AZIENDA CERTIFICATA ISO 9001

cod. 3541T620 - Rev. 05 - 04/2022

DORA 90 LT - 120 LT

EN USER, INSTALLATION AND MAINTENANCE MANUAL

ENGLISH

Translation of the original language of the Manufacturer.

Dear Customer,

thank you for choosing a **LAMBORGHINI** product.
Our company, always attentive to environmental issues, uses low environmental impact technologies and materials for its products, in compliance with EU WEEE standards (2012/19/EU – RoHS 2011/65/EU).

OBLIGATION

Read this instruction manual carefully before using the device and store it carefully.
In the event of a change in ownership of the device, deliver it to the next user/owner.

In the event of loss of or damage to this manual, another copy can be downloaded from the website **www.lamborghinicalor.it** by selecting the purchased product.

The images are for illustrative purpose only and do not constitute a commitment for the manufacturer and/or the Distributor.

LIST OF REVISIONS

Edition	Revision	Description
12.2021	0.4	General updates

KEEP FOR FUTURE CONSULTATION.

TECHNICAL ASSISTANCE DATA

For any request for TECHNICAL ASSISTANCE on the machine, refer to the following contacts.

For the service centre, visit:
www.lamborghinicalor.it

DEVICE IDENTIFICATION

This device is a 0.83 kW air-water heat pump for heating domestic hot water, available in versions with 90-litre and 120-litre tanks.

Version	Configuration description
90 LT - 120 LT	Air heat pump for the production of domestic hot water

CASING PROTECTION RATING

The equipment protection rating is: **IP24**.

SAFETY WARNINGS


ATTENTION


OBLIGATION

Read carefully before installing and using the device.

The manual must be kept for future reference until dismantling.


ATTENTION


R290

Any intervention on the device, including disposal, must be performed by qualified personnel with a suitable Refrigeration Technician's Licence aimed at the knowledge and management of systems containing HC type gases such as R290 (Propane).


ATTENTION

The unit can be used by children aged 8 years and over and by persons with reduced physical, sensory or mental capacities, or lacking in experience or the necessary knowledge, provided they are supervised or have received instructions regarding safe use of the unit and understand the related hazards.


ATTENTION

Children must not play with the device.
Cleaning and maintenance operations, which can be carried out by the user, must not be performed by children without supervision.


ATTENTION

Before carrying out any type of intervention on the device, the personnel in charge of maintenance must refer to what is reported in this manual in the following chapters and in particular to consult chapter “8. REQUIREMENTS FOR THE OPERATION, SERVICE AND INSTALLATION OF APPLIANCES THAT USE FLAMMABLE REFRIGERANT GASES ACCORDING TO ANNEX DD OF EN 60335-2-40” on page 147.


ATTENTION


R290

During the design and construction phase of the systems, local rules and regulations must be complied with.
The air inlet and outlet of the appliance must be channelled to the external environment as indicated in paragraph 6.6 on page 134.


ATTENTION

For equipment installation operations, refer to par. “6.4 PREPARATION OF THE INSTALLATION SITE” on page 133 and par. “6.5 WALL FIXING” on page 134.


ATTENTION

For the correct operation of the device, the inlet water pressure must be:
- maximum 0.7 MPa (7 bar);
- minimum 0.15 MPa (1.5 bar).


ATTENTION

- Water can drip from the discharge pipe of the overpressure device; leave this pipe open to the atmosphere.
- The decompression device must be operated regularly to remove limescale deposits and to check that it is not blocked.
- Connect a rubber pipe to the condensate drain, taking care not to force too much so as not to break the drain pipe and refer to par. “6.7.1 Condensate drain connection” on page 136.


ATTENTION

For the correct operation of the device, it is essential to install a 0.7 MPa safety unit (7 bar, light series supplied as standard) on the cold water inlet.
The drain hose is connected to the pressure relief device installed below and in an environment not subject to freezing.


ATTENTION

Use only connecting pipes (not supplied), rigid and resistant to electrolysis both at the inlet of cold water and at the outlet of hot water from the device.


ATTENTION

The device must be installed in compliance with the regulations on electrical systems in force in the country of installation.
Refer to par. “6.8 ELECTRICAL CONNECTIONS” on page 137 and par. “6.8.1 Remote connections” on page 137.


ATTENTION

Connect the device to an efficient grounding system.


ATTENTION

Do not use extension cords or adapters.


ATTENTION

For connection to mains and safety devices, comply with the IEC 60364-4-41 standard.


ATTENTION

Fixed devices are not equipped with means of disconnection from the mains with a separation of the contacts on all poles capable of guaranteeing complete disconnection in the overvoltage category III, the instructions indicate that the means of disconnection must be integrated in the fixed wiring in compliance with the wiring regulations.


ATTENTION

The device must be protected by an adequate differential switch.
The type of differential switch should be selected by assessing the type of electrical devices used by the system as a whole.


ATTENTION

DO NOT TAMPER WITH THE POWER CORD.
If the power supply cable is damaged, it must be replaced by the manufacturer or the technical assistance service or in any case by a person with similar qualifications, in order to prevent any risk.


ATTENTION

In case of replacement of the fuse, replace it with a new delayed-type one of 5 A 250V IEC 60127-2/II (T5AL250V) certified (refer to par. 7.1 on page 145).


ATTENTION

Before carrying out any repairs to the product, carefully read the wiring diagram shown in chapt. "6.9 ELECTRICAL DIAGRAM" on page 139 and also refer to the inside the product itself.

► USE INTENDED BY THE MANUFACTURER

Definition
Air heat pump for the production of domestic hot water

The device covered in this manual has been designed for domestic use in accordance with the requirements provided for in the reference standards indicated in paragraph 1.4.
Moreover, to meet the design and safety features:

- the device must be used according to the instructions and limits of use indicated in this manual;
- the procedures indicated in this user manual must be followed;
- ordinary maintenance must be carried out periodically in the times and in the manner indicated;
- extraordinary maintenance must be performed promptly in case of need.

In consideration of the design features, it is not possible to use the device for other purposes, nor can the manufacturer envisage other ways of use.


PROHIBITION

Using the product for purposes other than that specified is prohibited. Any other use is considered inappropriate and is not permitted.

► REASONABLY FORESEEABLE MISUSE

Reasonably foreseeable misuses are listed below:

- **no aeraulic connection with the external environment (ref. par. 6.6 on page 134)**;
- introduction of liquid or solid materials containing chemically aggressive substances;
- use the equipment differently from what is envisaged in paragraph "USE INTENDED BY THE MANUFACTURER" and as indicated in par. "5.3 TECHNICAL FEATURES" on page 131.

Any use other than the one envisaged must be previously authorised in writing by the Manufacturer.
In the absence of such written authorisation, the use is to be considered "**improper use**"; therefore **LAMBORGHINI** declines all responsibility in relation to any damage caused to things or people and deems any type of guarantee on supply null and void.

NB! The manufacturer declines any liability for uses different from those for which the equipment is designed, and for any installation errors or improper use of the unit.

► INTENDED USE OF THE DEVICE

The device is intended to be used in a domestic environment within the limits of allowed environmental conditions indicated in chapter 6.

► RISK FROM INADEQUATE MAINTENANCE OR REPAIR


EXPERT TECHNICIAN


R290

Any intervention on the device, including disposal, must be performed by qualified personnel with a suitable Refrigeration Technician's Licence aimed at the knowledge and management of systems containing HC type gases such as R290 (Propane).


PROHIBITION

Never try to carry out maintenance work or repairs on the product yourself.

- Have a qualified technician immediately remove faults and damage.
- Comply with the prescribed maintenance intervals.

► DANGER DUE TO MISUSE

An incorrect command can put yourself and others at risk and cause material damage.

- Read these instructions and all complementary documentation carefully.
- Perform the activities described in this instruction manual.

► DANGER TO LIFE DUE TO REFRIGERANT GAS LEAKAGE

ATTENTION! Flammable refrigerant gas (R290).

Any intervention on the device, including disposal, must be performed by qualified personnel with a suitable Refrigeration Technician's Licence aimed at the knowledge and management of systems containing HC type gases such as R290 (Propane).

During the design and construction phase of the systems, local rules and regulations must be complied with. The air inlet and outlet of the appliance must be channelled to the external environment as indicated in paragraph 6.6 on page 134.

There is a risk of explosion in case of refrigerant gas leaks.

- Ventilate the installation environment.
- **Do not use open flames** (e.g. lighters, matches).
- **Do not smoke**.
- **Do not use components or devices** that may generate sparks (for example: do not turn lights on by switches, do not connect electrical equipment, etc.).
- Leave the building immediately, prevent other people from accessing and contact the emergency personnel.

► DANGER OF DEATH DUE TO CHANGES TO THE PRODUCT OR THE INSTALLATION ENVIRONMENT

- **Do not install the device** in conditions other than those described in this manual (ref. chapter 6 on page 132).
- **Never remove, tamper with, bypass or block** the safety devices.
- **Do not remove or destroy any seal** applied to components.
- **Do not make** changes:
  - to the product
  - to the water and electricity networks
  - to the drain pipes.

► DANGER OF BURNS DUE TO HIGH TEMPERATURES

The protruding hoses and hydraulic connections become very hot during operation.

- **Do not touch** the hydraulic connections.
- **Do not touch** the air inlet and outlet points.

Domestic hot water heated to temperatures above 50 °C can cause scalding during use (shower, sink, etc.).
Even lower temperatures can be dangerous for children and the elderly.
It is always recommended to install a mixing valve in the outlet connection of the water heater and to set an operating temperature that is not too high.

► AVOID THE RISK OF INJURY AND DAMAGE TO THE ENVIRONMENT DUE TO ACCIDENTAL LEAKAGE OF THE REFRIGERANT GAS

The equipment contains R290 refrigerant gas.
It is an ecological refrigerant gas, which has a low environmental impact and does not damage the earth's ozone layer; however, in the event of an accidental gas leak:

- **do not touch** any part of the product;
- **do not inhale** vapours or gases.

Call a physician immediately if you come into contact with the refrigerant gas.

The refrigerant gas must not be released into the atmosphere.
Before disposing of the device, the refrigerant gas contained in it must be poured into a suitable container to be recycled or disposed of in accordance with current regulations.


EXPERT TECHNICIAN


R290

Any intervention on the device, including disposal, must be performed by qualified personnel with a suitable Refrigeration Technician's Licence aimed at the knowledge and management of systems containing HC type gases such as R290 (Propane).

► DANGERS FROM CHANGES IN THE INSTALLATION ROOM

- Before installing the device, it is mandatory to check the minimum requirements of the installation room.

Certain set-up and renovation works in the installation room can compromise the functionality of the product.

- Before carrying out any renovation work on the installation room, check that the minimum requirements indicated in chapter “6. INSTALLATION AND COMMISSIONING” on page 132 remain valid.
- Contact your installer before carrying out the relevant work.

SUMMARY

INSTRUCTIONS FOR:	
 USER	 EXPERT TECHNICIAN / MANUFACTURER'S TECHNICAL ASSISTANCE

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1. GENERAL INFORMATION

This instruction manual for use, installation and maintenance is to be considered an integral part of the heat pump (hereinafter referred to as “device”).
The manual describes the installation procedures to be observed for correct and safe operation of the device, and the methods of use and maintenance.

The manual must be kept with the device for future reference until it is dismantled and must, in any case, always be available to qualified installation and maintenance personnel.
If the device is sold or passed on to another user, the manual must accompany it to its new destination.

For the EXPERT TECHNICIAN/ MANUFACTURER'S TECHNICAL ASSISTANCE ONLY.
The manual describes the installation methods to be followed for correct and safe operation of the device and maintenance interventions.
Before installing the equipment, carefully read this instruction manual and in particular chapter 8 on safety.
Symbols are used throughout the manual to find the most important information more quickly (paragraph “3.3 DESCRIPTION OF THE SYMBOLS USED IN THE MANUAL AND ON THE PACKAGING” on page 125).

1.1 RECIPIENTS OF THE MANUAL

It is intended for the specialist installer (installers - maintenance technicians) and the end user.

To distinguish the content of the manual based on the characteristics of the recipient (user and expert technician), the instructions are divided as follows:

RECIPIENT OF THE INSTRUCTIONS	
 USER	Person who uses the device under normal conditions. This symbol (where present) indicates that the information and instructions **are intended for them**.
 USER	ATTENTION! This symbol (where present) indicates that the information and instructions **are not intended for them**. For each type of intervention, the user must contact the **EXPERT TECHNICIAN / MANUFACTURER'S TECHNICAL ASSISTANCE**.
 EXPERT TECHNICIAN / MANUFACTURER'S TECHNICAL ASSISTANCE	Person in charge of installation and maintenance. The technician has access to all the information contained in this manual. **Any intervention on the device, including disposal, must be performed by qualified personnel with a suitable Refrigeration Technician's Licence aimed at the knowledge and management of systems containing HC type gases such as R290 (Propane).**

 ATTENTION	**In case of doubts about the correct interpretation of the instructions contained in this Manual, contact the manufacturer’s TECHNICAL ASSISTANCE to receive the necessary clarifications.**

1.2 GUIDE TO THE MANUAL

For the correct use of the device, the technical reference is the “USE, INSTALLATION AND MAINTENANCE MANUAL” supplied with it.
In order to make the instruction manual compliant with the device described therein, it was drawn up in accordance with the Directives in force at the date of the document's edition:

- IEC/IEEE 82079-1:2019 - *Preparation of information for use (instructions for use) of products. Principles and general requirements.*
- ISO 7000:2019 - *Graphical symbols for use on device — Registered symbols.*
- UNI EN ISO 7010:2021 - *Graphic signs - Safety colours and safety signs - Registered safety signs*

Moreover, the preparation and composition of the instruction manual complies with the principles dictated by the technical regulations referring to the product.

ATTENTION

LAMBORGHINI is not liable for any damage to things or people caused by accidents caused by failure to comply with the instructions contained in this user manual and warnings.

The “USE, INSTALLATION AND MAINTENANCE MANUAL” defines the purpose for which the device was built and contains all the information necessary to ensure safe and correct installation and use.
Further technical information not reported in this manual constitute an integral part of the technical file drawn up by **LAMBORGHINI**, available at its registered office.
The constant compliance with the rules contained therein guarantees the safety of man and equipment, the economy of operation and a longer duration of operation.

The careful analysis carried out by **LAMBORGHINI** has made it possible to eliminate most of the risks; however, it is recommended to strictly follow the instructions given in this document.

ATTENTION

LAMBORGHINI is not liable for any damage to things or people caused by accidents caused by failure to comply with the instructions contained in this user manual and warnings.

1.2.2 Updates

This manual reflects the technique at the time of purchase of the device and contains the information and specifications in force at the current date of the edition.
LAMBORGHINI reserves the right to make modifications, changes or improvements in the manual or on the machines, at any time and without notice.

1.2.3 Copyright

1.2.4 Language

The manual was written in Italian (IT), the original language of the manufacturer.
Any translations into additional languages must be made from the original instructions.
The Manufacturer is held responsible for the information contained in the original instructions; translations into different languages cannot be fully verified, therefore, if an inconsistency is found, it is necessary to follow the original language text or contact our Technical Documentation Office.

1.3 DECLARATION OF CONFORMITY

The device is supplied with a “*EU Declaration of Conformity*” and exclusively concerns the device in the state in which it was placed on the market.

1.4 COMPLIANCE WITH EUROPEAN REGULATIONS

This heat pump is a product intended for domestic use in compliance with the following European directives:

- Directive 2012/19/EU of the European Parliament and of the Council OF 4 July 2012 on **waste electrical and electronic device (WEEE)**.
- Directive 2011/65/EU of the European Parliament and of the Council OF 8 June 2011 on the **restriction of the use of certain hazardous substances in electrical and electronic device (RoHS)**.
- Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to **electromagnetic compatibility**.
- Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of **electrical equipment designed for use within certain voltage limits**.
- Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of **ecodesign requirements for energy-related products**.
- Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of **radio equipment** and repealing Directive 1999/5/EC.
- Regulation (EU) 2017/1369 of the European Parliament and of the Councilo of 4 July 2017 setting a framework for **energy labelling** and repealing Directive 2010/30/EU.

1.5 DEVICE WARRANTY

Refer to the attached certificate (if present, depending on the country of destination of use).

1.6 DISCLAIMER OF LIABILITY

The conformity of these operating instructions with the hardware and the software has been carefully checked. There may, however, be some differences, therefore, we do not assume any liability if they are incomplete.
In the interest of technical perfection, we reserve the right to carry out manufacturing modifications or changes to technical data at any time.
Therefore, any claim based on indications, figures, drawings or descriptions is excluded. Except in the case of errors.

LAMBORGHINI is not liable for damage attributable to operating errors, improper use, inappropriate use or due to unauthorised repairs or modifications.

2. USE OF THE WATER HEATER

2.1 BASIC SAFETY RULES


PROHIBITION

Do not open or disassemble the product when it is electrically powered.


PROHIBITION

Do not touch the product if barefoot or with wet or damp parts of the body.


PROHIBITION

Do not climb, sit and/or place any type of object on the product.


VISUAL INSPECTION

Check that the device is free from tools or utensils of various kinds. If present, remove them.

2.2 MAINTENANCE BY THE USER


ATTENTION

Before cleaning, it is important to make sure that the machine is turned off and the plug is not connected to the socket.


DANGER

Do not remove the plug from the socket by pulling the power cord.

2.2.1 General and control panel cleaning

	Periodicity:	Equipment to be used
 USER	MONTHLY (or in conditions of evident dirt)	Soft and dry cloth


PROHIBITION

Do not pour or spray water on the product.
Do not clean the surfaces with easily flammable substances (for example: alcohol or paint thinners).


MANUAL CLEANING

Clean only the external surface and the control panel using a soft, dry cloth.

2.2.2 Operating anomalies / failures

In case of operating anomalies, possible failures or replacement of parts due to wear/damage, the user must:

- switch off the water heater as indicated in the section "**Switching off**" in paragraph 2.4 and disconnect the power cord plug from the socket.
- Contact an expert technician or the technical assistance service.

2.3 MAINTENANCE TO BE CARRIED OUT BY THE EXPERT TECHNICIAN


EXPERT TECHNICIAN


R290

Any intervention on the device, including disposal, must be performed by qualified personnel with a suitable Refrigeration Technician's Licence aimed at the knowledge and management of systems containing HC type gases such as R290 (Propane).

CHECK OF THE DEVICE

		Periodicity:
 USER	 EXPERT TECHNICIAN / MANUFACTURER'S TECHNICAL ASSISTANCE	YEARLY

To ensure the functionality and efficiency of the device, it must be subjected to **regular checks**.

- Refer to chapter 8.

TROUBLESHOOTING / REPLACEMENT / MAINTENANCE

USER	EXPERT TECHNICIAN / MANUFACTURER'S TECHNICAL ASSISTANCE	Periodicity: IN CASE OF ANOMALY OR FAULTS.

Before carrying out any type of intervention on the device, the personnel in charge of maintenance must refer to what is reported in this manual in the following chapters and in particular to consult chapter “8. REQUIREMENTS FOR THE OPERATION, SERVICE AND INSTALLATION OF APPLIANCES THAT USE FLAMMABLE REFRIGERANT GASES ACCORDING TO ANNEX DD OF EN 60335-2-40” on page 147.

ATTENTION

LAMBORGHINI cannot be held responsible for interventions carried out by non-expert and non-qualified personnel.

ATTENTION

DO NOT TAMPER WITH THE POWER CORD.
If the power supply cable is damaged, it must be replaced by the manufacturer or the technical assistance service or in any case by a person with similar qualifications, in order to prevent any risk.

2.4 DESCRIPTION OF THE USER INTERFACE

fig. 1

Description	Symbol
"On/Off" button for switching on, putting the product in standby mode, unlocking buttons, saving changes	
"Set" button to edit the parameter value, confirm;	
“Increase” key to increase the set-point value, parameter or password	
“Decrease” key to decrease the set-point value, parameter or password	
Heat pump operation (ECO mode)	HP
Heating element operation (electric mode)	
Automatic mode	HP +
Boost mode (symbols flash)	HP +
Button lock active	
Defrosting	
Frost protection	
Anti-legionella cycle	
Holiday mode;	
Operation with time bands	
Clock setting (symbol flashes)	
Connected with Wi-Fi (the symbol flashes when there is no connection)	
Photovoltaic mode (with symbol flashing the supplement is not active)	
NOT USABLE	
Fault or protection active	
Off-Peak mode (with symbol flashing the equipment remains on standby)	

The user interface of this water heater model consists of four capacitive buttons, and a LED display.
As soon as the water heater is powered the four buttons are backlit and all the icons and display segments light up simultaneously for 3 s.
During normal operation of the product the three digits on the display show the water temperature in °C, measured with the upper water probe if parameter P11 is set to 1 or with the lower water probe if P11 = 0.
During modification of the selected operating mode set-point, the set-point temperature is shown on the display.
The icons indicate the selected operating mode, the presence or not of alarms, Wi-Fi connection status, and other information on product status.

2.5 HOW TO TURN THE WATER HEATER ON AND OFF AND UNLOCK THE KEYS

When the water heater is correctly powered it can be "ON" and, therefore, in one of the available operating modes (ECO, Automatic, etc.) or in standby mode.
During standby mode the four capacitive buttons are backlit for easy visibility, the Wi-Fi icon is lit up according to the connection status with an external Wi-Fi router (not supplied) and, in the absence of alarms or frost protection active, all other icons as well as the segments of the three digits are off.

Turning on

With the water heater in standby mode and "button lock" function active (padlock icon at the bottom left lit up), it is necessary to first "unlock" the buttons by pressing the ON/OFF button for at least 3 seconds (the padlock icon goes off), then press the ON/OFF button again for 3 seconds to turn on the water heater.

Turning off

With the water heater on and “button lock" function active, it is necessary to first "unlock" the buttons by pressing the ON/OFF button for at least 3 seconds, then press the ON/OFF button again for 3 seconds to turn off the water heater (putting in standby mode).
In any status, 60 seconds after the last press of any of the four user interface buttons, the button lock function is automatically activated to prevent possible interactions with the water heater, e.g. by children, etc. At the same time the backlighting level of the buttons and display decreases to reduce the unit’s energy consumption.
By pressing any of the four buttons, the backlighting of the buttons and display will immediately return to its normal level for better visibility.

2.6 SETTING THE CLOCK

- With the buttons unlocked, press button ✓ for 3 seconds to access the clock settings (the symbol 🕒 flashes).
- Set the time with the “+” and “-” buttons, press ✓ to confirm and then set the minutes.
- Press button ✓ to confirm and exit.

2.7 SETTING THE TIME BANDS

The device clock must be set before activating the time bands.
- Select the desired operating mode then set the time bands. The time bands can be activated only in the ECO - AUTOMATIC - BOOST - ELECTRIC and VENTILATION modes.
- With the buttons released, press button ✓ and “-” button together for 3 seconds to set the time bands (the symbol ⏰ is displayed).
- Set the switch-on time using buttons “+” and “-” , press “ ✓ ” to confirm and then set the On minutes.
- Press ✓ to confirm and go to switch-off time setting.
- Press ✓ to confirm, then, using the “+” and “-” buttons, select the desired operating mode for the time band (ECO, AUTOMATIC, BOOST, ELECTRIC, VENTILATION).
- Press ✓ to confirm and exit.

Note: At the end of the time band the device goes to standby mode until repetition of the time band the next day.

To deactivate the time bands:
- set the on and off times to midnight (00:00);
- press ✓ to confirm;
- press button ✓ and “-” button together for 3 seconds (the symbol 🕒 goes off).

2.8 SETTING THE HOT WATER SET-POINT

It is possible to adjust the hot water set-point in the ECO, AUTOMATIC, BOOST and ELECTRIC modes
- Select the desired mode with button ✓, then adjust the set-point with buttons “+” and “-”.
- Press button ✓ to confirm and ⏻ to exit.

Mode	Hot water set-point	
	Range	Default
ECO	38÷62°C	53°C
AUTOMATIC	38÷62°C	53°C
BOOST	38÷75°C*	53°C
ELECTRIC	38÷75°C	53°C

* In BOOST mode the maximum set-point value for the heat pump is 62°C. Therefore, by setting a higher value this is to be

considered only for the heating element.

2.9 OPERATING MODE

The following modes are available for this water heater:
- ECO;
- BOOST;
- ELECTRIC;
- VENTILATION;
- HOLIDAY;
- AUTOMATIC.

The equipment is set in ECO mode; pressing this button ⊘ it is possible to select the desired mode.

For the ECO, BOOST and AUTOMATIC modes, by pressing button "+" and "-" simultaneously for 3 seconds, it is possible to activate the "silent mode" (for example during the night) which reduces the noise of the equipment; in this condition, performance in terms of water heating rate may be lower.
To deactivate this mode, press buttons "+" and "-" again for 3 seconds.

2.9.1 ECO

The display shows the symbol **HP**

With this mode only the heat pump is used within the product operating limits to ensure maximum possible energy saving.
The heat pump is switched on 5 minutes after selecting this mode or from the last switch-off.
In case of switching off, within the first 5 minutes, the heat pump will remain on anyway to ensure at least 5 minutes of continuous operation.

2.9.2 BOOST

The display shows the symbols **HP** + flashing.

This mode uses the heat pump and the heating element, within the product operating limits, to ensure faster heating.
The heat pump is switched on 5 minutes after selecting this mode or from the last switch-off.
In case of switching off, within the first 5 minutes, the heat pump will remain on anyway to ensure at least 5 minutes of continuous operation.
The heating element is switched on immediately.

2.9.3 ELECTRIC

The display shows the symbol .

With this mode only the heating element is used within the product operating limits and is useful in situations of low inlet air temperatures.

2.9.4 VENTILATION

The display shows the message FAn.

With this mode only the electronic fan inside the device is used and is useful for recirculating the air in the installation room if desired.
In automatic mode the fan will be adjusted to the minimum speed.

2.9.5 HOLIDAY

The display shows the symbol .

This mode is useful when away for a limited time and then automatically finding the device working in automatic mode.
Using buttons + and - it is possible to set the days of absence during which you want the equipment to remain in stand-by.
- Press ⊘ and then on off to confirm.
-

2.9.6 AUTOMATIC

The display shows the symbol **HP** + .

With this mode the heat pump is used and, if necessary, also the heating element, within the product operating limits, to ensure best possible comfort.
The heat pump is switched on 5 minutes after selecting this mode or from the last switch-off.
In case of switching off, within the first 5 minutes, the heat pump will remain on anyway to ensure at least 5 minutes of continuous operation.

2.10 ADDITIONAL FEATURES

2.10.1 Photovoltaic mode **HP**+ or **HP**+ + or +

When the photovoltaic mode is activated from the installer menu, only ECO - AUTOMATIC - HOLIDAY will be available.
When the symbol on the display flashes, the photovoltaic

mode is not operating and the unit works in the set mode: ECO, AUTOMATIC or HOLIDAY.
When the symbol on the display is lit up, the energy produced by the photovoltaic system is used to heat the water inside the tank.
With ECO mode selected, the heat pump will operate until the set-point is reached and the heating element is switched on until the photovoltaic set-point set from the installer menu is reached.
Otherwise, with AUTOMATIC mode selected, the heating element can also be switched on before reaching the set-point of this mode if the conditions require it.

2.10.2 Off-Peak Mode HP + or HP + +

When the photovoltaic mode is activated from the installer menu, only ECO - AUTOMATIC will be available.
When the symbol on the display flashes, the Off-Peak mode is not operating and the unit remains on standby and the heat pump and heating element are off.
Otherwise, when the symbol on the display is lit up, the unit works in the ECO or AUTOMATIC mode.

2.10.3 Anti-Legionella

The display shows the symbol .

Every two weeks, at the set time, a water heating cycle is carried out by means of the heating element inside the tank, up to the anti-legionella temperature, maintaining it for the set time.
If, on reaching the anti-legionella temperature, the cycle is not performed correctly within 10 hours, it is stopped and will be run again after 2 weeks.
If the request for the anti-legionella function occurs with HOLIDAY mode selected, the anti-legionella cycle will be carried out immediately when the unit is reactivated after the set days of absence.

Anti-legionella parameters	Range	Default
Anti-legionella temperature set-point (P3)	50÷75°C	75°C
Anti-legionella cycle duration (P4)	0÷90 min	30 min
Anti-legionella cycle activation time (P29)	0÷23 h	23 h

2.10.4 Defrost function

The display shows the symbol .

This device has an automatic evaporator defrost function which is activated, when the operating conditions require it, during heat pump operation.
Defrosting occurs through the injection of hot gas into the evaporator, allowing it to be rapidly defrosted.
During defrosting, the heating element, which the equipment is provided with, is switched off unless otherwise set via the installer menu (parameter P6).
The max. duration of defrosting is 8 minutes.

2.10.4.1 Frost protection

The display shows the symbol .

This protection prevents the water temperature inside the tank from reaching values close to zero.
With the equipment in standby mode, when the water temperature inside the tank is below or equal to 5°C (parameter configurable via installer menu), the frost protection function activates, which switches on the heating element until 12°C is reached (parameter configurable via installer menu).

2.11 CONTROL OF THE DEVICE VIA APP

This water heater has a Wi-Fi module integrated in the product which enables it to be connected to an external Wi-Fi router (not supplied) and therefore to be controlled via a smartphone APP.
Depending on the availability of a smartphone with Android® or iOS® operating system, via the dedicated app.

Google Play App Store

Download and install the App **"DORA Smart"**


DORA Smart

Start the **"DORA Smart"** app from your smartphone by pressing the icon as indicated above.

User registration

To use the **"DORA Smart"** application for the first time, user registration is required: create a new account → enter the mobile number/email address → enter the verification code and set the password → confirm.

fig. 2

Press the register button to register, then enter your mobile number or email address to obtain the verification code needed for registration.

Press button "+" on the top right to select your model of water heater (DORA wall-mounted).

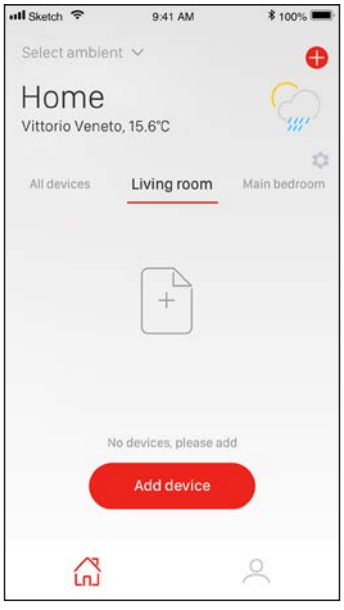


fig. 3

fig. 4

Make sure the equipment is powered.
With the buttons released, press the button ✓ + ⏻ together for 5 seconds. When the Wi-Fi symbol on the device display flashes quickly, press the confirm button on the App.

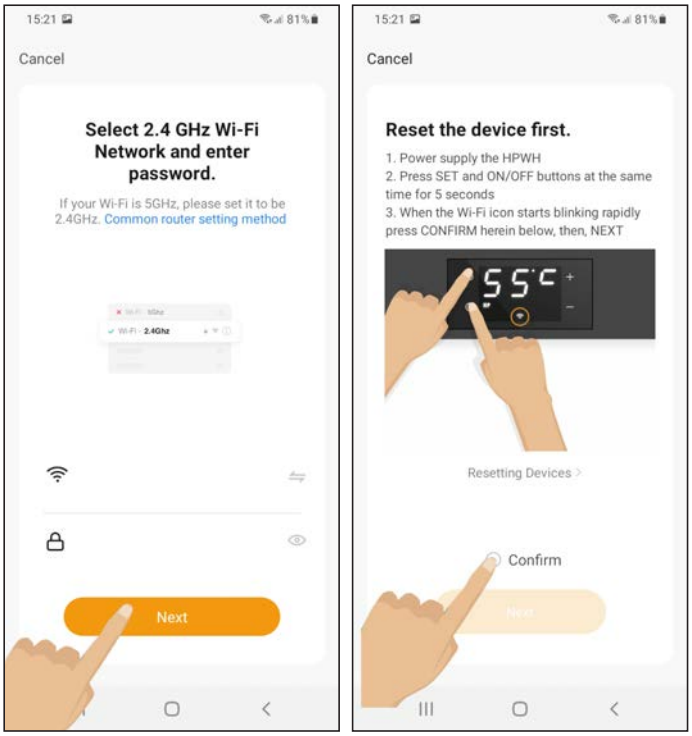


fig. 5

Select the Wi-Fi network and enter the password of the network for connecting the equipment, then press confirm on the app.

fig. 6

Wait for the equipment to be connected to the router.

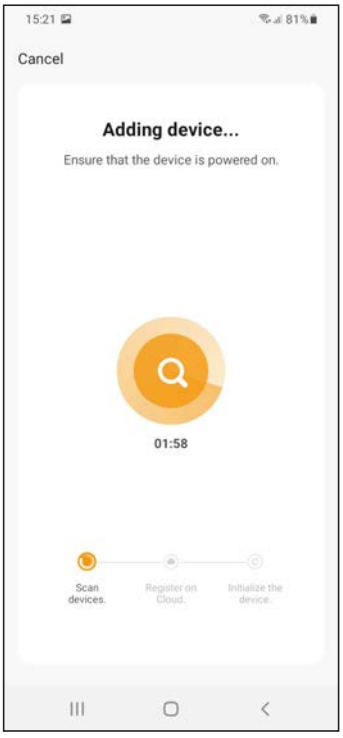


fig. 7

If the procedure for connection with the Wi-Fi router was successful, you will see your device added as shown below.

fig. 8

Press on the icon of the equipment to access the control panel.

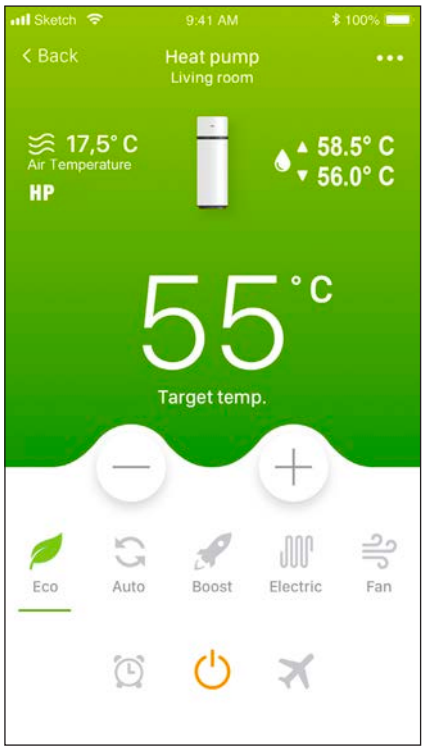


fig. 9

Press on the symbol Auto to select, for example, the automatic operating mode.

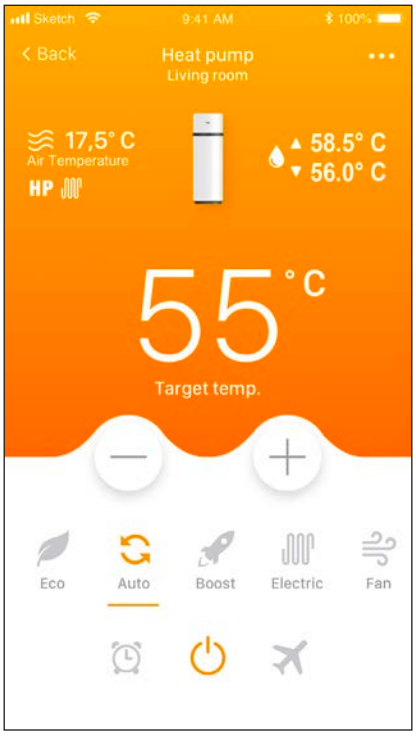


fig. 10

The time bands can be activated, in any operating mode except HOLIDAY, by pressing the symbol .

Then press on the symbol of the following image.

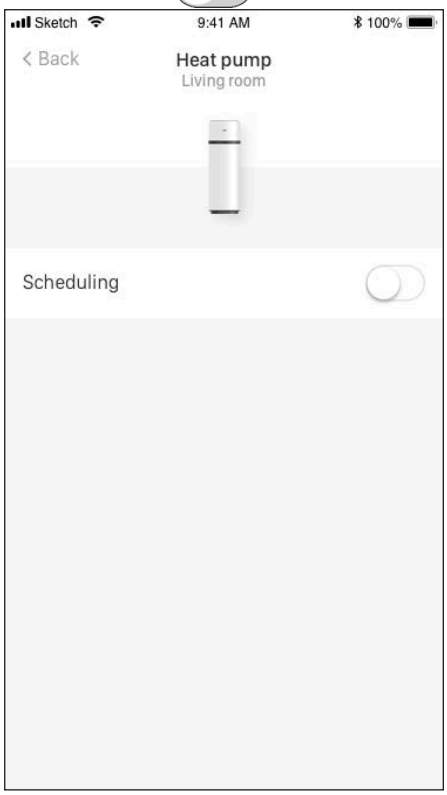


fig. 11

Set the operating mode desired during time band operation, the equipment switch-on and switch-off time and press the confirm button.

Now, press the back button at the top left.

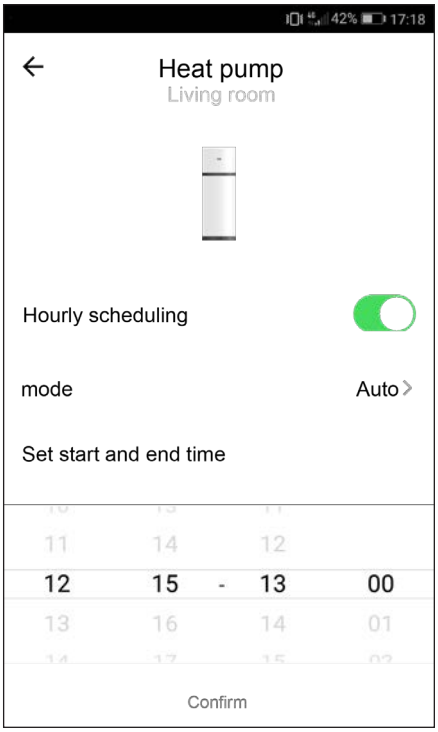


fig. 12

When time band operation is activated, outside the time band the equipment is in standby mode and this is the screen displayed.

fig. 13

Holiday mode can be activated in any operating mode by pressing on the symbol . Then press on the symbol of the following image.

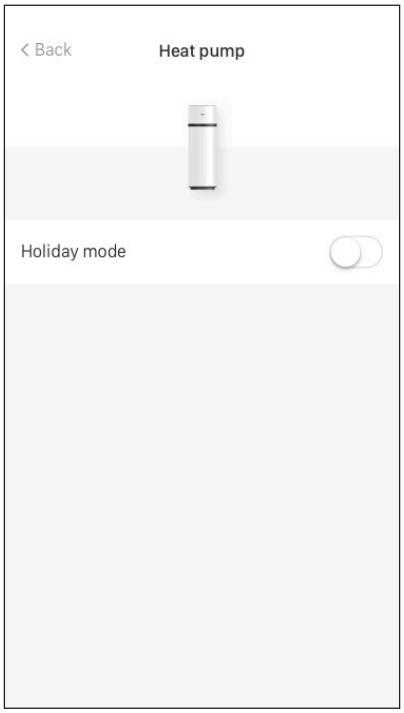


fig. 14

Set the number of days of absence and press confirm.

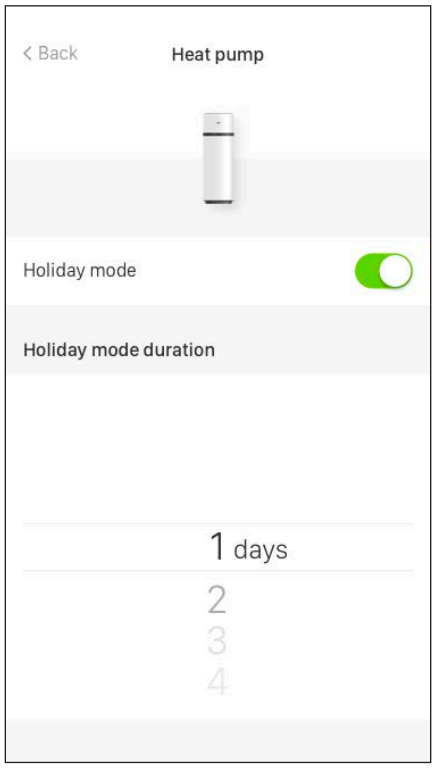


fig. 15

To disable the holiday mode before its end, press the holiday mode "disable" button.

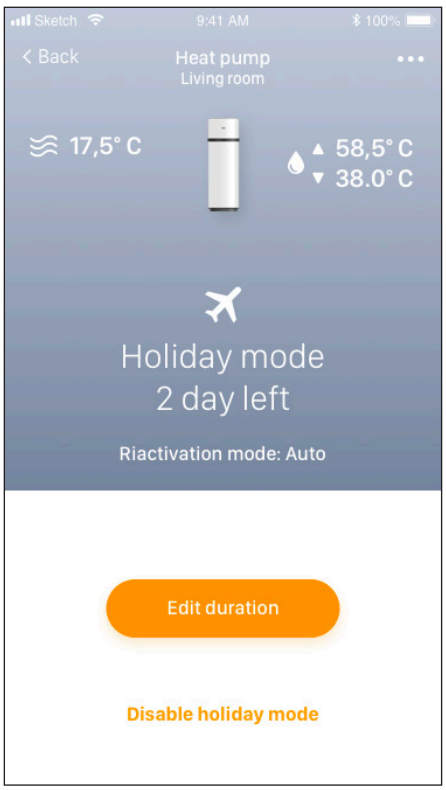


fig. 16

Then press confirm on the next screen.

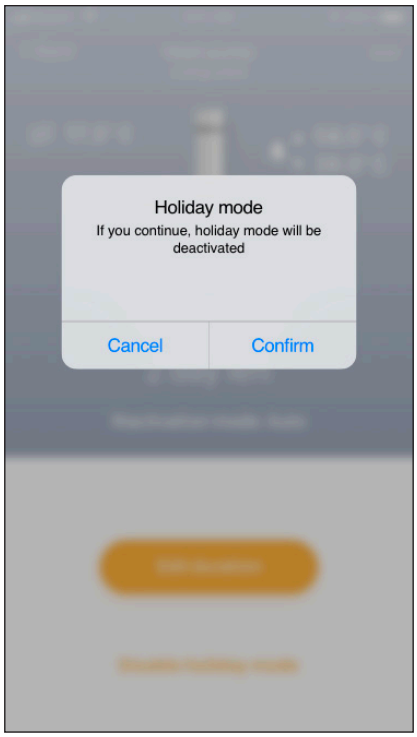


fig. 17

From the App it is possible to turn off the equipment by pressing on the on/off symbol (the symbol is orange when the equipment is on).

2.12 FAULTS/PROTECTION

This device has a self-diagnosis system that covers some possible faults or protections from anomalous operating conditions through: detection, signalling and adoption of an emergency procedure until resolution of the fault.

Fault/Protection	Error code	Display indication
Tank lower probe fault	P01	+ P01
Tank upper probe fault	P02	+ P02
Defrost probe fault	P03	+ P03
Inlet air probe fault	P04	+ P04
Evaporator inlet probe fault	P05	+ P05
Evaporator outlet probe fault	P06	+ P06
Compressor flow probe fault	P07	+ P07
Solar collector probe failure (Not used)	P08	+ P08
High pressure protection	E01	+ E01
Recirculation circuit alarm	E02	+E02
Temperature not suitable for heat pump operation alarm. (With alarm active the water is heated only with heating element)	PA	+PA
No communication (with alarm active the device does not work)	E08	+ E08
Electronic fan fault	E03	+ E03

EXPERT TECHNICIAN / MANUFACTURER'S TECHNICAL ASSISTANCE

If one or more of the above faults occur, contact the manufacturer's technical assistance, indicating the error code shown on the display.

2.13 TROUBLESHOOTING

If the equipment is not working properly, without any alarm signaling, before contacting the manufacturer's technical assistance service, it is advisable to carry out the following.

Malfunction	Recommended action	
The equipment does not switch on.	 **USER**	• Check that the plug is properly inserted in the socket. • Check that the ignition procedure has been carried out from the control panel (ref. par. 2.5 on page 115). • Disconnect the plug from the socket (**without pulling the power cord**) and wait a few minutes; insert the plug back into the socket. ***If the problem persists***: contact a qualified technician or the technical assistance service.
	 **EXPERT TECHNICIAN / MANUFACTURER'S TECHNICAL ASSISTANCE**	• Check the status of the power cable inside the product. • Check that the **fuse** on the power board is intact. Otherwise, replace it with a new delayed **5 A 250V**, IEC 60127-2/II (**T5AL250V**) certified (refer to par. 7.1 on page 145).
Water cannot be heated via the heat pump in ECO or AUTOMATIC mode	 **USER**	• Turn off the device (ref. par. 2.5 on page 115) and turn it back on after a few hours. ***If the problem persists***: contact a qualified technician or the technical assistance service.
	 **EXPERT TECHNICIAN / MANUFACTURER'S TECHNICAL ASSISTANCE**	• Disconnect the device from the power grid. • Drain part of the water contained in the tank (about 50%) and refill it. • Turn the appliance on again in ECO mode.
The heat pump stays on continuously and never turns off	 **USER**	• Check that, by not opening any valve for a few hours, the equipment reaches the set point temperature. ***If the problem persists***: contact a qualified technician or the technical assistance service.
Water cannot be heated via the integrated heating element in AUTOMATIC mode	 **EXPERT TECHNICIAN / MANUFACTURER'S TECHNICAL ASSISTANCE**	• Switch off the device and check the safety thermostat of the heating element inside the device and reset it if necessary. Then turn on the equipment in AUTOMATIC mode. • Disconnect the device from the power supply then drain part of the water contained in the tank (about 50%) then recharge it and turn the device back on in AUTOMATIC mode. • Enter the installer menu and increase the value of parameter P32 for example to 7°C. • Check that the electrical resistor **safety thermostat** has not intervened (ref. par. 7.2 on page 145).
The product cannot be controlled via APP	 **USER**	• Check that there is Wi-Fi network coverage, e.g. via smartphone where the product is installed, then carry out the configuration procedure again with the router. • Then ensure that the Wi-Fi symbol on the display is steady on.

INSTRUCTIONS FOR:	
USER	EXPERT TECHNICIAN / MANUFACTURER'S TECHNICAL ASSISTANCE
P.P.E. NEEDED:	

The following instructions are intended for experienced technical personnel.

ATTENTION

LAMBORGHINI cannot be held responsible for interventions carried out by non-expert and non-qualified personnel.

EXPERT TECHNICIAN

R290

Any intervention on the device, including disposal, must be performed by qualified personnel with a suitable Refrigeration Technician's Licence aimed at the knowledge and management of systems containing HC type gases such as R290 (Propane).

3. GENERAL INFORMATION

3.1 PLATE DATA

Read the data plate affixed to the device and check that the user manual corresponds to the model indicated.

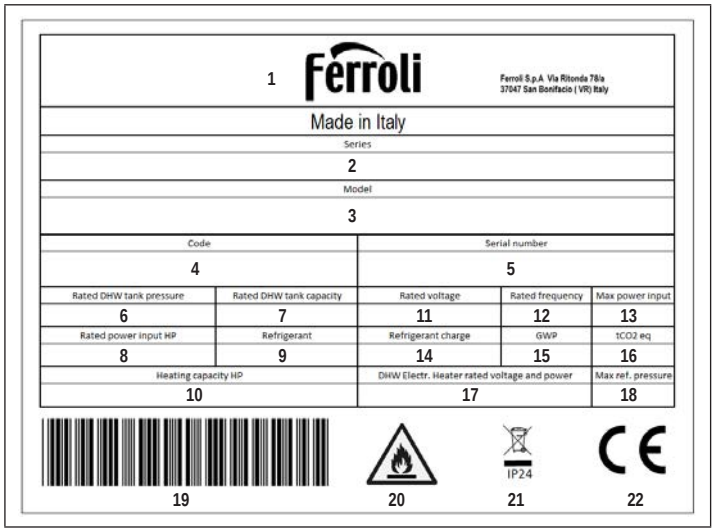


fig. 18

REF.	DESCRIPTION
1	References of the Manufacturer
2	Series
3	Model
4	Product code
5	Serial number
6	Rated tank pressure
7	Rated tank capacity
8	Rated absorbed power HP
9	Refrigerant gas
10	HP thermal power
11	Rated voltage
12	Rated frequency
13	Maximum absorbed power
14	Refrigerant charge
15	Global warming potential associated with each refrigerant
16	Tons of CO_2 equivalent. It allows to express the greenhouse effect produced by a certain refrigerant gas.
17	Rated voltage and power of the electric heater
18	Maximum pressure of the refrigerant circuit (high / low)
19	Barcode
20	Fire hazard (R290 REFRIGERANT GAS)
21	Professional waste to be disposed of in special collection centres
22	Identifies compliance with European requirements

ATTENTION	**Do not tamper with the data plate in any way.**

In the event of a request for information or technical assistance, it is necessary to specify, in addition to the model and type of machine, also the relative serial number.

3.2 IDENTIFICATION PLATES OF THE MAIN ELEMENTS

The labels of all components not built directly by **LAMBORGHINI** are directly applied to the components themselves, in the points where the respective manufacturers originally placed them.

3.3 DESCRIPTION OF THE SYMBOLS USED IN THE MANUAL AND ON THE PACKAGING

The symbols shown in the following table can be used in whole or in part in this manual and accompanied by their description. Some of these may be affixed to the device and/or its packaging.

Symbol	Definition
SYMBOLS USED IN THE MANUAL	
ATTENTION DANGER	**RISK OF ELECTROCUTION.** Any intervention that involves the removal of covers or panels on which this symbol is affixed must be carried out exclusively by qualified technicians.
ATTENTION	**GENERIC DANGER.** Symbol used to identify important warnings for the safety of the operator and/or the device.
R290	**REFRIGERANT GAS R290** The device is equipped with R290 refrigerant gas; ***strictly follow the warnings where this symbol is shown***.
OBLIGATION	**GENERIC OBLIGATION.** Symbol used to identify information of particular importance.
OBLIGATION	**OBLIGATION.** Symbol used to identify the specific obligation of grounding connection.
OBLIGATION	**OBLIGATION.** Symbol used to identify the obligation to read this instruction manual before any type of intervention on the device.
PROHIBITION	**GENERIC PROHIBITION.** Symbol used to identify the prohibition of the prescribed description.
	WEIGHT. Symbol that identifies the weight of the machine. If present on the packaging, it indicates the weight of each package.
	RECYCLING / DISPOSAL. Symbol that identifies the recovery and recycling of materials.
	PROFESSIONAL WASTE Indicates that this product must not be treated as household waste but must be delivered to the appropriate collection point for the recycling of electrical and electronic equipment (DIRECTIVE 2012/19/EU)
	VISUAL INSPECTION Symbol that identifies visual inspection.
	MANUAL CLEANING Symbol that identifies manual cleaning.
2x	**MINIMUM NUMBER OF OPERATORS EMPLOYED** Operations that must be carried out by at least two people.
SYMBOLS USED ON THE PACKAGING	
	POSITIONING DIRECTION Affixed to the packaging, it indicates the correct orientation.
	PROTECTION FROM WEATHER CONDITIONS Affixed to the packaging, it indicates to protect from rain and atmospheric agents. Store in a dry place.
	FRAGILE Affixed to the packaging, it indicates to handle it with care in order to avoid any breakage of the contents.

Symbol	Definition
	**LIMITATION OF PACKAGING OVERLAP** Affixed to the packaging, it indicates not to overlap the packaging.
	It indicates the position on the transport package where the clamps must be positioned during handling with mechanised means.
	**RECYCLING / DISPOSAL.** Symbol that identifies the recovery and recycling of materials.

3.4 GLOSSARY OF TERMS

Term	Definition
DEVICE	Indicates the product described in this instruction manual.
MANUFACTURER	Natural or legal person who is responsible for design, construction, packaging or labelling and placing on the market.
TECHNICAL ASSISTANCE	Persons or entities liable to the responsible organisation, who install, assemble, maintain or repair the machine.
INTENDED USE	The use of a product in compliance with the specifications, instructions and information provided by the manufacturer.
NORMAL USE	Operation including periodic checks according to the instructions for use.
PROCEDURE	Defined ways to perform an activity.
DAMAGE	Physical injury or damage to the health of people or animals, or damage to property and/or the environment.
DANGER	A potential source of damage.
MAINTENANCE	Periodic operations in order to check correct operation (example: cleaning) addressed to the qualified employee.

3.5 PERSONAL PROTECTIVE EQUIPMENT

The clothes worn by people who work or carry out maintenance work must comply with the essential safety requirements defined by the laws in force in the country in which it is installed.

Signal	Definition
	**IT IS MANDATORY TO WEAR PROTECTIVE OR INSULATING GLOVES** Use appropriate clothing to protect the upper limbs.
	**IT IS MANDATORY TO WEAR EYE PROTECTION.** Use appropriate clothing to protect eyesight.
	**IT IS MANDATORY TO WEAR PROTECTIVE CLOTHING WITHOUT FLAPPING PARTS** Use clothing with no flapping parts to avoid the risk of them getting caught on machine parts.
	**IT IS MANDATORY TO WEAR SAFETY SHOES** Use suitable shoes to protect the lower limbs.

3.6 NOISE

The data on noise level are indicated in the tables in par. 5.3.

3.7 VIBRATIONS

The vibrations produced by the equipment, depending on how it is operated, are not dangerous for its intended use.


ATTENTION

Excessive vibration can only be caused by a mechanical failure that must be immediately reported and eliminated, in order not to jeopardise the safety of the device and the operator.

3.8 RESIDUAL RISKS

The design was carried out in order to ensure the essential safety requirements for the operator in charge and for the end user.
As far as possible, safety has been integrated into the design and construction of the device; however, there are still risks from which operators must be protected.

Risk	Definition
 **ELECTRICAL HAZARD**	**RISK DUE TO ELECTRICITY.** Machine access and maintenance operations expose operators to risk due to electricity. Work on live equipment must only be carried out by expert and qualified personnel. The following safety measures are recommended: • **do not carry out maintenance work without having previously disconnected the device from electricity**; • **carry out the interventions only if you are sure and described in this manual; in case of doubts contact the Manufacturer**.
 **DANGER**	**RISK OF GAS LEAKS.** The machine must have ducts to allow any refrigerant gas leaks to escape into the external environment.

4. HANDLING AND TRANSPORT

4.1 HANDLING OF PACKAGING

The device comes in a cardboard box on a wooden pallet.
The type of packaging may vary at the discretion of the manufacturer.

For unloading operations, use a forklift truck or transpallet: these should have a capacity of at least 250 kg.

The packaged device must be kept upright during all loading operations.

fig. 19

4.2 UNPACKING


ATTENTION

The packaging material (staples, boxes, etc.) must not left within the reach of children as they pose a risk to them.

Unpacking must done carefully in order not to damage the device casing if using knives or cutters to open the cardboard packaging.

After removing the packaging, check the integrity of the unit. In case of doubt, do not use the device and contact an authorised technician.
Before eliminating the packaging in accordance with current environmental protection laws, make sure that all the accessories supplied have been removed from it.

RECYCLING / DISPOSAL.
All packaging materials must be disposed of in accordance with the laws in force in the country of use.

4.3 RECEIPT

In addition to the units, the packages contain accessories and technical documentation for use and installation.

- Check that the following are present:
  - User, Installation and Maintenance Manual
  - Safety valve
  - 6-core cable digital inputs

For the entire period in which the device remains inactive, pending commissioning, it is advisable to place it in a place protected from atmospheric agents and the environmental conditions indicated in paragraph “6.1 STORAGE” on page 132.

5. CONSTRUCTION CHARACTERISTICS

5.1 COMPONENT IDENTIFICATION

REF.	DESCRIPTION (fig. 20 - fig. 21 - fig. 22)
1	Heat pump
2	User interface
3	Steel casing
4	Electrical resistor
5	Magnesium anode
6	Ventilation air outlet (Ø 125 mm)
7	Ventilation air inlet (Ø 125 mm)
8	Cold water inlet connection
9	Hot water outlet connection
11	Condensate drain
14	Steel tank with vitreous enamel coating according to DIN 4753-3
15	Condenser
16	Rotary compressor
17	Finned pack evaporator
18	Electronic fan
19	Boiler probes
21	Polyurethane insulation
23	Safety thermostat bulb tube
24	Power board
25	Wi-Fi card
26	Cover for accessing heating element, safety thermostat bulb, boiler probes and power board

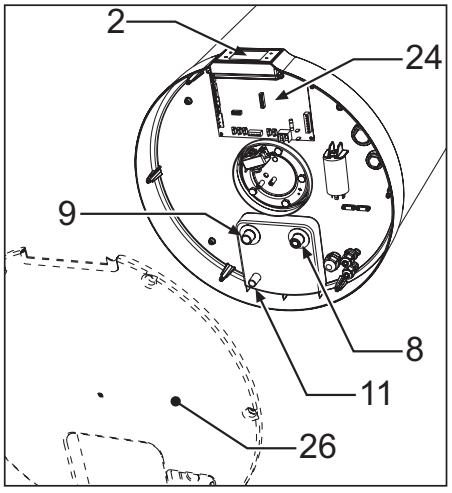


fig. 20

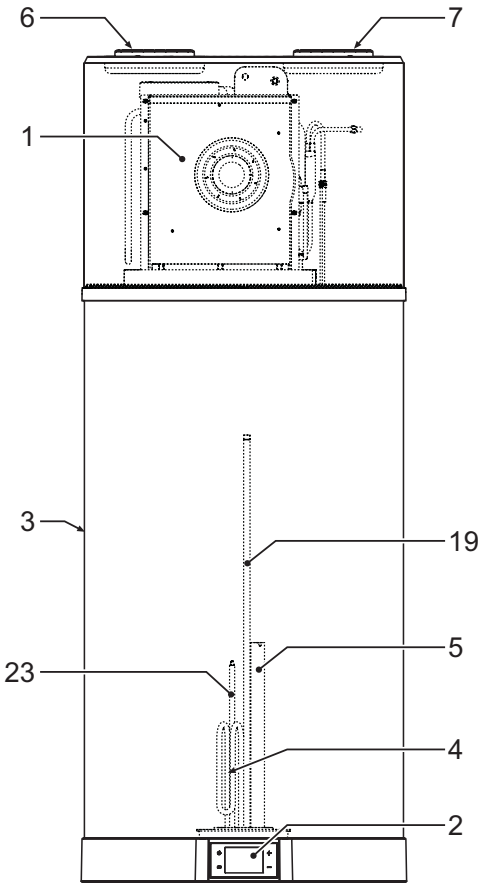


fig. 21

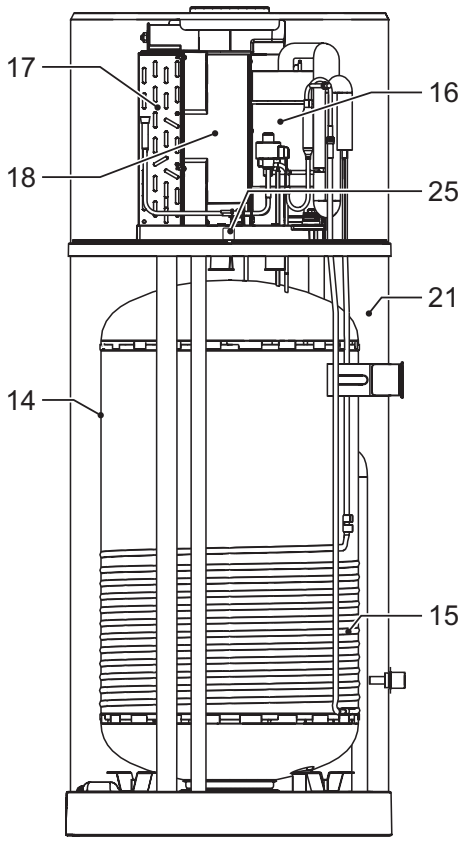


fig. 22

5.2 DIMENSIONAL DATA

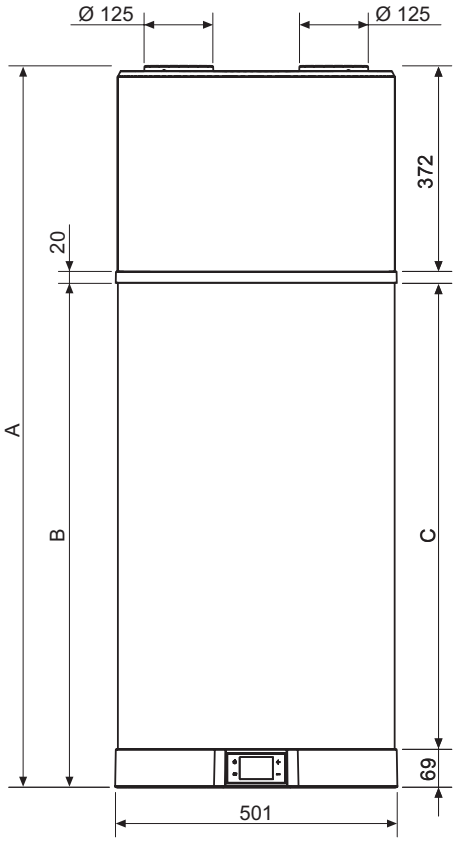


fig. 23

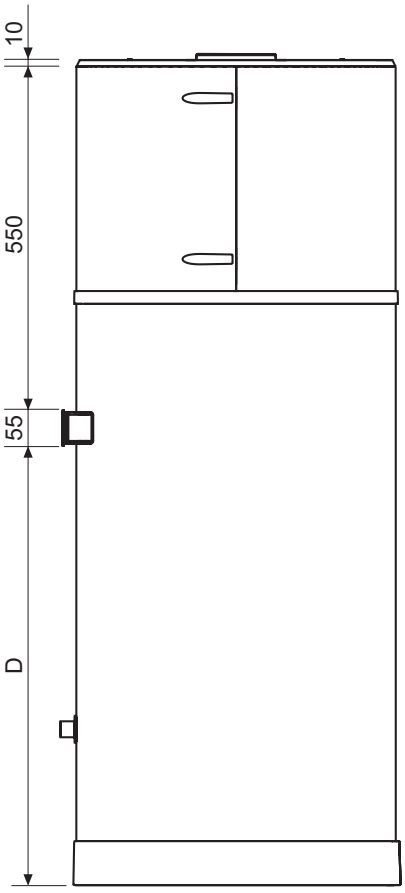


fig. 24

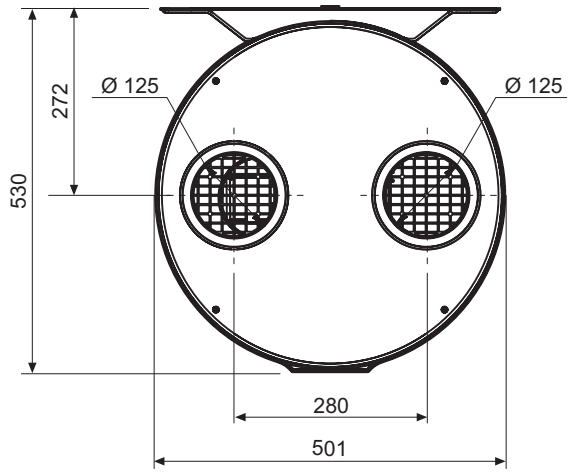


fig. 25

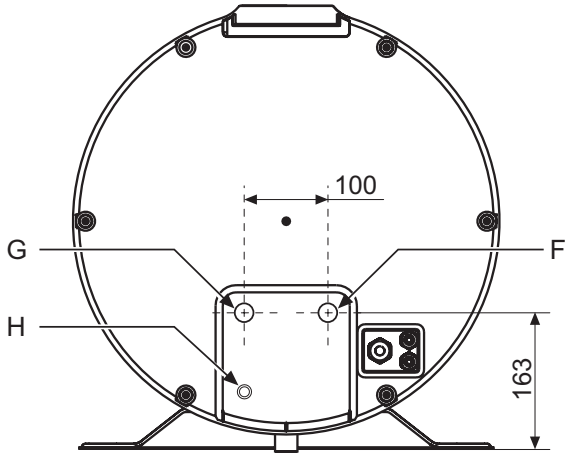


fig. 26

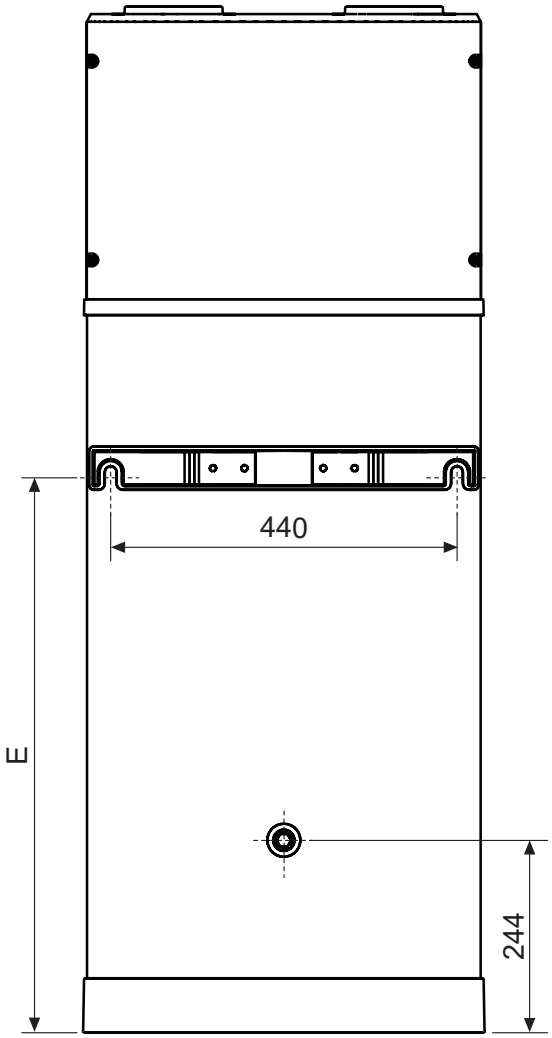


fig. 27

Technical data table (fig. 23 - fig. 24 - fig. 25 - fig. 26 - fig. 27)

Ref.	Ø	90 LT	120 LT	UM
A	/	1303	1555	mm
B	/	912	1162	mm
C	/	843	1094	mm
D	/	690	940	mm
E	/	711	963	mm
F (ref. 8 - fig. 20)	1/2"G	163	163	mm
G (ref. 9 - fig. 20)	1/2"G	163	163	mm
H (ref. 11 - fig. 20)	16 mm*	68	68	mm

H - Outlet connection in plastic material

5.3 TECHNICAL FEATURES

Model		90 LT	120 LT	-
Heat pump	Power supply	230-1-50		V-f-Hz
	Thermal power (UNI)	833	833	W
	Total absorbed power in heating (UNI)	270	270	W
	COP (UNI)	3.08	3.08	W/W
	Rated current in heating (UNI)	1.25	1.25	A
	Max. total absorbed power in heating	380	380	W
	Max. current in heating	1.74	1.74	A
	Heating time (EN) (1)	05:52	08:15	h:min
	Heating energy (EN) (1)	1.42	2.02	kWh
	Standby consumption (Pes) (EN) (1)	14	17	W
	Class of use (EN) (1)	M	M	Type
	Electricity consumption during the service cycle WEL-TC (EN) (1)	2.28	2.09	kWh
	COPDHW (EN) (1)	2.6	2.7	W/W
	COPDHW (EN) (4)	2.7	2.8	W/W
	Water reference temperature (EN) (1)	53.0	52.8	°C
	Max. usable amount of water(EN) (2)	0.098	0.128	m^3
	Heating efficiency ref. standard (EU)	107	112	%
	Efficiency class ref. standard (EU)	A+	A+	-
	Yearly power consumption (EU)	479	458	kWh/year
Electrical resistor	Power	1200	1200	W
	Current	5.2	5.2	A
Heat pump + heating element	Total absorbed power	1470	1470	W
	Rated current	6.37	6.37	A
	Total max. absorbed power	1580	1580	W
	Max. current	6.95	6.95	A
	Heating time (1)			h:min
Storage	Storage capacity	89	118	l
	Rated pressure	0.7	0.7	MPa
	Material	Enameled steel		type
	Cathodic protection	Mg anode		type
	Insulation type/thickness	polyurethane/50		type/mm
Air circuit	Fan type	Centrifugal		type
	Air flow rate	190	190	m^3/h
	Duct diameter	125	125	mm
	Max. available head	100	100	Pa
Refrigeration circuit	Compressor	Rotary		type
	Refrigerant Refrigerant gas charge	R290 0.15		type kg
	Evaporator	Copper - Aluminum Finned coil		type
	Condenser	Aluminum tube wound outside tank		type
Internal sound power levels (3)		52	52	dB(A)
External sound power levels (3)		50	50	dB(A)
Empty weight	Net	60	70	kg

NOTES

- **(UNI):** data according to standard **UNI EN 16147:2017**
- **(EU):** data according to regulation **2017/1369/EU**
- **(1):** Heating cycle Air inlet temp = 7°C BS/6°C BU Initial water temperature 10°C
- **(2):** Operating temperature limit 40°C - Water inlet temperature 10°C
- **(3):** data according to the **UNI EN 12102-1:2018** standard
- **(4):** Heating cycle Air inlet temp = 14°C BS/13°C BU Initial water temperature 10°C

6. INSTALLATION AND COMMISSIONING

Product installation, commissioning and maintenance must be carried out by qualified and authorised personnel.

EXPERT TECHNICIAN

R290

Any intervention on the device, including disposal, must be performed by qualified personnel with a suitable Refrigeration Technician's Licence aimed at the knowledge and management of systems containing HC type gases such as R290 (Propane).

Comply with the warnings given in chapter 8 on page 147.

6.1 STORAGE

R290

For the storage of devices equipped with flammable refrigerant gas, refer to local regulations in force.

NEVER place the device outdoors; atmospheric agents would damage it, making it unreliable and dangerous for the operator and user.

6.1.1 Environmental storage conditions

The device must be stored in a dry place, protected from dust or anything else that may damage it.

Ambient temperature (min. / max.)
-20 °C / +70 °C

6.2 LIMITS OF USE

ATTENTION

PROHIBITION

This product has not been designed, nor is it intended as such, to be used in hazardous environments according to Directive 2014/34/EU (due to the presence of potentially explosive atmospheres - ATEX).

ATTENTION

PROHIBITION

Or for applications that require a degree higher than IP24 or that require safety features (fault-tolerant, fail-safe) such as life support systems and/or technologies or any other context in which the malfunction of an application may lead to the death or injury of persons or animals, or to serious damage to property or the environment.
If a fault or malfunction of the product could cause damage (to persons, animals and property), then a separate, performance-monitoring system is required, equipped with alarms to exclude such damage.

6.3 OPERATING LIMITS

The product in question is designed exclusively for heating hot water for sanitary uses within the limits described below.
For this purpose, it must be connected to the domestic water supply and the power supply (see chapter “6. INSTALLATION AND COMMISSIONING”).

6.3.1 Temperature range

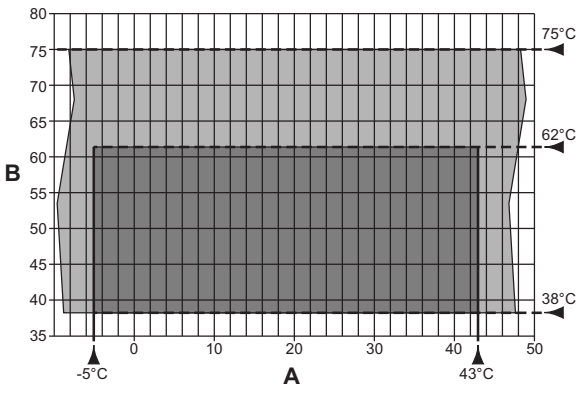


fig. 28 - Chart

A = Inlet air temperature (°C)
B = Hot water temperature (°C)
= Operating range for heat pump (HP)
= Integration with heating element only

6.3.2 Environmental conditions for operation

PROHIBITION

The device cannot operate in rooms classified as environments with an explosive atmosphere or at risk of fire.

ATTENTION

The general operation of the device is guaranteed by observing the environmental conditions indicated.

ATTENTION

The device was not designed to be installed outdoors, but to be used in a "closed" environment not exposed to bad weather with an ambient temperature between +4 °C / +43 °C.

For the correct operation of the device it is necessary that its positioning meets the following requirements:

- away from heat sources,
- away from direct sunlight,
- away from air conditioning systems,
- in a dust-free environment.

The environmental conditions for operation are shown in the table below.

Ambient external air temperature (min. / max.)
-5 °C / +43 °C

6.3.3 Water hardness

The device must not operate with water hardness of less than 12°F. Conversely, if the water hardness is very high (over 25°F), use a suitably calibrated and monitored water softener, because the residual hardness must not drop below 15°F.

6.4 PREPARATION OF THE INSTALLATION SITE

Proper operation affects the life of the device and its components, but above all it affects the efficiency of the system. We recommend that you carefully follow the instructions below; our Technical Assistance Office is available for any clarifications on the matter.

OBLIGATION

R290

During the design and construction phase of the systems, local rules and regulations must be complied with.
The air inlet and outlet of the appliance must be channelled to the external environment as indicated in paragraph 6.6 on page 134.

The product must be installed in a suitable place, i.e. to allow normal use and adjustment operations as well as routine and extraordinary maintenance.
The place where it will be operated must, therefore, be prepared according to the values shown in fig. 29.

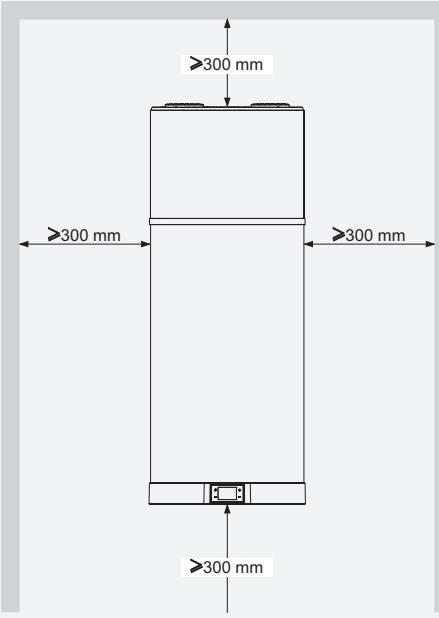


fig. 29 - Minimum spaces

The room must also be:

- Equipped with adequate water and electricity supply lines;
- Prearranged for the condensation water discharge connection;
- Prearranged with adequate water drains in case of boiler damage or safety valve intervention or the breakage of pipes/connections;
- Equipped with possible containment systems in case of serious water leakage;
- Sufficiently illuminated (where required);
- Protected from frost and keep dry.

6.5 WALL FIXING

The product must be installed on a solid wall that is not subject to vibrations. For securing choose the most suitable type of expansion plug according to the specific wall type.

- Drill as shown in fig. 30.

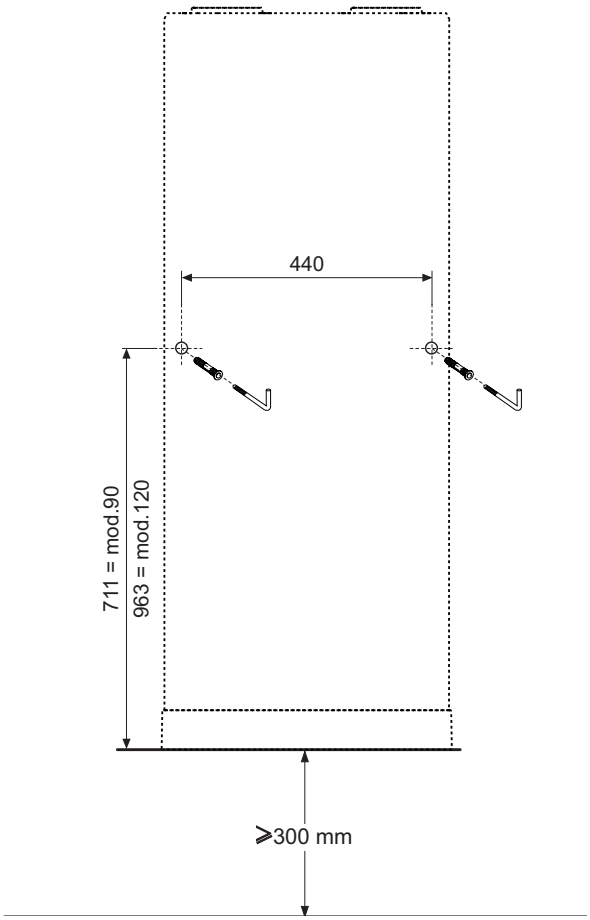


fig. 30 - Drilling indication

- Hook the boiler with the special fastening bracket (fig. 31).

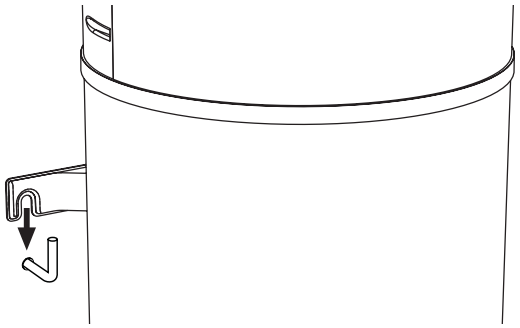


fig. 31 - Wall fixing

6.6 AERAULIC CONNECTIONS

In addition to the spaces indicated in section 6.4, the heat pump requires adequate air ventilation.

- Create a dedicated air duct as indicated in fig. 32.

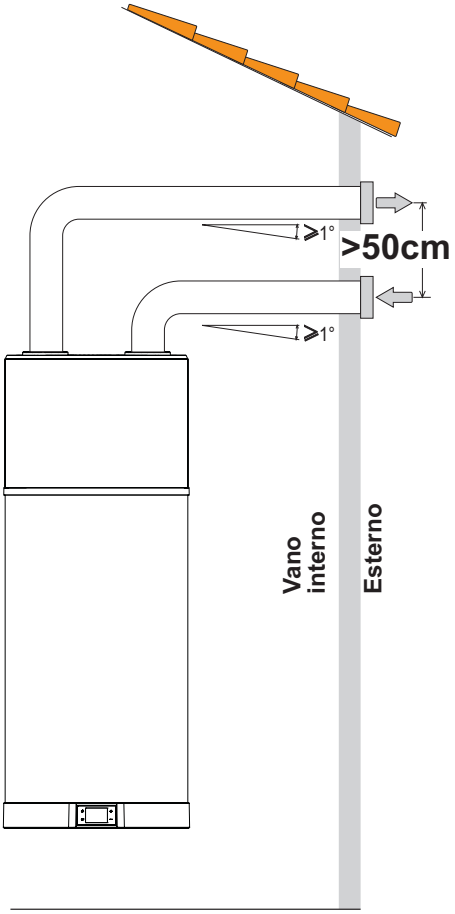
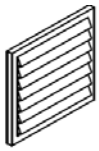


fig. 32- Example of air outlet connection

Install each air duct making sure that:

- It does not weigh down on the equipment.
- It allows maintenance operations.
- It is adequately protected to prevent the accidental intrusion of materials inside the equipment.
- The connection to the outside must be done with suitable, non-flammable piping.
- The total equivalent length of the extraction pipes plus the delivery, including grilles, must not exceed 12 m.

The table gives the characteristic data of commercial ducting components with reference to nominal air flows and diameters 125 mm.

Data	Smooth straight pipe	Smooth 90 ° curve	Grille	UM
Type				
Effective length	1	\	\	m
Equivalent length	1	2	2	m

- While operating, the heat pump tends to lower the temperature of the room if the air is not ducted outside.
- A suitable protection grille must be fitted during installation near the external air exhaust pipe, to prevent foreign bodies from getting inside the device. To ensure maximum product performance, the grille must be selected from those with low pressure loss.
- To prevent the formation of condensate: isolate the air exhaust pipes and the ducted air cover attachments with a vapour proof thermal coating of a suitable thickness.
- If necessary, install mufflers to prevent noise due to the air flow. Fit the pipes, wall entries and connectors to the heat pump systems with vibration damping.


ATTENTION

Operating an open-chamber hearth (e.g. open fireplace) and the heat pump at the same time will cause a dangerous drop in pressure in the room.

The negative pressure can cause the return of exhaust gases into the room.

- **Do not operate the heat pump together with an open fireplace.**
- **Only operate fireplaces with airtight chambers (approved) with separate combustion air ducting.**
- **Keep the doors of the boiler rooms sealed and closed which do not share the flow of combustion air with the living spaces.**

6.7 HYDRAULIC CONNECTIONS

- Connect the cold water supply line and the outlet line to the appropriate connection points (fig. 33).

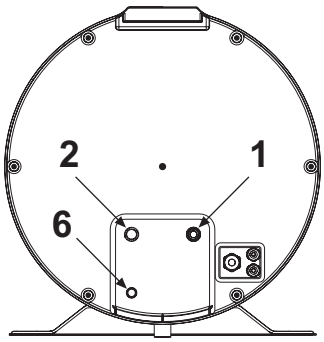


fig. 33

The table below shows the characteristics of the connection points.

Ref.	Model	90 LT - 120 LT	UM
1	Cold water Inlet	1/2"G	"
2	Hot water outlet	1/2"G	"
6	Condensate drain (*)	16	mm


ATTENTION

For the correct operation of the device, the inlet water pressure must be:
- maximum 0.7 MPa (7 bar);
- minimum 0.15 MPa (1.5 bar).


OBLIGATION

For the correct operation of the device, it is essential to install a 0.7 MPa safety unit (7 bar, light series supplied as standard) on the cold water inlet. Use only connecting pipes (not supplied), rigid and resistant to electrolysis both at the inlet of cold water and at the outlet of hot water from the device.

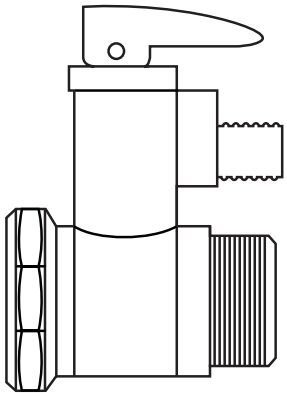


fig. 34 - Safety valve 0.7 MPa (7 bar)

The figure below shows an example of a hydraulic connection.

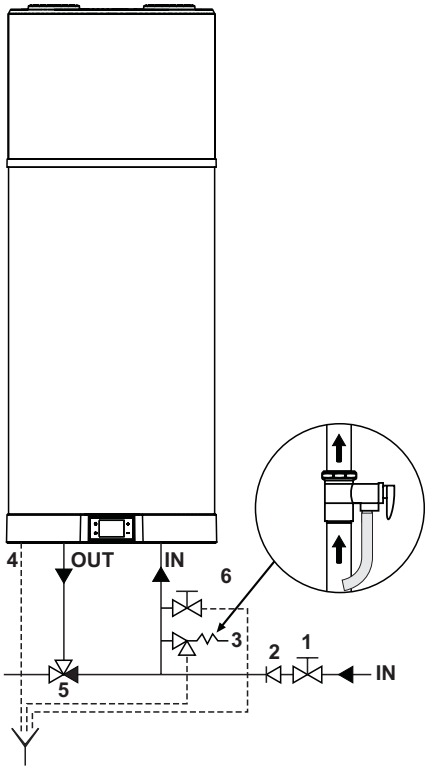


fig. 35 - Example of water system

REF.	DESCRIPTION (fig. 35)
1	Shut-off valve
2	Unidirectional valve
3	Safety valve (supplied)
4	Condensate drain
5	Thermostatic device for automatic mixing
6	Drain valve

ATTENTION

- **Water can drip from the discharge pipe of the overpressure device; leave this pipe open to the atmosphere.**
- **The decompression device must be operated regularly to remove limescale deposits and to check that it is not blocked.**
- **Connect a rubber hose to the condensate drain, taking care not to force too much so as not to break the drain hose itself.**

6.7.1 Condensate drain connection

The condensate forming during heat pump operation flows through a special drain pipe (½") that runs inside the insulation casing and comes out the bottom of the equipment (fig. 36).
It must be connected to a duct so that the condensate can flow regularly (example of installation fig. 37).

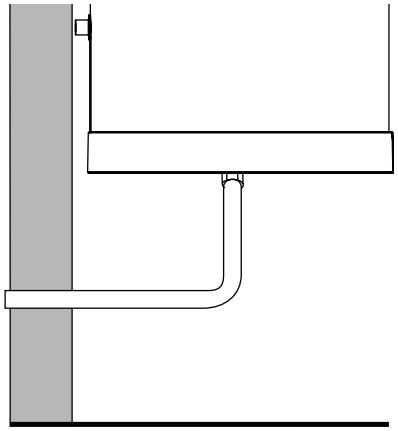


fig. 36- Example of condensate drain connection without a trap

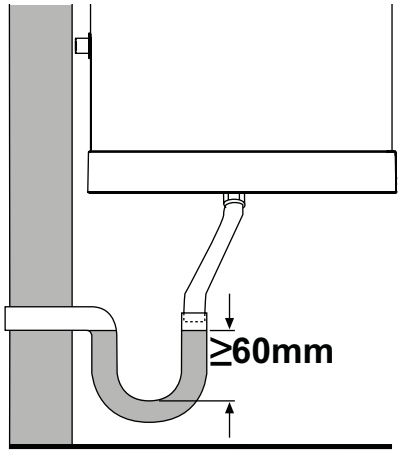


fig. 37- Example of condensate drain connection with a trap

6.8 ELECTRICAL CONNECTIONS

The device is equipped with a power cable with Schuko plug to be connected to the power grid via a suitable socket (fig. 38 and fig. 39).

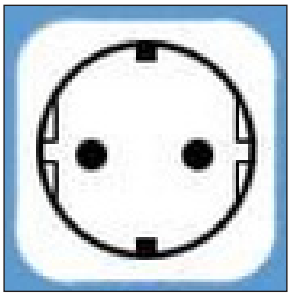


fig. 38 - Schuko socket

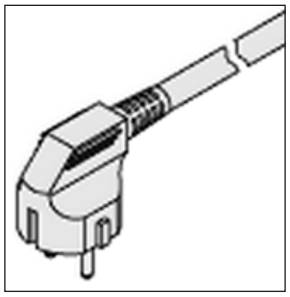


fig. 39 - Unit plug

ATTENTION

The device must be installed in compliance with the regulations on electrical systems in force in the country of installation.

OBLIGATION

Connect the device to an efficient grounding system.

PROHIBITION

Do not use extension cords or adapters.

ATTENTION

For connection to mains and safety devices, comply with the IEC 60364-4-41 standard.

ATTENTION

Fixed devices are not equipped with means of disconnection from the mains with a separation of the contacts on all poles capable of guaranteeing complete disconnection in the overvoltage category III, the instructions indicate that the means of disconnection must be integrated in the fixed wiring in compliance with the wiring regulations.

ATTENTION

The device must be protected by an adequate differential switch. The type of differential switch should be selected by assessing the type of electrical devices used by the system as a whole.

ATTENTION

DO NOT TAMPER WITH THE POWER CORD.
If the power supply cable is damaged, it must be replaced by the manufacturer or the technical assistance service or in any case by a person with similar qualifications, in order to prevent any risk.

6.8.1 Remote connections

The equipment is prearranged to be connected to other remote energy systems or energy meters (solar thermal, photovoltaic, Off-Peak)

INPUTS

- Digital 1 **(DIG1)**. NOT USABLE.
- (THETWOWIRES,WHITEANDBROWN,OFTHE6-CORE CABLE ARE NOT TO BE USED).

- Digital 2 **(DIG2)**. Digital input for photovoltaic. In case of a photovoltaic system connected to the plant, it can be used to subtract energy in the form of hot water in times of overproduction. If there is a voltage-free contact, e.g. from the inverter, which closes when there is overproduction of energy, it can be connected to the two **green** and **yellow** wires of the 6-core cable supplied with the device. Set the parameter **P23 = 1** to activate the supplement with photovoltaic.

- Digital 3 **(DIG3)**. Input for Off-Peak. This function, available only in some countries, allows the equipment to be activated only when there is a signal coming from outside with preferential tariff. If the electric contactor has a voltage-free contact which closes when the preferential tariff is available, it can be connected to the two **grey** and **pink** wires of the 6-core cable supplied with the device. Set the parameter **P24 = 1** to activate Off-peak in ECO mode or **P24 = 2** for Off-peak in AUTO mode.

6.8.1.1 Remote connection mode

For the connection to the digital inputs of the device, proceed as follows:

- Disconnect the power to the device.
- Remove the bottom cover.
- Connect the 6-core cable, supplied with the equipment, to connector CN5 on the power board.
- Secure the cable on the free jumper next to the power one.
- Use one of the two free cable glands present near the power cable for correct anchoring of the cable for the remote connection.
- Place the bottom cover previously removed.

The following figures give an example of remote connection (fig. 40 and fig. 41)which must not be longer than **3 m**.

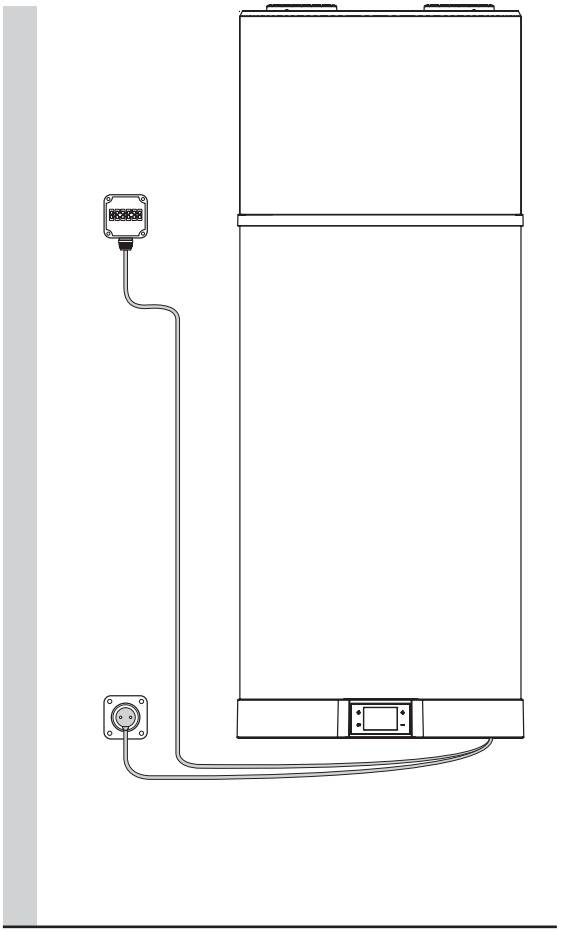


fig. 40 - Example of remote connection

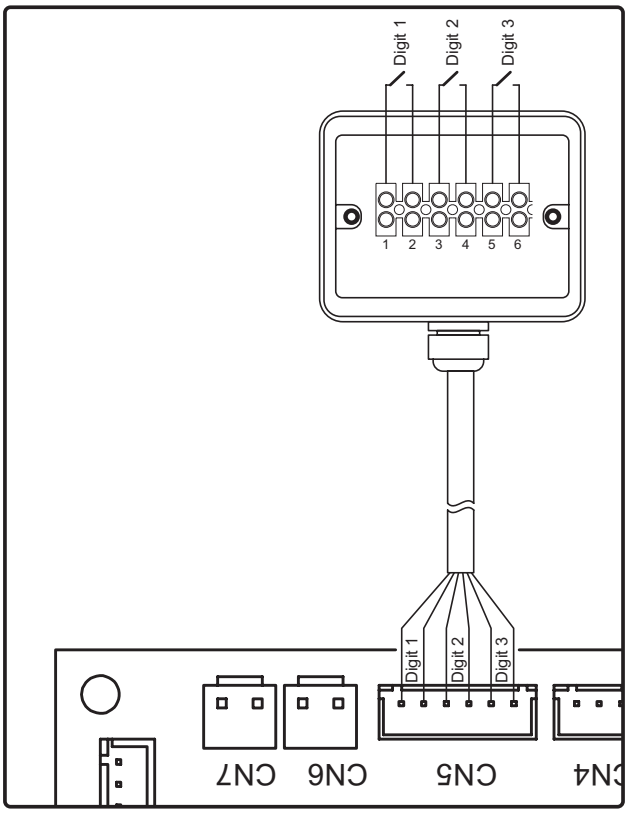


fig. 41

6.9 ELECTRICAL DIAGRAM

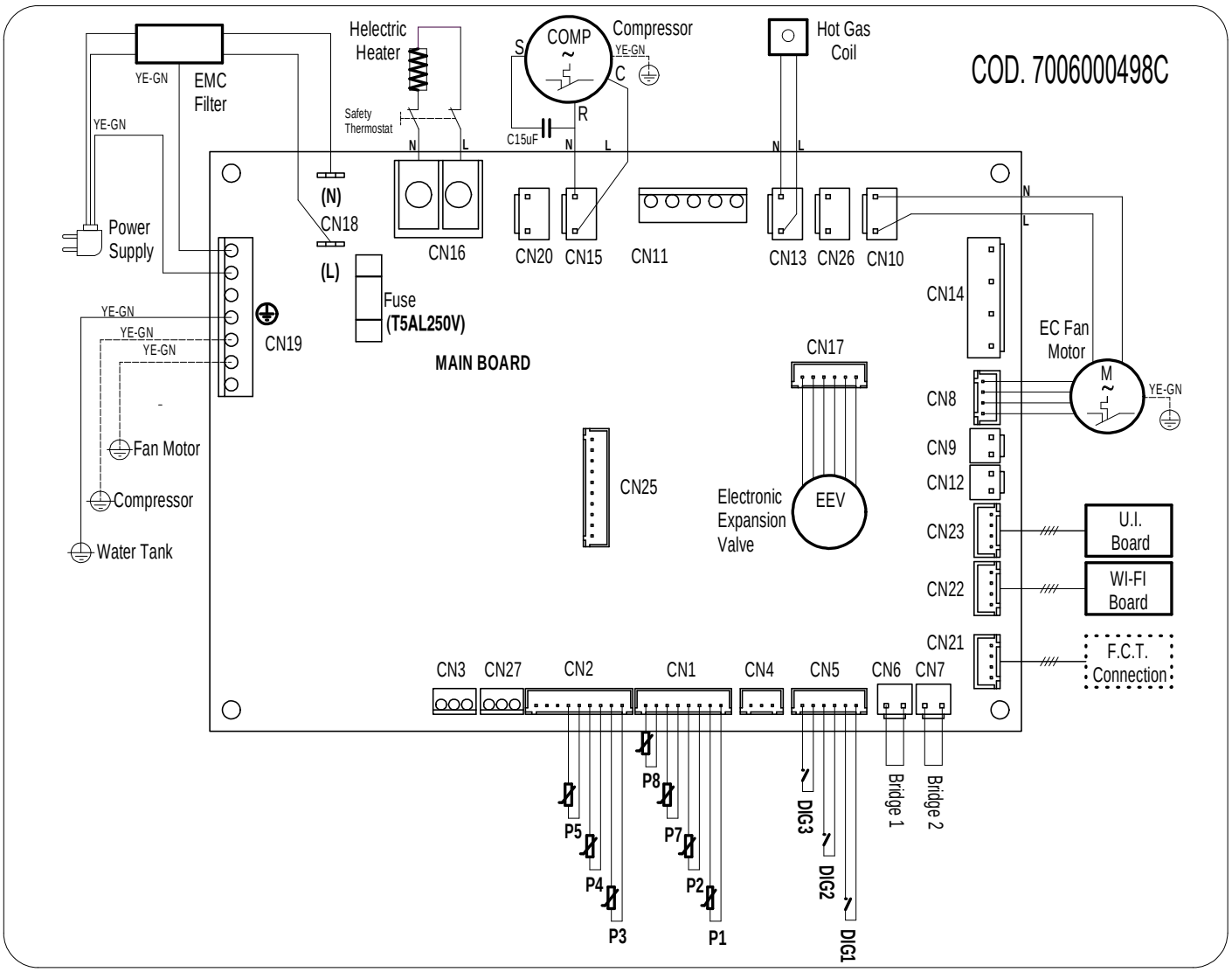


fig. 42 - Device wiring diagram

Description of connections available on the power board

REF.	DESCRIPTION	REF.	DESCRIPTION
CN1	Air, defrost and water NTC probes	**CN14**	Not usable
CN2	Compressor delivery, evaporator inlet and outlet NTC probes	**CN15**	230 Vac compressor power supply
CN3	Not usable	**CN16**	230 Vac electrical resistance power supply
CN4	Not usable	**CN17**	Electronic expansion valve (EEV) power supply
CN5	Solar digital inputs (Not usable), PV, Off-peak	**CN18**	230 Vac main power supply
CN6	Not usable	**CN19**	Ground connections
CN7	Not usable	**CN20**	230 Vac power supply for impressed current anode converter
CN8	Electronic fan PWM control (EC)	**CN21**	Connection with end of line inspection/test
CN9	Not usable	**CN22**	WI-FI card connection
CN10	230 Vac EC fan power supply	**CN23**	User interface connection
CN11	Not usable	**CN25**	Not usable
CN12	Not usable		
CN13	Hot gas defrost valve power supply		

6.10 COMMISSIONING

To commission the device, perform the following operations.

6.10.1 Preliminary checks


OBLIGATION

Check that the device has been connected to the ground cable.


ATTENTION

Check that the line voltage corresponds to that indicated on the device plate.


VISUAL INSPECTION

Check that the device is free from tools or utensils of various kinds. If present, remove them.

6.10.2 General cleaning


PROHIBITION

- **Do not pour or spray water on the product.**
- **Do not clean the surfaces with easily flammable substances (for example: alcohol or paint thinners).**


MANUAL CLEANING

Clean only the external surface using a soft and dry cloth.

6.10.3 System commissioning

- Fill the tank completely via the inlet faucet and check that there are no water leaks from gaskets and connections.
- Do not exceed the max. permissible pressure indicated in the "general technical data" section.
- Check the water circuit safety devices.
- Plug the unit into the power outlet.
- When the plug is inserted, the boiler is in standby mode, the display remains off, the power button lights up.
- Press button ⏻, the unit is activated in “ECO” mode (factory setting).

In case of a sudden power outage, when restored the equipment will restart from the operating mode prior to the interruption.

6.10.4 Query, editing operating parameters

This equipment has two distinct menus, respectively, for consulting and editing the operating parameters (see “6.10.5 List of equipment parameters”).
With the equipment operating, the parameters can be freely consulted at any time by unlocking the buttons (see “2.5 HOW TO TURN THE WATER HEATER ON AND OFF AND UNLOCK THE KEYS”) and pressing buttons “✓” and “+” together for 3 seconds. The label of the first parameter is shown on the display with the letter "A".
Pressing the "+" button displays its value and, pressing this button again, the label of the second parameter "B" is displayed, and so on.
The entire parameter list can then be scrolled forward/back with the "+" and "-" buttons.
Press the "ON/OFF" button to exit.
Editing one or more operating parameters can only be done with the equipment in standby mode and requires the password to be entered.

NB!: Use of the password is reserved for qualified personnel; any consequences due to incorrect parameter settings will be the sole responsibility of the customer. Therefore, any interventions requested by the customer from an authorised technical assistance centre LAMBORGHINI during the standard warranty period, for product problems due to incorrect settings of password-protected parameters, will not be covered by the standard warranty.

With buttons unlocked, **only in standby mode**, press buttons “ ✓ ” and “+” buttons together for 3 seconds to access the equipment parameter editing menu (password protected: 35). The display shows the two digits "00". Press button “ ✓ ”. The digit “0” on the left flashes and with “+” and “-” select the first number to enter (3) and press “ ✓ ” to confirm. Proceed in the same way for the second digit (5).
If the password is correct, the parameter P1 is displayed. Pressing the “+” button displays the default value of this parameter which can be modified by pressing ✓, and using the

"+" and "-" buttons it is possible to change the value within the permissible range for this parameter. Then press ✓ to confirm and "+" button to continue with the other parameters.
After editing the desired parameters, press the on/off button to save and exit.
The equipment now returns to standby mode.

6.10.5 List of equipment parameters

Parameters	Description	Range	Default	Notes
A	Lower water temperature probe	-30÷99°C	Measured value	Not modifiable
B	Upper water temperature probe	-30÷99°C	Measured value	Not modifiable
C	Defrosting temperature probe	-30÷99°C	Measured value	Not modifiable
D	Supply-air temperature probe	-30÷99°C	Measured value	Not modifiable
E	Evaporator inlet gas temperature probe	-30÷99°C	Measured value / "0°C" if P33 = 0	Not modifiable
F	Evaporator outlet gas temperature probe	-30÷99°C	Measured value / "0°C" if P33 = 0	Not modifiable
G	Compressor discharge gas temperature probe	0÷125°C	Measured value / "0°C" if P33 = 0	Not modifiable
H	Solar collector temperature probe (PT1000)	0÷150°C	Measured value / "0°C" if P16 = 2	Not modifiable (1)
I	EEV opening step	30÷500	Measured value / P40 value if P39 = 1	Not modifiable
J	Power-board firmware version	0÷99	Current value	Not modifiable
L	User-interface firmware version	0÷99	Current value	Not modifiable
P1	Hysteresis on lower water probe for heat-pump working	2÷15°C	7°C	Modifiable
P2	Electrical heater switching-on delay	0÷90 min	6 min	Function excluded
P3	Antilegionella setpoint temperature	50°C÷75°C	75°C	Modifiable
P4	Antilegionella duration	0÷90 min	30 min	Modifiable
P5	Defrosting mode	0 = compressor stop 1 = hot-gas	1	Modifiable
P6	Electrical heater usage during defrosting	0 = OFF 1 = ON	0	Modifiable
P7	Delay between two consecutive defrosting cycle	30÷90 min	45 min	Modifiable
P8	Temperature threshold for defrosting start	-30÷0°C	-2°C	Modifiable
P9	Temperature threshold for defrosting stop	2÷30°C	3°C	Modifiable
P10	Maximum defrosting duration	3min÷12min	8 min	Modifiable
P11	Water temperature probe value shown on the display	0 = lower 1 = upper	1	Modifiable
P12	External pump usage mode	0 = exclusive function 1 = hot-water recirculation 2 = Thermal solar system	1	Modifiable (1)
P13	Hot-water recirculation pump working mode	0 = with heat-pump 1 = always ON	0	Modifiable (1)

Parame-ters	Description	Range	Default	Notes
P14	Type of evaporator fan (EC; AC; AC with double speed; EC with dynamic speed control)	0 = EC 1 = AC 2 = AC with double speed 3 = EC with dynamic speed control	0	Modifiable
P15	Type of safety flow switch for hot / solar water re-circulation circuit, low pressure selection switch	0 = NC 1 = NO 2 = low pressure selection switch	0	Modifiable (1)
P16	Solar mode integration	0 = exclusive function 1 = working with DIG1 2 = Direct control of thermal solar system	0	Modifiable (1)
P17	Heat-pump starting delay after DIG1 opening in solar mode= 1 (with DIG1)	10÷60 min	20 min	Modifiable (1)
P18	Lower water probe temperature value to stop the heat-pump in solar mode integration = 1 (working with DIG1)	20÷60°C	40°C	Modifiable (1)
P19	Hysteresis on lower water probe to start the pump in solar mode integration = 2 (direct control of thermal solar system solar)	5÷20°C	10°C	Modifiable (1)
P20	Temperature threshold for solar drain valve / solar collector roll-up shutter action in solar mode integration = 2 (direct control of thermal solar system solar)	100÷150°C	140°C	Modifiable (1)
P21	Lower water probe temperature value to stop the heat-pump in photovoltaic mode integration	30÷70°C	62°C	Modifiable
P22	Upper water probe temperature value to stop the electrical heater in photovoltaic mode integration	30÷80°C	75°C	Modifiable
P23	Photovoltaic mode integration	0 = exclusive function 1 = activated	0	Modifiable
P24	Off-peak working mode	0 = exclusive function 1 = activated with ECO 2 = activated with AUTO	0	Modifiable
P25	Offset value on upper water temp probe	-25÷25°C	0°C	Modifiable
P26	Offset value on lower water temp probe	-25÷25°C	0°C	Modifiable
P27	Offset value on air-inlet temp probe	-25÷25°C	0°C	Modifiable
P28	Offset value on defrosting temp probe	-25÷25°C	0°C	Modifiable
P29	Antilegionella starting hour	0÷23 hours	23 hours	Modifiable
P30	Hysteresis on upper water probe for electrical heater working	2÷20°C	7°C	Modifiable
P31	Heat-pump working period in AUTO mode for heating rate calculation	10÷80 min	30 min	Modifiable
P32	Temperature threshold for electrical heater usage in AUTO mode	0÷20°C	4°C	Modifiable

Parameters	Description	Range	Default	Notes
P33	Electronic-expansion valve (EEV) control	0 = permanently deactivated 1 = activated	1	Modifiable
P34	Superheating calculation period for EEV automatic control mode	20÷90s	30 s	Modifiable
P35	Superheating setpoint for EEV automatic control mode	-8÷15°C	3°C	Modifiable
P36	Desuperheating setpoint for EEV automatic control mode	60÷110°C	88°C	Modifiable
P37	EEV step opening during defrosting mode (x10)	5÷50	15	Modifiable
P38	Minimum EEV step opening with automatic control mode (x10)	3~45	9	Modifiable
P39	EEV control mode	0= automatic 1 = manual	0	Modifiable
P40	Initial EEV step opening with automatic control mode / EEV step opening with manual control mode (x10)	5÷50	25	Modifiable
P41	AKP1 temperature threshold for EEV KP1 gain	-10÷10°C	-1°C	Modifiable
P42	AKP2 temperature threshold for EEV KP2 gain	-10÷10°C	0°C	Modifiable
P43	AKP3 temperature threshold for EEV KP3 gain	-10÷10°C	0°C	Modifiable
P44	EEV KP1 gain	-10÷10	3	Modifiable
P45	EEV KP2 gain	-10÷10	2	Modifiable
P46	EEV KP3 gain	-10÷10	1	Modifiable
P47	Maximum allowed inlet temperature for heat-pump working	30÷50°C	43°C	Modifiable
P48	Minimum allowed inlet temperature for heat-pump working	-10÷10°C	-5°C	Modifiable
P49	Threshold on inlet temperature for evaporator EC or AC with double speed blower speed setting	10÷40°C	18°C	Modifiable
P50	Antifreeze lower water temperature setpoint	0÷15°C	12°C	Modifiable
P51	Evaporator EC blower higher speed setpoint	60÷100%	92%	Modifiable
P52	Evaporator EC blower lower speed setpoint	10÷60%	60%	Modifiable
P53	EC evaporator fan defrost speed setpoint	0÷100%	50%	Modifiable
P54	Low pressure switch bypass time	1÷240 min	1	Modifiable

Parameters	Description	Range	Default	Notes
P55	Band 1 evaporator temperature proportional regulation	1÷20°C	4°C	Modifiable
P56	Differential temperature with activation of maximum speed	P57÷20°C	2°C	Modifiable
P57	Differential temperature with deactivation of maximum speed	1°C÷P56	1°C	Modifiable
P58	Use of the evaporator fan with the compressor off	0 = OFF 1 = ON with manual speed control 2 = ON with automatic speed control	0	Modifiable
P59	Evaporator fan speed (EC) with compressor off	0÷100%	40%	Modifiable
P60	Temperature difference 1 of evaporation of the air for the calculation of the setpoint	1÷25°C	4°C	Modifiable
P61	Temperature difference 2 of evaporation of the air for the calculation of the setpoint	1÷25°C	2°C	Modifiable
P62	Temperature difference 3 of evaporation of the air for the calculation of the setpoint	1÷25°C	6°C	Modifiable
P63	Temperature difference 4 of evaporation of the air for the calculation of the setpoint	1÷25°C	3°C	Modifiable
P64	Temperature difference 5 of evaporation of the air for the calculation of the setpoint	1÷25°C	10°C	Modifiable
P65	Temperature difference 6 of evaporation of the air for the calculation of the setpoint	1÷25°C	18°C	Modifiable
P66	Band 2 evaporator temperature proportional regulation	1÷20°C	2°C	Modifiable
P67	Band 3 evaporator temperature proportional regulation	1÷20°C	9°C	Modifiable
P68	Band 4 evaporator temperature proportional regulation	1÷20°C	5°C	Modifiable
P69	Band 5 evaporator temperature proportional regulation	1÷20°C	10°C	Modifiable
P70	Band 6 evaporator temperature proportional regulation	1÷20°C	5°C	Modifiable
P71	EC evaporator fan speed reduction for silent mode	0÷40%	15%	Modifiable
P72	EC fan speed regulator gain	1÷100	5	Modifiable

(1) = NOT USABLE FOR THIS EQUIPMENT

7. REPLACEMENTS

ATTENTION

Incorrect repairs may put the user in serious danger. If your device needs any repair, contact the technical assistance service**.**

EXPERT TECHNICIAN

R290

Any intervention on the device, including disposal, must be performed by qualified personnel with a suitable Refrigeration Technician's Licence aimed at the knowledge and management of systems containing HC type gases such as R290 (Propane).

ATTENTION

Before undertaking any maintenance operation make sure the equipment is not and cannot accidentally be electrically powered.
Therefore, turn off the device and remove the plug from the socket.

ATTENTION

Carrying out repair work on parts with safety function compromises safe operation of the equipment. Only replace defective parts with original spare parts.

7.1 POWER BOARD FUSE REPLACEMENT

Proceed as indicated below (reserved for qualified technical personnel only):

- Disconnect the power to the device.
- Remove the bottom cover.
- Remove the fuse cap, then the fuse, using a suitable screwdriver.
- Install a new IEC 60127-2/II **(T5AL250V)** certified time-delay **5 A 250V** fuse, then refit the protective cap.
- Reassemble all the plastics and make sure the equipment is correctly installed before powering it.

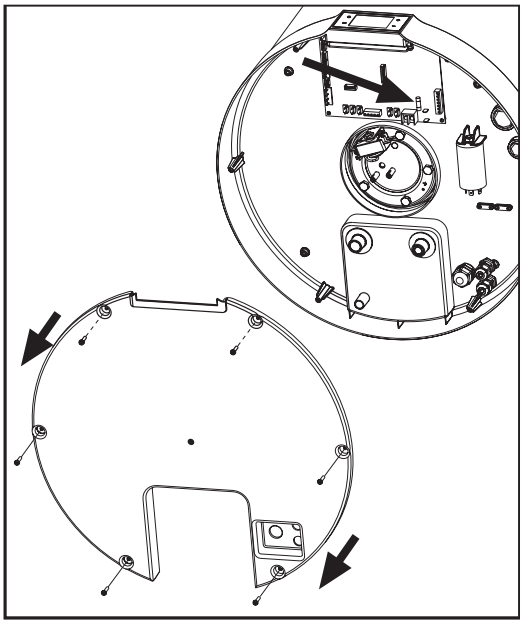


fig. 43

7.2 REPLACEMENT OF ELECTRIC RESISTOR SAFETY THERMOSTAT

This equipment has a manual-reset safety thermostat connected in series with the heating element immersed in water, which interrupts the power supply in case of overtemperature inside the tank.
If necessary, proceed as follows to reset the thermostat (reserved for qualified technical personnel):

- Unplug the product.
- Remove the bottom cover by first undoing the locking screws (fig. 43).
- Manually reset the tripped safety thermostat (fig. 44). In case of tripping, the central pin of the thermostat comes out by about 2 mm.
- Refit the previously removed bottom cover.

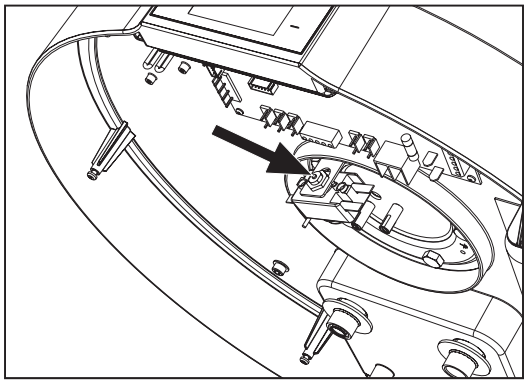


fig. 44- Safety thermostat reset

ATTENTION

The intervention of the safety thermostat may occur due to a fault in the control board or the absence of water in the boiler tank.

NB!: The intervention of the thermostat excludes the operation of the electrical resistance but not the heat pump system within the allowed operating limits.

ATTENTION

If the operator is unable to eliminate the fault, switch off the equipment and contact the Technical Assistance Service, communicating the model of the product purchased.

7.3 CHECK/REPLACEMENT OF THE SACRIFICIAL ANODE

The integrity of the Mg anodes must be checked at least once every two years (once a year is recommended). The check should be carried out by a qualified technician.

The magnesium anode (Mg), also known as an "sacrificial" anode, prevents any eddy currents generated inside the boiler from triggering surface corrosion.
Magnesium is, in fact, a less noble metal than the material lining the inside of the boiler, therefore, it attracts the negative charges first that are formed by heating the water, and is consumed. The anode, therefore, “sacrifices” itself and corrodes instead of the boiler tank. The boiler has two anodes, one fitted in the lower part of the tank and one fitted in the upper part of the tank (area more subject to corrosion).

Before carrying out the check, you must:

- Close the cold water inlet.
- Proceed with emptying the boiler (see par. “7.4 EMPTYING THE BOILER”).
- Remove the bottom cover 1.
- Disconnect the heating element safety thermostat electrical connection from the power board and remove the water NTC probes from the dedicated pipe in the element flange.
- Remove the flange by unscrewing the bolts 3. The corrosion of the anode 4 can then be checked; if it affects more than 2/3 of the anode surface, proceed with replacement.

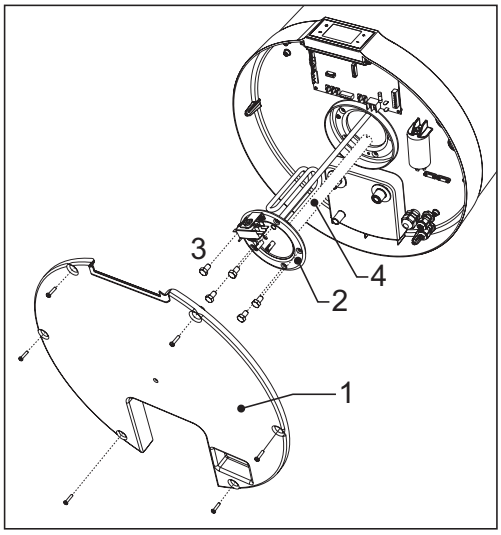


fig. 45

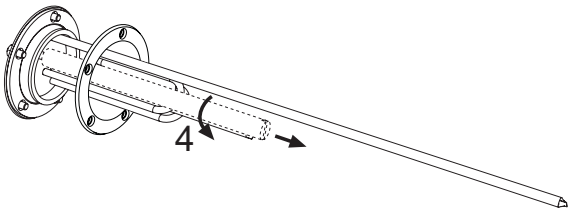


fig. 46

The flange has a special gasket which must be replaced if the anode is checked or replaced.

7.4 EMPTYING THE BOILER

If not in use, especially in case of low temperatures, it is advisable to drain the water inside the boiler. For the equipment in question, just open the drain cock as per the example hydraulic connections chap. “6.7 HYDRAULIC CONNECTIONS” on page 135 (see fig. 35).

NB!: In case of low temperatures, remember to empty the system to avoid freezing.

7.5 REPLACEMENT OF THE POWER CORD


ATTENTION

DO NOT TAMPER WITH THE POWER CORD.
If the power supply cable is damaged, it must be replaced by the manufacturer or the technical assistance service or in any case by a person with similar qualifications, in order to prevent any risk.

The cable must be replaced in compliance with the laws in force in the country where the product is used.
Replace the damaged power cord with a new one with the same or equivalent characteristics to the original cord.

8. REQUIREMENTS FOR THE OPERATION, SERVICE AND INSTALLATION OF APPLIANCES THAT USE FLAMMABLE REFRIGERANT GASES ACCORDING TO ANNEX DD OF EN 60335-2-40

8.1 GENERAL WARNINGS


OBLIGATION

Any maintenance operation must be performed by qualified personnel in accordance with the instructions in this manual.


OBLIGATION

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


OBLIGATION

The unit must be placed in a room that does not have continuous ignition sources (e.g. naked flames, a gas appliance or electric heater in operation).


OBLIGATION

Do not pierce or burn.


OBLIGATION

Remember that refrigerant fluids may be odorless.


OBLIGATION


R290

The appliance must be installed, operated and placed in an installation space with an area greater than 10 m^2 and a minimum height of not less than 2 meters. The overall volume of the installation compartment must be greater than 20 m^3.
The air inlet and outlet of the appliance must be channelled to the external environment as indicated in paragraph 6.6 on page 134.


R290

The product is supplied with an R290 refrigerant charge of 0.15 kg; any recharging operations can only be performed at the manufacturer's production site.
No repairs/replacements are allowed on components that are an integral part of the refrigerant circuit.

8.2 FIRE RISK

The product must be installed in a room equipped with adequate air change to prevent the risk of fire in case of a refrigerant gas leak.

If the above is not possible, the installer must carry out the necessary work to ensure that no refrigerant gas stagnation occurs.

Periodically check that there are no obstructions in the openings that ensure the change of air inside the installation room.

The product must not be installed in a compartment where there are naked flames, e.g. open-chamber gas boilers, wood stoves, electric stoves and in general any other possible source of ignition.

Smoking near or inside the installation compartment is prohibited.

Operating with naked flames near or inside the installation compartment is prohibited.

8.3 MAINTENANCE

Any intervention on the device, including disposal, must be performed by qualified personnel with a suitable Refrigeration Technician's Licence aimed at the knowledge and management of systems containing HC type gases such as R290 (Propane).

During any routine or extraordinary maintenance or failure the manufacturer recommends that maintenance personnel use a suitable HC gas detector equipped with the necessary safety devices to prevent ignition in the presence of a potentially explosive atmosphere.
Always ensure adequate ventilation of the installation compartment before carrying out any work on the product, as the refrigerant gas used is odorless.

Maintenance personnel must therefore implement all the procedures and precautions necessary to prevent any dangerous situation in the presence of a flammable gas.

The product does not have a charging or recharging valve, as this operation cannot and must not be performed for any reason on site. In case of a leak in the refrigeration circuit or if it is partially or entirely empty, the maintenance technician must have the entire system replaced.

During maintenance operations, the operator in charge must check the following points.

Installation conditions
Check that:
- The dimensions of the installation compartment are those specified in this manual.
- Sufficient ventilation of the room is ensured.
- The markings and graphic signs on the product are present and legible.
- There are no signs of damage or corrosion on the product that could impair its operation or cause refrigerant gas to escape.

In case of differences in the product installation conditions, maintenance personnel are required to inform the owner and proceed with elimination of the non-conformities found.

Checks and repairs of electrical components
Check that:
- There are no conditions of imminent danger for the operator;
- The circuit is not powered.
- If it is not possible to operate without power supply, make sure the owner has been notified regarding the situation.
- The electric capacitors have been safely discharged without producing sparks.
- There is continuity in the ground connection.
- The electrical components are replaced only with original spare parts.
- No cuts or joints are made on the cables of the electrical components.
- The cables and wires do not have any damage which could compromise the integrity of the product and the safety of people and/or property.

Note: Only original replacement electrical components are guaranteed by the manufacturer as safe and tested by a third party for use with flammable refrigerants.

Leak detection

- Do not use any kind of flame to detect refrigerant leakage.
- Use electric detectors only if sure of their efficiency and safety in an explosive environment; for this purpose the instrument must be able to detect an R290 leak equivalent to a maximum of 25% of the LFL (Lower Flammability Level).
- Alternatively, specific leak detector sprays can be used for refrigerant gases; the product used must be non-corrosive type.

In order to be used safely, the leak detection instruments must have a calibration tool normally called a calibrated leak. Checking the sensitivity of the detector with the aid of the calibration tool must be carried out far from the place of installation in order to ensurer correct calibration.

9. DISPOSAL

EXPERT TECHNICIAN

R290

Any intervention on the device must be performed by qualified personnel with a suitable Refrigeration Technician's Licence aimed at the knowledge and management of systems containing HC type gases such as R290 (Propane).

R290

This equipment contains 0.15 kg of flammable gas (Propane R290). Carefully read the warnings indicated in chapter 8 on page 147.

At the end of use, the heat pumps must be disposed of in compliance with current regulations.

ATTENTION

Divide the materials and dispose of them in special collection centres suitable for waste disposal, according to the laws and regulations in force in the country of use.

Disposal operations must only be carried out at an authorised centre by qualified personnel and in full compliance with current regulations.

Before proceeding with the disposal of the product, it is necessary to safely remove the refrigerant gas from the circuit; this operation must be performed according to the following procedure:

- The product must not be connected to the power grid.
- Before starting, ensure you have an adequate gas recovery system equipped with cylinders suitable for the quantity and type of gas you are about to recover, make sure you are wearing suitable PPE.
- Empty the circuit from the pipe used by the manufacturer to charge the refrigerant gas and at the same time from the compressor suction pipe.
- Start the refrigerant gas recovery system, taking care not to exceed more than 80% in filling and in the maximum operating pressure.
- The operation ends when the desired vacuum level has been reached; at this point close the recovery cylinder valves and remove the device.
- The removed gas can only be reused after it has been purified and checked by its supplier.

Product disposal label

The product must be identified with a label indicating that it must be scrapped, bearing the date and signature of the employee in charge.
The label must indicate that the product contains a flammable gas.

Recovery of refrigerant gas

To perform this operation, the recovery equipment used must be in full working order and properly maintained, suitable for use with flammable gases and accompanied by an instruction manual for proper use.
The connecting pipes must be in good condition and equipped with leak-free connections.
The recovery cylinders must be suitable for use and equipped with a safety valve and shut-off valve, if possible, cool the cylinders before carrying out the recovery operation.
The refrigerant gas recovered must be correctly identified and not mixed with other different gases within the same cylinder; the cylinders must then be sent to the gas supplier who will perform recovery and purification.
If it is necessary to dispose of the compressor or the oil contained in it, it is advisable to first provide for the electrical heating of the compressor body in order to allow the complete and quick evaporation of the refrigerant gas that may have remained dissolved in the oil. The oil must then be managed appropriately.

The main materials that make up the device in question are:

- steel - magnesium - plastic - copper - aluminium - polyurethane

USER INFORMATION

Pursuant to Directives 2011/65/EU and 2012/19/EU on the restriction of the use of hazardous substances in electrical and electronic equipment, as well as the disposal of waste.
The crossed-out bin symbol on the equipment or on its packaging indicates that, at the end of its useful life, the product must be collected separately from other waste.

Therefore, at the end of its life, the user must give the equipment to the appropriate recycling centers for electrical and electronic equipment, or return it to the dealer when purchasing new, equivalent type equipment, on a one-to-one basis.
Adequate separate waste collection for subsequent sending of the decommissioned equipment to environmentally compatible recycling, treatment and/or disposal helps prevent negative effects on the environment and health and favors the reuse and/or recycling of the materials that make up the equipment.
The illegal disposal of the product by the user may lead to the application of the administrative penalties laid down the legislation in force.

10. PRODUCT SHEET

Descriptions	u.m.	90 LT	120 LT
Declared load profile		M	M
Energy efficiency of water heating under average climatic conditions		A+	A+
Energy efficiency of water heating in % under average climatic conditions	%	107	112
Annual energy consumption in kWh in terms of final energy in average climatic conditions	kWh	479	458
Temperature setting of the water heater thermostat	°C	53	53
Acoustic power level Lwa inside in dB	dB	52	52
The water heater can also work in off-peak hours		NO	NO
Any specific precautions to take during assembly, installation or maintenance of the water heater		See manual	
Energy efficiency of water heating in % under the coldest climatic conditions	%	91	86
Energy efficiency of water heating in % under the hottest climatic conditions	%	114	119
Annual energy consumption in kWh in terms of final energy in the coldest climatic conditions	kWh	565	596
Annual energy consumption in kWh in terms of final energy in the hottest climatic conditions	kWh	449	430
Acoustic power level Lwa outside in dB	dB	50	50

11. NOTES ON RADIO DEVICES AND APPS

This product incorporates a radio module (Wi-Fi) and complies with the RED (Radio Equipment Directive) 2014/53/EU. The following are the main data of the radio part:

- Transmission protocol: IEEE 802.11 b/g/n
- Frequency range: 2412÷2472 MHz (13 channels)
- Maximum transmitter power: 100 mW (20.00 dBm)
- Maximum power spectral density: 10 dBm/MHz
- Maximum antenna gain: 3.23 dBi

Wireless networks can be affected by surrounding wireless communication environments.

The product may not be able to connect to the Internet or lose the connection due to the distance from the Wi-Fi router or electrical interference from the surrounding environment. Wait a few minutes and try again.

If your internet service provider records the MAC address of PCs or modems for identification purposes, this product may fail to connect to the Internet. In this case, contact your internet service provider for assistance.
The firewall settings of your network system may prevent this product from accessing the Internet. Contact your internet service provider for assistance. If this problem persists, contact an authorised service centre or dealer.
In order to configure the wireless router (AP) settings, refer to the router's user manual.
Visit the Google Play Store or Apple App Store and search for the app provided for this product to find out the minimum installation requirements and to download it to your smart device.
This app is not available for some tablets/smartphones and, for the purpose of constant performance improvement, is subject to changes/updates without notice, or an interruption of support according to the manufacturer's policies.