

Installation manual
(Translation of original
instructions)

EN



innova

N420833A - Rev. 03 - 04/2023

3in1

5 - 7 - 9 - 12 - 15

First of all, we would like to thank you for having chosen a device of our production.

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 you have purchased will operate without problems giving you optimum room temperatures with minimum energy costs.

INNOVA S.r.l.

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.

1.1.1 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

- procedures
- lists

In the control panels

- actions required
- Expected responses following an action.*


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.


1.1.2 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 the Technical Service Centre**
 - 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.

1.1.3 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).

Technical Service Centre

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).

1.1.4 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.

Product presentation

It addresses all recipients.

It contains the information to identify the product, its components, compatible accessories and destination of use.

Installation

It is addressed exclusively to the installer.

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

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.

1.2.1 Specific warnings for R32

ⓘ **This document contains only some of the warnings related to the refrigerant R32. For more comprehensive 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.).
- ⚠ If refrigerant gas escapes, aerate the room abundantly and leave. Call the Technical Assistance Service or professionally qualified personnel as soon as possible and do not intervene on the appliance yourself.

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.

1.3.1 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.

Packaging plate

Shows the identification data of the device.

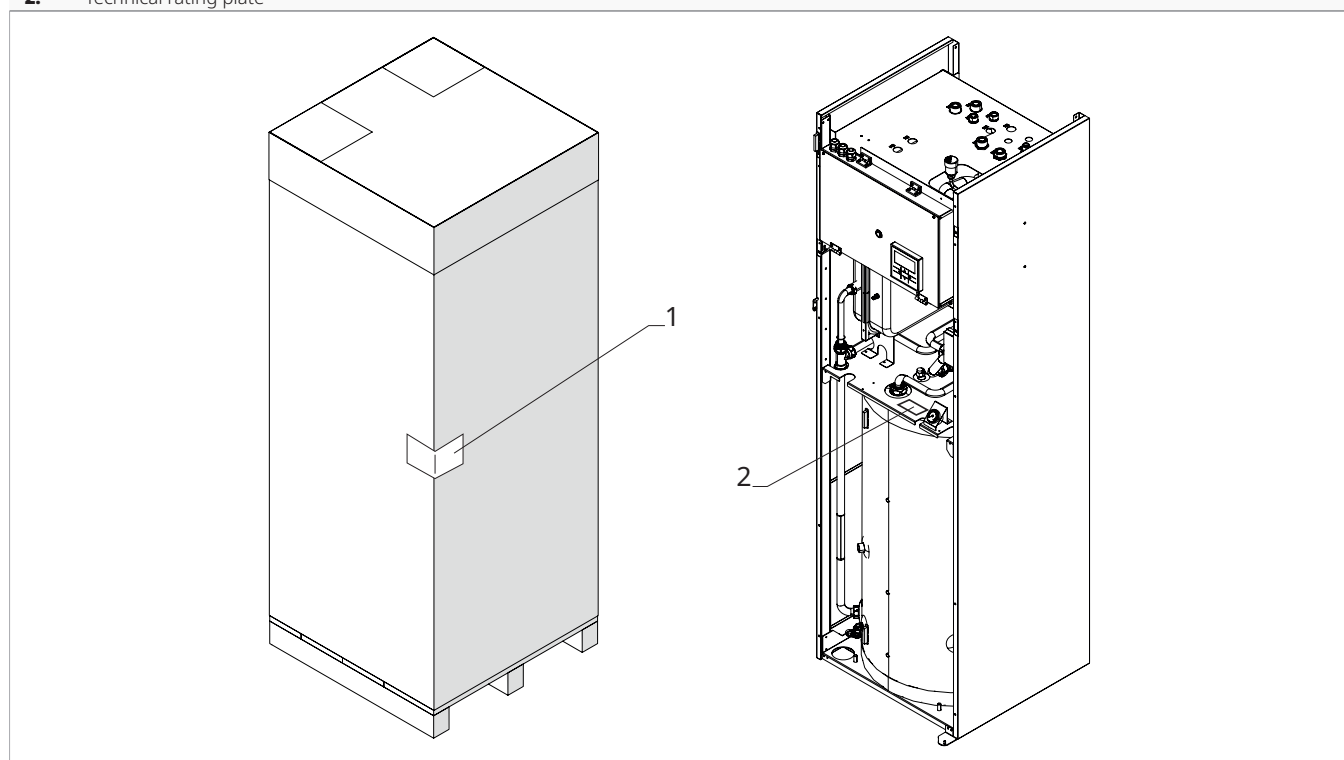
Technical rating plate

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 combined outdoor 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.

1. Packaging plate
2. Technical rating plate



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

3in1 indoor units are designed for indoor, floor installation and work in combination with the outdoor units of the same series.

The unit complete with: 200 L tank for domestic hot water instantaneous exchanger, 24 L expansion tank, diverter valve for domestic hot water, connection for auxiliary boiler, safety valves.

The units are manufactured in different sizes, distinguished by performance:

Models 05 - 07 - 09 - 12 - 15

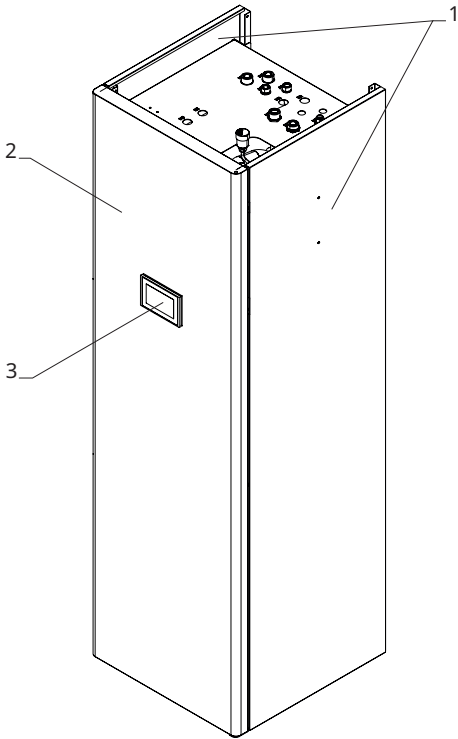
3in1 size matchability

Indoor unit	05	07	09	12	15
Single-phase outdoor unit	5M	7M	9M	12M	15M
Three-phase outdoor unit	-	-	-	12T	15T

2.4 List of external components

2.4.1 Indoor unit

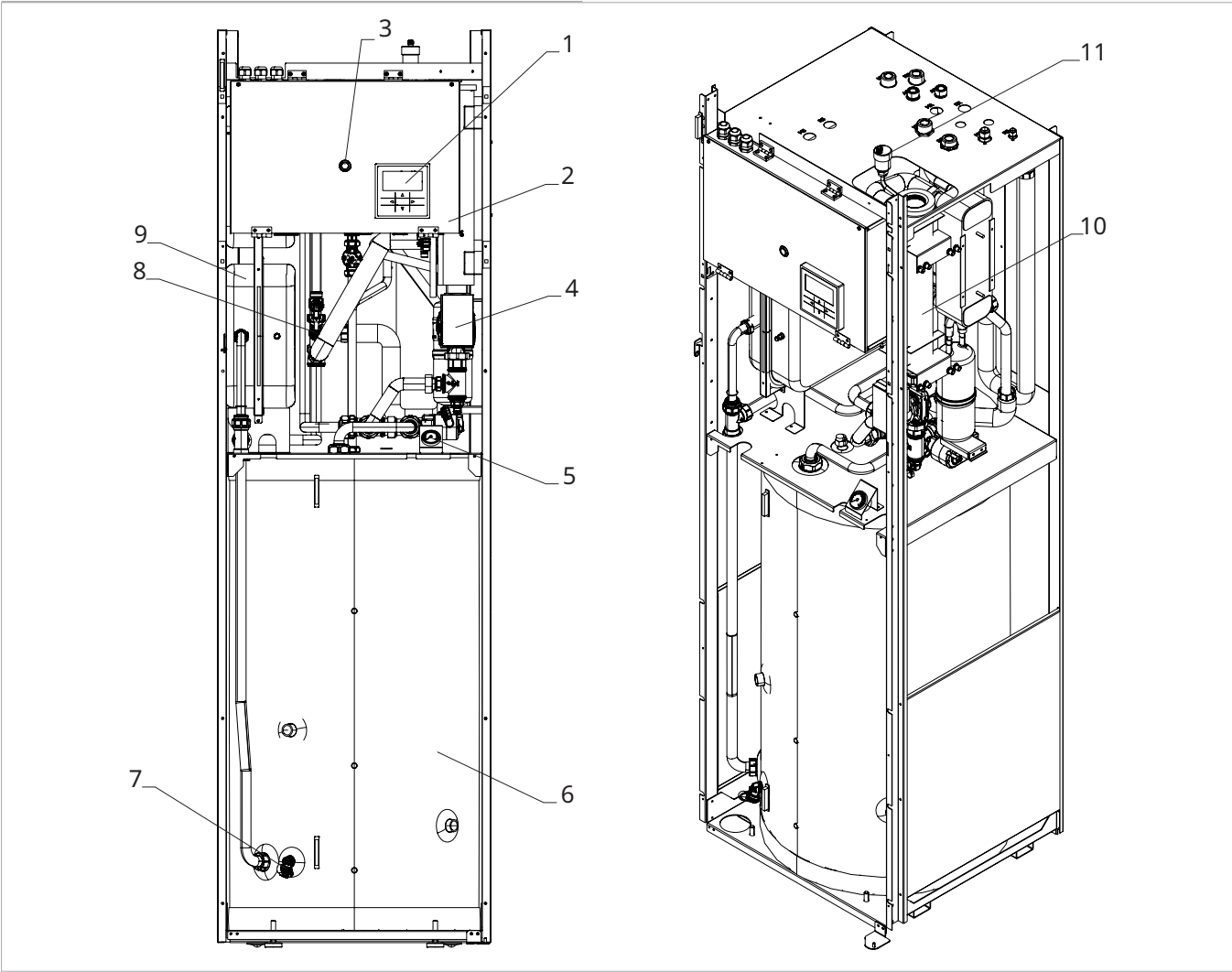
- 1. Cosmetic side panel
- 2. Access panel
- 3. Control Panel



2.5 List of internal components

2.5.1 Indoor unit

1.	External unit control	7.	Drain cock
2.	Electrical panel	8.	Filling cock
3.	BUTLER PRO switch	9.	Expansion vessel
4.	PP1 primary circulation pump	10.	Manifold for heating element
5.	Pressure gauge	11.	Automatic vent valve
6.	Domestic hot water tank		



2.6 Compatible accessories

	Accessory description	Combinable products	Code
Network controls			
Butler			
	BUTLER: codes, accessories and price list in relevant section	All	
Configuration accessories			
Heater kit			
	Heating elements 6 kW (3 steps of 2 kW). Factory setting 2 kW for single-phase heat pumps	All	GB1118II (1)
Tank			
	Integrated inertial tank 20 L	All	GB1016II (1) (2)
Secondary separator kit			
	Secondary separator kit - Secondary hydraulic unit: hydraulic separator, system pump (DC Inverter class A) and fittings	5 7	GB0683II (1) (3)
	Oversized secondary separator kit - Secondary hydraulic unit: hydraulic separator, system pump (DC Inverter class A) and fittings	All	GB1020II (1) (3)
Heated towel rail kit			
	Hydraulic unit and circulation pump for high temperature Heated towel rail feeding	All	GB0736II (1)
Solar heating kit			
	Solar unit: control unit, pump, safety valve, 24 litre expansion tank, loading unit	All	GB0685II (1)

- 1. Accessories can be installed and tested at the factory
- 2. The 20 litre inertial tank kit can be supplied if the solar kit is not present / installed on the system flow
- 3. The separator kit is mandatory unless it is already present in the system.

⚠ For detailed information on accessories please refer to the "Configuration accessories" [p. 55](#) section.

INSTALLATION

3.1 Preliminary warnings

- ⚠ **This section is dedicated to the Installer. The features of the installer are described in the "Recipients" [p. 7](#) chapter.**
- ⚠ **For detailed information on the products, refer to chapter "Technical information" [p. 63](#).**
- ⚠ **For detailed information on accessories please refer to the "Configuration accessories" [p. 55](#) 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.

3.1.1 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

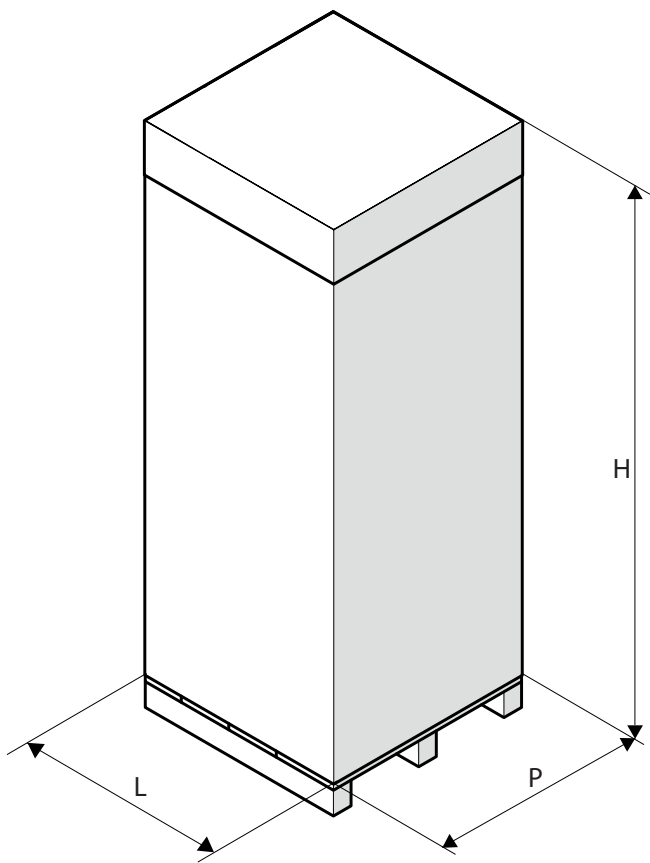
3.2.1 Preliminary warnings

- ⚠ Upon receipt of the package check that it is not damaged, otherwise accept the goods with reserve, producing photographic evidence of any damage.
- ⚠ 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.

3.2.2 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



3.3.1 Indoor unit

Models		m.u.	5	7	9	12	15
Total width		mm	720	720	720	720	720
Total height		mm	2120	2120	2120	2120	2120
Total depth		mm	720	720	720	720	720
Weight		kg	220,0	220,0	220,0	220,0	220,0

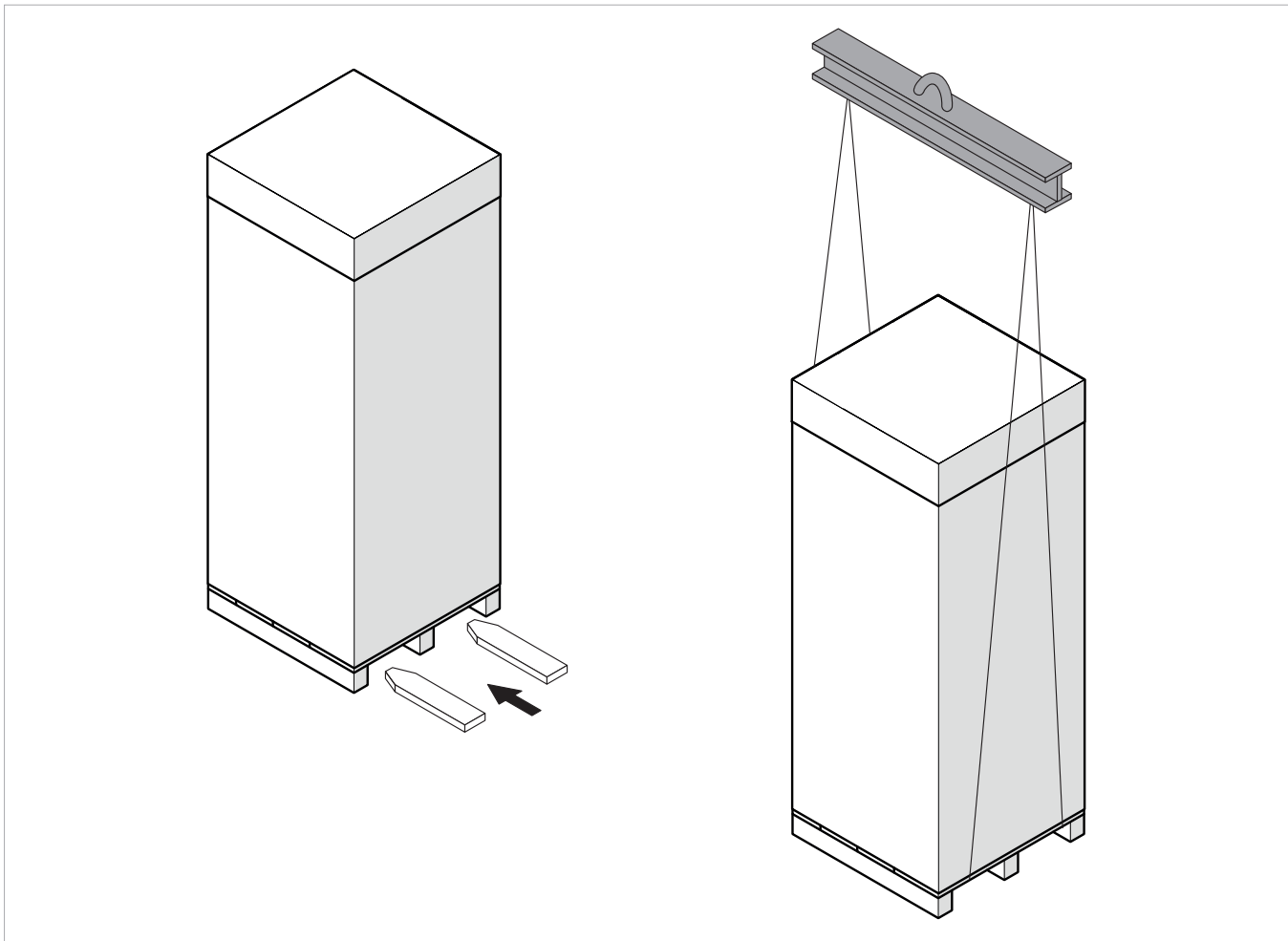
3.4 Handling with packaging

3.4.1 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.
- ⚠ 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.

- ⚠ Move the unit to an upright position.
- ⚠ Do not turn the packaging upside down.
- ⚠ Do not stack the appliances.

3.4.2 Movement methods



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.

3.5 Storage

3.5.1 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.

3.5.2 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

3.5.3 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 plastic protective films
- check that the electrical panels are closed

3.6 Unpacking

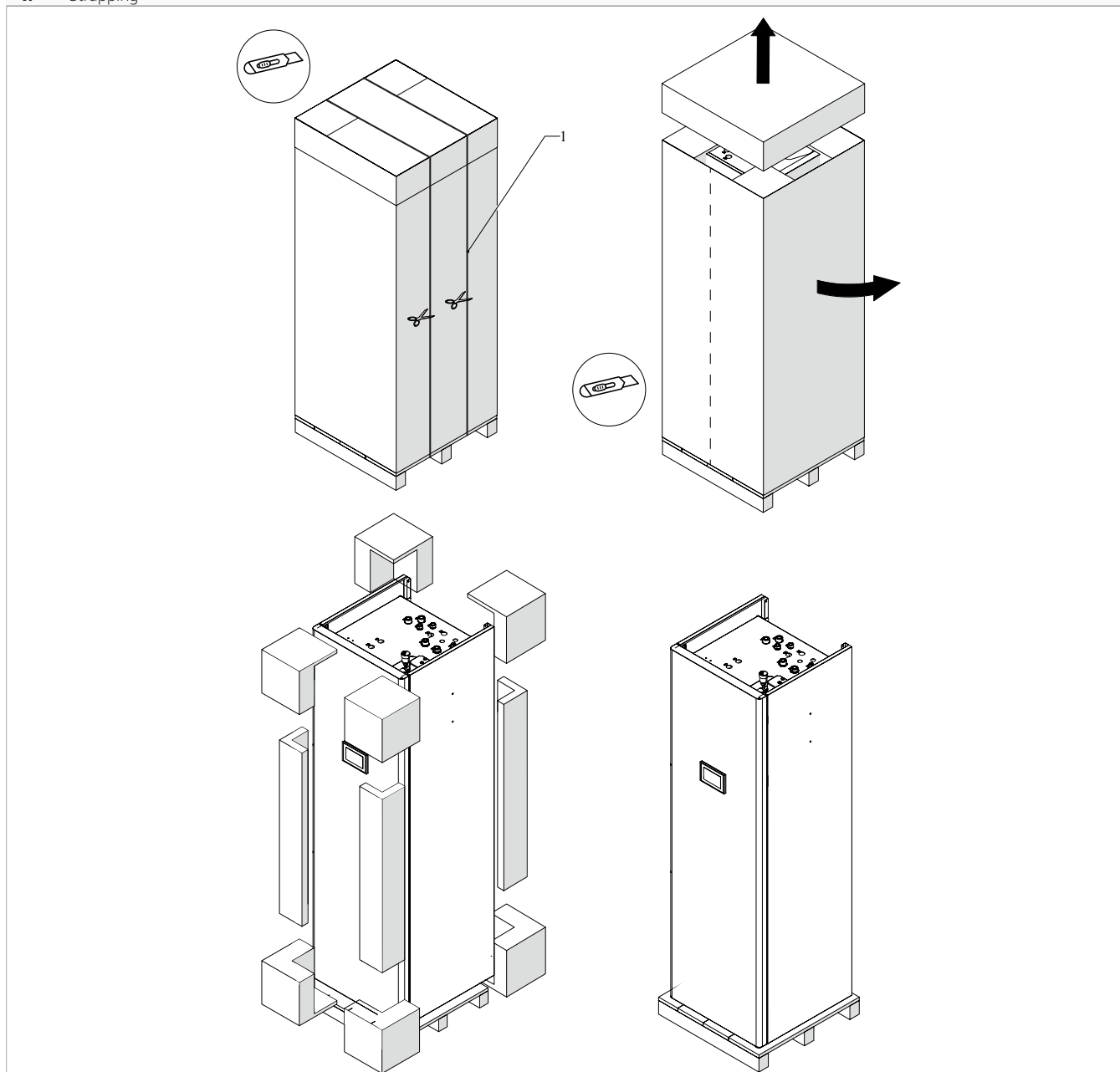
3.6.1 Preliminary warnings

- ⚠ 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.

3.6.2 Remove the package

1. Strapping



Remove the packing:

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

- ⚠ All aesthetic panels must be removed before removing the appliance from the pallet.

Accompanying material

They are included with the appliance, inside the packaging:

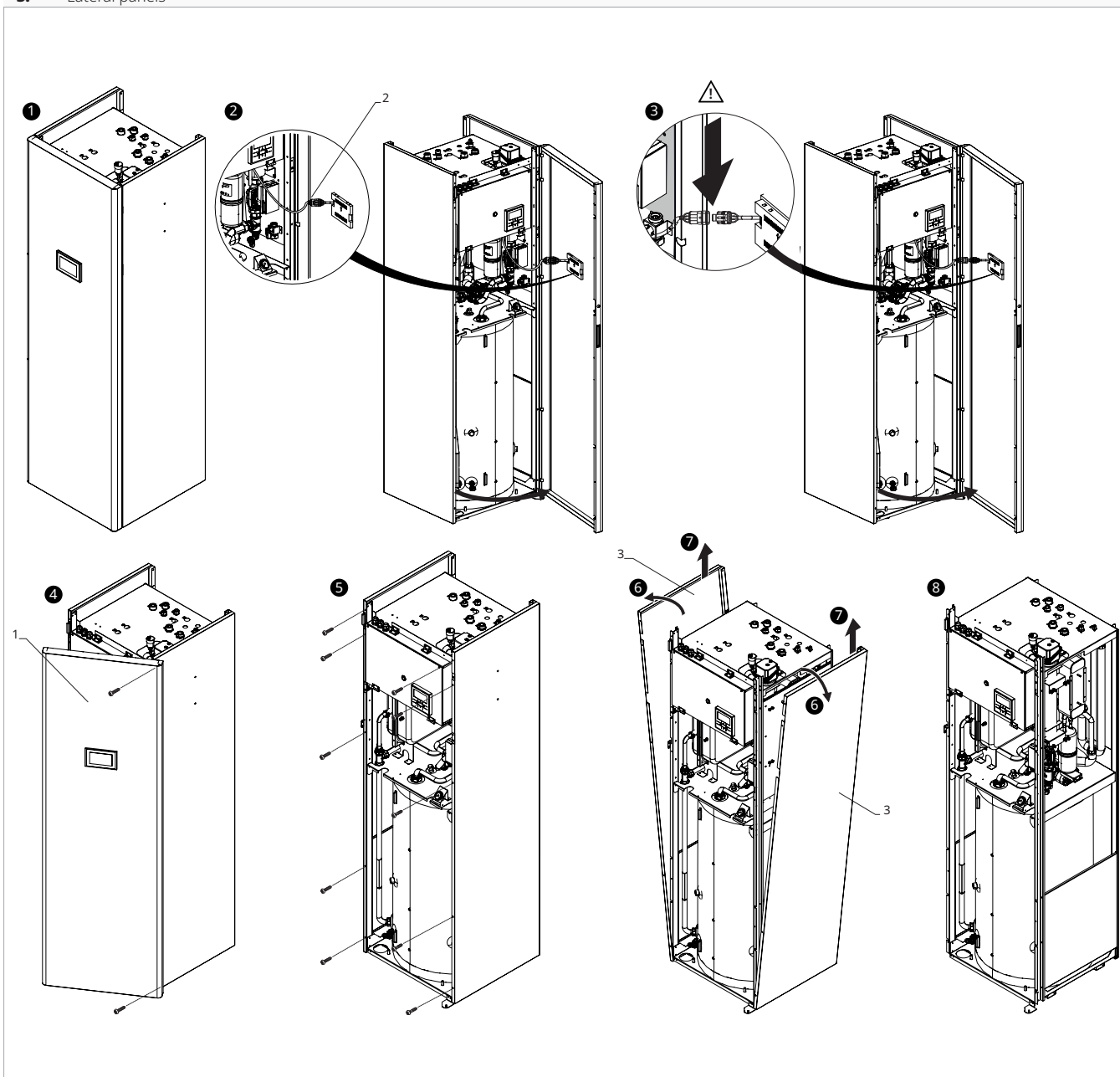
⚠ Check the presence of the individual components.

Indoor unit

- 1 installer manual of the unit
- 1 user and installer manual for the Control Panel
- 1 first start-up form
- One Energy efficiency label
- 1 key to open the access panel

3.7 Removal of aesthetic panels

1. Access panel
2. Connectors
3. Lateral panels



Removal of aesthetic panels:

- use the key provided
- open the access panel
- Disconnect the display connector
- Unscrew the access panel fixing screws
- lift and remove the panel
- Unscrew the lateral panels fixing screws

- tilt the lateral panels slightly outwards
- lift and remove the panels

⚠ Disconnect the connector connected to the control panel before removing the access panel.

⊘ Removing the 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

3.8.1 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.

⚠ Move the unit to an upright position.

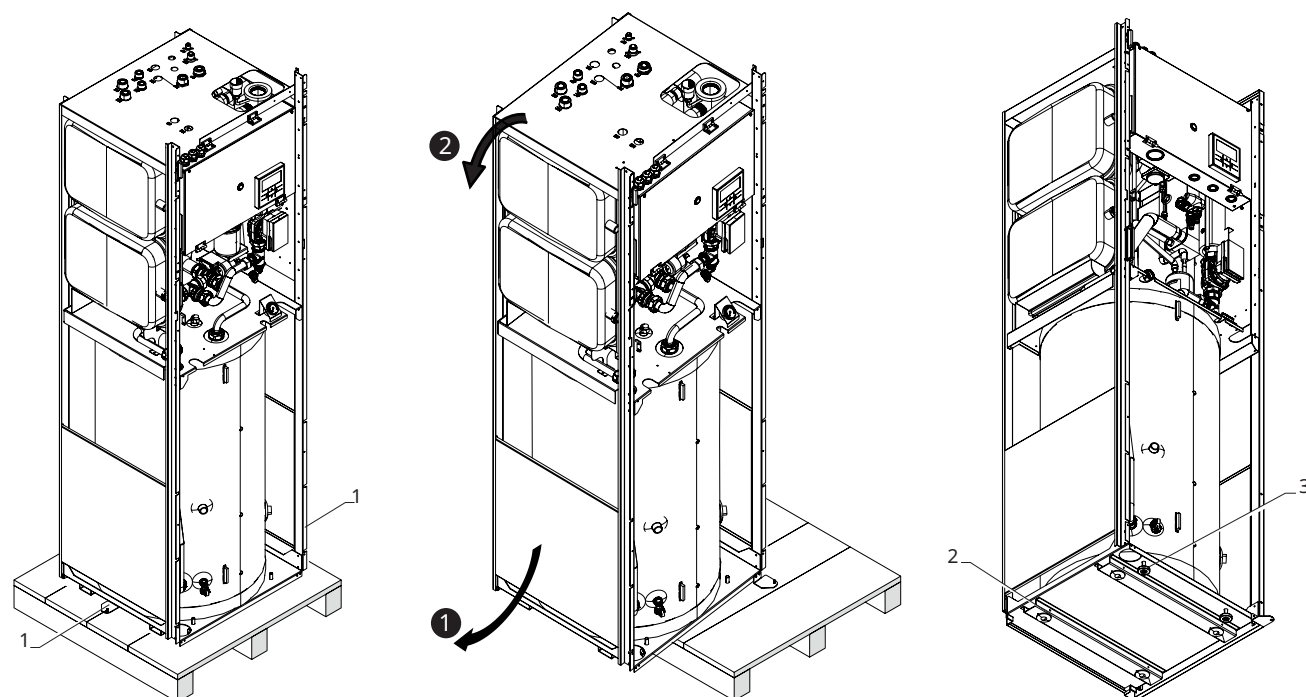
⚠ The unit is provided with four ball wheels to facilitating handling.

⚠ The use of protective gloves is mandatory.

⚠ The use of protective shoes is mandatory.

3.8.2 Movement methods

1. Locking brackets
2. Ball wheels for movement
3. Locking feet



To handle:

- remove locking brackets
- slide the appliance slowly
- turn the appliance to rest it on the ground

- slide the pallet out completely
- move the unit by pushing it

⚠ The machine must be handled with the utmost care to prevent the unit from tipping over.

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 to be installed indoors.

3.9.1 Preliminary warnings

- ⚠️ Avoid installing the unit near:
 - narrow places where the sound level of the appliance can be enhanced by reverberations or resonances
 - environments with the presence of flammable or explosive gases
 - very humid environments (laundries, greenhouses, etc.)
 - environments with aggressive atmospheres
 - solar radiation and proximity to heat sources
- ⚠️ Avoid placing the unit within 1 metre of radio and video equipment.
- ⚠️ 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 floor is able to support the weight of the appliance.
 - the floor is not crossed by pipelines, load-bearing construction elements or power lines
 - the appliance must be installed in a position where it can be easily serviced
- ⚠️ Provide the following:
 - a drain and a water supply nearby
 - a compliant power supply nearby

Preliminary warnings for R32

- ⚠️ The appliance must be installed in well-ventilated rooms with a minimum floor area as indicated in the Minimum floor area table according to the total refrigerant charge in the circuit.
- ⚠️ **The refrigerant charge means the total charge of the circuit given by the sum of the factory charge and any additional charge.**
- ⚠️ Refer to the rating plate on the paired outdoor unit for the amount of refrigerant gas loaded in the unit.
- ⚠️ If the appliance is located in a poorly ventilated place, precautions must be taken to prevent stagnation in the event of leakage of refrigerant to avoid creating a risk of fire or explosion.
- ⚠️ The appliance must be placed in 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).

- ⚠️ Any ventilation openings must be kept free of obstacles.
- ⚠️ 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

Minimum floor area

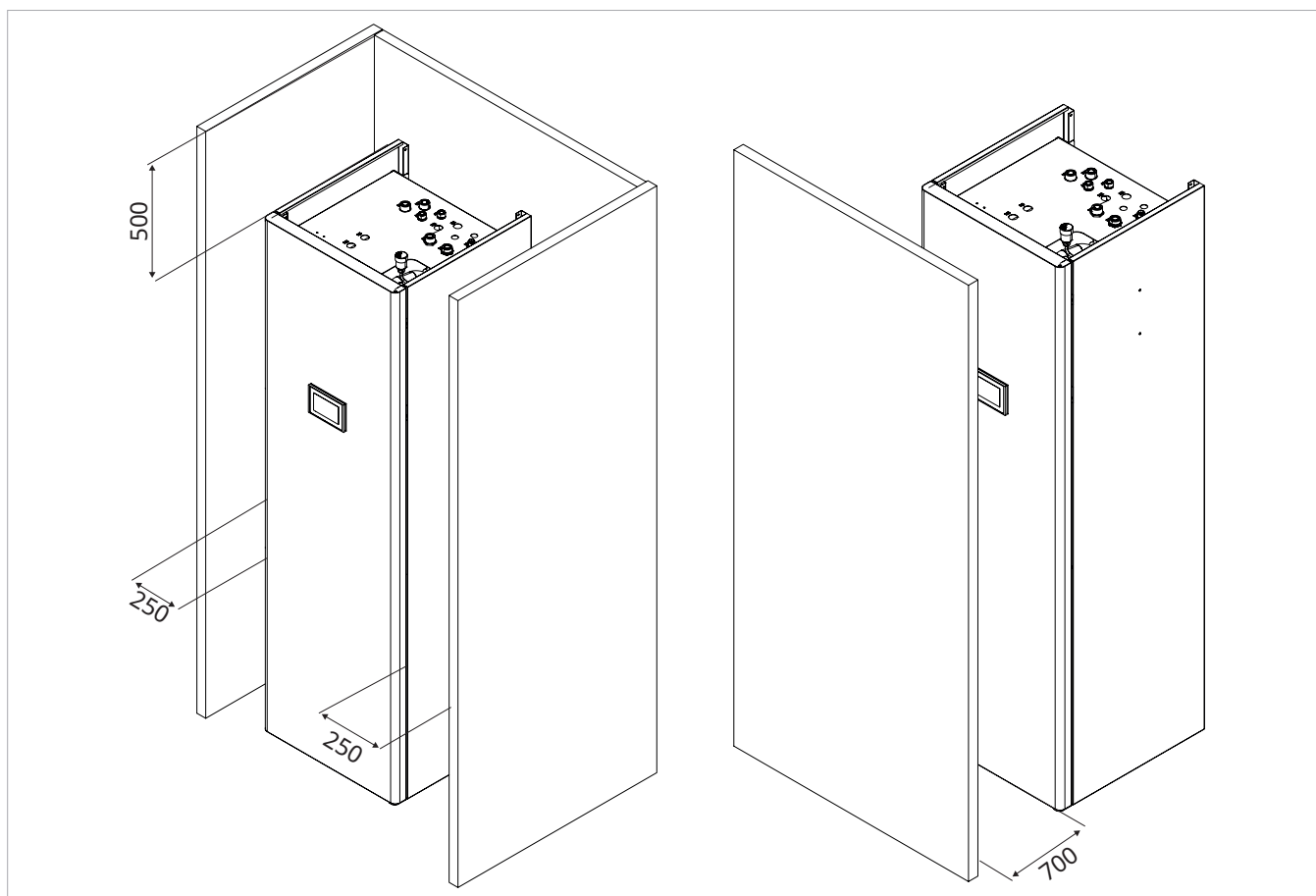
m (kg)	Amin (m²)
1,8	Without limitations
2,0	3,81
2,2	4,61
2,4	5,49
2,6	6,44
2,8	7,47
3,0	8,58
3,2	9,76
3,4	11,02
3,6	12,36
3,8	13,77
4,0	15,26
4,2	16,82
4,4	18,46
4,6	20,18
4,8	21,97
5,0	23,84
5,2	25,79
5,4	27,81
5,6	29,91
5,8	32,09
6,0	34,34
6,2	36,67

- 1. **m** Refrigerant charge
- 2. **Amin** Minimum floor area

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 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.



3.11 Positioning

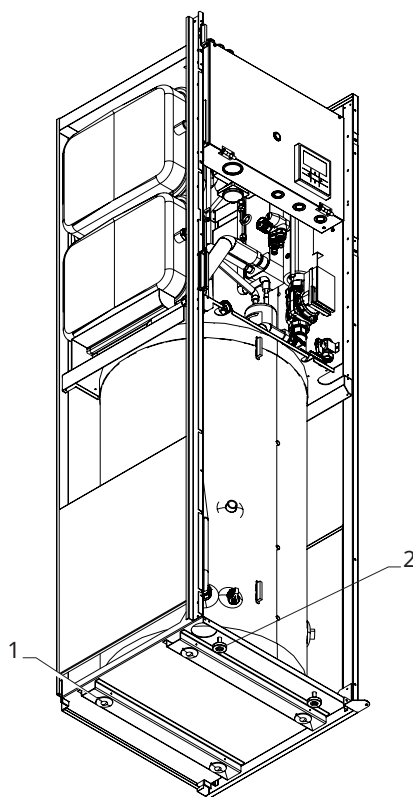
Exposed units can be positioned on the floor.

3.11.1 Preliminary warnings

- ⚠ Make sure that:
 - the floor supports the weight of the appliance
 - the floor is not crossed by pipelines, load-bearing construction elements or power lines
- ⚠ The unit is provided with four ball wheels to facilitating handling.
- ⚠ The unit is provided with two locking and adjustment feet.

3.11.2 Positioning

1. Ball wheels for movement
2. Locking feet



⚠ **For dimensional information, refer to chapter "Technical information" p. 63.**

- ⚠ The appliances are fitted with four ball wheels at the base to facilitate handling.
- position the appliance

– Adjust the two locking feet

Make sure that:

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

3.12 Hydraulic connections

3.12.1 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 "Technical information" p. 63. 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.

3.12.2 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 imbalance-

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
- increased system performance
- improved temperature stability and accuracy

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.

es in the refrigeration circuits and to guarantee the correct level of comfort.

3.12.3 Plant water content and minimum flow rate

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	7	9	12	15
Minimum system water content	L	20	30	40	50	65

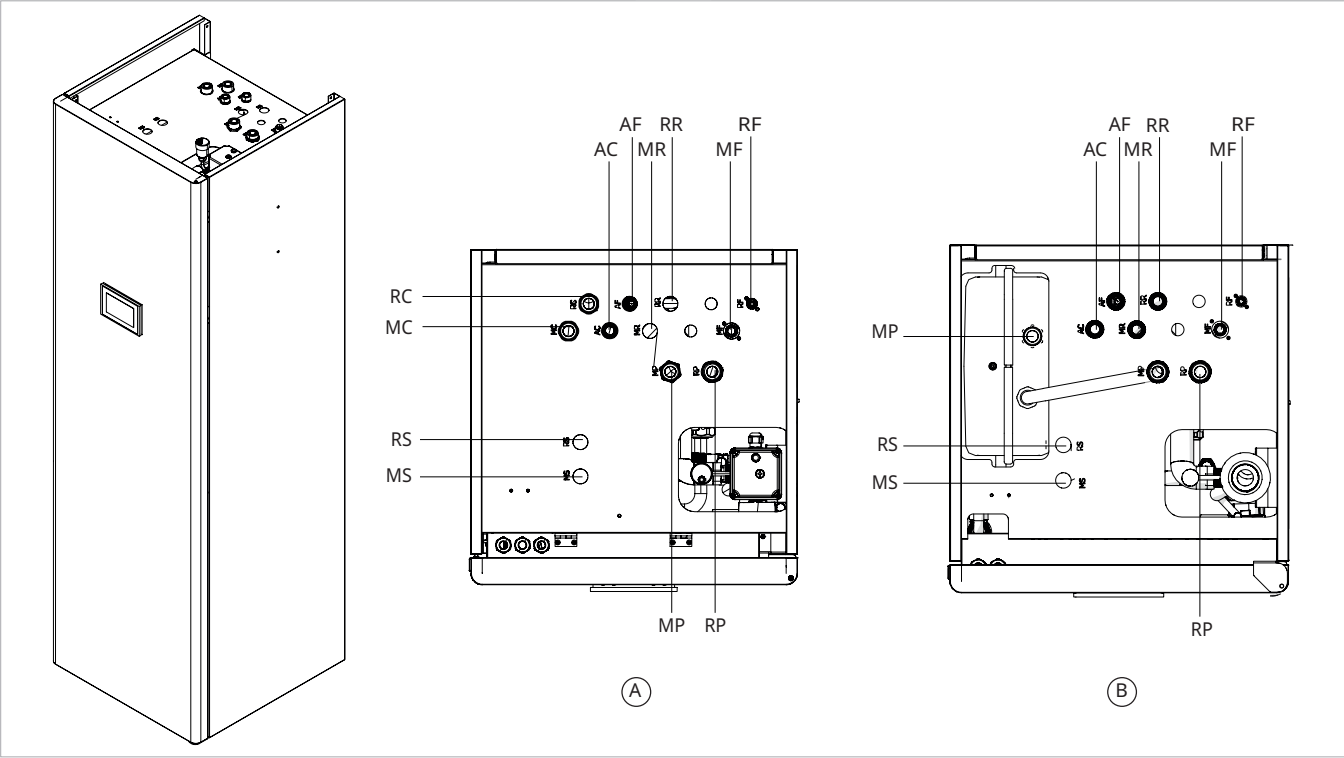
A hydraulic separator must be provided if the plant requires a higher head than that available from the pump of the unit.

Models	m.u.	5	7	9	12	15
Minimum water flow rate	L/min	11,2	14,3	16,2	23,2	29,3

3.12.4 Position and dimensions

A	Standard units
B	Unit with integrated inertial tank 20 L (cod. GB1016)
MC	Boiler flow
RC	Boiler return
AC	Domestic hot water
AF	Domestic hot water supply
MR	Second circuit supply from storage tank

RR	Second circuit return from storage tank
MS	Solar flow
RS	Solar return
MP	Plant delivery
RP	System return
MF	Gas line connection
RF	Liquid line connection



Models	m.u.	5	7	9	12	15
Hydraulic connections						
Boiler flow	" GAS	1	1	1	1	1
Boiler return	" GAS	1	1	1	1	1
Domestic hot water	" GAS	3/4	3/4	3/4	3/4	3/4
Hot water feed	" GAS	3/4	3/4	3/4	3/4	3/4
High temperature utilities flow	" GAS	3/4	3/4	3/4	3/4	3/4
High temperature utilities return	" GAS	3/4	3/4	3/4	3/4	3/4
Solar flow	mm	12	12	12	12	12
Solar return	mm	12	12	12	12	12
Plant return	" GAS	1	1	1	1	1
Plant delivery	" GAS	1	1	1	1	1

⚠ Some of the connections shown are only present if the respective accessories have been installed. For detailed information on accessories please refer to the "Configuration accessories" [p. 55](#) section.

⚠ **For dimensional information, refer to chapter "Technical information" [p. 63](#).**

If cosmetic panels are mounted:

– remove as indicated in the chapter "Removal of aesthetic panels" [p. 18](#)

3.12.5 Connection to the system

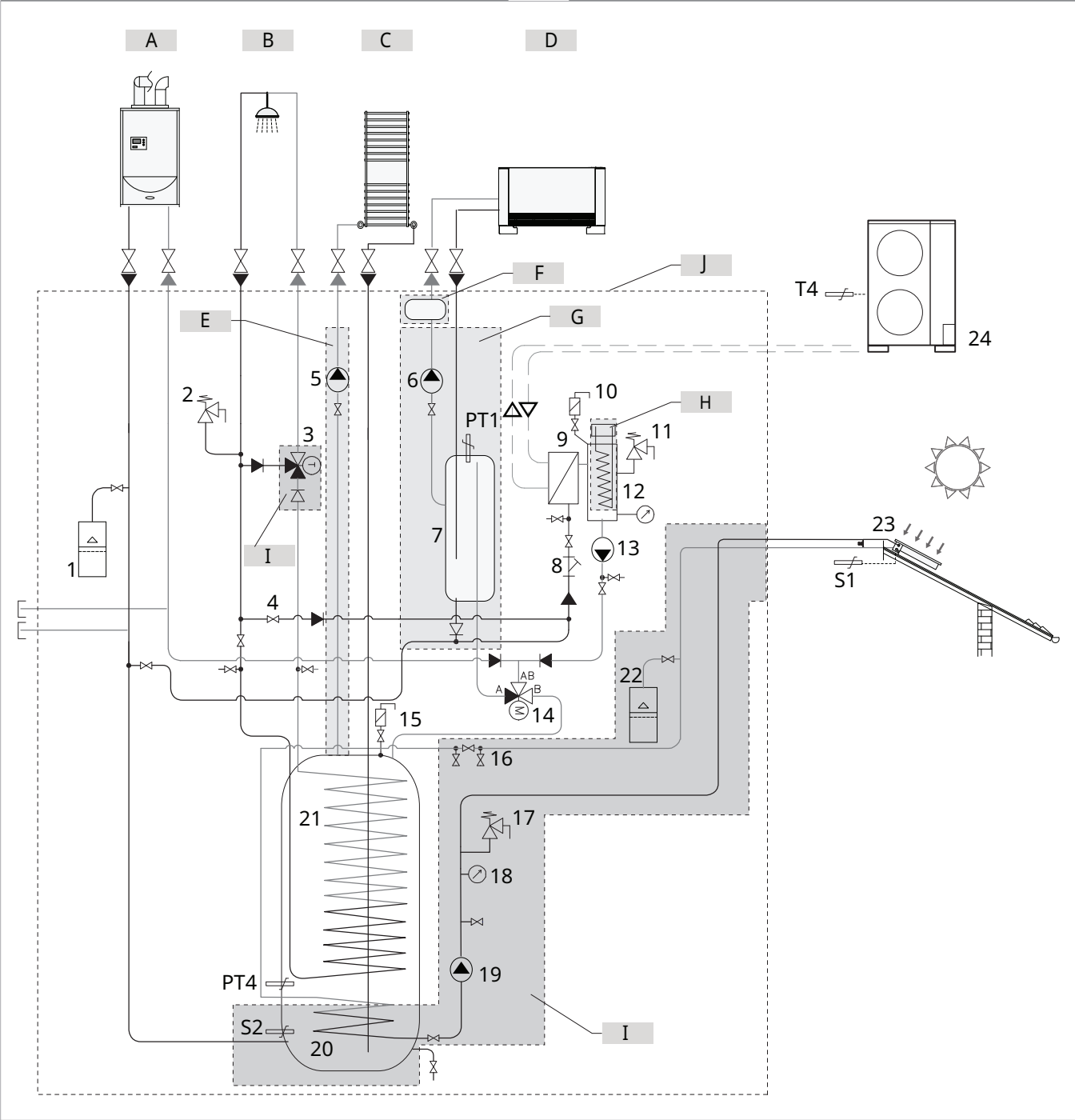
Preliminary warnings

- ⚠ 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 as indicated in the table. Keep in mind that undersized pipelines lead to poor system operation and/or a loss of thermal 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.

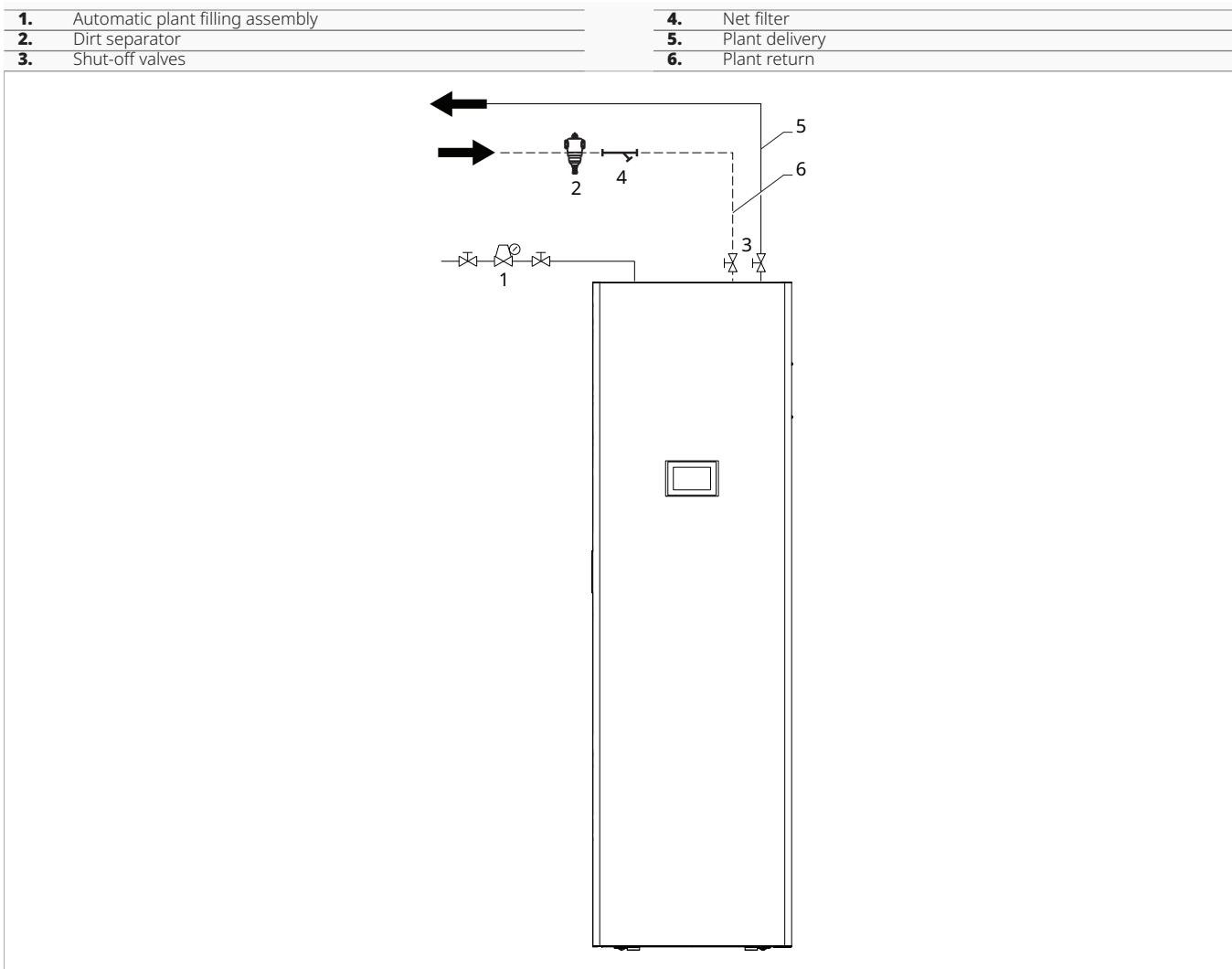
- ⚠ Avoid over-tightening the pipes to avoid damage to the insulation.
- ⚠ Carefully check that the insulation is tight, in order to prevent the making and dripping of condensate.
- ⚠ Installing a dirt separator or mains water filter at the inlet of the appliance in an area accessible for maintenance is compulsory to safeguard the appliance from impurities in the water.
- ⊖ Operating the unit without the water filter installed and clean is forbidden.

Basic hydraulic scheme

A	Boiler
B	Domestic hot water consumers
C	High temperature (radiator) utilities
D	System utilities
E	Heated towel rail kit (optional)
F	Tank (optional)
G	Secondary separator kit (optional)
H	Heater kit (optional)
I	Solar heating kit (optional)
J	Indoor unit
1.	24 litre system expansion vessel
2.	7-bar safety valve
3.	Thermostatic mixing valve (supplied with the solar kit)
4.	Filling cock
5.	High-temperature circulation pump PP4
6.	Secondary circulation pump PP3
7.	Hydraulic separator
8.	Net filter
9.	Plate exchanger
10.	Automatic vent valve
11.	3-bar safety valve
12.	Collector with heating element
13.	PP1 primary circulation pump
14.	3-way on/off valve PV1
15.	Boiler vent valve
16.	Solar filling cock
17.	4 bar solar safety valve (optional)
18.	Pressure gauge
19.	Solar circuit pump PP7
20.	Solar serpentine
21.	200 litre tank for domestic hot water
22.	24 L solar expansion vessel
23.	Solar panel
24.	Outdoor unit



Connection diagram



Connection

The hydraulic connections may be made towards the wall (concealing them from sight) or upwards. Connect a drain pipe to water safety valve so as to prevent that some water leakage can get inside electrical parts.

To make the connections:

- hydraulic lines positioning
- use the "wrench against wrench" method
- tighten the connections
- check for leaks
- coat the connections with insulating material

The hydraulic connections must be completed by installing:

- air vent valves at the highest points of the piping
- flexible elastic joints
- shut-off valves
- a suitably sized storage tank for plant water
- the secondary separator kit is available as accessory
- a mains water filter and a dirt separator at the inlet of the appliance on the system front

⚠ The separator kit is mandatory unless it is already present in the system.

⚠ Be careful not to invert delivery and return lines.

3.12.6 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.

3.12.7 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.

3.12.8 Air 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.

3.13 Filling the plant

The plant must be filled once the hydraulic connections have been completed.
The appliance is fitted with a tap to divert the domestic water supply and fill the system circuit.

⚠ After the system has been loaded, the tap must be returned to its original position.

3.13.1 Preliminary warnings

- ⚠ 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.

3.13.2 Water quality requirements

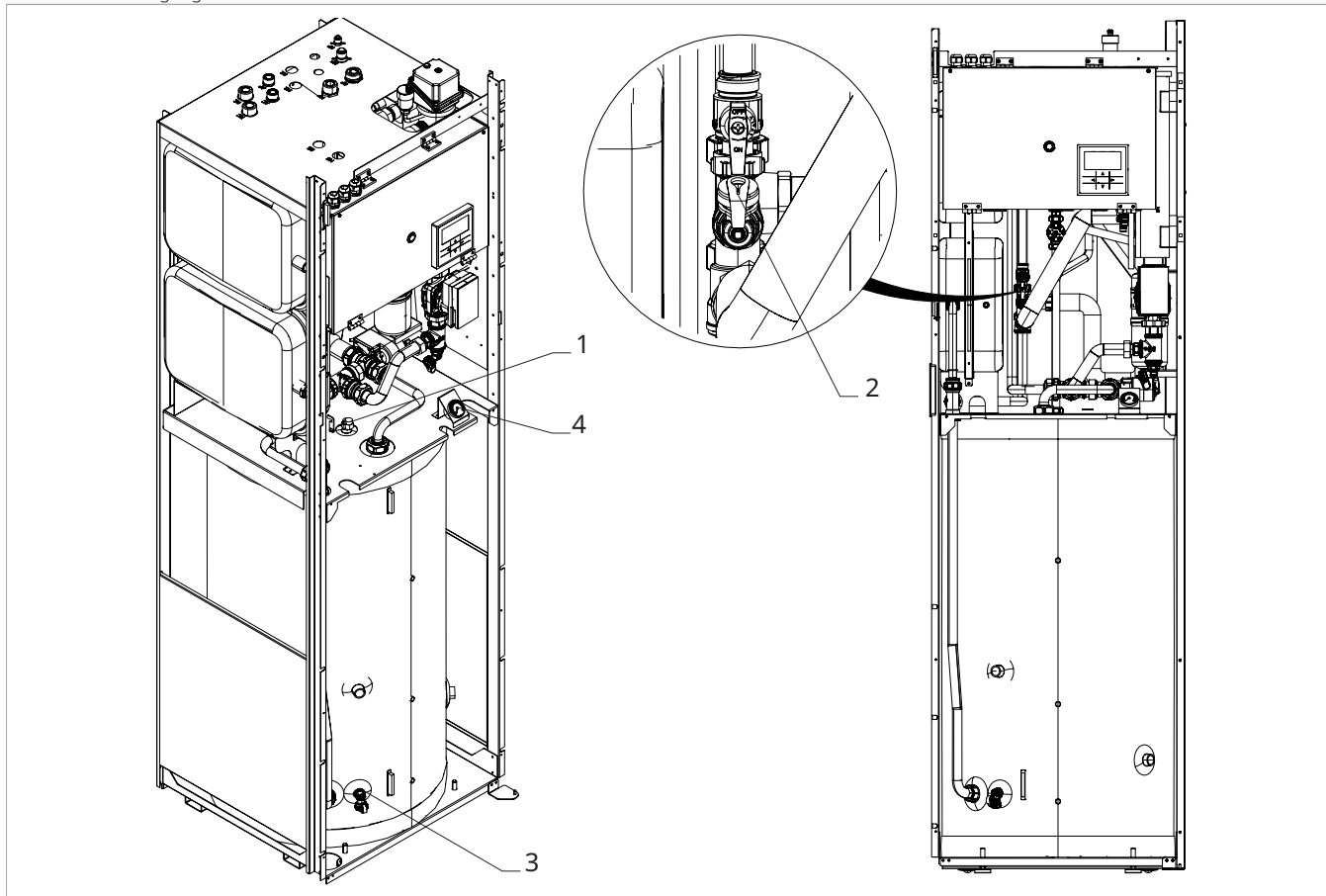
The quality of the water used must comply with the requirements set out in the following table; otherwise, a treatment system must be provided.

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.

3.13.3 Filling

1. Manual air vent valve
2. Plant filling cock
3. Plant drain cock
4. Pressure gauge



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

When water starts coming out of the terminal vent valves:

- close the vent 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 Refrigeration connections

3.14.1 Preliminary warnings

⚠ 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.

⚠ For dimensional information, refer to chapter "Technical information" p. 63.

⚠ Use equipment suited for the refrigerant in the system.

⚠ Plan the route of the pipeline so as to reduce the length and number of bends as much as possible for best performance of the system.

⚠ The refrigeration lines must be as straight as possible and the radius of any bends must be greater than 40 mm.

⚠ Use only special copper pipes for cooling.

- ⚠ The pipes must be supplied clean and sealed at the ends. Pre-insulated copper refrigeration pipes can be used.
- ⚠ The pipes must not contain residues of shavings, dirt or water which could damage the components of the unit and impair its correct operation.
- ⊖ Using pipes with diameters other than that indicated in the technical data table is forbidden.
- ⊖ Employing used refrigeration lines is prohibited because the tightness of the flare fitting cannot be guaranteed.
- ⊖ Making connections using the normal plumbing system is forbidden.
- ⊖ Welding in the presence of refrigerant in the refrigerant circuit is forbidden. If necessary, the refrigerant must be recovered and the circuit cleaned with oxygen-free nitrogen.

Specific warnings for R32

- ⚠ The length of the connecting pipes must be kept to a minimum.
- ⚠ Connecting pipes must be protected from physical damage and must not be installed in an unventilated space if this space is smaller than that shown in the Minimum Floor Area table.
- ⚠ The connecting pipes must be installed in a position where they are unlikely to be exposed to corrosive substances unless they are constructed of materials that are inherently corrosion-resistant or adequately protected against corrosion.
- ⚠ Compliance with national legislation for the gas in use is mandatory.
- ⚠ The refrigerant fittings must be accessible for maintenance purposes.
- ⚠ A controlled procedure must be followed to minimise the risk of flammable gases or vapours being present while working.
- ⊖ Work with heat (welding, soldering, etc.) is prohibited.
- ⚠ The following precautions must be taken when establishing the refrigeration fittings:

Area inspections

- 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

Checks for the presence of refrigerant

- The area must be checked with an appropriate refrigerant detector before and during work to ensure that the technician is aware of potentially flammable atmospheres
- make sure that the leak detection equipment is suitable for use with flammable refrigerants, i.e. that it does not produce sparks, is adequately sealed or intrinsically safe

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

Combustion source inspections

- the people operating on a refrigeration system involving the exposure of pipes that either contain or contained a flammable refrigerant must not use any source of combustion that could lead to a risk of fire or explosion
- all potential sources of combustion, including lit cigarettes, must be kept sufficiently far away from the workplace during operations in which flammable refrigerant could be released into the surrounding space
- check the area around the equipment to ensure there is no fire hazard or risk of combustion
- put up "No smoking" signs

Area ventilation inspections

- ensure that the area is adequately ventilated
- there must be a continuous degree of ventilation while working
- ventilation must safely disperse any released refrigerant and preferably expel it outside into the atmosphere

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.

Charging procedure

- ⚠ For the charging procedure make sure that:
 - there is no contamination between different refrigerants
 - the pipes of the charging equipment are as short as possible to minimise the amount of refrigerant
 - the cylinders are kept in a vertical position
 - the refrigeration system is earthed before charging
- ⚠ Make sure that the leak test has been carried out before charging.
- ⚠ Check if there are no leaks of refrigerant before leaving the site.

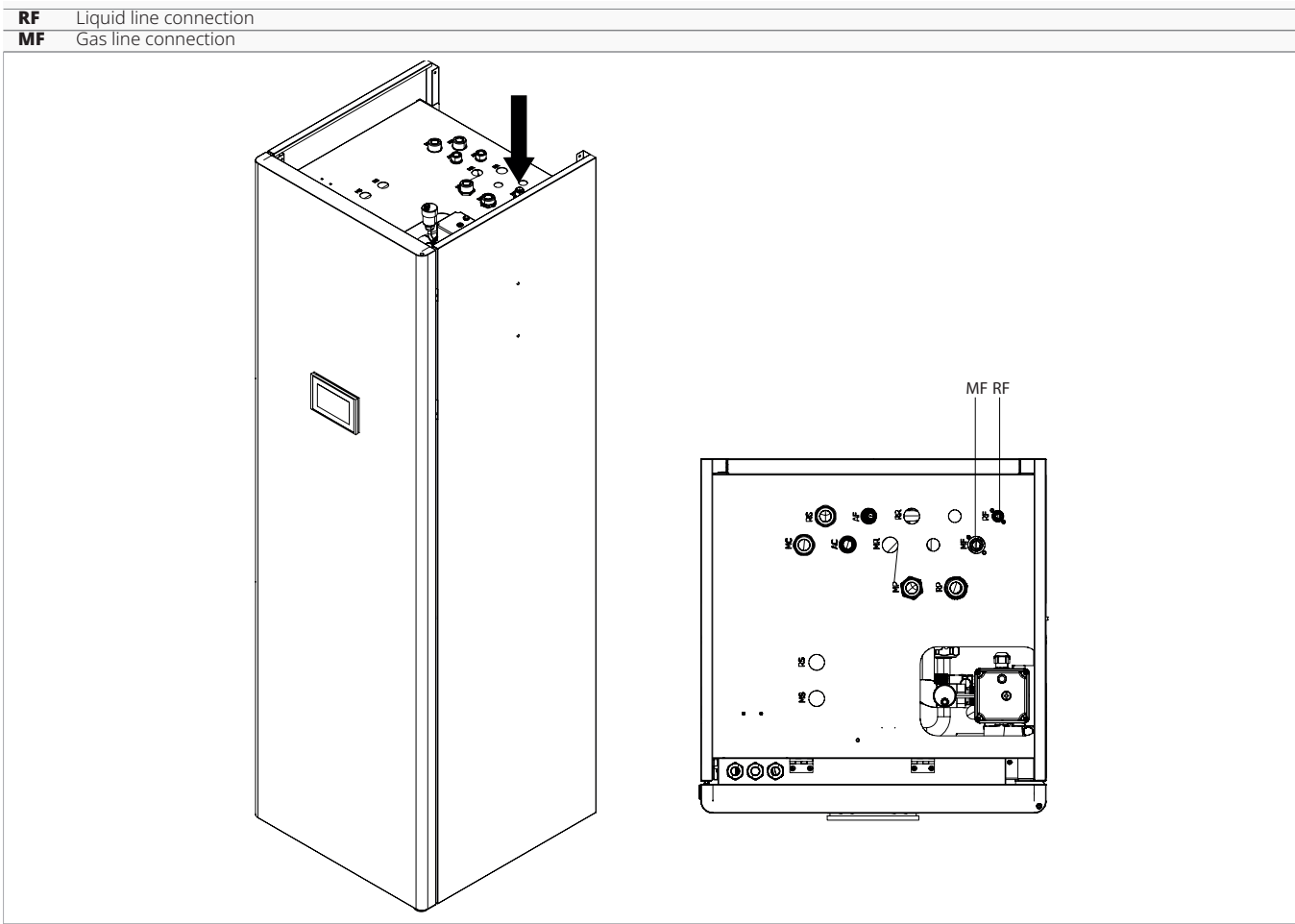
- ⚠

Label the system when charging is complete.
- ⊖

Overloading the refrigeration circuit is forbidden.
- ⊖

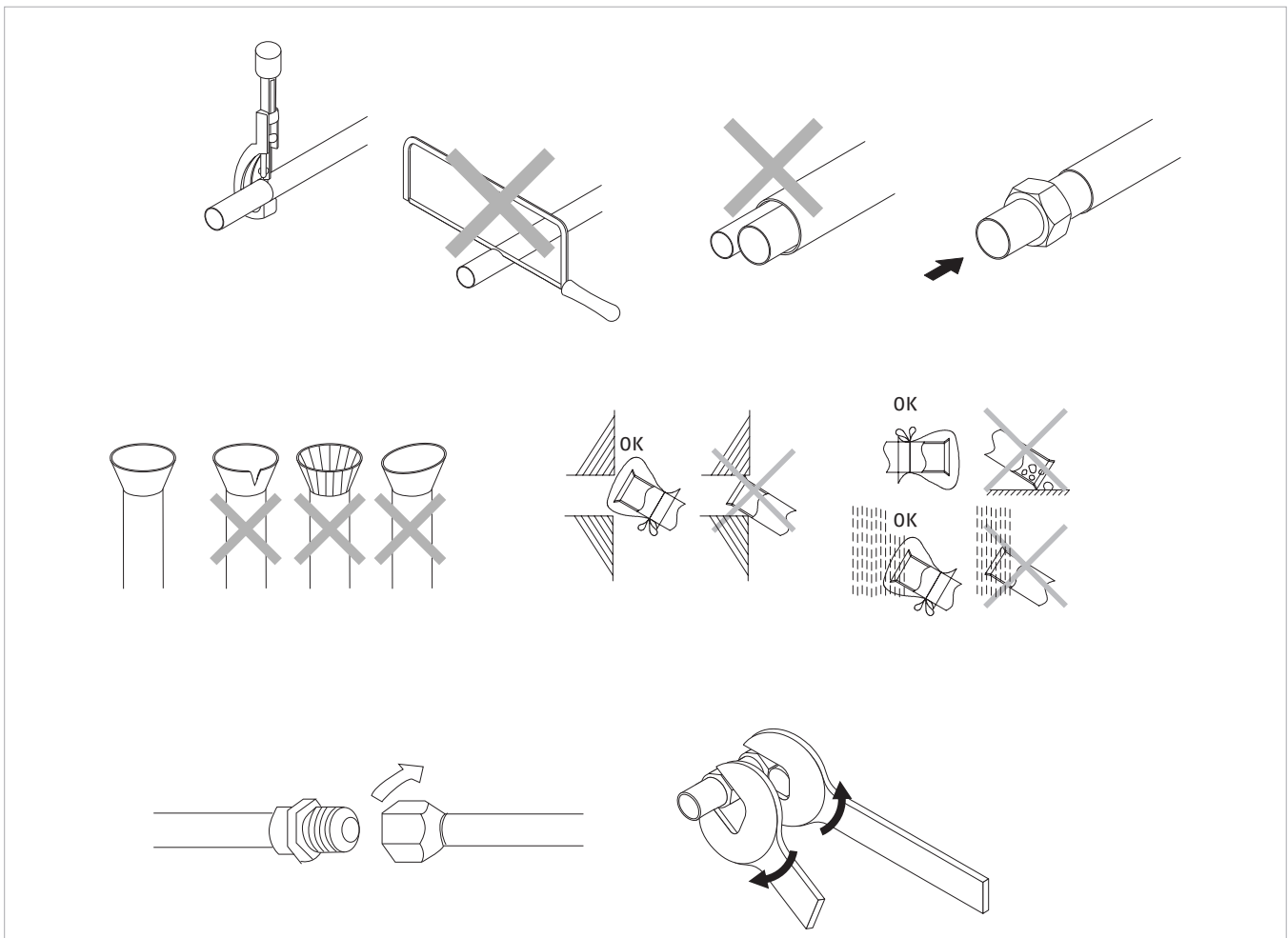
Introducing a refrigerant other than the one indicated or mixing different refrigerants into the system is forbidden.

3.14.2 Position



Models		m.u.	5	7	9	12	15
Refrigerant gas data							
Suction		"SAE	5/8				
Liquid		"SAE	1/4	1/4	3/8	3/8	3/8

3.14.3 Connection of piping



Preliminary warnings

- ⚠ Fasten a cable raceway to the wall (possibly with internal partitioning) of suitable size for the pipes and electrical wires to pass through.
- ⚠ The refrigeration fittings, equipped with shut-off valves, are ready for flared fittings.
- ⚠ Cut the sections of pipe leaving an extra 3-4 cm on the ends.
- ⚠ Immediately after cutting and deburring the pipes, seal the ends with insulating tape.
- ⚠ Remove possible burrs with the special tool.
- ⚠ Use a wheel pipe cutter only to cut the pipes clamping it in short lengths so as not to crush the pipe.
- ⚠ **NEVER USE A NORMAL HANDSAW, scraps could fall inside the pipe and enter the circuitry of the system, damaging the parts severely.**
- ⚠ Avoid introducing non-condensable gases (air) into the circuit. Otherwise, high pressures could be generated during operation with the risk of breakage.

Connection

Before connecting:

- insert the fixing nut into the pipe
- flare the pipe ends using the special tool

- Lubricate the connecting thread with oil for coolant

- ⚠ Do not use any other type of lubricant.
- ⚠ The flared fitting must be free of cracks, crazing or flaking.
- ⚠ Avoid using refrigerant oil on the outside of the countersink.

To connect:

- positioning the refrigeration lines
- screw the pipe nut manually on the connecting thread
- hold the threaded part of the fitting still with a spanner
- use a torque wrench on the nut to tighten it definitively

- ⚠ Keep the leak detector switched on near the unit to signal any refrigerant leaks while connecting.

Pipeline Ø		Tightening torque
mm	inches	Nm
6,35	1/4	18
9,52	3/8	42
12,70	1/2	55
15,88	5/8	60
19,05	3/4	110

⚠ For the next operations refer to the manual of the paired outdoor unit.

3.15 Electric connections

The appliance leaves the factory fully wired and only needs to be connected to the external unit and any accessories.

3.15.1 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.
- ⚠ **For all safety warnings, please refer to the manual of the combined outdoor unit.**

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

3.15.2 Connection of heating element kit

Preliminary warnings

- ⚠ 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
 - install a dedicated switch-disconnector equipped with delayed fuses or an omnipolar magneto-thermal circuit breaker complying with CEI-EN standards, suited to the draw of the equipment, with a differential relay with a maximum setting equal to that prescribed by the individual electrical standards
- ⚠ Ensure that an earth connection is established. 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. Incomplete connection of the covers may result in overheating of the terminals, electric shock or fire.
- ⚠ 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.
- ⊖ It is forbidden the use of gas and water pipes for grounding the appliance.

Power line dimensioning of heating elements

In case of installation of the accessory Electric Heating Kit, use the tables below for the dimensioning 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).

- ⚠ 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.

Single-phase power supply

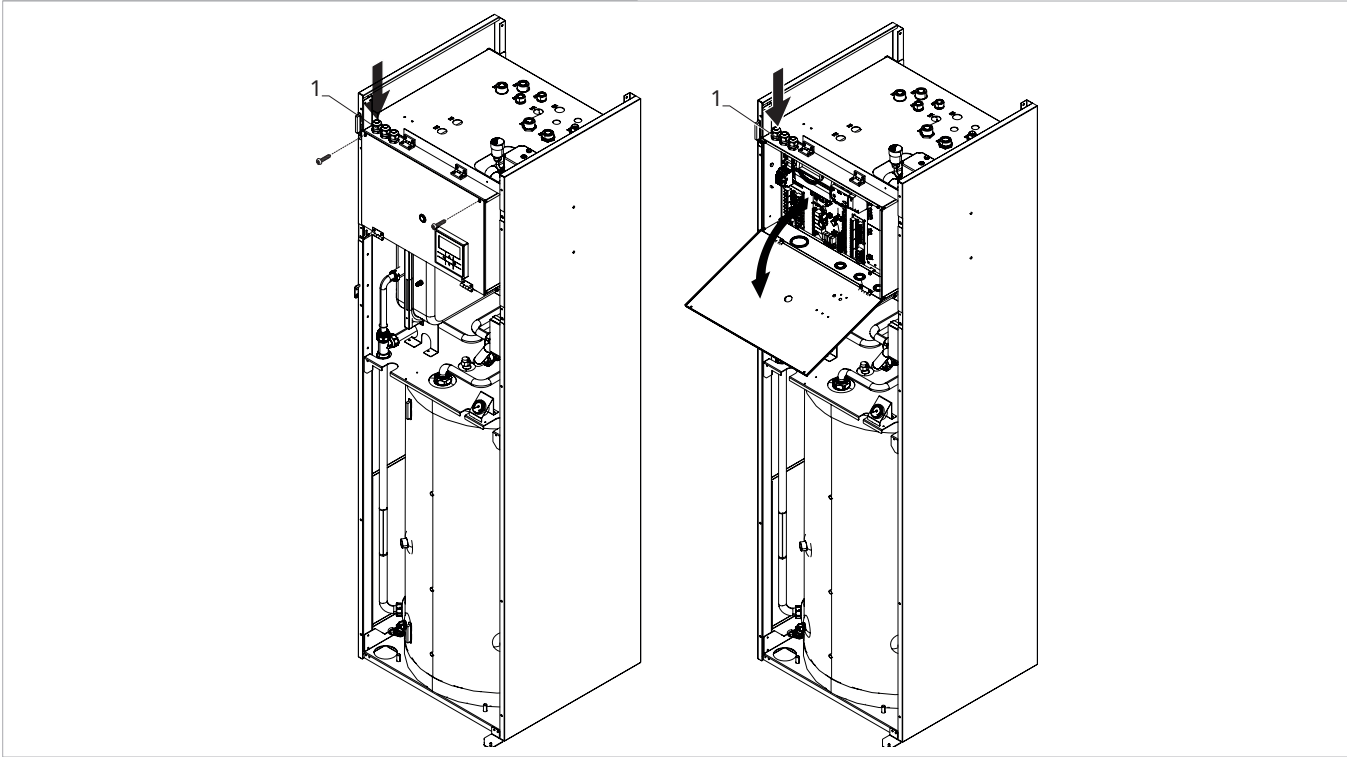
Connection		Stage 1	Stage 2
Power draw	kW	2,00	4,00
Current draw	A	8,70	17,39
Minimum wire cross-section area	mm ²	4,00	4,00

Three-phase power supply

Connection		Stage 1+2+3
Power draw	kW	6,00
Current draw	A	8,70
Minimum wire cross-section area	mm ²	2,50

3.15.3 Access to the electrical panel

1. Power cable input



- ⚠ 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 after installation" [p. 40](#)
- To access the connections:**
 - undo the screws of the closing panel of the electric panel
 - open the panel

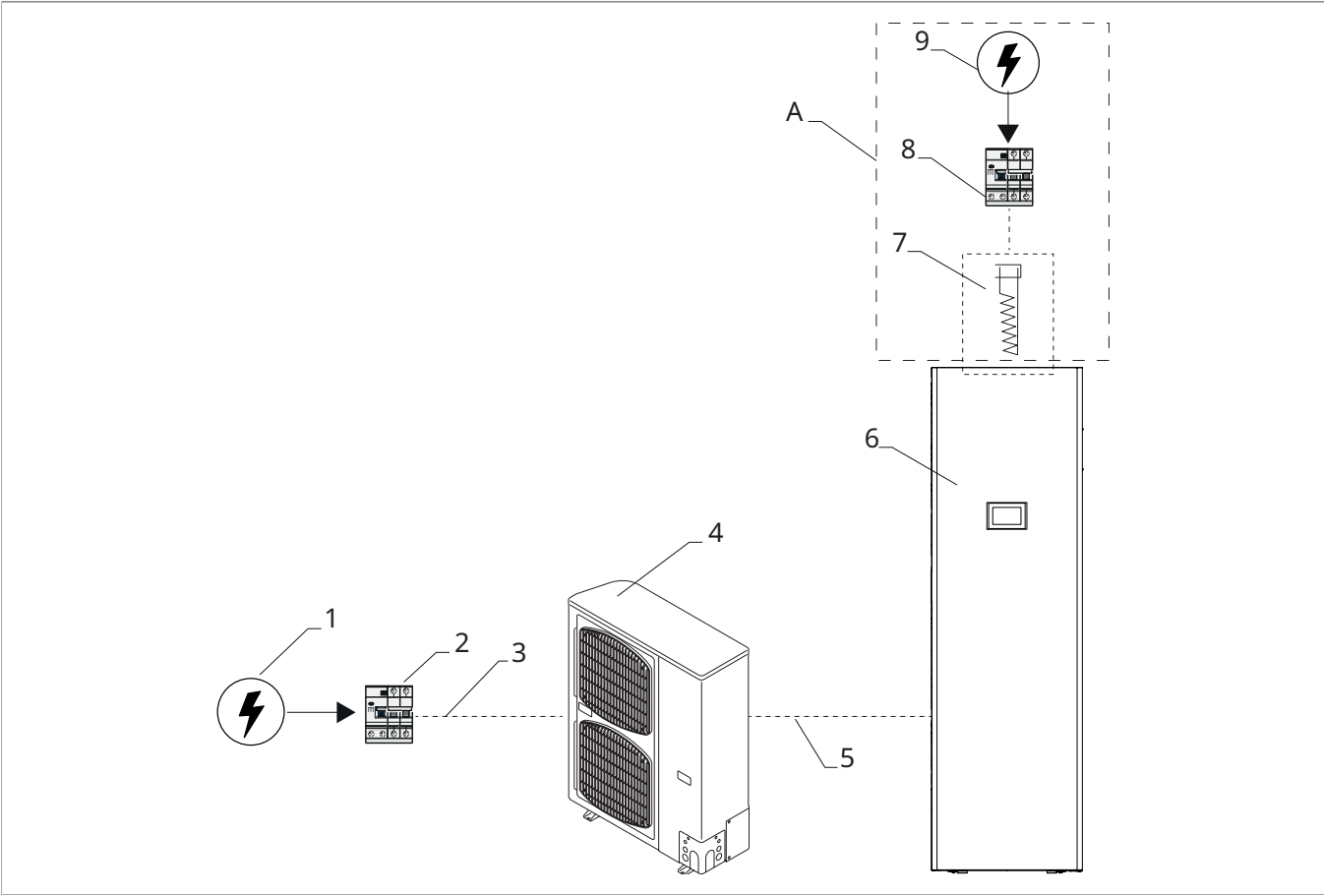
- ⊖ It is prohibited to continue if the power supply to the outdoor unit has not been switched off.
- ⚠ Use properly sized cables to avoid voltage drops or overheating.
- ⚠ Before connecting to the terminals, read this manual carefully.

3.15.4 Connection

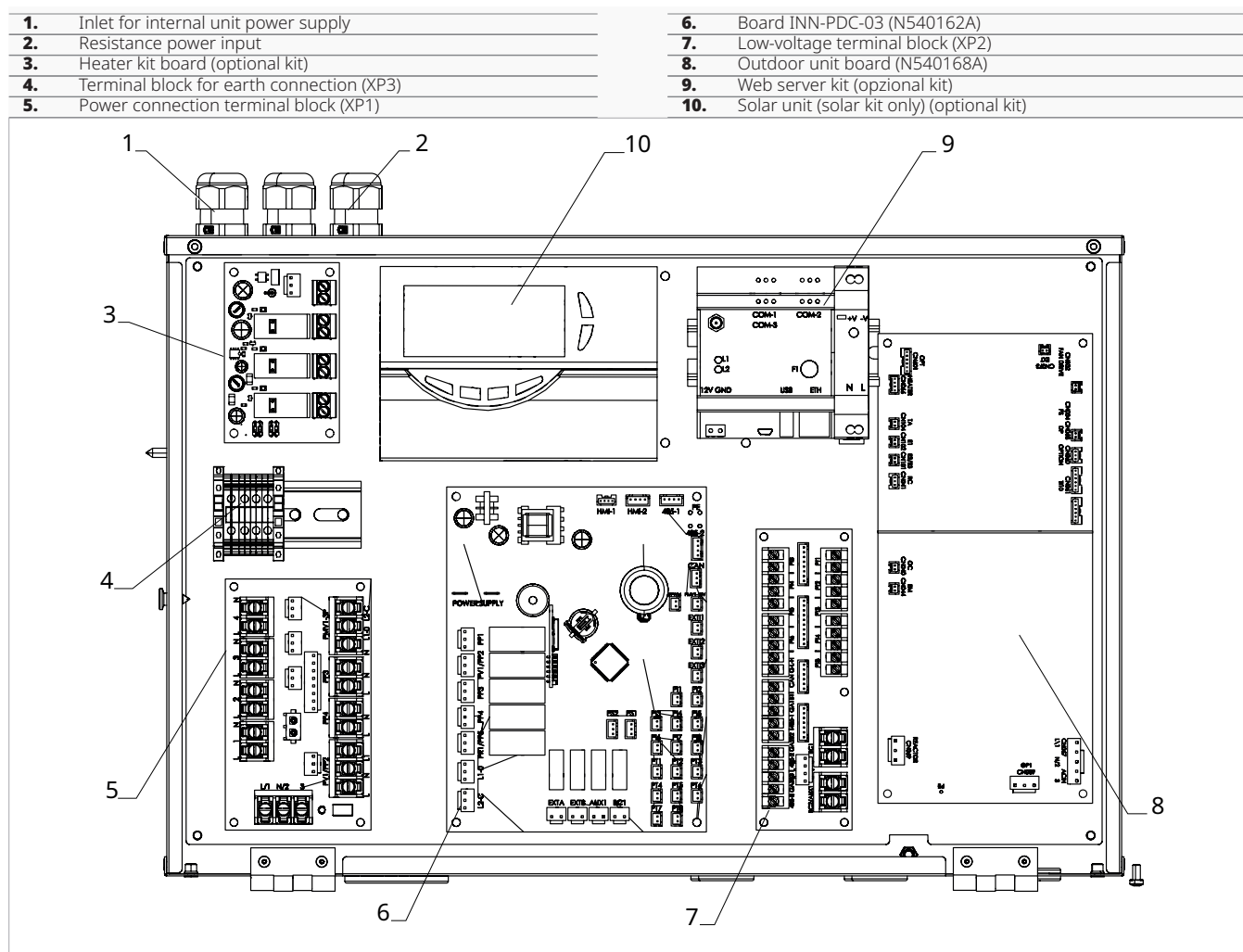
- ⚠ Before connecting the outdoor unit to the electrical power supply, make sure that the power supply to the outdoor unit has been switched off.

Connection diagram

1.	Unit power supply 230/1/50 0 400/3/50 depending on model
2.	Protection switch (by installer)
3.	Power cable
4.	Outdoor unit
5.	Power line communication outdoor unit - indoor unit (3 x 1,5 m²)
6.	Indoor unit
7.	Heating element kit (Optional kit)
8.	Protection switch
9.	Emergency heating element power supply
A	Connection of electrical resistance



Layout of electrical panel aboard unit



To make the connection:

- 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

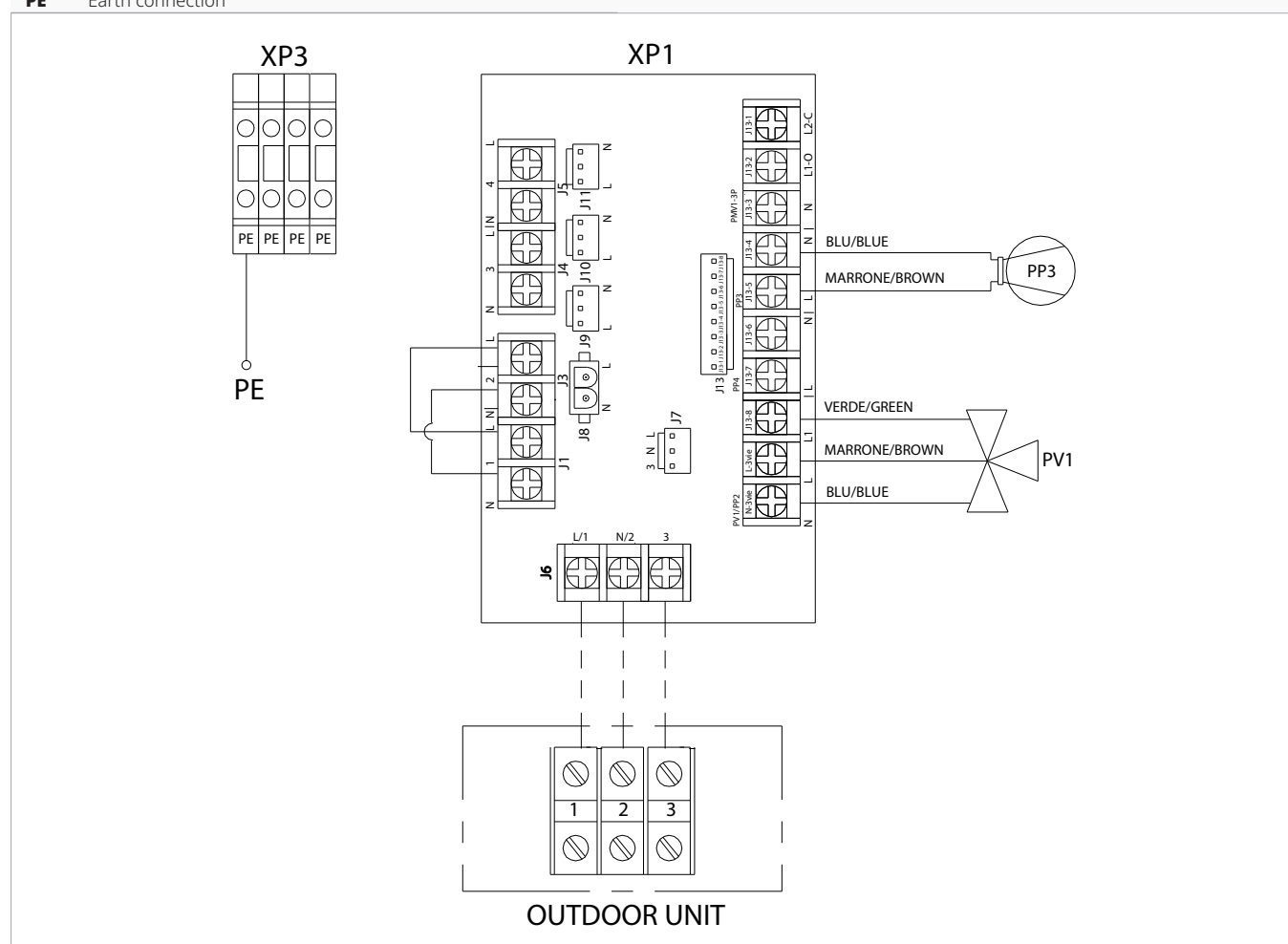
⚠ The power cable must be sized according to this manual.

⚠ Use a double-insulated multi-core cable mod. H07RNF for outdoor applications in cable duct, or mod. H05VVF for indoor applications.

⚠ For connections, please refer to the diagrams in the "Connection boards" [p. 36](#) section.

Connection boards

XP1	Power connection terminal block	1-2 morsetto J6	Indoor unit power supply 230V AC
Outdoor unit	Outdoor unit connection	2-3 morsetto J6	Power line communication outdoor unit - indoor unit
XP3	Terminal block for earth connection		
PE	Earth connection		



⚠ The unit leaves the factory with terminals J1 and J3 jumpered.

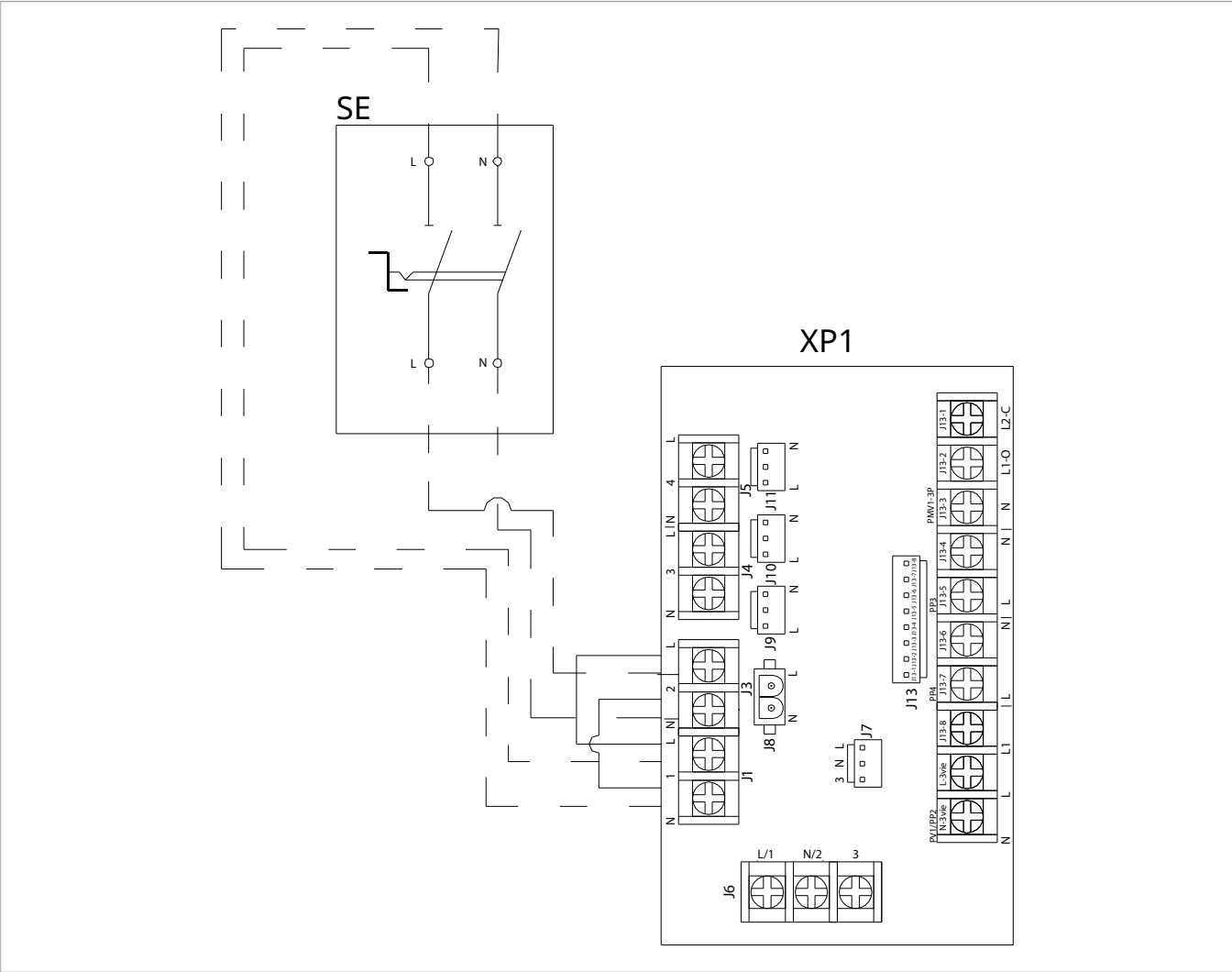
If necessary, a protection switch can be connected to terminals J1 and J3 by removing the jumpers inserted at the factory.

⚠ Attention, opening the protection switch does not completely disconnect the power supply to the unit. Terminals J6 remain powered by the outdoor unit.

⚠ To completely disconnect the power supply, the protective switch on the power supply line of the outdoor unit must be opened.

Connection of the protection switch on the indoor unit

XP1	Power connection terminal block
SE	protection switch (not supplied, connections by installer)
N-L morsetto J1	Protection switch input
N-L morsetto J3	Protective switch output



- 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 jumpered (contact closed). Remove the jumper to connect the CT consent and the ON/OFF consent.

P16: FTV photovoltaic input management for Smart Grid

Setting parameter P16=FTV and connecting a consent from a photovoltaic system control unit results in an increase of the DHW setpoint from SSP to 55 °C in order to 'store' energy in the DHW tank.

The consent must be closed for no less than 10 consecutive minutes before the FTV function is activated.

When the input is opened, the DHW setpoint is reset to the standard SSP value.

Probe terminals (XP2)

PT4: connection of domestic hot water storage tank temperature probe PT4.

PT1: connection of plant temperature probe PT1.

⚠ The probes are supplied connected to the terminal board of the unit. Position the probe used in a suitable sump on the relevant tank (max. distance 50 m).

⚠ If the secondary separator kit is supplied, the probe is placed on the kit.

PT8: External air temperature detection sensor input. The sensor should be positioned so that it detects the real outside air temperature and must not be influenced by factors which may distort the reading (e.g. direct sunlight, other heat sources, accumulations of snow/ice).

⚠ The probe is supplied connected to the terminal block of the unit. Position the probe outside the unit (max. distance 50 m).

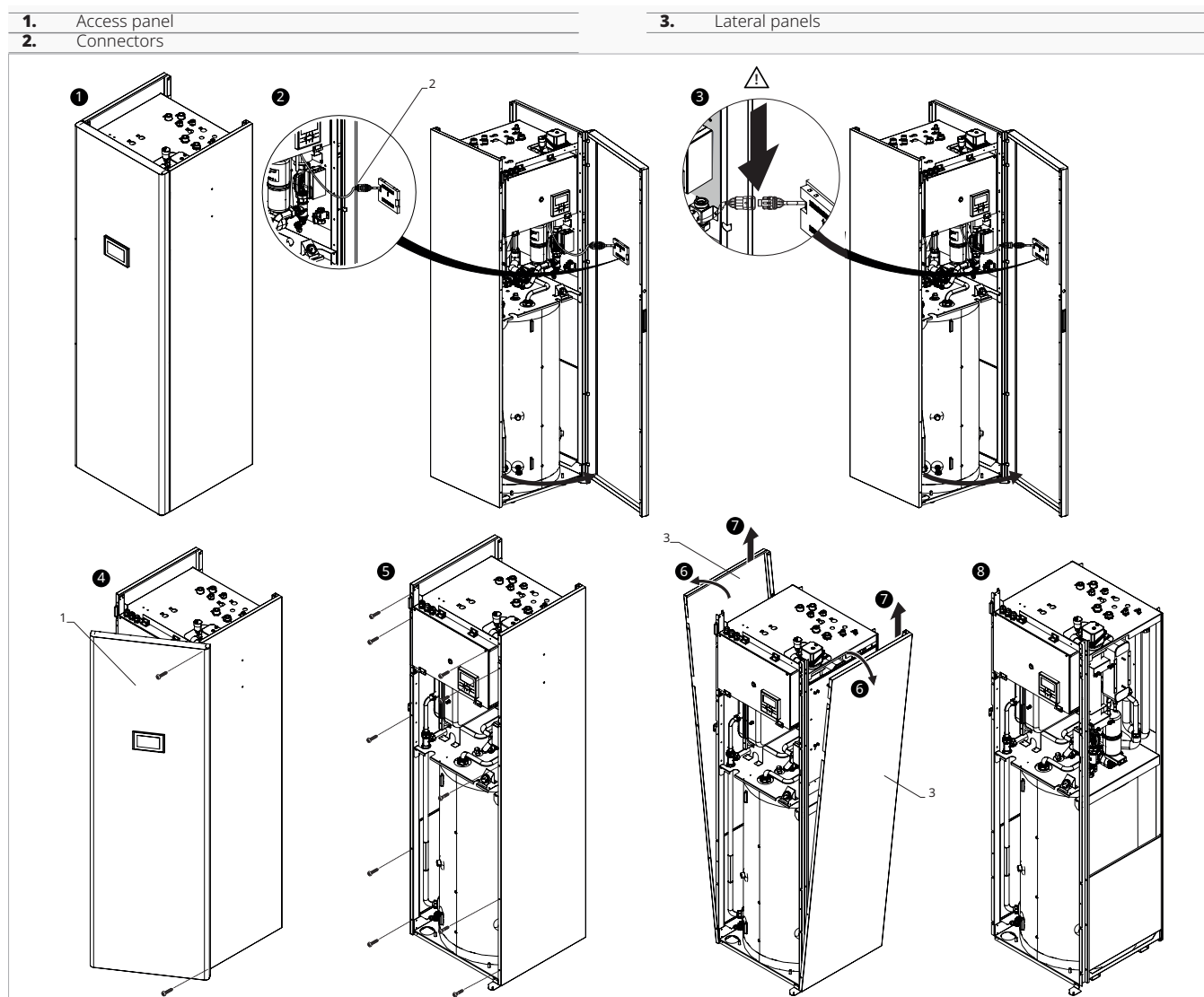
Output terminals (XP1)

PP3: PP3 secondary pump connection (by installer).

PV1: PV1 plant/domestic hot water diverter valve connection.

⚠ To connect the 3-way valve accessory, you must cut the connector and connect the cables separately.

3.16 Disassembly and assembly of cosmetic panels after installation



Removal of aesthetic panels:

- use the key provided
- open the access panel
- Disconnect the display connector
- Unscrew the access panel fixing screws
- lift and remove the panel
- Unscrew the lateral panels fixing screws
- tilt the lateral panels slightly outwards
- lift and remove the panels

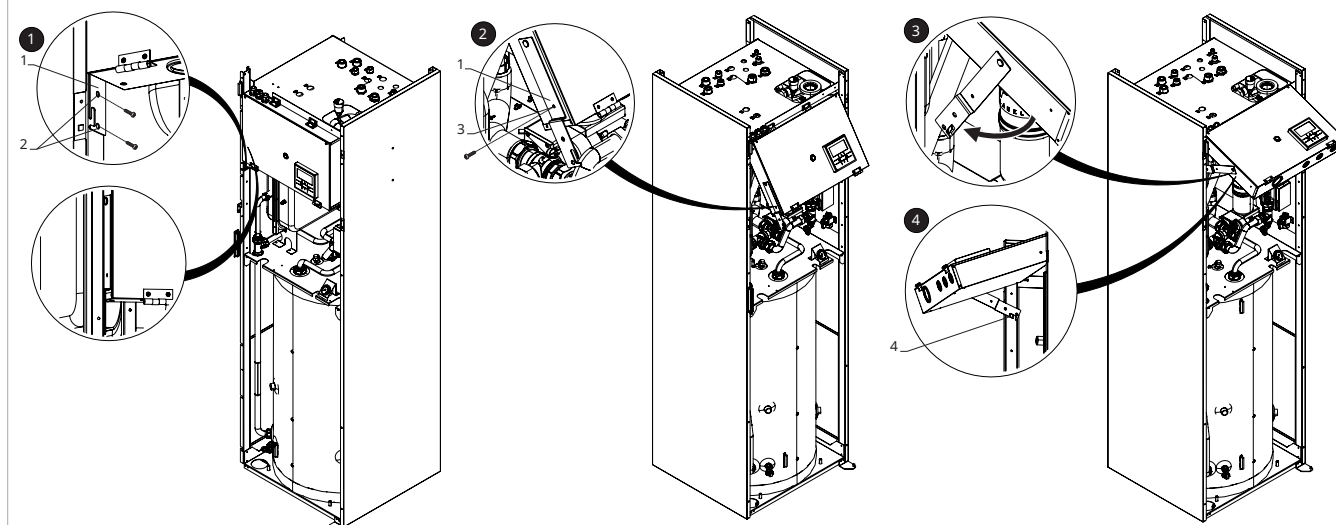
⚠ Disconnect the connector connected to the control panel before removing the access panel.

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

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

1. Electrical support bracket
2. Bracket fixing screws

3. Bracket locking screw
4. Bracket support screw



For access to internal components

- Unscrew the bracket fixing screws
- raising the electrical panel slightly
- Unscrew the bracket locking screw
- rotate electrical panel support bracket
- Attach the electrical panel support bracket to the bracket support screw

Assembly of panels

⚠ To assemble the panels, proceed in reverse order.

PUTTING IT INTO SERVICE

4.1 Preliminary warnings

⚠ This section is dedicated to the Technical Service Assistance. The features of the Technical Service Assistance are described in chapter "Recipients" p. 7.

⚠ 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. 55 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.

4.1.1 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.

⚠ 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.

4.2 First start-up

4.2.1 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 loading tap is closed
- the shut-off valves of the hydraulic circuit are open
- the mesh filter is installed and clean

⊖ 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
- all control wires are connected and all electrical connections are firmly in place

- the control panel has been installed and connected correctly

Refrigeration

- the refrigerant connections have been made according to the instructions in the manual
- the hydraulic circuit interception valves are open

4.2.2 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.


4.2.3 Powering up

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

- ⚠ Make sure that the control panel is switched off.

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 for operation.**

4.2.4 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 010

If the alarm ALRM 010 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 mesh 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.

4.2.5 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 circulation pump is running and the water flow rate is sufficient to close the contact of the differential pressure switch
- the water supply is correct (see chapter "Thermal gradient" [p. 43](#))
- the differential pressure switch is functioning correctly

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 %

Hydraulics

- the hydraulic circuit is completely deaerated (see chapter "Presence of air" [p. 43](#))

Thermal gradient

The temperature difference must be verified with:

- 100% compressor capacity
- all distribution valves open
- all consumers on
- any secondary pumps in operation switched on and calibrated, see chapter "Circulation pumps optional kits" [p. 61](#)

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

If the temperature difference is less than 4 °C, set a lower circulator speed, see chapter "PP1 primary circulation pump" [p. 44](#).

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

4.3.1 Setting the head value

The maximum head value must be set with:

- 100% compressor capacity
- all distribution valves open

- all consumers on
- any secondary pumps in operation switched on and calibrated, see chapter "Circulation pumps optional kits" [p. 61](#)

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.

4.4.1 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" [p. 44](#).

⚠ 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 variant 1

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

To select maximum speed:

- act on the knob
- set to 3

Pump model variant 2

1. Selection button

To select maximum speed:

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

- Fixed speed selection
- Medium speed
- Maximum speed

4.5 Circulation pumps optional kits

⚠ Refer to the "Configuration accessories" [p. 55](#) section to set the circulation pumps of the optional kit.

4.6 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

4.7 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.

4.8 Draining the plant

The units are provided with a drain cock.

4.8.1 Preliminary warnings

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

4.8.2 Draining

Before starting the emptying operation:

- set the main system switch to "Off"
- check that the plant water filling/top-up cock is closed

To drain the plant:

- open the water drain tap in the bottom left of the hot water tank
- Open the manual vent on the top of the hot water tank

⚠ If the system is fitted with antifreeze, the liquid must not be discharged freely because it is polluting.

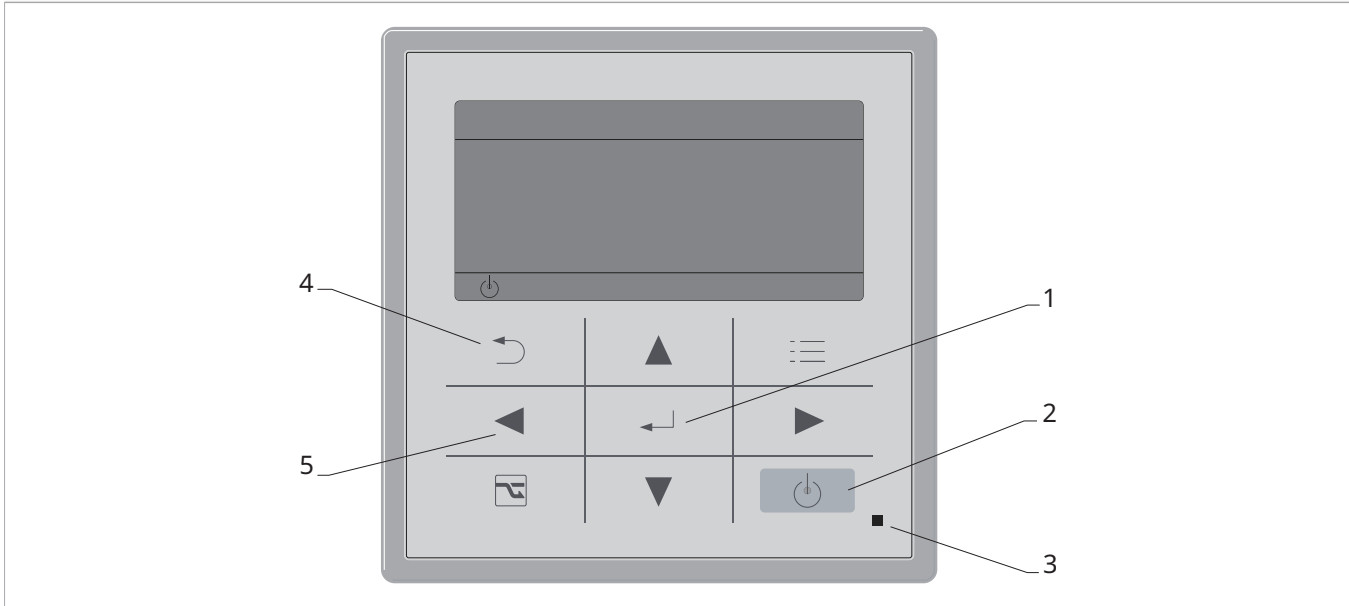
External unit control panel

4.9.1 Control Panel

⚠ The external unit control panel is not a remote control

⚠ The external unit control panel it is only used during commissioning for automatic address setting and first start-up. Do not press any button, switch it off or attempt to programme it after this.

1.	Send button
2.	Power button
3.	Operating LED indicator (lights up during operation/flashes during the alarm)
4.	Back button
5.	Selection button



4.9.2 First start-up

- turn the system master switch to "on"
- turn the master switch Q1 of the device on the electric panel to the I-ON position
- check the touch screen interface is off
- check that OFF appears on the emergency interface, otherwise press the Standby icon

Within few minutes the prompt ASSIGNING will appear and flash on the control panel of the external unit. This signal will cease within a maximum time of 4-5 minutes once the panel has correctly communicated with the external unit.

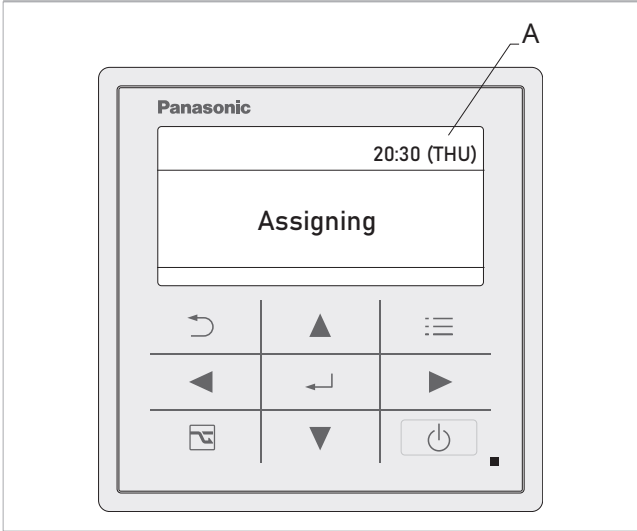
⚠ On three-phase 12, 15, 18 versions, reverse the two power phases if alarm P05 appears on the external unit control panel.

4.9.3 Automatic address setting (Assigning)

Before starting the Assigning procedure:

- check that the electrical connections between the outdoor unit and the indoor unit at terminal block J6 have been made correctly. See "Connection boards" [p. 36](#).

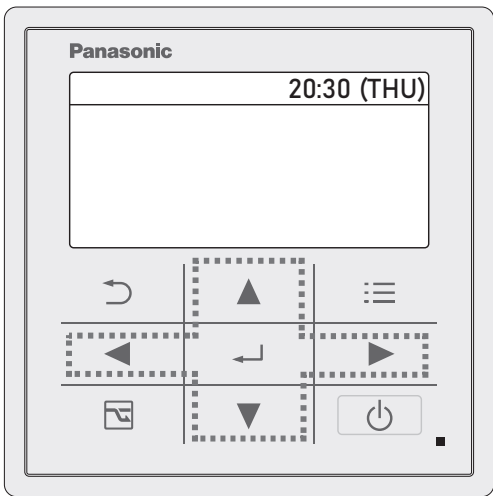
A Stand-by display



To start the Assigning procedure:

- supply the appliance with electricity
*On the display appears Assigning
Assigning procedure starts*

- wait a few minutes



On the display disappears Assigning
The Assigning procedure is complete

- wait a minute
- proceed with switching on the control panel of the outdoor unit

- ⚠ If the Assigning procedure doesn't restart automatically or remains in the display the symbol ⚠ accompanied by R.C.1, call the Technical Service Centre.
- ⚠ If during the Assigning procedure appears the symbol ⚠ accompanied by R.C.1 disconnect the device from the power supply.

Meaning of the warning lights on the external unit electronic board

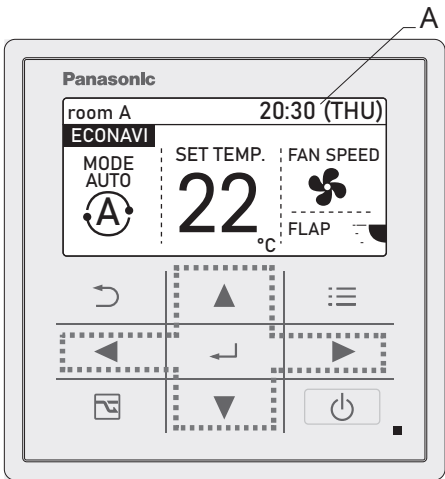
Meaning	LED 1	LED 2
Upon power-up		
• no communication with the indoor unit	○	○
• established communication with the indoor unit	●	○
• normal communication OK (validating power and quantity)	●	●
• automatic address setting in progress	☀	☀

- on
- off
- ☀ alternative flashing

4.9.4 External unit control panel first switch-on

- press ⏻

A Display on



- press ◀
- select MODE
- press ↩
- press ⏻
- select the auto mode
- press ↩
- wait a few seconds
On the display appears ☀.
- wait a few seconds
- remove tension
- re-energize the appliance
- check that the settings have been memorised

4.9.5 Checks during and after the first start-up

- After starting up, check that
- the current consumption of the appliance is lower than the maximum current indicated in the manual of the indoor unit
- ⚠ During compressor operation, the power supply voltage does not fall below the nominal value -10 %.
 - the appliance operates within the recommended operating conditions
 - the hydraulic circuit is completely deaerated
 - the hydrometer pressure is between 1 and 2 bar
 - the air-to-water heat pump performs a shutdown and subsequent restart
 - the thermal gradient between the delivery and return is between 4 ÷ 7 °C
- ⚠ Set a lower circulator speed if the thermal gradient is lower than 4 °C.
 - ⚠ 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.
 - disconnect and reconnect power to the device and check correct operation

MAINTENANCE

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

5.1 Preliminary warnings

⚠ This section is dedicated to the Technical Service Assistance. The features of the Technical Service Assistance are described in chapter "Recipients" *p. 7*.

⚠ For detailed information on accessories please refer to the "Configuration accessories" *p. 55* 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.

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.

5.2.1 Routine maintenance of the unit

Hydraulic circuit

Check:

- water circuit filling
- cleaning the net filter
- 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 cosmetic covering elements

Refrigeration checks

Make sure that:

- the amount of charge complies with the size of the room in which the parts containing the refrigerant are installed (see table "Minimum floor area" *p. 20*)
- ventilation equipment and vents functioning properly and not obstructed
- the marking on the equipment must remain visible and legible. Illegible markings and graphics must be corrected
- the refrigerant pipes and components are installed in a position in which they are unlikely to be exposed to corrosive substances unless the components are made of inherently corrosion-resistant materials or adequately protected against corrosion
- the thermodynamic values are within the nominal parameters

⚠ Under the provisions of Directive 517/2014/EU, plants containing more than 5 equivalent tonnes of CO₂ (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 in the manual of the combined external unit.

⚠ 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.

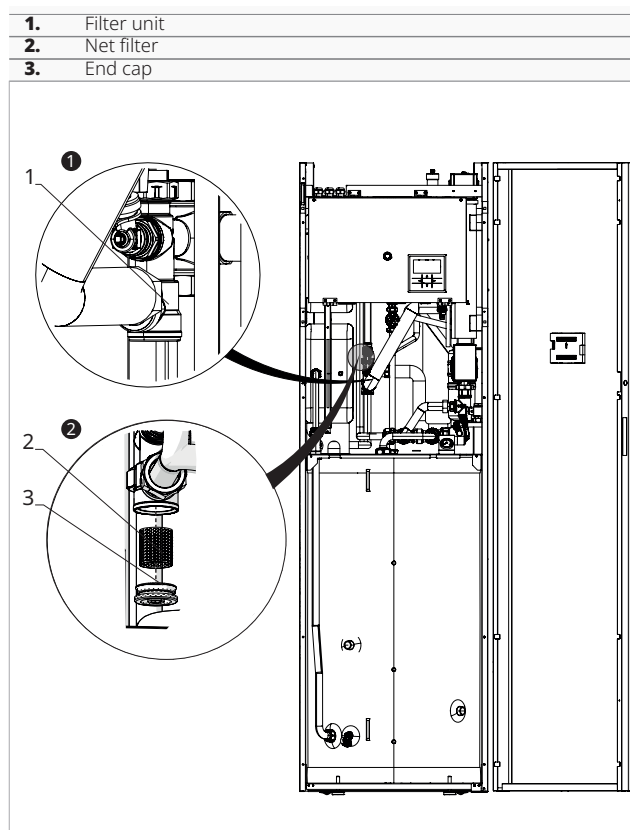
5.2.2 Cleaning the net filter

To access:

- use the key provided
- open the access panel
- disconnect the display connector
- remove aesthetic panels
- see chapter "Disassembly and assembly of cosmetic panels after installation" [p. 40](#)
- raising the electrical panel
- see chapter "Disassembly and assembly of cosmetic panels after installation" [p. 40](#)
- remove the insulation shell from the filter assembly

To extract:

- use an Allen key
- unscrew the end cap
- extract the filter



To clean:

- remove the dust from the filter with a cloth
- wash the filter with water, without using detergents or solvents
- allow it dry

To reassemble:

- proceed in reverse order

5.3 Periodic operations

The routine maintenance plan includes the following cleaning operations.

5.3.1 External cleaning

Clean the external surfaces with a soft damp cloth.

⚠ Disconnect the unit from the power supply before each cleaning and maintenance intervention by setting the main power supply switch to off.

⚠ Do not use abrasive sponges or abrasive or corrosive detergents as you might damage the painted surfaces.

TROUBLESHOOTING

6.1 Preliminary warnings

⚠ For detailed information on accessories please refer to the "Configuration accessories" p. 55 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	Cause	Solution
ALLARME 001	Inlet water temperature probe malfunction	PT6	Probe disconnected, faulty or abnormal value	Check the connection and if necessary replace the probe
ALLARME 002	Water outlet temperature probe malfunction	PT5	Probe disconnected, faulty or abnormal value	Check the connection and if necessary replace the probe
ALLARME 003	Domestic water temperature probe malfunction	PT4	Probe disconnected, faulty or abnormal value	Check the connection and if necessary replace the probe
ALLARME 004	Outdoor temperature probe malfunction	PT8	Probe disconnected, faulty or abnormal value	Check the connection and if necessary replace the probe
ALLARME 005	Low water temperature	PT5	The minimum frost protection temperature alarm has triggered. The temperature of the exiting water dropped below 5 °C.	<ul style="list-style-type: none"> Check that nothing is preventing the good water circulation in the plant (air, partially closed valves, clogged sieve filter) Check that the thermal gradient between the plant delivery and return is between 4÷7 °C by querying parameter PT5 Set a lower circulator speed if the thermal gradient is lower than 4 °C 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
ALLARME 006	Low water temperature PT5 (and PT6 and if enabled PT1) on standby	PT1, PT5, PT6	The frost temperature alarm has triggered during the stand-by state. The outlet water temperature has dropped below 5 °C.	<ul style="list-style-type: none"> During the stand-by state, a dangerous situation developed that could lead to serious damage to the device. 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.
ALLARME 007	Low water temperature in standby	PT4	The frost temperature alarm has triggered during the stand-by state. The outlet water temperature has dropped below 5 °C.	<ul style="list-style-type: none"> During the stand-by state, a dangerous situation developed that could lead to serious damage to the device. 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.
ALLARME 008	High water temperature	PT5	Inlet water temperature detected by PT5 exceeded 80 °C	<ul style="list-style-type: none"> If a boiler is installed in the system check the system's diverter valves
ALLARME 009	High water temperature	PT4	The domestic water tank temperature detected by PT4 has exceeded 80 °C	<ul style="list-style-type: none"> If a boiler is installed in the system check the system's diverter valves If a solar collector is present in the system, PT4 in the hot water tank detects a high temperature but this does not prevent the production of hot or cold water for the system
ALLARME 010	Plant flowmeter tripped	PI1	The water circulation in the plant is not good	<p>Check that:</p> <ul style="list-style-type: none"> The check valves are open the three -way valve for hot-cold diversion (if present) is in the correct position, There are no air bubbles inside the circuit At least one of the consumers has an open circuit or is equipped with a 3-way valve The external mesh filter is not clogged The plant water pressure is correct The circulation pump is working properly (unlock it if necessary)
ALLARME 011	Malfunctioning of condensing unit	-	<ul style="list-style-type: none"> The alarm P05 appears on the control panel of the outdoor unit on size 15 or 18. (Size 18 refers to the eHPoca indoor unit only). The outdoor unit is not working properly. 	<ul style="list-style-type: none"> Invert two of the three-phase power phases. Check on the control panel of the outdoor unit the meaning of the alarm Contact the Technical Service Centre
ALLARME 012	Anti-legionella cycle terminated after LTO timeout exceeded	-	The anti-Legionella cycle ended in-correctly after 5 hours instead of holding 60°C for 2 hours.	<ul style="list-style-type: none"> The auxiliary heater (resistor or backup boiler) is not available or the power is not sufficient to perform the function Contact the installer

Alarm	Description	Correlated variables	Cause	Solution
ALLARME 013	Plant temperature probe malfunction	PT1	Probe disconnected, faulty or abnormal value	Check the connection and if necessary replace the probe
ALLARME 014	Low water temperature	PT1	The minimum frost protection temperature alarm has triggered. The temperature of the exiting water dropped below 5°C.	Check that: <ul style="list-style-type: none">• There is nothing to prevent good water circulation in the system (air, partially closed valves, clogged mains water filter, etc.)• Check that the thermal gradient between the plant flow and return is between 4÷7 °C by querying parameter PT1• Set a lower circulator speed if the thermal gradient is lower than 4 °C• 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
ALLARME 015	Low water temperature	PT6	The minimum frost protection temperature alarm has triggered. The temperature of the exiting water dropped below 5°C.	Check that: <ul style="list-style-type: none">• There is nothing to prevent good water circulation in the system (air, partially closed valves, clogged mains water filter, etc.)• Check that the thermal gradient between the plant flow and return is between 4÷7 °C by querying parameter PT6• Set a lower circulator speed if the thermal gradient is lower than 4 °C• 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
-	Noise and turbulence is coming from the hydraulic circuit	-	There is air inside the circuit	<ul style="list-style-type: none">• Vent the air via the external devices and the vent on the buffer tank of the machine and bring the circuit to the correct pressure• Check that the suction pressure (hydraulic circuit return) with the pump on is higher than 0.6 bar.
-	Unsatisfactory cooling or heating	-	<ul style="list-style-type: none">• The setpoint set on the controller is too low (heating mode) or too high (cooling mode)• The control panel is regulated to too high a temperature for cooling (or too low for heating)• Open doors and/or windows	<ul style="list-style-type: none">• Reset according to needs• Adjust the temperature to a suitable value• Close them to prevent air from entering

1. **Note:**
2. In general, alarm resetting is automatic when the activation condition is established again.
3. 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.
4. 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.

6.5 Alarms shown on the control panel of the external unit

The control panel of the outdoor unit displays the alarms that occur during operation of the heat pump.

⚠ If the PdC alarm appears on the user interface, refer to the Technical Service Centre.

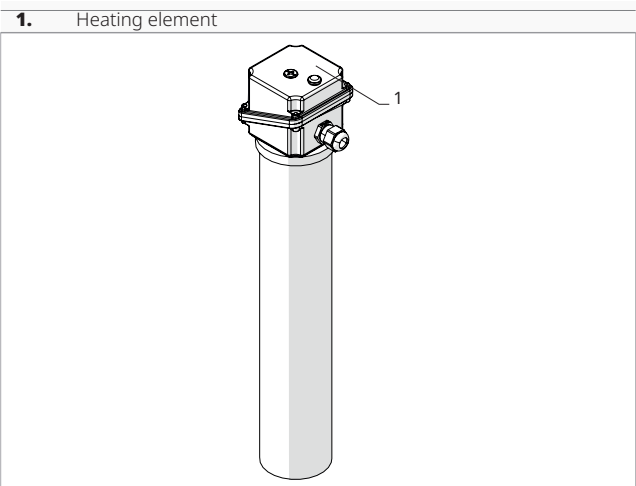
Alarms displayed	Cause	Solution
P03	Anomalous compressor discharge temperature > 0 = at 103 °C.	Check cooling cycle (possibly excessive refrigerant charge). Check opening of cooler taps. Check TD compressor delivery sensor and replace it if needed.
P04	External unit high pressure switch tripped.	In the summer cycle, check the free circulation of air on the outdoor unit. Check the refrigerant charge. In the winter cycle, check that the refrigerant taps are open.
P05	One of phases missing or incorrect connection of power phases in three-phase versions. No neutral in single-phase versions.	Check for presence and sequence of R, S and T phases and that the device is not powered with two phases in one-phase systems.
P10	Electrical jumper on connector CN034 of PAW-ACXA73-38670 board missing or disconnected.	Check connection.
P11	Electric jumper on connector CN068 of PAW-ACXA73-38670 board missing or disconnected.	Check connection.
P15	Insufficient refrigerant charge.	Check the cooling circuit to locate the possible leakage.
P16	Excessive compressor draw.	Check values of resistors.
P19	Four-way valve jammed.	Check electric power and operation of the four-way valve.
P20	High refrigerant pressure protection.	Check the cleanness of the external heat exchanger and respect of minimum clearances. Check fan operation and correct air exhaust from the condenser.
P22	External fan motor not working correctly. External fan inverter circuit protection tripped.	Check free fan movement. Replace fan motor inverter board.
P26	Compressor inverter circuit protection tripped.	Disconnect and reconnect power to the device and check that the compressor starts up correctly.
P29	Compressor not working properly.	Check inverter board wiring and replace it, if needed.
H01	Surge detected by inverter board of the compressor.	Cooling problem of the radiating plate of the inverter board. Check cleanness of the heat sink. Check electric connections of the compressor.
H05	External unit control board software to be updated.	Contact Technical Service Centre for replacement.
H31	HIC driver board malfunction	Contact Technical Service Centre for replacement.
F01	Liquid sensor E1 on indoor unit disconnected, interrupted or short-circuited.	Check sensor and replace it, if needed.
F02	Condensation sensor E2 sensor on indoor unit disconnected, interrupted or short-circuited.	Check sensor and replace it, if needed.
F04	Compressor delivery sensor TD disconnected, interrupted or short-circuited.	Check sensor and replace it, if needed.
F06	Liquid sensor C1 on external unit battery disconnected, interrupted or short-circuited.	Check sensor and replace it, if needed.
F07	Condensation sensor C2 on external unit battery disconnected, interrupted or short-circuited.	Check sensor and replace it, if needed.
F08	External temperature sensor TO disconnected, interrupted or short-circuited.	Check sensor and replace it, if needed.
F10	Adjustment signal connection from controller disconnected, interrupted or short-circuited.	Check the connection of the Tout connector and the INN-PDC_03 controller to the CN104 connector on the PAW-ACXA73-38670 board.
F12	Compressor intake sensor TS disconnected, interrupted or short-circuited.	Check sensor and replace it, if needed.
F29	Indoor unit EEprom problem.	Disconnect and reconnect to the device and check for correct operation. Replace the EEprom of the PAW-ACXA73-38670 board.
F31	Indoor unit EEprom problem.	Disconnect and reconnect power to the device and check correct operation. Replace and reprogram the external unit board.
L02	Parameter incompatibly between internal and external unit.	Check the automatic settings of the address again. Contact Technical Service Centre to run programming again.
L08	No setting in the indoor unit.	
L09	No setting in the indoor unit.	
L10	No setting in the indoor unit.	
L13	Incorrect settings of parameters in the indoor unit.	
L18	4-way valve malfunctioning. E1 and E2 probes measure low temperatures during heating. E1 and E2 probes measure high temperatures during cooling.	This could be a transitory situation. Disconnect and reconnect power to the unit and check for correct operation.

Alarms displayed	Cause	Solution
E01	Automatic address setting has not been completed. Wiring between internal and external unit are cut or not connected correctly.	Check the connection between the indoor unit and the outdoor unit.
E03	Signal reception error by indoor unit.	
E04	Signal reception error by indoor unit.	
E06	Problems of communication between external and indoor units.	
E07	Problems of communication between external and indoor units.	
E15	Power of indoor unit lower than external unit.	Check device size and reconfigure the indoor unit.
E16	Power of external unit lower than indoor unit.	Check device size and reconfigure the indoor unit.
E20	Automatic addressing procedure interrupted.	Check the connection between the indoor unit and the outdoor unit.
E31	Problems of communication between external and indoor units.	

CONFIGURATION ACCESSORIES

7.1 Heater kit

GB0684II - Heating elements 6 kW (3 steps of 2 kW). Factory setting 2 kW for single-phase heat pumps



7.1.1 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
Minimum wire cross-section area	mm ²	4,00	4,00

Three-phase power supply

Connection		Stage 1+2+3
Power draw	kW	6,00
Current draw	A	8,70
Minimum wire cross-section area	mm ²	2,50

7.1.2 Checks with the machine switched on

ⓘ This check should only be carried out if the unit is equipped with an electrical heating element.

After starting up, check that

- the heating element operation indicator light is on

7.1.3 Failures of the heating element

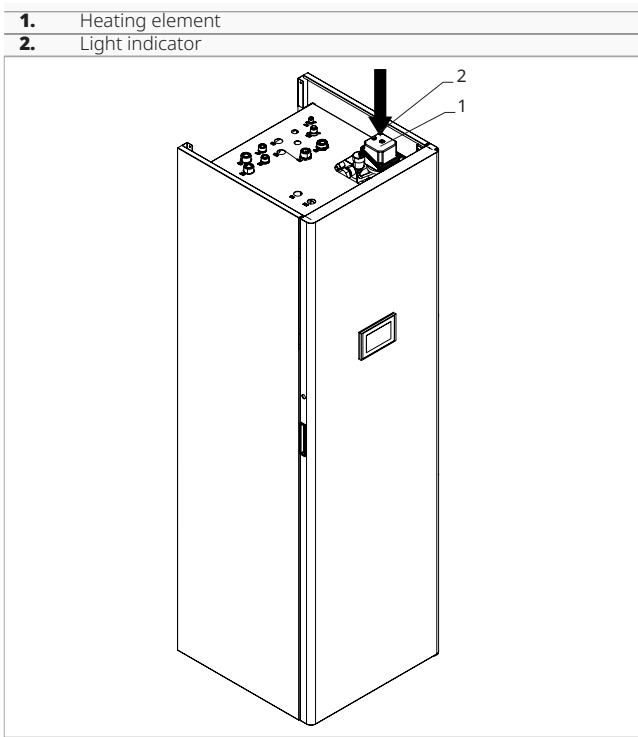
Failure of the electrical resistance is indicated by the operating light going out.

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.

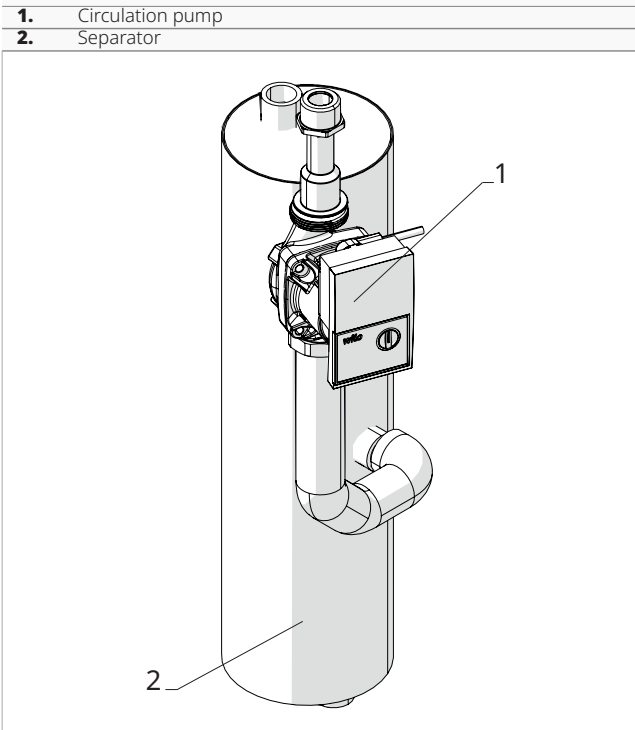
⚠ If the fault occurs several times in a given period of time (e.g. 3 times in 1 hour), contact the Technical Service Centre.



7.2 Secondary separator kit with circulation pump PP3

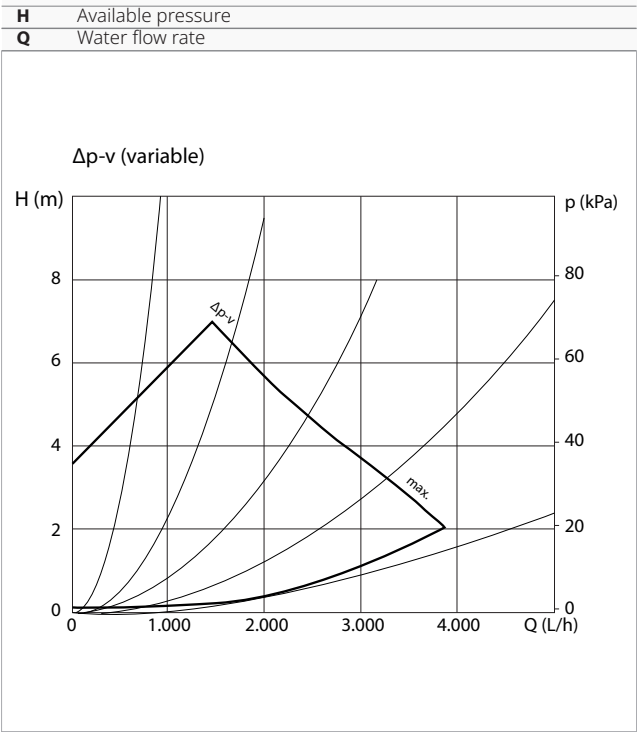
GB0683II - Secondary separator kit - Secondary hydraulic unit: hydraulic separator, system pump (DC Inverter class A) and fittings
GB1020II - Oversized secondary separator kit - Secondary hydraulic unit: hydraulic separator, system pump (DC Inverter class A) and fittings

- ⚠ The separator kit is mandatory unless it is already present in the system.
- ⚠ Accessories can be installed and tested at the factory.

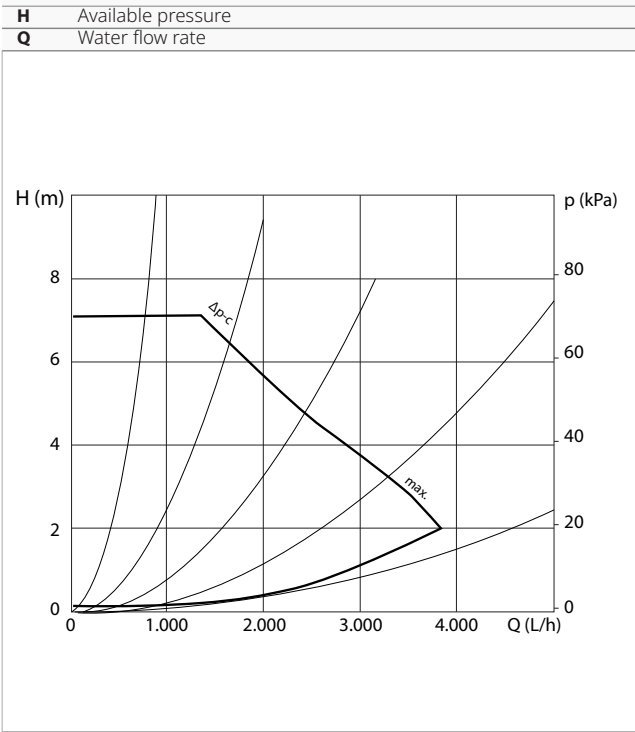


7.2.1 Pump flow rate/head graph secondary separator kit

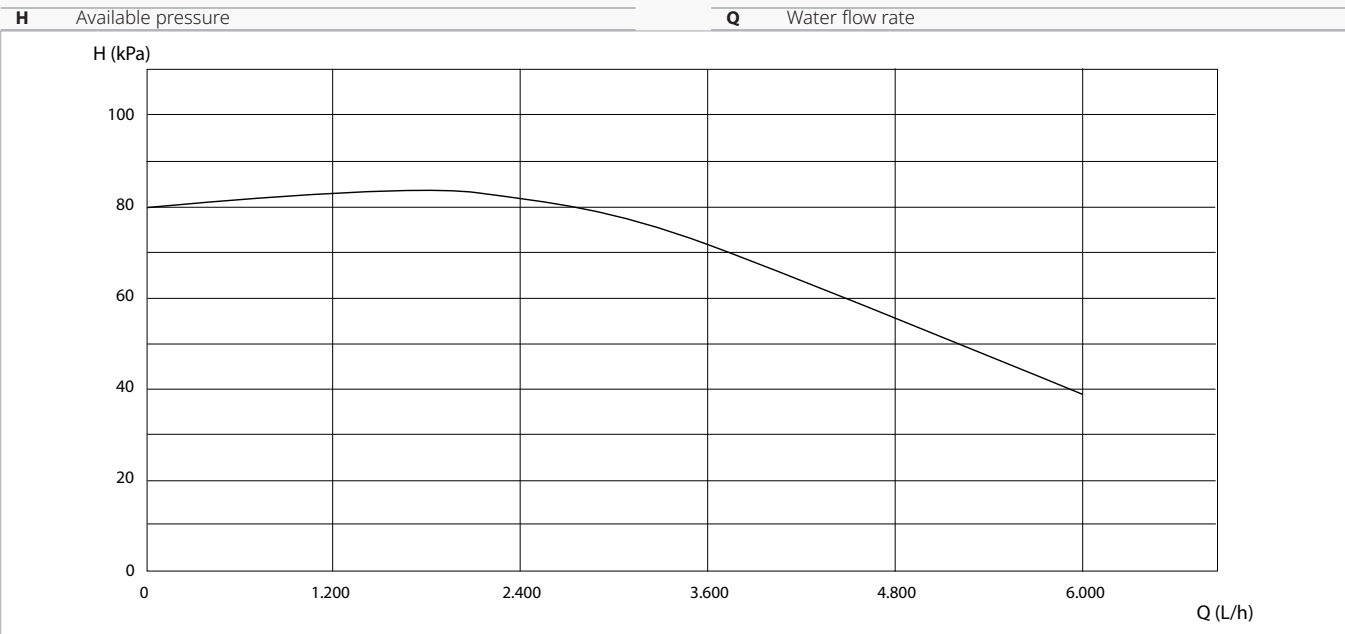
Proportional control



Constant pressure

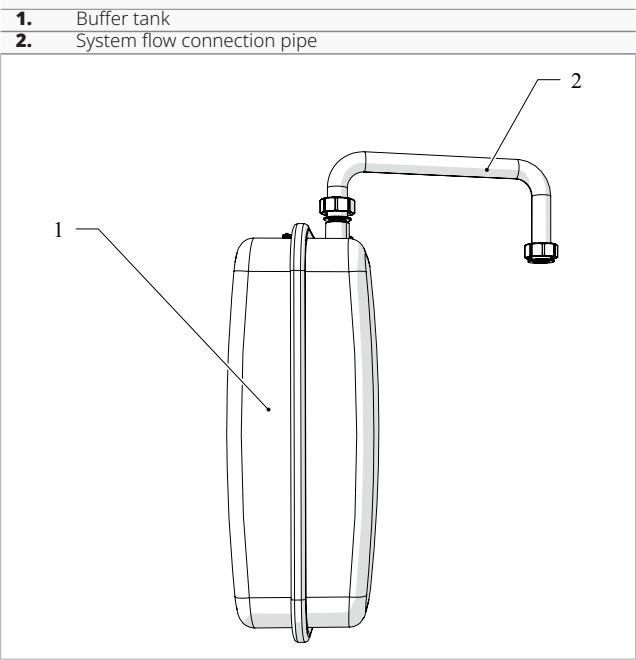


7.2.2 Pump flow rate/head graph Oversized secondary separator kit

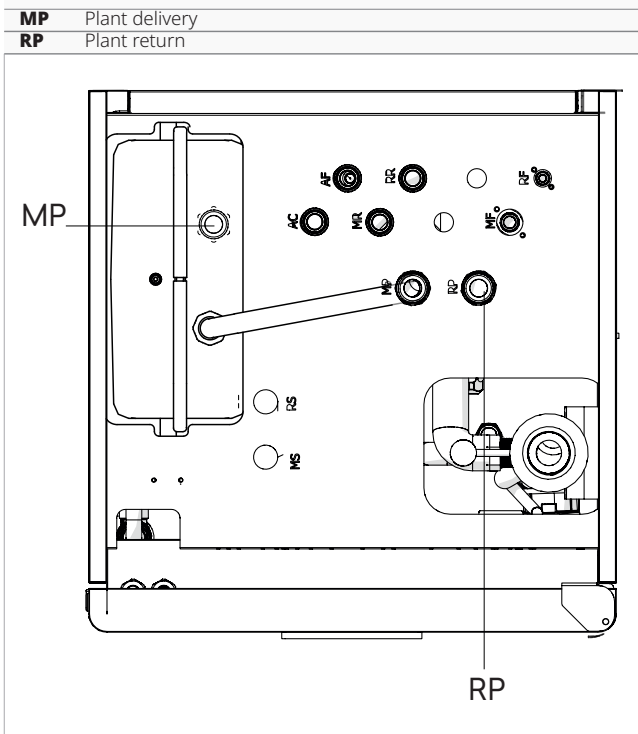


7.3 Buffer vessel kit

GB1016II - Integrated inertial tank 20 L

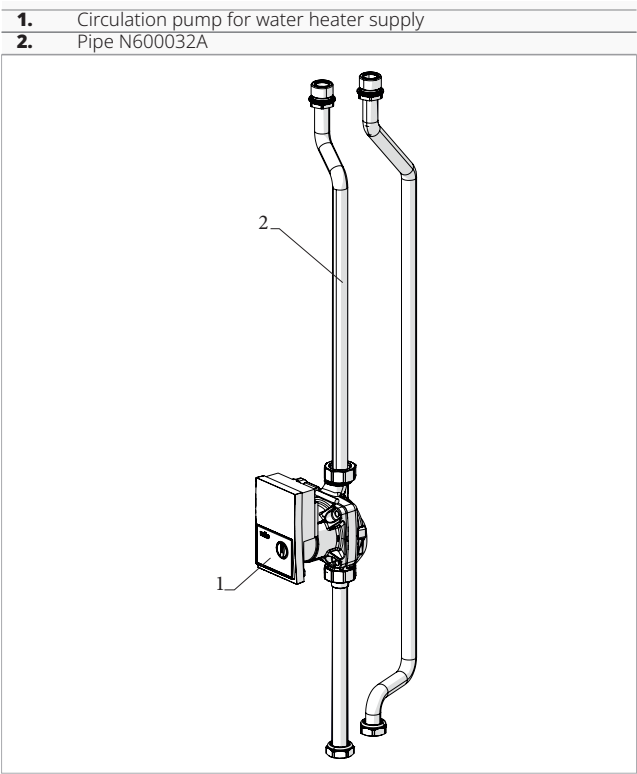


7.3.1 Hydraulic connections

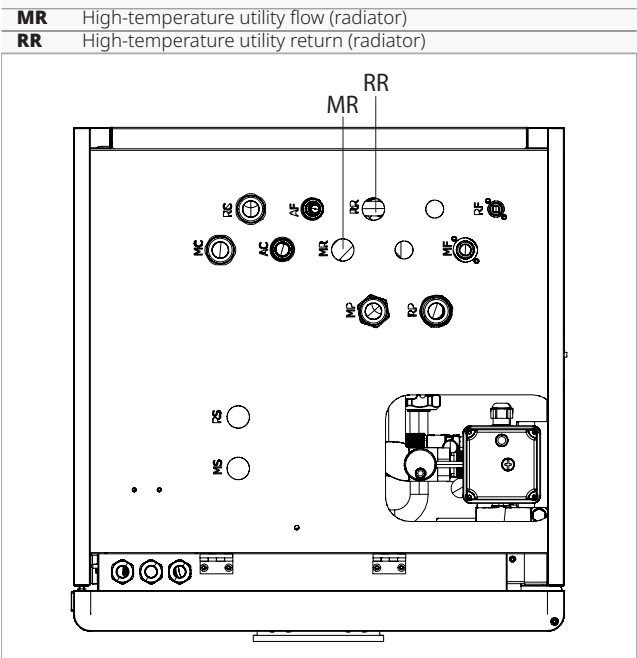


7.4 Heated towel rail kit

GB0736II - Hydraulic unit and circulation pump for high temperature Heated towel rail feeding



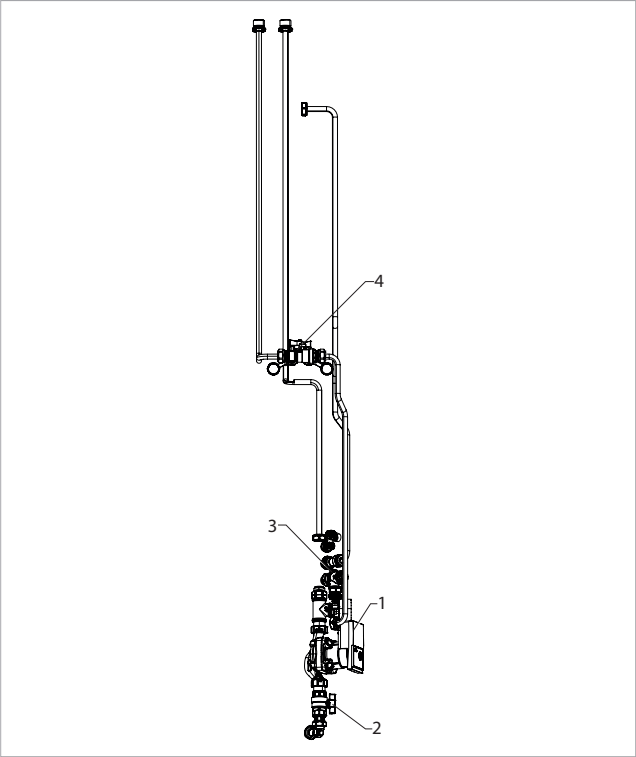
7.4.1 Hydraulic connections



7.5 Solar heating kit

GB0685II - Solar unit: control unit, pump, safety valve, 24 litre expansion tank, loading unit

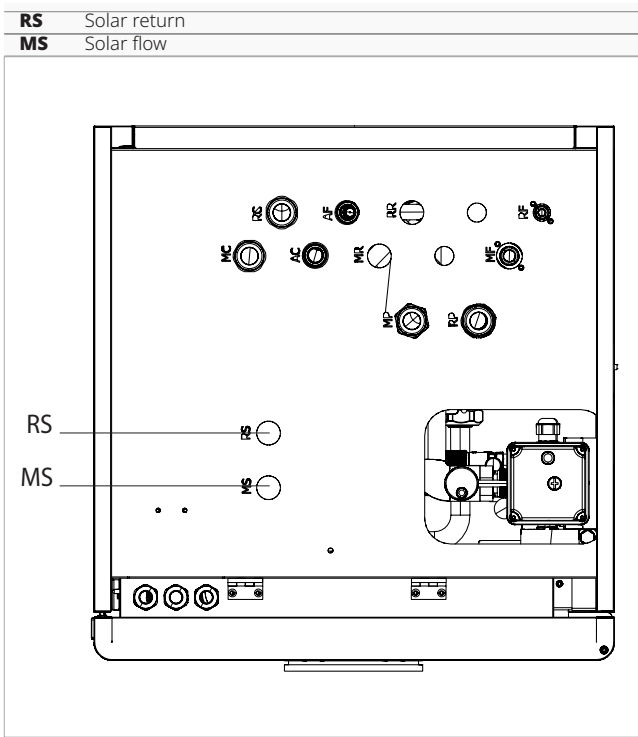
- | | |
|----|--------------------|
| 1. | Circulation pump |
| 2. | Solar kit cock |
| 3. | 3-bar safety valve |
| 4. | Charge/drain valve |



⚠ In order to prevent the occurrence of undesirable natural circulation, install a check valve at the outlet to the collector (MS connection), or preferably make a siphon.

7.5.1 Hydraulic connections

Position and dimensions



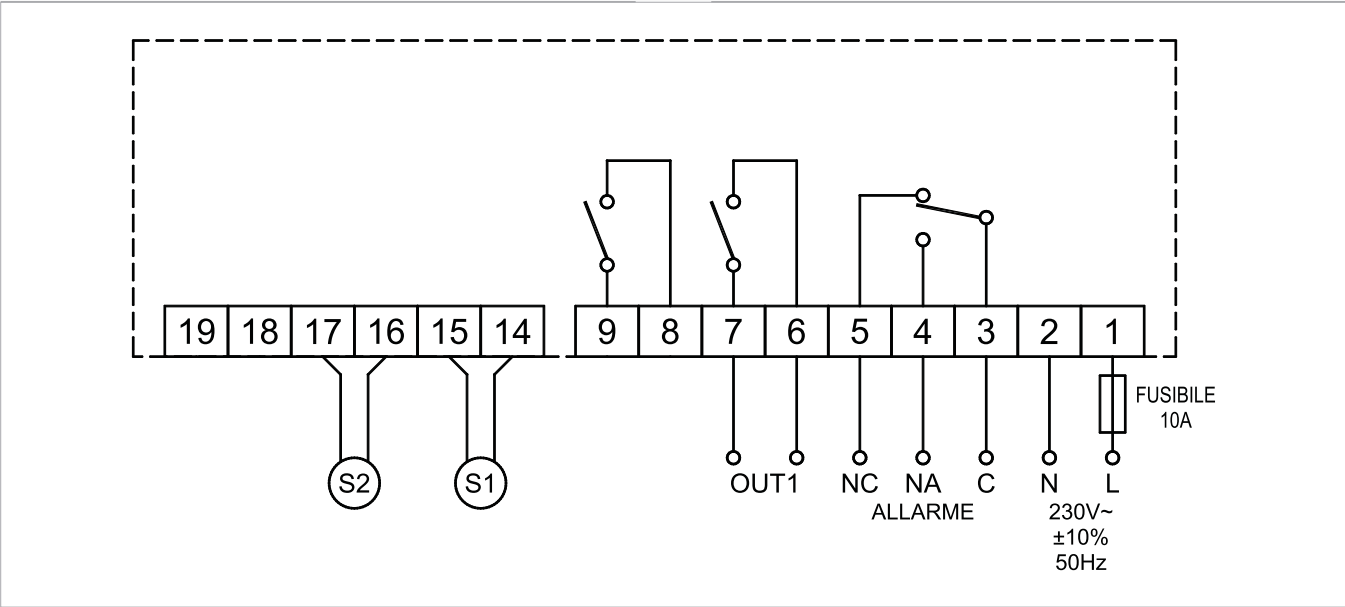
7.5.2 Solar unit connection

The device with solar integration is provided complete with electronic control unit which was pre-wired at the factory.

– sensor S1 must be positioned on the solar collector

- | | |
|------|-------------------------------|
| S1 | Solar panel sensor |
| S2 | Hot water tank sensor |
| OUT1 | PSO solar pump output |
| NC | Alarm contact normally closed |

- | | |
|----|-----------------------------|
| NA | Alarm contact normally open |
| C | Common |
| N | Neutral (power supply) |
| L | Line (power supply) |



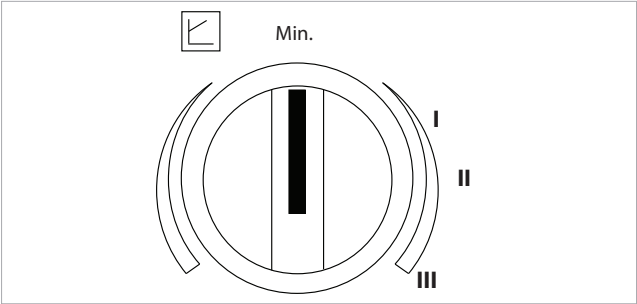
Solar pump PSO

On the front part of the pump body there is a regulator that allows to select the head according to the actual solar system requirement.

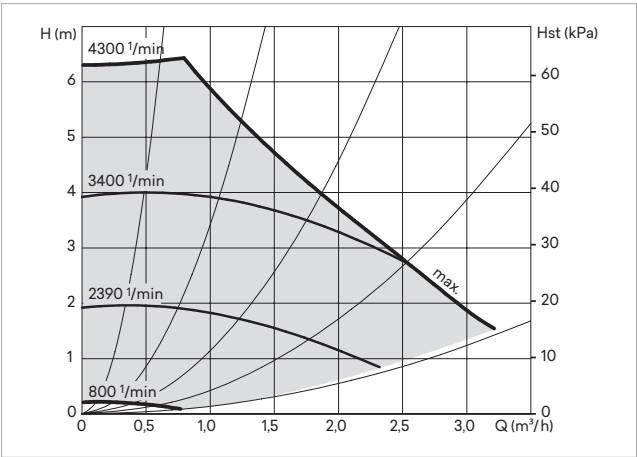
The setting of the head value of the solar pump PSO must be carried out with:

- the solar system working
- all distribution valves open
- utilities on

⚠ Verify that the temperature difference is congruent with the project.



Solar circuit PSO pump flow rate/head graph



7.6 Circulation pumps optional kits

Some optional kits require the use of circulation pumps. The control electronics allow selection of constant or variable head operating modes to allow automatic adaptation of performance to changing operating conditions of the hydraulic system.

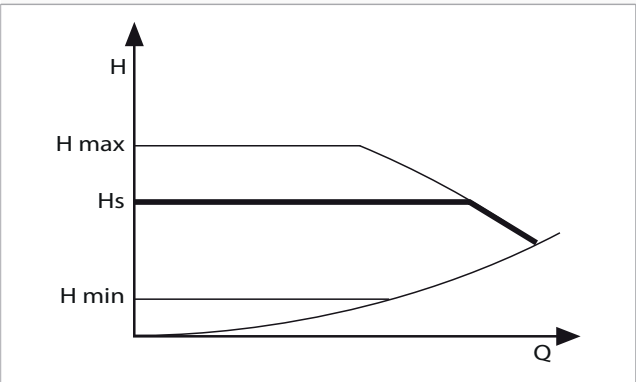
On the front of the pump body there is a regulator for selecting the following operating modes:

7.6.1 Constant pressure mode

In this mode (factory-set) the head generated by the pump is kept constant at the set value throughout the permitted flow rate range. This mode is indicated for systems with constant pressure drop, consumers in parallel and 2-way valves.

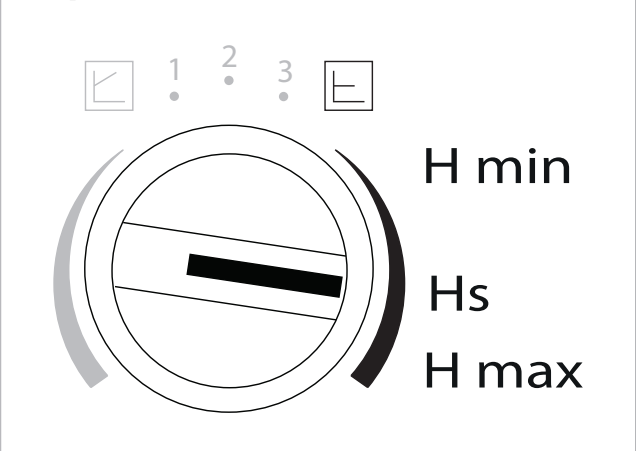
Constant pressure

H	Head
Q	Flow rate
H max	Maximum head
H min	Minimum head
Hs	Set head



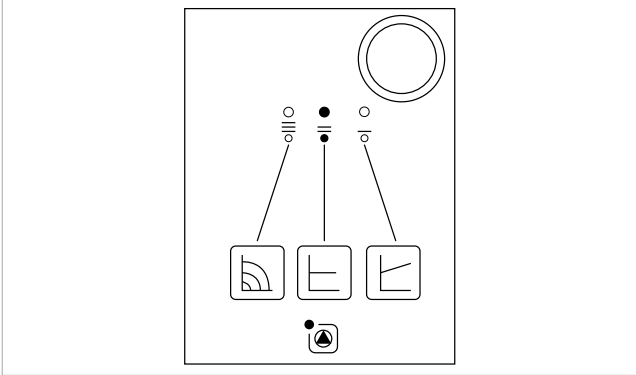
There are two different control modes according to the installed pump model:

Pump model variant 1



To adjust the speed:
– act on the knob
– select the desired function

Pump model variant 2



To adjust the speed with constant head:
– press the selection button in sequence until the LEDs light up

 Constant head mode

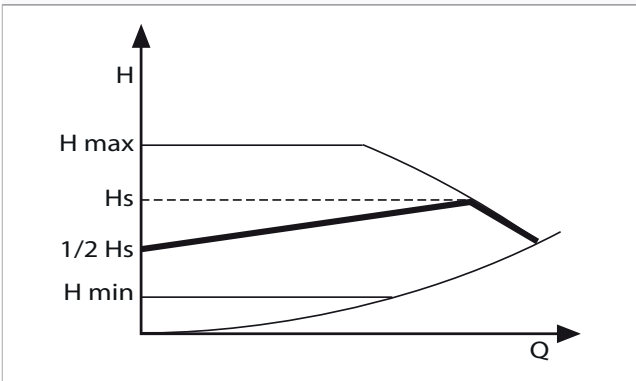
 Medium speed

7.6.2 Variable pressure mode

In this mode, the electronic system varies the head developed by the pump between the set value and half of the same as the water flow rate varies. This mode is particularly suitable for plants with constant pressure drop and 3-way valves.

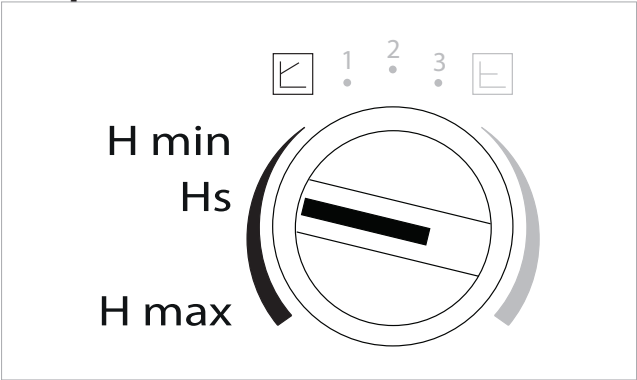
Variable pressure

H	Head
Q	Flow rate
H max	Maximum head
H min	Minimum head
Hs	Set head



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

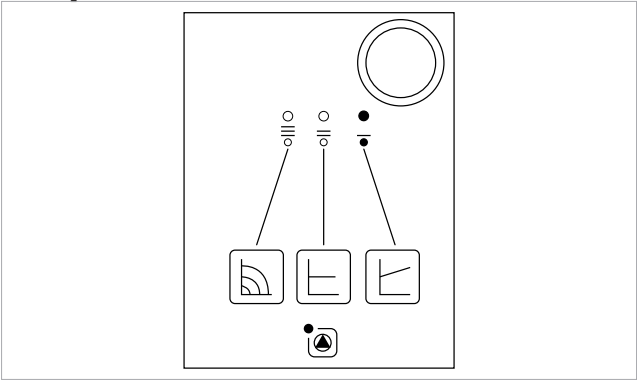
Pump model variant 1



To adjust the speed:

- act on the knob
- select the desired function

Pump model variant 2



To adjust the speed with constant head:

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


- Variable head mode
- Minimum speed

TECHNICAL INFORMATION

8.1 Technical data

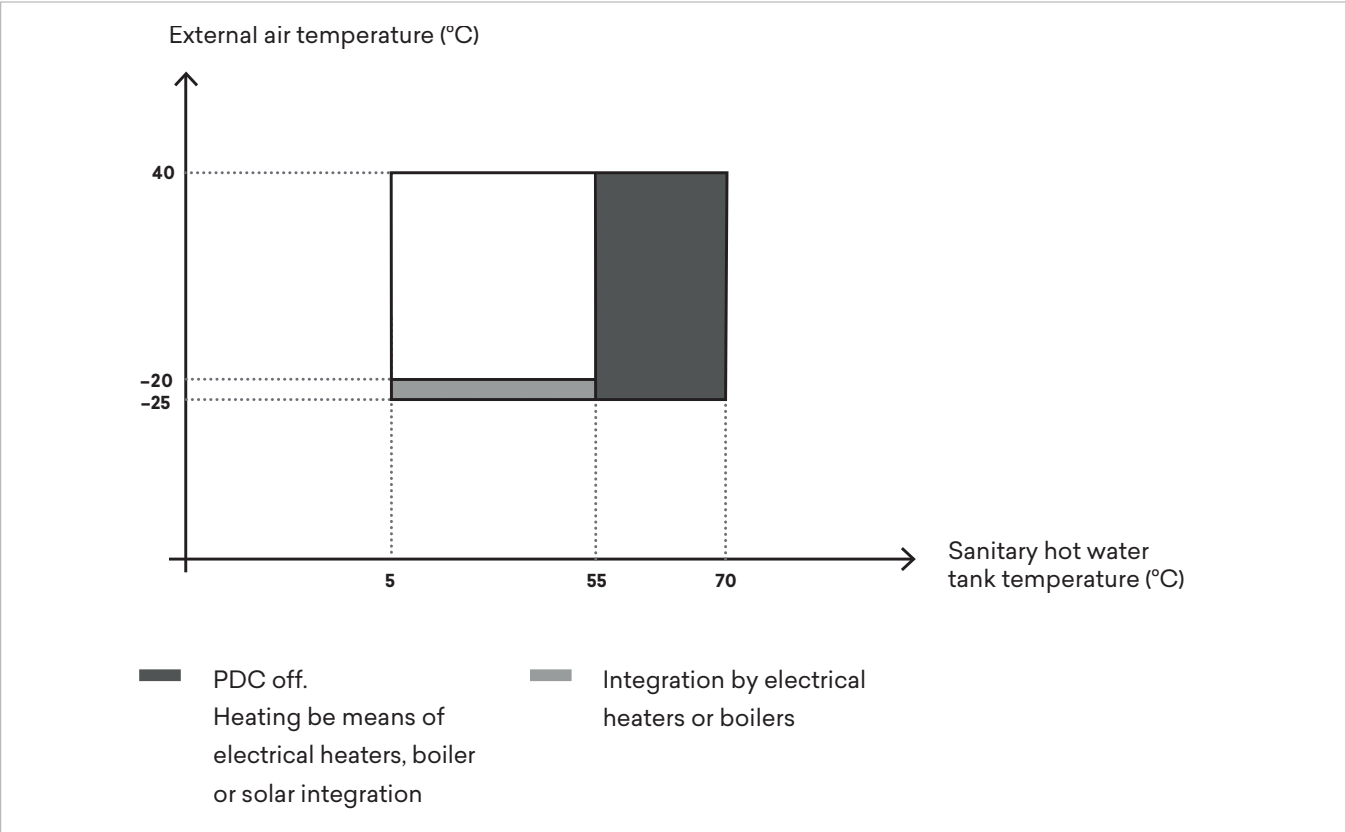
Models		m.u.	5	7	9	12	15
Heating performances (A 7 °C BS; W 35 °C)							
Maximum heat output	(1)	kW	6,80	8,50	13,07	18,32	22,80
Nominal heat power	(1)	kW	5,58	7,10	8,10	11,59	14,61
Total absorbed power	(1)	kW	1,31	1,64	1,79	2,35	2,95
COP	(1)		4,26	4,33	4,53	4,93	4,95
SCOP	(1)(2)		4,90	4,80	4,82	4,89	4,92
Energy efficiency							
Energy efficiency class	(3)		A+++				
Heating performances (A-7 °C BS; W 35 °C)							
Maximum heat output	(4)	kW	4,59	7,72	8,73	11,70	14,74
Nominal heat power	(4)	kW	3,76	4,32	4,86	6,93	9,03
Total absorbed power	(4)	kW	1,25	1,52	1,67	2,11	2,87
COP	(4)		3,01	2,84	2,91	3,28	3,15
Cooling performances (A35 °C; W 18 °C)							
Maximum cooling capacity	(5)	kW	6,00	11,01	11,27	16,74	18,56
Nominal cooling power	(5)	kW	4,70	7,40	8,70	12,30	15,60
Total absorbed power	(5)	kW	1,30	1,80	2,10	3,00	3,90
EER	(5)		3,66	4,02	4,21	4,09	4,00
SEER	(5)		6,80	7,30	6,90	7,05	6,62
Cooling performances (A35 °C; W 7°C)							
Maximum cooling capacity	(6)	kW	4,11	7,56	8,11	11,79	13,34
Nominal cooling power	(6)	kW	3,50	5,30	6,30	8,90	11,20
Total absorbed power	(6)	kW	1,40	1,80	1,80	2,80	3,50
EER	(6)		2,48	3,03	3,18	3,22	3,20
SEER	(6)		5,78	5,80	5,45	5,50	5,12
Hydraulic data							
Nominal flow rate		L/min	16,0	20,4	23,2	33,2	41,9
Available pressure primary circuit		kPa	65,0	64,0	58,0	31,0	31,0
expansion vessel capacity		L	24	24	24	24	24
Minimum system water content		L	20	30	40	50	65
Refrigerant gas data							
Refrigerant charge		kg	1,32	1,32	1,80	3,05	3,05
<div>1. Water temperature in/out 30/35 °C; outdoor air temperature 7 °C; U.R. 85%</div> <div>2. Value referred to the Average climate profile for supply temperature of 35 °C. Values in compliance with Regulation 811/2013.</div> <div>3. 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</div> <div>4. Water temperature in/out 30/35 °C; outdoor air temperature -7 °C</div> <div>5. Water in/out temperature 23/18 °C; outside air temperature 35 °C (radiant application)</div> <div>6. Water in/out temperature 12/7 °C; outside air temperature 35 °C (fancoil application)</div> <div>7. Sound pressure measured at a distance of 1 meter according to ISO 7779</div>							

Models		m.u.	5	7	9	12	15
Refrigerant			R32				
Suction		“SAE	5/8				
Liquid		“SAE	1/4	1/4	3/8	3/8	3/8
Sound data							
Sound pressure	(7)	dB(A)	30,0	30,0	30,0	31,0	31,0
Electrical data							
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
Indoor unit protection degree			IPX2				
Product dimensions and weight							
Total width		mm	600	600	600	600	600
Total height		mm	2000	2000	2000	2000	2000
Total depth		mm	600	600	600	600	600
Empty weight		kg	179,0	179,0	179,0	179,0	179,0
1. Water temperature in/out 30/35 °C; outdoor air temperature 7 °C; U.R. 85% 2. Value referred to the Average climate profile for supply temperature of 35 °C. Values in compliance with Regulation 811/2013. 3. 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 4. Water temperature in/out 30/35 °C; outdoor air temperature -7 °C 5. Water in/out temperature 23/18 °C; outside air temperature 35 °C (radiant application) 6. Water in/out temperature 12/7 °C; outside air temperature 35 °C (fancoil application) 7. Sound pressure measured at a distance of 1 meter according to ISO 7779							

 Refer to the manual of the outdoor unit for data about the refrigerating circuit.

8.2 Operating limits

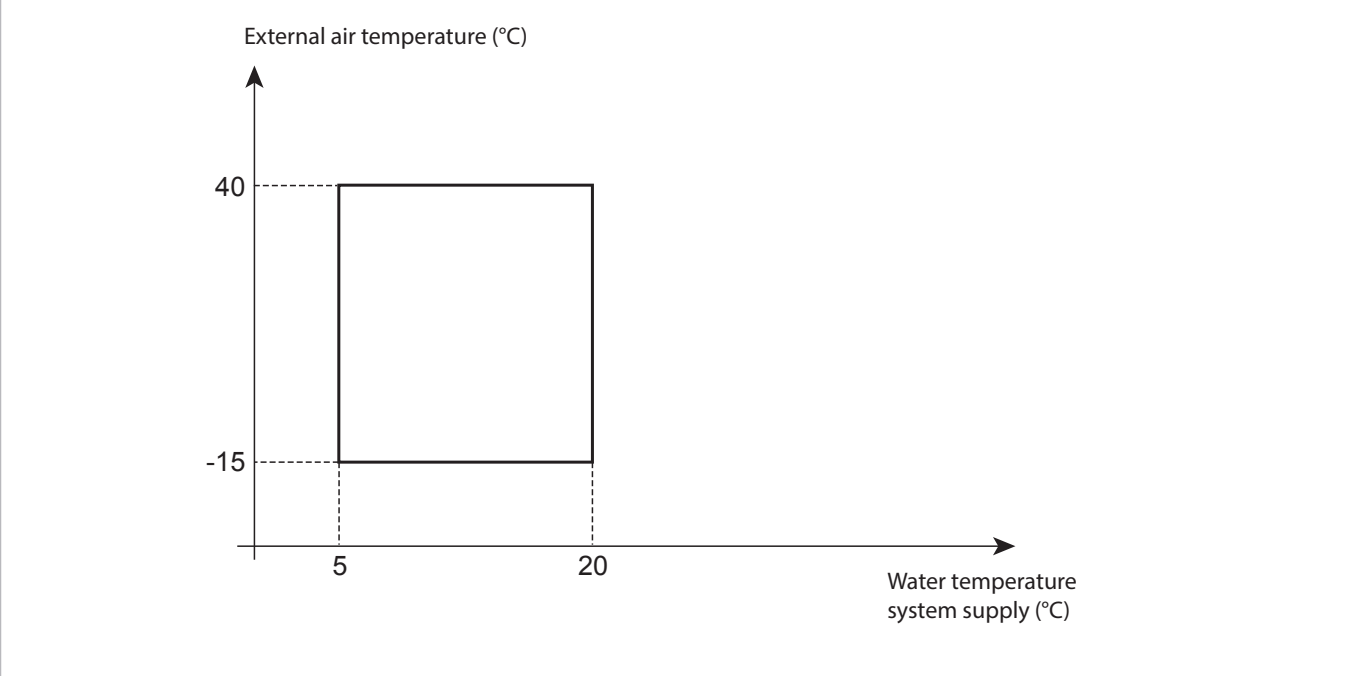
Domestic hot water



⚠ 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.

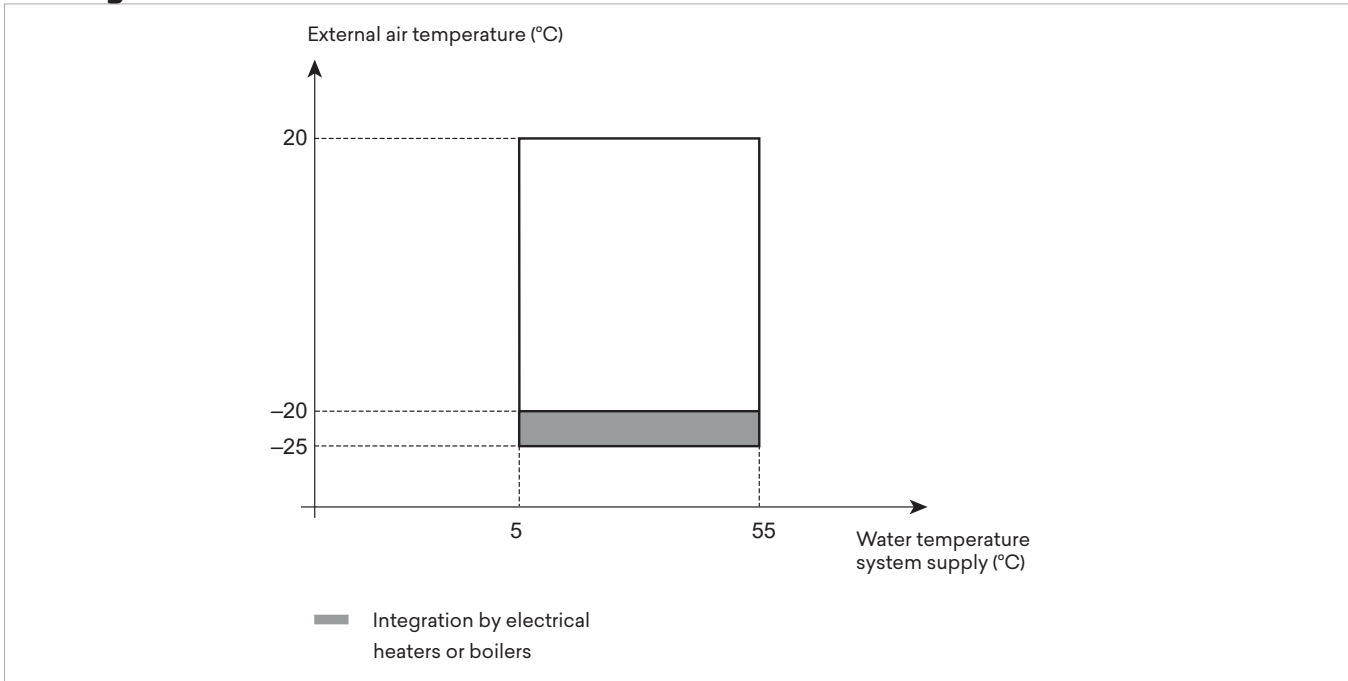
⚠ the unit may reduce the outlet water temperature of the condenser at outdoor air temperatures below -15 °C.

Cooling



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

Heating



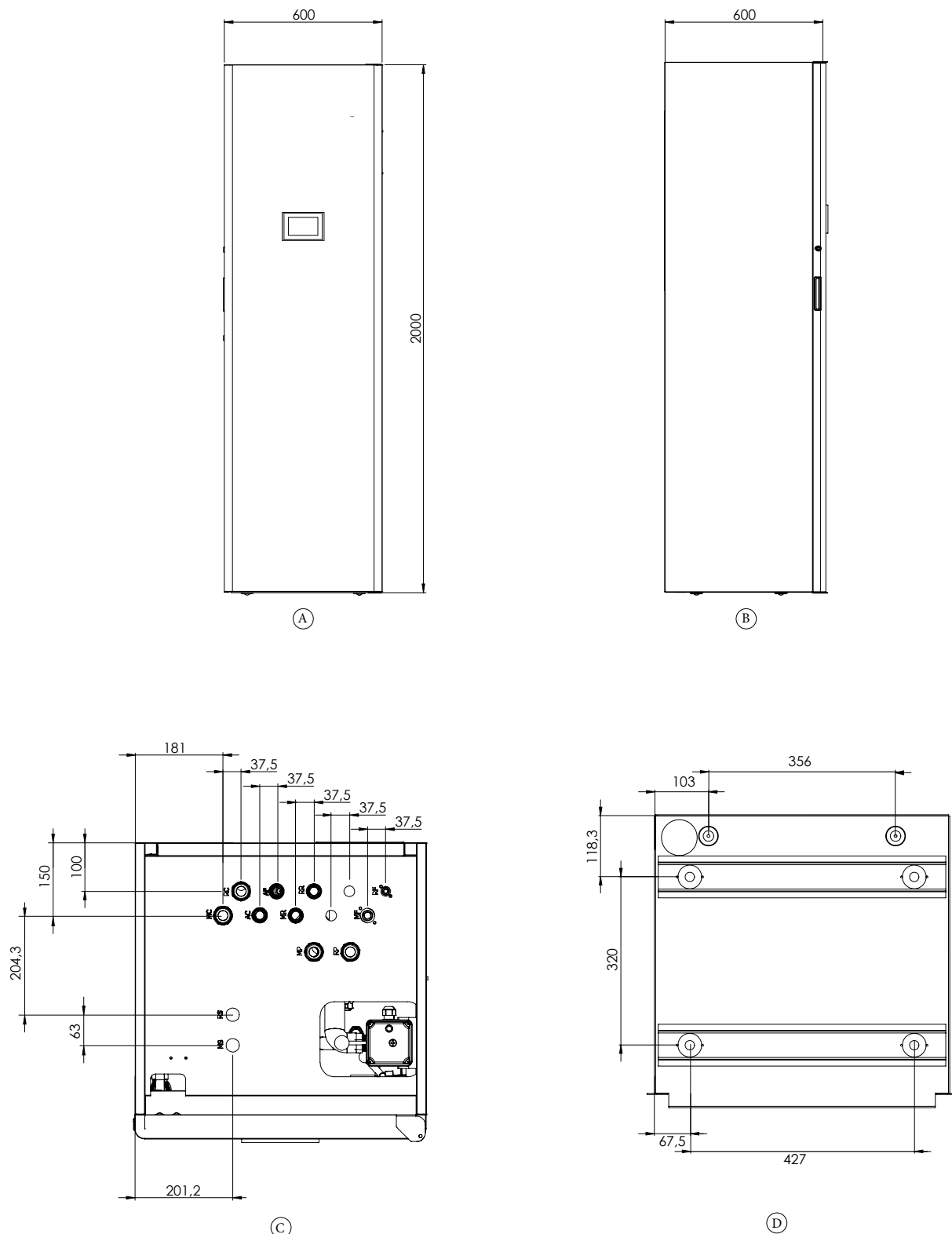
⚠ The areas represented by the graph marked by back-up heater are simplified. They could be more advantageous (greater contribution of the heat pump) in relation to the operating conditions and internal operating parameters.

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

8.3 Dimensions

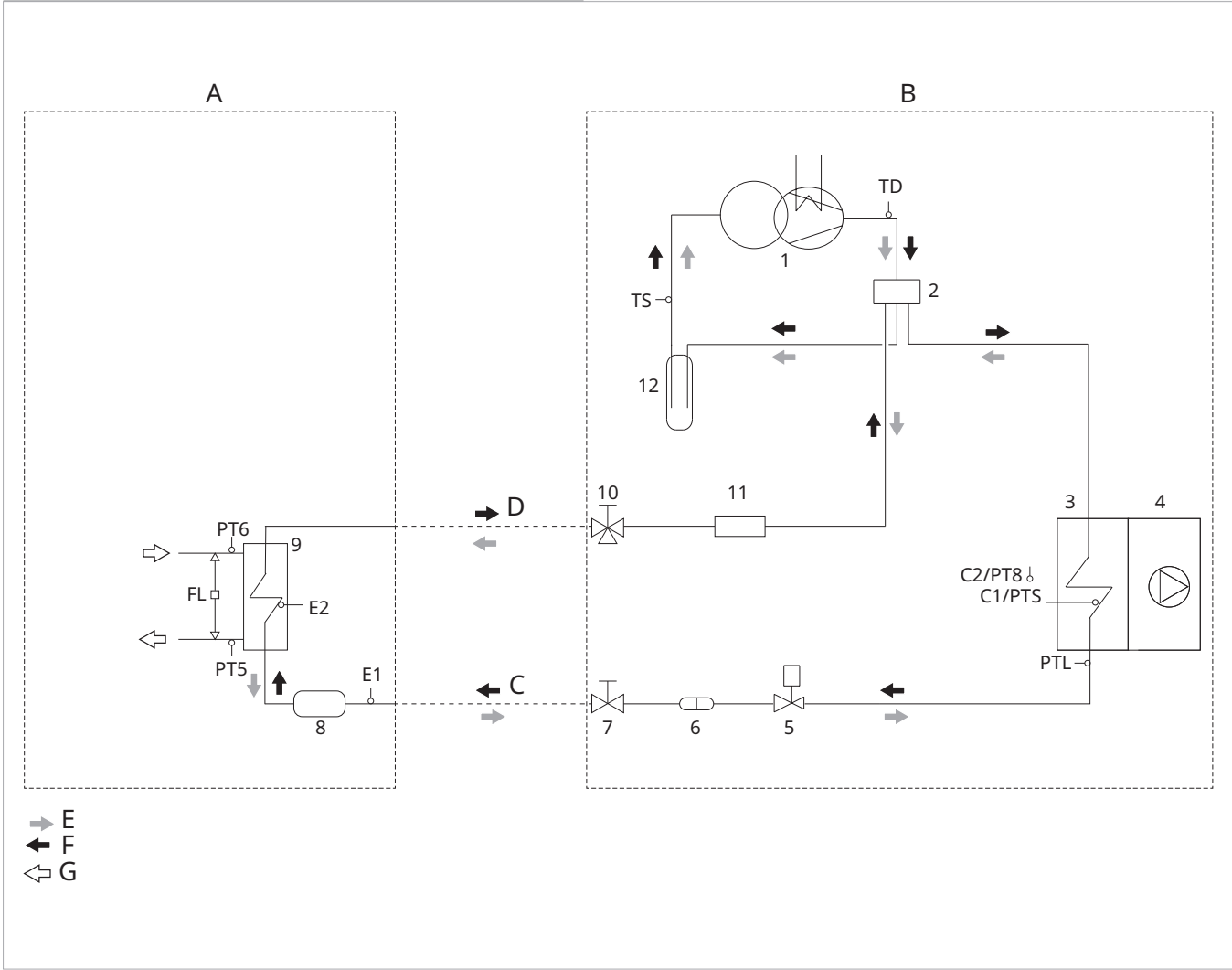
8.3.1 Indoor unit

A	Front view
B	Lateral view
C	Top view
D	Bottom view



8.4 Refrigerator diagram

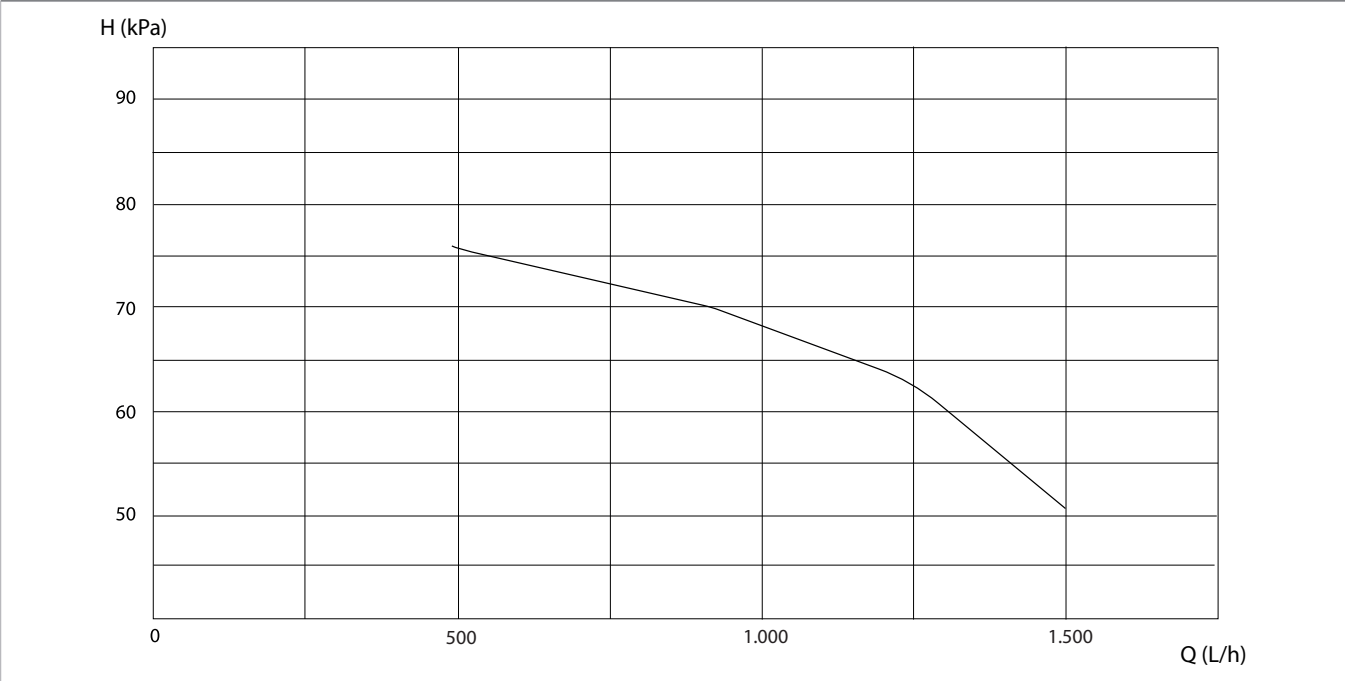
A	Indoor unit	9.	Heat exchanger
B	Outdoor unit	10.	Three-way shut-off valve
C	Liquid connection pipe	11.	Silencer with filter
D	Gas connection pipe	12.	Suction separator
E	Refrigerant direction in heating	TS	Intake probe
F	Refrigerant direction in cooling	TD	Delivery probe
G	Water system direction	TO/PT8	Outside air probe
1.	Compressor	C2	Condenser probe
2.	Four-way valve	C1	Liquid line probe
3.	Heat exchanger	E1	Evaporator pipe probe
4.	Fan	E2	Exchanger probe
5.	Electronic expansion valve	FL	Flow switch
6.	Filter	PT5	Water outlet probe
7.	Two-way shut-off valve	PT6	Water inlet probe
8.	Liquid receiver		



8.5 PP1 circulation pump graphs

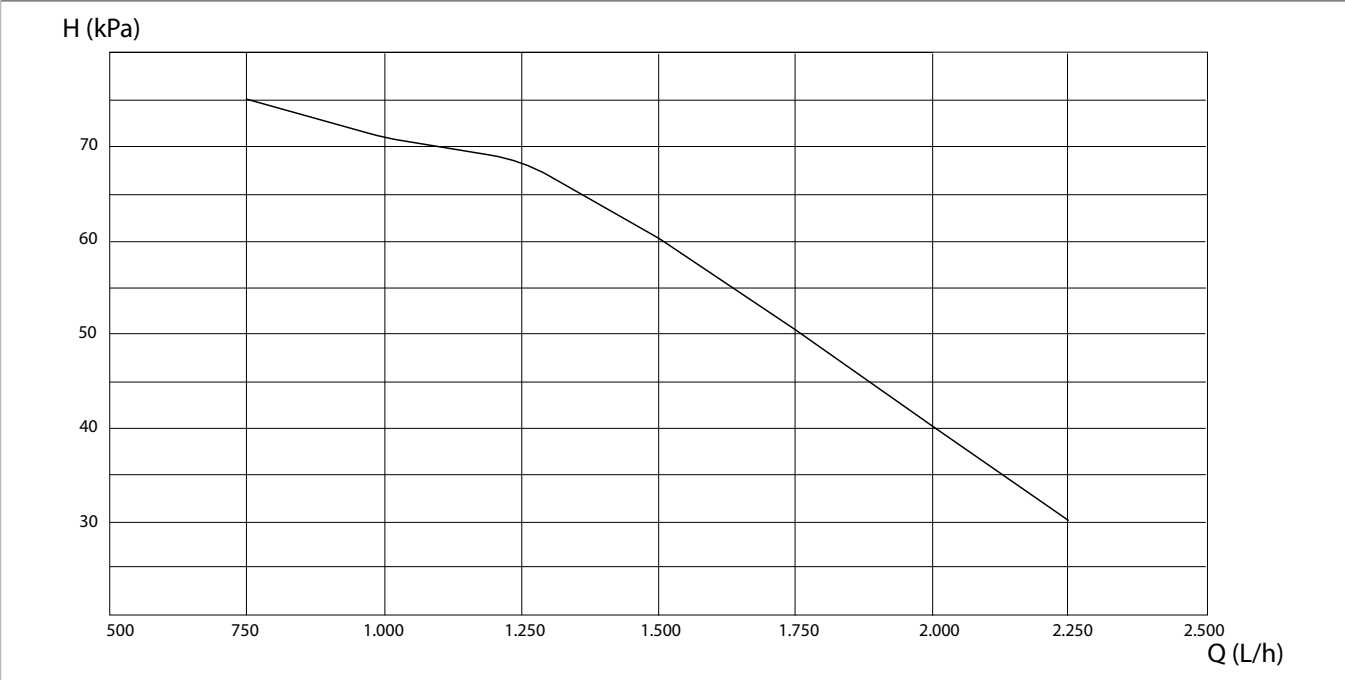
8.5.1 Model 5 - 7 - 9

A Static pressure available
B Water flow



8.5.2 Model 12 - 15

A Static pressure available
B Water flow





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INNOVA S.r.l.
Via I Maggio 8 - 38089 Storo (TN) - ITALY
tel. +39.0465.670104 - fax +39.0465.674965
info@innovaenergie.com