



OMNIA S HYBRID C 3.2

INDOOR WALL UNIT FOR HYBRID REVERSIBLE SPLIT HEAT PUMP WITH INSTANT DHW PRODUCTION



3542B250

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EN

INSTALLATION, USE AND MAINTENANCE MANUAL

- 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 can compromise 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 appears on the product or the packaging or in the documentation, indicates that the product must not be collected, recycled or disposed of with household waste at the end of its life cycle. Improper disposal of electrical and electronic equipment can cause the leakage of hazardous substances contained in the product. In order to avoid any potential harm to the environment or health, the user is requested to separate this equipment from other types of waste and deliver it to the local city waste collection service or to request collection by the distributor according to the conditions and methods included in national legislation in the implementation of Directive 2012/19/EU. Separate waste collection and the recycling of discarded equipment helps to preserve natural resources and guarantee that the waste treated with respect for the environment and ensuring the protection of health. For further information on the methods of collecting waste from electrical and electronic equipment, please contact your local councils or the competent public authorities for the issue of authorisations.
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Allowed uses

The series of heat pumps in question is ideal for producing hot and cold water to use in hydronic systems for the purpose of air conditioning/heating and producing instant domestic hot water.

Any other use that differs from or is outside the operational limits outlined in this manual is forbidden unless agreed with the company beforehand.

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 documentation 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.



HAZARD

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.

Table 1 - Information symbols

Symbol	Description
	This symbol indicates that this appliance uses a flammable refrigerant. If the refrigerant leaks and is exposed to a strong external ignition, there is a risk of fire.
	This symbol indicates that the instruction manual must be read carefully
	This symbol indicates that the support staff should refer to the installation manual when handling this appliance.
	This symbol shows that information is available such as the operating manual or the 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.

💡 NOTE

- 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.

⚠ WARNING

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

💡 NOTE

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_c) is ≤ 1.842 kg, there are no additional minimum floor area requirements.

If the total refrigerant charge in the system (m_c) is > 1.842 kg, you need to comply with additional minimum floor area requirements as described in the following flow chart.

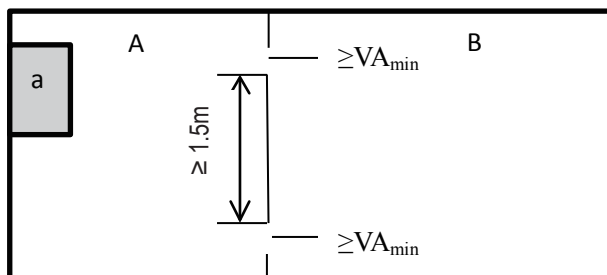


fig. 1 - indoor unit installation

Legend

- a** Indoor unit
- A** Room where the indoor unit is installed.
- B** Room adjacent to room A.
- VA_{min}** $n^{\circ}2$ openings ($n^{\circ}1$ at the top and $n^{\circ}1$ at the bottom) between Room A and Room B.

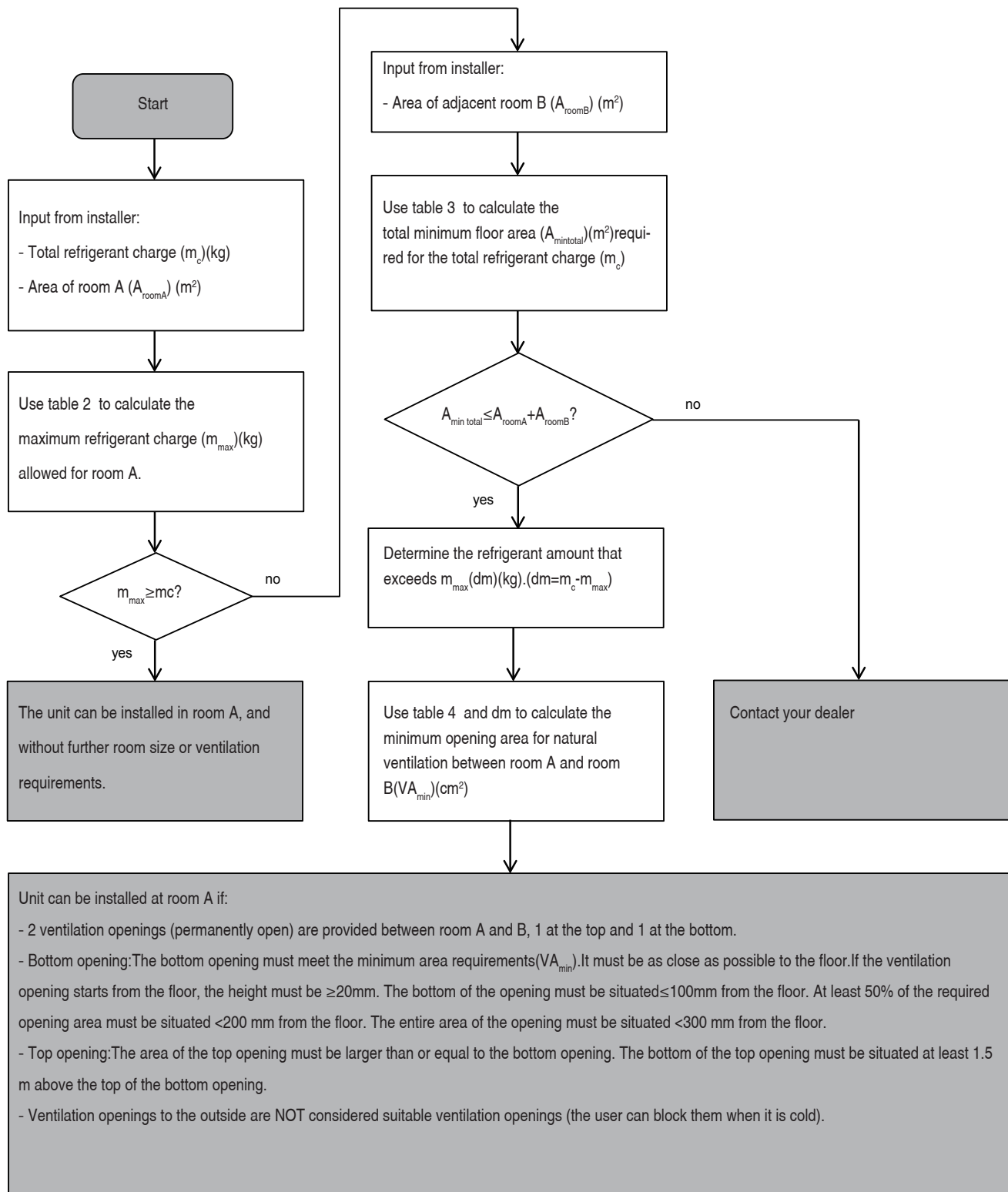
💡 NOTE

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.



The flow chart uses the following tables:

Table 2 - Maximum refrigerant charge allowed in a room based on the surface of the installation area.

A [m ²]	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 “installation height (H)” is considered to be 1800 mm to be compliant with the IEC 60335-2-40 standard: 2018 clause GG2. For intermediate A_{room} 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”.

Table 3 - Minimum floor area

mc [kg]	1.9	2	2.1	2.2	2.3	2.4	2.5
A _{min} [m ²]	4.58	4.83	5.07	5.31	5.55	5.79	6.03

NOTE

For wall-mounted models, the “installation height (H)” is considered to be 1800 mm to be compliant with the IEC 60335-2-40 standard: 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.

Table 4 - Minimum venting opening area for natural ventilation

Sub-table m _c = 1.9 kg				Sub-table m _c = 2.0 kg				Sub-table m _c = 2.1 kg				Sub-table 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

Sub-table m _c = 2.3 kg				Sub-table m _c = 2.4 kg				Sub-table 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 “installation height (H)” is considered to be 1800 mm to be compliant with the IEC 60335-2-40 standard: 2018 clause GG2.

Based on the value of m_c (total refrigerant charge 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 equivalent, at 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.

 HAZARD

- 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.

 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.



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 electrical 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 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, e.g. near the sea.
- 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.

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

If the power cable is damaged, it must be replaced by the manufacturer or the local service agent or a 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 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.

The product must be securely fastened. Use reinforcements, if necessary.

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 conditions are satisfied:

- 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.
- 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.
- Do not install the unit near the sea or in the presence of corrosive gases.

WARNING

- **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.**

Using copper wire may break the unit or cause a fire.

- **Never use a flammable spray such as hair spray, lacquer or 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, hazardous substance can leak into the groundwater and get into the food chain, damaging your health and well-being.**
- **Contact your technical support service to avoid refrigerant leakages.**

When the system is installed and operated in a small space, the concentration of refrigerant must be monitored because a refrigerant leak could lead to a decrease in oxygen and consequently, the risk of suffocation.

- **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 flooding

- **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.

- **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.



WARNING

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 minimised. 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 maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. work in confined spaces shall be avoided.

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. Make sure there is a dry powder 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 adequately ventilated before entering the system or conducting any maintenance 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

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.



NOTE

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

11) Repairing 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. Intrinsically 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 fluids are

- bubble method
- fluorescent method agents

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

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

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

14) Removal and evacuation

When you enter the refrigerant circuit to carry out repairs for any other reason, conventional procedures must be used. It is, however, important to follow best practices because flammability is a hazard. 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 atmosphere, 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 place. This operation is absolutely vital if brazing operations on the pipe-work are to take place.

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 protective 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 must be carried out prior to returning 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.

20) Transportation, marking and storage for units

- **General.** The following information is provided for units that use 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

> MAIN FEATURES:

- The hybrid heat pump family combines heat pump technology and the condensation boiler with the production of instant DHW in a single compact product.
- It is the ideal solution for replacing existing old boilers even on high temperature systems with radiators.
- The compact size, similar to that of a wall-hung boiler, makes it easier to replace without significant loss of space or the need for major restructuring work.
- By running the boiler or heat pump as the climatic conditions vary, the internal electronics optimise the output of the system by constantly operating in the most economic and efficient mode possible.
- When the heat pump is operating in heating or cooling mode, the boiler can produce domestic hot water at the same without affecting with the heat pump operation, thus maximising the comfort of both services.
- If the heat pump is partially or totally blocked, the boiler can operate independently in heating mode and produce domestic hot water.
- It consists of an external inverter unit, available with a choice of 4 different powers, associated with an indoor condensation unit with an integrated hydronic module to manage the cooling circuit.
- A highly versatile system which can operate in very cold climate conditions (external air up to -25°C).
- The split cooling circuit avoids the risk of freezing for outdoor installations in very cold climates.
- The user interface consists of a digital controller built into the indoor unit, equipped with a large display and simple setting commands.
- Wall flue gas exhaust in the cases pertaining to Italian Leg. Decree no. 102 of 4 July 2014.

> INDOOR UNIT FEATURES

- Very robust and suitable for replacements even in highly critical and resistant systems.
- Combustion module with a high modulation range (1:10) and extra-thick stainless steel heat exchanger with larger channels to maintain high efficiency even on old oxidised and soiled systems.
- M.G.R: Methane, LPG, Propane-air Ready, using a simple configuration, the outdoor unit can run on natural gas, LPG and a propane-air mixture without the use of any additional conversion kits.
- MC2: Multi Combustion Control, combustion system with patented gas-adaptive technology for improved adaptability of use to variations in the gas supply conditions (e.g. pressure fluctuations or drops).
- F.P.S: Flue gas protection system. The standard flue gas check valve offers easy connection to pressurised collective flue systems
- Particularly suited to operating in flues requiring "heavy-duty" pipes thanks to approval for operation with flue gas exhaust pipes with a diameter of 50mm.
- Can be combined with pre-heating systems for DHW.
- Installation site: also for outdoor use in partially protected areas up to -5°C as standard.
- Methane/LPG/Propane-air transformation free when checking the product and activating the warranty, to be requested from the authorised support centre.

> OUTDOOR UNIT FEATURES

- Approved for external use in completely exposed site.
- 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 sound-absorbing material to minimize vibrations and noise
- DC inverter compressor that allows to modulate the capacity from 30 to 120% of the rated capacity
- Electronic bifold 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 pre-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

Description	Component	Q.ty	
		Indoor unit 6	Indoor unit 10
Use, maintenance and installation manual (this manual)		1	1
Energy label		1	1
Brass adaptor 3/8" SAE - 1/4" SAE		1	-
Wall fastening bracket	-	1	1
Boiler condensate drainage siphon and pipe	-	1	1

2.3 User interface

The user interface consists of a controller integrated into the indoor unit with a multilanguage menu (IT Italian, EN English, ES Spanish, FR French, NL Dutch, Polish PL, Romanian RO, EL Greco, Albanian SQ, Serbian SR) which allows the management of:

- **HEATING AND COOLING** 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.
- **HEATING WITH BOILER.** It can be activated in integration or replacement of the heat pump based on the set parameters. The board will also activate the boiler if the heat pump does not work.
- **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 (e.g. 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 HOURLY PROGRAMMING.** This allows differentiated hourly programming for each day of the week, defining the mode (COOL/WARM/DHW) and operating setpoints for each time slot.
- **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 boiler.
- **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.
- **SMART GRID INPUT.** The unit is equipped with 1 digital contact to manage an input from the electricity grid. Working logic:
 - If the smart grid input is closed, the unit functions 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.**

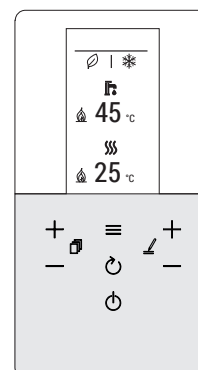


fig. 2 - user interface

2.4 Accessories

2.4.1 Hydraulic kit

The hydraulic kit is available on request (code 012099X0 consisting of a gas tap, water inlet tap, pipes and fittings) for the hydraulic connection of the wall-mounted indoor unit.

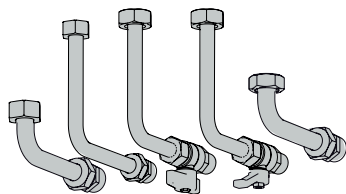


fig. 3 - Hydraulic kit

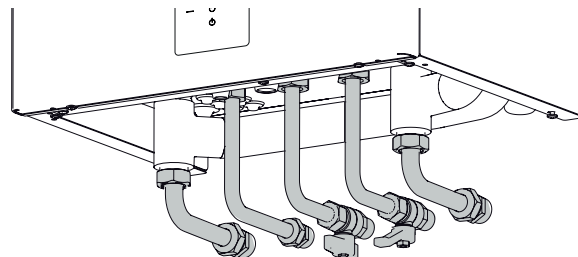


fig. 4 - Assembled hydraulic kit

2.4.2 Fittings cover kit

The fittings cover kit is available on request (code 016009X0) to add an aesthetic cover of the wall hydraulic connections. The kit consists of a galvanised metal panel in the same colour as the unit, to be fastened with 4 screws under the indoor unit

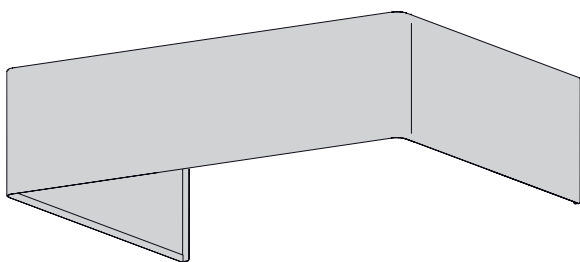


fig. 5 - Fittings cover kit

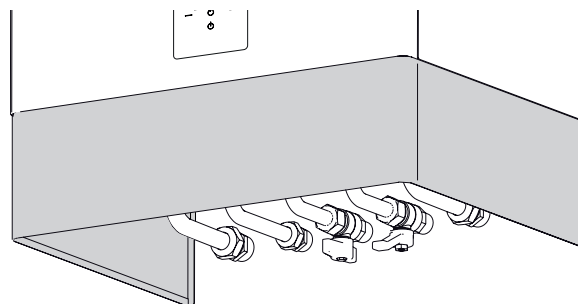


fig. 6 - Fittings cover kit assembled

 Fittings cover kit accessory

3. TECHNICAL DATA AN PERFORMANCE

3.1 Heat pump technical data

-	Models		4	6	8	10	UM
A7W35	Thermal power	nom	4.20	6.35	8.40	10.0	kW
	Power absorbed	nom	0.82	1.28	1.63	2.02	kW
	COP		5.10	4.95	5.15	4.95	W/W
	Water flow rate		722	1092	1445	1720	l/h
	External static pressure		81	76	61	47	kPa
A7W45	Heating capacity	nom	4.30	6.30	8.30	10.0	kW
	Power absorbed	nom	1.13	1.70	2.16	2.67	kW
	COP		3.80	3.70	3.85	3.75	W/W
	Water flow rate		740	1084	1428	1720	l/h
	External static pressure		81	76	62	47	kPa
A7W55	Heating capacity	nom	4.40	6.00	7.50	9.50	kW
	Power absorbed	nom	1.49	2.03	2.36	3.06	kW
	COP		2.95	2.95	3.18	3.10	W/W
	Water flow rate		473	645	806	1021	l/h
	External static pressure		83	81	80	77	kPa
A35W18	Cooling capacity	nom	4.50	6.50	8.30	9.90	kW
	Power absorbed	nom	0.82	1.35	1.64	2.18	kW
	EER		5.50	4.80	5.05	4.55	W/W
	Water flow rate		774	1118	1428	1703	l/h
	External static pressure		80	75	62	48	kPa
A35W7	Cooling capacity	nom	4.70	6.50	7.45	8.20	kW
	Water flow rate	nom	1.36	2.17	2.22	2.52	kW
	EER		3.45	3.00	3.35	3.25	W/W
	Water flow rate		808	1118	1281	1410	l/h
	External static pressure		80	75	68	63	kPa

The values refer to a unit without any optionals or 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. / system: water in 30°C out 35°C

A7W45 = source: air in 7°C d.b. 6°C w.b. / system: water in 40°C out 45°C

A7W55 = source: air in 7°C d.b. 6°C w.b. / system: water in 47°C out 55°C

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

A35W7 = source: air in 35°C d.b. / system: water in 12°C out 7°C

Outdoor unit technical data		4	6	8	10	UM
Power supply		220/240-1-50				V-ph-Hz
Type of compressor		Twin Rotary DC				-
No. compressors / No. refrigeration circuits		1 / 1				no.
Exchanger type		finned coil				-
Fan type		DC axial				-
No. of fans		1				no.
Refrigerant fittings / liquid line		1/4" SAE / Ø 6.35		3/8" SAE / Ø 9.52		-
Refrigerant fittings / gas line		5/8" SAE / Ø 15.88				-
Type of refrigerant		R32				type
GWP		675				kg-CO ₂ eq.
Factory refrigerant charge *		1.5 / 1.01		1.65 / 1.11		kg / t-CO ₂ eq.
Refrigeration lines (max length / max vertical height difference)		30 / 20				m
SWL - Sound power level in heating **	A7W35	55	57	59	60	dB(A)
	A7W55	56	58	59	60	dB(A)
	Max	60	61	61	62	dB(A)
	Sil. 1	56	56	57	58	dB(A)
	Sil. 2	53	53	55	55	dB(A)
SWL - Sound power level in cooling *	A35W18	56	58	59	60	dB(A)
	A35W7	56	58	59	60	dB(A)
	Max	60	61	61	62	dB(A)
	Sil. 1	55	57	57	58	dB(A)
	Sil. 2	52	54	54	54	dB(A)
Maximum input current		12	14	16	17	A
Net weight		58		77		kg
Weight of packaged unit		65		94		kg

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

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

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

A7W55 = source: air in 7°C d.b. 6°C w.b. / system: water in 47°C out 55°C.

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

A35W7 = source: air in 35°C d.b. / system: water in 12°C out 7°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) is measured in accordance with standard ISO 9614.

Indoor unit technical data	06 / 10				UM
Power supply	220/240-1-50				V-ph-Hz
Exchanger type	Brazed stainless steel plate type				-
Type of pump	Electronic circulator (8 mca)				-
System expansion tank volume	10				l
System water safety valve calibration	3				bar
System hydraulic fittings	3/4" GAS M				-
DHW hydraulic fittings	1/2" GAS M				-
Refrigerant fittings / liquid line ***	3/8" SAE / Ø 9.52				-
Refrigerant fittings / gas line	5/8" SAE / Ø 15.88				-
Minimum system water content	15				l
System temperature (min-max)	5 - 65				°C
System pressure (min-max)	1 - 3				bar
SWL - Sound power level indoor unit	39	39	39	39	dB(A)
Max absorbed current	1				A
Net weight	43				kg
Weight when working ****	45				kg
Weight of packaged unit	45				kg

*** For matching with external units mod. 4-6, an adapter from 3/8" SAE to 1/4" SAE is supplied for the liquid line Ø 6.35.

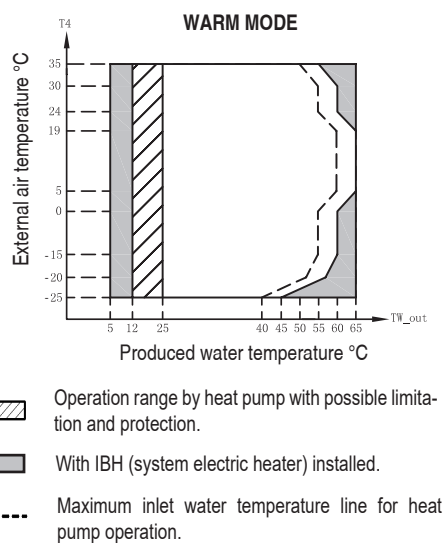
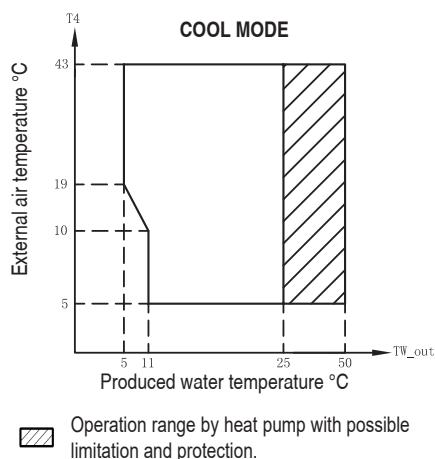
**** Weight refers to basic unit without accessories

3.2 ERP data

Model		4	6	8	10	UM
Efficiency class in heating	low temperature (produced water 35°C)	187	191	200	201	ηs (%)
		A+++				class
	average temperature (produced water 55°C)	128	137	131	136	ηs (%)
		A++				class
SEER	produced water 7°C	4.99	5.34	5.83	5.98	W/W
	produced water 18°C	7.77	8.21	8.95	8.78	W/W

NOTE: Efficiency class calculated according to the European regulation 811/2013. The values refer to a unit without any optionals or accessories.

3.3 Heat pump operational limits



3.4 Boiler technical data

3.4.1 Table for boiler technical data

DESTINATION COUNTRIES	IT DE ES BG RO PL GR		
GAS CATEGORY	II2HM3+ (IT) II2E3B/P (DE) II2H3+ (ES) II2H3B/P (BG) II2H3B/P (RO)		
	II2H3+ (GR) II2ELwLs3B/P (PL) II2H3B/P (AT)		
PRODUCT IDENTIFICATION CODES	0T4B4AWA		
Max. heating capacity	kW	24,5	Qn
Min. heating capacity	kW	2,9	Qn
Max. heat output in heating (80/60°C)	kW	24	Pn
Min. heat output in heating (80/60°C)	kW	2,8	Pn
Max. heat output in heating (50/30°C)	kW	26	Pn
Min. heat output in heating (50/30°C)	kW	3,1	Pn
Max. heating capacity in DHW	kW	28,5	Qnw
Min. heating capacity in DHW	kW	3,2	Qnw
Max. heat output in DHW	kW	28	
Min. heat output in DHW	kW	2,8	
Efficiency Pmax (80-60°C)	%	98,1	
Efficiency Pmin (80-60°C)	%	98	
Efficiency Pmax (50-30°C)	%	106,1	
Efficiency Pmin (50-30°C)	%	107,5	
Efficiency 30%	%	109,7	
Flue loss with burner ON (80/60) - Pmax / Pmin	%	1,92 / 1,71	
Shell loss with burner ON (80/60) - Pmax / Pmin	%	0,39 / 2,36	
Flue loss with burner ON (50/30) - Pmax / Pmin	%	1,11 / 0,74	
Shell loss with burner ON (50/30) Pmax / Pmin	%	0,34 / 1,05	
Flue loss with burner OFF (50K / 20K)	%	0,02 / 0,01	
Shell loss with burner OFF (50K / 20K)	%	0,15 / 0,06	
Flue gas temperature (80/60 °C) - Pmax / Pmin	%	66 / 58	
Flue gas temperature (50/30 °C) - Pmax / Pmin	%	51 / 43	
Flue gas flow rate - Pmax / Pmin	%	11,1 / 1,6	
Gas supply pressure G20	mbar	20	
Gas nozzle G20	m3/h	5,6	
Gas flow rate G20 - Max / min	m3/h	3,02 / 0,37	
CO2 - G20	%	9±0,8	
Gas supply pressure G31	mbar	37	
Gas nozzle G31	kg/h	5,6	
Gas flow rate G31 - Max / min	kg/h	2,21 / 0,27	
CO2 - G31	%	10 ±0,8	
NOx emissions class	-	6 (< 56 mg/kWh)	NOx
Max. working pressure in heating	bar	3	PMS
Min. working pressure in heating	bar	0,8	
Heating max. adjustment temperature	°C	95	tmax
Heating water content	liters	2,9	
Heating expansion vessel capacity	liters	8	
Heating expansion vessel precharge pressure	bar	0,8	
Max. working pressure in DHW	bar	9	PMW
Min. working pressure in DHW	bar	,3	
DHW flow rate Δt 25°C	l/min	16,1	
DHW flow rate Δt 30°C	l/min	13,4	D
DHW content	liters	,3	H2O
Protection rating	IP	IPX4D	
Power supply voltage	V/Hz	230V~50HZ	
Electrical power input	W	82	W
Empty weight	kg	28,4	
Type of unit	C(10)3-C(11)3-C13-C23-C33-C43-C53-C63-C83-C93-B23-B33		
Flue installation pressure C ₍₁₀₎₃ -C ₍₁₁₎₃	Pa	89	

If not otherwise indicated, the values are calculated using G20 fuel

3.4.2 Boiler ErP product data sheet

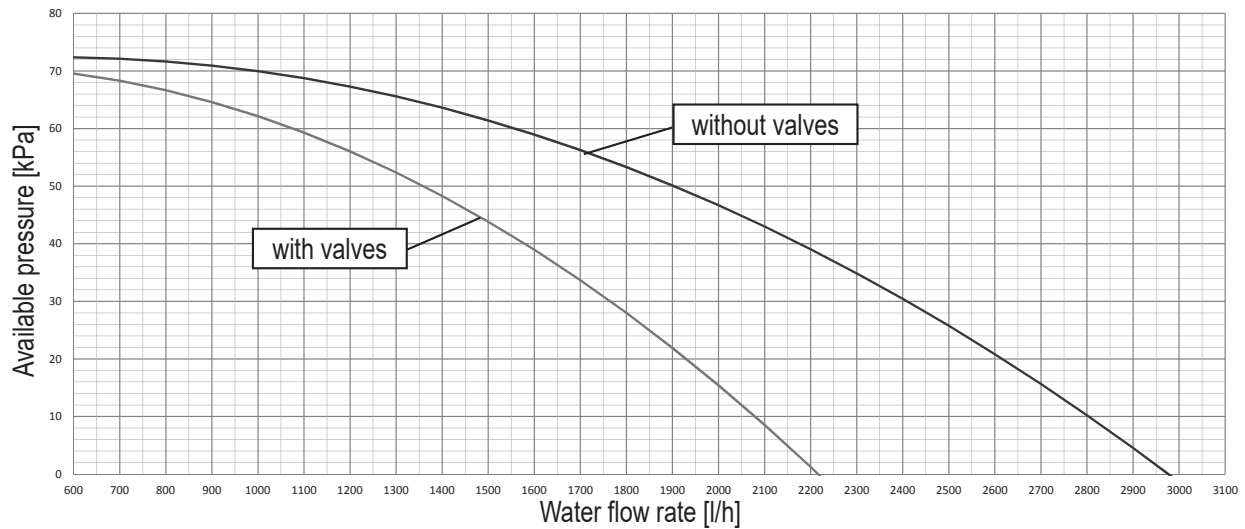
Condensing boiler: YES			
Low-temperature boiler (**): YES			
B1 Boiler: NO			
Combination heater: YES			
Cogeneration space heater: NO			
Item	Symbol	Unit	Value
Seasonal space heating energy efficiency class (from A+++ to D)			
Seasonal space heating energy efficiency class (from A+++ to D)			A
Rated heat output	P _n	kW	24
Seasonal space heating energy efficiency	η_s	%	94
Useful heat output			
Useful heat output at rated heat output and high-temperature regime (*)	P ₄	kW	24,0
Useful heat output at 30% of rated heat output and low-temperature regime (**)	P ₁	kW	4,5
Useful efficiency			
Useful efficiency at rated heat output and high-temperature regime (*)	η_4	%	88,3
Useful efficiency at 30% of rated heat output and low-temperature regime (**)	η_1	%	98,8
Auxiliary electricity consumption			
At full load	el _{max}	kW	0,028
At part load	el _{min}	kW	0,011
In standby mode	PSB	kW	0,003
Other items			
Standby heat loss	P _{stby}	kW	0,042
Ignition burner power consumption	P _{ign}	kW	0,000
Annual energy consumption	Q _{HE}	GJ	44
Sound power level	L _{WA}	dB	48
Emissions of nitrogen oxides	NO _x	mg/kWh	39
For combination heaters			
Declared load profile			XL
Water heating energy efficiency class (from A+ to F)			A
Daily electricity consumption	Q _{elec}	kWh	0,148
Annual electricity consumption	AEC	kWh	32
Water heating energy efficiency	η_{wh}	%	87
Daily fuel consumption	Q _{fuel}	kWh	20,220
Annual fuel consumption	AFC	GJ	17

(*) High-temperature regime means 60°C return temperature at heater inlet and 80°C feed temperature at heater outlet.

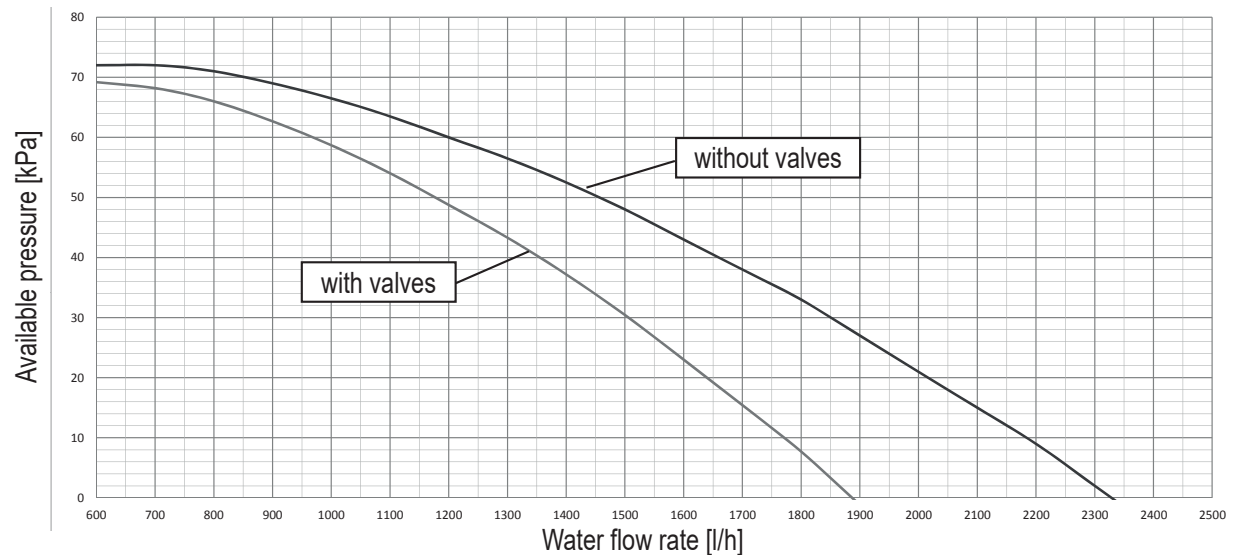
(**) Low temperature means for condensing boilers 30°C, for low-temperature boilers 37°C and for other heaters 50°C return temperature (at heater inlet).

3.5 Available pressure

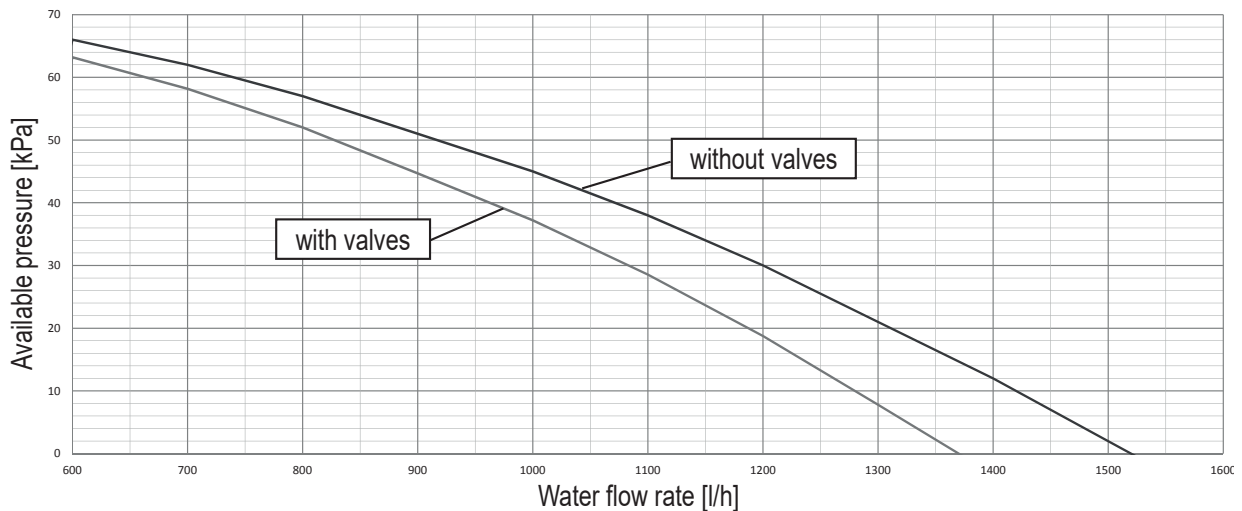
3.5.1 Heat pump circulator + boiler circulator



3.5.2 Heat pump circulator



3.5.3 Boiler circulator



NOTE

For the correct operation of the system, a hydraulic bypass must be provided on the system capable of ensuring sufficient water circulation to avoid the blocking of the heat pump due to lack of water flow alarm. This is, for example, essential if the system includes zone valves or thermostatic valves which, if they go into partial or complete closure, would result in a reduction / lack of water flow with consequent water flow switch alarm and therefore the blocking the heat pump.

4. DIMENSIONAL AND PHYSICAL DATA

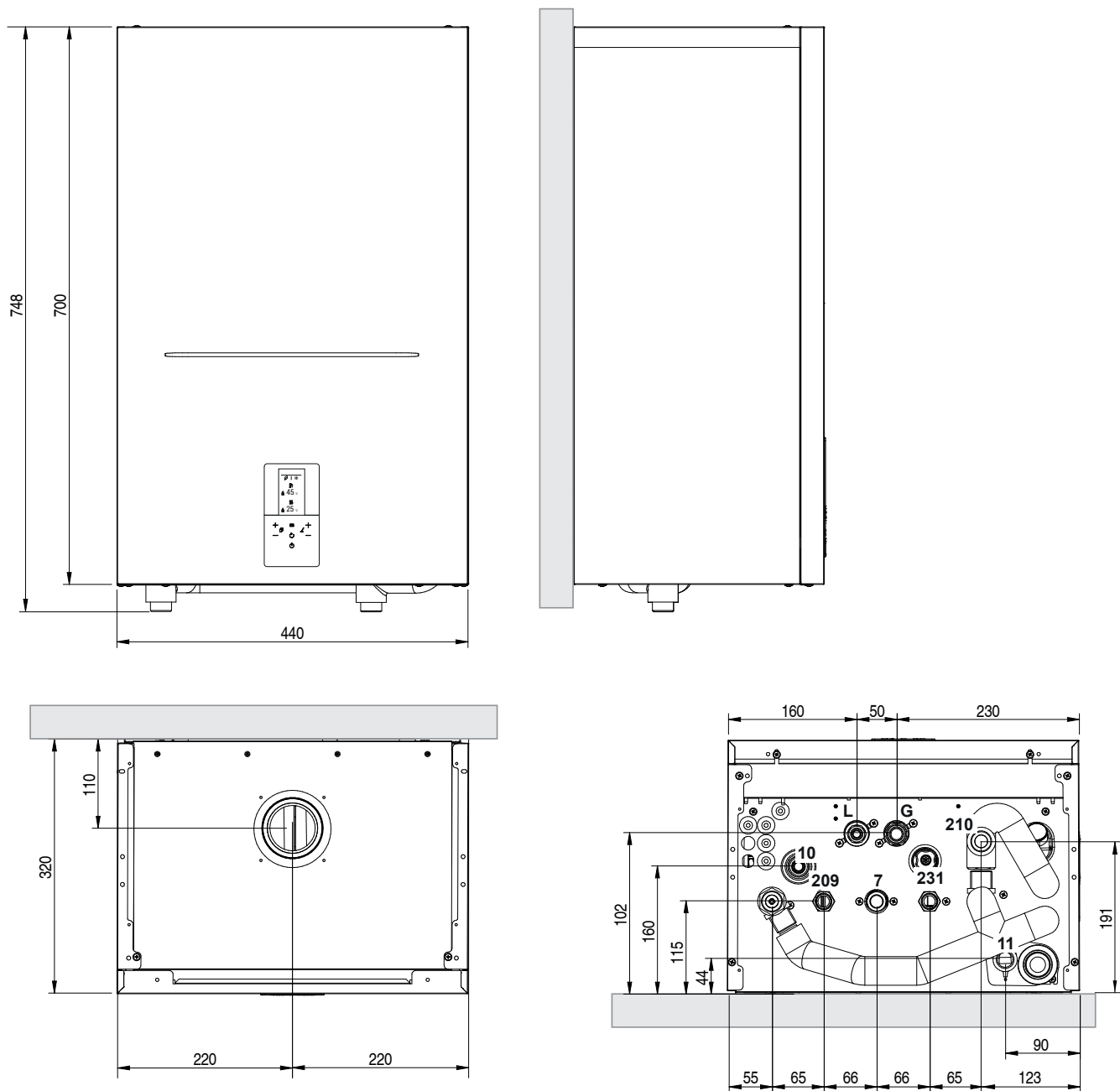


fig. 7 - dimensional data and connections

- 7 Gas inlet - Ø 3/4" M
- 8 DHW outlet - Ø 1/2" M
- 9 DHW inlet - Ø 1/2" M
- 10 System delivery - Ø 3/4" M
- 11 System return - Ø 3/4" M
- 14 Safety valve and system drain

- 74 System filling tap
- A6 Condensate drain connection
- G Gas line - Ø 15.88 (5/8")
- L* Liquid line - Ø 9.52 (3/8")

* For combination with outdoor units mod. 4-6, an adapter from 3/8" SAE to 1/4" SAE is supplied for the liquid line Ø 6.35.

5. GENERAL VIEW AND INTERNAL UNIT FUNCTIONAL DIAGRAM

5.1 General view

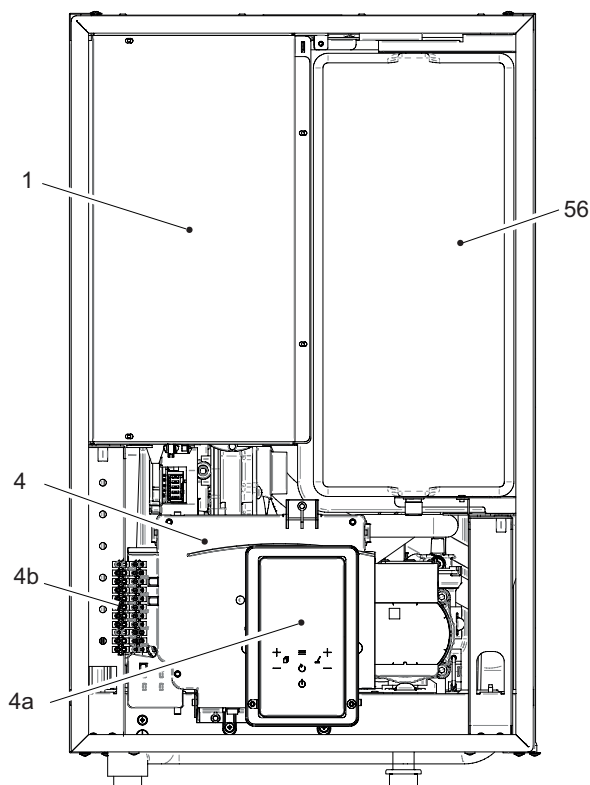


fig. 8 - View without front panel

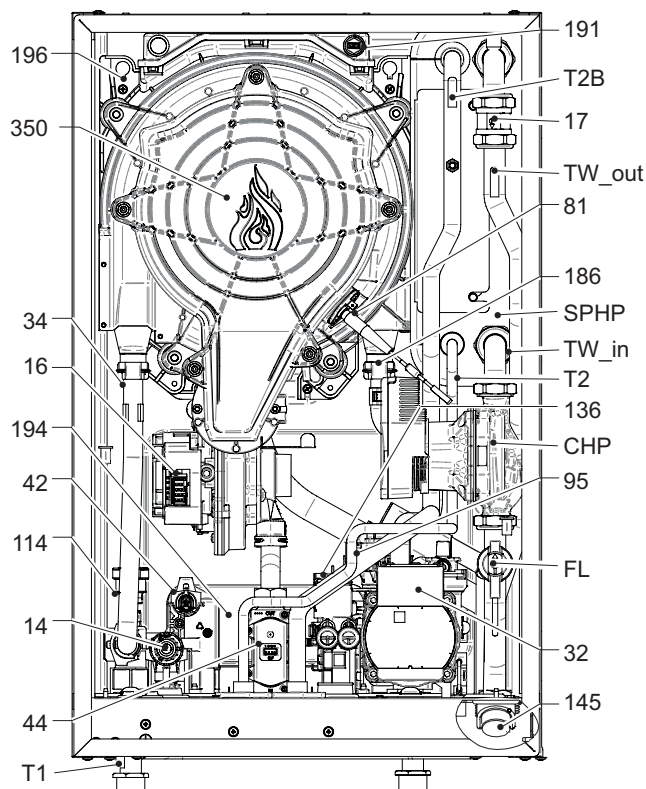


fig. 9 - General view

5.2 Indoor unit functional diagram

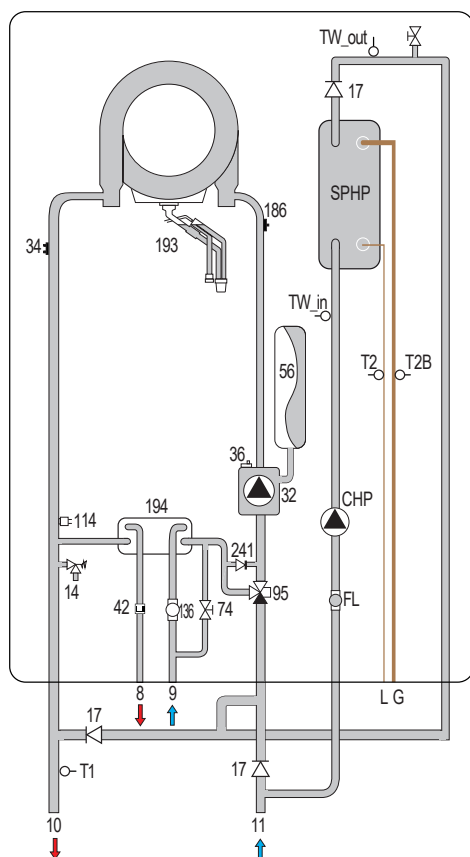
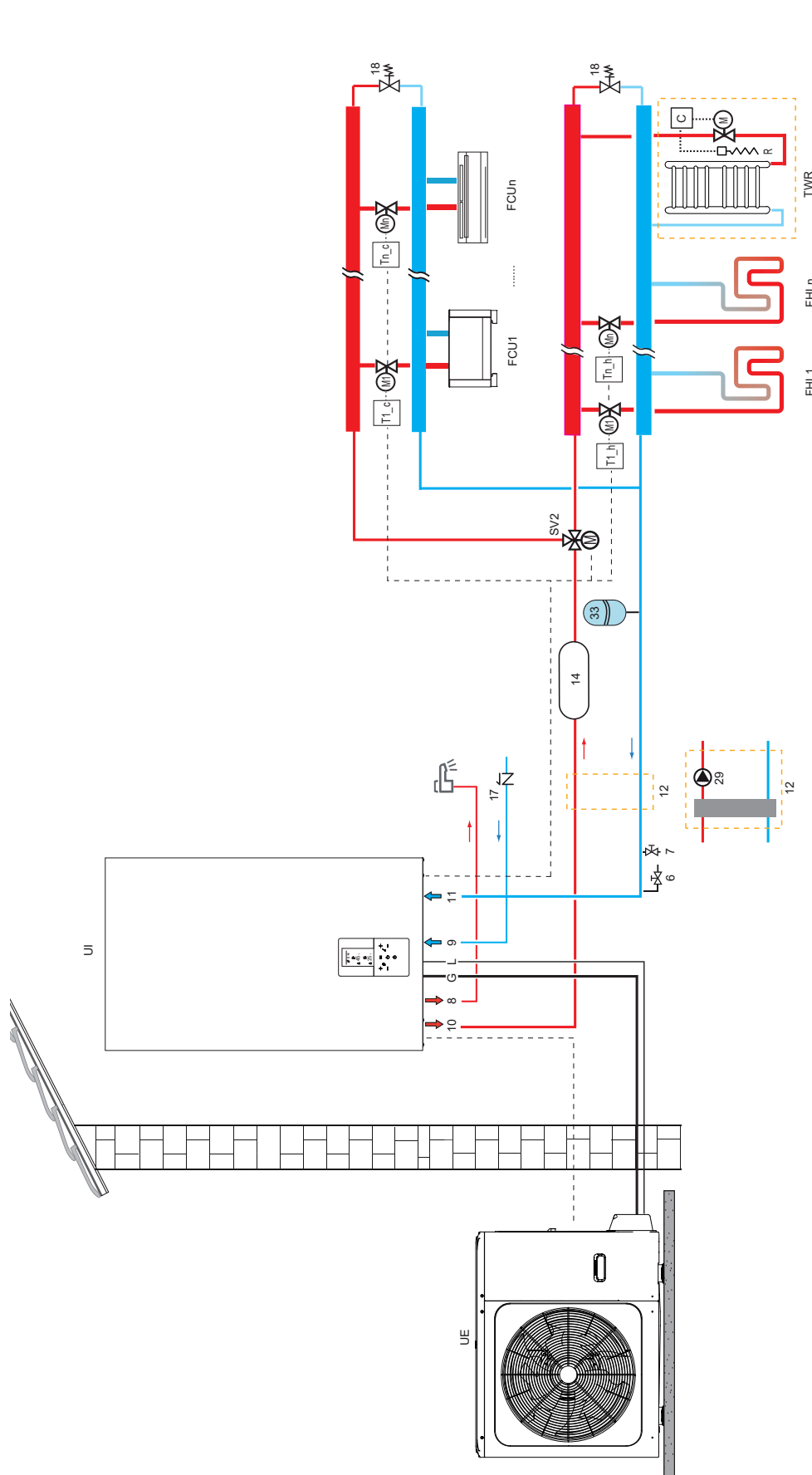


fig. 10 - Indoor unit hydraulic diagram

LEGEND

- | | | | |
|-----|----------------------------------|--------|--|
| 1 | Heat pump electrical box | 145 | Hydrometer |
| 4 | Boiler electric box | 186 | Boiler outlet temperature probe |
| 4a | Boiler controller | 191 | Fume temperature sensor |
| 4b | User terminal block | 193 | Boiler siphon |
| 8 | DHW water outlet | 194 | DHW plate exchanger |
| 9 | DHW water inlet | 196 | Condensate tray |
| 10 | System delivery | 241 | Automatic bypass (inside the boiler circulator unit) |
| 11 | System return | 350 | Burner/fan unit |
| 14 | Safety valve | CHP | Heat pump circulator |
| 16 | Fan | FL | Heat pump flow switch |
| 17 | Non-return valve | G | Refrigerant gas line |
| 32 | Boiler circulator | L | Refrigerant liquid line |
| 34 | Boiler outlet temperature probe | SPHP | Heat pump plate exchanger |
| 36 | Automatic air vent | T1 | Indoor unit outlet water temperature probe |
| 42 | DHW temperature probe | T2 | Heat pump liquid refrigerant temperature probe |
| 44 | Gas valve | T2B | Heat pump liquid refrigerant temperature probe |
| 56 | Expansion vessel | TW_in | Plate heat exchanger water inlet temperature probe |
| 74 | System filling tap | TW_out | Plate heat exchanger water outlet temperature probe |
| 81 | Ignition/ionization electrode | | |
| 95 | Boiler diverter valve | | |
| 114 | System water pressure transducer | | |
| 136 | Boiler flow meter | | |

6. EXAMPLE OF SYSTEM LAYOUT



> KEY

- 6 Water drain Valve (not supplied)
- 7 Water fill Valve (not supplied)
- 8 Plant outlet
- 9 DHW outlet
- 10 DHW inlet
- 11 Plant inlet
- 12 Hydraulic separator and booster pump (not supplied), assess the need to install in the event of high water load losses in the system.
- 14 Plant water inertial tank (not supplied)
- 17 Check valve (not supplied)
- 18 Bypass valve (not supplied)
- 33 System expansion vessel (not supplied)
- FCU 1 ... n Fan coil units: they can be used for cooling only with

FHL 1...n

G

L

P_o

SV2

T1_c - T1_h

TWR

heating without radiant floor or for cooling and or for cooling and heating without radiant floor

Radiant floor / radiator only heating in zones

Gas Line

Liquid Line

External pump (not supplied), assess the need to install based on the system water load loss,

controlled by the heat pump.

Three-way valve for heating / cooling zone (not supplied)

Cooling request room thermostat (not supplied)

Heating request room thermostat (not supplied)

Heated lower rail integration in bathroom: if connected to the heating system, it must be integrated with an electric heating element

(R) controlled by the command (C) which simultaneously closes the valve (M); if not connected to the heating system, only the

valve (M); if not connected to the heating system, only the

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pled

UI

UE

electrical heating element (R) controlled by the command (C) is sup-

plied

Internal unit

External unit

Electrical connections

NOTE

For the correct operation of the system, a hydraulic bypass must be provided on the system capable of ensuring sufficient water circulation to avoid the blocking of the heat pump due to lack of water flow alarm.

This is, for example, essential if the system includes zone valves or thermostatic valves which, if they go into partial or complete closure, would result in a reduction / lack of water flow with consequent water flow switch alarm and therefore the blocking of the heat pump.

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 abandon 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.

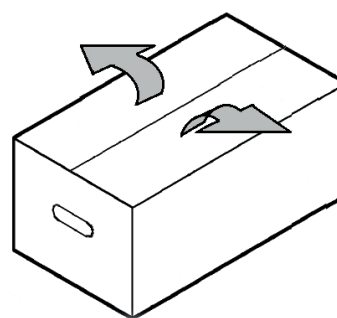


fig. 11 -

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.

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.

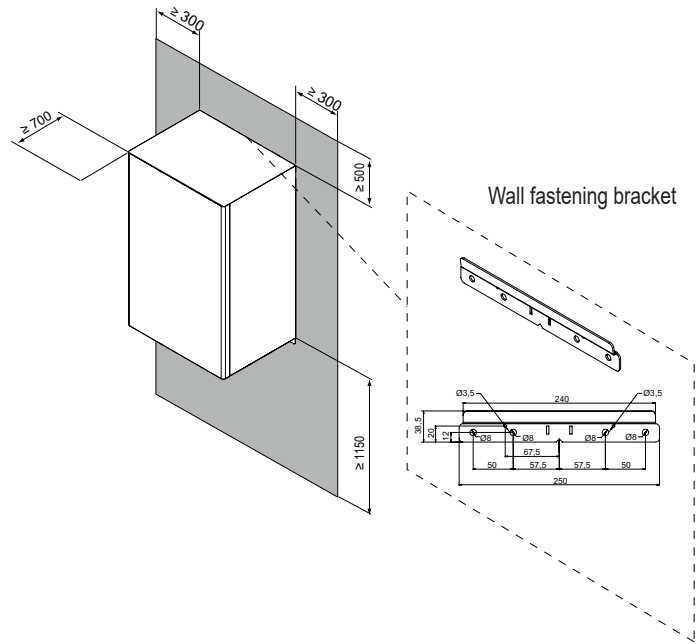
- Select an installation site where the following conditions are satisfied and one that meets with your customer's approval.
 - Places that are well-ventilated.
 - Safe places which can bear the unit's weight and vibration and where the unit can be installed at an even level.
 - Places where there is 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 far as possible.
 - Do not install the unit in places often used as a work space. The unit must be covered in the event of construction work (e.g. grinding, etc.) where a lot of dust is created.
 - 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.
 - Do not install the unit near the sea or in the presence of corrosive gases.

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

- Place that allows the maximum lengths allowed for pipes to be respected, connections to the temperature probe unit, 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.



 CAUTION

- 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. 12.
- The space around the unit allows for sufficient air circulation.
- There is a provision for pressure relief valve blow-off.

 CAUTION

- 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 Limits to the length and height 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.

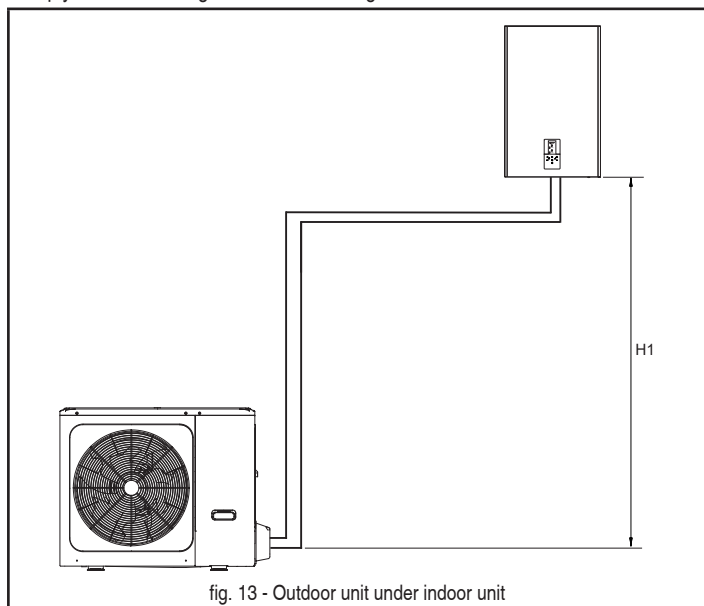


fig. 13 - Outdoor unit under indoor unit

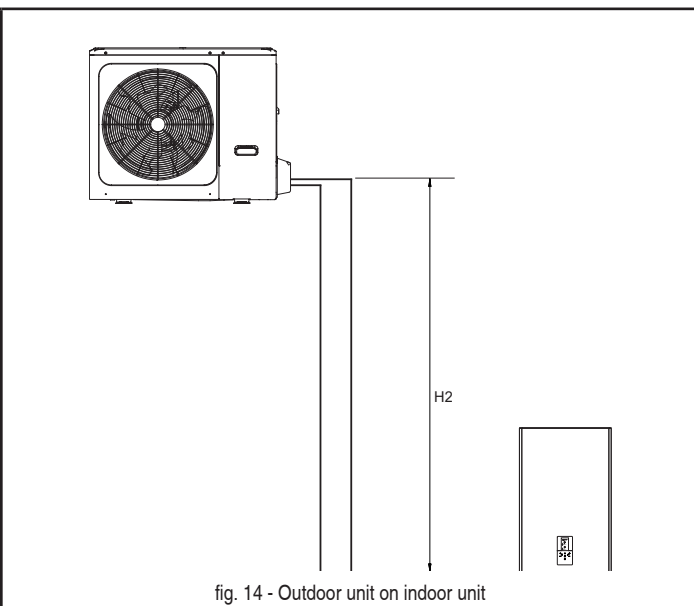


fig. 14 - Outdoor unit on indoor unit

Outdoor unit	4	6	8	10	UM
Liquid refrigerant connection	1/4"	1/4"	3/8"	3/8"	SAE
Refrigerant gas connection	5/8"	5/8"	5/8"	5/8"	SAE
Standard refrigerant load (R32)	1.5	1.5	1.65	1.65	kg

Indoor unit	6 - 10				UM
Liquid refrigerant connection	3/8" ⁽¹⁾	3/8" ⁽¹⁾	3/8"	3/8"	SAE
Refrigerant gas connection	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.

Refrigeration connections	4	6	8	10	UM
Liquid refrigerant pipe (external diameter)	6.35	6.35	9.52	9.52	mm
Gas refrigerant pipe (external diameter)	15.88	15.88	15.88	15.88	mm
Maximum length of pipe with standard refrigerant load	15	15	15	15	m
Refrigerant load for each metre in length over 15 m	20	20	38	38	g/m
Maximum length between the indoor and outdoor unit	30	30	30	30	m
Maximum height difference (H1)	20	20	20	20	m
Maximum height difference (H2)	20	20	20	20	m

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

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 all 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 [4.3 MPa (43 bar) for R32] should be used in the airtightness 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.

7.3 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 connecting 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 and G "fig. 7 - dimensional data and connections" on page 24).
- Tighten the union by hand and then torque it with the aid of an adequate wrench.

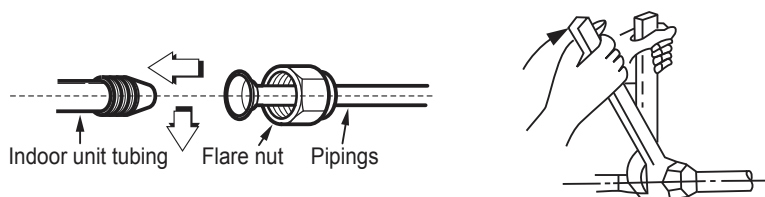


fig. 15 -

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.

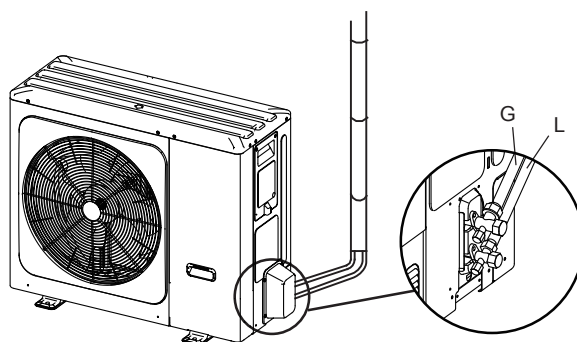


fig. 16 -

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.

Ext. diameter	Torque tightening (Nm)	Additional torque tightening (Nm)
Ø 6.35	15	16
Ø 9.52	25	26
Ø 15.88	45	47

CAUTION

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

7.3.1 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. 17) and the coupling (part 2 - fig. 17) of the gas valve (the larger one)
- Connect the service valve to a pressure gauge unit plus an oxygen-free nitrogen (OFN) bottle.
- Pressurise the system to a maximum 43 bar (44kg/cm²).
- 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.

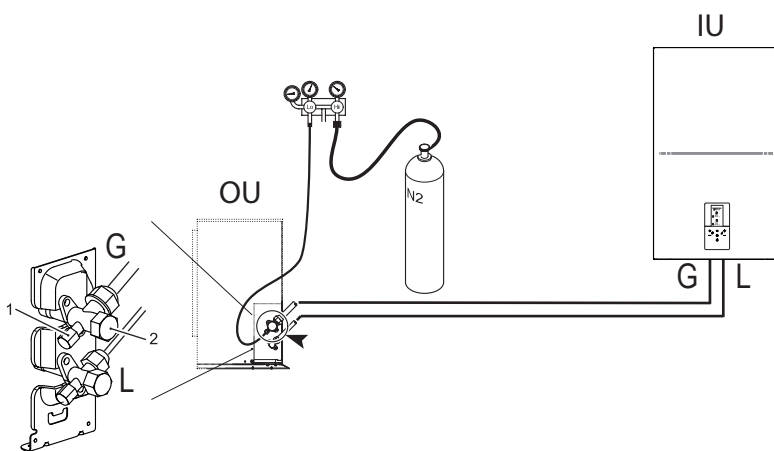


fig. 17 - Airtight test and leakage detection

7.3.2 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.

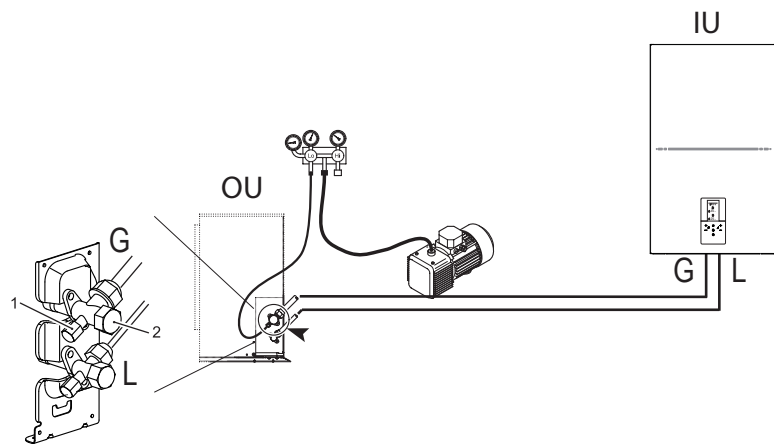


fig. 18 - Air purge with vacuum pump

NOTE

OU = Outdoor unit
IU = Indoor unit

7.3.3 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 pipe on the gas side should use closed cell foam insulation material, with B1 glass fire-retardant and heat resistance over 120 °C.
- 2) When the external diameter of the copper pipe $\leq \Phi 12.7$ mm, the thickness of the insulating layer at least greater than 15mm; When the external diameter of the copper pipe $\geq \Phi 15.9$ mm, the thickness of the insulating layer at least greater than 20mm.
- 3) Use heat-insulating materials to do the heat insulation without leaving any parts uninsulated.

7.3.4 Refrigerant amount to be added

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

If the length of the pipe on the liquid side is less than 15 metres, there is no need to add more refrigerant.

	System model	Total length of liquid pipe L (m)	
		≤ 15 m	> 15 m
Refrigerant amount to be added	4/6	0g	(L-15)×20g
	8/10	0g	(L-15)×38g

7.4 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

For the correct operation of the system, a hydraulic bypass must be provided on the system capable of ensuring sufficient water circulation to avoid the blocking of the heat pump due to lack of water flow alarm.

This is, for example, essential if the system includes zone valves or thermostatic valves which, if they go into partial or complete closure, would result in a reduction / lack of water flow with consequent water flow switch alarm and therefore the blocking the heat pump.

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.

Since the fittings of the indoor unit are brass and brass is a material that deforms easily, use suitable tools to connect the hydraulic circuit. Unsuitable tools may damage the pipes.

Make the connections to the respective points (see "fig. 7 - dimensional data and connections" on page 24) and to the symbols given on the unit.

7.4.1 Antifreeze system, antifreeze fluids, additives and inhibitors

If necessary, the use of antifreeze fluids, additives and inhibitors is allowed on if the manufacturer of these liquids or additives provides a guarantee that states that the products are suitable for the use and will not damage the boiler heat exchanger or other components and/or materials of the boiler/heat pump and system. The use of generic antifreeze fluids, additives and inhibitors is forbidden which are not expressly suited to use in heating systems and compatible with the materials of the boiler/heat pump and system.

7.4.2 Characteristics of the system water



The hybrid heat pumps are suitable for installation in heating systems with no significant oxygen ingress (ref. "Case I" systems EN14868 standard). In systems with continuous oxygen ingress (e.g. underfloor systems without de-aeration pipes or open expansion vessel), or intermittent oxygen ingress (less than 20% of the system water content), a physical separator must be installed (e.g. a plate heat exchanger).

The water in a heating system must comply with the laws and regulations in force, with the characteristics laid down by the UNI 8065 standard and the indications of the EN14868 standard (protection of metallic materials against corrosion) must be observed.

The filling water (initial filling and subsequent top-ups) must be clear, with a hardness of less than 15°F and treated with chemical conditioners recognised as suitable to ensure that no build-ups, corrosion or attacks on metallic and plastic materials are triggered, that gases do not develop and bacterial or microbial colonies do not proliferate in low temperature systems.

Only use conditioners, additives, inhibitors and antifreeze liquids declared by the producer to be 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 system.

The chemical conditioners must ensure complete deoxygenation of the water, they must contain specific protective properties for yellow metals (copper and copper alloys), anti-scaling agents for limescale, neutral PH stabilisers 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

The appliance features an antifreeze system which activates the heat pump in heating mode when the system supply water temperature drops below 4 °C. The device is not activated if the electric and/or gas supply to the appliance is removed. If necessary, use a suitable antifreeze to protect the system which complies with the same requirements indicated previously in line with the UNI 8065 standard.

If adequate chemical-physical treatments of both system and input water and frequent scheduled checks are carried that can ensure the required parameters, for industrial process applications only, installation of the product in open vessel systems is allowed with a hydrostatic pressure height of the vessel that ensures compliance with the minimum operating pressure indicated in the product technical specifications.

The presence of deposits on the exchange surface of the indoor unit caused by the failure to comply with the above-mentioned provisions will result in the warranty being voided.

7.4.3 Water filter

It is mandatory to install a water filter on the unit input.

The unit is supplied as standard with two perpendicular taps. The valve with the blue handle has a filter (which can be removed by unscrewing the rear coupling) and acts, therefore, as a shut-off valve and water filter; this valve should be installed on the system return connection (see detail 11 "fig. 7 - dimensional data and connections" on page 24). The valve with the red handle should be installed on the system delivery connection (see detail 10 "fig. 7 - dimensional data and connections" on page 24).



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.

7.4.4 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 unit 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 pipes.

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.

7.4.5 Filling with water

1. Connect the water supply to the relevant connection (see detail 9 "fig. 7 - dimensional data and connections" on page 24) and open the valve.
2. Make sure that the automatic vent valve is open.
3. Fill with water until the manometer indicates a pressure of approximately 2.0 bar. Use the vent valve to remove the air in the circuit.



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 pipes.

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.

7.4.6 Water circuit anti-freeze protection

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.



CAUTION

When the unit is not in use for a long period, make sure that the unit is always switched on. If you want to disconnect the power supply, the water in the indoor unit must be drained to prevent damage to the pump and pipes from freezing temperatures.

- 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.

7.4.7 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.

7.5 Boiler gas connection

CAUTION

Before making the connection, check that the appliance is pre-configured for operating with the type of gas available.

The gas connection must be made to the relevant fitting (see “fig. 7 - dimensional data and connections” on page 24) in compliance with the regulation in force, with a rigid metal pipe or a flexible stainless steel hose pipe, with a gas tap placed between the system and the boiler. Check that all the gas connections are tight. If not, there may be a risk of fire, explosion or asphyxiation .

7.6 Boiler fume ducts

WARNING

THE BOILERS MUST BE INSTALLED IN ROOMS WHICH FULFIL THE BASIC AERATION REQUIREMENTS. IF NOT, THERE IS A RISK OF ASPHYXIATION OR INTOXICATION.

READ THE INSTALLATION AND MAINTENANCE INSTRUCTIONS BEFORE INSTALLING THE APPLIANCE.

OBSERVE THE DESIGN INSTRUCTIONS AS WELL.

IF THERE ARE PRESSURES IN THE FUME DISCHARGE PIPES OVER 200 Pa, CLASS “H1” FLUES MUST BE USED.

7.6.1 Warnings

The appliance is a “type C” with a sealed chamber and forced draft; the air inlet and smoke outlet must, therefore, be connected to one of the evacuation/extractor systems indicated below. Before installation, check and strictly comply with the relevant provisions. Also respect the provisions on the positioning of the wall and/or roof terminals and the minimum distances from windows, walls, ventilation openings, etc.

In the case of installation with maximum resistance (coaxial or separate chimney), we recommend calibration [AUTO SETUP] to optimise boiler combustion.

7.6.2 Connection with coaxial pipes

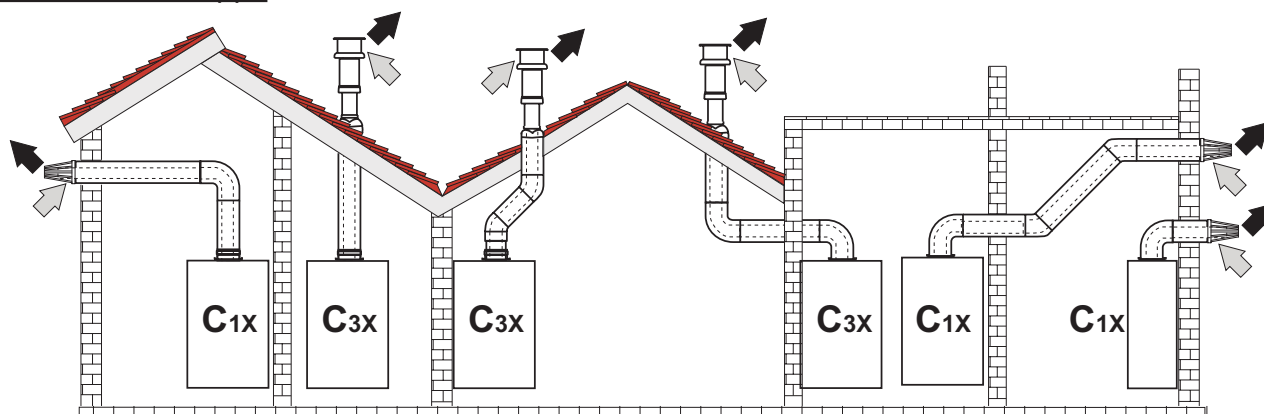


fig. 19 - Example of connection with coaxial pipes (➡ = Air / ➡ = Fumes)

Install one of the following starter accessories on the device for the coaxial connection. Refer to the figure on the cover for the position of the holes on the wall. Any horizontal fume discharge sections must be slightly inclined towards the boiler to prevent any condensation from flowing outwards and causing drips.

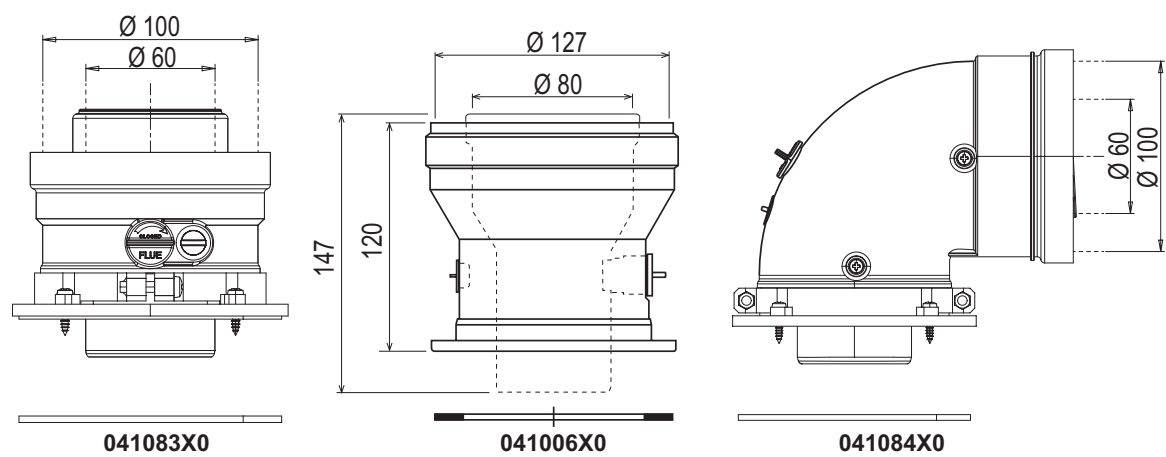


fig. 20 - Starter accessories for coaxial pipes

Table 5 - Maximum length of coaxial pipes

	Coaxial 60/100	Coaxial 80/125
Maximum length allowed (horizontal)	7 m	20 m
Maximum length allowed (vertical)	8 m	
90° bend reduction factor	1 m	0.5 m
45° bend reduction factor	0.5 m	0.25 m

7.6.3 Connection with separate pipes

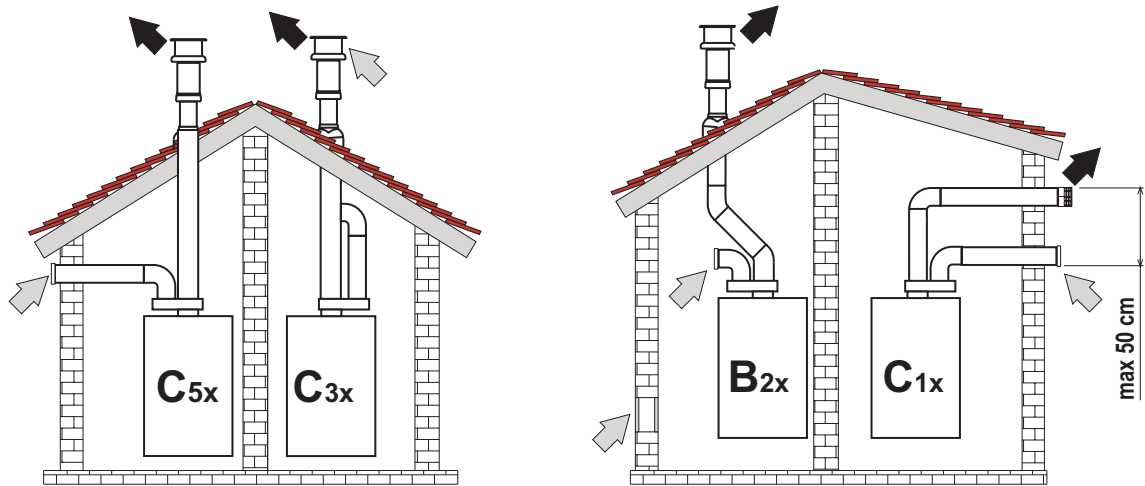


fig. 21 - Example of connection with separate pipes (↔ = Air / ➡ = Fumes)

Table 6 - Type

Type	Description
C1X	Wall-mounted horizontal extraction and discharge. The input/output terminals must be either concentric or close enough to be subjected to similar wind conditions (within 50 cm)
C3X	Vertical extraction and exhaust on the roof. Input/output terminals as for C12
C5X	Wall- or roof-mounted separate extraction and discharge pipes and, in any case, in different pressure zones. The discharge and extraction pipes must not be positioned on opposite-facing walls
C6X	Extraction and exhaust with separately certified pipes (EN 1856/1)
B2X	Extraction from the installation room and wall or roof discharge ⚠ IMPORTANT - THE ROOM MUST HAVE SUITABLE VENTILATION

Install the following starter accessory on the appliance for the connection of separate pipes:

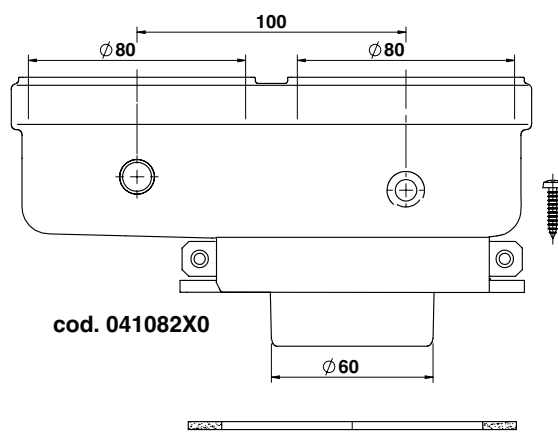


fig. 22 - Starter accessories for separate pipes

Before installing, check that the maximum length allowed has not been exceeded with a simple calculation:

1. Completely define the layout of the split flue system, including accessories and outlet terminals.
2. Consult "Table 8 - Accessories" and identify the losses in meq (equivalent metres) of each component based on the installation position.
3. Check that the total sum of the losses is less than or equal to the maximum length allowed in "Table 7 - Maximum length of separate pipes".

Table 7 - Maximum length of separate pipes

Maximum length allowed	70 m _{eq}
------------------------	--------------------

Table 8 - Accessories

				Losses in m _{eq}		
				Air extraction	Fumes exhaust	
					Vertical	Horizontal
Ø 80	PIPE	1 m M/F	1KWMA83W	1.0	1.6	2.0
	BEND	45° M/F	1KWMA65W	1.2	1.8	
		90° M/F	1KWMA01W	1.5	2.0	
	PIPE JOINT	with test port	1KWMA70W	0.3	0.3	
	TERMINAL	air wall-mounted	1KWMA85A	2.0	-	
		fumes wall-mounted with wind cowl	1KWMA86A	-	5.0	
	FLUE	Split air/fumes 80/80	010027X0	-	12.0	
Fumes only outlet Ø80		010026X0 +		4.0		
		1KWMA86U				
Ø 60	PIPE	1 m M/F	1KWMA89W		6.0	
	BEND	90° M/F	1KWMA88W		4.5	
	REDUCTION	80/60	041050X0		5.0	
	TERMINAL	fumes wall-mounted with wind cowl	1KWMA90A		7.0	
Ø 50	PIPE	1 m M/F	041086X0		12	
	BEND	90° M/F	041085X0		9	
	REDUCTION	80/50	041087X0		10	
 CAUTION				GIVEN THE HIGH LOAD LOSSES OF THE ACCESSORIES Ø50 and Ø60, ONLY USE THEM IF NECESSARY AND IN LINE WITH THE FINAL FUMES EXHAUST SECTION.		

7.6.4 Use of flexible hose pipe Ø50 and Ø60

The calculation shown in the tables below includes the starter accessories with code 041087X0 for Ø50 and code 041050X0 for Ø60.

Flexible hose pipe

A maximum of 4 metres of flue Ø80 mm can be used between the boiler and the tract to the reduced diameter (Ø50 o Ø60), and a maximum of 4 metres of flue Ø80 mm on the extraction (with the maximum flue length with Ø50 and Ø60) see "fig. 23 - Diagram for pipe installation with flexible pipes only" on page 38.

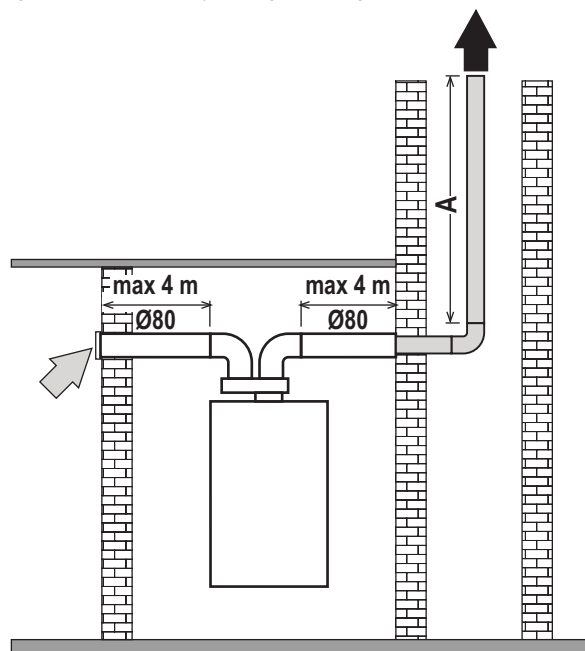


fig. 23 - Diagram for pipe installation with flexible pipes only

A =
 Ø50 - 22 m MAX
 Ø60 - 60 m MAX

Follow the indications shown below to use this diameter.

Enter the TSP parameter menu and change the value of the P68 parameter to the value of the length of the flue used. After changing the value, perform the calibration procedure (see "11.2.5 Checking the boiler combustion values" on page 67).

SC04

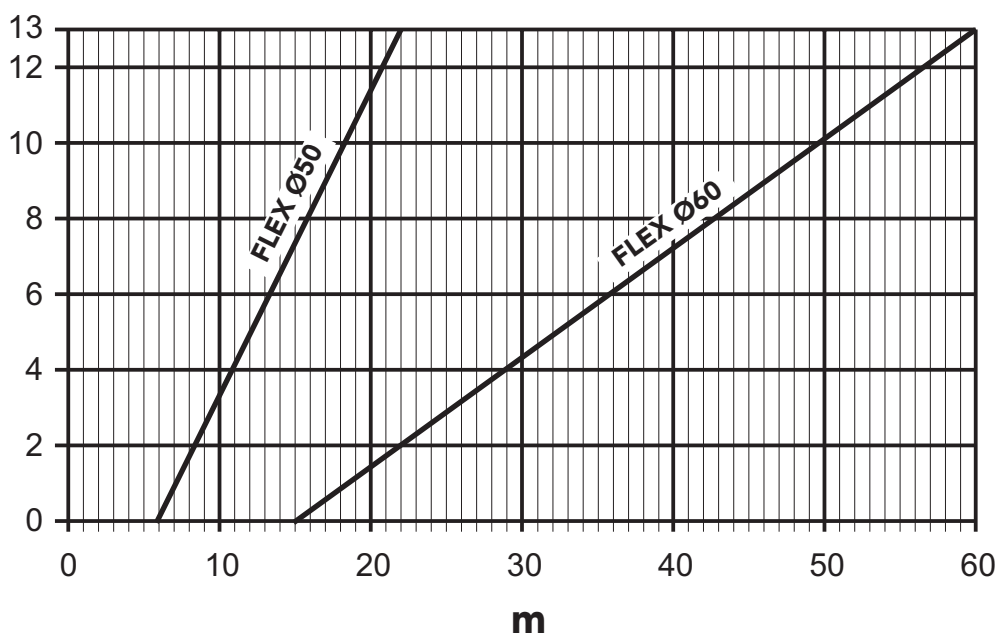


fig. 24 - Graph for choice of flue parameter

7.6.5 Connection to collective chimneys

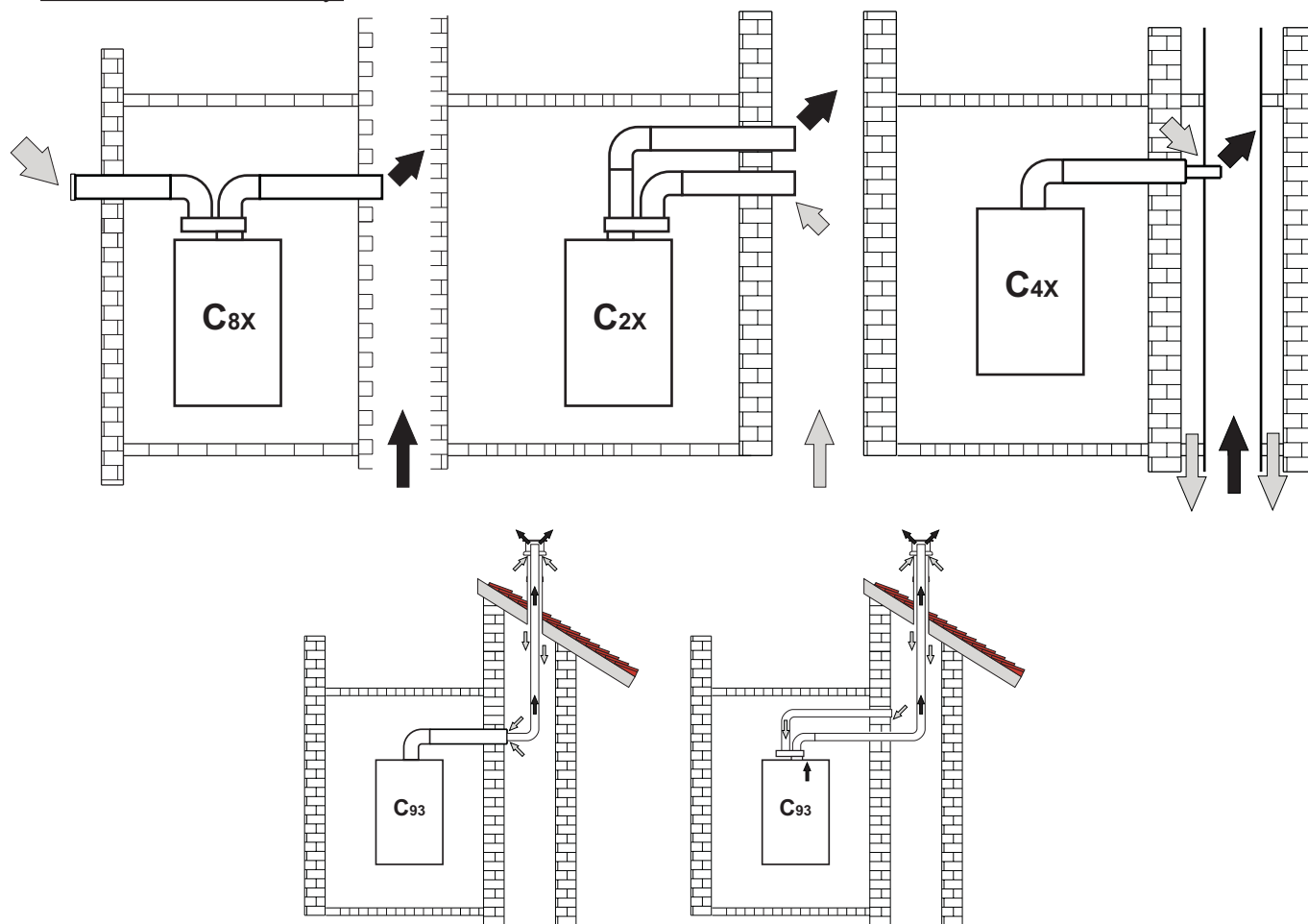


fig. 25 - Example of connection to chimneys (→ = Air / → = Fumes)

Table 9 - Type

Type	Description
C8X	Single or collective exhaust flue and wall-mounted extraction
B3X	Extraction from the installation site using a concentric pipe (which includes the exhaust) and exhaust in a collective chimney with natural draught. ⚠ IMPORTANT - THE ROOM MUST HAVE SUITABLE VENTILATION
C93	Exhaust to a vertical terminal and intake from existing chimney.

If you intend to connect the boiler to a chimney or to a single natural draught chimney, the chimney or flue must be specifically designed by professionally qualified technical personnel in compliance with current standards and be suitable for sealed chamber appliances equipped with a fan.

Anti-backflow check valve

The boiler is standard-fitted with a check valve (anti-backflow system), therefore, it can be connected to collective chimneys under positive pressure only if it operates with G20 gas. Parameter P67 must be set to 1 with this type of installation.

If you are installing a type C(10)3 or C(11)3 boiler, affix the relevant white adhesive rating plate, located in the document envelope supplied with the device, to the FRONT PANEL SO THAT IS CLEARLY VISIBLE.

Check the tightness of the gas and fumes circuit when the installation has been completed.

IF NOT, THERE IS A RISK OF ASPHYXIATION DUE TO THE LEAKAGE OF COMBUSTION FUMES.

7.7 Connection to boiler condensate discharge

WARNINGS

The boiler has an internal siphon for condensate discharge. Install the flexible hose pipe "B" by connecting it under pressure. Before starting up, fill the siphon with about 0.5 litres of water and connect the hose pipe to the drainage system. The drains connected to the sewer system must be resistant to acid condensate. If the condensate drain is not connected to the waste water drainage system, a neutraliser must be installed.



HAZARD

THE APPLIANCE MUST NEVER BE STARTED UP WITH THE SIPHON EMPTY!

IF NOT, THERE IS A RISK OF ASPHYXIATION DUE TO THE LEAKAGE OF COMBUSTION FUMES.

THE CONDENSATE DRAIN MUST BE CONNECTED TO THE SEWER SYSTEM SO THAT THE LIQUID IN IT CANNOT FREEZE.

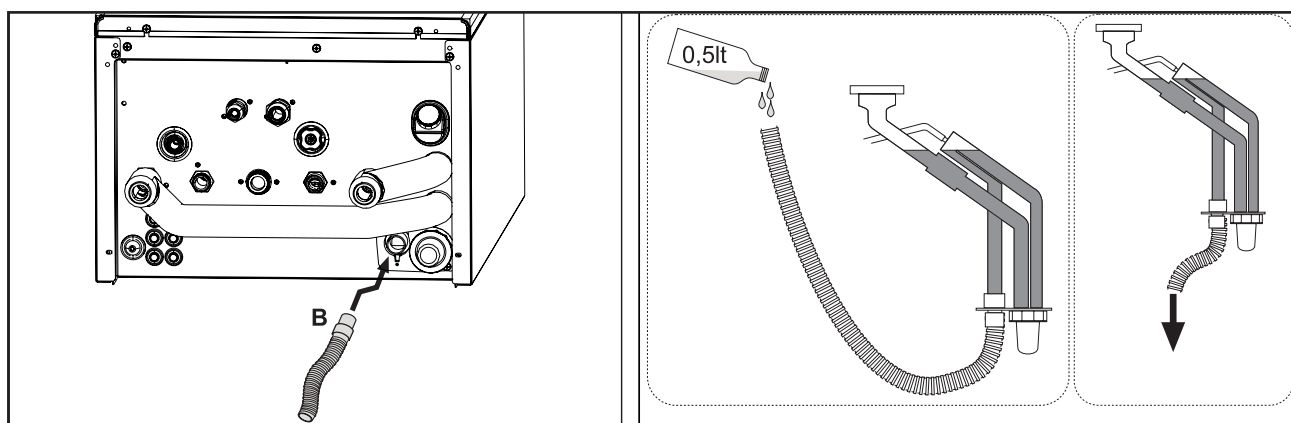


fig. 26 - Condensate drain connection

7.8 Electrical connections

7.8.1 Electrical data

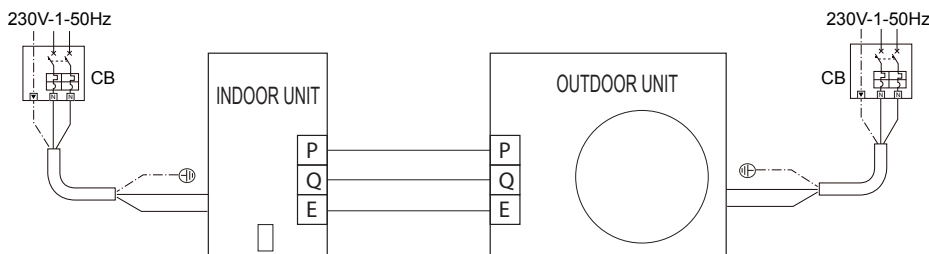
Table 10 - Electrical data

Indoor unit	MOD.	6 - 10
Supply voltage	"	220-240V 50 Hz
Automatic switch recommended	A	2

The customer must install the automatic circuit breaker.

Communication cable between indoor and outdoor unit	MOD.	6 - 10
Cable section (shielded cable)	mm ²	3x0.75

Example of basic connection



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 shocks.

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.



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.



HAZARD

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 pre-wired and has a three-pole cable, with no plug, for the connection to the electricity power supply. The grid connections must be permanent and fitted with a double-pole switch with a minimum contact opening of at least 3 mm, placing an automatic switch (refer to "Table 10 - Electrical data" on page 40) between the indoor unit and the line.

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



HAZARD

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. If replaced, only use a "HAR H05 VV-F" 3x0.75 mm² cable with a max external diameter of 11mm.

7.8.1 Opening the front panel

1. To dismount the front panel of the indoor unit:

Partially unscrew the screws A (see "fig. 27 - removing the front panel").

Pull the panel B out and release it from the upper fixings (see "fig. 27 - removing the front panel").

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 be positioned as indicated in "fig. 28 - assembly with bottom screws").

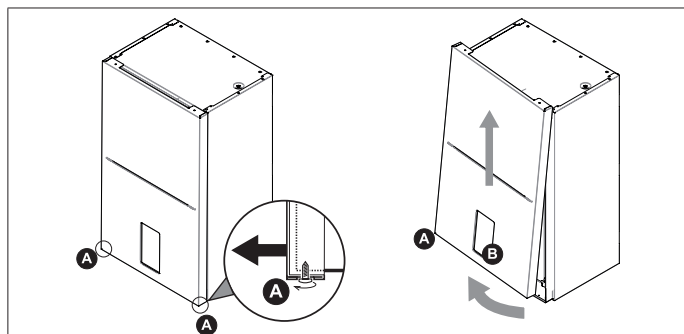


fig. 27 - removing the front panel

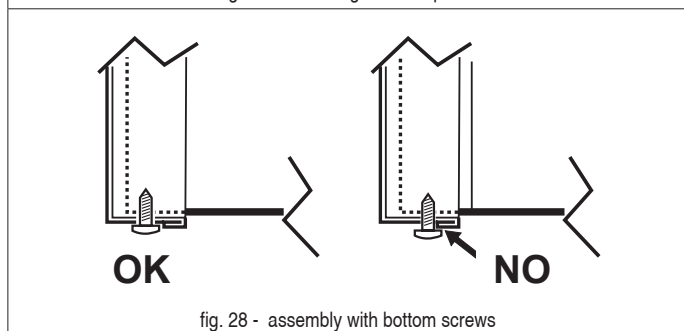


fig. 28 - assembly with bottom screws

7.8.2 User terminal block connections

The terminal block (detail 4b "fig. 29 - User terminal block") is located on the left side of the boiler electric box. The terminal block is a male-female connector strip. There is an identification label of the 11 terminals available on the side of the terminal block.

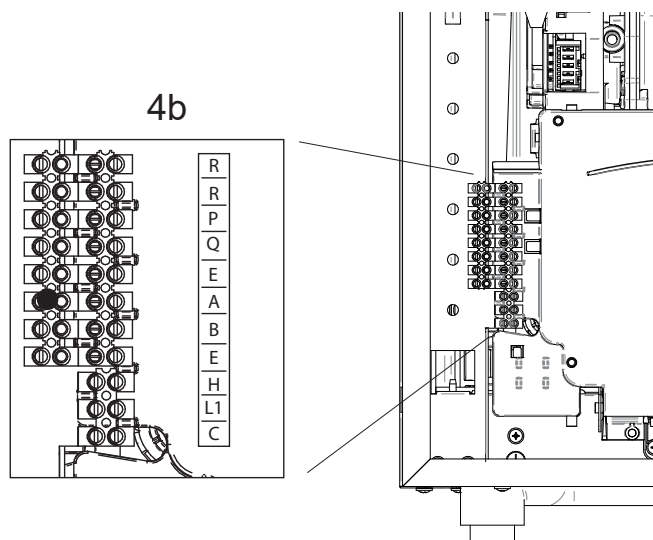


fig. 29 - User terminal block

ID TERMINAL	FUNCTION	NOTES
R	For factory testing	Reserved
R	For factory testing	Reserved
P	Serial Modbus	For serial connection to the outdoor unit
Q		
AND		
A	Serial Modbus	For connection to the external monitoring system (BMS) or remote control
B		
AND		
H	For connection to room thermostats	For details, see the following paragraph "H-L1-C - Digital inputs for room thermostat"
L1		
C		

H-L1-C - Digital inputs for room thermostat

If the digital inputs H-L1-C are enabled by parameter 6.1 and parameter 5.3 (see "9.2.2 Heat pump service menu" on page 59), they have priority over ON/OFF settings and mode change (only for Method A) from user interface.

Digital inputs not enabled (default)

Set par. 6.1 = 0

Digital inputs enabled

• Method A - operating mode setting

The request can occur, for example, via 2 Heat and Cool operating status switches: Set par. 6.1 = 1 (mode set).

H-L1 (Heat)	L1-C (Cool)	Operating status
Closed	Open	System heating mode
Open	Closed	System cooling mode
Closed	Closed	System cooling mode
Open	Open	Off on system

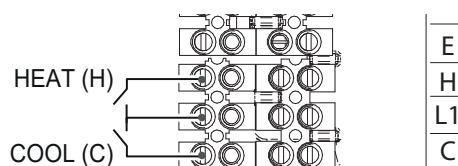


fig. 30 - Method A thermostat (for mode change)

• Method B - Operating request on system

The request may come, for example, from a room thermostat. The system will operate in the mode set by the user interface.

Set par. 6.1 = 2 (one zone)

Operating status:

H-L1	L1-C	Operating status
Closed	Not used	Used by the system
Open	Not used	Off on system

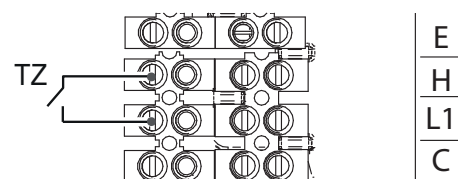


fig. 31 - Method B thermostat (1 zone)

• **Method C - setting for thermostat temperature control from two zones**
The request may come, for example, from the two room thermostats of the two system zones to be served. The system will operate in the mode set by the user interface.
Set par. 6.1 = 3 (mode set).
Set par. 5.3 = 1 (enabling control of 2 zones)

H-L1 (TZ1 - zone 1)	L1-C (TZ2 - zone 2)	Operating status
Closed	Open	Serving zone 1 through the activation of pump P _o
Open	Closed	Serving zone 2 through the activation of pump P _c and temperature control sent with mixing valve SV3 (if installed) and water temperature probe Tw2 (if installed)
Closed	Closed	Serving zone 1 through the activation of pump P _o and serving zone 2 through the activation of pump P _c and temperature control sent with mixing valve SV3 (if installed) and water temperature probe Tw2 (if installed)
Open	Open	Off zone 1 and zone 2

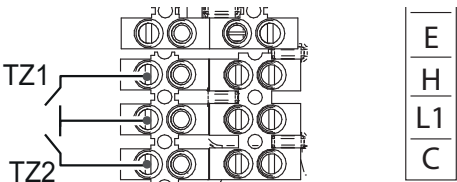


fig. 32 - Method C thermostat (2 zones)

NOTE

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

7.8.2 Connection of system add-ons

The unit can manage system add-ons, such as an external circulation pump / zone 1 water pump, zone 2 water pump, 3-way mixer valve for zone 2, 3-way diverter valve for hot/cold mode and smart grid. All these elements are controlled by the heat pump hydronic board.

7.8.3 How to access the heat pump hydronic board

Remove the front panel (see “7.8.1 Opening the front panel” on page 42)
The board (detail A “fig. 33 - heat pump hydronic board”) is located inside the heat pump electric box (see “fig. 8 - View without front panel” on page 25). To access it, you need to remove the sheet metal cover by removing the fastening screws.

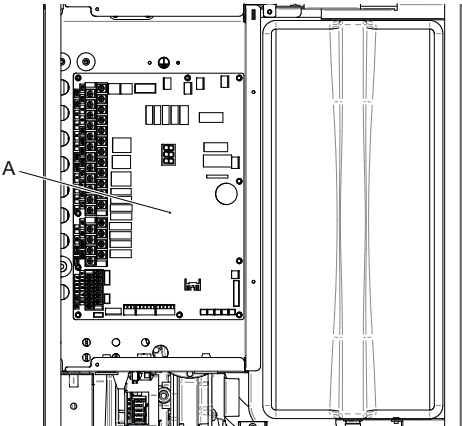


fig. 33 - heat pump hydronic board

7.8.4 Heat pump hydronic board

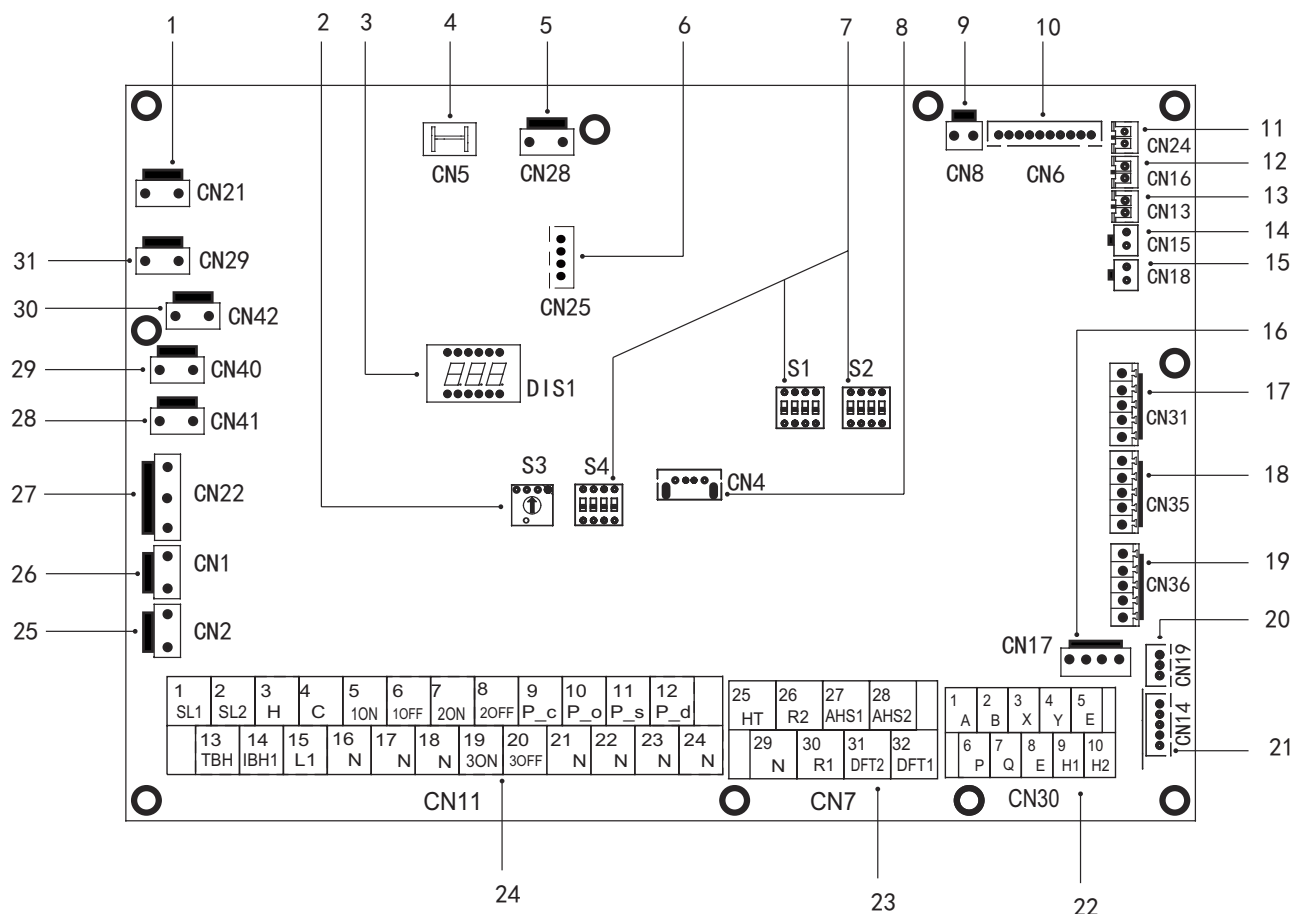


fig. 34 - Detail of heat pump hydronic board

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

Ref.	Port	Code	Description	NOTE
22	CN30	1 A	Reserved	/
		2 B		
		3 X		
		4 Y		
		5 AND	Reserved	/
		6 P		
		7 Q		
		8 AND		
		9 H1	Reserved	/
		10 H2		
23	CN7	26 R2	Compressor operation (the contact is closed when the compressor is operating)	1
		30 R1		
		31 DFT2	Defrost run (the contact is closed when the defrost is enabled)	1
		32 DFT1		
		25 HT	Reserved	2
		29 N		
		27 AHS1	Gas boiler (the contact is closed when the gas boiler is requested) *	1
		28 AHS2		
24	CN11	1 SL1	Reserved	/
		2 SL2		
		3 H	Room thermostat inlet (high voltage)	2
		4 C		
		15 L1	SV1 (3-way diverter valve) system / DHW	B
		5 1ON		
		6 1OFF		
		16 N		
		7 2ON	SV2 (3-way valve) heat/cool	2
		8 2OFF		
		17 N	Zone 2 pump	2
		9 P_c		
		21 N	External circulation pump / zone 1 pump	2
		10 P_o		
		22 N	Solar panel pump *	2
		11 P_s		
		23 N	DHW recirculation pump *	2
		12 P_d		
		24 N	DHW electric boiler heating element *	2
		13 TBH		
		16 N	Indoor reserve system electric heater 1 *	B
		14 IBH1		
		17 N		
		18 N	SV3 mixer valve (3-way valve zone 2)	2
		19 3ON		
		20 3OFF		
25	CN2	TBH_FB	Port for automatic circulator switch of TBH (shortcircuited by default)	/
26	CN1	IBH1/2_FB	Port for automatic circulator switch of IBH (shortcircuited by default)	/
27	CN22	IBH1	Control port for indoor reserve system electric heater 1	/
		IBH2	Reserved	/
		TBH	Control port for electric resistance DHW heater *	/
28	CN41	HEAT8	Reserved	/
29	CN40	HEAT7	Reserved	/
30	CN42	HEAT6	Reserved	/
31	CN29	HEAT5	Reserved	/

NOTES:

*: Do not use

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.

Current	220-240VAC
Maximum working current (A)	0.2
Cable section (mm ²)	0.75

7.8.5 Connections to the heat pump board

Connect the cable to the appropriate terminals as shown in the following images. Fasten the cables securely and pass them through the relevant cable gland.

P_o - For outside circulation pump or water pump zone 1

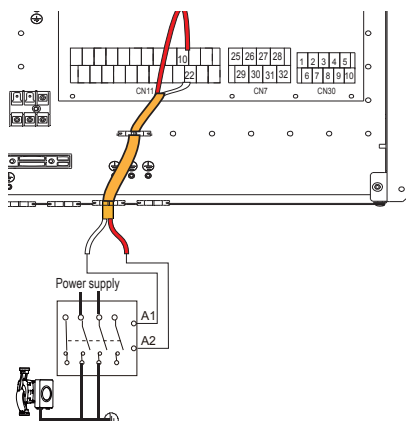


fig. 35 -

P_c - Water pump of zone 2

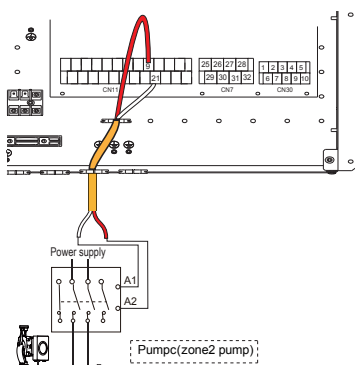


fig. 36 -

SV3 - 3-way mixing valve for zone 2

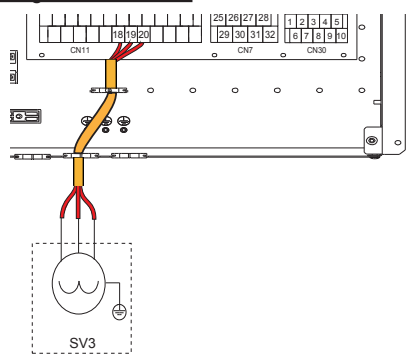


fig. 37 -

SV2 - 3-way diverter valve for heat/cool

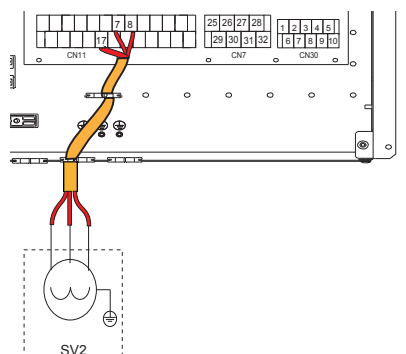


fig. 38 -

	Terminals	
Mode	7 (2ON)	8 (2OFF)
Heat	230V	0V
Cool	0V	230V

SG Digital inputs for smart grid input from mains electricity

If the digital inputs for photovoltaic input (not available) and smart grid from mains electricity are enabled by parameter 15.2 (see "9.2.2 Heat pump service menu" on page 59) and are active. They take priority over the user interface settings.

Digital inputs not enabled (default)

Set par. 15.2 = 0

Digital inputs enabled

Set par. 15.2 = 1

EVU (photovoltaic input)	SG (smart grid input)	Operating status
Open	Closed	Normal operation
Open	Open	Smart grid operation

Normal operation

In this case, the system works normally according to the set parameters

Smart grid operation

This operation is usually dependent of a smart grid request by the mains electricity which basically informs the system that the deliverable electric power is decreasing (for example, in the case of electricity production systems through wind or photovoltaic farms).

The heat pump can support the system in cooling or heating mode for a specific time (which can be set via a parameter), then it will be deactivated. Once this set heating time has expired, only the boiler is activated. The DHW production is, however, guaranteed by the activation of the boiler.



NOTE

If you only want to use smart grid input, jumper EVU

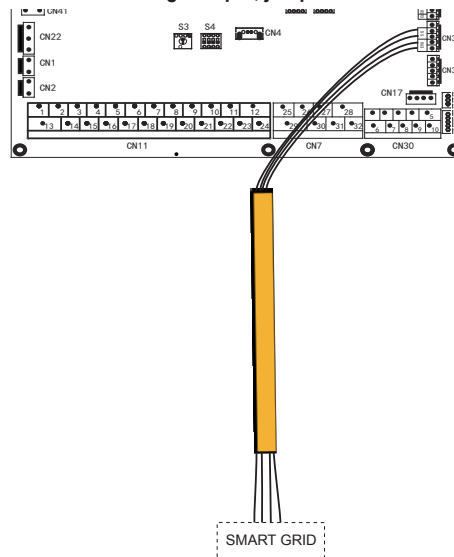


fig. 39 -

Additional temperature probes

To control the additional system temperature probes, additional temperature probes may be necessary (available as an accessory).

The probes are connected to the heat pump hydronic board (see "7.8.4 Heat pump hydronic board" on page 44).

Refer to the instructions supplied with the accessory for the installation.

For the setting parameters, see "9.2.2 Heat pump service menu" on page 59.

Tbt1 probe (system water tank temperature probe)

Set par.15.4=1

Tw2 probe (mixed water temperature probe sent to zone 2)

Set par.15.3=1

8. USER INTERFACE

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

8.1 Key function description

User interface	Key function description		
fig. 40 -	ID key	Function	Function details
	SW1	UP	On MAIN, select/scroll up/down between DHW - SYSTEM or DHW - SYS. Z1 -SYS. Z2 if the 2nd zone is enabled
	SW2	DOWN	Scroll up/down the menu rows in the menu
	SW3	MENU/CONFIRM	Access to the main menu and confirm parameter value if changed
	SW4	BACK	Return to previous screen
	SW5	OFF	Switch off -short press – switches of DHW or Z1 or Z2 depending on the selection - pressure >5 sec. switches off everything (DHW-Z1-Z2)
	SW6	UP VALUE	- Increases DHW-Z1-Z2 set temperature - Increases the parameter value selected in the menu
	SW7	DOWN VALUE	- Decreases DHW-Z1-Z2 set temperature - Decreases the parameter value selected in the menu

8.2 Meaning of display icons

--	--	--

Index	Icon	Description	Function	Additional NOTE
1		Water circulator	Enabled when the pump is active	
2		compressor	Enabled when the compressor is active	
3		Additional heating source (boiler)	Enabled when the boiler is active	
		System electric heater	Enabled when the electric heater is active	
4		External temperature	Allows you to view the external air temperature.	

Index	Icon	Description	Function	Additional NOTE
5		timer	Enabled when one of the timer functions is active	-
6		Eco function	Enabled when the ECO function is active	It can be activated 24h or based on scheduled event.
7		Photovoltaic FV	Enabled when FV dig-in=closed	They only appear if the smart grid function is enabled. The icons appear based on the status of the dig-in. Hydronic board EVU and SG.
		SG smart grid	Enabled when SG dig-in=closed	
		Maximum energy consumption	Appears when EVU and SG dig-in = both open.	
8		Anti-freeze	Enabled when the anti-freeze is in progress	Shared position on the display. They appear based on the active function. Priority index In the event of simultaneous request 1 anti-freeze 2 defrost 3 silent mode
		Defrost	Enabled when the defrost is in progress	
		Silent mode	Enabled when the silent mode is in progress	
9		DHW symbol	DHW mode	if crossed out = disabled
10		Anti-legionella	Anti-legionella in progress	
11		Solar panels	Enabled when the thermal solar panel is operating	Shared position on the display. They appear depending on the active function. They cannot be run at the same time.
		DHW electric boiler heater	Enabled when the DHW electric boiler heater is operating.	
12	22°C	DHW temperature - DHW set point	Displays the DHW heater probe temperature (if present)	Displays the DHW setp. during the change. If DHW=off, OFF appears instead of the temperature.
13		Heating symbol	Heating mode active	Shared position on the display. They appear depending on the active function.
		Cooling symbol	Cooling mode active	
14		Holiday mode	Holiday period active	
15	33°C	- Delivery set point - Delivery set point zone 1 - Delivery set point zone 2	- Delivery set point single zone - without Z1-Z2 on the side. - Delivery set point zone 1 if Z1 on the side - Delivery set point zone 2 if Z2 on the side	If only the single zone is configured, Z1/Z2 will not be shown on the side. If the dual zone is configured, either Z1 or Z2 will always be shown on the side to indicate which zone the value displayed refers to. If single zone, either z1 or z2=off, OFF appears
16	Z1	Zone 1 indicator	Appears when the zone control is enabled and is always displayed next to the set point (15)	Indicates that the zone 1 set point is displayed. Not present if double zone is not enabled.
17-18-19		Selection indicator between DHW-Z1-Z2 to change set point	Indicates the selected set point for change	When a set point appears on the side, it means that it can be changed. You can move using the SW1-SW2 buttons
20	Z2	Zone 2 indicator	Appears when the zone control is enabled and is always displayed 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 DHW and system on and off

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:

- Select DHW and with 1sec pressure on OFF, only DHW switches off/on
- Select single zone and with 1sec pressure on OFF, only DHW switches off/on
- Select Z1 and with 1sec pressure on OFF, only Z1 switches off/on
- Select Z2 and with 1sec pressure on OFF, only Z2 switches off/on

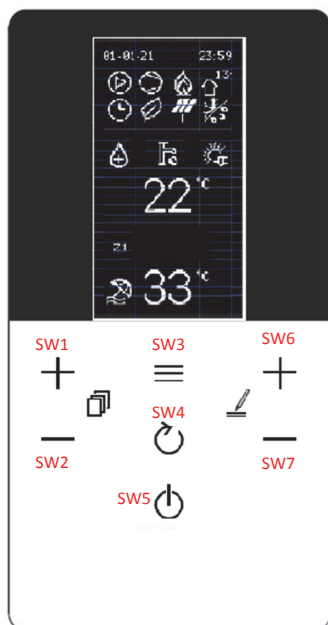
General shut-down:

The prolonged pressure of the SW5 key, for more than 3 sec, activates or deactivates the forced OFF state. In this state, all requests are disabled, while the protection functions remain active (antifreeze, disinfection-anti-legionella, ...)



fig. 41 -

8.4 DHW and system set point configuration



NOTE

The ◀ icon indicates which setpoint is being modified

DHW set point (min 30°C, max 60°C)

To change the **DHW set point**, proceed as follows:

- press the SW1/SW2 buttons to select the set point
- press the SW6/SW7 buttons to change the set point
- confirm the modified value with the SW3 button

01-01-2021 01:07
-5°C

22°C
33°C

Single zone set point

Type of terminal selected	Heat setpoint (min:max)	Cool setpoint (min:max)
FLH (radiant floor)	25: 55	18: 25
FCU (fancoil) / RAD (radiator)	25: 65	5: 25

To change the **single zone set point**, proceed as follows:

- press the SW1/SW2 buttons to select the set point
- press the SW6/SW7 buttons to change the set point
- confirm the modified value with the SW3 button

01-01-2021 01:07
-5°C

22°C
33°C

Zone Z1 set point

Type of terminal selected	Heat setpoint (min:max)	Cool setpoint (min:max)
FLH (radiant floor)	25: 55	18: 25
FCU (fancoil) / RAD (radiator)	25: 65	5: 25

To change the **zone Z1 set point**, proceed as follows:

- press the SW1/SW2 buttons to select the set point
- press the SW6/SW7 buttons to change the set point
- confirm the modified value with the SW3 button

01-01-2021 01:07
-5°C

22°C
Z1 33°C

Zone Z2 set point

Type of terminal selected	Heat setpoint (min:max)	Cool setpoint (min:max)
FLH (radiant floor)	25: 55	18: 25
FCU (fancoil) / RAD (radiator)	25: 65	5: 25

To change the **zone Z2 set point**, proceed as follows:

- press the SW1/SW2 buttons to select the set point
- press the SW6/SW7 buttons to change the set point
- confirm the modified value with the SW3 button

01-01-2021 01:07
-5°C

22°C
Z2 33°C

9. GENERAL USER MENU

To access the user menu, press the  button. To scroll the rows using the SW1 and SW2 buttons to access the submenu, press the  button. The menu is structured in multiple levels as shown in the following table.

Level 1	Level 2	Description	Lower limit	Upper limit	Remedy	Unit of measurement	Default value
System	Plant type *	Select the heat pump system type (Electric, Hybrid C, Hybrid H)	Electric	Hybrid H			Hybrid C
Hp menu	See "9.2.1 User heat pump menu (Menù Hp)"	you enter the heat pump menu					
Boiler menu	See "9.1 Boiler menu"	you enter the boiler menu					
BMS menu	Device address	communications port settings for BMS	1	247			1
	Bitrate		9600	38400		Baud rate	9600
	Parity		None-Even-Odd				None
	Stop bit		1	2			1

*: Do not modify

9.1 Boiler menu

9.1.1 User boiler menu

Press the  button to access the boiler menu and select the line "Boiler menu". The menu is structured in multiple levels as shown in the following table.

Level 1	Level 2	Level 3	Level 4	Description	Lower limit	Upper limit	Remedy	Unit of measurement	Default value
Service	"Password" 1234	TSP, see "Menu for modifying the [TSP] parameters" on page 51	b01 - P69	boiler parameters					
		Test							
		AutoSetip							
Diagnostic	CH1 temp			delivery probe temperature	0	125	1	°C	
	CH2 temp			return probe temperature	0	125	1	°C	
	DHW temp			DHW temperature	0	125	1	°C	
	Ext temp			external temperature	-30	70	1	°C	
	Fume temp			temperature of fumes	0	125	1	°C	
	Fan speed			Fan speed	0	120	100	rpm	
	Pump speed			Circulator speed	0	100	1	%	
	Power			Burner power	0	100	1	%	
	DHW flow			DHW flow	0	99	0.1	l/min	
	Water pressure			System water pressure	0	9.9	0.1	bar	
	Flame			Flame signal	0	255	1		
Counters	Burner			Burner operating hours	0	99999	1	hr	-
	Ignition ok			Number of ignitions					
	Ignition error			Number of failed ignitions					
	CH pump time			CH pump operating hours					
	DHW pump time			DHW pump operating hours					
Alarm	Alarm1 XX								
	Alarm2 YY								
	 --								
	Alarm10 --								
	Clear								

9.1.2 Boiler service menu

ACCESS TO THE SERVICE MENU AND CHANGING PARAMETERS CAN ONLY BE CARRIED OUT BY QUALIFIED PERSONNEL.

To continue, you must enter the password "1234". Set the cell value with the SW6 and SW7 buttons while you can change positions with the SW1 and SW2 buttons. Confirm with the button.

Menu for modifying the [TSP] parameters

You can scroll the list by pressing the SW1 and SW2 buttons while the value is displayed with the button. To modify, press the SW6 and SW7 buttons, confirm with the button or cancel with the button.

Index	Description	Modulation	Default
b01	Boiler type selection	3 = COMBINED MONOTHERMAL (DO NOT MODIFY)	3
b02	Boiler type	1 = 24 _C 2 = 28 _C 3 = 34 _C 4 = 45 _C 5 = 24 _C (high range) 6 = 28 _C (high range) 7 = 34 _C (high range)	6
b03	Gas type	0 = Methane 1 = LPG 2 = Propane-air	0
b04	Water system pressure protection selection	0 = Pressure switch 1 = Pressure transducer	1
b05	Summer/Winter function	0 = WINTER - SUMMER - OFF 1 = WINTER - OFF	0 = Enabled
b06	Variable input contact function selection	0 = Flow meter exclusion 1 = System thermostat 2 = Second Room thermostat 3 = Warning/Notification 4 = Thermostat safety device	2
b07	LC32 relay board operation selection	0 = External gas valve 1 = Alarm 2 = System loading solenoid valve 3 = Solar 3-way valve 4 = Second heating pump 5 = Alarm2 6 = Burner on 7 = Antifreeze active	0
b08	Hours without DHW withdrawal	0-24 hours (time for temporary deactivation of comfort without withdrawal)	24
b09	Fault 20 status selection	0 = Disabled 1 = Enabled (Only for versions with pressure transducer)	0
b10	Not implemented	--	--
b11	Flow meter timing	0 = Disabled 1-10 = seconds	0
b12	Comfort mode	0 = Activation with withdrawal 1 = Always active	0
b13	Not implemented	--	--
b14	DHW factor	0 - 1	0
b15	Flow meter type selection	1 = Flow. (450 sys/l) 2 = Flow. (700 sys/l) 3 = Flow (190 sys/l)	3
b16	Not implemented	--	--
b17	Not implemented	--	--
b18	DHW mode activation flow rate	0-100L/min/10	25
b19	DHW deactivation flow rate	0-100L/min/10	20
b20	Flue material selection	0 = Standard 1 = PVC 2 = CPVC	0
b21	Not implemented	--	--
b22	Not implemented	--	--
b23	Maximum temperature standard flue switch off	60-110°C	105
b24	Maximum temperature PVC flue switch off	60-110°C	93
b25	Maximum temperature CPVC flue switch off	60-110°C	98
b26	Not implemented	--	--

Index	Description	Modulation	Default
b27	Calibration procedure [AUTO SETUP]	5 = Calibration procedure [AUTO SETUP] enabled All the other values = Calibration procedure [AUTO SETUP] disabled (See "Calibration procedure [AUTO SETUP]" on page 33)	0
b28	Not implemented	--	--
b29	Restore factory settings	See sect. "** Restore Factory Settings" on page 37.	0
P30	Heating ramp	10÷80 (e.g. 10=20°C/min, 20=12°C/min, 40=6°C/min, 80=3°C/min)	40
P31	Heating wait time	0-10 minutes	4
P32	Heat post circulation	0 ÷ 255 minutes (Multiply the value by 10. Example 15x10 = 150 seconds)	15
P33	Pump operation	0 = Continuous pump (only active in winter mode) 1 = Modulating pump	1
P34	DeltaT pump modulation	0 ÷ 40°C	20
P35	Minimum speed modulating pump	30 ÷ 100%	30
P36	Start speed modulating pump	90 ÷ 100%	90
P37	Maximum speed modulating pump	90 ÷ 100%	100
P38	Pump switch-off temperature during post circulation	0 ÷ 100°C	55
P39	Pump switch-on hysteresis temperature during post circulation	0 ÷ 100°C	25
P40	User heating maximum setpoint	20 ÷ 90°C	80
P41	Maximum heating power	0 ÷ 100%	85
P42	Burner switch-off in DHW	0 = Fixed 1 = Linked to setpoint 2 = Solar	0
P43	Comfort temperature activation	0 ÷ 80°C	40
P44	Hysteresis comfort deactivation	0 ÷ 20°C	20
P45	DHW wait time	30 ÷ 255 seconds	120
P46	User DHW maximum setpoint	40 ÷ 65°C	55
P47	Dhw pump post circulation	0 ÷ 255 seconds	30
P48	DHW maximum power	0 ÷ 100%	100
P49	Not implemented (b01=2)	--	--
P50	Not implemented (b01=2)	--	--
P51	Burner switch-off in DHW (P42 = 2)	0 ÷ 100 ° C OFF = DHW user setpoint + P51	10
P52	Burner switch-on in DHW (P42 = 2)	0 ÷ 100 ° C ON = DHW user setpoint - P52	10
P53	Solar wait time	0 ÷ 255 seconds	10
P54	System pre-circulation time	0 ÷ 60 seconds	30
P55	System filling method	0 = Disabled 1 = Automatic	0
P56	System pressure minimum limit value	0-8 bar/10 (Only for boilers with water pressure sensor)	4
P57	System nominal pressure value	5-20 bar/10 (Only for boilers with water pressure sensor)	7
P58	System pressure maximum limit value	25-35 bar/10 (Only for boilers with water pressure sensor)	28
P59	Pump deactivation with OpenTherm	0 = Pump active in heating 1 = Circulator deactivated in heating with request only from OpenTherm)	0
P60	Antifreeze power	0 ÷ 50% (0 = minimum)	0
P61	Minimum power	0 ÷ 50% (0 = minimum)	0
P62	Minimum fan speed	DO NOT MODIFY (The parameters are automatically updated)	G20/G230: 44 G30/G31: 46
P63	Fan speed acc.	DO NOT MODIFY (The parameters are automatically updated)	G20/G230: 160 G30/G31: 152
P64	Maximum fan speed	DO NOT MODIFY (The parameters are automatically updated)	G20/G230: 172 G30/G31: 156
P65	Not implemented	--	1
P66	Valve frequency	0 ÷ 2	1
P67	Installation C(10)3/C(11)3	0 - 1 (1 = installation C(10)3 / C(11)3)	0
P68	Flue parameters	0 ÷ 10 (modify according to the flue table)	0
P69	Heating hysteresis after switch-on	6 ÷ 30°C	10

* Restore factory settings

To reset all the parameter to the factory value, set parameter b29 to 10 and confirm.

Disconnect the electrical power for 10 seconds and then, reconnect it.

at this point, you must reset parameter b02 to the correct value, according to the type of boiler. Parameter b27 will be automatically set to 5.

9.2 Heat pump menu

9.2.1 User heat pump menu (Menù Hp)

To access the heat pump menu, select the line "Menù Hp" and press the button. The menu is structured in multiple levels as shown in the following table.

You can scroll the list by pressing the SW1 and SW2 buttons while the value is displayed with the button. To modify, press the SW6 and SW7 buttons, confirm with the button or cancel with the button.

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description	Lower limit	Upper limit	Remedy	Unit of measurement	Default value
Operation Mode	Heat / Cool	---	---		Cool, Heat	Cool	Heat	/	/	Heat
Preset Temp.	Preset Temp Cool	Monday	Event 1	Enabled y/n	Enable the event	YES	NO	/	/	NO
			Event 2	Time	Start time hh:mm	00.00	23.59	1 min	hh:mm	00.00
			Event 3	Temperature	Water temperature setpoint	min*	max*	1	°C	8
			Event 4							
			Event 5							
			Event 6							
		Tuesday	Event 1	Enabled y/n	Enable the event	YES	NO	/	/	NO
			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							
		Wednesday	Event 1	Enabled y/n	Enable the event	YES	NO	/	/	NO
			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							
		Thursday	Event 1	Enabled y/n	Enable the event	YES	NO	/	/	NO
			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							
		Friday	Event 1	Enabled y/n	Enable the event	YES	NO	/	/	NO
			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	Enable the event	YES	NO	/	/	NO
			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							
		Sunday	Event 1	Enabled y/n	Enable the event					
			Event 2	Time	Start time hh:mm					
			Event 3	Temperature	Water temperature setpoint					
			Event 4							
			Event 5							
			Event 6							

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description	Lower limit	Upper limit	Remedy	Unit of measurement	Default value
Preset Temp.	Preset Temp Heat	Monday	Event 1	Enabled y/n	Enable the event	YES	NO	/	/	NO
			Event 2	Time	Start time hh:mm	00.00	23.59	1 min	hh:mm	00.00
			Event 3	Temperature	Water temperature setpoint	25	65	1	°C	35
			Event 4							
			Event 5							
			Event 6							
		Tuesday	Event 1	Enabled y/n	Enable the event	YES	NO	/	/	NO
			Event 2	Time	Start time hh:mm	00.00	23.59	1 min	hh:mm	00.00
			Event 3	Temperature	Water temperature setpoint	25	65	1	°C	35
			Event 4							
			Event 5							
			Event 6							
		Wednesday	Event 1	Enabled y/n	Enable the event	YES	NO	/	/	NO
			Event 2	Time	Start time hh:mm	00.00	23.59	1 min	hh:mm	00.00
			Event 3	Temperature	Water temperature setpoint	25	65	1	°C	35
			Event 4							
			Event 5							
			Event 6							
		Thursday	Event 1	Enabled y/n	Enable the event	YES	NO	/	/	NO
			Event 2	Time	Start time hh:mm	00.00	23.59	1 min	hh:mm	00.00
			Event 3	Temperature	Water temperature setpoint	25	65	1	°C	35
			Event 4							
			Event 5							
			Event 6							
	Preset Temp Heat	Friday	Event 1	Enabled y/n	Enable the event	YES	NO	/	/	NO
			Event 2	Time	Start time hh:mm	00.00	23.59	1 min	hh:mm	00.00
			Event 3	Temperature	Water temperature setpoint	25	65	1	°C	35
			Event 4							
			Event 5							
			Event 6							
		Saturday	Event 1	Enabled y/n	Enable the event	YES	NO	/	/	NO
			Event 2	Time	Start time hh:mm	00.00	23.59	1 min	hh:mm	00.00
			Event 3	Temperature	Water temperature setpoint	25	65	1	°C	35
			Event 4							
			Event 5							
			Event 6							
		Sunday	Event 1	Enabled y/n	Enable the event	YES	NO	/	/	NO
			Event 2	Time	Start time hh:mm	00.00	23.59	1 min	hh:mm	00.00
			Event 3	Temperature	Water temperature setpoint	25	65	1	°C	35
			Event 4							
			Event 5							
			Event 6							
	Climatic Temp.	Z1 Cool Mode	Enabled y/n		Enables the climatic curve for zone 1 in cooling mode	YES	NO	/	/	NO
			Clim Curve Sel		to select the climatic curve in cooling mode	1	9	1	/	5
		Z1 Heat Mode	Enabled y/n		Enables the climatic curve for zone 1 in heating mode	YES	NO	/	/	NO
			Clim Curve Sel		to select the climatic curve in heating mode	1	9	1	/	5
		Z2 Cool Mode	Enabled y/n		to select the climatic curve in cooling mode	YES	NO	/	/	NO
			Clim Curve Sel		to select the climatic curve in heating mode	1	9	1	/	5
		Z2 Heat Mode	Enabled y/n		Enables the climatic curve for zone 2 in heating mode	YES	NO	/	/	NO
			Clim Curve Sel		to select the climatic curve in heating mode	1	9	1	/	5
	Eco Mode	Enabled y/n	yes/no		enables the ECO function (not available for 2 zones)	YES	NO	/	/	NO
		Clim Curve Sel	01-set		select the climatic curve from 1 to 9	1	9	1	/	5
		Timer enabled y/n	yes/no		Enable the timer	YES	NO	/	/	NO
		Start	hh:mm		start time	00.00	24:00	1 min	hh:mm	00.00
		End	hh:mm		end time	00.00	24:00	1 min	hh:mm	00.00

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description	Lower limit	Upper limit	Remedy	Unit of measurement	Default value
Dhw Settings	Disinfect	Enabled y/n	yes/no		enable the anti-legionella disinfection function	YES	NO	/	/	NO
		Operate Day	Sunday/ Monday		anti-legionella day	Sunday	Monday	/	/	Friday
		Start	hh.mm		anti-legionella start time	00.00	23.59	1 min	hh:mm	00.00
	Fast Dhw state	Enabled Y/N	yes/no		activates all the sources for fast DHW heating - the function is automatically disabled and stays disabled when the setpoint is reached.	None / ON / OFF		/	/	None
	Tank Heater state	Enabled Y/N	yes/no		activate the DHW boiler electric heating element	None / ON / OFF			/	None
	Dhw Pump Circ	T1 Enabled y/n	S t a r t hh.mm		if yes, it is possible to set the start time and then the pump will operate for a time defined in the parameter t INTERVAL_DHW	YES	NO	/	/	NO
		T2 Enabled y/n	S t a r t hh.mm		if yes, it is possible to set the start time and then the pump will operate for a time defined in the parameter t INTERVAL_DHW	YES	NO	/	/	NO
		T3 Enabled y/n	S t a r t hh.mm		if yes, it is possible to set the start time and then the pump will operate for a time defined in the parameter t INTERVAL_DHW	YES	NO	/	/	NO
		T4 Enabled y/n	S t a r t hh.mm		if yes, it is possible to set the start time and then the pump will operate for a time defined in the parameter t INTERVAL_DHW	YES	NO	/	/	NO
		T5 Enabled y/n	S t a r t hh.mm		if yes, it is possible to set the start time and then the pump will operate for a time defined in the parameter t INTERVAL_DHW	YES	NO	/	/	NO
		T6 Enabled y/n	S t a r t hh.mm		if yes, it is possible to set the start time and then the pump will operate for a time defined in the parameter t INTERVAL_DHW	YES	NO	/	/	NO
		T7 Enabled y/n	S t a r t hh.mm		if yes, it is possible to set the start time and then the pump will operate for a time defined in the parameter t INTERVAL_DHW	YES	NO	/	/	NO
		T8 Enabled y/n	S t a r t hh.mm		if yes, it is possible to set the start time and then the pump will operate for a time defined in the parameter t INTERVAL_DHW	YES	NO	/	/	NO
		T9 Enabled y/n	S t a r t hh.mm		if yes, it is possible to set the start time and then the pump will operate for a time defined in the parameter t INTERVAL_DHW	YES	NO	/	/	NO
		T10 Enabled y/n	S t a r t hh.mm		if yes, it is possible to set the start time and then the pump will operate for a time defined in the parameter t INTERVAL_DHW	YES	NO	/	/	NO
		T11 Enabled y/n	S t a r t hh.mm		if yes, it is possible to set the start time and then the pump will operate for a time defined in the parameter t INTERVAL_DHW	YES	NO	/	/	NO
		T12 Enabled y/n	S t a r t hh.mm		if yes, it is possible to set the start time and then the pump will operate for a time defined in the parameter t INTERVAL_DHW	YES	NO	/	/	NO
Options	Silent Mode	Enable Y/N	yes/no		enables silent mode	YES	NO	/	/	NO
		Silent Level 1-2			to set silent level	0	2	1	/	0
		Timer 1	Enable		it is possible to set the start time of timer 1	Yes	No			No
			From Date		it is possible to set the end time of timer 1	0:00	24:00			0:00
			Until date		enable timer 1 or not	0:00	24:00			0:00
		Timer 2	Enable		it is possible to set the start time of timer 2	Yes	No			No
			From Date		it is possible to set the end time of timer 2	0:00	24:00			0:00
			Until date		enable timer 2 or not	0:00	24:00			0:00
	Holiday	Enabled Y/N			activates holiday mode	YES	NO	/	/	NO
		Dhw Mode On/Off			to set if DHW is on/off during the holidays	ON	OFF	/	/	ON
		Disinfect On/Off			to set if the disinfect function is enabled/disabled during the holidays	ON	OFF	/	/	ON
		Heat Mode On/Off			to set if the heating mode is enabled/disabled during the holidays	ON	OFF	/	/	ON
		From Date			first day of holiday	01/01/2000	01/06/2099	/	/	01/01/2021
		Until Date			last day of holiday	01/01/2000	01/06/2099	/	/	01/01/2021
	Backup Heater state	Bckp Heat On/Off			Enabling and disabling of back-up electric heater (1=ON - 2=OFF)	None / ON / OFF		/	/	None
Service Information	Parameters	Main Set Temp			system temp set point temp based on selected mode	5	65	1	°C	12 cooling / 40 heating
		Main Actual Temp			Water delivery temperature (TW_OUT)	/	/	1	°C	/
		Tank Set Temp			Setpoint DHW heater (T5s)	30	60	1	°C	50
		Tank Actual Temp T5			Temperature DHW heater (T5)	/	/	1	°C	/
		Smart Grid Run Time			total daily run time of the smart grid	0	24	1	hh	/
	Display	Date and time			to set the date and time	Hours 00-23	Min 00-59	Day 00-31	Month 00-12	Year 2000-2099
		Contrast	on/off		to set the display contrast	MIN-2-3-4-5-6-7-8-9-MAX				5
		Brightness			to set the display brightness	MIN-30%-40%-50%-60%-70%-80%-90%-MAX				MAX
		Backlight time			to set the start of the backlighting	1	10	1	min	2
		Smart Grid	S.Grid Run Time Set		set working time for SMART GRID	0	24	1	h	2
	Error Code	Error List	Code		error code with date and time of the event	/	/	/	/	/
			Date		date of the event	/	/	/	/	/
			Hh.Mm		event time	/	/	/	/	/

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Menu Level 5	Description	Lower limit	Upper limit	Remedy	Unit of measurement	Default value
Operation Parameter	Online Units N				UNIT IN LINE INFO	/	/	/	/	/
	Operate Mode				Operating mode (Heat or Cool or Off)	0	3	1	/	/
	Sv1 State		on/off		3-way valve status SV1 (system = off, DHW = on)	ON	OFF	/	/	/
	Sv2 State				3-way valve status SV2 (off = cool, on = heat)	ON	OFF	/	/	/
	Sv3 State				3-way valve status of zone 2 (mixer valve)	ON	OFF	/	/	/
	Pump_I				Water pump status of the unit	ON	OFF	/	/	/
	Pump_O				Water pump status of zone 1	ON	OFF	/	/	/
	Pump_C				Water pump status of zone 2	ON	OFF	/	/	/
	Pump_S				Solar water pump status	ON	OFF	/	/	/
	Pump_D				DHW recirculation pump status	ON	OFF	/	/	/
	Pipe Bckp He				Back-up system electric heater status IBH1	ON	OFF	/	/	/
	Tank Bckp He				DHW electric boiler heater status (TBH)	ON	OFF	/	/	/
	Gas Boiler				Gas boiler status	ON	OFF	/	/	/
	T1 Leav W Temp				Water temperature measured by probe T1	/	/	1	°C	/
	Water Flow				Water flow rate (estimated)	/	/	0.001	m3/h	/
	Heat Pump Cap				Heat pump capacity (estimated)	/	/	0.1	kW	/
	T5 W. Tank				Water temperature measured by probe T5	/	/	1	°C	/
	Tw2 Cir2 W. Temp.				Water temperature measured by probe Tw2	/	/	1	°C	/
	T1S1 Cir1 Cli Temp				Setpoint of water calculated by the climatic curve for zone 1	/	/	1	°C	/
	T1S2 Cir2 Cli Temp				Setpoint of water calculated by the climatic curve for zone 2	/	/	1	°C	/
	Tw_O Plate Out Temp.				Water temperature measured by probe TW_out	/	/	1	°C	/
	Tw_I Plate Inl Temp.				Water temperature measured by probe TW_in	/	/	1	°C	/
	Tbt1 Buf Tank Up Temp.				Water temperature measured by probe Tbt1	/	/	1	°C	/
	Tbt12 Buf Tank Low Temp.				not used	/	/	/	°C	/
	Tsolar				Water temperature measured by probe Tsolar	/	/	1	°C	/
	Idu Sw				Indoor unit software	/	/	/	/	/
	Odu Model				Outdoor unit model	/	/	/	/	/
	Compr Current				Current absorbed by compressor	/	/	1	A	/
	Compr Freq				Compressor working frequency	/	/	1	Hz	/
	Compr Run Time				Run time since last compressor start-up	/	/	1	min	/
	Compr Run Time Tot				Total run time of compressor	/	/	1	h	/
	Exp Valve Open				Opening steps of expansion valve	0	500	1	STEP	/
	Fan Speed				Fan speed	0	650	10	RPM	/
	Unit Target Freq.				Compressor frequency requested by indoor unit	/	/	1	Hz	/
	Freq Lim Type				Diagram of frequency limitation	/	/	/	/	/
	Supply Voltage				Supply voltage	0	450	1	V	/
	Dc Gener Voltage				DC bus voltage	0	255	1	V	/
	Dc Gener Current				DC bus current	0	255	1	A	/
	T2 Plate Gas Out T.				Refrigerant temperature measured by probe T2	/	/	1	°C	/
	T2B Plate Gas In T.				Refrigerant temperature measured by probe T2B	/	/	1	°C	/
	Th Comp Suc Temp				Refrigerant temperature measured by probe Th	/	/	1	°C	/
	Tp Comp Disch Temp				Refrigerant temperature measured by probe Tp	/	/	1	°C	/
	T3 Outd Exch Temp				Refrigerant temperature measured by probe T3	/	/	1	°C	/
	T4 Outd Air Temp.				Outdoor air temperature measured by probe T4	/	/	1	°C	/
	Tf Modul Temp				Inverter module temperature measured by probe Tf	/	/	1	°C	/
	P1 Compr H_Press				Compressor high pressure P1	0	5000	1	kPa	/
	P2 Compr L_Press				Compressor high pressure P2	0	5000	1	kPa	/
	Odu Sw Date				Outdoor unit SW date	/	/	/	/	/
	Odu Sw Ver				Outdoor unit SW version	/	/	/	/	/
	Idu Sw Date				Indoor unit SW date	/	/	/	/	/
	Idu Sw Ver				Indoor unit SW version	/	/	/	/	/
For serviceman	Password				Password to access service menu	0000	9999	1	/	/

Heat / Cool operating mode selection (Operation Mode)

Menù Hp > Operation mode > select the desired mode and confirm with the SW3 button

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

Menù Hp > 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.

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)

Menù Hp > 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.

Monday	Event 1	Enabled y/n	Enable the event
	Event 2	Time	Start time hh:mm
	Event 3	Temperature	Water temperature setpoint
	Event 4		
	Event 5		
	Event 6		

Heat mode weekly schedule (Preset Temp. Heat)

Menù Hp > 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.

Monday	Event 1	Enabled y/n	Enable the event
	Event 2	Time	Start time hh:mm
	Event 3	Temperature	Water temperature setpoint
	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.

Climate curves (Weather Temp Set)

Menù Hp > 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 the climatic curve for zone 1 in cooling mode
	Clim Curve Sel	to select the climatic curve in cooling mode
Z1 Heat Mode	Enabled y/n	Enables the climatic curve for zone 1 in heating mode
	Clim Curve Sel	to select the climatic curve in heating mode
Z2 Cool Mode	Enabled	to select the climatic curve in cooling mode
	Clim Curve Sel	to select the climatic curve in heating mode
Z2 Heat Mode	Enabled y/n	Enables the climatic curve for zone 2 in heating 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.

Economy mode (Eco Mode)

Menù Hp > Preset temp > Eco Mode

Enabled y/n	yes/no	enables the ECO function (not available for 2 zones)
Clim Curve Sel	1-9	select the climatic curve from 1 to 9
Timer enabled y/n	yes/no	Enable 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

Silent Mode

Menù Hp > 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 silent mode
Silent Level 1-2		to set silent level
Timer 1 Start		it is possible to set the start time of timer 1
Timer 1 End		it is possible to set the end time of timer 1
Timer 1 On/Off		enable timer 1 or not
Timer 2 Start		it is possible to set the start time of timer 2
Timer 2 End		it is possible to set the end time of timer 2
Timer 2 On/Off		enable timer 2 or not

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

Holiday mode

Menù Hp > 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 board.

Enabled Y/N		activates holiday mode
Dhw Mode On/Off		to set if DHW is on/off during the holidays
Disinfect On/Off		to set if the disinfect function is enabled/disabled during the holidays
Heat Mode On/Off		to set if the heating mode is enabled/disabled during the holidays
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.

Error code

Menù Hp > Service information > sError 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 codes
	Date	date of the event
	Hh.Mm	time of the event

Parameters

Menù Hp > Service information > Parameters

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

Main Set Temp		system temp set point temp based on selected mode
Main Actual Temp		Water delivery temperature (TW_OUT)
Tank Set Temp		Setpoint DHW heater (T5s)
Tank Actual Temp T5		Temperature DHW heater (T5)
Smart Grid Run Time Info		total daily run time of the smart grid

Display

Menù Hp > Service information > Display

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

Date and time		to set the date and time
Contrast	on/off	to set the display contrast
Brightness		to set the display brightness
Backlight time		to set the start of the backlighting
Smart Grid	S.Grid Run Time Set	set working time for SMART GRID

Operation Parameter

Menù Hp > Operation Parameter

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

9.2.2 Heat pump service menu

ACCESS TO THE SERVICE MENU AND CHANGING PARAMETERS CAN ONLY BE CARRIED OUT BY QUALIFIED PERSONNEL.

To access the heat pump service menu, select the line "For serviceman" and press the button.

To continue, you must enter the password "1234". Set the cell value with the SW6 and SW7 buttons while you can change positions with the SW1 and SW2 buttons.

Confirm with the button or cancel with the button.

NOTE

When you access the service menu, the "HEATING/COOLING and DHW" functions are forced to OFF.

When you exit the service menu, the "HEATING/COOLING and DHW" functions must be reactivated manually.

The menu is structured in multiple levels as shown in the following table.

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Description	Lower limit	Upper limit	Remedy	Unit of measurement	Default value
For Serviceman	1 DhW Mode Settings								
		1.2 Disinfect		ENABLING ANTI-LEGIONELLA (function not available)	Yes	No	/	/	No
		1.3 DhW Priority		DHW MODE PRIORITY - heating/cooling or DHW	Yes	No	/	/	Yes
		1.4 DhW Pump		To enable DHW recirculation pump	Yes	No	/	/	No
		1.5 DhW Priority Time Set		Enabling minimum times for DHW mode and system	Yes	No	/	/	No
		1.6 Dt5_On		Hysteresis set point DHW heater	1	30	1	°C	5
		1.7 Dt1S5		Set point temperature difference between water sent to the DHW heater coil and DHW heater temperature.	5	40	1	°C	10
		1.8 T4Dhwmax		The external air temperature to which the heat pump can operate for the heating of the DHW heater	35	43	1	°C	43
		1.9 T4Dhwmin		The minimum external air temperature to which the heat pump can operate for the heating of the DHW heater	-25	30	1	°C	-10
		1.10 T_Interval_Dhw		The minimum switch-off time interval of the compressor between 2 start-ups in DHW mode	5	5	/	min	5
		1.11 Dt5_Tbh_Off		Temperature difference between T5 and T5S which switches off the DHW heater electric heating element.	0	10	1	°C	5
		1.12 T4_Tbh_On		Maximum external air temperature to which the DHW heater electric heating element (TBH) can operate.	-5	50	1	°C	5
		1.13 T_Tbh_Delay		Compressor operating time before the start-up of the DHW heater electric heating element	0	240	5	min	30
		1.14 T5S_Di		DHW heater temperature set point in anti-legionella function	60	70	1	°C	65
		1.15 T_Di_Hightemp		DHW heater temperature retention time at value greater than "T5S_Di" in anti-legionella function	5	60	5	min	15
		1.16 T_Di_Max		Maximum time for the anti-legionella function	90	300	5	min	210
		1.17 T_Dhwhp_Restrict		System maximum operating time with parameter "Dhw Priority Time Set" =YES.	10	600	5	min	30
		1.18 T_Dhwhp_Max		DHW mode maximum operating time with parameter "Dhw Priority Time Set" =YES.	10	600	5	min	90
		1.19 DhW Pump Time Run		Enables or disables the operating timer of the DHW recirculation pump	OFF	ON	/	/	OFF
		1.20 Pump Running Time		t_pumpDHW - time for which the DHW recirculation pump will continue to operate	5	120	1	min	5
		1.21 DhW Pump Di Run		Enables/disables the DHW recirculation pump during the anti-legionella function	Yes	No	/	/	No

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Description	Lower limit	Upper limit	Remedy	Unit of measurement	Default value
For Serviceman	2 Cool Mode Settings	2.1 COOL MODE		Enables or disables the cooling mode	Yes	No	/	/	Yes
		2.2 t_T4_FRESH_C		The set point update time calculated by the climatic curve for the cooling mode	0.5	6	0.5	hours	0.5
		2.3 T4CMAX		The maximum external air temperature to which the heat pump can operate in cooling mode	35	52	1	°C	52
		2.4 T4CMIN		The minimum external air temperature to which the heat pump can operate in cooling mode	-5	25	1	°C	10
		2.5 dT1SC		Hysteresis set point for restarting the heat pump in cooling mode	2	10	1	°C	5
		2.6 Reserved		Reserved	-	-	-	-	-
		2.7 t_INTERVAL_C		Time between shut-down and start-up of the compressor in cooling mode	5	30	1	min	5
		2.8 T1SetC1		Set point 1 of climatic curve no. 9 for cooling mode.	5	25	1	°C	10
		2.9 T1SetC2		Set point 2 of climatic curve no. 9 for cooling mode.	5	25	1	°C	16
		2.10 T4C1		The external air temperature 1 of the climatic curve no. 9 for the cooling mode.	-5	46	1	°C	35
		2.11 T4C2		The external air temperature 2 of the climatic curve no. 9 for the cooling mode.	-5	46	1	°C	25
		2.12 ZONE1 C-EMISSION		The type of zone 1 terminal for cooling mode: FCU (fancoil), RAD (radiator), FLH (floor heating)	FCU/RAD	FLH	/	/	FLH
		2.13 ZONE2 C-EMISSION		The type of zone 2 terminal for cooling mode: FCU (fancoil), RAD (radiator), FLH (floor heating)	FCU/RAD	FLH	/	/	FLH
For Serviceman	3 Heat Mode Setting	3.1 Heat Mode		Enables or disables the heating mode	Yes	No	/	/	Yes
		3.2 T_T4_Fresh_H		The set point update time calculated by the climatic curve for the heating mode	0.5	6	0.5	hours	0.5
		3.3 T4Hmax		The maximum external air temperature to which the heat pump can operate in heating mode	20	35	1	°C	25
		3.4 T4Hmin		The minimum external air temperature to which the heat pump can operate in heating mode	-25	30	1	°C	-15
		3.5 Dt1Sh		Hysteresis set point for restarting the heat pump in heating mode	2	20	1	°C	5
		3.6 Reserved		Reserved	-	-	-	-	-
		3.7 T_Interval_H		Time between shut-down and start-up of the compressor in heating mode	5	60	1	min	10
		3.8 T1Seth1		Set point 1 of climatic curve no. 9 for heating mode.	25	65	1	°C	35°C
		3.9 T1Seth2		Set point 2 of climatic curve no. 9 for heating mode.	25	65	1	°C	28°C
		3.10 T4H1		The external air temperature 1 of the climatic curve no. 9 for the heating mode.	-25	35	1	°C	-5°C
		3.11 T4H2		The external air temperature 2 of the climatic curve no. 9 for the heating mode.	-25	35	1	°C	7°C
		3.12 Zone1 H-Emission		The type of zone 1 terminal for cooling mode: FCU/RAD (fancoil/radiator), FLH (floor heating)	FCU/RAD	FLH	/	/	FCU/RAD
		3.13 Zone2 H-Emission		The type of zone 2 terminal for cooling mode: FCU/RAD (fancoil/radiator), FLH (floor heating)	FCU/RAD	FLH	/	/	FLH
		3.14 T_Delay_Pump		Delay between pump activation and subsequent compressor activation	2	20	0.5	MIN	2
For Serviceman	5 Temp. Type Setting	5.1 Water Flow Temp.		Reserved	Yes	No	/	/	Yes
		5.2 Room Temp.		Reserved	Yes	No	/	/	No
		5.3 Double Zone	Double zone	Enables/disables control of 2 zones	Yes	No	/	/	No
For Serviceman	6 Room Thermostat	6.1 Room Thermostat	none/mode setting/one zone/double zone	Select the type of control on the thermostat digital input (none, mode setting, one zone, double zone)	None / Mode Set / One Zone / Double Zone				None
For Serviceman	7 Other Heating Source	7.1 dT1_IBH_ON		The temperature difference between T1S and T1 for starting the reserve system electric heater.	2	10	1	°C	5
		7.2 t_IBH_DELAY		Compressor operating time before the activation of the backup system electric heater	15	120	5	MIN	30
		7.3 T4_IBH_ON		Maximum external air temperature below which the backup system electric 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
		7.5 t_AHS_DELAY		Compressor operating time before activating the additional heating source (gas boiler)	5	120	5	MIN	30
		7.6 T4_AHS_ON		Maximum external 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	Installation position of the reserve system electric heater IBH PIPE LOOP = 0 if the system electric heater is installed in series with the heat pump; BUFFER TANK = 1 if the system electric heater is installed on the system tank	0	1	0	/	0

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Description	Lower limit	Upper limit	Remedy	Unit of measurement	Default value
For Serviceman	8 Holiday Setting	8.1 T1S H.A. H		The target water output temperature for heating the room in holiday mode	20	25	1	°C	25
		8.2 T5S H.A. DHW		DHW water heater temperature set point in holiday mode	20	25	1	°C	25
For Serviceman	10 Restore Factory Settings	10.1 Restore Factory Settings		Restore Factory Settings	Y	N	/	/	N
For Serviceman	11 Test Run	11.1 Test Run Enable		TEST RUN ENABLE 0 = OFF 1 = ON - to enable the menu "11.2 Trail run steps"	OFF	ON	/	/	OFF
		11.2 Trail run steps		Point Check = to activate the menu "11.3 Point Check" Air purge = ON - to activate the air bleed Water pump = ON - to activate the water pump Cooling = ON - to activate the cooling mode Heating = ON - to activate the heating mode Dhw = ON - to activate the DHW mode	Point Check / Air purge / Water pump / Cooling / Heating / Dhw				Point Check
		11.3 Point Check	3way-valve 1	TEST ON-OFF Allows you to run a functional test on single loads, individually forcing the activation and subsequent switching off.	OFF	ON	/	/	OFF
			3way-valve 2		OFF	ON	/	/	OFF
			PUMPS		OFF	ON	/	/	OFF
			PUMP	Also allows you to temporarily force the system in specific function modes for the test (air bleed, recirculation pump running, etc.).	OFF	ON	/	/	OFF
			PUMPC		OFF	ON	/	/	OFF
			PUMPSOLAR		OFF	ON	/	/	OFF
			PUMPDHW	The switching on/off of each function is always done manually. It is only possible to enable/disable one function at a time; it is not allowed at the same time.	OFF	ON	/	/	OFF
			INNER BACKUP HEATER		OFF	ON	/	/	OFF
			TANK HEATER		OFF	ON	/	/	OFF
			3WAY-VALVE 3	If one function is active and you exit the Test Run menu while it is active, the function will automatically switch off.	OFF	ON	/	/	OFF
For Serviceman	14 Power Input Limitation	14.1 POWER LIMITATION		To limit the power absorbed by the heat pump (refer to "Table 11 - Max current input (A) for different level of power input limitation" on page 62.	0	8	1	/	0
For Serviceman	15 Input Define	15.1 On/Off(M1M2)		Reserved	Yes	No	/	/	No
		15.2 Smart Grid		Enables or disables SMART GRID	Yes	No	/	/	No
		15.3 T1B(Tw2)		Enables or disables temperature probe T1B (Tw2)	Yes	No	/	/	No
		15.4 Tbt1		Enables or disables temperature probe Tbt1	Yes	No	/	/	No
		15.5 Tbt2		Reserved	-	-	/	/	No
		15.7 Solar Input	SOLAR ENABLE	Enables solar input	Yes	No	/	/	No
			IN SOLAR	Type of solar input; Tsolar (to enable the Tsolar solar panel probe temperature); SL1SL2 = do not use	Tsolar	SL1SL2	/	/	SL1SL2
		15.8 F-Pipe Length		Reserved	Yes	No	/	/	No
		15.10 Rt/Ta_Pcb		Reserved	Yes	No	/	/	No
For Serviceman	17 FW Update USB	17.1 Program fw	/	/	/	/	/	/	/
		17.2 Verify Download --%	/	BMS address setting of the heat pump	1	16	1	/	0

NOTE

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

Table 11 - Max current input (A) for different level of power input limitation

Mod. / Limitation level of input power	0	1	2	3	4	5	6	7	8
4-6	18	18	16	15	14	13	12	12	12
8-10	19	19	18	16	14	12	12	12	12

10. SETTINGS TO ENTER BEFORE STARTING UP

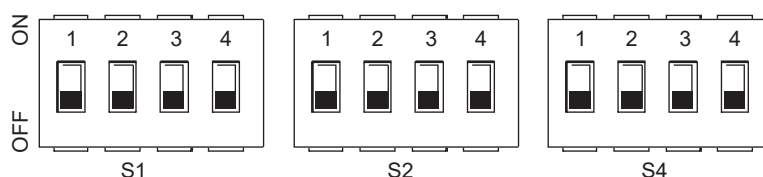
The unit should be configured by the installer to match the installation environment (outdoor climate, installed options, etc.) and user expertise.

10.1 Dip switch setting on indoor unit hydronic board

DIP switch S1,S2 is located on the indoor unit electronic hydraulic board (refer to "fig. 34 - Detail of heat pump hydronic board" on page 44) and allows configuration of additional heating source thermistor installation, the second inner backup heater installation, etc.

⚠ WARNING

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 settings
S1	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
	3/4	0/0 = without IBH and AHS 1/0 = with IBH 0/1 = with AHS for heating mode 1/1 = with AHS for heating mode and DHW mode		OFF / ON
DIP switch		ON=1	OFF=0	Factory settings
S2	1	Starting the pumping after six hours will not be valid	Starting the pumping after six hours will be valid	OFF
	2	without TBH	with TBH	ON
	3/4	0/0 = variable pump speed, maximum prevalence: 8.5 m (GRUNDFOS) 0/1 = constant pump speed (WILO) 1/0 = variable pump speed, maximum prevalence: 10.5 m (GRUNDFOS) 1/1 = variable pump speed, maximum prevalence: 9.0 m (WILO)		ON / ON
DIP switch		ON=1	OFF=0	Factory settings
S4	1	Reserved	Reserved	OFF
	2	Reserved	Reserved	OFF
	3/4	Reserved		OFF / OFF

10.2 Dip switch setting of outdoor unit cooling circuit board

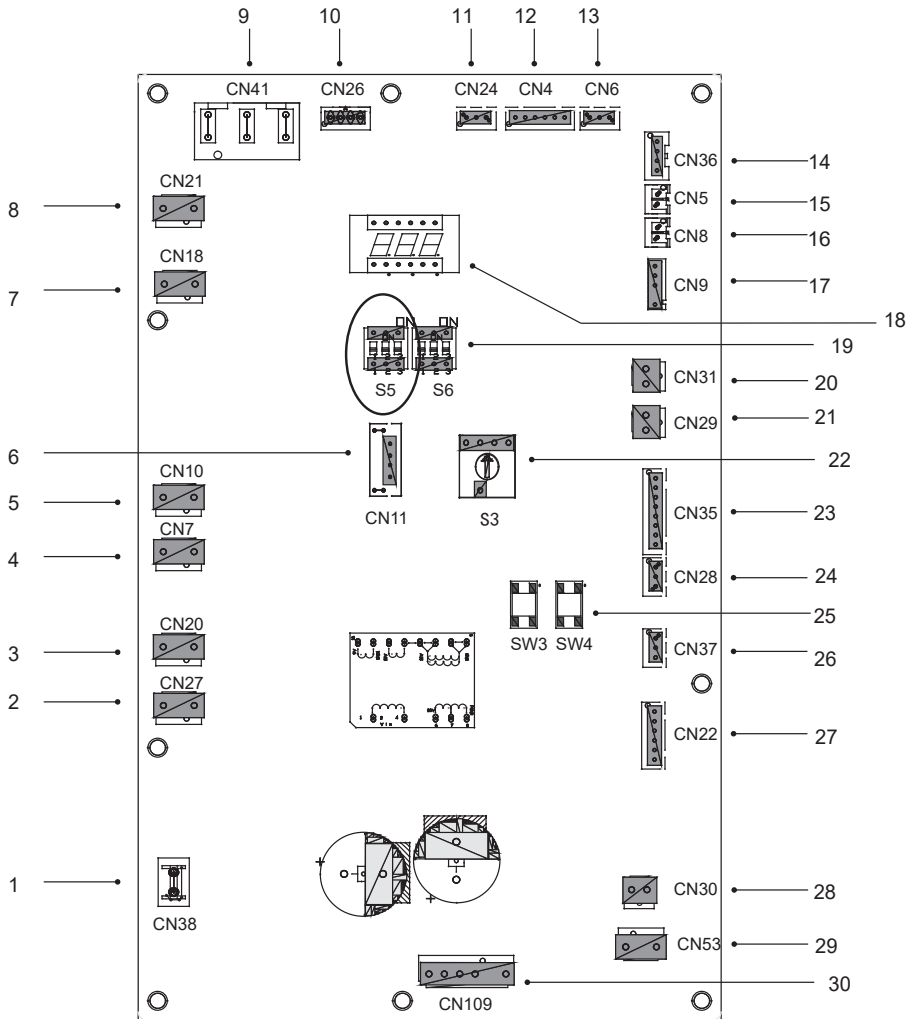


fig. 42 - Position of dip switch S5 on the electronic board of the cooling circuit

Check that the dip switches of the cooling circuit board of the outdoor unit are set as indicated in the following table:

Dip switch S5	S5-1	S5-2	S5-3	
Status	ON	OFF	OFF	

10.3 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.

10.3.1 Temperature curves for heating mode and ECO heating mode

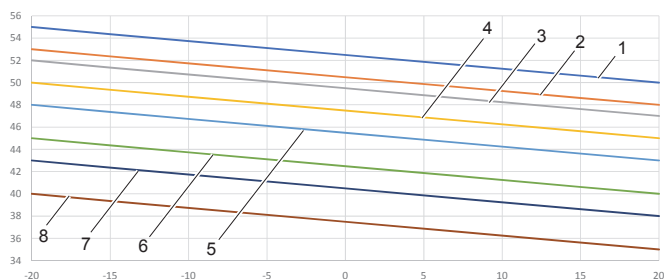
User terminals type (to set up on service menu cool and heat mode setting).
Based on the type of user terminal selected the climatic curves set is limited, refer to the below table:

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

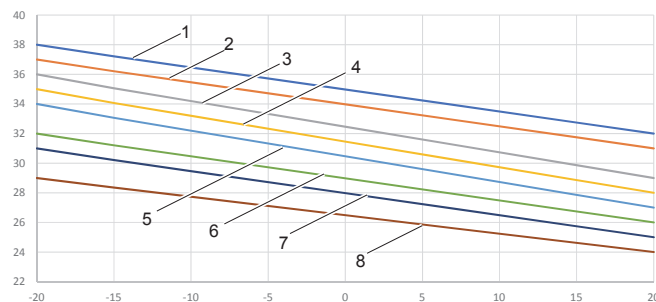
CLIMATIC CURVES (WTS) HEATING MODE

T4 (external air temperature) [°C]	-20	-15	-10	0	7	15	20	curve id climatic	Type of terminal selected on remote control	Set climatic curves
T1S or T2S (system water set point) [°C]	55.0	54.4	53.7	52.5	51.6	50.6	50.0	1	Fancoil or Radiators	H1
	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		
	48.0	47.4	46.7	45.5	44.6	43.6	43.0	5		
	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		
	40.0	39.4	38.7	37.5	36.6	35.6	35.0	8		
	38.0	37.2	36.5	35.0	33.9	32.7	32.0	1	Heating with radiant floor	H2
	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		
	34.0	33.1	32.2	30.5	29.3	27.9	27.0	5		
	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		

Heating mode (climatic curve set to H1)



Heating mode (climatic curve set to H2)



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 "9.2.2 Heat pump service menu" on page 59).

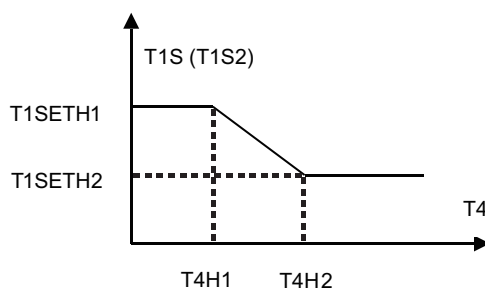
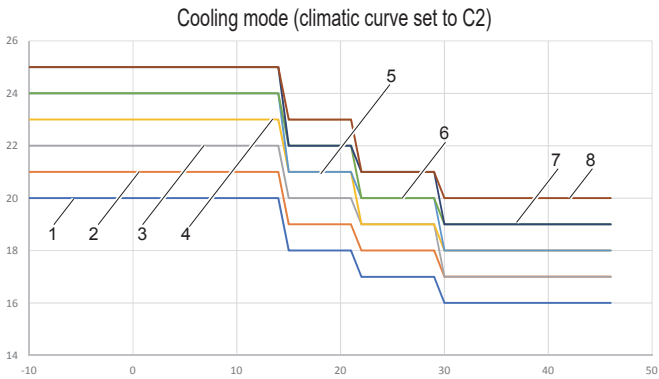
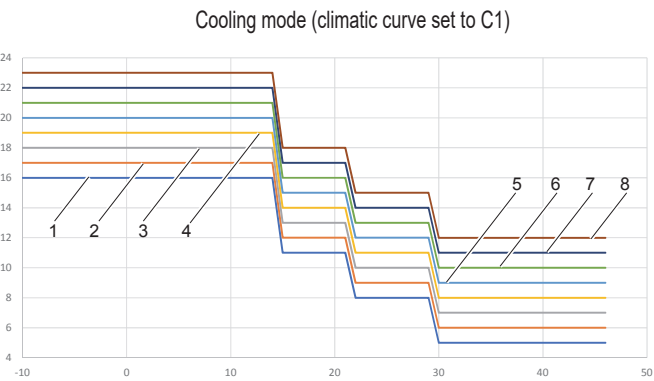


fig. 43 - Climatic curve 9 in heating mode

10.3.2 Temperature curves for cooling mode

CLIMATIC CURVES (WTS) COOLING MODE											
T4 (external air temperature) [°C]	-10	14	15	21	22	29	30	46	curve id climatic	Type of terminal selected on remote control	Set climatic curves
T1S or T2S (system water set point) [°C]	16.0	16.0	11.0	11.0	8.0	8.0	5.0	5.0	1	Fancoil	C1
	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		
	20.0	20.0	15.0	15.0	12.0	12.0	9.0	9.0	5		
	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		
	23.0	23.0	18.0	18.0	15.0	15.0	12.0	12.0	8		
	20.0	20.0	18.0	18.0	17.0	17.0	16.0	16.0	1	Radiant floor heating or radiator	C2
	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		
	24.0	24.0	21.0	21.0	20.0	20.0	18.0	18.0	5		
	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		



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 "9.2.2 Heat pump service menu" on page 59).

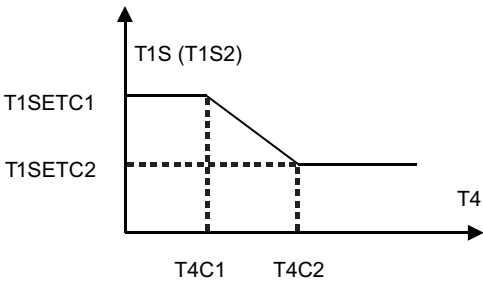


fig. 44 - Climatic curve 9 in cooling mode

11. COMMISSIONING

11.1 Heat pump commissioning

Before starting up for the first time, after a long pause, the following preliminary checks should be carried out on the electrical part and refrigeration 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 there are no traces of oil on the pipes (they are found in line with refrigerant leakages from the cooling circuit).



HAZARD

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 Commissioning the boiler

11.2.1 Boiler preliminary checks

- Check the tightness of the gas system.
- Check the correct pre-load of the expansion vessel.
- Fill the hydraulic system and vent all the air in the boiler and system.
- Make sure that there are not water leaks in the system, DHW circuits, connections or in the boiler.
- Make sure there are no flammable liquids or materials in the immediate vicinity of the boiler.
- Check the correct connection of the electrical system and the grounding function.
- Fill the siphon (see chap. 2.7).



HAZARD

IF THE ABOVE-MENTIONED INDICATIONS ARE NOT OBSERVED, THERE MAY BE A RISK OF SUFFOCATION OR POISONING DUE TO GAS OR EXHAUST FUME LEAKS, RISK OF FIRE OR EXPLOSION. THERE MAY ALSO BE A RISK OF ELECTRIC SHOCK OR FLOODING OF THE ROOM.

11.2.2 First boiler switch-on

- Make sure that there are no DHW withdrawals and requests from the room thermostat.
- Open the gas and check that the gas supply pressure valve upstream from the appliance complies with the one in the technical data table or, in any case, with the tolerance laid down by the regulation.
- Power on the unit, the number of the software version of the control unit and display will appear.
- If the gas type is changed (G20 - G30 - G31 - G230), check if the relevant parameter is suitable for the type of gas present in the supply system ("Menu for modifying the [TSP] parameters" on page 51).
- Check if the value of the flue parameter P68 - "Menu for modifying the [TSP] parameters" on page 51, is suitable for the length of flue installed.
- Switch the boiler to DHW or heating mode.
- In heating mode, make a request: the radiator symbol flashes on the display and the flame is displayed when the burner is lit.
- DHW mod with hot water withdrawal present: the tap symbol flashes on the display and the flame is displayed when the burner is lit.
- Run the combustion check as described in the paragraph "11.2.5 Checking the boiler combustion values" on page 67.



CAUTION

All the regulations described in this chapter can only be performed by qualified personnel.

11.2.3 Successive boiler switch-ons

Every time the unit is powered on, the firmware versions (display) are shown. FH (5 sec) will then appear on the display, followed by Fh (300 sec) which indicates the air vent cycle (this cycle is only performed if at least one function, heating and/or DHW are set to ON).

11.2.4 Transformation of boiler gas feed

The appliance can operate with a gas supply from the II^a or III^a family and is clearly indicated on the packaging and technical data rating plate of the appliance. If it is necessary to use the appliance with a different gas than the set one, proceed as follows:

1. disconnect the power supply and close the gas.
2. Remove the front panel (see "7.8.1 Opening the front panel" on page 42).
3. Apply the rating plate for LPG gas provided in the document bag, near the technical data rating plate.
4. Put the front panel back in place and power up the boiler.
5. Modify the parameter to type of gas:
 - Enter the main menu [MENU] with the button.
 - Follow the installer menu path [Service] > enter the password 1234 > parameter mode [TSP].
 - Select parameter b03 with SW1 and SW2 and set the corresponding value with the SW6 and SW7 buttons:
 - 0 = G20
 - 1 = G30/G31
 - 2 = G230
 - Press the button to confirm.
 - Disconnect the electrical power for 10 seconds and then, reconnect it.
 - Wait until Fh mode has finished.
 - Put the boiler in stand-by and enable calibration mode [AUTO SETUP] (see "Boiler calibration procedure [AUTO SETUP]" on page 67).

11.2.5 Checking the boiler combustion values

MAKE SURE THAT THE FRONT PANEL IS CLOSED AND THE FUME EXTRACTION/EXHAUST PIPES ARE FULLY ASSEMBLED.

1. Put the boiler in heating or DHW mode for at least 2 minutes.
2. Enable the Test mode [Test] (see "11.2.6 Boiler test mode [Test]" on page 68).
3. Using a combustion analyser, connected to the pre-configured parts on the starting accessories on the boiler, check that the CO₂ content in the fumes, with the boiler operating at maximum and minimum power, corresponds to the values in the following table.

Case study		G20	G30/G31	G230
A	New boiler (first switch-on/transformation or electrode replacement)	7.5%-9.9%	9%-11.5%	9%-11.5%
B	Boiler with at least 500 hours of operation	9%+/-0.8	10%+/-0.8	10%+/-0.8

4. If the combustion values do not correspond, adjust the Offset values in the Test mode as described in the following paragraph.

CAUTION

During the **CALIBRATION PROCEDURE [AUTO SETUP]**, the **TEST PROCEDURE [Test]** or during the **CO₂ VALUE CHECK**, the **FRONT PANEL** must be **CLOSED** and the **FUME EXTRACTION/EXHAUST PIPES** fully assembled. The boiler must also not be in **OFF** mode (see detail C in fig. 11) and there must not be a request from the **DHW** or heating circuit.

Boiler calibration procedure [AUTO SETUP]

1. Enter the parameters menu [TSP].
2. Select parameter b27 with the SW1 and SW2 buttons and set it to 5 with the SW6 and SW7 buttons. Confirm with the button. Return to the main menu [MENU].
3. Go back to the installer menu [Service] > enter the password 1234. The menu for the calibration [Auto Setup] is now displayed.
4. Select and confirm it with the button.
5. The procedure will start automatically and find the optimal ignition point (a few tries are required to determine the exact point).
6. After ignition, the burner is positioned at the various powers (max, med, min) indicated by the point ("fig. 45 -").
7. After the calibration sequence has finished, the message [Completed] will be displayed for a few seconds before returning the Service menu.
8. If the ignition sequence described in point "6" is not successful, the message max_err will appear at point and an error code at point ("fig. 45 -").
9. Exit with the SW4 button and unlock the boiler. Repeat the sequence from point "4".

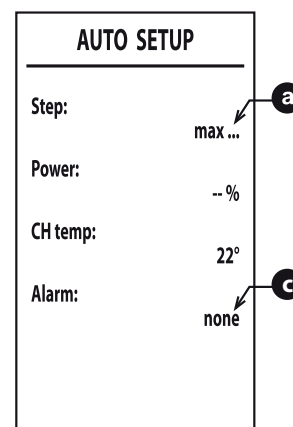


fig. 45 -

The calibration procedure [Auto Setup] can only be performed if parameter b27 is set to 5.

Parameter b27 can be set to 5 manually or in the following ways:

- by modifying the "gas type" parameter b03.
- by setting parameter P67 to 1.

- by modifying the value of parameter P68.
- by performing "Restore factory settings" with parameter b29=10 (after performing this step, switch the power supply off and on again for about ten seconds).

In each of the above-mentioned cases, b27 automatically switches to 5.

The calibration procedure [Auto Setup] must be run in the following cases:

- after replacing the electronic board
- after changing the gas (b03)
- setting parameter P67 to 1
- after changing the value of parameter P68
- after setting parameter b27 to 5 for the replacement of components, such as the electrode, burner, gas valve, fan or for installations with maximum flue resistance
- when the fault conditions A01, A06 have occurred or in other faults where it is requested ("Boiler fault codes" on page 74). Respect the sequence of the fault remedies).

The calibration procedure [Auto Setup] resets the previously recorded combustion parameters and must only be performed in the cases described above.

11.2.6 Boiler test mode [Test]

Perform a heating or DHW request.

1. Enter the main menu [MENU] with the  button. Follow the installer menu path [Service] > enter the password 1234 > test menu mode [Test]. Confirm with the  button.
2. After ignition, the power adjusts to medium power "med". When the combustion value is stable, "med ok" is displayed (point **a**).
3. You can vary the power on 4 levels with the SW1 and SW2 buttons: min (minimum power), med (medium power), max CH (maximum power CH) and max (maximum power DHW) (point **a**).
4. You can adjust the CO₂ with the SW6 and SW7 buttons only when the step value to the set power is followed by "ok" (med ok, min ok, etc.). The "Offset" value will increase by one unit when the SW6 button is pressed (point **b**). The Offset value will change by 3 units when the SW6 and SW7 buttons are pressed for more than 2 sec., (Offset can only adjusted to the steps: max, med and min). When the power value is followed by "ok", the combustion value will be saved.
5. The "Offset" has an adjustment range from -8 to +8. If the value is increased, the CO₂ will decrease; if the value is decreased, the CO₂ will increase.

The CO₂ must not be adjusted with less than 500 hours of burner operation because the system self-adjusts.

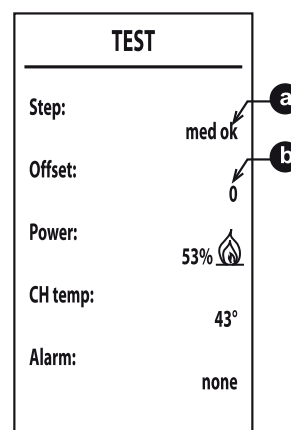


fig. 46 -

To exit the mode, just press the  button.

If **Test mode [Test]** is enabled and there is a DHW request, which activates DHW mode, the boiler remains in Test mode [Test] but the 3-way valve is positioned in DHW.

The **Test mode [Test]**, however, is automatically disabled after 15 minutes or by closing the DHW request (if a DHW request resulted in activating DHW mode).

11.3 Final check before turning on the unit

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.

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" on page 47.

11.5 System delivery water setpoint setting

There must be a request for the unit to operate in heating or cooling mode.

The request can be made:

- by setting the desired operating mode and putting the system in ON from the display (if parameter 6.31 Room Thermostat = 0, i.e. without thermostat) and
- by setting the desired operating mode and the closure of one of the digital inputs H-L1-C (if parameter 6.31 Room Thermostat ≠ 0, i.e. with thermostat).

For details, see "User terminal block connections" on page 42.

11.5.1 Heating mode

The heating setpoint (T1Sh) can be modified by the user between 25 and 65°C via the display (see "8.4 DHW and system set point configuration" on page 49).

The maximum hot water temperature sent to the system before the system is switched off varies depending on whether the heat pump is operating (on its own or in integration with the boiler) or only the boiler.

Heat pump operation (on its own or in integration with the boiler):

Twoutmax (when the heat pump switches off) = minimum value between T1Sstop and T1Sh+dT1Sh where:

- T1stop=maximum temperature allowed to not operate outside the operating limits (see "3.3 Heat pump operational limits" on page 20)
- dT1Sh parameter which can be set under heat pump service menu (see "9.2.2 Heat pump service menu" on page 59).

Example 1:

T1Sh = 50°C
dT1Sh = 5°C
Texternal air = 5°C

In these external air conditions, the heat pump has an operating temperature limit (T1stop) equal to 65°C, so

Twoutmax (before switch-off) = minimum value between 65 and 55 = 55°C.

NB: the boiler may or may not start in integration to the heat pump based on the parameters set in the heat pump service menu. If there is a block due to a heat pump alarm, the boiler will be activated to reach the same Twoutmax value which the heat pump should have reached, i.e. 55°C. When this value is reached, the boiler will be switched off.

Boiler only operation with heat pump stopped due to operating limit reached:

Twoutmax (before the boiler is switched off) = T1Sh + dT1Sh + 5°C where:

- dT1Sh parameter which can be set under heat pump service menu (see "9.2.2 Heat pump service menu" on page 59).

Example 2:

T1Sh = 60°C
dT1Sh = 15°C
Texternal air = 5°C

In these external air conditions, the heat pump has an operating temperature limit (T1stop) equal to 65°C, so Twoutmax (before the heat pump switches off) = lower value between 65 and 75 = 65°C.

NB: the boiler may or may not start in integration to the heat pump based on the parameters set in the heat pump service menu. If the heat pump is blocked due to an alarm or reaching the operating limits (in this case when T1 water temperature output from the unit = T1stop = 65°C), the boiler will either be already activated or will be activated, in any case, to reach the value of Twoutmax = 60 + 15 = 75°C

11.5.2 Cooling mode

The cooling setpoint (T1Sc) can be modified by the user between 5 and 25°C via the display (see "8.4 DHW and system set point configuration" on page 49). The Twoutmin minimum cold water temperature sent to the system before the heat pump is switched off is calculated as follows:

Twoutmax (when the heat pump switches off) = maximum value between T1Sstop and T1Sc where:

- T1stop = minimum temperature allowed to not operate outside the operating limits (see "3.3 Heat pump operational limits" on page 20)

Example 3:

T1Sc = 7°C
Texternal air = 25°C

In these external air conditions, the heat pump has an operating temperature limit (T1stop) equal to 5°C, so,

Twoutmax (before switch-off) = maximum value between 5 and 7 = 7°C.

Example 4:

T1Sc = 7°C
Texternal air = 10°C

In these external air conditions, the heat pump has an operating temperature limit (T1stop) equal to 11°C, so,

Twoutmax (before switch-off) = maximum value between 11 and 7 = 11°C.

11.6 Setting DHW temperature production

The DHW setpoint (T5S) can be modified by the user between 30 and 55°C via the display (see "8.4 DHW and system set point configuration" on page 49). To change the maximum value of the DHW setpoint, parameter P46 must be changed (see "Menu for modifying the [TSP] parameters" on page 51).

12. TROUBLESHOOTING

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

LCD display off

If after touching the keys, the display does not switch on, check that the board is connected to the power supply. Check for the supply voltage using a digital multimeter. If there is no voltage present, check the wiring.

If there is a suitable voltage (Range 195 – 253 Vac), check the state of the fuse (3.15AL@230VAC). The fuse is located on the board. To access it, see "fig. 60 -" on page 82.

12.1 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!

12.2 General symptoms

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

Possible causes	Corrective action
Some parameter settings are incorrect.	Check the parameters T4HMAX, T4HMIN in heating mode. T4CMAX, T4CMIN in cooling mode T4DHWMAX, T4DHWMIN in DHW mode.
The water flow is too low.	Make sure that all the shut-off valves in the hydraulic circuit 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 (with cold system water). Make sure that the expansion vessel 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 higher than the minimum value requested

Symptom 2: the unit is turned on but the compressor does not start (system heating or DHW heating)

Possible causes	Corrective action
The unit could be operating outside its operating range (the water temperature is too low).	If the water temperature is low, the system uses the reserve system electric heater to reach the first minimum water temperature (12°C). Check that the reserve system electric heater power supply is correct. Check that the electric protection of the reserve system electric heater is correct. Check that the thermal cut-off switch of the reserve system electric heater is not activated. Check that the reserve system electric heater meters are not faulty.

Symptom 3: the pump is noisy (cavitation)

Possible causes	Corrective action
There is air in the system.	Bleed the air.
The pump input water pressure is too low.	Check the water pressure. The water pressure must be > 1 bar (measured with cold water). Make sure that the expansion vessel is not broken or empty. Check that the preload of the expansion vessel is correct

Symptom 4: the water pressure relief valve opens

Possible causes	Corrective action
The expansion vessel is broken or empty	Replace the expansion vessel. Refill the expansion vessel.
The filling water temperature in the system is greater than 3 bar.	Make sure that the filling water temperature in the system is about 1 or 2 bar.

Symptom 5: the water pressure relief valve leaks

Possible causes	Corrective action
Dirt has blocked the water safety valve.	Check that the safety valve is working correctly by turning the red knob on the valve anti-clockwise: • If you don't hear a metallic noise, contact the local technical support service. • If the water continues to leak from the unit, close the water input and output check valves and then, contact the local technical support service.

Symptom 6: room heating capacity insufficient when external temperatures are low

Possible causes	Corrective action
The reserve system electric heater operation is not enabled.	Check that the system electric heater is enabled "9.2.2 Heat pump service menu" on page 59. Check if the reserve system electric heater thermal cut-off switch is enabled or not. Check if the DHW electric heater is working, the back-up heater and DHW electric heater cannot operate at the same time.
A high heating capacity has been requested in DHW mode or some parameters are not correctly set (only applicable to installation with DHW heater).	Check that "t_DHWHP_MAX" and "t_DHWHP_RESTRICT" re configured properly: • Check that "HOT WATER PRIORITY" is disabled in the user interface. • Enable "T4_TBH_ON" in the user interface / FOR SERVICEMAN to activate the electric heating element of the DHW boiler for heating domestic hot water.

12.3 Heat pump error codes

When a safety device is activated, an error code is displayed on the user interface (which does not include an external fault). The table below shows a list of all the errors and corrective actions. Reset the safety by turning the unit OFF and back ON. If this procedure to reset the safety device is not successful, contact your local dealer.

Error code	Unit in error	Malfunction or protection	Cause of fault and corrective action
C7	EU	Inverter mode temperature too high	-
E0	IU	Insufficient water flow (after 3 interventions error E8)	1.The wiring is incorrect (short-circuited or open). Reconnect the wire correctly. 2.The water flow is too low. 3. The water flow switch is faulty. Replace the water flow switch.
E1	IU	No phase or neutral or power supply below the permissible level or phase connections inverted (for three-phase unit only)	1.Check that the power supply cables are securely fastened. 2.Check the phase sequence and invert it, if necessary
E2	IU	Communications error between user interface and hydronic board	1.The connection cable has been interrupted. 2.The communication cable sequence is incorrect. Reconnect the cable in the correct sequence. 3.If there is a strong magnetic field or high power interference, like lifts, large power transformers, etc. Add a barrier to protect the unit or move the unit elsewhere.
E3	IU	Final water outlet temperature probe fault (T1)	1.Check the probe resistance. 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4.Faulty probe; replace it.
E4	IU	DHW heater temperature probe fault (T5)	1.Check the probe resistance. 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4.Faulty probe; replace it.
E5	EU	Temperature probe fault. Refrigerant leaking from coil (T3)	Check the probe resistance. 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4.Faulty probe; replace it.
E6	EU	External air temperature probe fault (T4)	Check the probe resistance. 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4.Faulty probe; replace it.
E7	IU	System tank temp. probe fault (Tbt1)	1.Check the probe resistance. 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4.Faulty probe; replace it.
E8	IU	No water flow	Make sure that all the shut-off valves in the hydraulic circuit are completely open. 1. Check if the water filter need cleaning. 2. Make sure there is no air in the system (bleed the air). 3. Check the water pressure. The water pressure must be > 1 bar. 4. Check that the pump speed setting is on the maximum speed. 5. Make sure that the expansion vessel is not broken or empty. 6. Check that the resistance in the water circuit is not too high for the pump.
E9	EU	Compressor extraction temperature probe fault (Th)	Check the probe resistance. 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4.Faulty probe; replace it.
EA	EU	Compressor drainage temperature probe fault (Tp)	Check the probe resistance. 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4.Faulty probe; replace it.
Eb	IU	Solar temperature probe fault (Tsolar)	1.Check the probe resistance. 2.The probe connector is disconnected. Reconnect it. 3.The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4.Faulty probe; replace it.

Error code	Unit in error	Malfunction or protection	Cause of fault and corrective action
Ec	IU	System accumulation lower temperature probe fault (Tbt2)	1. Check the probe resistance. 2. The probe connector is disconnected. Reconnect it. 3. The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4. Faulty probe; replace it.
Ed	IU	Plate exchanger input water temperature probe fault (Tw_in)	1. Check the probe resistance. 2. The probe connector is disconnected. Reconnect it. 3. The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4. Faulty probe; replace it.
EE	IU	EEPROM fault on hydronic board	The hydronic control board is faulty; replace it
F1	EU	DC current too low	-
H0	UI / UE	Communication error between indoor and outdoor unit	1. The cables between the hydronic board of the indoor unit and outdoor unit are not connected. Reconnect them. 2. If there is a strong magnetic field or high power interference, like lifts, large power supply transformers, etc., add a barrier to protect the unit or move the unit elsewhere.
H1	EU	Communications error between board A of the inverter module and board B of the main control board of the outdoor unit	1. Check that the boards are powered. Check that the PCB indicator light on the inverter module is on or off. If the light is off, reconnect the power supply cable. 2. If the indicator light is off, check the cable connection between the inverter module board and the main control board; if the cable is loose or broken, reconnect the cable or replace it with a new one. 3. Replace both the boards in turn to see if one of the 2 is faulty.
H2	IU	Refrigerant liquid temperature probe fault (T2)	1. Check the probe resistance. 2. The probe connector is disconnected. Reconnect it. 3. The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4. Faulty probe; replace it.
H3	IU	Refrigerant gas temperature probe fault (T2B)	1. Check the probe resistance. 2. The probe connector is disconnected. Reconnect it. 3. The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4. Faulty probe; replace it.
H4	EU	Three times P6 fan protection	refer to P6
H5	IU	Temperature probe fault. Room (Ta)	1. Check the probe resistance. 2. The probe connector is disconnected. Reconnect it. 3. The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4. Faulty probe; replace it.
H6	EU	Fan protection	1. Strong wind against the expulsion flow of the fan can cause the fan to rotate in the reverse direction. Change the position of the unit or create a shelter to avoid this phenomenon. 2. Fan motor broken, replace it with a new motor
H7	EU	Voltage protection outside limits	1. Check if the power supply voltage falls within the permitted range. 2. Switch off and on again multiple times in rapid succession. Leave the unit switched off for more than 3 minutes, then switch it on again. 3. Faulty hydronic board. Replace it with a new one.
H8	EU	Pressure sensor fault	1. The pressure sensor connection is loose; reconnect it. 2. Pressure sensor fault. Replace it with a new one.
H9	IU	Water outlet temperature probe fault for zone 2 (Tw2)	1. Check the probe resistance. 2. The probe connector is disconnected. Reconnect it. 3. The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4. Faulty probe; replace it.
HA	IU	Plate heat exchanger water outlet temperature probe fault (Tw_out)	1. Check the probe resistance. 2. The probe connector is disconnected. Reconnect it. 3. The probe connector is wet. Remove the water and dry the connector. Apply waterproof adhesive tape. 4. Faulty probe; replace it.
Hb	IU	Appears after 3 interventions of the "PP" error with Tw_out < 7°C	Refer to "PP" error.

Error code	Unit in error	Malfunction or protection	Cause of fault and corrective action
Hd	IU	Communications error between the hydronic boards (for cascaded applications)	1. The signal cables of the slave and master units are not correctly connected. After checking that all the signal cables are securely connected and ensuring that there are no strong magnetic interferences, switch on again; 2. There are two or more hydronic boards connected to the user interface. Keep only one user interface connected to the master unit and then, switch on again; 3. The start delay between the master and slave units is greater than 2 minutes. After ensuring that the interval between the start-up of the master unit and slave unit is less than 2 min, switch on again; 4. Conflict between the master and slave unit addresses: When you press the SW2 button on the main slave unit board, the address code of the slave unit is displayed (the code used normally goes from 1, 2, 3 ... to 15); check if there is a duplicated address. If there is a duplicated address, after switching off the system, set S4-1 to "ON" on the control unit hydronic board and on the hydronic board which displays the "Hd" error. Switch on all the units again, wait 5 minutes without the "Hd" error, switch off again and set S4-1 to "OFF". The system will be reset.
HE	IU	Communications error between the main board and the thermostat expansion board	The RT/Ta board is correctly configured on the user interface, but the thermostat expansion board is not connected or the communication between the board and the hydronic board is interrupted.
HF	EU	Eeprom EE error on the inverter module board	1. EEprom error; rewrite the data on the EEprom. 2. The EEprom is faulty; replace it with a new one. 3. The inverter module board is broken; replace it with a new one.
HH	EU	H6 displayed 10 times in 2 hours	Refer to H6
HP	EU	Low pressure protection in cooling $P_e < 0.6$ occurred 3 times in one hour	Refer to P0
L0	EU	Inverter module protection	-
L1	EU	Protection for low voltage on DC bus	-
L2	EU	Protection for high voltage on DC bus	-
L4	EU	MCE error	-
L5	EU	Zero speed protection	-
L7	EU	Phase sequence error	-
L8	EU	Frequency variation of the compressor greater than 15Hz per second	-
L9	EU	Working frequency of the compressor different over 15Hz compared to target frequency.	-
P0	EU	Low pressure switch protection	1. The system has no refrigerant. Look for the leak, repair it and fill with the correct load. 2. The water flow is too low in cooling mode. Increase the water flow. 4. The electric expansion valve is blocked or the power supply has come loose. Try to release the valve by gently tapping it. Connect/disconnect the connector multiple times to ensure that the valve is working correctly.
P1	EU	High pressure switch intervention	-
P3	EU	Compressor electrical current absorption greater than maximum limit allowed	-
P4	EU	Compressor drain temperature (T_p) greater than the maximum limit allowed	-
P5	IU	Temperature difference between T_{w_out} and T_{w_in} too high	1. Make sure that all the shut-off valves in the water circuit are completely open. 2. Check if the water filter need cleaning. 3. Make sure there is no air in the system (bleed the air). 4. Check the water pressure. The water pressure must be > 1 bar 5. Check that the pump speed setting is on the maximum 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.
P6	EU	Inverter module protection	-
Pb	IU	Antifreeze protection	The unit will automatically return to normal operation.
Pd	EU	Coil probe temperature (T_3) greater than maximum limit allowed in cool mode	-
PP	IU	Error due to difference in temperature between T_{wout} and T_{win} not in line with the operating mode. The error appears in heat mode if T_{wout} is less than T_{win} for more than 15 minutes	1. Check the resistance of the 2 temperature probes. 2. Check the position of the 2 probes. 3. The probe connector is disconnected. Reconnect it. 4. One or both probes are faulty; replace them. 5. The four-way valve is blocked. Restart the unit to allow the valve to be released. 6. The four-way valve is broken; replace it.

UI: Indoor unit
UE: Outdoor unit

12.4 Boiler fault codes

The screen displays the fault id code in the event of faults or malfunctions.

There are faults which cause permanent blocks (marked with the letter "A"): to reset operation, just press the  button for 5 seconds and confirm with the  button or with RESET on the remote timer control (optional), if installed. If the boiler does not restart, the fault must be resolved.

Other faults cause temporary blocks (marked with the letter "F") which are automatically reset as soon as the value returns to the normal operation range of the boiler.

Fault code	Fault	Possible cause	Remedy
A01	The burner does not ignite	No gas	"Check that the gas flow to the boiler is normal and that the air has been eliminated from the pipes"
		Detection/ignition electrode fault	"Check the electrode wiring and make sure it is correctly positioned and free of any deposits. Replace the electrode, if necessary."
		Insufficient mains gas supply pressure	Check the mains gas supply pressure
		Siphon clogged	Check and clean the siphon, if necessary
		Air/fume pipes clogged	"Unclog the flue, fumes exhaust pipes, air inlet and terminals."
		Incorrect calibration	"Run the calibration procedure [AUTO SETUP]."
		Faulty gas valve	"Check and replace the gas valve, if necessary"
A02	Flame signal present with burner off	Electrode fault Board fault	"Check the ionisation electrode wiring"
			Check the electrode for damage
			Electrode grounded
			Cable grounded
			Check and clean the siphon, if necessary
			Check the board
F05	Fan fault	No 230V power	Check the wiring of the 5-pole connector
		Tachometric signal interrupted	
		Fan damaged	"Check the fan and replace it, if necessary"
A06	No flame after ignition phase	Ionisation electrode fault	"Check the position of the ionisation electrode, remove any deposits and run the calibration procedure [AUTO SETUP]. Replace the electrode, if necessary."
		Flame unstable	Check the burner
		air/fume pipes clogged	"Unclog the flue, fumes exhaust pipes, air inlet and terminals"
		Siphon clogged	Check and clean the siphon, if necessary
		Incorrect calibration	"Run the calibration procedure [AUTO SETUP]."
		Insufficient mains gas supply pressure	Check the mains gas supply pressure
F15 - A07	High fumes temperature	The fumes probe detects an excessive temperature	Check the exchanger
			Check the fumes probe
			Check the flue material parameter
A08	Overtemperature protection triggered	Sensor not correctly positioned on the delivery pipe or damaged	"Check the correct position and operation of the heating sensor and replace it, if necessary"
		"No water circulation in the system"	Check the circulator
		Air in the system	Bleed the system
A09	Exchanger protection triggered	"No water circulation in the system"	"Check the circulator and heating system"
		"Poor circulation and abnormal increase in the delivery probe temperature"	Bleed the system
		exchanger clogged	check the exchanger and system

Fault code	Fault	Possible cause	Remedy
F09	Overtemperature protection triggered	Delivery sensor damaged	"Check the correct position and operation of the delivery sensor and replace it, if necessary"
		"No water circulation in the system"	"Check the circulator and heating system"
		Air in the system	Bleed the system
F10	Delivery sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring short-circuited	
		Wiring interrupted	
F11	Return sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring short-circuited	
		Wiring interrupted	
A11	Gas valve connection	"Damage to the electrical connection between the control unit and gas valve"	check the wiring or replace the valve
F12	DHW sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring short-circuited	
		Wiring interrupted	
F13	Fumes probe fault	Probe damaged	Check the wiring or replace the fumes probe
		Wiring short-circuited	
		Wiring interrupted	
A14	"Fumes evacuation pipe safety device triggered"	"A07 fault generated 3 times in the last 24 hour"	See fault A07
F34	"Supply voltage lower than 180V"	Problems with the mains electricity	Check the electrical system
F35	"Power supply frequency incorrect"	Problems with the mains electricity	Check the electrical system
A23- A24- A26-F20 F21- F40- F47-F51	Pressure sensor fault	"Parameter configured incorrectly"	"Check if parameter b04 is configure correctly"
		"System pressure problems (transducer)"	System pressure value outside the set limits (transducer)
		b06 set to 3	
F37	System water pressure incorrect	Pressure too low	Load the system
		Pressure transducer not connected or damaged	Check the pressure transducer
F39	External probe fault	Probe damaged or wiring short-circuited	Check the wiring or replace the sensor
		"Probe disconnected after activating sliding temperature"	Reconnect the external probe or disable the sliding temperature"
F19	Board parameter fault	"Incorrect setting of board parameter"	"Check and change parameter b15 to 3, if necessary"
F50 - F53	Thermostat limit fault with parameter b06 = 1 or 4	"No/poor water circulation in the system"	"Check the circulator and heating system"
		Air in the system	Bleed the system
		Incorrect parameter	Check the correct parameter setting
F64	Maximum number of consecutive resets exceeded	Maximum number of consecutive resets exceeded	"Disconnect the power supply to the boiler for 60 seconds and then, reset the boiler"
F62	Calibration request	"New board or boiler not yet calibrated"	"Run the calibration procedure [AUTO SETUP]."
A88	Combustion control or gas valve specific errors	"Calibration activated with burner lit. Combustion problem, gas valve or electronic board faulty"	"Reset the fault and run the calibration procedure [AUTO SETUP]". Replace the gas valve or the electronic board, if necessary."

Fault code	Fault	Possible cause	Remedy
F65 ÷ F98	Combustion control specific errors	Fumes pipe clogged. Low gas pressure. Condensate siphon clogged. Combustion problem or fumes recirculation	"Check that the fumes pipes and condensate siphon are not clogged. Check the correct pressure of the gas supply. Run the CO ₂ adjustment in TEST mode. Run the calibration procedure [AUTO SETUP], if necessary."
A65 ÷ A97	Combustion control specific errors	"Fumes pipe clogged. Low gas pressure (A78 - A84). Condensate siphon clogged. Combustion problem or fumes recirculation"	"Check that the fumes pipes and condensate siphon are not clogged. Check the correct pressure of the gas supply. Run the CO ₂ adjustment in TEST mode. Run the calibration procedure [AUTO SETUP], if necessary."
F99	Communication fault between the display and control unit	"Connection cable interrupted or not inserted"	Check the connection
		"Parameters misaligned between control unit and display"	Disconnect and reconnect the power supply
		Run a fault default reset	Disconnect and reconnect the power supply
A98	Too many SW errors or error appeared for board replacement	Replace the board	"Reset the fault and proceed with the calibration procedure [AUTO SETUP]."
		"Fumes pipe clogged. Low gas pressure. Condensate siphon clogged. Combustion problem or fumes recirculation."	"Resolve the problem first, reset the fault and check correct ignition. Run the calibration procedure [AUTO SETUP]. Replace the board, if necessary."
A99	Generic error	Electronic board hardware or software error	"Reset the fault and check correct ignition. Run the calibration procedure [AUTO SETUP]. Replace the board, if necessary, if the problem persists."
F96	Flame combustion specific errors	Flame unstable or flame signal unstable after ignition.	"Check the gas supply, fumes and condensate drain pipes. Check the correct position and status of the electrode. After about 3 minutes, the error is reset."
A44	Multiple requests error	Repeated requests for short period	"Check if there are any pressure peaks in the DHW circuit. Change parameter b11, if necessary."
A80	Parasitic flame signal after valve closure	Electrode problem. Gas valve problem. Electronic board problem.	"Check the correct position and status of the electrode. Check the electronic board. Check the gas valve and replace it, if necessary."

13. MAINTENANCE

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



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 sucking 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 shocks 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	Residual risk hazard	Mode	Precautions
Refrigeration and hydraulic pipes	Burns	Contact with pipes	Avoid contact by wearing protective gloves
Refrigerant pipes, plate heat exchanger.	Explosion	Excessive pressure	Switch off the machine, check the high pressure switch and the safety valve, fans and capacitor
Refrigerant pipes	Ice burns	Refrigerant leakage	Do not pull the pipes
Electric cables, metal parts	Electrocution, serious burns	Insulation of faulty cable, live metal parts	Suitable electric protection (correct unit grounding)

General rules for maintenance

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 a databook (not supplied), however, 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 troubleshooting, if required.

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

13.1 Access to internal components



Some components inside the unit can reach temperatures high enough to inflict serious burns. Before carrying out any operation, wait until these components have cooled down or, alternatively, wear suitable gloves.

To access the internal components, see "7.8.1 Opening the front panel" on page 42.



The casing also acts as a sealed chamber in this appliance. After every operation which involves opening the boiler, check correct assembly and tightness of the front panel.

Proceed in reverse order to reassemble the front panel. Make sure that it is correctly secured to the upper fastenings and fully resting in the sides. The head of screw "A", once tightened, should not be below the lower profile (see "fig. 28 - assembly with bottom screws" on page 42).

To access the internal components after removing the front panel, you must remove the two fastening screws of the heat pump electric box, then turn it first to the left and afterwards, turn the expansion vessel to the right (fig. 47). It is then possible to turn the boiler electric box downwards after removing the two lower screws (see "fig. 59 -" on page 82).

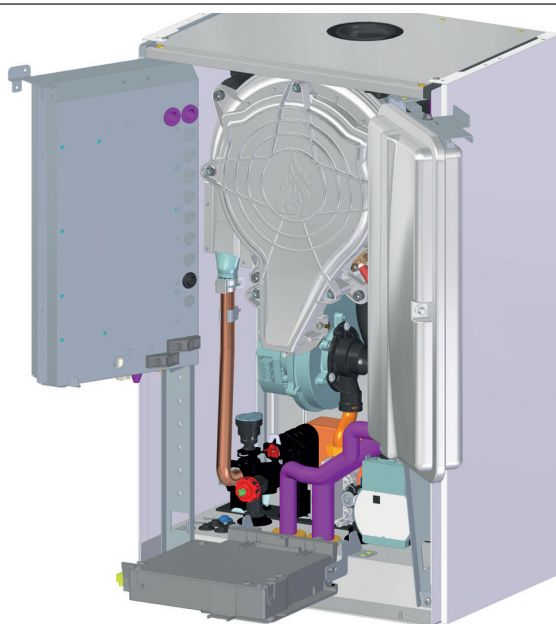


fig. 47 - access to internal components

13.2 Water load and system hydraulic pressure adjustment

The loading pressure to the cold system, read on the boiler hydrometer (detail 2 - fig. 48), must be about 1.0 bar. If the system pressure drops to values below the minimum, the boiler stops and the display shows fault F37. Pull out the loading knob (detail 1 - fig. 48) and turn it anti-clockwise to reset it to the initial value. Always close it at the end of the operation.

Once the system pressure has been restored, the boiler will activate the air vent cycle for 300 seconds identified on the display with Fh.

To prevent the boiler from blocking, it is advisable to periodically check the pressure indicated on the pressure gauge when the system is cold. If the pressure is below 0.8 bar, we recommend restoring it.

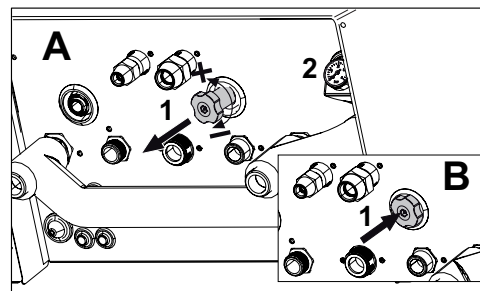


fig. 48 - Loading knob

13.3 System water drain

The drain tap ring is positioned under the safety valve located inside the device. To drain the system, turn the ring (ref. 1 - fig. 49) anti-clockwise to open the tap. Do not use any tools and only use your hands.

To drain only the indoor unit water, first open the shut-off valve between the system and indoor unit before turning the ring.

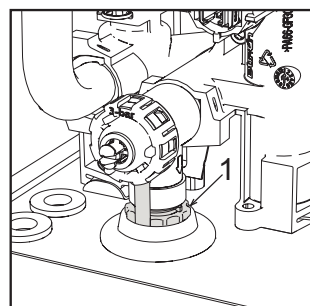


fig. 49 - Safety valve with drain tap

13.4 Periodic maintenance of the heat pump

The inspection tasks on the unit described below do not require specific technical expertise and are summed up as simple checks on some of the unit components. The table below lists the recommended checks to carry out and the frequency with which to perform them.

Carry out more frequent checks and tasks in the event of more intense use (continual or highly intermittent, close to the operating limits, etc.) or critical uses (essential service such as data centres, hospitals, etc.)

Maintenance work	Frequency
Visual inspection of the unit structure	Annual
Hydraulic system check	Annual
Electrical system check	Annual
Finned coil and fan check	Annual
Heat pump water exchanger check	Annual
Water filter check	Annual
Heat pump circulation pump check	Annual

• Visual inspection of the unit structure

When checking the status of unit structure components, pay extra attention to the parts subject to oxidation. If the onset of oxidation is visible, treat it with paint that will either eliminate or reduce the phenomenon. Make sure that the external panels of the unit are firmly secured.

Poor fastening causes noise and abnormal vibrations.

• Hydraulic system check

Visually check that the hydraulic circuit does not have any leaks. Check that the water filters are clean.

• Electrical system check

Check that the unit supply cables are not split, cracked or altered in any way that could compromise the insulation.

Perform an accurate visual inspection of the components of the electrical panel to check for damaged or badly connected components or cables (check the tightness of the terminal screws).

• Check the finned coil and fans (outdoor unit)

The finned coil exchanger consists of fins made of aluminium or other thin material, so any contact, even accidental, could cause injury from cuts.

Finned coil

Given the function of this component, it is important that the exchanger surface is free from any obstructions caused by objects that could decrease the fan air flow rate and thus, the performance of the unit. The potential tasks to carry out are:

- removing all the impurities with a brush or by hand, such as paper, leaves, etc. which could obstruct the coil surface;
- if objects are deposited on the fins and removing them manually proves difficult, use a pressurised air or water jet on the surface of the aluminium coil, taking care to aim the jet vertically to the coil to avoid damaging the fins and in the opposite direction of the air movement induced by the fan;
- comb the fins with the right spacing of the teeth for fins if parts of the fins are bent or crushed.

Fans

Carry out a visual inspection of the support grille and unit structure grille. Check the fan bearings and the closure of the box terminal covers and cable glands. Deteriorated bearings cause noise and abnormal vibrations.

• Heat pump water exchanger check

The exchanger must guarantee the maximum thermal exchange possible, so it must be free from any build-up or dirt that could reduce its efficiency. Check that the difference in temperature between the output water and the evaporation/condensate temperature does not increase. If the difference exceeds 8-10°C, the exchanger must be cleaned on the water side, taking care to follow these indications: the water circulation must be in the opposite direction compared to the normal one, the fluid speed must not exceed 1.5 times the rated speed, use water or mildly acidic materials for washing and clean water only for the subsequent rinse.

• Water filter check

Check the cleanliness of the water filter and eliminate any impurities that obstruct the correct water flow, contributing to the load losses and thus, the energy consumption of the pumps.

• Heat pump circulation pump check

Check for the absence of water leaks.



CAUTION

After unscheduled maintenance work on the cooling circuit with the replacement of components, carry out the following tasks before restarting the machine:

- Pay the utmost attention when restoring the refrigerant load indicated on the machine rating plate.
- Open all the valves in the cooling circuit.
- Connect the electric power supply and grounding correctly.
- Check all the hydraulic connections.
- Check that the water pump is working correctly.
- Clean the water filters.
- Check that the finned coils are not dirty or clogged.
- Check that the fans are turning correctly.
- Check the correct intervention of the safety devices with particular attention to the water differential pressure switch and/or water flow switch.

13.5 Unscheduled maintenance and replacement of heat pump components

13.5.1 Heat pump circulator

NOTE

Before starting with the following instructions, we recommend organising protective devices to protect the inner parts and the electrical system of the indoor unit from any accidental water leaks.



fig. 50 - Replacement/maintenance of the heat pump circulator

- Disconnect the electrical power supply and close the gas tap upstream of the valve.
- Disconnect the power supply to the circulator.
- Drain the water from the indoor unit (see "13.3 System water drain" on page 78).
- Unscrew the couplings and remove the circulator (fig. 50.)

13.6 Periodic boiler maintenance

To maintain the correct operation of the appliance, a qualified technician must perform an annual check which includes the following checks:

- The control and safety devices (gas valve, flow meter, thermostats, etc.) must work correctly.
- The fume evacuation circuit must be fully efficient.
- The sealed chamber must be tight.
- The air-fume pipes and terminal must be free from obstacles and leaks
- The burner and exchanger must be clean and free from build-up. Use suitable brushes for any cleaning required. Do not use chemical products under any circumstances.
- The electrode must be free from build-up and correctly positioned.
- The electrode must be freed from build-up using only brushes with non-metal bristles and must NOT be sanded.
- The gas and water systems must be tight.
- The water pressure of the cold system must be about 1 bar; if it is not, restore it to this value.
- The circulation pump must not be blocked.
- The expansion vessel must be loaded.
- The gas flow and pressure must correspond to the indications in the respective tables.
- The condensate evacuation system must be efficient and must not have any leaks or blockages.
- The siphon must be filled with water.
- Check the quality of the water in the system.
- Check the state of the exchanger insulation.
- Check the gas connection between the valves and the venturi tubes.
- If necessary, replace the burner gasket because it is damaged.
- At the end of the inspection, always check the combustion parameters (see "checking the combustion values").

13.7 Unscheduled maintenance and replacement of boiler components

After replacing the gas valve, burner, electrode and electronic board, the calibration procedure [AUTO SETUP] must be performed (see "Boiler calibration procedure [AUTO SETUP]" on page 67). Then, follow the instructions in paragraph "11.2.5 Checking the boiler combustion values" on page 67.

13.7.1 Replacement of the boiler gas valve

CAUTION

Disconnect the electrical power supply and close the gas tap upstream of the valve

- Disconnect the electric connectors "1" ("fig. 51 -").
- Disconnect the gas supply pipe "2" ("fig. 51 -")
- Loosen the screws "3" ("fig. 52 -")
- Extract the gas valve "4" gas diaphragm "5" ("fig. 53 -").
- Install the new valve following the instructions described in reverse order.

- If the gas diaphragm needs replacing, refer to the instruction leaflet provided in the kit.

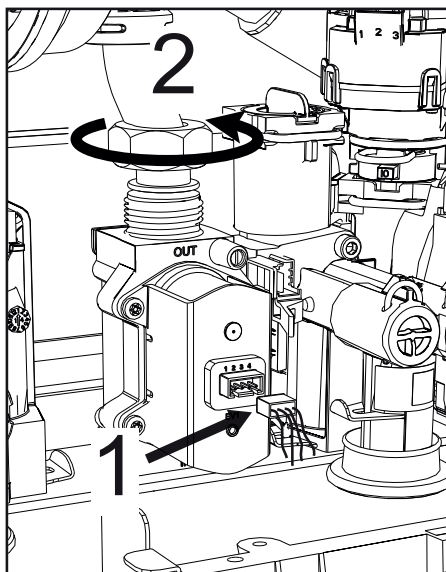


fig. 51 -

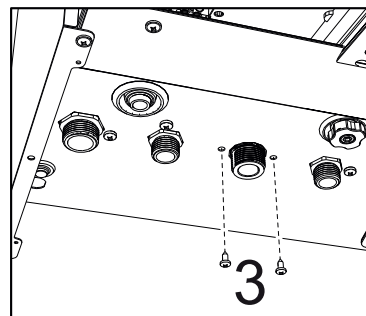


fig. 52 -

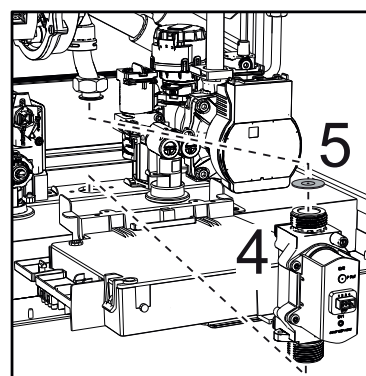


fig. 53 -

13.7.2 Replacement of the boiler main heat exchanger

INFO

Before starting with the following instructions, we recommend organising protective devices to protect the inner parts and the boiler electric box from any accidental water leaks.

CAUTION

Disconnect the electrical power supply and close the Ngas tap upstream of the valve.

- Disconnect the fumes sensor connector 1.
- Disconnect the fan connector
- Disconnect the ignition electrode connector connected to the board.
- Drain the water of the boilers heating circuit.
- Extract the flue connection (concentric or accessory for separate flues)
- Remove the fan
- Remove the springs of the two pipes on the exchanger, pimp and hydraulic unit
- Loosen the two lower screws "5" fastening the exchanger to the frame ("fig. 57 -")
- Loosen the two upper screws "6" fastening the exchanger to the frame ("fig. 58 -")
- Remove the exchanger
- Insert the new exchanger resting it on the lower screws "5"
- Perform the steps in reverse order to assemble it

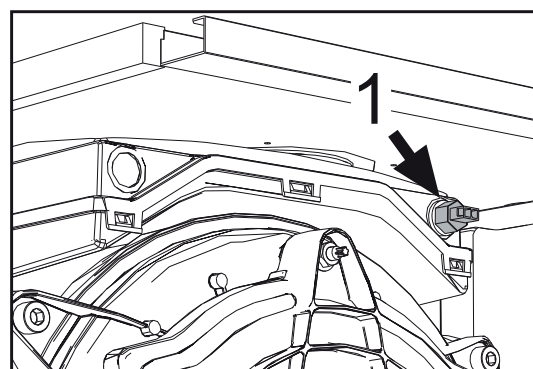


fig. 54 -

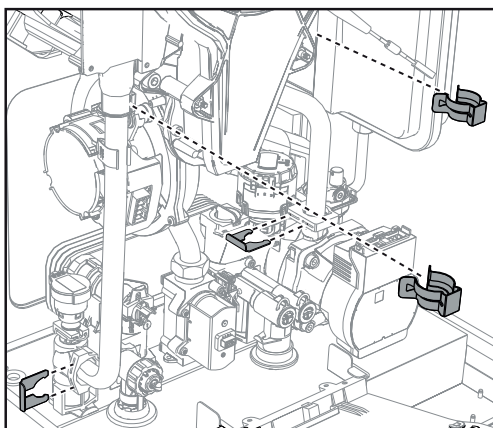


fig. 55 -

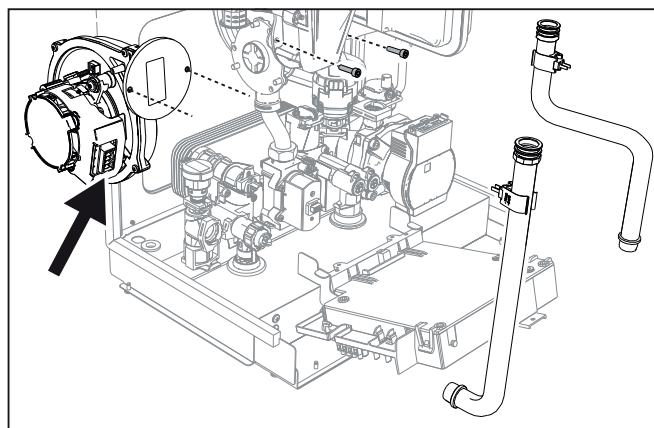


fig. 56 -

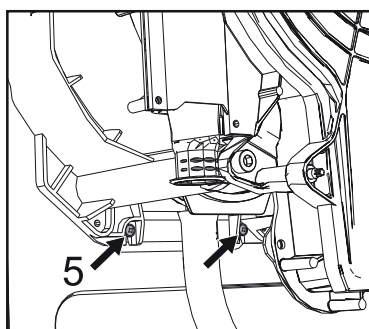


fig. 57 -

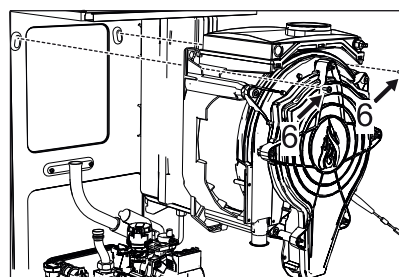


fig. 58 -

13.7.3 Replacement of the boiler electronic board



CAUTION

Disconnect the electrical power supply and close the gas tap upstream of the valve.

- Loosen the two screws "1" and rotate the dashboard.
- Lift the cover of the electric box by releasing the catches "2".
- Loosen the screws "3". Raise the board by releasing the side catches "4".
- Remove all the electrical connectors.
- Insert the new board and reconnect the electrical connections.

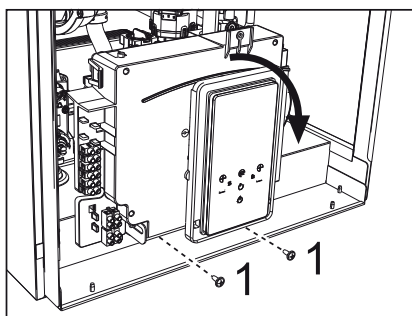


fig. 59 -

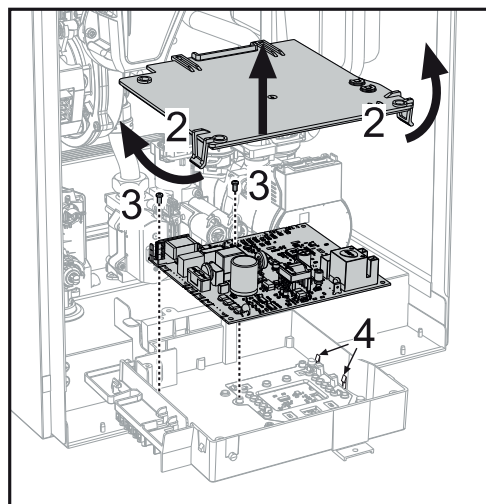


fig. 60 -

13.7.4 Replacement of boiler fan



CAUTION

Disconnect the electrical power supply and close the gas tap upstream of the valve

- Remove the electrical connections for the fan.
- Loosen the screws "1" and the connection of the gas pipe "2".

- Remove venturi tube "3".

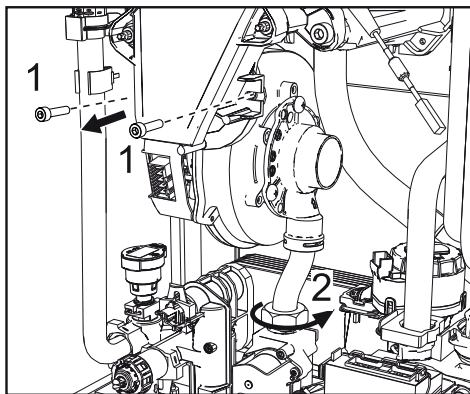


fig. 61 -

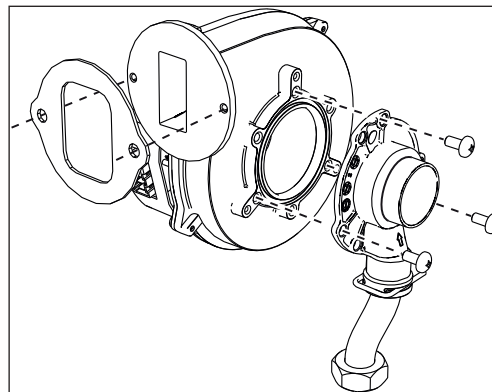


fig. 62 -

13.7.5 Replacement of boiler pressure transducer



NOTE

Before starting with the following instructions, we recommend organising protective devices to protect the inner parts and the boiler electric box from any accidental water leaks.

- Drain the water of the heating circuit.
- Remove the pressure transducer connector "2" and the fastening clip "1".
- Remove the pressure transducer "2".

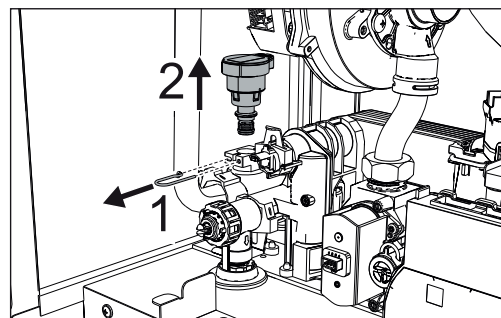


fig. 63 -

13.7.6 Boiler water inlet filter cleaning



CAUTION

Disconnect the electrical power supply and close the gas tap upstream of the valve

- Isolate the boiler by turning the shut-off valve at the domestic water and system inlet.
- Clean the water inlet filter.

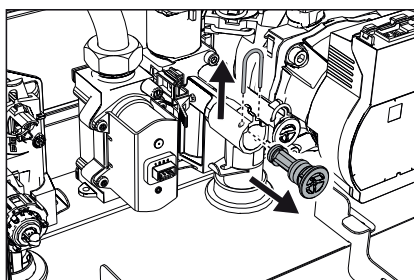


fig. 64 -

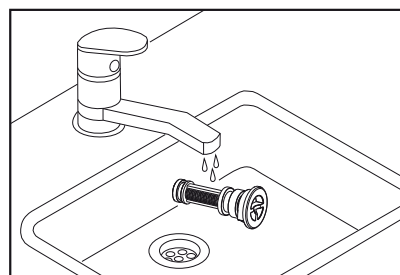


fig. 65 -

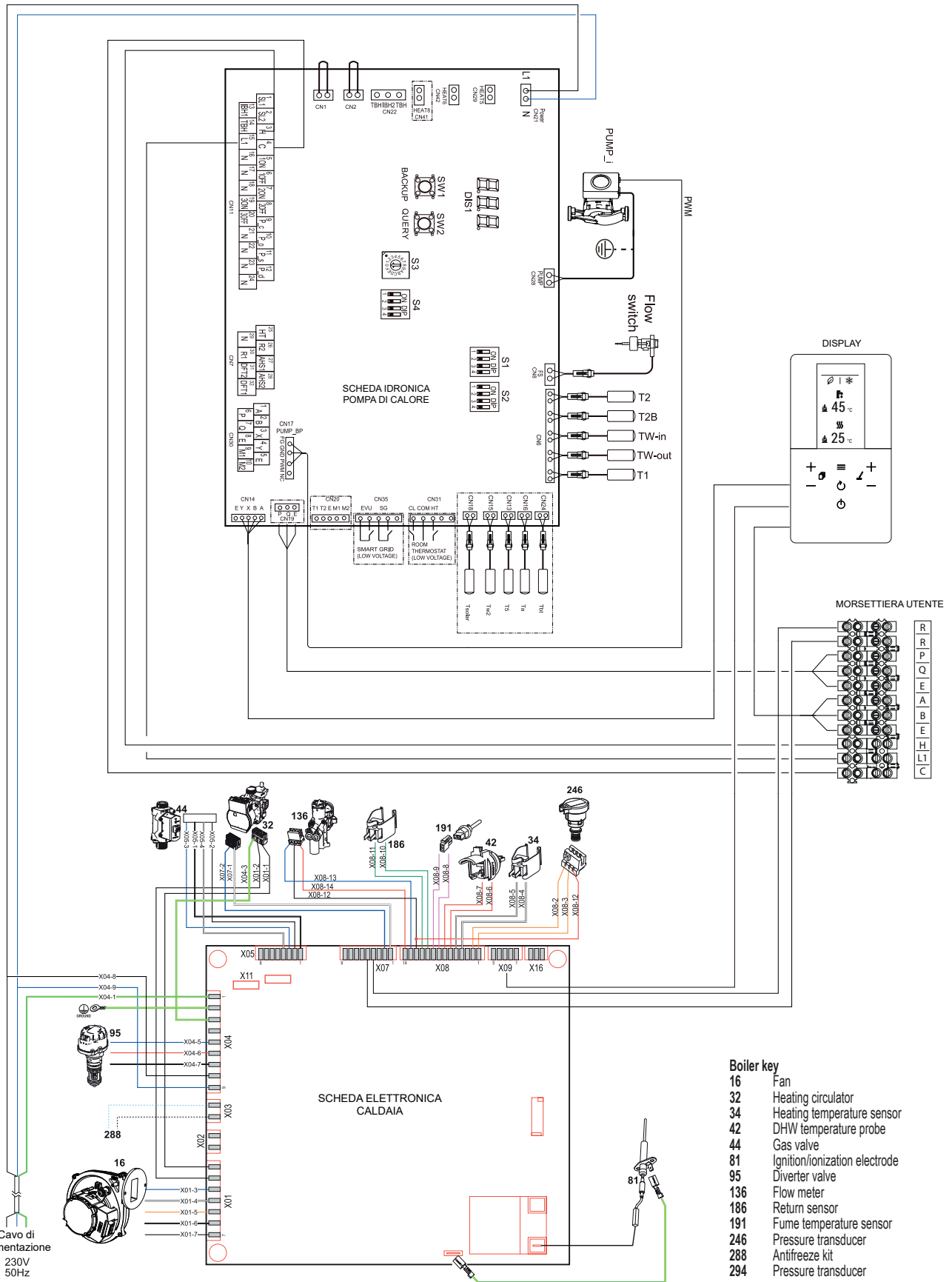


fig. 66 -

15. REFRIGERANT DIAGRAM

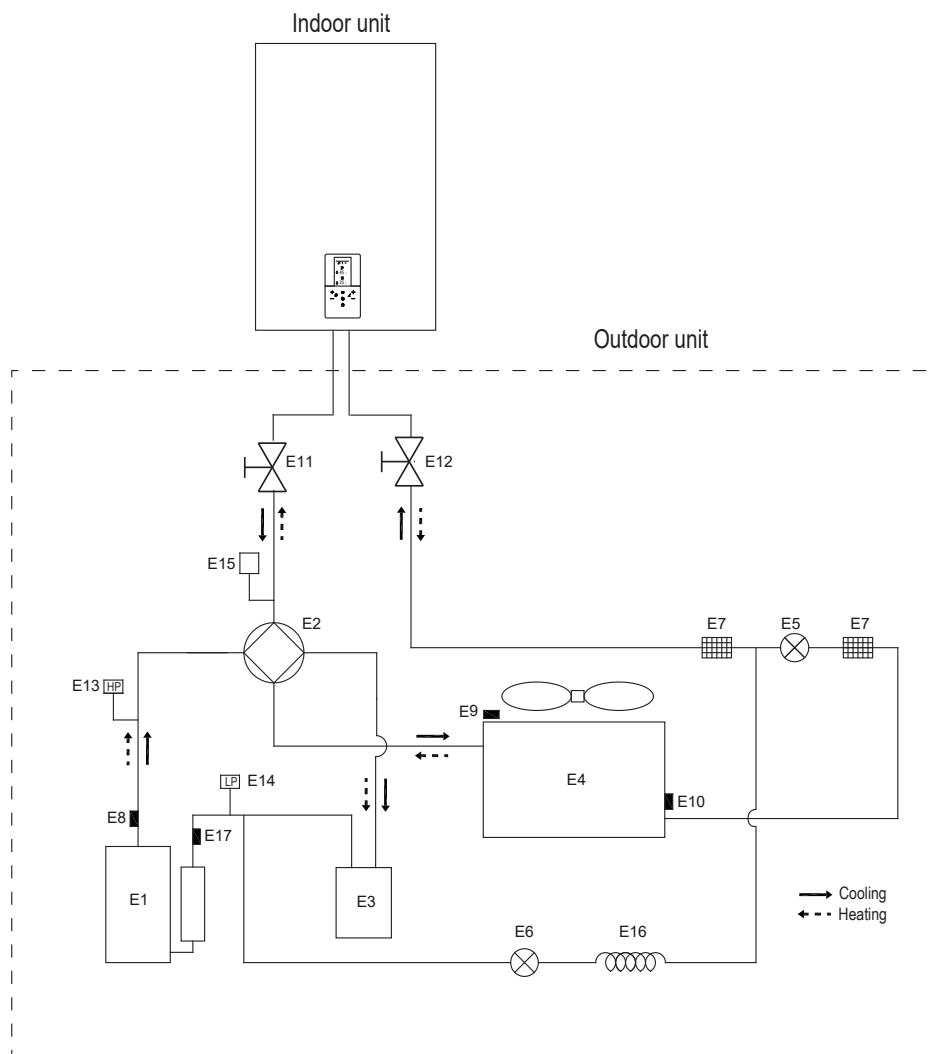


fig. 67 -

LEGEND

E1	Compressor
E2	4-way valve
E3	Gas-liquid separator
E4	Heat exchange air side
E5	Electronic expansion valve
E6	Single-direction electromagnetic valve
E7	Filter
E8	Drain temperature probe
E9	External temperature probe

E10	External exchanger probe
E11	Stop valve (gas)
E12	Stop valve (liquid)
E13	High pressure switch
E14	Low pressure switch
E15	Pressure sensor
E16	Capillary
E17	Extraction temperature probe

NOTE

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