

# Installation manual

Air/water monobloc heat pump  
for residential applications



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*First of all, we would like to thank you for having chosen our product.*

*We are sure you will be happy with it because it represents the state of the art in the technology of home air conditioning.*

*By following the suggestions contained in this manual, the product that you have purchased will operate without problems giving you optimum room temperatures with minimum energy costs.*

*Giacomini S.p.A.*

## Conformity

This unit complies with the European directives:

- EN 60335-2-40 Household and similar electrical appliances - Safety Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers
- Low Voltage Directive 2014/35/UE
- EMC Directive 2014/30/EU on Electromagnetic Compatibility
- RoHS2 Directive 2011/65/EU2 on the restriction of the use of hazardous substances in electrical and electronic equipment
- Directive 2012/96/EC (WEEE) on waste electrical and electronic equipment
- ErP Directive 2009/125/EC and Regulation 2012/206/EC
- F-Gas Regulation 2014/517/EU on fluorinated greenhouse gases
- Directive 2014/68/EU PED on pressure equipment

And subsequent amendments.

## Markings



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## GENERAL INFORMATION

### 1.1 About the manual

This manual was written to provide all the explanations for the correct management of the appliance.

-  This instruction manual forms an integral part of the device and therefore must be carefully preserved and must ALWAYS travel with it, even if you transfer the device to another owner or relocate it to other premises. If the manual gets damaged or lost, download a copy from the website.

-  Read this manual carefully before proceeding with any operation and follow the instructions in the individual chapters.

-  The manufacturer is not responsible for damages to persons or property caused by failure to follow the instructions in this manual.

-  This document is restricted in use to the terms of the law and may not be copied or transferred to third parties without the express authorization of the manufacturer.

### Editorial pictograms

The pictograms in the next chapter provide the necessary information for correct, safe use of the machine in a rapid, unmistakable way.

#### Related to security

##### High risk warning (bold text)

- The operation described above presents a risk of serious physical injury, fatality, major damage to the appliance and/or to the environment if not carried out in compliance with safety regulations.

##### Low risk warning (plain text)

- The operation described above presents a risk of minor physical injury or minor damage to the appliance and/or to the environment if not carried out in compliance with safety regulations.

##### Prohibition (plain text)

- Refers to prohibited actions.

##### Important information (bold text)

- This indicates important information that must be taken into account during the operations.

#### In the texts

- Actions required

*Expected responses following an action*

- Lists

#### In the figures

1 The numbers indicate the individual components.

A The capital letters indicate component assemblies.

 The white numbers in black marks indicate a series of actions to be carried out in sequence.

 The black letter in white identifies an image when there are several images in the same figure.

### Pictograms on the product

Symbols are used in some parts of the appliance:

#### Related to security

##### Caution: electrical danger

- The concerned personnel is informed to the presence of electricity and the risk of suffering an electric shock.

#### Related to refrigerant R32

##### Caution: low flammability material

- R32 refrigerant gas is slightly flammable and odourless. Avoid proximity to sources of ignition in continuous operation (open flames, gas appliances, electric stoves, lighted cigarettes, etc.).



##### Instructions

- Read the instructions carefully before performing any work on the appliance.



##### Instructions for Service

- The Technical Service Centre must read the instructions carefully before performing any work on the appliance.



##### Instructions for the user

- Further information can be found in the technical documentation of the appliance.

### Recipients

#### User

Non-expert person capable of operating the product in safe conditions for people, for the product itself and the environment, interpreting an elementary diagnostic of

faults and abnormal operating conditions, carrying out simple adjustment, checking and maintenance operations.

**Installer**

Expert person qualified to position and connect (hydraulically, electrically, etc.) the unit to the plant; this person is responsible for handling and correct installation according to the instructions provided in this manual and the national standards currently in force.

To work on the refrigeration circuit, the installer must comply with the provisions of Regulation 303/2008/EC which defines, in accordance with Directive 842/2006/EC, the requirements for companies and personnel with regard to fixed refrigeration, air conditioning and heat pump equipment containing certain fluorinated greenhouse gases (F-gas licence).

**Manual organisation**

The manual is divided into sections each dedicated to one or more target groups.

**General information**

It addresses all recipients.

It contains general information and important warnings that should be known before installing and using the appliance.

**Installation**

It is addressed exclusively to the installer.

It contains specific warnings and all the information necessary for positioning, mounting and connecting the appliance.

**Service**

Expert and qualified person authorised directly by the manufacturer to carry out all routine and supplementary maintenance operations, as well as every adjustment, check, repair and replacement of parts necessary during the life of the unit itself.

Service personnel must comply with the provisions of Regulation 303/2008/EC which defines, in accordance with Directive 842/2006/EC, the requirements for companies and personnel with regard to fixed refrigeration, air conditioning and heat pump equipment containing certain fluorinated greenhouse gases (F-gas licence).

**Commissioning, maintenance and troubleshooting**

They are addressed exclusively to the Technical Assistance Centre.

It contains specific warnings useful information for the most common commissioning and routine maintenance.

**Configuration accessories**

It is addressed to the installer and the Technical Assistance Centre.

It contains specific warnings and all detailed information on configuration accessories.

**Technical information**

It addresses all recipients.

It contains detailed technical information about the appliance.

**1.2 General warnings**

- ⚠ Specific warnings are given in each chapter of the document and must be read before starting operations.
- ⚠ All personnel involved must be aware of the operations and dangers that may arise when beginning all unit installation operations.
- ⚠ Installation performed outside the warnings provided in this manual and use of the appliance outside the prescribed temperature limits will invalidate the warranty.
- ⚠ The installation and maintenance of climate control equipment could be dangerous because there is pressurised refrigerant gas and live electrical components inside the appliances. The installation, initial start-up and subsequent maintenance phases must be carried out exclusively by authorised and qualified personnel (see first start-up request form enclosed with the appliance).
- ⚠ Any contractual or extra-contractual liability for damage caused to persons, animals or property, due to installation, adjustment and maintenance errors or improper use is excluded. All uses not expressly indicated in this manual are not permitted.
- ⚠ Only qualified installer companies are authorised to install the device. After having completed installation, the installer will issue a declaration of conformity to the plant manager, as required by the applicable standards and the guidelines provided by contractor's instruction manual supplied with the device.

- ⚠ First start-up and repair or maintenance operations must be carried out by the Technical Assistance Centre or by qualified personnel following the provisions of this manual.
- ⚠ Do not modify or tamper with the appliance as this can lead to dangerous situations.
- ⚠ Use suitable accident-prevention clothing and equipment during installation and/or maintenance operations. The manufacturer is not liable for the non-observance of the current safety and accident prevention regulations.
- ⚠ In the event of liquid or oil leaks, set the master switch of the plant to "off" and close the water taps. Call the authorised Technical Assistance Centre or professionally qualified personnel as soon as possible and do not work on the appliance yourself.
- ⚠ In case of replacement of parts, use only original parts.
- ⚠ The manufacturer reserves the right to make changes to its models at any time to improve its product, without prejudice to the essential characteristics described in this manual. The manufacturer is not obliged to add such modifications to machines previously manufactured, already delivered or under construction.

**Specific warnings for R32**

- ⓘ **This document contains only some of the warnings related to the refrigerant R32. For more com-**

**prehensive information, carefully read the safety data sheet available from the dealer.**

- ⚠ Each chapter contains specific warnings for the operations it describes. These warnings must be read before starting activities.
- ⚠ All precautions concerning the treatment of the refrigerant must be observed following the regulations in force.

- ⚠ The unit uses environmentally friendly R32 refrigerant gas, with a Global Warming Potential (GWP) = 675. Do not release R32 gas into the atmosphere.
- ⚠ R32 refrigerant gas is slightly flammable and odourless.
- ⚠ Do not place flammable objects (spray cans) within 1 metre of the air outlet.
- ⚠ Avoid proximity to sources of ignition in continuous operation (open flames, gas appliances, electric stoves, lighted cigarettes, etc.).

### 1.3 Basic rules of security

Please keep in mind that the use of products powered by electricity and water call for operators to comply with certain essential safety rules:

- ⊖ The use of the appliance to children and unassisted disabled persons is prohibited.
- ⊖ It is forbidden to touch the device with wet or damp body parts.
- ⊖ It is forbidden to carry out any operation before disconnecting the appliance from the power supply by setting the plant master switch to "off".
- ⊖ It is forbidden to modify the safety or adjustment devices or adjust without authorization and indications of the manufacturer.
- ⊖ It is forbidden to pull, unplug or twist the device's electric cables, even if it is disconnected from the mains.

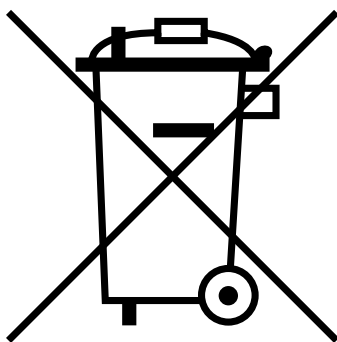
- ⊖ It is forbidden to introduce objects and substances through the air inlet and outlet grilles.
- ⊖ It is forbidden to open the access doors of the device's internal parts without first having set main switch of the system to "off".
- ⊖ It is forbidden to dispose of, or leave in the reach of children, the packaging materials which could become a source of danger.

#### Specific safety rules for R32

**This document contains only some of the safety rules related to refrigerant R32. For more comprehensive information, carefully read the safety data sheet available from the dealer.**

- ⊖ Smoking in the vicinity of the appliance is prohibited.
- ⊖ Using a mobile phone near the appliance is prohibited.
- ⊖ Using leak detectors with halogen lamps is prohibited.

### 1.4 Disposal



The symbol on the product or its packaging indicates that the product must not be treated as normal household waste, but must be taken to the appropriate collection point for the recycling of electrical and electronic equipment.

Proper disposal of this product avoids harm to humans and the environment and promotes the reuse of valuable raw materials.

For more detailed information about the recycling of this product, contact your local city office, your household

waste disposal service or the shop where you purchased the product.

Illegal disposal of the product by the user involves the application of the administrative sanctions provided for by the regulations in force.

This provision is only valid in the EU Member States.

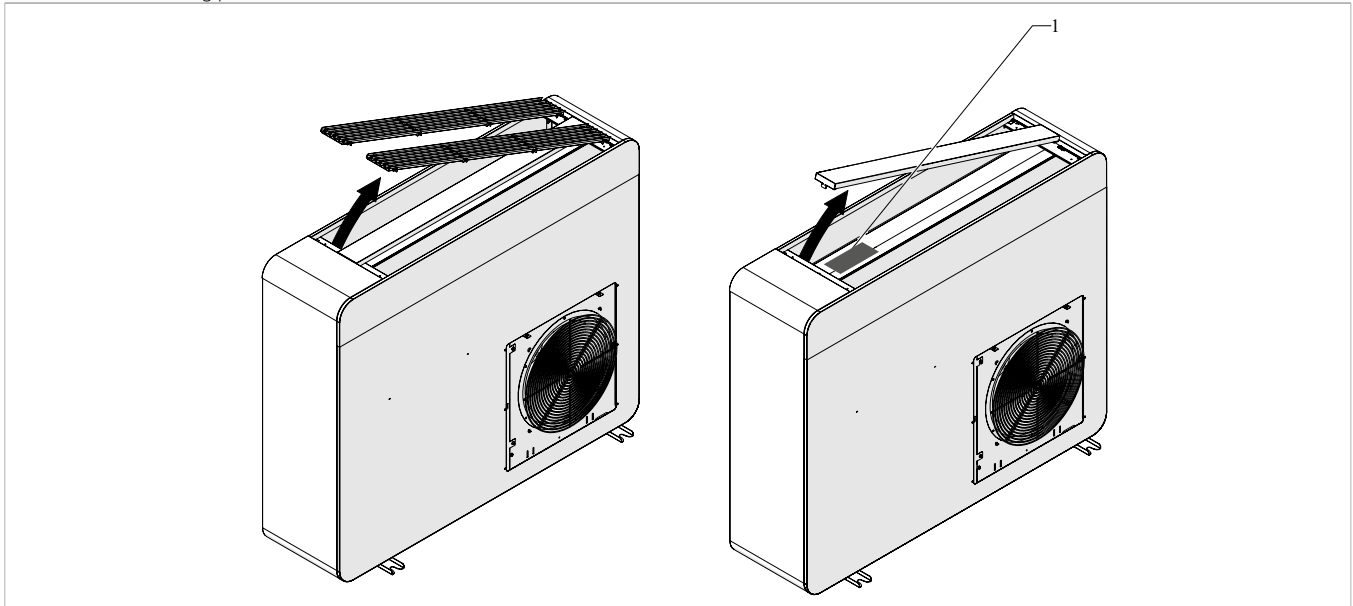
- ⚠ Avoid disassembling the unit yourself.
- ⚠ This unit contains fluorinated greenhouse gases covered by the Kyoto Protocol. Maintenance and disposal operations must be carried out by qualified personnel only.
- ⚠ **Contact an authorised Technical Assistance Centre to disassemble the appliance.**

## PRODUCT PRESENTATION

### 2.1 Identification

The appliance can be identified by the rating plate:

#### 1. Technical rating plate



#### Technical rating plate

This shows the technical and performance specifications of the appliance.

⚠ According to EU Regulation No. 517/2014 concerning certain fluorinated greenhouse gases, it is mandatory to indicate the total amount of refrigerant present in the installed system. This information can be found on the rating plate of the unit.

⚠ Tampering with, removal of, or lack of identification plates will not allow for the safe identification of the product by its serial number and therefore invalidates the warranty.

### 2.2 Destination of use

These appliances are designed for air-conditioning/heating and/or domestic hot water (DHW) production and must

be intended for this use compatibly with their performance characteristics.

### 2.3 Description of the appliance

The heat pumps in the range **HPM-EV** version, are designed for vertical outdoor installation, on the floor or wall.

The units are manufactured in different sizes, distinguished by performance and type of power supply:

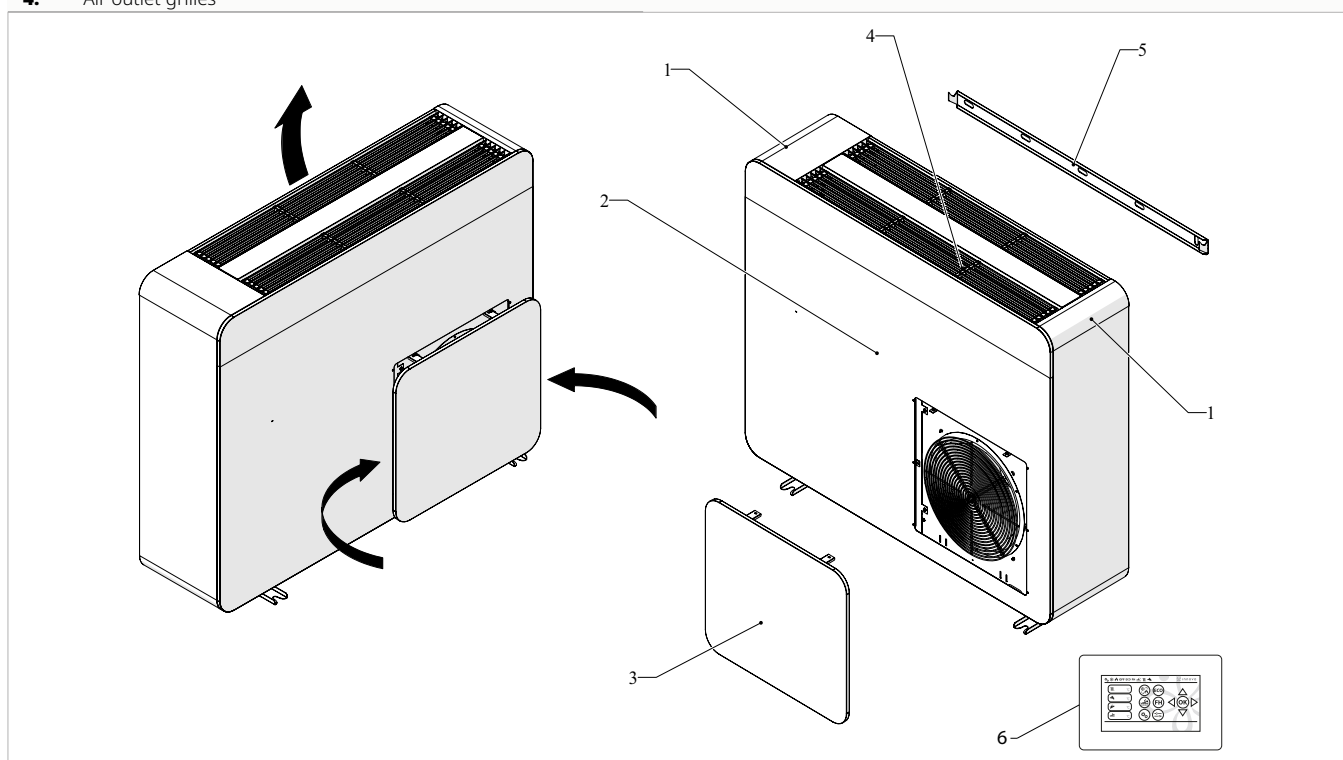
**Single-phase models 5M - 7M - 9M - 11M - 13M - 15M**

**Three-phase 11T - 13T - 15T models**

## 2.4 List of external components

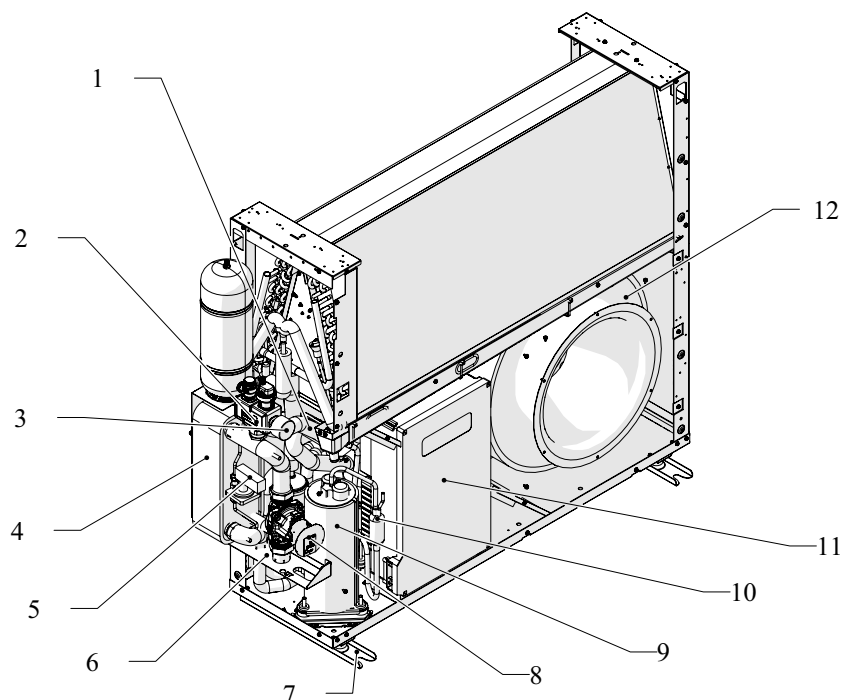
1. Cosmetic side panel
2. Cosmetic front panel
3. Fan screen (supplied unassembled)
4. Air outlet grilles

5. Wall mounting bracket
6. Control Panel

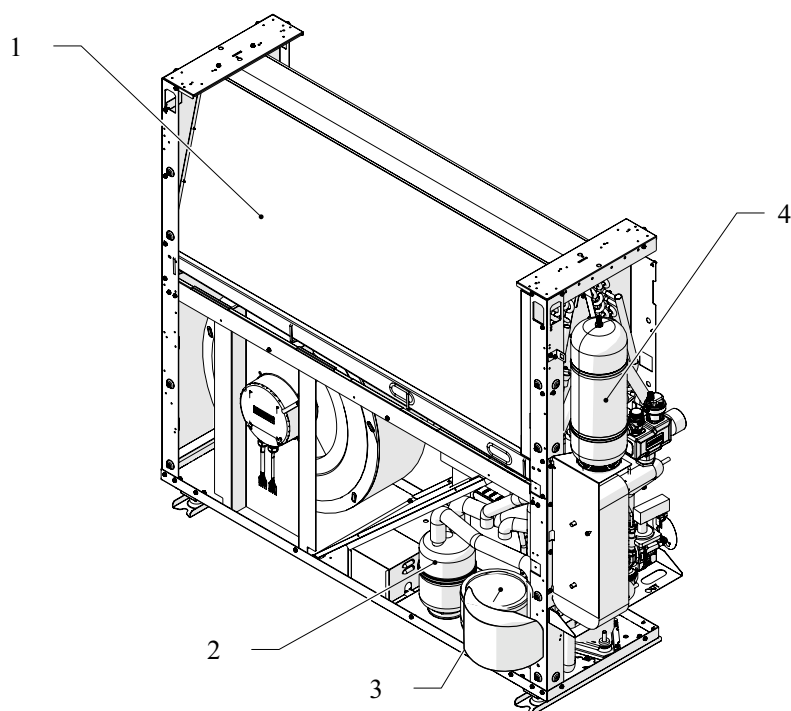


## 2.5 List of internal components

- |                                           |                                                                               |
|-------------------------------------------|-------------------------------------------------------------------------------|
| <b>1.</b> Valve reversing cycle           | <b>7.</b> Floor fixing bracket with vibration dampers (exposed versions only) |
| <b>2.</b> Safety valve and air vent group | <b>8.</b> PP1 primary circulation pump                                        |
| <b>3.</b> Pressure gauge                  | <b>9.</b> Inverter driven rotary compressor                                   |
| <b>4.</b> Plate heat exchanger            | <b>10.</b> Silencer muffler                                                   |
| <b>5.</b> Differential pressure switch    | <b>11.</b> Electrical panel                                                   |
| <b>6.</b> Hydraulic connections           | <b>12.</b> Single suction fan                                                 |



- |                                       |                            |
|---------------------------------------|----------------------------|
| <b>1.</b> External air heat exchanger | <b>3.</b> Liquid receiver  |
| <b>2.</b> Suction separator           | <b>4.</b> Expansion vessel |



## 2.6 Compatible accessories

|         | Accessory description                             |
|---------|---------------------------------------------------|
| R148HP  | Freezing protection valve for monobloc heat pumps |
| R586HPI | Hydronic unit for heat pump                       |
| R146C   | Magnetic dirt separator                           |
| R279B   | 3-way quick diverting valve                       |
| R150M   | Automatic filling unit                            |

## INSTALLATION

### 3.1 Preliminary warnings

- ⚠ **For detailed information on the products, refer to chapter "Technical information" p. 51**
- ⚠ **For detailed information on accessories please refer to the "Configuration accessories" p. 49 section.**
- ⚠ The installation must be carried out by the installer. There is a risk of water leakage, electric shock or fire if the installation is not performed correctly.
- ⚠ During the installation, it is necessary to observe the precautions mentioned in this manual, and on the labels placed inside the equipment, as well as to adopt any precaution suggested by common sense and by the Safety Regulations in force in the place of installation.

- ⚠ Be sure to use the supplied or specified installation parts. Use of other parts may cause the unit to come to lose, water leakage, electrical shock, or fire.
- ⚠ Failure to apply the indicated rules may cause malfunctions of the appliances and relieves the manufacturer from any warranty and from any damage caused to persons, animals or property.

#### Preliminary warnings for R32

- ⚠ Safety checks must be carried out to ensure that the risk of combustion is minimised before starting work on systems containing flammable refrigerants.
- ⚠ The appliance must be protected against accidental impacts to prevent mechanical damage.
- ⚠ Do not puncture or burn.

### 3.2 Reception

#### Preliminary warnings

- ⚠ Upon receipt of the package check that it is not damaged, otherwise accept the goods with reserve, producing photographic evidence of any damage.
- ⚠ The package must be transported in an upright position; otherwise, notify the carrier immediately.
- ⚠ In the event of damage, notify the shipper within 3 days of receipt of any damage by registered mail with return receipt, submitting photographic evidence. Similar information should be sent by fax to the manufacturer (jurisdiction will be at the Court Trento for any dispute).
- ⚠ No notice of damage will be accepted after 3 days from delivery.

#### Preliminary warnings for R32

- ⚠ Check if there is refrigerant inside the package using an electronic leak detector suitable for the system refrigerant. If it is present, the refrigeration circuit is likely damaged. In this case, do not install the appliance and call the Technical Assistance Centre.

#### Package description

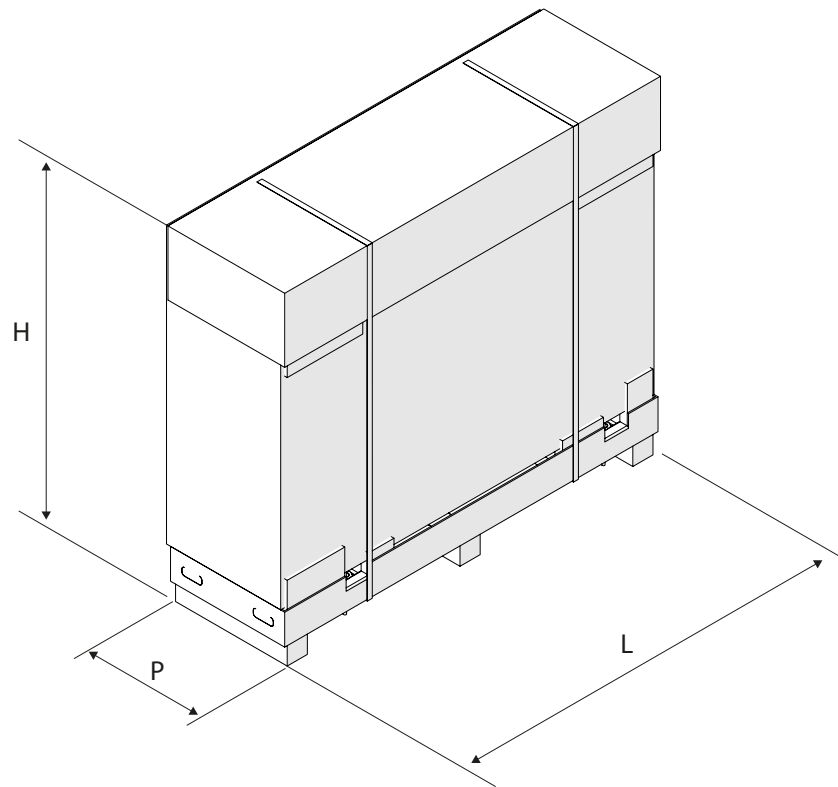
The packaging is made of suitable material and carried out by experienced personnel.

The appliance is shipped in standard packaging consisting of a cardboard sleeve and a set of expanded polystyrene protectors.

There is a pallet underneath the packaging of the unit to facilitate transport and moving.

Units are delivered complete and in perfect condition.

### 3.3 Dimensions and weights with packaging



| Models       | m.u. | 5     | 7     | 9     | 11    | 13    | 15    |
|--------------|------|-------|-------|-------|-------|-------|-------|
| Total width  | mm   | 1250  | 1250  | 1500  | 1500  | 1700  | 1700  |
| Total height | mm   | 1150  | 1150  | 1300  | 1300  | 1650  | 1650  |
| Total depth  | mm   | 420   | 420   | 450   | 450   | 520   | 520   |
| Weight       | kg   | 140,0 | 140,0 | 157,0 | 163,0 | 180,0 | 186,0 |

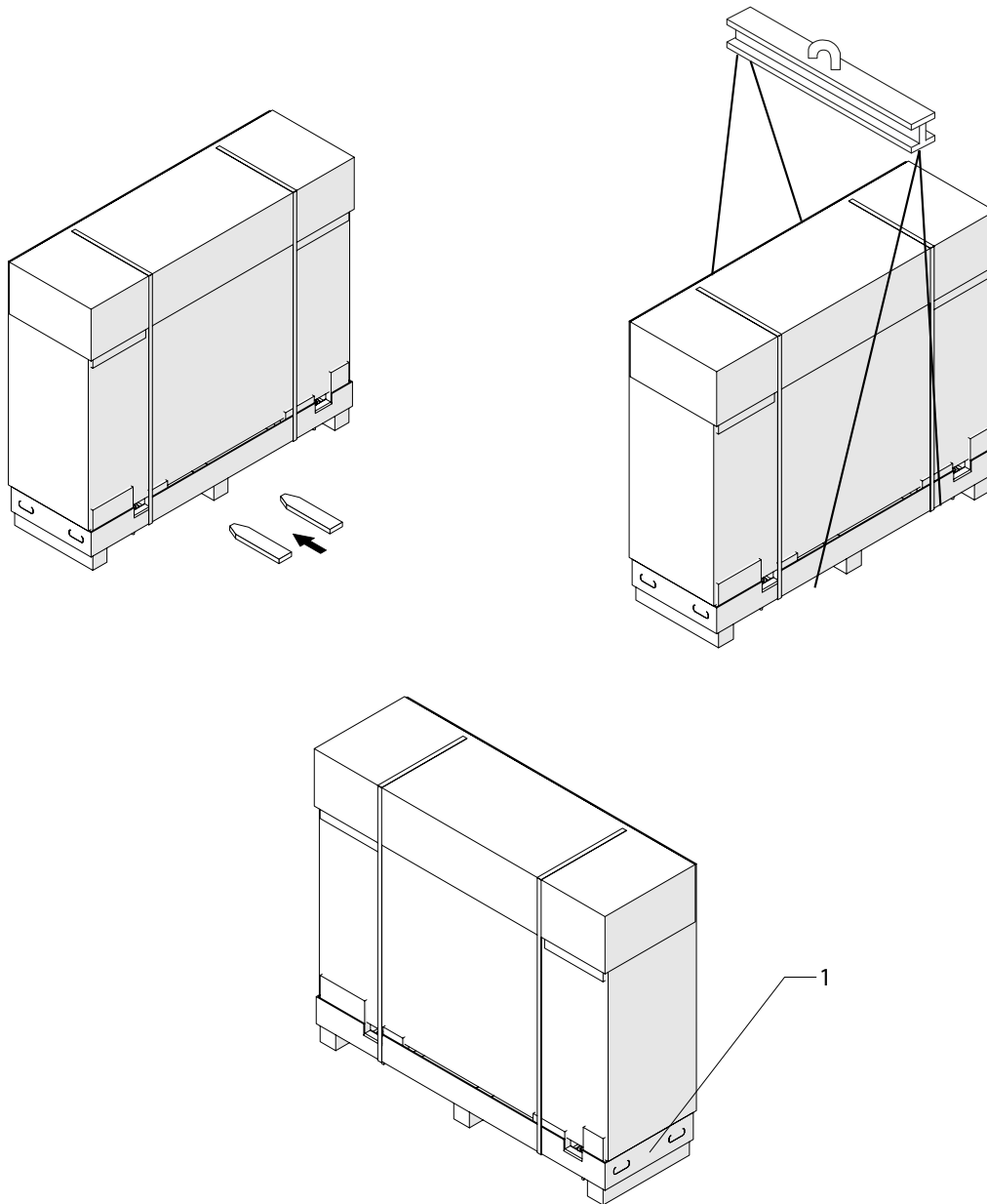
### 3.4 Handling with packaging

#### Preliminary warnings

- ⚠ The appliance must be handled only by qualified personnel, adequately equipped and with equipment suitable for the weight and dimensions of the appliance.
- ⚠ Before moving the unit, check the lifting capacity of the machinery used following the instructions on the packaging.
- ⚠ Move the unit to an upright position.
- ⚠ Stay clear of the area below and around it when the load is lifted off the ground.
- ⚠ If a forklift truck is used, put the base in the appropriate openings.
- ⚠ Avoid dangerous situations when using a hoist to lift the appliance.

## Movement methods

### 1. Handles for handling



The product can be handled as follows:

- using a hoist or a crane
- using a fork lift or a transpallet which can bear its weight

⚠ Use a small balance to prevent the pressure of the belts damages the unit.

⚠ Only in exceptional cases can the unit be moved manually for short distances using the handles provided on the packaging. In this case, the weight of the unit must be carefully checked.

## 3.5 Storage

### Preliminary warnings

⚠ Stored in accordance with the applicable national regulations.

⚠ Do not turn the packaging upside down.

⚠ Do not stack the appliances.

⚠ Only place the appliance in a vertical position.

### Preliminary warnings for R32

- ⚠ The appliance must be protected against accidental impacts to prevent mechanical damage that causes leakage of refrigerant.
- ⚠ The appliance must be placed in a room where there are no open flames continuously in operation (e.g. a gas appliance in operation) and no sources of ignition (e.g. an electric heater in operation).

### Appliance with packaging

- Store the package:
- in a dry and clean place

- in a closed environment protected from atmospheric elements
- insulated from the ground by crossbars or pallets

### Appliance without packaging

The following procedures are recommended in the case of medium to long term storage:

- check that no water is present in the hydraulic systems
- do not remove the protection of the heat exchanger
- do not remove plastic protective films
- check that the electrical panels are closed

## 3.6 Unpacking

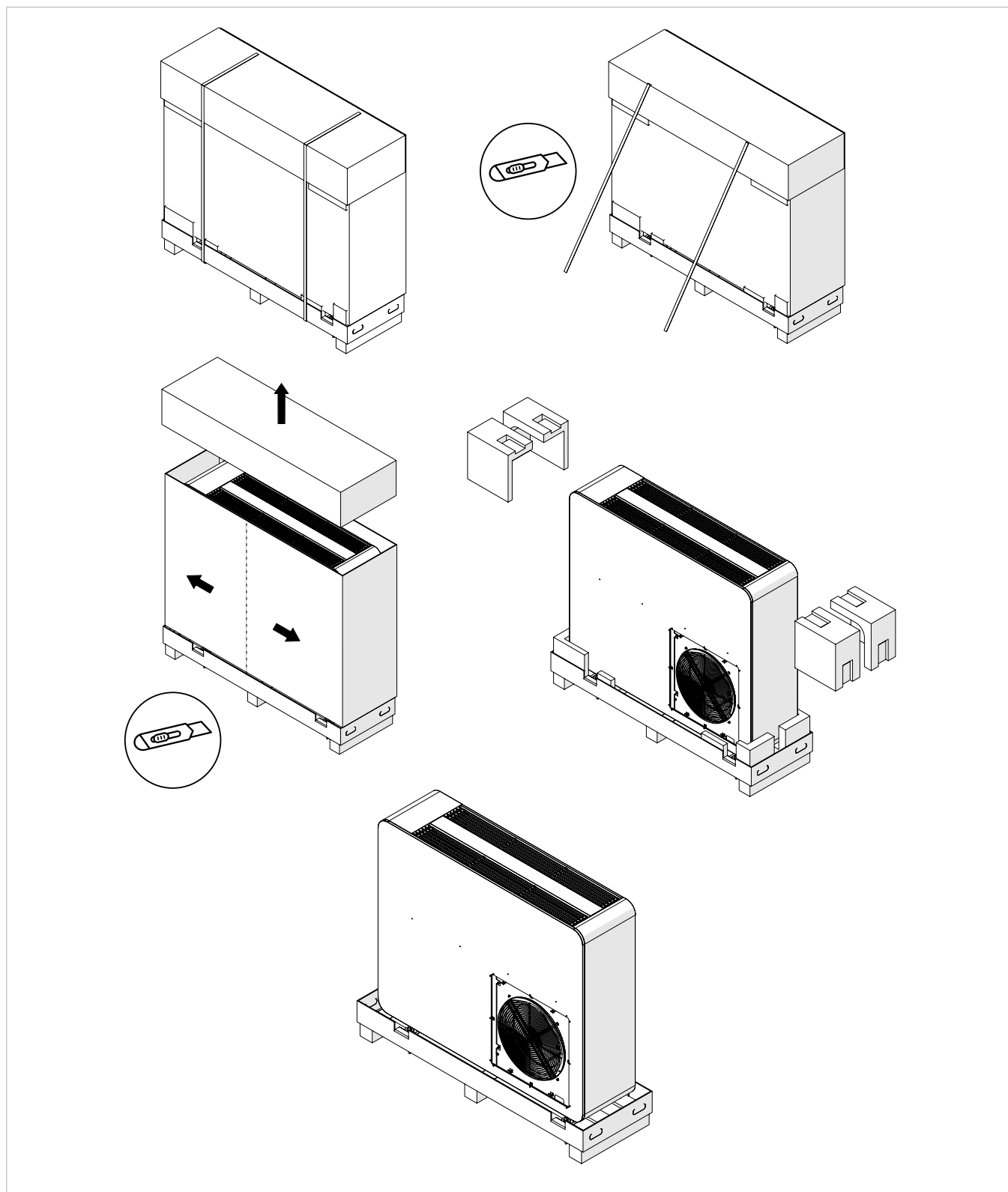
### Preliminary warnings

- ⚠ **All cosmetic panels and grilles must be removed before removing the appliance from the pallet.**
- ⚠ Check that no components were damaged during transport.
- ⚠ Dispose of the packaging components following the applicable waste disposal regulations. Check for disposal arrangements with your municipality.
- ⊖ The packing material (cardboard, staples, plastic bags, etc.) must not be dispersed or abandoned in the surrounding environment and must be kept out of children reach, as it can be dangerous.
- ⊖ Removing the appliance from the pallet with the cosmetic panels and grilles fitted is forbidden.

### Specific warnings for R32

- ⚠ Check if there is refrigerant inside the package using an electronic leak detector suitable for the system refrigerant. If it is present, the refrigeration circuit is likely damaged. In this case, do not install the appliance and call the Technical Assistance Centre.
- ⚠ Check that there are no sources of ignition in continuous operation (open flames, gas appliances, electric stoves, lighted cigarettes, etc.).
- ⊖ Using leak detectors with halogen lamps is prohibited.
- ⊖ Smoking in the vicinity of the appliance is prohibited.
- ⊖ Using a mobile phone near the appliance is prohibited.

## Remove the package



### Remove the packing:

- cut the strapping
- remove the upper cover
- use a cutter
- cut vertically
- remove the packing
- remove the polystyrene elements

**⚠ All cosmetic panels and grilles must be removed before removing the appliance from the pallet.**

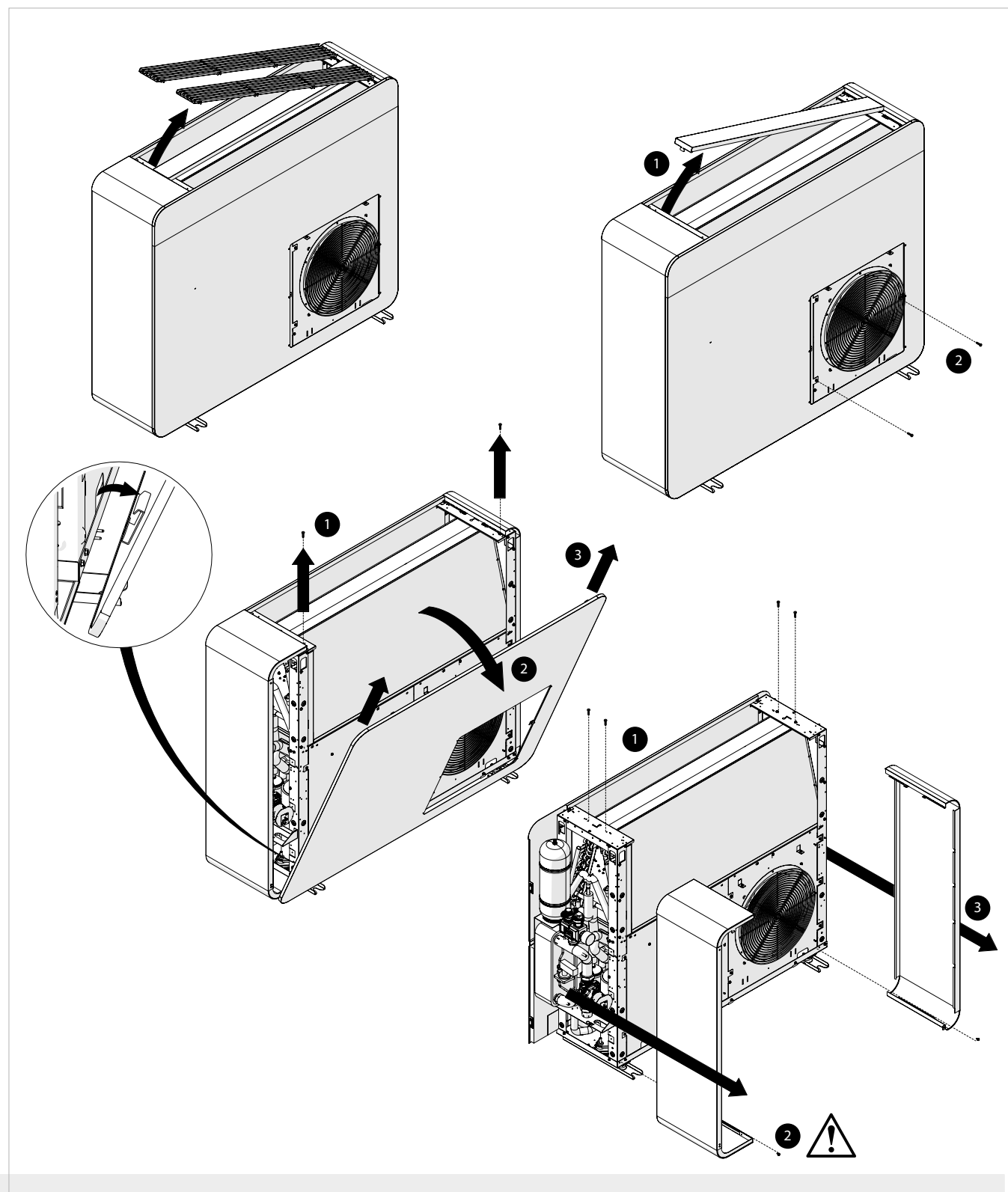
## Accompanying material

They are included with the appliance, inside the packaging:

 Check the presence of the individual components.

- 1 installer manual of the unit
- 1 user and installer manual for the Control Panel
- 1 declaration of conformity
- 1 energy label
- 1 fan screen
- 10 screws and 4 brackets for fixing fan screen
- 1 plant probe
- 1 domestic hot water probe
- 1 wall mounting bracket
- 2 vibration dampers for wall mounting bracket
- 1 first start-up form
- 1 control panel

### 3.7 Removal of aesthetic panels and grilles



**⚠ Make sure you have also undone the lower fixing screws before removing the side panels.**

**⊘ Removing the side panels without completely removing the fixing screws is forbidden.**

**⚠ Do not install the cosmetic panels until all connections have been established.**

### 3.8 Handling without packaging

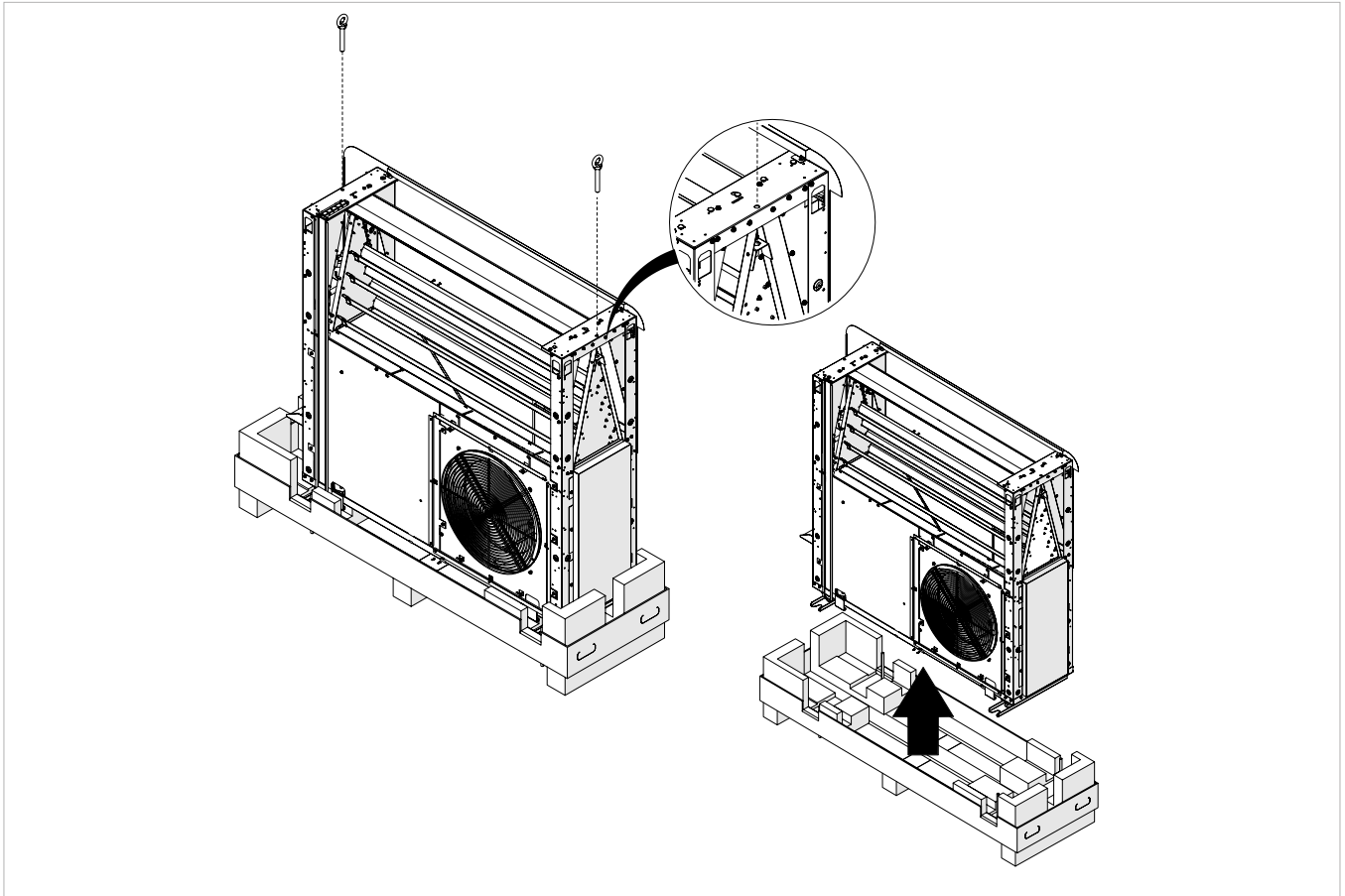
#### Preliminary warnings

- ⚠ The appliance must be handled only by qualified personnel, adequately equipped and with equipment suitable for the weight and dimensions of the appliance.

⚠ **All cosmetic panels and grilles must be removed before removing the appliance from the pallet.**

- ⊖ Removing the appliance from the pallet with the cosmetic panels and grilles fitted is forbidden.

#### Movement methods



#### To handle:

- insert the eyebolts supplied in the predefined positions

– lift from the base of the packaging

- ⚠ Use means suitable for the weight of the appliance and how it is to be handled.

### 3.9 Installation site

The location of the appliance must be determined by the plant engineer or a competent person and must take into account both purely technical requirements and any national/local legislation in force.

The appliance is intended for outdoor installation. Depending on the version, the expected installation methods are:

#### STØNE M1-V exposed version with upper air delivery

- exposed in a vertical position with floor positioning
- exposed in a vertical position with wall positioning
- 

#### Preliminary warnings

- ⚠ Avoid installing the unit near:
  - positioning in utility shafts and/or hopper window

- obstacles or barriers that cause recirculation of the exhaust air
- narrow places where the sound level of the appliance can be enhanced by reverberations or resonances
- bedrooms and places used for resting
- positioning in corners where dust, leaves and anything else that may reduce the efficiency of the appliance by obstructing the air passage is usual
- environments with the presence of flammable or explosive gases
- very humid environments (laundries, greenhouses, etc.)
- environments with aggressive atmospheres
- environments with the presence of steam or mineral oil mist
- solar radiation and proximity to heat sources

- areas prone to strong gusts of wind
- places with strong voltage fluctuations

- ⚠ The sound level measured under actual installation conditions may be higher than that indicated in the technical data of the unit due to ambient noise and acoustic reflections.
- ⚠ Avoid placing the unit within 1 metre of radio and video equipment.
- ⚠ Avoid installation in locations directly exposed to sea winds. The saline atmosphere accelerates the corrosion process of the materials reducing the life of the unit.
- ⚠ Avoid placement in vehicles or on ships.
- ⚠ Make sure that:
  - the installation site of the unit must be chosen with the utmost care to guarantee adequate protection from shocks and consequent damage
  - the supporting surface or wall can bear the weight of the appliance
  - the section wall does not involve load-bearing construction elements, piping or electrical lines
  - no load-bearing elements of the construction are compromised
  - the appliance must be installed in a position where it can be easily serviced
  - the safety distances between the units and other appliances or structures are scrupulously respected so

that the air entering and leaving the fans is free to circulate

- air expulsion is not hindered by strong winds in the opposite direction
- ⚠ Baffle panels must be installed in case of installation in places with strong gusts of wind in direction opposing the air expulsion. Take the minimum distances shown under "Installation minimum distances" [p. 20](#) into account.
- ⚠ If the appliance is installed incompletely or on an inappropriate base, it could cause damage to persons or property if it should detach from its base.
- ⚠ Provide the following:
  - a drain and a water supply nearby
  - a compliant power supply nearby
  - fixing elements suitable for the type of support

### Preliminary warnings for R32

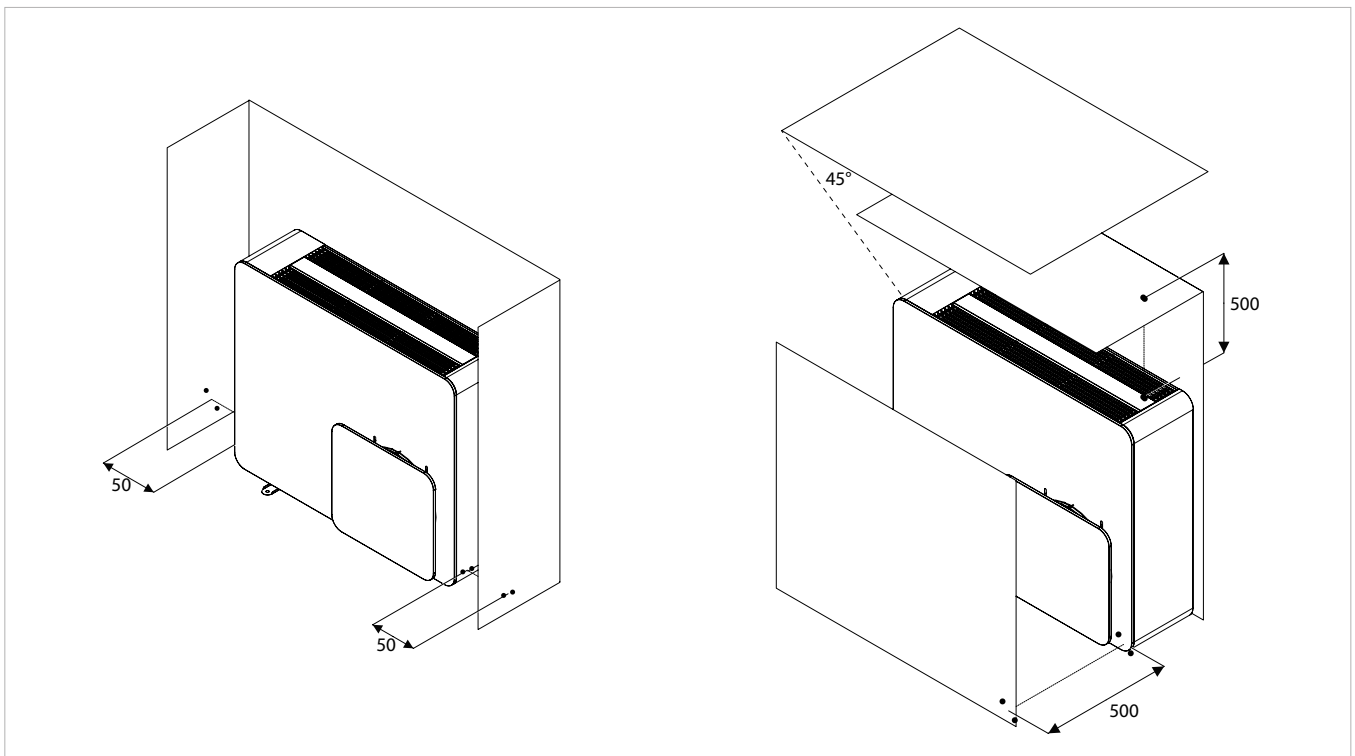
- ⚠ Perform the following checks:
  - carry out safety checks to ensure that the risk of combustion is minimised
  - avoid working in confined spaces
  - delimit the area around the workspace
  - ensure safe working conditions around the area by controlling flammable material

## 3.10 Installation minimum distances

The clearance zones for the installation and maintenance of the appliance are shown in the figure. Established spaces are necessary to avoid barriers to airflow and allow for normal cleaning and maintenance.

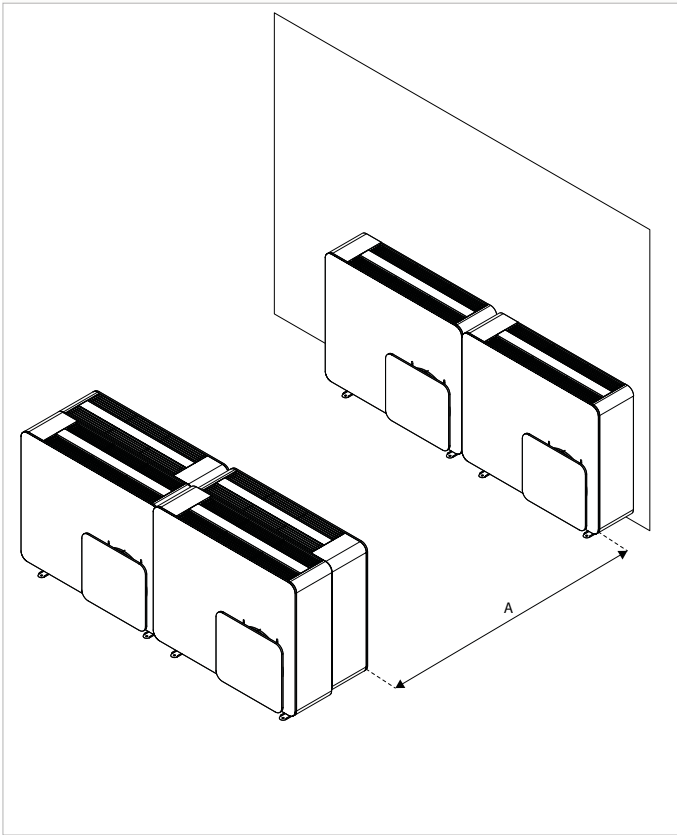
- ⚠ Make sure that there is sufficient space to allow the panels to be removed for routine and supplementary maintenance operations.

### Single installation



## Multiple installation

**A** 900



⚠ Each unit must be fixed independently to the supporting wall.

⊘ Do not stack the units on top of each other.

### 3.11 Positioning

#### Preliminary warnings

⚠ When installing in locations subject to gusts of wind, install windbreaks to prevent the unit from malfunctioning.

⚠ When installing in locations subject to heavy snowfalls, the unit must be mounted at a height above the maximum snow level.

⚠ Install the unit in a well-ventilated place so that the outdoor temperature does not exceed 40°C.

Exposed units can be positioned on the floor or wall

#### Floor positioning

##### Preliminary warnings

⚠ The unit must be fixed to the ground.

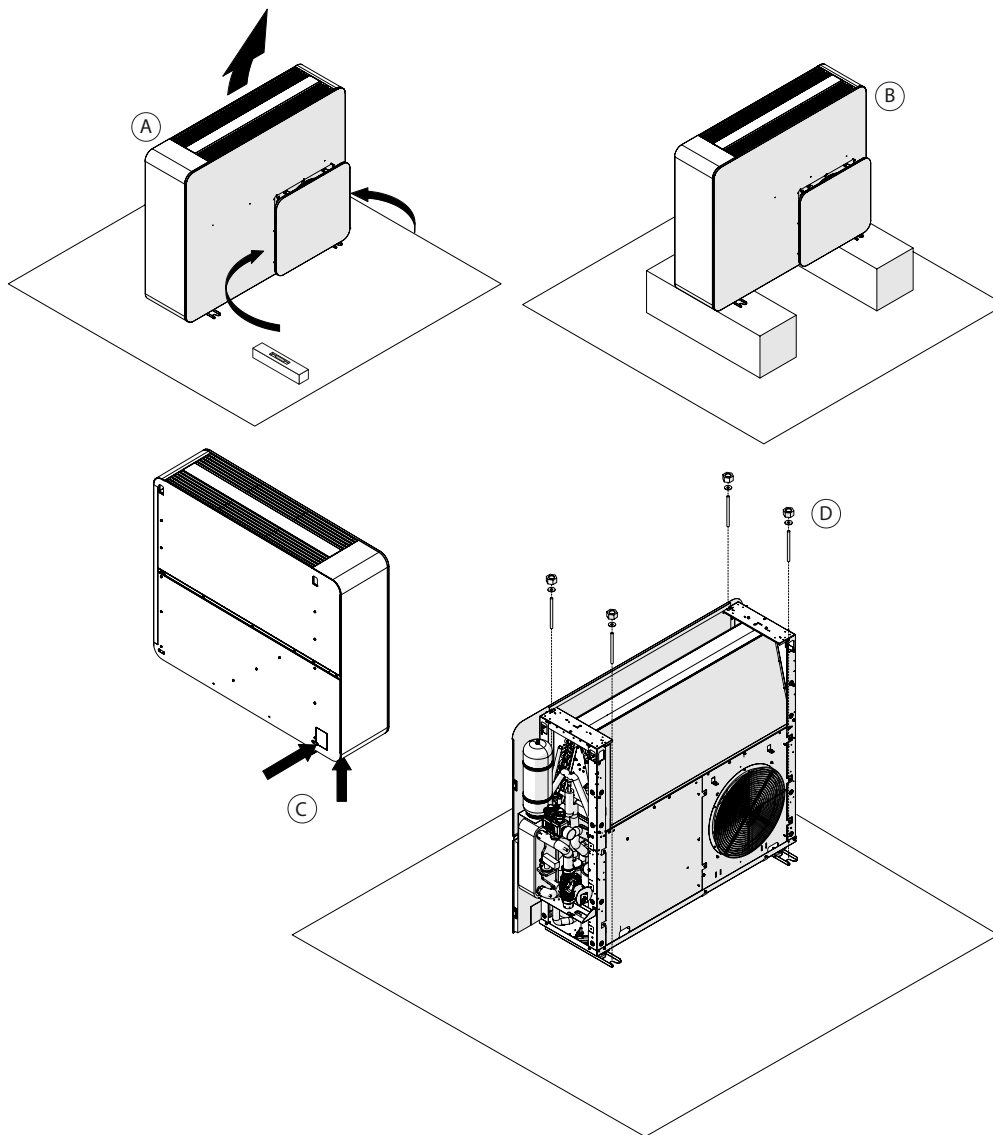
⚠ The unit is supplied with the vibration dampers already mounted.

⚠ Make sure that:

- the supporting surface supports the weight of the appliance
- the slab is sufficiently rigid and does not transmit vibrations to the rooms below or adjacent to it

## Positioning

- (A) Positioning on the ground
- (B) Raised positioning
- (C) Connection entry
- (D) Ground fixing



### ⚠ For dimensional information, refer to chapter "Technical information" p. 51

- place the unit on a perfectly level surface
- fix the brackets to the floor

#### Make sure that:

- it is levelled
- easy access is allowed to the hydraulic and electrical parts

## Wall mounting

### Preliminary warnings

- ⚠ The wall mounting bracket supplied as an accessory is required to position the unit on the wall.
- ⚠ Remove the support brackets before attaching the unit to the wall-mount bracket.
- ⚠ Make sure that:
  - the wall supports the weight of the appliance

- the section of floor or wall does not concern piping or electrical lines
- the functionality of load-bearing elements is not compromised

### ⚠ The device contains moving parts that can transmit vibrations to the supporting structure. In particular, the following must be avoided when positioning on the wall on the fixing bracket:

- fixing on rigid structures with little mass (e.g. wooden houses) which can amplify the effect and generate resonances
- positioning on exterior walls of rooms in which quietness is required (e.g. bedrooms)

## Positioning

### ⚠ For dimensional information, refer to chapter "Technical information" p. 51

- use screws and expansion plugs suitable for the weight of the appliance and the material of the supporting wall
- attach the wall mounting bracket to the supporting wall
- hang the appliance on the bracket

### Make sure that:

it is levelled

- easy access is allowed to the hydraulic and electrical parts
- the backrest vibration dampers mounts of rear of the unit are present and rest against the supporting wall

⚠ Check that no metal parts of the unit are resting on the supporting wall.

## 3.12 Hydraulic connections

### Preliminary warnings

- ⚠ The engineer is responsible for choosing the right water lines and their size, in accordance with good installation practices and the applicable law.
- ⚠ The hydraulic system is made by the installer and must be carried out with reference to the diagrams in this manual or on the website.
- ⚠ The hydraulic pipes connecting to the appliance must be suitably sized for the actual water flow rate required by the plant during operation. The water flow rate to the heat exchanger must always be constant.
- ⚠ The maximum permissible pressure drops must be compared with the data shown in chapter "PP1 primary circulation pump graphs" p. 57. If higher heads are required due to high pressure drops in the plant, an external pump with respective buffer vessel must be used.

⚠ Make sure that the quantity of water in the primary circuit is greater than the minimum volume indicated in chapter "Plant water content and minimum flow rate" p. 23, to prevent the risk of ice formation during defrosting operations or continuous modulation of the compressor frequency

⚠ It is important to note that the heat pump Control Panel manages all the adjustments of the primary circuit (plant and domestic hot water set-point, circulation pump, dynamic set control and auxiliary heater management).

⚠ Any regulation that foresees the management of the plant with a control unit or a boiler conflicting with these regulations must be submitted to the manufacturer's technical office in advance for approval otherwise the warranty will be invalidated.

⚠ If the appliance is connected in parallel with a boiler, make sure that the temperature of the water circulating in the heat pump does not exceed 60 °C during operation.

### Hydraulic plant

Heat pumps require plants that guarantee a constant flow of fluid to the appliance, within the minimum and maximum values and with sufficient volumes to avoid imbalances in the refrigeration circuits and to guarantee the correct level of comfort.

### Water content

A minimum volume of water in the primary circuit of the plant must be guaranteed for the correct operation of the appliance.

⚠ The minimum volume is necessary to prevent risks of ice formation during defrosting operations or continuous modulation of the compressor frequency.

It also allows the following advantages:

- less wear and tear on the appliance

### Plant water content and minimum flow rate

- increased system performance
- improved temperature stability and accuracy

The minimum volume is indicated in the table below:

⚠ If the minimum volume is not reached, a suitably sized storage tank must be provided.

⚠ The minimum volume must be guaranteed in all operating modes and under all conditions.

| Models                       | m.u. | 5-M | 7-M | 9-M | 11-M | 11-T | 13-M | 13-T | 15-M | 15-T |
|------------------------------|------|-----|-----|-----|------|------|------|------|------|------|
| Minimum system water content | L    | 20  | 25  | 30  | 35   | 35   | 40   | 40   | 50   | 50   |

### Minimum flow rate

To prevent the differential pressure switch from tripping, a minimum water flow rate must be guaranteed to the appliance.

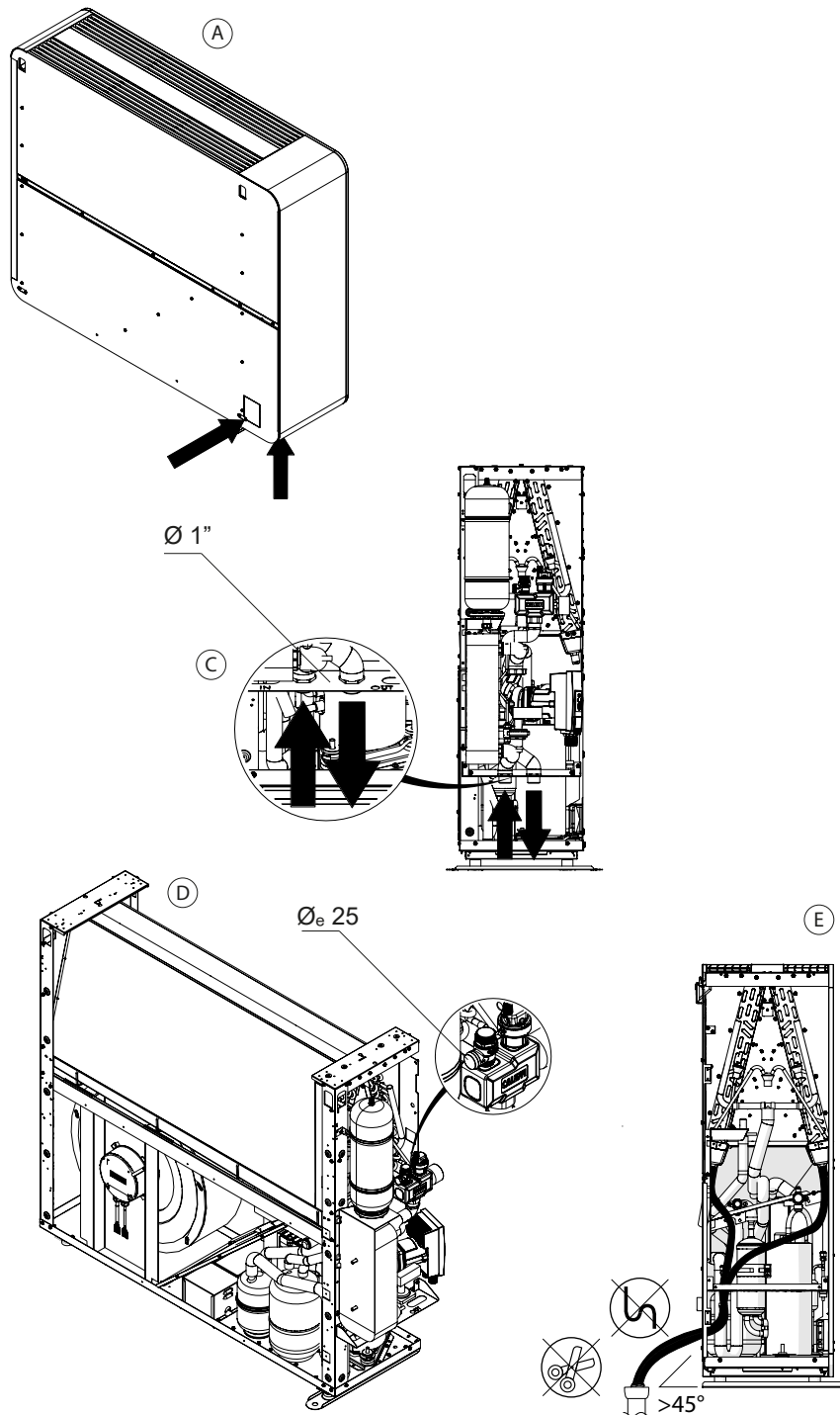
The minimum flow rate must be guaranteed in all operating modes and under all conditions, if necessary by adding a by-pass valve.

A hydraulic separator must be provided if the plant requires a higher head than that available from the pump of the unit.

| Models                  |  | m.u.              | 5-M | 7-M | 9-M | 11-M | 11-T | 13-M | 13-T | 15-M | 15-T |
|-------------------------|--|-------------------|-----|-----|-----|------|------|------|------|------|------|
| Minimum water flow rate |  | m <sup>3</sup> /h | 0,6 | 0,9 | 1,1 | 1,2  | 1,2  | 1,4  | 1,4  | 1,7  | 1,7  |

## Position and dimensions

- (A) Connection input for exposed versions
- (C) Plant connections
- (D) Safety valve connection
- (E) Condensate drain connection



**⚠ For dimensional information, refer to chapter "Technical information" p. 51**

**If cosmetic panels are mounted:**

- remove as indicated in the chapter "Disassembly and assembly of cosmetic panels and grilles after installation" p. 38

## Connection to the system

### Preliminary warnings

- ⚠ To allow maintenance or repair operations, each hydraulic connection must be equipped with the respective manual shut-off valves.
- ⚠ It is advisable to create a by-pass in the plant to be able to wash the plate exchanger without having to disconnect the appliance.
- ⚠ Before connecting the piping, make sure that it do not contain stones, sand, rust or foreign matter that could damage the plant.
- ⚠ **The minimum nominal diameter of the connecting pipes must be 1". Keep in mind that under-sized piping determines malfunctions and/or loss of heating and cooling performance.**
- ⚠ The connection piping must be suitably supported so as not to bear on the appliance with its weight.
- ⚠ Plants filled with antifreeze or special legal provisions require the use of hydraulic disconnectors.

⚠ Flush the plant thoroughly before connecting the unit. This cleaning process removes any residue, such as welding drops, slag, rust or other fouling from the pipes. These substances may otherwise settle inside and cause the appliance to malfunction.

⚠ Hydraulic lines and joints must be thermally insulated. Insulate the water distribution piping with polyethylene foam or similar materials with a minimum thickness of 13 mm. Shut-off valves, elbows and various fittings must also be adequately insulated.

⚠ Avoid partial insulation of the pipes.

⚠ Avoid over-tightening the pipes to avoid damage to the insulation.

⚠ Carefully check that the insulation is tight, in order to prevent the making and dripping of condensate.

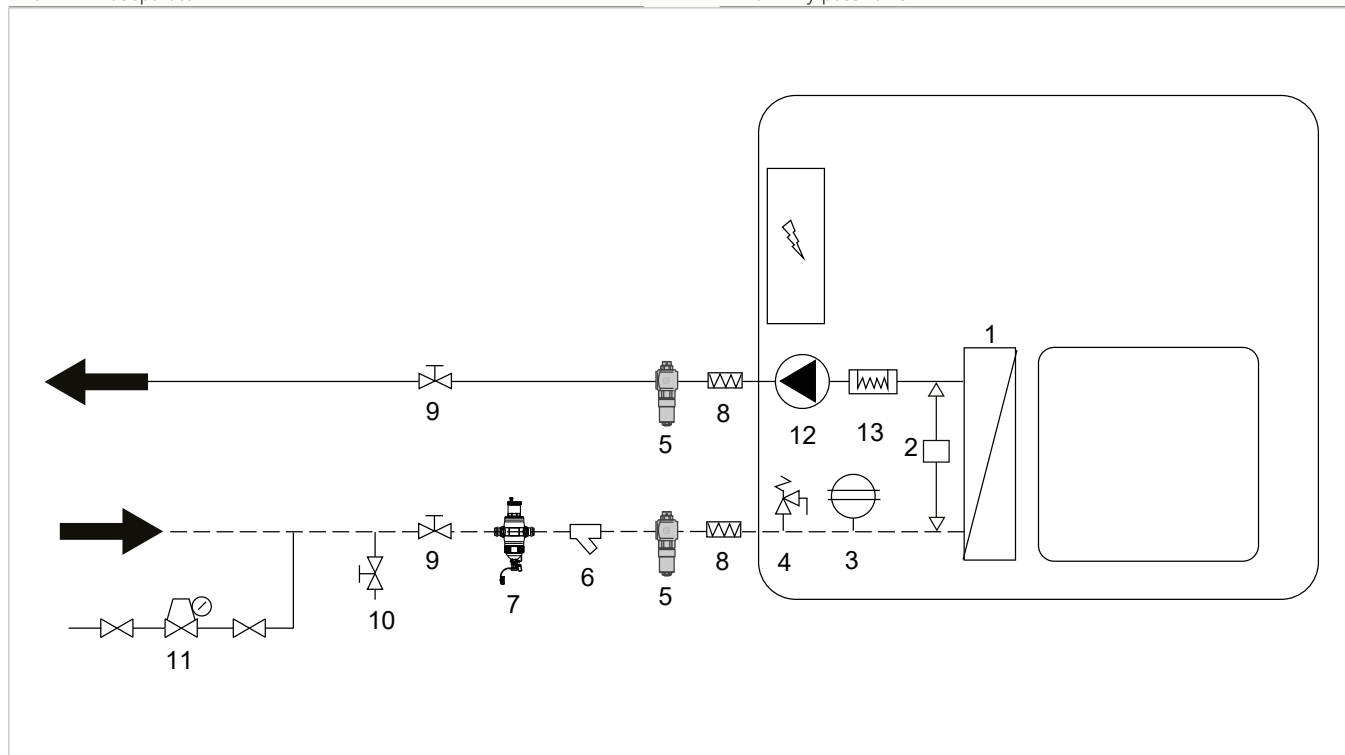
⚠ **It is necessary to install a filtration system at the inlet of the appliance in an area accessible for maintenance, in order to protect the appliance from impurities in the water.**

⊖ Operating the unit without the water filter installed and clean is forbidden.

### Hydraulic connection diagram

- |    |                                            |
|----|--------------------------------------------|
| 1. | Plate exchanger                            |
| 2. | Flow switch (differential pressure switch) |
| 3. | Expansion vessel                           |
| 4. | 3-bar safety valve                         |
| 5. | Antifreeze valve                           |
| 6. | Network water filter                       |
| 7. | Dirt separator                             |

- |     |                                      |
|-----|--------------------------------------|
| 8.  | Flexible connections                 |
| 9.  | Shut-off valves                      |
| 10. | Plant drain cock                     |
| 11. | Automatic plant filling assembly     |
| 12. | PP1 primary circulation pump         |
| 13. | Electric heating element (accessory) |
| 14. | By-pass valve                        |



### Connection

#### To make the connections:

- hydraulic lines positioning

- use the "wrench backup wrench" method
- tighten the connections
- check for leaks
- coat the connections with insulating material

**The hydraulic connections must be completed by installing:**

- air release valves at the highest points of the piping
- flexible elastic joints
- shut-off valves
- drain cock
- filling cock
- a suitably sized storage tank for plant water
- a domestic hot water storage tank chosen so that the combined exchanger has sufficient surface area to exchange all the power of the heat pump under all conditions
- a mains water filter at the appliance inlet
- antifreeze valves (only if required by operating conditions)

**Filtration system**

⚠ **It is necessary to install a filtration system at the inlet of the appliance in an area accessible for maintenance, in order to protect the appliance from impurities in the water.**

⚠ The recommended filtration system is through a dirt separator. Alternatively, a net filter can be used.

**Condensate drain**

The appliance is equipped with two trays for collecting the condensate that is produced during winter operation and which must be conveyed to a suitable draining place. The appliance is shipped from the factory with the tray connections connected to two drain pipes.

⚠ **The two pipes are insulated and there is an electrical heating element inside to prevent the condensate from freezing.**

⚠ **Do not cut the piping. It would also cut the heating element and affect its operation.**

⊖ It is forbidden to cut the condensate drain pipes.

**To connect:**

- insert a drainage pipe
- direct it to a suitable place for dropping
- maintain a minimum slope of 45°

⚠ Avoid siphons.

⚠ Avoid counter-slope sections.

⚠ Make sure all joints are sealed to prevent leakage of water.

**Safety valve**

The outlet of the installed safety valve must be connected to a suitable collection and evacuation system to prevent any water spillage from coming into contact with the electrical parts of the appliance.

⚠ The manufacturer of the appliance is not responsible for any flooding caused by the intervention of the safety valves.

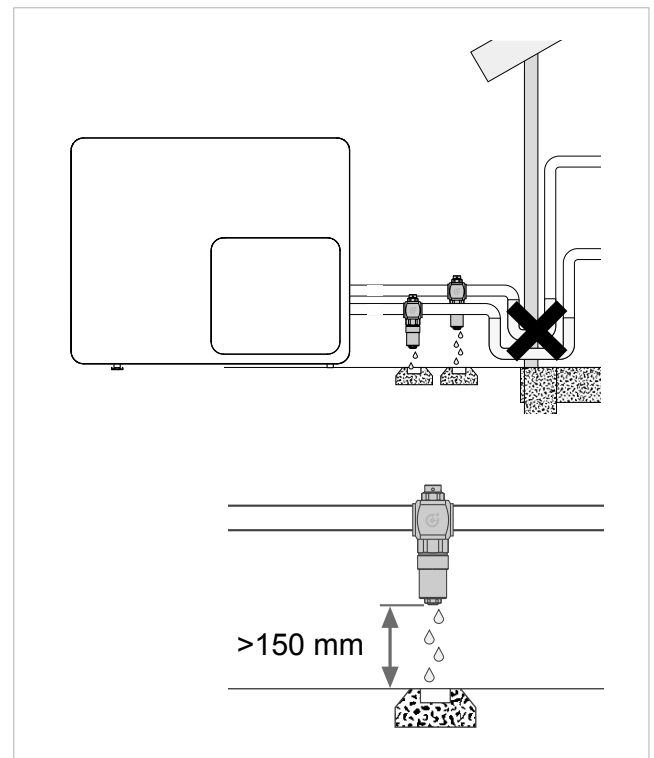
⚠ Provide a pressure reducer if the mains pressure exceeds 3 bar.

**Coil vent**

To avoid air pockets inside the circuit, place automatic or manual venting devices at all points (higher piping, siphons, etc.) where air can accumulate.

**Antifreeze valve**

The antifreeze safety device prevents the formation of ice in the hydraulic circuit avoiding possible damage to the machine and piping.



**The antifreeze valves must:**

- be installed outdoors
- be installed in the coldest part of the plant
- be positioned away from heat sources that may alter the correct operation

⚠ The device should only be installed in a vertical position so that the drained water can flow properly and freely downwards.

⚠ Install two antifreeze valves, one per pipe.

⚠ Keep a distance of at least 150 mm from the ground to prevent the formation of any column of ice in the area underneath preventing water from escaping from the valve.

⚠ Avoid siphon connections.

⊖ Installing the valves inside buildings is forbidden.

**3.13 Filling the plant**

The plant must be filled once the hydraulic connections have been completed.

**Preliminary warnings**

⚠ A filling system external to the unit must be provided.

- ⚠ All operations must be carried out with the machine stopped and disconnected from the power supply.
- ⚠ If an external auxiliary pump is used, it must be switched off.
- ⚠ The operating pressure of the plant must not exceed 1.5 bar with the pump off. To check for leaks in the plant during testing, it is advisable to raise the test pressure and then discharge it later to reach the correct working pressure. If the pressure exceeds 3 bar, the safety valve opens and discharges the excess water outside.

### Water quality requirements

The quality of the water used must comply with the requirements set out in the following table; otherwise, a treatment system must be provided.

| Plant water reference values |       |           |
|------------------------------|-------|-----------|
| pH                           |       | 6,5 ÷ 7,8 |
| Electrical conductivity      | µS/cm | 250 ÷ 800 |
| Total hardness               | °F    | 5 ÷ 15    |
| Total Iron                   | ppm   | 0,2       |
| Manganese                    | ppm   | < 0,05    |
| Chlorides                    | ppm   | < 250     |
| Sulphur ions                 |       | none      |
| Ammonia ions                 |       | none      |

- ⚠ Well or groundwater not coming from an aqueduct should always be carefully analysed and, if necessary, conditioned with appropriate treatment systems.
- ⚠ A water softening plant must be used if the initial water hardness exceeds the value indicated in the table.

- ⚠ An excessive water softening (total hardness < 1.5 mmol/l) could generate corrosive phenomena in contact with metallic elements (piping or parts of the boiler). Also keep the conductivity value within 600 µS/cm.
- ⚠ Check the chloride concentration at the outlet after resin regeneration.
- ⊖ Introducing acids into the washing circuit is forbidden.
- ⊖ Constantly or frequently topping up the plant is forbidden because this can damage the heat exchanger of the appliance.

### Filling

#### Before starting the filling operation:

- set the plant master switch in the OFF position.
- check that the plant drain cock is closed
- open all the air valves of the plant and its terminals
- open all the system's shut-off devices

#### To fill the system:

- start filling by slowly opening the plant water filling cock on the outside of the appliance

#### When water starts coming out of the terminal vent valves:

- close the breather valves
- continue filling up to the pressure value required by the plant
- check that the expected nominal pressure has been reached
- close the water tap
- check the tightness of the gaskets

- ⚠ It is recommended to repeat this operation after the device has been running for a few hours.
- ⚠ Regularly check the system's pressure.
- ⚠ Keep the system bleed during operation, penalty, loss of performance and energy consumption.

## 3.14 Electric connections

The appliance leaves the factory fully wired and only needs to be connected to the power supply, Control Panel, disconnector and any accessories.

- ⚠ **For the operation of the unit, the Control Panel must be ordered as an accessory.**

### Preliminary warnings

- ⚠ All operations of an electrical nature must be carried out by qualified personnel having the necessary legal requirements, trained and informed about the risks related to such operations.
- ⚠ All connections must be made following the regulations in force in the country of installation.
- ⚠ Before carrying out any work, make sure that the power supply is switched off.
- ⚠ The unit must only be powered after all plumbing and electrical work has been completed.
- ⚠ References:
  - refer to the wiring diagrams in this manual for the electrical connections, especially the part concerning the power supply terminal block

- refer to the technical rating plate located on the appliance for the power supply voltage

- ⚠ Make sure that:
  - the characteristics of the electric network are adapted to the absorption of the apparatus, considering also any other devices in parallel operation
  - the power supply voltage and system frequency match to the values indicated on the device's plate data
  - the cables must be appropriate for the type of installation in accordance with the applicable IEC standards
  - the cable terminals are provided with pin terminals of a cross-section proportionate to the connecting cables before inserting them into the terminal block
  - the power supply is provide with protection against overload and/or short-circuit
- ⚠ It is required:
  - connect the device an efficient ground connection
  - for units with three-phase power supply, check that the phases are connected correctly

- ⚠ It must be possible to disconnect the power supply line from the rest of the electrical network of the building using an omnipolar magneto-thermal circuit breaker complying with EN 60335 part 1 (contact opening of at least 3 mm), suitable for the draw of the appliance, with differential relay with the maximum setting as prescribed by the individual electrical regulations.
- ⚠ Do not connect the appliance to earth using distribution piping, surge arresters or to the telephone plant earth. Improper earthing can result in electric shock. Momentary high-voltage surges caused by lightning or other causes could damage the heat pump.
- ⚠ It is recommended to install a residual-current device. Failure to install this device may result in electric shock.
- ⚠ Electrical connections must be made following the instructions in this manual and with the standards or practices governing the connection of electrical equipment throughout the country. Insufficient capacity or incomplete electrical connections may result in electric shock or fire.
- ⚠ The power supply line must be adequately sized to avoid voltage drops or overheating of cables or other devices placed on the line itself.
- ⚠ Use a dedicated power circuit. Never use a power supply to which another appliance is also connected because of the risk of overheating, electric shock or fire.
- ⚠ For the electrical connection, use a cable that is long enough to cover the entire distance without any connection. Do not use extension cables. Do not apply other loads on the power supply.
- ⚠ After connecting the interconnection and power cables, make sure that the cables are routed so that they do not apply excessive forces on the covers or electrical panels. Fit the covers on the cables. Incomplete connection of the covers may result in overheating of the terminals, electric shock or fire.

### Power line dimensioning

Use the tables below for the sizing of the power supply line and its protection device. These are not average draw or transient peaks, but values to be considered for the correct sizing of the plant and the request of the contractual power (excluding loads due to the normal operation of the building).

| Models                          | m.u.            | 5-M      | 7-M      | 9-M      | 11-M     | 11-T     | 13-M     | 13-T     | 15-M     | 15-T     |
|---------------------------------|-----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>Electrical data</b>          |                 |          |          |          |          |          |          |          |          |          |
| Power Supply                    | V/ph/Hz         | 230/1/50 | 230/1/50 | 230/1/50 | 230/1/50 | 400/3/50 | 230/1/50 | 400/3/50 | 230/1/50 | 400/3/50 |
| Maximum power consumption       | kW              | 2,90     | 3,80     | 4,50     | 5,30     | 5,30     | 5,90     | 5,90     | 7,30     | 7,30     |
| Maximum current consumption     | A               | 14,00    | 18,00    | 21,30    | 25,00    | 8,50     | 28,00    | 9,30     | 34,50    | 11,50    |
| Protection tripping current     | A               | 16       | 16       | 20       | 25       | 10       | 32       | 10       | 32       | 16       |
| Minimum wire cross-section area | mm <sup>2</sup> | 4,0      | 4,0      | 6,0      | 6,0      | 2,5      | 6,0      | 2,5      | 10,0     | 2,5      |

- ⚠ **For units equipped with electrical heating elements, the draw values of the units must be added to those of the heating elements shown in the following tables.**

- ⚠ If you need to replace the power cable, contact only qualified staff and in compliance with the applicable national laws.
- ⚠ The manufacturer is not liable for any damage caused by the lack of earthing or failure to comply with the specifications in the respective diagrams.
- ⚠ The device is equipped with suppression filter as laid down by the applicable laws and standards. Use selective circuit breakers to compensate for the micro-dispersion on the ground of this device.
- ⊖ It is forbidden the use of gas and water pipes for grounding the appliance.

### Preliminary warnings for R32

- ⚠ R32 refrigerant gas is slightly flammable and odourless.
- ⚠ Do not place flammable objects (spray cans) within 1 metre of the air outlet.
- ⚠ All precautions concerning the treatment of the refrigerant must be observed following the regulations in force.
- ⚠ Avoid proximity to sources of ignition in continuous operation (open flames, gas appliances, electric stoves, lighted cigarettes, etc.).
- ⊖ Smoking in the vicinity of the appliance is prohibited.
- ⊖ Using a mobile phone near the appliance is prohibited.
- ⚠ Perform the following checks:
  - carry out safety checks to ensure that the risk of combustion is minimised
  - avoid working in confined spaces
  - delimit the area around the workspace
  - ensure safe working conditions around the area by controlling flammable material

- ⚠ Maximum power is reached only in exceptional cases. Therefore, the indicated trip current is suggested to guarantee a balance between machine absorption and incidence in the general system.
- ⚠ The indicated minimum cable cross-section area must be verified according to the actual conditions of the installation: length of the cable, characteristics of the electrical supply, etc.

## Heating elements

### Single-phase power supply

| Connection   |    | Stage 1 | Stage 2 |
|--------------|----|---------|---------|
| Power draw   | kW | 2,00    | 4,00    |
| Current draw | A  | 8,70    | 17,39   |

### Three-phase power supply

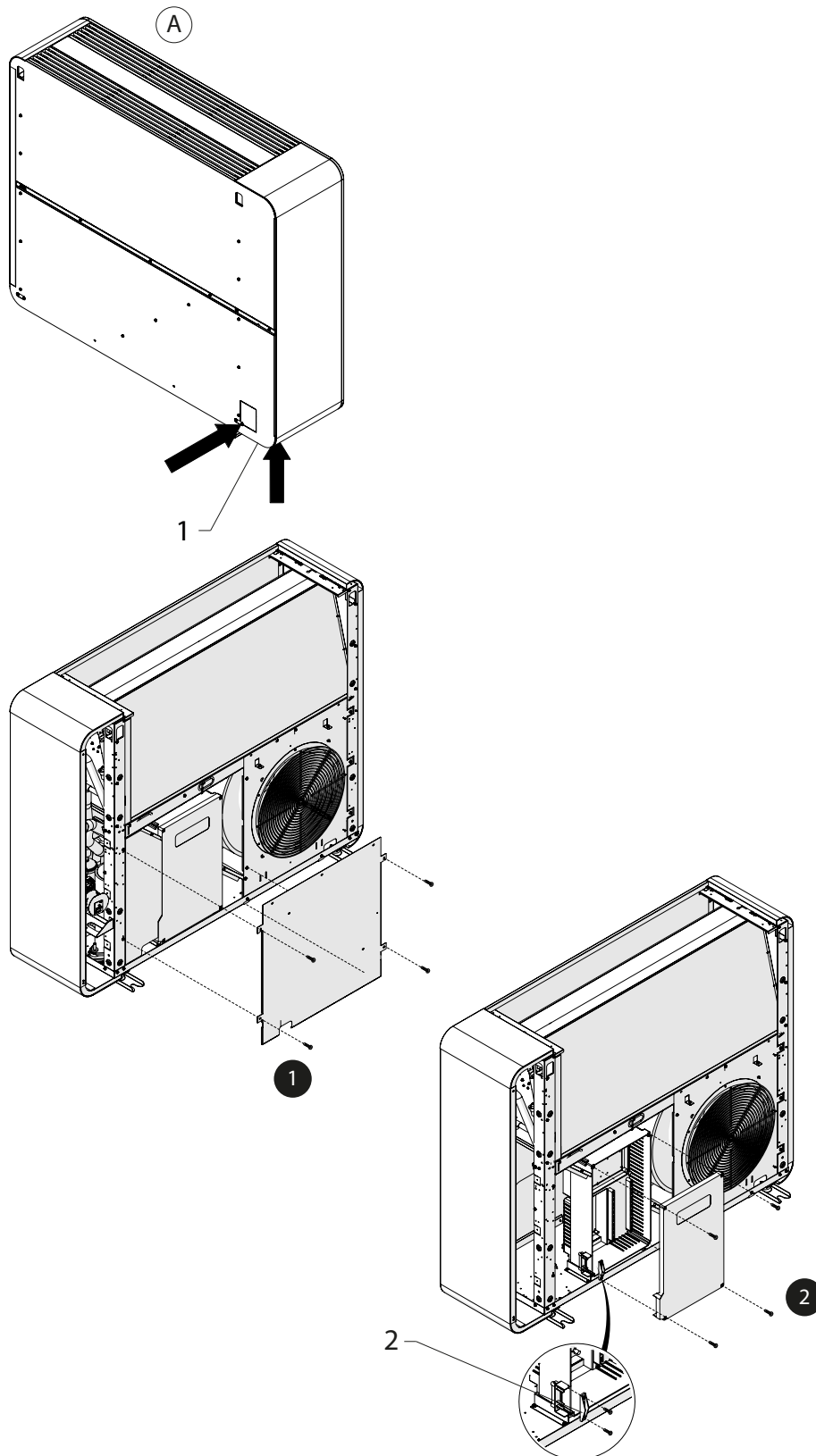
| Connection   |    | Stage 1 | Stage 2 | Stage 3 |
|--------------|----|---------|---------|---------|
| Power draw   | kW | 2,00    | 4,00    | 6,00    |
| Current draw | A  | 8,70    | 8,70    | 8,70    |

| Models                                                           | m.u.            | 5-M  | 7-M  | 9-M  | 11-M | 11-T | 13-M | 13-T | 15-M | 15-T |
|------------------------------------------------------------------|-----------------|------|------|------|------|------|------|------|------|------|
| <b>Electrical data</b>                                           |                 |      |      |      |      |      |      |      |      |      |
| Protection tripping current with electrical heating elements     | A               | 50   | 50   | 50   | 63   | 20   | 63   | 20   | 63   | 20   |
| Minimum wire cross-section area with electrical heating elements | mm <sup>2</sup> | 16,0 | 16,0 | 16,0 | 25,0 | 6,0  | 25,0 | 6,0  | 25,0 | 6,0  |

## Access to the electrical panel

(A) Exposed units

1. Connection entry
2. Cable gland



⚠ Access to the electrical panel is only permitted to qualified personnel.

⚠ Before doing any work, make sure that the supply power is disconnect.

**To access:**

- remove the cosmetic panels (if fitted)
- see chapter "Disassembly and assembly of cosmetic panels and grilles after installation" [p. 38](#)

**To access the connections:**

- undo the screws of the closing panel of the electric panel
- remove the panel

**Connection**

Before connecting the unit to the mains power supply, make sure that the disconnecter is open. The power supply

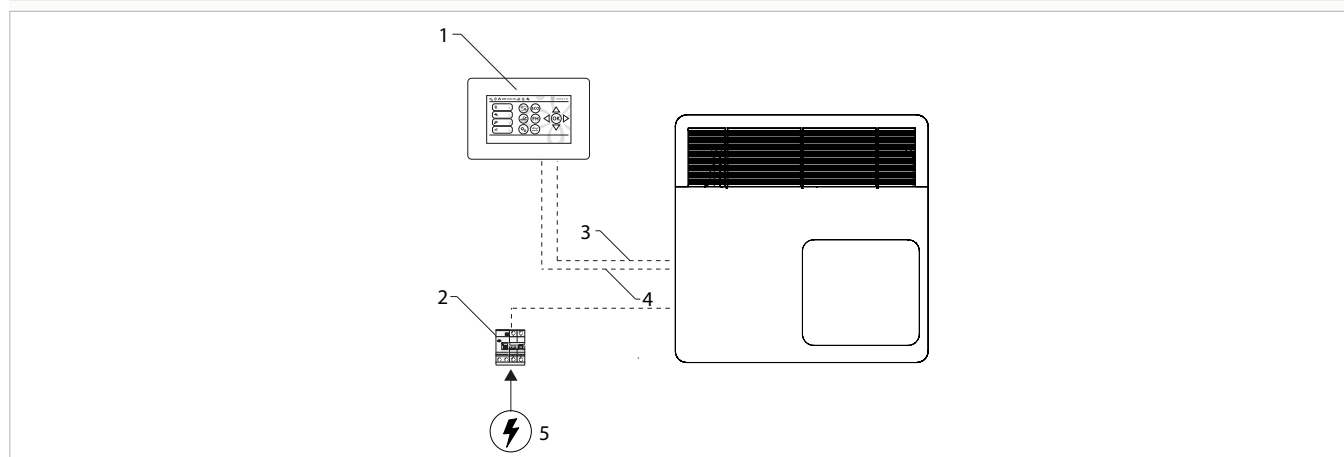
**Wiring diagram**

There are two types of connection according to the need to use the relays present in the Control Panel.

**No relay used**

The Control Panel can be powered by the heat pump.

1. Control Panel
2. Thermal magnetic circuit breaker and differential protection (not supplied)
3. Communication cable with Control Panel
4. Remote Control Panel power cable; minimum cross-section area 0.5 mm, maximum length 50 m
5. Unit power supply 230/1/50 0 400/3/50 depending on model

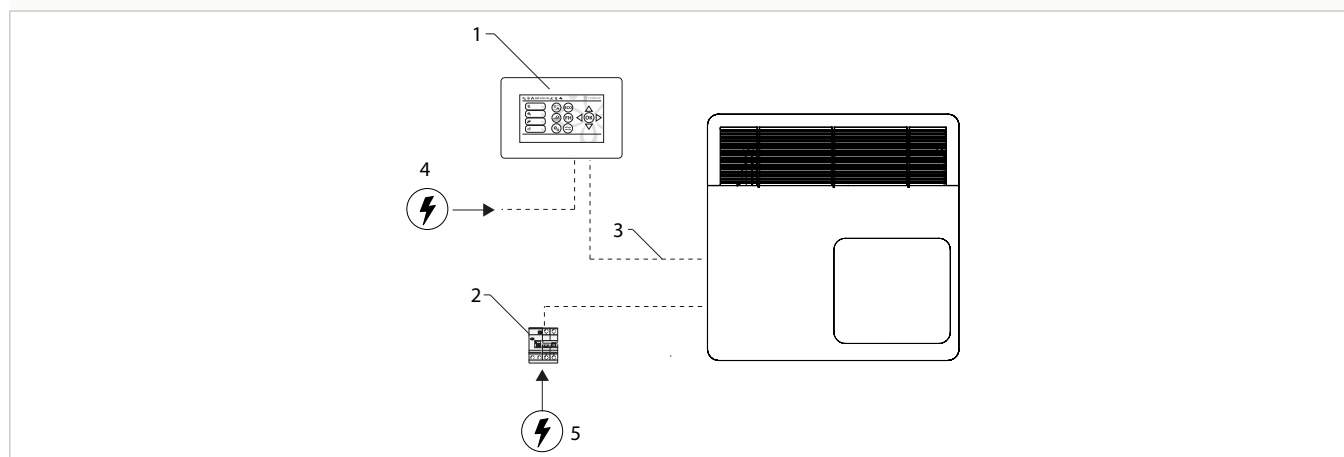


- ⊖ Using this connection diagram is forbidden if at least one of the relay contacts on the Control Panel is used.

**At least one relay used**

The Control Panel must have a separate power supply.

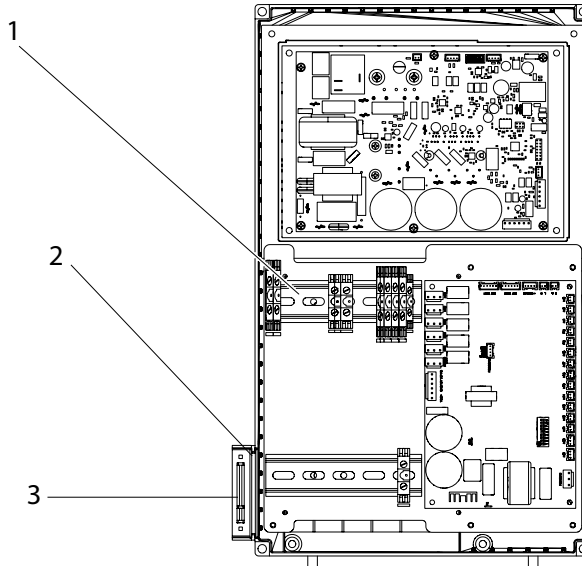
1. Remote Control Panel
2. Thermal magnetic circuit breaker and differential protection (not supplied)
3. Communication cable with Control Panel
4. Power supply Control Panel 12 or 24 VDC - 3 W + the power required by the coils of the relays used
5. Unit power supply 230/1/50 0 400/3/50 depending on model



## Electrical panel aboard the unit

### Connection terminal blocks

1. Terminal blocks
2. Rubber gasket
3. Cable gland



#### To make the connection:

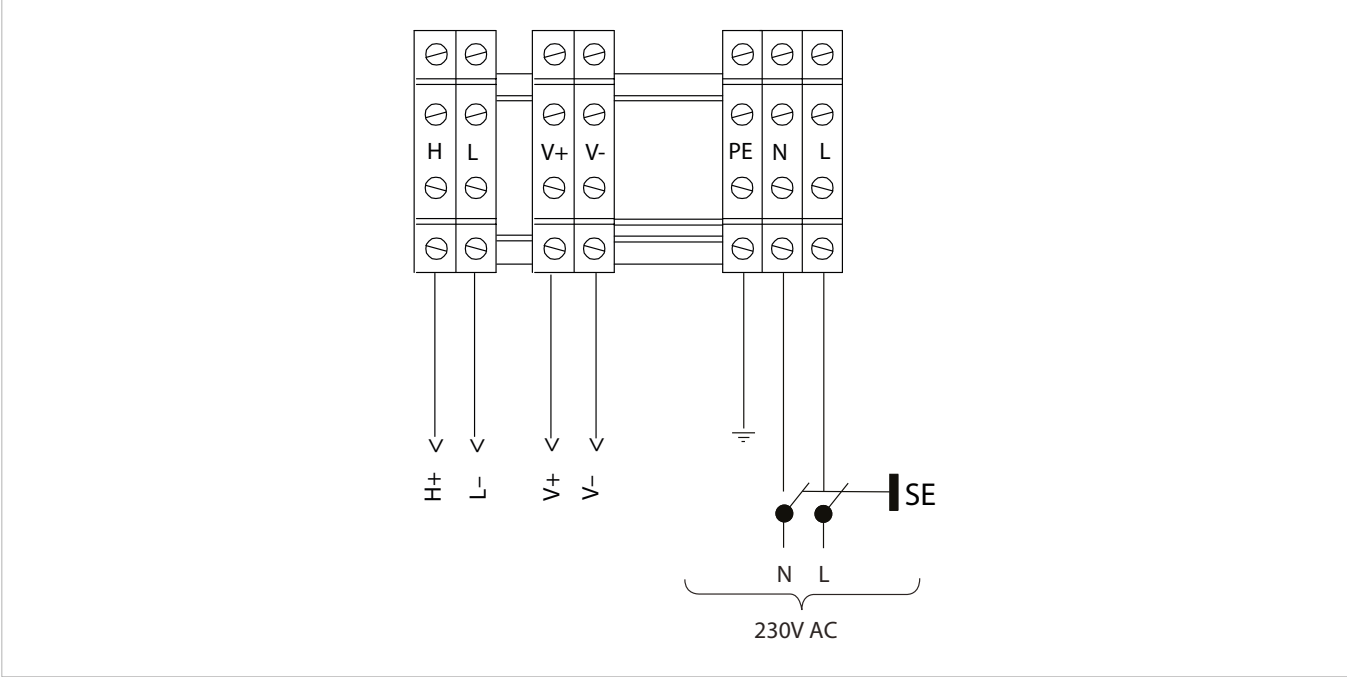
- remove the cable clamp
- insert the cables through the rubber seal
- bring the power cord to the terminal block
- making the connections
- refer to the information in the wiring diagram of the unit you are installing

#### After the connection:

- replace the rubber gasket
- fix the cables with the cable clamp
- close the electrical panel again

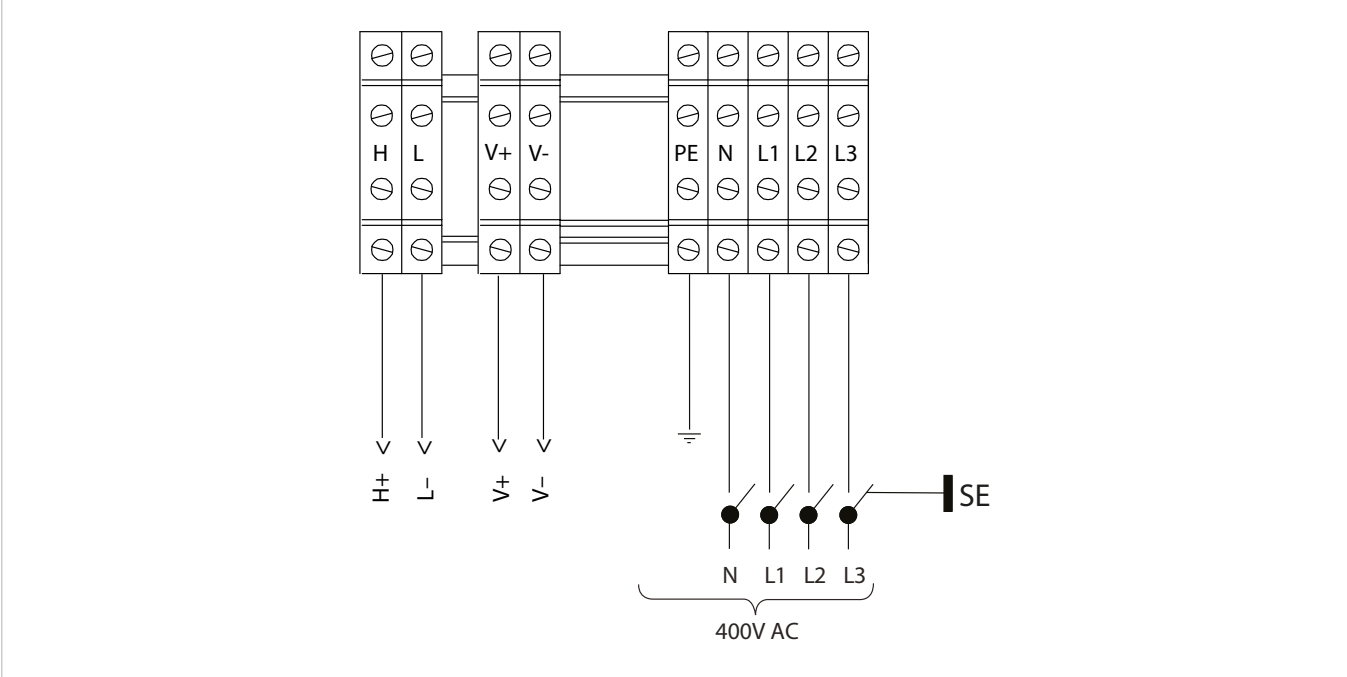
- ⚠ Make sure that the rubber gasket is correctly positioned before closing the panel.
- ⚠ The power cable must be sized according to this manual.
- ⚠ Use a double-insulated multi-core cable mod. H07RNF for outdoor applications in cable duct, or mod. H05VVF for indoor applications.

Single-phase unit terminal block



- H+ L-** Serial connection with Control Panel
- V+ V-** Control Panel power supply to be used only if no relay output on the terminal board of the control is used
- SE** Disconnect switch (not supplied)
- 230V AC** Unit power supply

Three-phase unit terminal block

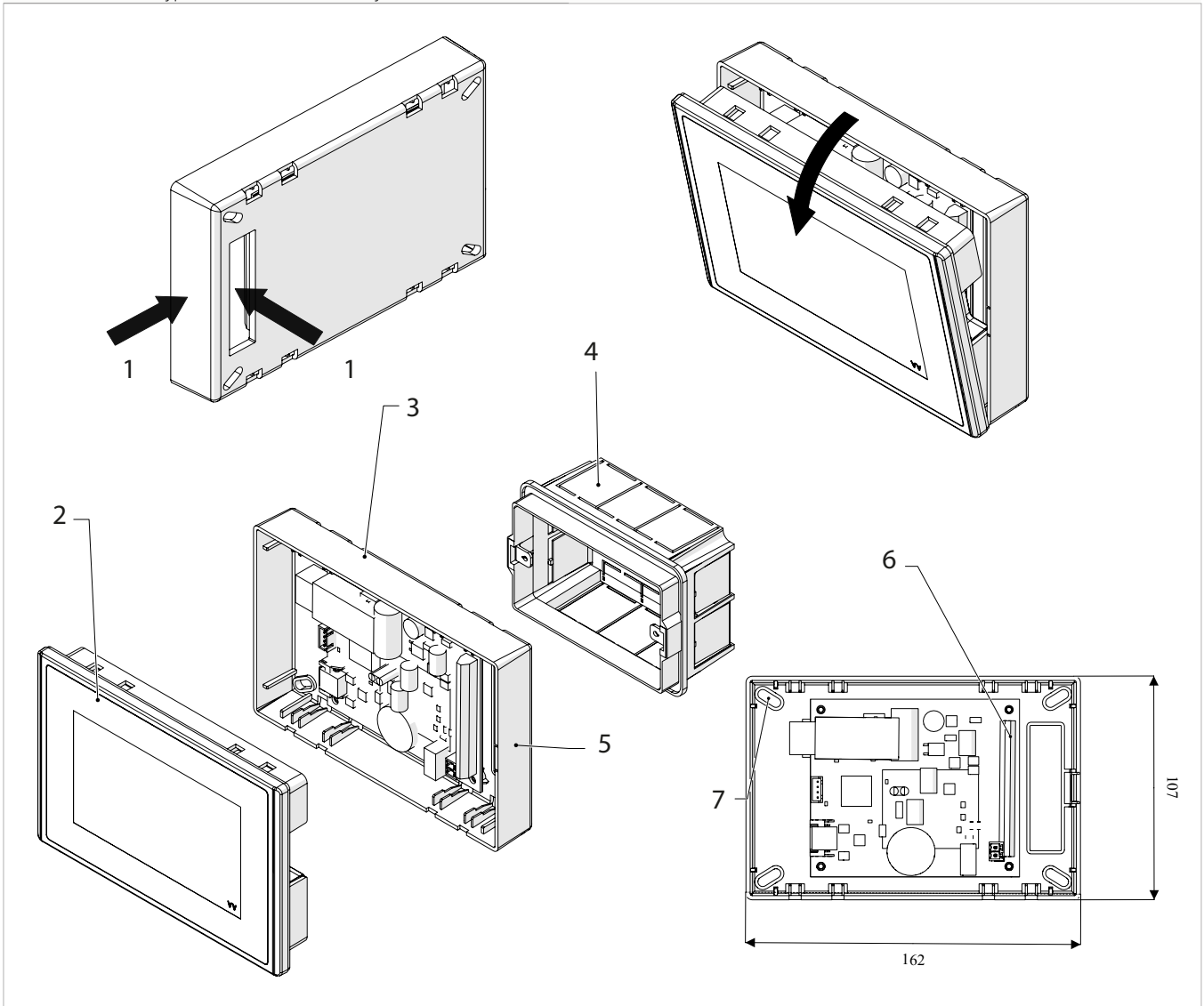


- V+ V-** Control Panel power supply to be used only if no relay output on the terminal board of the control is used
- H+ L-** Serial connection with Control Panel
- SE** Disconnect switch (not supplied)
- 400V AC** Unit power supply

## Control Panel

1. Connection entry
2. Display
3. Base
4. Built-in box type 503 for connection entry from behind

5. Pre-cut for side entry of connections
6. Connection terminal block
7. Slots for wall mounting



The Control Panel regulates and coordinates all the main functions of the appliance. The appliance allows the summer/winter selection, the production of domestic hot water, the temperature regulation, the control of all the main functions of the appliance and the display of possible alarms.

- establish the electrical connections
- reposition the display on the base

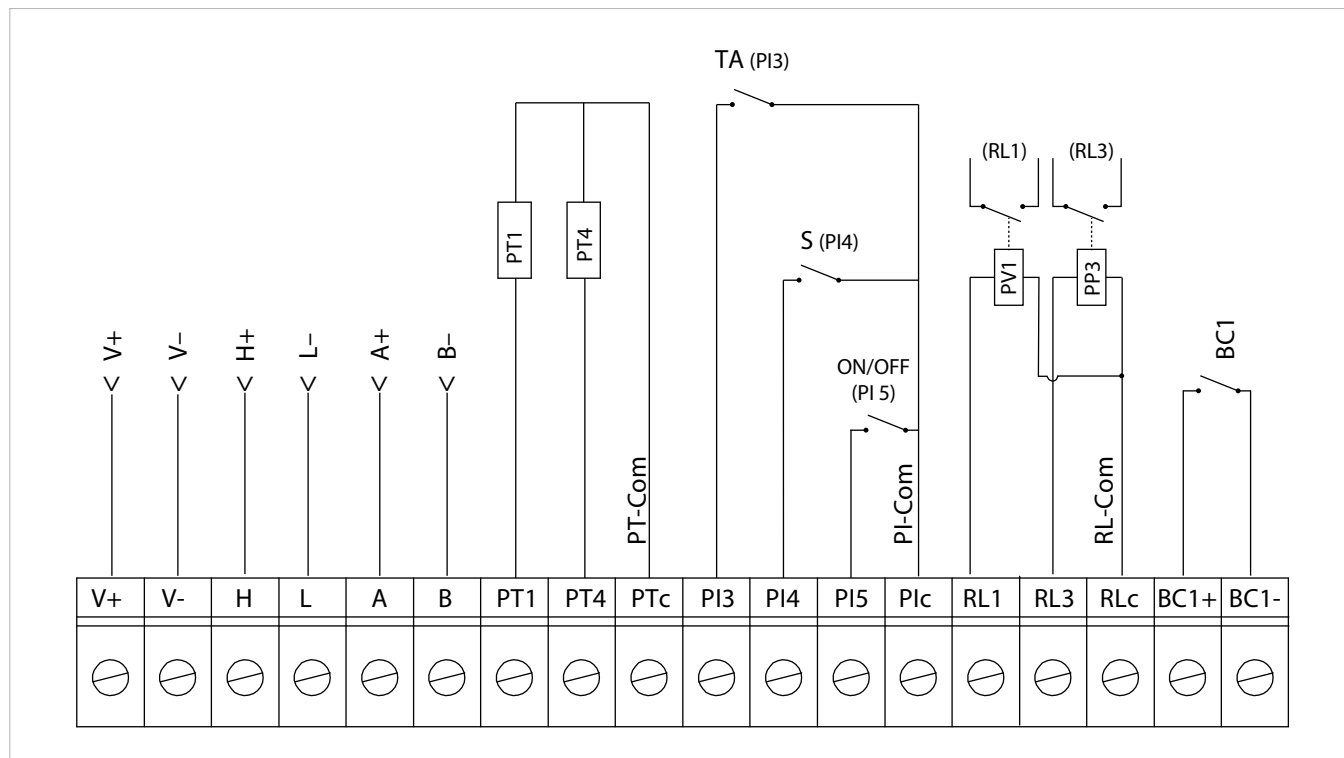
### The Control Panel must be installed:

- on internal walls
- at a height of about 1,5 m from the floor
- away from doors or windows
- away from heat sources (heaters, convectors, stoves, direct sunlight)

### To install:

- use a sharp instrument
- separate the display from the base
- use the base as a template
- mark the fixing positions
- drill holes in the wall
- use screws and expansion plugs
- fix the base on the wall

## Terminal block for wiring



### Power supply and communications

- V+ V-** Control Panel power supply 12 or 24V DC, 3W
- H+ L-** Serial connection for communication with the CONTROL PANEL (CAN Bus)
- A+ B-** Modbus connection

### Probes

- PT1** Plant temperature probe
- PT4** Domestic hot water tank temperature probe
- PT-Com** Probe connection common

### Digital inputs

- TA** Consent from room thermostat or generic voltage-free contact
- S** Silent or Heating/Cooling switching

### ON/OFF Remote On/Off

- PI-Com** Common for digital inputs

### Relay outputs

- PV1** Plant/domestic hot water diverter valve (to activate the output a relay with a 12V DC coil is required, to be purchased and connected by the installer)
- PP3** Secondary circulation pump (to activate the output a relay with a 12V DC coil is required, to be purchased and connected by the installer)

### RL-Com Relay output common

### Auxiliary generator

- BC1** Backup heat generator

## Description of auxiliary contacts

### Power and communication terminals

**V+ V-:** power supply connection of the Control Panel. There are two cases distinguished:

- No relay output used: the power supply can come from the heat pump board with a two-core cable with a minimum cross-section area of 0.5 mm<sup>2</sup> and a maximum length of 50 m.
- Minimum one relay output used: the power supply must come from a separate source with 12 or 24V DC characteristics, 3W + the power required by the coils of the relays used.

**H+ L-:** serial connection to the control panel. The connection is polarised. Use a core shielded cable for RS485 serial connection, minimum cross-section area of 0.35 mm<sup>2</sup>, maximum length of 100 m, separated from the power supply cables.

**A+ B-:** Modbus connection for control with external supervisor.

### Probe terminals

**PT1 -PTc:** connection of plant temperature probe PT1. For the cases of use, see the chapter

on plant water management in the Control Panel manual.

**PT4 - PTc:** connection of domestic hot water tank temperature probe PT4.

The probes are supplied with the unit. Position the probe used in a suitable sump on the relevant tank (max. distance 50 m).

### Digital input terminals

**PI3 - PIc:** TA consent from room thermostat or general voltage-free contact

- Closed contact: the unit is switched on for heating or cooling the plant water.
- Open contact: the unit is switched off for heating or cooling the plant water

⚠ If the domestic hot water function is active, this function has priority even when the contact is open.

⚠ The terminals are supplied jumped (contact closed). Remove the jumper to connect the TA consent.

**PI4 - PIc:** S configurable input for activating/deactivating the Silent function or for switching the Cooling/Heating operating mode. The Silent function reduces the noise level of the appliance by lowering the work-

ing frequency of the compressor and the fan.

- Operation must be activated by parameter **PF5** (see Control Panel manual).

**PI5 - PIc:** ON/OFF contact for remote activation/deactivation of the appliance.

- Operation must be activated by parameter **PF4** (see Control Panel manual).

### Relay output terminals

**RL1 - RLc** **PV1 relay with 12V DC 500 mW coil for connecting to the plant/domestic hot water diverter valve.**

**RL3 - RLc:** PP3 relay with 12V DC 500 mW coil for secondary pump connection.

**⚠ If at least one relay output is used, the Control Panel cannot be supplied by the heat pump but must be supplied separately.**

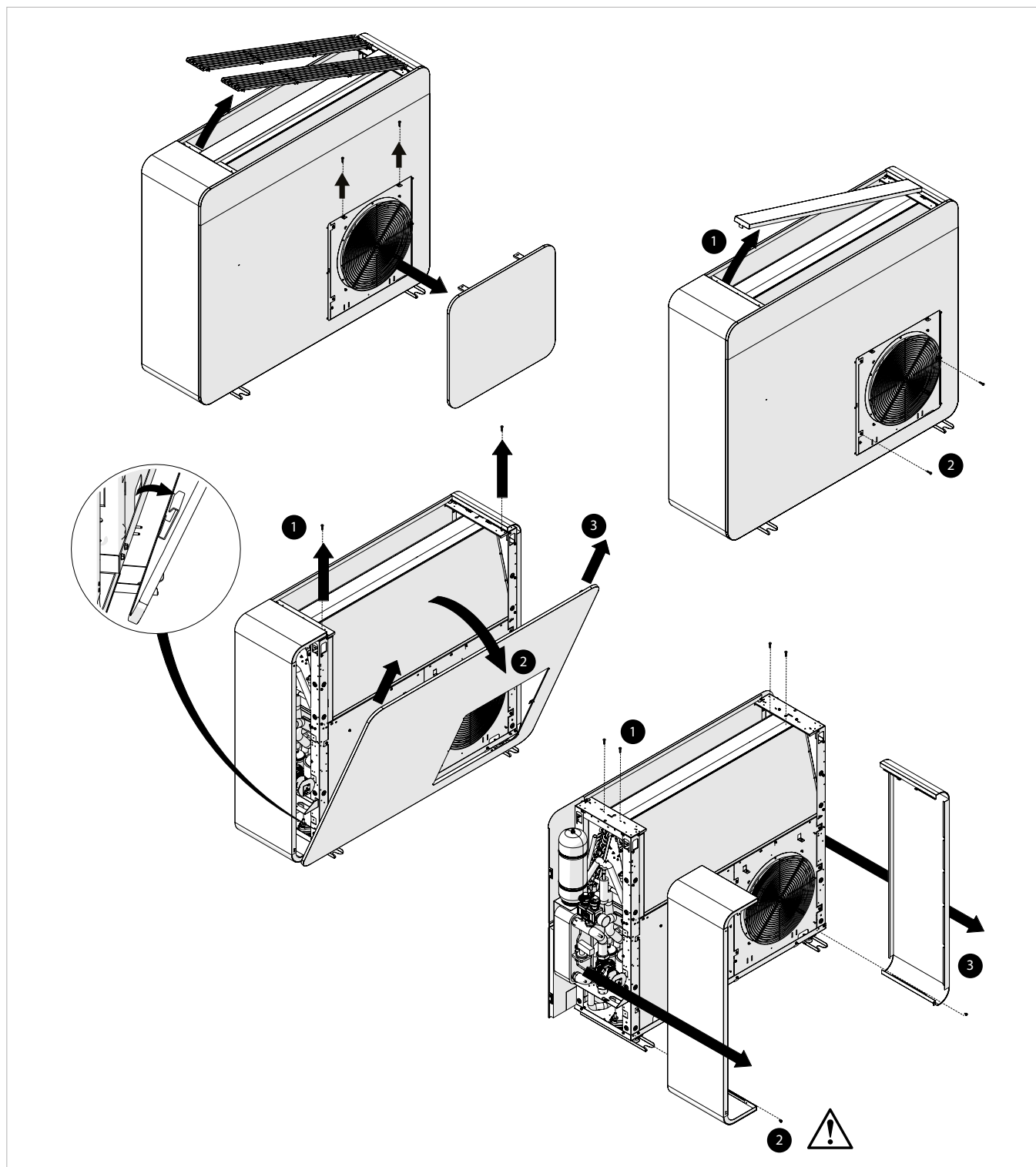
### Support generator terminals

**BC1+ BC1-:** BC1 normally open potential-free contact for backup heat generator. Maximum contact rating 1 A 230 VAC or 2 A 30 VDC (resistive load).

**⚠** Check the tightness of all power conductor terminals at first start-up and 30 days after commissioning.

### 3.15 Disassembly and assembly of cosmetic panels and grilles after installation

#### Removing of cosmetic covering elements

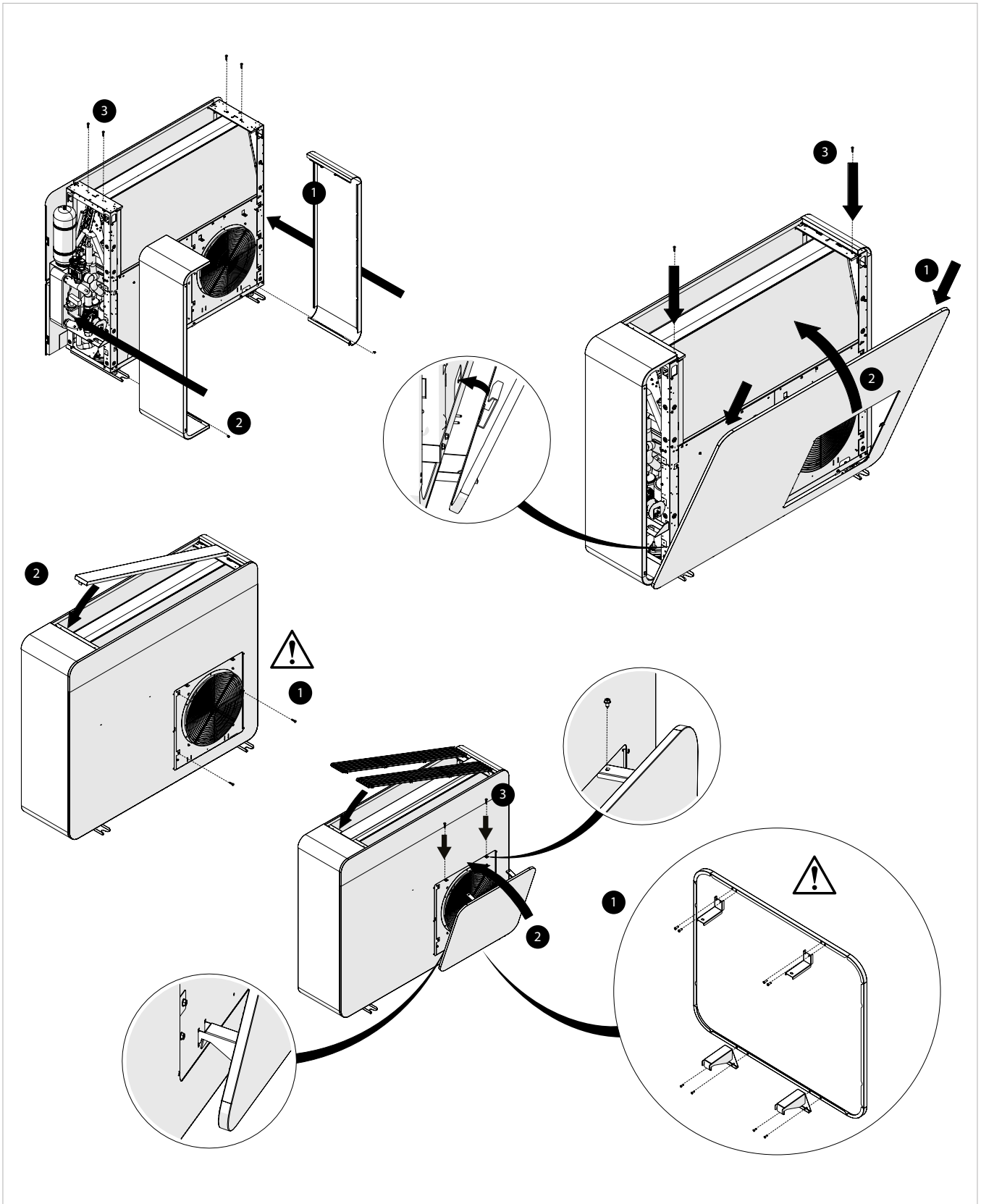


⚠ The number of screws securing the front panel varies according to the size of the product.

⚠ Make sure you have also undone the lower fixing screws before removing the side panels.

⊖ Removing the side panels without completely removing the fixing screws is forbidden.

## Fitting of cosmetic covering elements



⚠ The number of screws securing the front panel varies according to the size of the product.

⚠ The number of screws securing the front panel varies according to the size of the product.

⚠ Make sure you have also undone the lower fixing screws before removing the side panels.

## PUTTING IT INTO SERVICE

### 4.1 Preliminary warnings

- ⚠ **The initial start-up of the heat pump must be carried out by the Service Centre.**
- ⚠ **For detailed information on accessories please refer to the "Configuration accessories" p. 49 section.**
- ⚠ The customer must be present when the appliance is tested and informed of the contents of the manual and procedures. After commissioning, the manual and the warranty certificate must be handed over to the customer.
- ⚠ Before start-up, all work (electrical and plumbing connections, filling and venting of air from the plant) must be completed.

#### Preliminary warnings for R32

- ⚠ The unit uses environmentally friendly R32 refrigerant gas, with a Global Warming Potential (GWP) = 675. Do not release R32 gas into the atmosphere.
- ⚠ R32 refrigerant gas is slightly flammable and odourless.
- ⚠ Do not place flammable objects (spray cans) within 1 metre of the air outlet.
- ⚠ All precautions concerning the treatment of the refrigerant must be observed following the regulations in force.
- ⚠ Avoid proximity to sources of ignition in continuous operation (open flames, gas appliances, electric stoves, lighted cigarettes, etc.).
- ⚠ Do not use any means to speed up the defrosting process.
- 🚫 Smoking in the vicinity of the appliance is prohibited.

- 🚫 Using a mobile phone near the appliance is prohibited.
- ⚠ Perform the following checks:
  - carry out safety checks to ensure that the risk of combustion is minimised
  - avoid working in confined spaces
  - delimit the area around the workspace
  - ensure safe working conditions around the area by controlling flammable material

#### Leak detection

- 🚫 The use of combustion fluid detectors, e.g. a halide torch or other detection system using an open flame, is forbidden.
- ⚠ Follow the instructions below for leak detection:
  - use electronic detectors to detect flammable refrigerants
  - check that the detectors are properly calibrated before use
  - calibration operations must be carried out in an area free from refrigerant
  - make sure that the detector is not a potential source of combustion and that it is suitable for the refrigerant used
  - all open flames must be removed if a leak is suspected
  - in the event of a leak requiring brazing, it is mandatory to recover all the refrigerant from the system or isolate it (by means of shut-off valves) in a part of the system away from the leak
- ⚠ The use of silicone sealant may affect the effectiveness of some types of leak detectors.

### 4.2 First start-up

#### Preliminary checks

Before proceeding with start-up, check that:

##### Functional

- all safety conditions have been met
- the unit has been properly secured to the supporting surface or wall
- the minimum technical clearances have been respected

##### Hydraulics

- the hydraulic connections have been made according to the instructions in the manual
- the hydraulic plant has been filled and vented
- the system pressure is between 1 and 2 bar with the circulation pump switched off

- the loading tap is closed
- the shut-off valves of the hydraulic circuit are open
- condensate drainage has been carried out correctly
- the discharge of the safety valve has been channelled and connected to a suitable collection and evacuation system
- the antifreeze valves have been installed correctly
- the mesh filter is installed and clean

- 🚫 It is forbidden to operate the unit without antifreeze valves installed.
- 🚫 Operating the unit without the water filter installed and clean is forbidden.

#### Electrics

- the cross-section of the power supply cables is suitable for the absorption of the appliance and the length of the connection made
- the earthing was performed correctly
- the electrical connections have been established correctly
- all electrical connections are properly secured and all terminals properly tightened
- the voltage is within a tolerance of 10% of the rated voltage of the unit
- the power supply of the three-phase models has a maximum unbalance between phases of 3%
- all control wires are connected and all electrical connections are firmly in place
- the control panel has been installed and connected correctly

### Water quality checks

The technician must measure the reference values of the water in the system with special test kits.

- ⚠ Take the necessary steps to achieve the indicated limits if the total hardness is greater than 15 °F or some top-up water reference values are not within the limits indicated.
- ⚠ Water from wells or groundwater that is not from an aqueduct should always be carefully analysed. If necessary, condition with appropriate treatment systems.
- ⚠ If a softener is installed, in addition to following the manufacturer's instructions, adjust the outlet water hardness to not less than 5 °F (by performing pH and salinity tests) and check the outlet chloride concentration after adjusting the resins.

### Powering up

- ⚠ **Power up the unit for at least 12 hours before starting.**

⚠ Make sure that the control panel is switched off.

#### To start the unit:

- set the main switch to ON

The display will light up a few seconds after power-up, check that the operating status is OFF. Otherwise, press the  button to put it in Standby.

- ⚠ **Refer to the Control Panel Manual to carry out the operations.**

### Start-up

Once all checks have been made, the unit can be started up.

#### To activate the device

- press the key 
  
The symbol  or  lights up

#### Functional checks:

- verify the different modes of operation
- check that the appliance performs a shutdown and subsequent restart
- switch the appliance off and on again and check that it restarts correctly

- ⚠ Carry out the measurements indicated on the Test Sheet for the first start-up.

- ⚠ Refer to the Control Panel Manual to carry out the operations.

- ⚠ During start-up, the primary pump must be operated in fixed speed mode set at maximum speed (factory setting).

- ⚠ The first start-up must be carried out with standard settings. Only after the test has been completed, change the operating set point values.

#### Intervention ALRM 017

If the alarm ALRM 017 appears after the start-up of the circulation pump, check that

- the plant valves are open
- there is at least one consumer with an open circuit
- the sieve filter is not clogged
- there are no air bubbles inside the circuit
- the water pressure of the plant is correct

If necessary, rearm the alarm.

### Checks with the machine switched on

After starting up, check that

#### Functional

- the appliance operates within the recommended operating conditions (see technical specifications table)
- the 3-way sanitary/plant diverter valve is functioning correctly
- Probe PT4 is correctly positioned inside the DHW tank.
- the temperature shown on the display is consistent with the actual water temperature (use a thermometer)

#### Electrics

- the current draw of the compressor is lower than the maximum indicated in the technical specifications table
- the supply voltage value is within the set limits and does not fall below the nominal value during compressor operation -10 %
- in models with three-phase power supply, the compressor noise level is not abnormal
- the three-phase supply has a maximum unbalance between phases of 3%

#### Hydraulics

- the hydraulic circuit is completely deaerated

## Thermal gradient

Check that the thermal gradient between the plant delivery and return is between 4-7°C by querying parameters PT5-M and PT6-M.

If the temperature difference is less than 4 °C, set a lower circulator speed, see chapter "PP1 primary circulation pump" [p. 42](#).

If the thermal gradient is greater than 7 °C check that all the valves on the plant are open and if necessary add an external pump to increase the water flow rate.

If the mains pressure exceeds 3 bar, install a pressure reducer on the filling line.

## Presence of air

Check that no air pockets are still present once the electrical connections have been established and the circulation pump has been switched on.

### In the presence of air pockets:

- stop the pump several times
- vent again

**⚠** To avoid dangerous cavitation that could damage the pump and make the entire appliance less efficient, the suction pressure, with the pump on, measured by the pressure gauge on the appliance, must not be less than 0.6 bar.

## 4.3 Adjustments

### Setting the head value

The maximum head value must be set with:

- 100% compressor capacity

- all distribution valves open
- all consumers on

## 4.4 PP1 primary circulation pump

The appliance uses a high-efficiency wet circulation pump, suitable for all heating and air-conditioning plants.

On the front of the pump body there is a regulator for select operating mode at fixed or variable speed:

**⚠ Fixed speed mode must be used for the primary pump.**

### Fixed speed mode

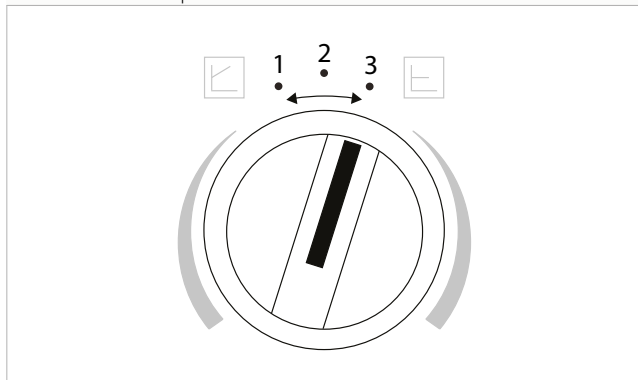
In this mode, the circulation pump operates at fixed speeds that are not subject to regulation. For operating curves (available at maximum speed) see chapter "PP1 primary circulation pump graphs" [p. 57](#).

**⚠** The unit is supplied with the selector set to maximum speed.

**There are two different control modes according to the installed pump model:**

### Pump model 1

- |    |               |
|----|---------------|
| 1. | Minimum speed |
| 2. | Medium speed  |
| 3. | Maximum speed |

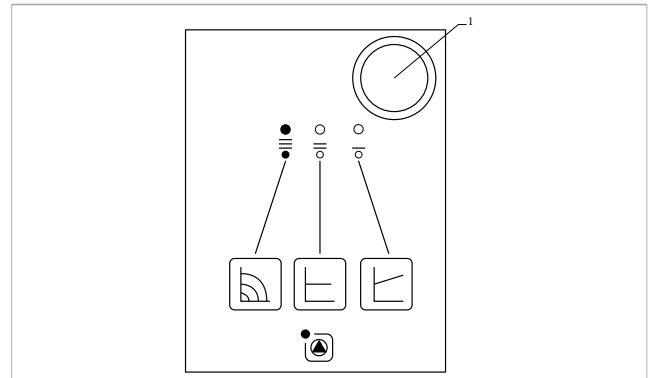


To select maximum speed:

- act on the knob
- set to 3

### Pump model 2

1. Selection button



To select maximum speed:

- press the selection button in sequence until the LEDs light up



Fixed speed selection



Maximum speed

## 4.5 Plant delivery

Once all the checks and controls on the correct operation of the plant have been completed, the installer must explain the following to the user:

- the basic functional characteristics of the appliance
- the instructions for use
- the routine maintenance

## 4.6 Long period shut-down

The following operations must be carried out if the air-to-water heat pump is not used for a long time:

- disable the device
- turn the master switch of the appliance to position 0-, OFF.

### After switching off the appliance:

- switch off the indoor terminal units by setting the switch of each appliance to the "off" position
- set the main system switch to "Off"
- close the water taps

 Contact the Technical Service Centre.

 If the outside temperature may fall below zero degrees centigrade, with the likelihood of frost, the hydraulic plant must be drained or antifreeze liquid (e.g. ethylene glycol) must be added in the doses recommended by the manufacturer.

To restart the heat pump after it has been out of operation for a long time, contact the Service Centre.

## 4.7 Draining the plant

The appliances are not equipped with a drain cock, it is necessary to provide one on a pipe connecting to the plant at a point near and below the appliance.

### Preliminary warnings

 All operations must be carried out with the machine stopped and disconnected from the power supply.

### Draining

#### Before starting the emptying operation:

- check that the plant water filling/top-up cock is closed

#### To drain the plant:

- open the drain cock on the outside of the appliance
- open all the air valves of the plant and its terminals

## 4.8 Checks

- make sure that the circulation pump is running and that the water flow rate is sufficient to close the contact of the differential pressure switch
- check the water flow rate
- make sure that the differential pressure switch is working properly

## MAINTENANCE

Routine maintenance is essential to keep the device always efficient, safe and reliable over time.

### 5.1 Preliminary warnings

**⚠ For detailed information on accessories please refer to the "Configuration accessories" p. 49 section.**

**⚠** This unit contains fluorinated greenhouse gases covered by the Kyoto Protocol. Maintenance and disposal operations must be carried out by qualified personnel only.

**Before each cleaning and maintenance intervention:**

- disconnect the device from the power mains by turning the system master switch to "OFF"
- wait for the components to cool down in order to avoid any burns

**⊖** Carrying out any technical or cleaning work before disconnecting the unit from the power supply is forbidden.

**⚠** Make sure that there is no voltage before operating.

**⚠** After completing the maintenance work, must be restored the original condition.

#### Preliminary warnings for R32

**⚠** The unit uses environmentally friendly R32 refrigerant gas, with a Global Warming Potential (GWP) = 675. Do not release R32 gas into the atmosphere.

**⚠** R32 refrigerant gas is slightly flammable and odourless.

**⚠** Do not place flammable objects (spray cans) within 1 metre of the air outlet.

**⚠** All precautions concerning the treatment of the refrigerant must be observed following the regulations in force.

**⚠** Avoid proximity to sources of ignition in continuous operation (open flames, gas appliances, electric stoves, lighted cigarettes, etc.).

**⊖** Smoking in the vicinity of the appliance is prohibited.

**⊖** Using a mobile phone near the appliance is prohibited.

**⚠** Perform the following checks:

- carry out safety checks to ensure that the risk of combustion is minimised
- avoid working in confined spaces
- delimit the area around the workspace
- ensure safe working conditions around the area by controlling flammable material

#### Leak detection

**⊖** The use of combustion fluid detectors, e.g. a halide torch or other detection system using an open flame, is forbidden.

**⚠** Follow the instructions below for leak detection:

- use electronic detectors to detect flammable refrigerants
- check that the detectors are properly calibrated before use
- calibration operations must be carried out in an area free from refrigerant
- make sure that the detector is not a potential source of combustion and that it is suitable for the refrigerant used
- all open flames must be removed if a leak is suspected
- in the event of a leak requiring brazing, it is mandatory to recover all the refrigerant from the system or isolate it (by means of shut-off valves) in a part of the system away from the leak

**⚠** The use of silicone sealant may affect the effectiveness of some types of leak detectors.

### 5.2 Once-a-year operations

The once-a-year maintenance plan includes the following operations and checks and must be carried out by the Technical Service Centre or by qualified personnel.

#### Routine maintenance of the unit

##### Hydraulic circuit

Check:

- water circuit filling
- filter cleanliness
- pressure switch and flowmeter control
- absence of air in the circuit (venting)
- that the water flow rate is always constant at the evaporator

- the status of thermal insulation of the hydraulic piping
- the glycol percentage, if any

##### Electric circuit

Check:

- electrical supply voltage
- electric draw

- tightness of connections
- that there is no damage or excessive wear on the electrical cables
- the seals and sealing materials have not deteriorated to such an extent that they are no longer suitable for preventing the development of flammable atmospheres inside
- correct fixing of the cable clamps
- safety devices

### Mechanical checks

Check:

- the tightness of the screws, the compressors and the electrical box, the external panelling of the unit
- the conditions of the structure

- ⚠ Poor fastenings cause abnormal noises and vibrations.
- ⚠ Treat any rusty parts with paints suitable to eliminate or reduce the rust.

### Cleaning

- clean the battery
- clean the condensate drip tray
- clean cosmetic covering elements

- ⚠ Use brushes or tools that do not involve risks of perforating the exchangers or igniting flames to clean the exchangers.

### Refrigeration checks

Make sure that:

- the marking on the equipment must remain visible and legible. Illegible markings and graphics must be corrected
- the thermodynamic values are within the nominal parameters

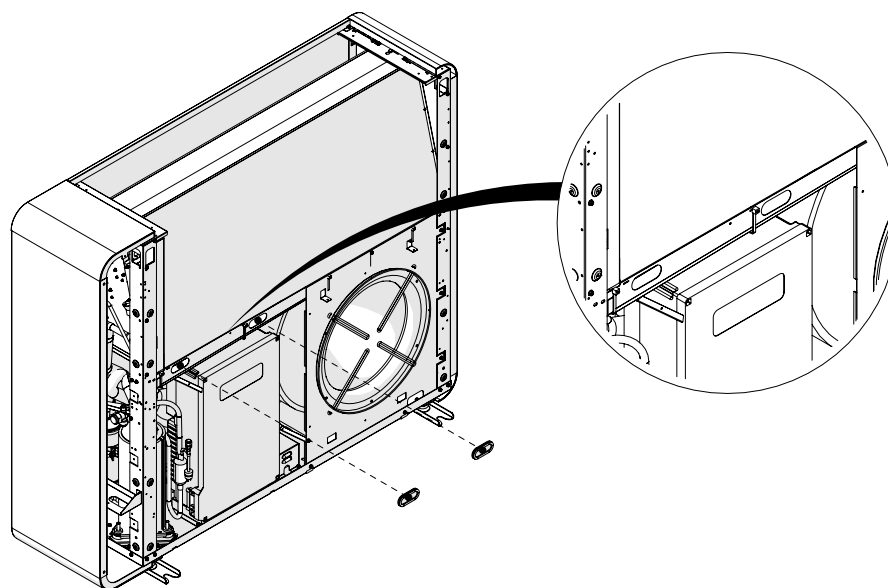
Under the provisions of Directive 517/2014/EU, plants containing more than 5 equivalent tonnes of CO<sub>2</sub> (7.41 kg of R32 gas or 2.39 kg of R410a gas) must be checked for leaks once a year, using either direct or indirect methods, by personnel certified under EU Regulation 2015/2067.

The company responsible for maintenance must keep a logbook in which the following information is recorded:

- the technician who performed the maintenance or repair,
- the dates and results of the checks,
- the quantity and type of fluorinated gas used,
- any quantities added or recovered during servicing, repair or final disposal.

- ⚠ If needed, a form is available at "System log box".
- ⚠ Filling the refrigeration circuit with a refrigerant other than the one indicated is forbidden. Using a different refrigerant gas can cause serious damage to the unit.

## Cleaning the condensate drip tray



If necessary, the condensate trays can be cleaned through the slots provided on the unit.

### To clean:

- remove the cover caps
- clean through the slots with a vacuum cleaner

### After the operation:

- replace the cover caps

- ⚠ Check if there are no leaks from the cover plugs.

## TROUBLESHOOTING

### 6.1 Preliminary warnings

 **For detailed information on accessories please refer to the "Configuration accessories" p. 49 section.**

**Should you encounter any of the anomalies below:**

- the ventilation does not start even if the water circuit is filled with hot or cold water
- the device is losing water in heating mode
- the device is losing water in cooling mode
- the device generates excessive noise
- there is dew on the front panel

**Follow the instructions below:**

- disconnect the device from power supply immediately
- close the water taps
- contact an authorised Technical Assistance Centre or professionally qualified personnel

 The interventions must be carried out by a qualified installer or by a specialized support center.

 Do not intervene personally.

### 6.2 Functional aspects not to be interpreted as faults

- The following functional aspects may occur during the operation of the appliance, these behaviours of the appliance are correct and should not be interpreted as a fault.
- The compressor does not start again until 3 minutes after being shut off.
- During operation in heating mode of systems with heat pump, heat is produced a few minutes after the compressor starts.
- Periodic defrosting cycles occur during heating operation.
- When switching from domestic hot water production to cooling and vice versa, the external heat pump is kept off for one minute to avoid mixing hot and cold water.

### 6.3 Faults reported by the Control Panel

Faults are indicated on the display of the Control Panel.

 For reading, refer to the Control Panel Manual.

#### **Manual reset of alarms**

Repeating a fault several times will put the appliance in safety and the alarm must be reset manually.

**To restore:**

- press and hold  for a few seconds
- the padlock disappears from the symbol 
- then the symbol  disappears

## 6.4 Troubleshooting Table

| Alarm    | Description                                                 | Correlated variables                               | Correlated parameters | Activation conditions                                                    | Restoration conditions                 | Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------|-------------------------------------------------------------|----------------------------------------------------|-----------------------|--------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALRM 001 | Temperature probe malfunction                               | PT1, PT4, PT5, PT6, MT1-6                          | -                     | Probe disconnected, faulty or abnormal value                             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| ALRM 002 | Low-pressure switch tripped                                 | MI2                                                | -                     | Open pressure switch opening contact                                     |                                        | <ul style="list-style-type: none"> <li>Insufficient refrigerant charge</li> <li>Excessive amount of antifreeze</li> <li>Insufficient air flow to air cooler</li> </ul>                                                                                                                                                                                                                                                                                                                                      |
| ALRM 003 | High-pressure switch tripped                                | MI1                                                | -                     | Open pressure switch opening contact                                     |                                        | <ul style="list-style-type: none"> <li>Excessive refrigerant charge</li> <li>Presence of non-condensable gases (air)</li> <li>Insufficient air flow to air cooler</li> <li>Set point setting too high</li> <li>Air temperature outside operating limits</li> </ul>                                                                                                                                                                                                                                          |
| ALRM 004 | Inverter driver high temperature                            | -                                                  | -                     | Driver temperature > 100 °C                                              | Driver temperature < 90 °C             | Heat sink obstruction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| ALRM 006 | Inverter driver error                                       | -                                                  | -                     | Driver active alarm                                                      |                                        | Faulty driver card                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| ALRM 007 | Compressor suction low temperature                          | MT1                                                | PM24, PM25            | MT1 < PM24                                                               | MT1 > PM24 + PM25                      | <ul style="list-style-type: none"> <li>Insufficient refrigerant charge</li> <li>Excessive amount of antifreeze</li> <li>Insufficient air flow to air cooler</li> </ul>                                                                                                                                                                                                                                                                                                                                      |
| ALRM 008 | Compressor discharge high temperature                       | MT2                                                | PM23                  | MT2 > PM23                                                               | MT2 < PM23 - 10 °C                     | <ul style="list-style-type: none"> <li>Incorrect refrigerant charge</li> <li>Presence of non-condensable gases (air)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                             |
| ALRM 009 | Outdoor unit communication error                            | -                                                  | -                     | Serial connection fault between indoor and outdoor units terminals H+ L- |                                        | Cable interrupted or disconnected                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| ALRM 010 | Evaporator liquid refrigerant low temperature               | MT4 (cooling), MT5 (heating)                       | PM102, PM1            | t < PM102                                                                | t > PM102 + PM1                        | Heating: <ul style="list-style-type: none"> <li>insufficient air flow to air cooler</li> </ul> Cooling: <ul style="list-style-type: none"> <li>insufficient water flow rate</li> <li>excessive amount of antifreeze</li> </ul>                                                                                                                                                                                                                                                                              |
| ALRM 012 | Fan malfunction                                             | -                                                  | -                     | No feedback from fan                                                     |                                        | Faulty fan motor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| ALRM 017 | Plant flowmeter tripped                                     | PI1, PP1                                           | -                     | PP1 active but PI1 open (with delay)                                     | PP1 active and PI1 closed (with delay) | Check that: <ul style="list-style-type: none"> <li>the check valves are open</li> <li>the 3-way valve for hot-cold diversion (if present) is in the correct position</li> <li>there are no air bubbles inside the circuit</li> <li>at least one of the consumers has an open circuit or is equipped with a 3-way valve</li> <li>the external sieve filter is not clogged</li> <li>the plant water pressure is correct</li> <li>the circulation pump is working properly (unlock it if necessary)</li> </ul> |
| ALRM 022 | High water temperature during domestic hot water production | The maximum value between PT5, PT6, PT4            | PF28, PM1             | t > PF28                                                                 | t < PF28 - PM1                         | <ul style="list-style-type: none"> <li>Set point setting too high</li> <li>Incorrect type of domestic hot water storage tank</li> <li>Domestic hot water temperature probe PT4 not positioned correctly</li> </ul>                                                                                                                                                                                                                                                                                          |
| ALRM 023 | High water temperature during heating operation             | The maximum value between PT5, PT6, PT1 if enabled | PF27, PM1             | t > PF27                                                                 | t < PF27 - PM1                         | <ul style="list-style-type: none"> <li>Set point setting too high</li> <li>Minimum water flow rate</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                               |

| Alarm    | Description                                                    | Correlated variables                               | Correlated parameters | Activation conditions | Restoration conditions | Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------|----------------------------------------------------------------|----------------------------------------------------|-----------------------|-----------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALRM 025 | Plant exchanger antifreeze cooling operation                   | The minimum value between PT5 and PT6              | PF23                  | $t < PF23$            | $t > PF23 + PM1$       | Check that: <ul style="list-style-type: none"> <li>nothing is preventing the good water circulation in the plant (air, partially closed valves, clogged sieve filter, etc.)</li> <li>the thermal gradient between the delivery and return is between 4-7 °C. Query the t1 and t3 parameters</li> <li>Set a lower circulation pump speed if the thermal gradient is less than 4 °C.</li> <li>If the thermal gradient is greater than 7 °C, check that all the valves on the plant are open and if necessary add an external pump to increase the water flow rate or insert a hydraulic separator.</li> </ul> |
| ALRM 027 | Domestic hot water storage antifreeze during cooling operation | PT4                                                | PF23                  | $t < PF23$            | $t > PF23 + PM1$       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| ALRM 028 | Plant exchanger and tank antifreeze during cooling operation   | The minimum value between PT5, PT6, PT1 if enabled | PF23                  | $t < PF23$            | $t > PF23 + PM1$       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

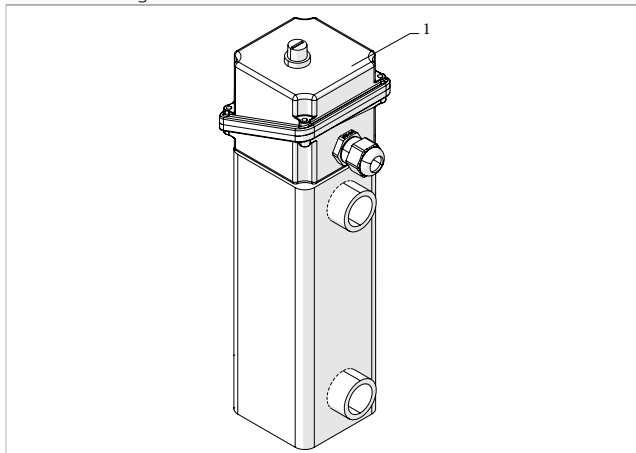
- Note:**
- In general, alarm resetting is automatic when the activation condition is established again.
- The activation or reset conditions must remain for a preset time (e.g. 30 s) before the alarm is activated or deactivated on the display. The duration of the preset time depends on the alarm type.
- If the alarm trips multiple times in a given time (e.g. 3 times in 1 hour), it must be reset manually by the Technical Service Centre.

## CONFIGURATION ACCESSORIES

### 7.1 Heater kit

Heaters maximum 6 kW (3 steps of 2 kW). Limitation to 2 kW for single phase heat pumps.

#### 1. Heating element



### Electric connections

The accessory is supplied installed and tested at the factory. No electrical connections are required.

#### Single-phase power supply

| Connection   |    | Stage 1 | Stage 2 |
|--------------|----|---------|---------|
| Power draw   | kW | 2,00    | 4,00    |
| Current draw | A  | 8,70    | 17,39   |

#### Three-phase power supply

| Connection   |    | Stage 1 | Stage 2 | Stage 3 |
|--------------|----|---------|---------|---------|
| Power draw   | kW | 2,00    | 4,00    | 6,00    |
| Current draw | A  | 8,70    | 8,70    | 8,70    |

| Models                                                           | m.u.            | 5-M  | 7-M  | 9-M  | 11-M | 11-T | 13-M | 13-T | 15-M | 15-T |
|------------------------------------------------------------------|-----------------|------|------|------|------|------|------|------|------|------|
| <b>Electrical data</b>                                           |                 |      |      |      |      |      |      |      |      |      |
| Protection tripping current with electrical heating elements     | A               | 50   | 50   | 50   | 63   | 20   | 63   | 20   | 63   | 20   |
| Minimum wire cross-section area with electrical heating elements | mm <sup>2</sup> | 16,0 | 16,0 | 16,0 | 25,0 | 6,0  | 25,0 | 6,0  | 25,0 | 6,0  |

### Checks with the machine switched on

#### Heating element

- i** This check should only be carried out if the unit is equipped with an electrical heating element.
- the heating element operation indicator light is on

### Failures of the heating element

Failure of the electrical resistance is indicated by the operating light going out.

The fault may be due to:

- intervention of the resistor safety thermostat
- resistor protection switch intervention

To reset, act manually on the tripped safety device.

 If the fault occurs several times in a given period of time (e.g. 3 times in 1 hour), contact the Technical Service Centre.

## TECHNICAL INFORMATION

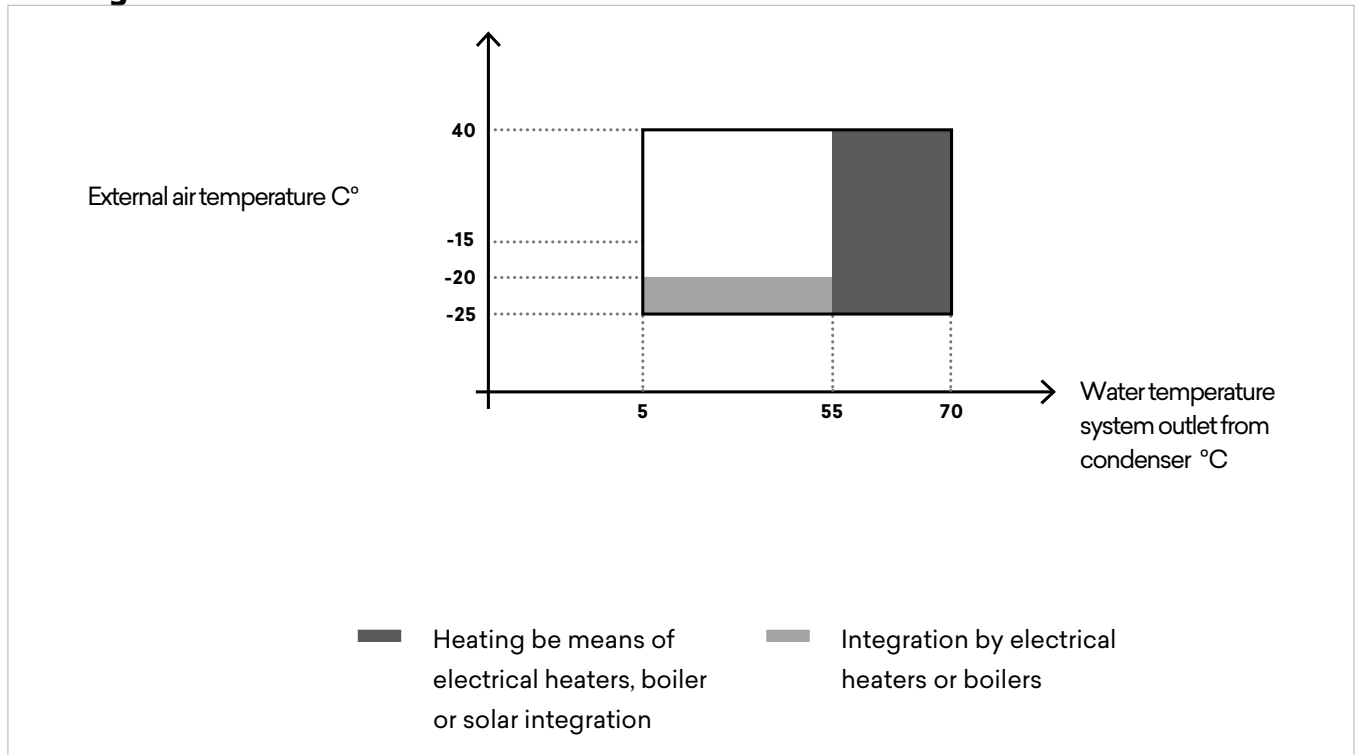
### 8.1 Technical data

| Models                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     | m.u.  | 5-M                     | 7-M   | 9-M   | 11-M  | 11-T  | 13-M  | 13-T  | 15-M  | 15-T  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Heating performances (A 7 °C BS; W 35 °C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |       |                         |       |       |       |       |       |       |       |       |
| Maximum heat output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | (1) | kW    | 7,54                    | 10,75 | 11,45 | 13,53 | 13,53 | 15,20 | 15,20 | 19,50 | 19,50 |
| Nominal heat power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | (1) | kW    | 5,51                    | 7,46  | 9,12  | 10,63 | 10,63 | 12,48 | 12,48 | 15,15 | 15,15 |
| Total absorbed power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | (1) | kW    | 1,16                    | 1,62  | 1,83  | 2,37  | 2,37  | 2,62  | 2,62  | 3,23  | 3,23  |
| COP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | (1) |       | 4,74                    | 4,43  | 4,67  | 4,48  | 4,48  | 4,76  | 4,76  | 4,70  | 4,70  |
| SCOP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | (1) |       | 4,55                    | 4,22  | 4,52  | 4,25  | 4,25  | 4,68  | 4,68  | 4,53  | 4,53  |
| Energy efficiency class                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (2) |       | A+++                    | A++   | A+++  | A++   | A++   | A+++  | A+++  | A+++  | A+++  |
| Heating performances (A-7 °C BS; W 35 °C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |       |                         |       |       |       |       |       |       |       |       |
| Maximum heat output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | (3) | kW    | 4,85                    | 6,45  | 7,05  | 7,88  | 7,88  | 9,05  | 9,05  | 11,42 | 11,42 |
| Total absorbed power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | (3) | kW    | 1,62                    | 2,26  | 2,38  | 2,91  | 2,91  | 2,87  | 2,87  | 3,91  | 3,91  |
| COP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | (3) |       | 2,98                    | 2,85  | 2,95  | 2,70  | 2,70  | 3,15  | 3,15  | 2,92  | 2,92  |
| Cooling performances (A35 °C; W 18 °C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |       |                         |       |       |       |       |       |       |       |       |
| Maximum cooling capacity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | (4) | kW    | 9,20                    | 11,55 | 13,05 | 14,35 | 14,35 | 16,90 | 16,90 | 20,50 | 20,50 |
| Nominal cooling power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | (4) | kW    | 6,90                    | 9,50  | 10,50 | 12,15 | 12,15 | 13,05 | 13,05 | 17,45 | 17,45 |
| Total absorbed power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | (4) | kW    | 1,59                    | 2,25  | 2,44  | 2,87  | 2,87  | 2,96  | 2,96  | 4,04  | 4,04  |
| EER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | (4) |       | 4,33                    | 4,23  | 4,31  | 4,23  | 4,23  | 4,41  | 4,41  | 4,32  | 4,32  |
| Cooling performances (A35 °C; W 7 °C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |       |                         |       |       |       |       |       |       |       |       |
| Maximum cooling capacity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | (5) | kW    | 6,70                    | 8,85  | 9,50  | 11,15 | 11,15 | 12,45 | 12,45 | 15,90 | 15,90 |
| Nominal cooling power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | (5) | kW    | 4,19                    | 6,44  | 7,78  | 8,75  | 8,75  | 9,98  | 9,98  | 12,04 | 12,04 |
| Total absorbed power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | (5) | kW    | 1,22                    | 2,00  | 2,33  | 2,65  | 2,65  | 2,99  | 2,99  | 3,71  | 3,71  |
| EER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | (5) |       | 3,43                    | 3,22  | 3,34  | 3,31  | 3,31  | 3,34  | 3,34  | 3,24  | 3,24  |
| Hydraulic data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |       |                         |       |       |       |       |       |       |       |       |
| Nominal flow rate for heating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     | L/min | 15,9                    | 21,5  | 26,3  | 30,6  | 30,6  | 35,9  | 35,9  | 43,6  | 43,6  |
| Nominal flow rate for cooling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     | L/min | 11,7                    | 18,6  | 22,4  | 25,3  | 25,3  | 28,9  | 28,9  | 34,9  | 34,9  |
| available pressure primary circuit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     | kPa   | 71,0                    | 60,0  | 54,0  | 70,0  | 70,0  | 60,0  | 60,0  | 58,0  | 58,0  |
| Diameter of hydraulic fittings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     | “GAS  | 1”                      |       |       |       |       |       |       |       |       |
| expansion vessel capacity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     | L     | 2                       | 2     | 4     | 4     | 4     | 6     | 6     | 6     | 6     |
| Safety valve calibration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     | bar   | 3                       | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     |
| Minimum system water content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | L     | 20                      | 25    | 30    | 35    | 35    | 40    | 40    | 50    | 50    |
| REFRIGERATION CIRCUIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |       |                         |       |       |       |       |       |       |       |       |
| Compressor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |       | Twin Rotary DC Inverter |       |       |       |       |       |       |       |       |
| Refrigerant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |       | R32                     |       |       |       |       |       |       |       |       |
| 1. Water temperature in/out 30/35 °C; outdoor air temperature 7 °C; U.R. 85%<br>2. Seasonal efficiency according to UNI EN 14825. Energy Efficiency Class referred to the Average climate profile for flow temperature of 35 °C in compliance with Regulation 811/2013<br>3. Water temperature in/out 30/35 °C; outdoor air temperature -7 °C<br>4. Water temperature in/out 23/18 °C; outdoor air temperature 35 °C<br>5. Water temperature out 12/7 °C; outdoor air temperature 35°C<br>6. Sound pressure at a distance of 1 metre in open field at maximum power<br>7. Sound pressure at a distance of 1 metre in open field with compressor modulating at 50% load |     |       |                         |       |       |       |       |       |       |       |       |

| Models                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     | m.u.    | 5-M      | 7-M      | 9-M      | 11-M     | 11-T     | 13-M     | 13-T     | 15-M     | 15-T     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Refrigerant charge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     | kg      | 1,80     | 1,80     | 2,80     | 2,80     | 2,80     | 3,80     | 3,80     | 3,80     | 3,80     |
| <b>Sound data</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |         |          |          |          |          |          |          |          |          |          |
| Sound pressure external Cooling/Heating unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | (6) | dB(A)   | 48       | 49       | 50       | 52       | 52       | 50       | 50       | 54       | 54       |
| Outdoor unit sound pressure Cooling/Heating 50% of the load                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | (7) | dB(A)   | 45       | 47       | 48       | 49       | 49       | 47       | 47       | 51       | 51       |
| <b>Electrical data</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |         |          |          |          |          |          |          |          |          |          |
| Power Supply                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     | V/ph/Hz | 230/1/50 | 230/1/50 | 230/1/50 | 230/1/50 | 400/3/50 | 230/1/50 | 400/3/50 | 230/1/50 | 400/3/50 |
| Degree of protection outdoor unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |         | IPX4     |          |          |          |          |          |          |          |          |
| Maximum current consumption                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     | A       | 14,00    | 18,00    | 21,30    | 25,00    | 8,50     | 28,00    | 9,30     | 34,50    | 11,50    |
| Maximum power consumption                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     | kW      | 2,90     | 3,80     | 4,50     | 5,30     | 5,30     | 5,90     | 5,90     | 7,30     | 7,30     |
| 1. Water temperature in/out 30/35 °C; outdoor air temperature 7 °C; U.R. 85%<br>2. Seasonal efficiency according to UNI EN 14825. Energy Efficiency Class referred to the Average climate profile for flow temperature of 35 °C in compliance with Regulation 811/2013<br>3. Water temperature in/out 30/35 °C; outdoor air temperature -7 °C<br>4. Water temperature in/out 23/18 °C; outdoor air temperature 35 °C<br>5. Water temperature out 12/7 °C; outdoor air temperature 35 °C<br>6. Sound pressure at a distance of 1 metre in open field at maximum power<br>7. Sound pressure at a distance of 1 metre in open field with compressor modulating at 50% load |     |         |          |          |          |          |          |          |          |          |          |

## 8.2 Operating limits

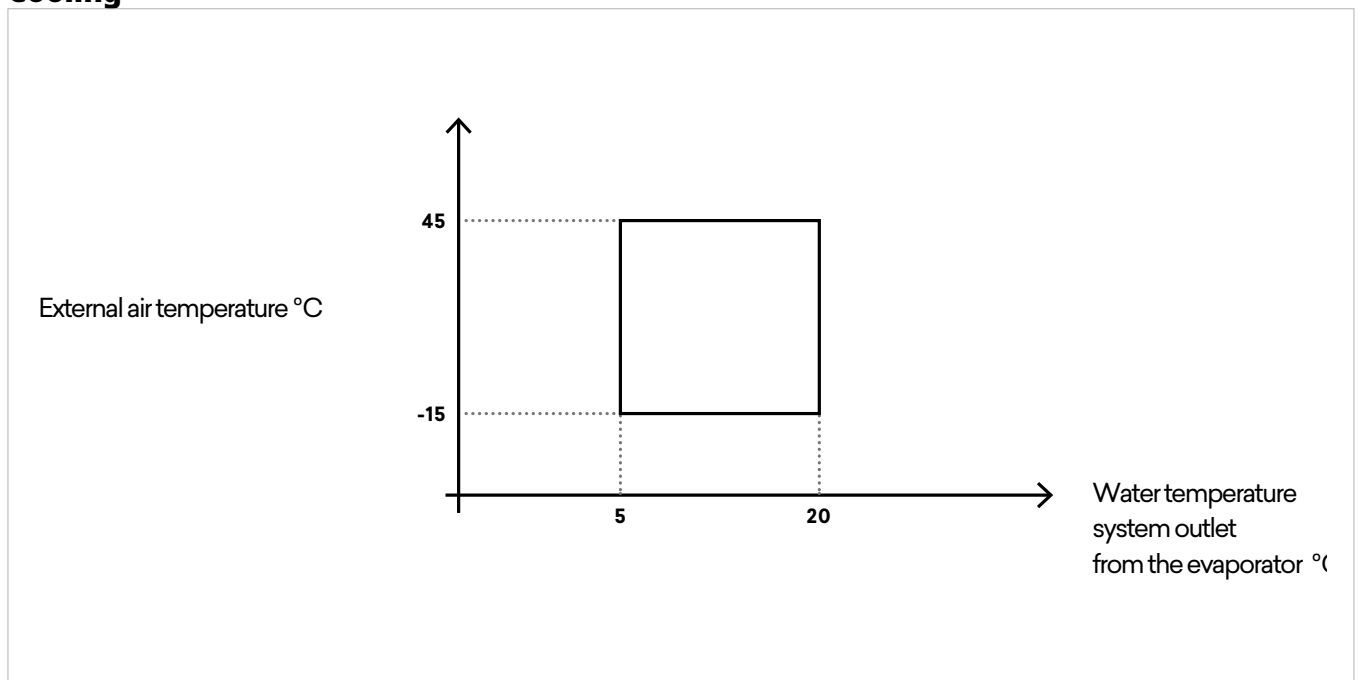
### Heating



⚠ The areas represented by the graph marked by back-up heater are simplified. They could be more advantageous (greater contribution of the heat pump) in relation to the operating conditions and internal operating parameters.

⚠ the unit may reduce the outlet water temperature of the condenser at outdoor air temperatures below -15 °C.

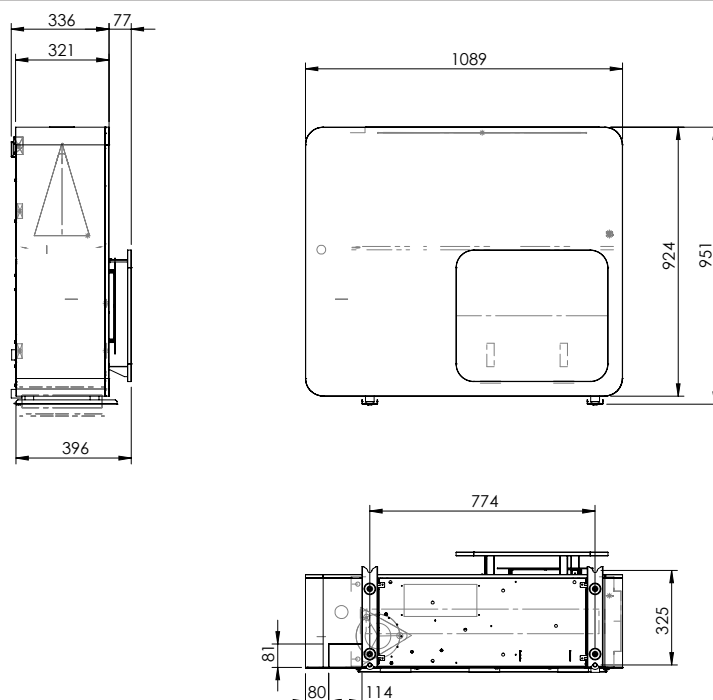
### Cooling



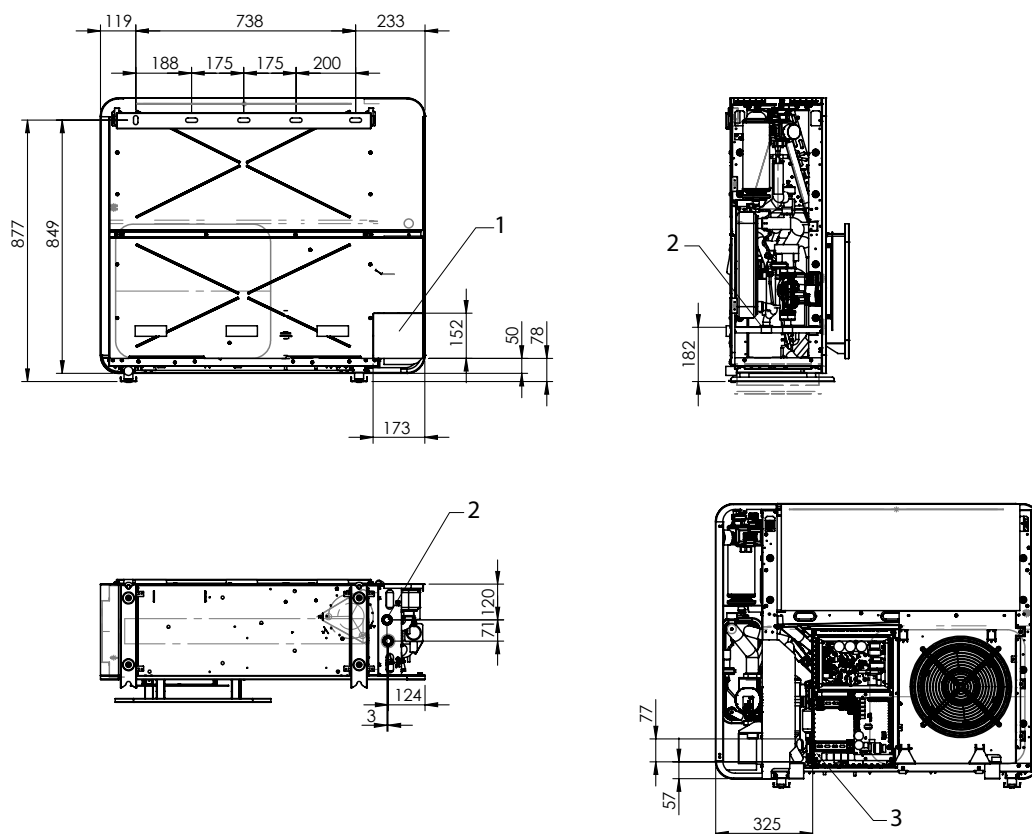
⚠ The area represented by the graph is simplified. It may be more advantageous depending of outdoor and working conditions.

## 8.3 Dimensions

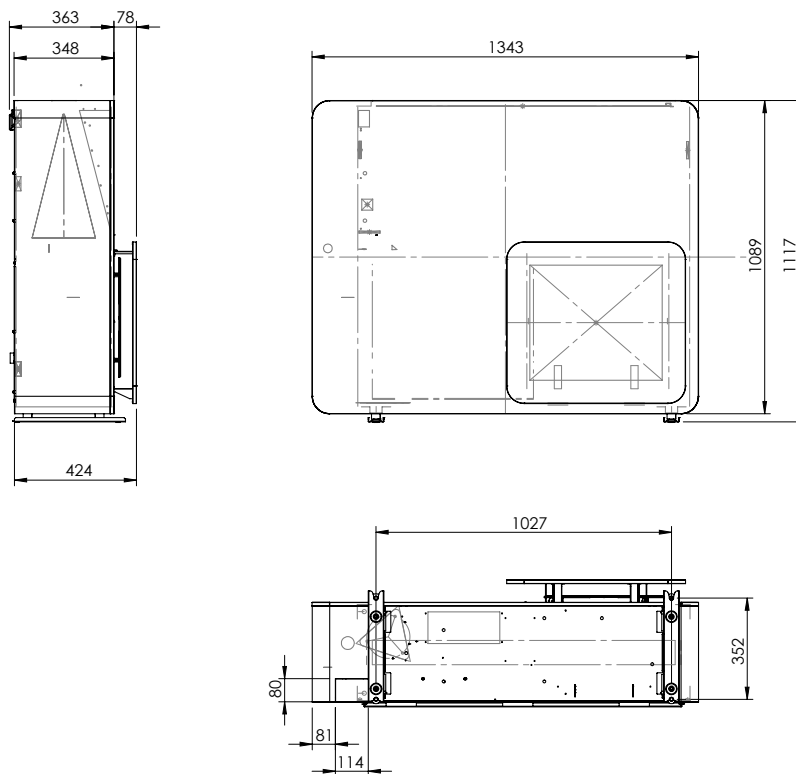
### Model 5 - 7



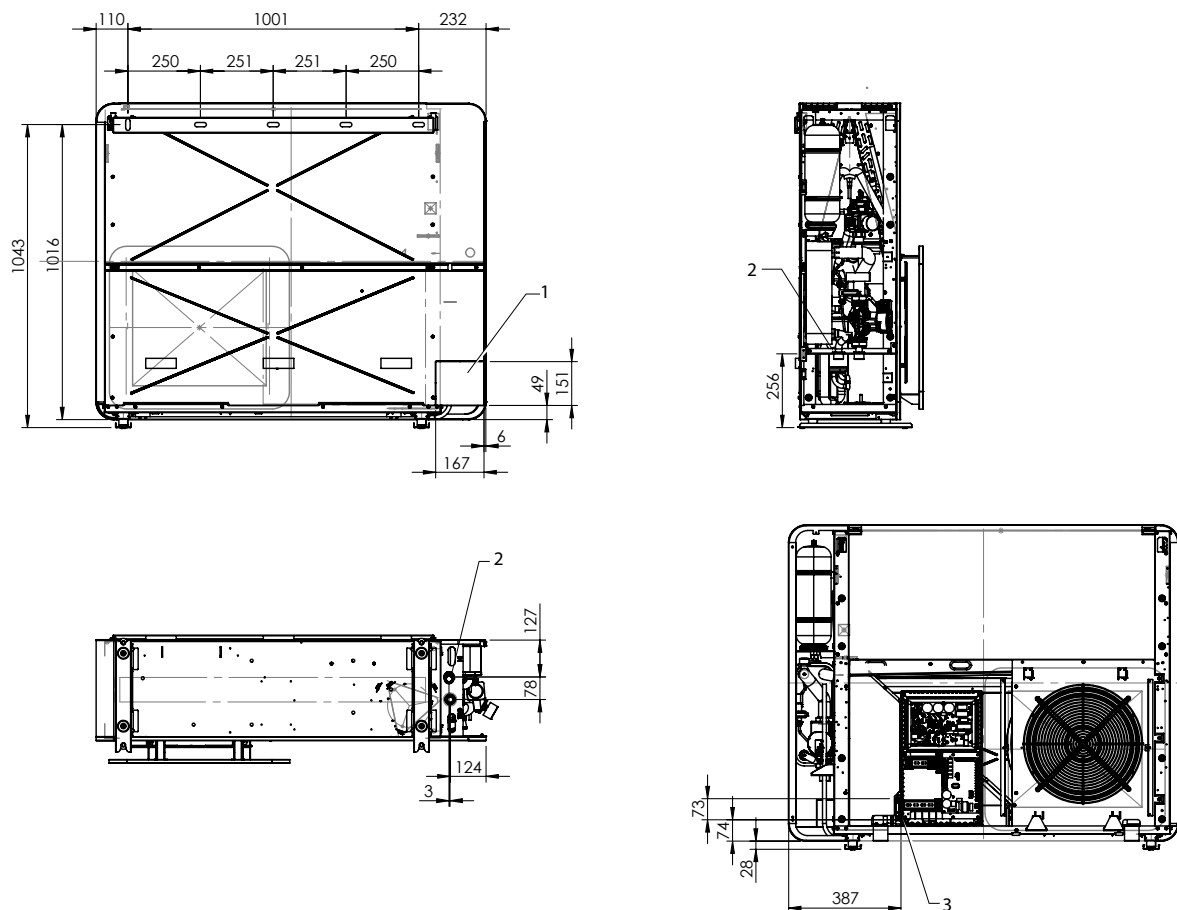
1. Connection entry pre-cut lines
2. Hydraulic connections
3. Electric connections



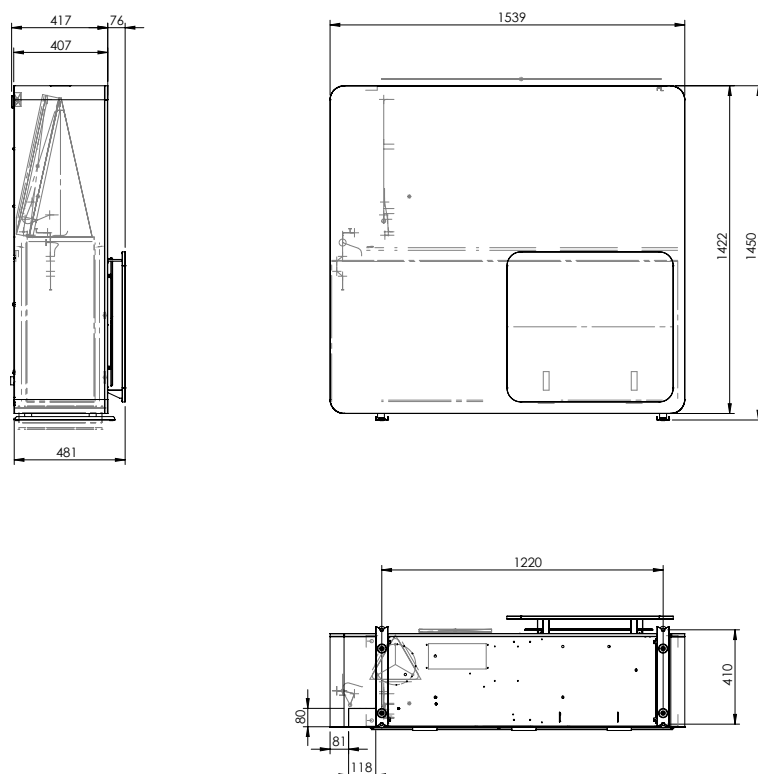
# Model 9 - 11



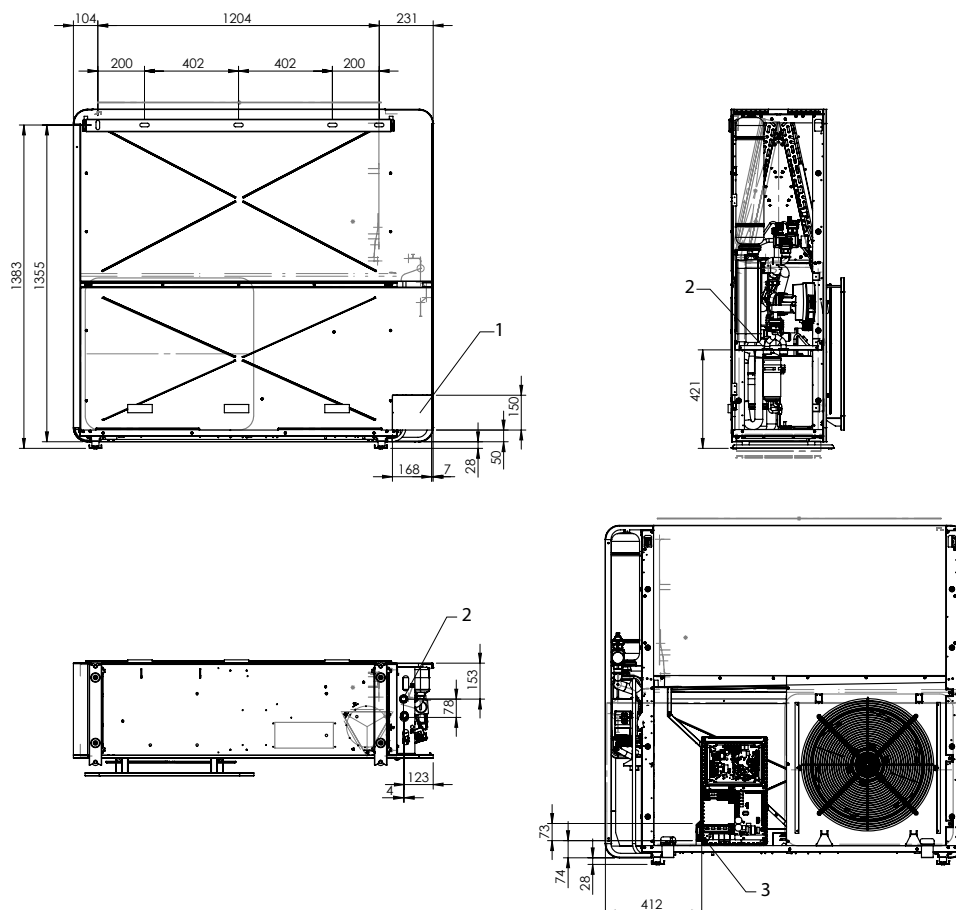
1. Connection entry pre-cut lines
2. Hydraulic connections
3. Electric connections



## Model 13 - 15



1. Connection entry pre-cut lines
2. Hydraulic connections
3. Electric connections



## 8.4 Weight

| Models     | m.u. | 5     | 7     | 9     | 11    | 13    | 15    |
|------------|------|-------|-------|-------|-------|-------|-------|
| Net weight | kg   | 120,0 | 120,0 | 134,0 | 140,0 | 154,0 | 160,0 |

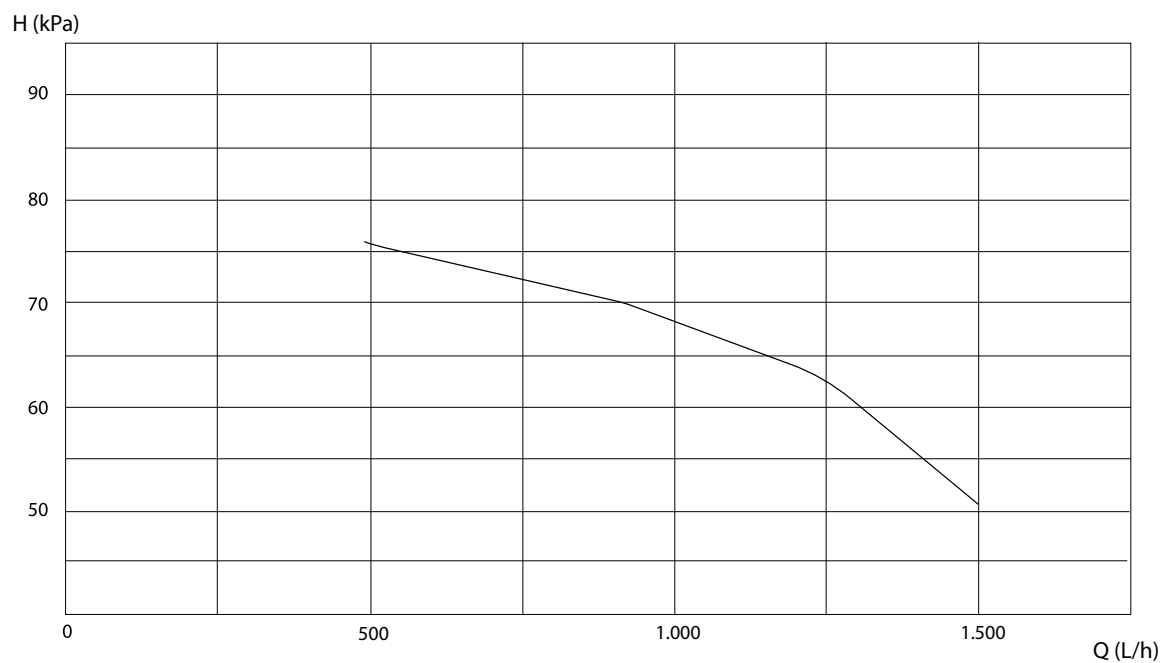
## 8.5 PP1 primary circulation pump graphs

### Model 5 - 7

**H** Available pressure

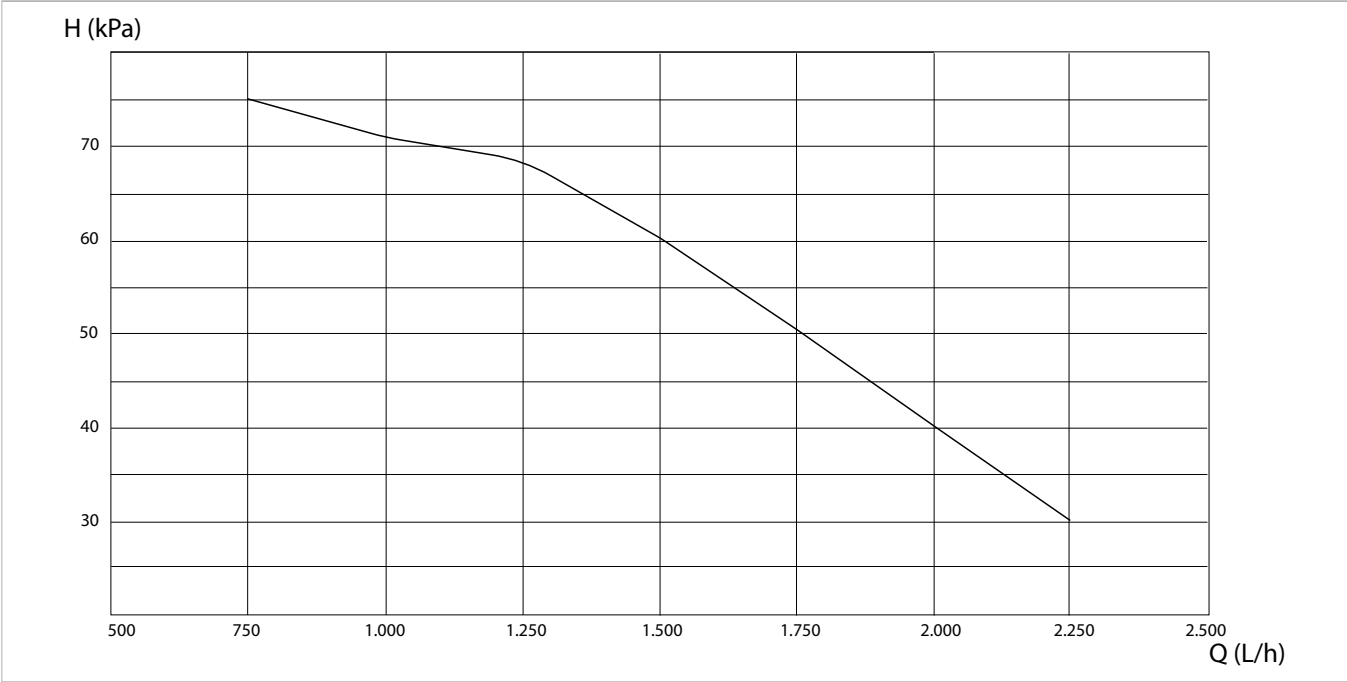
**Q** Water flow rate

**Curves refer to fixed maximum speed**



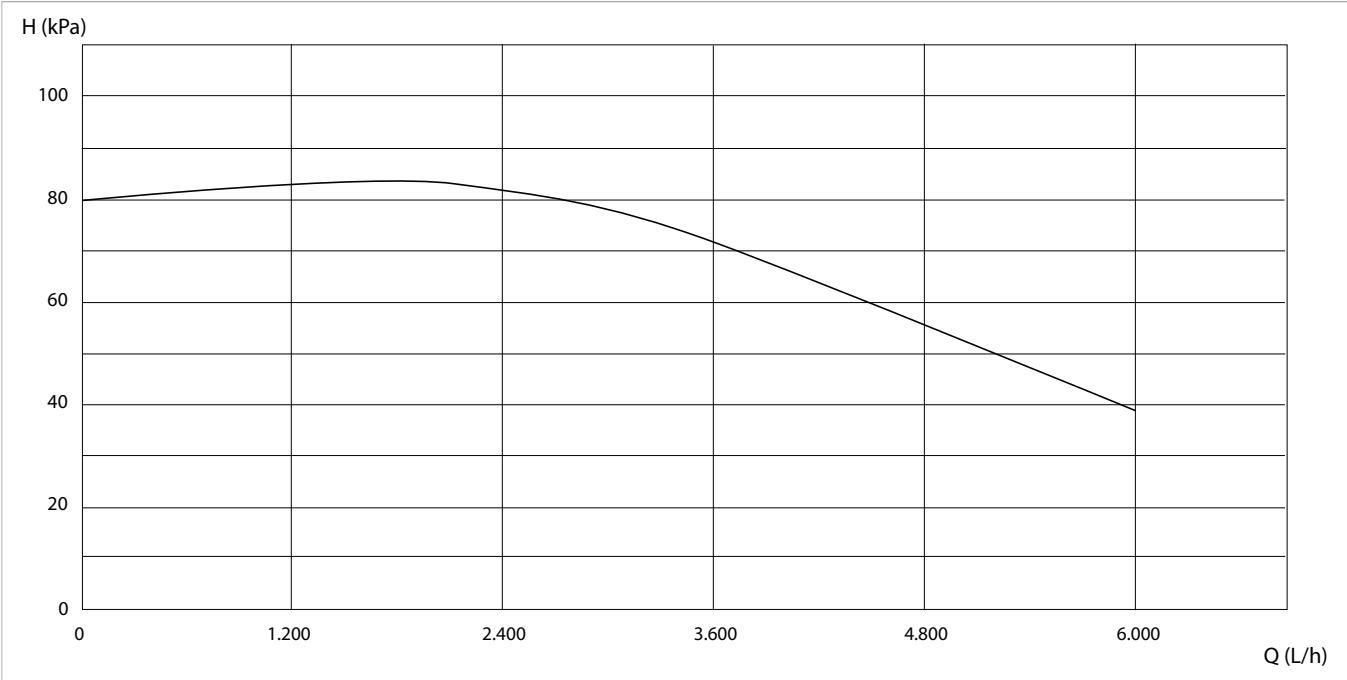
Model 9

|                                     |                    |
|-------------------------------------|--------------------|
| H                                   | Available pressure |
| Q                                   | Water flow rate    |
| Curves refer to fixed maximum speed |                    |



Model 11 - 13 - 15

|                                     |                    |
|-------------------------------------|--------------------|
| H                                   | Available pressure |
| Q                                   | Water flow rate    |
| Curves refer to fixed maximum speed |                    |





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L'apparecchio non deve essere eliminato con gli scarti domestici in quanto composto da diversi materiali che possono essere riciclati presso le strutture adeguate.

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