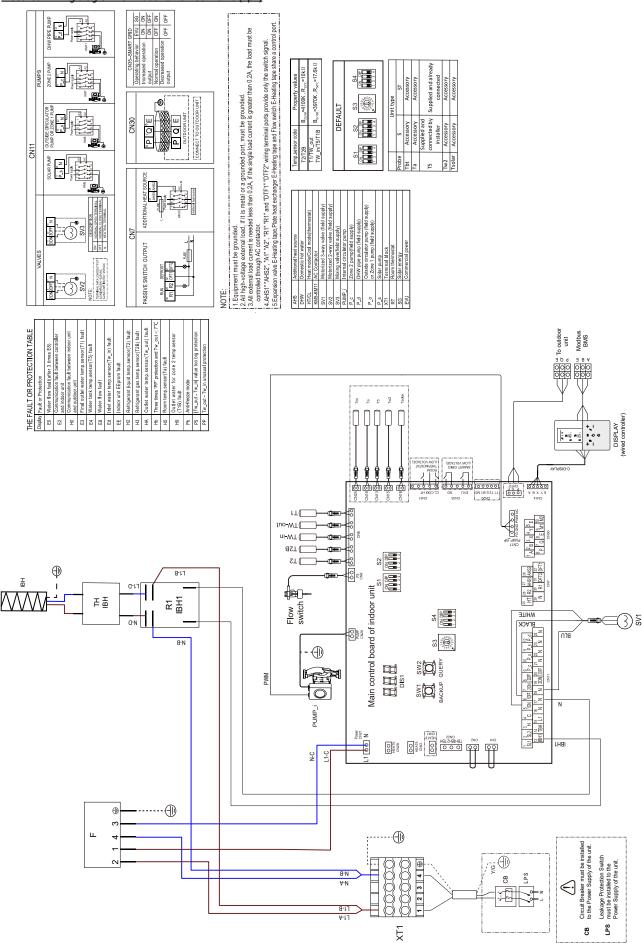
For details about how to access to the internal components refer to "How to access to the electric box" a pagina 33.

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13. ELECTRICAL WIRING DIAGRAM INDOOR UNIT

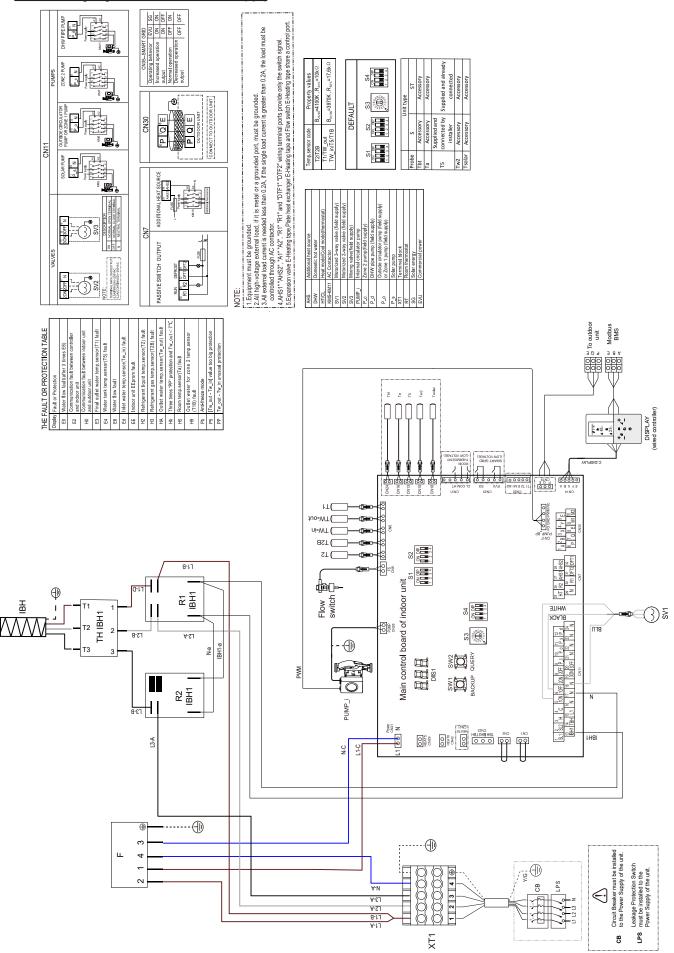
13.2.1 Electrical wiring diagram for indoor unit mod. 10-16 (1ph)



ΕN

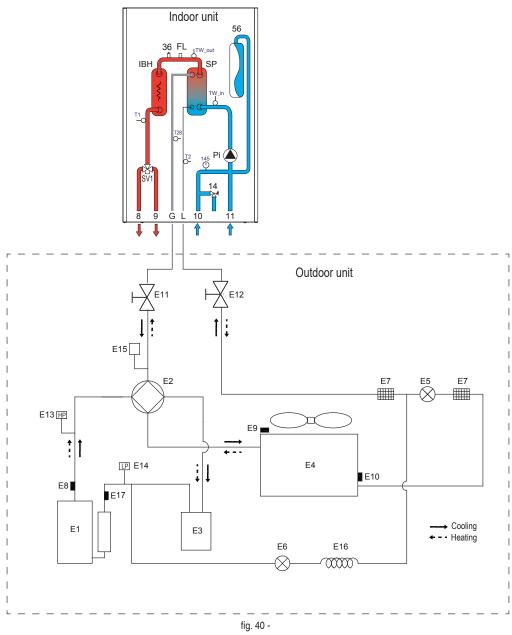


13.2.2 Electrical wiring diagram for indoor unit mod. 16T (3ph)





14. REFRIGERANT DIAGRAM



LEGEND

R UNIT	INDOOR UN	NIT
Compressor	8	System outlet
4-Way Valve	9	DHW outlet
Gas-liquid separator	10	DHW inlet
Air side heat exchanger	11	System inlet
Electronic expansion Valve	14	Safety valve
Single-way electromagnetic valve	36	Automatic air vent
Filter	56	Expansion vessel
Discharge temperature sensor	145	Water pressure gauge
Outdoor temperature sensor	FL	Flow switch
Outdoor exchanger sensor	G	Gas line
Stop valve (gas)	IBH	System electrical heater
Stop valve (liquid)	L	Liquid line
High Pressure Switch	Pi	Water circulator
Low Pressure Switch	SP	Plate heat exchanger
Pressure sensor	SV1	Diverter valve
Capillary	T1	Heat pump outlet water temperature probe
Suction temperature sensor	T2	Heat pump liquid refrigerant temperature probe
	T2B	Heat pump gas refrigerant temperature probe
	TW_in	Plate heat exchanger water inlet temperature probe
	TW_out	Plate heat exchanger water outlet temperature probe
	Compressor 4-Way Valve Gas-liquid separator Air side heat exchanger Electronic expansion Valve Single-way electromagnetic valve Filter Discharge temperature sensor Outdoor temperature sensor Outdoor exchanger sensor Stop valve (gas) Stop valve (liquid) High Pressure Switch Low Pressure Switch Pressure sensor Capillary	Compressor 8 4-Way Valve 9 Gas-liquid separator 10 Air side heat exchanger 11 Electronic expansion Valve 14 Single-way electromagnetic valve 36 Filter 56 Discharge temperature sensor 145 Outdoor temperature sensor G Stop valve (gas) IBH Stop valve (liquid) L High Pressure Switch Pi Low Pressure Switch SP Pressure sensor SV1 Capillary T1 Suction temperature sensor T2 T2B TW_in

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